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Agricultural Land Classification.

Land at Birds Edge, Penistone Road.

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1.0 Introduction

- 1.1 Patrick Stephenson Ltd is instructed by Yorkshire Planning Limited to investigate the Agricultural Land Classification (ALC) and soil resources of land to the northeast of Birds Edge ('the Site'). The envelope covers approximately 4 hectares for development of residential dwellings. The land is at Grid Reference SE 2007 3385.
- 1.2 Guidance for assessing the quality of agricultural land in England and Wales is set out in the Department for Environment and Rural Affairs (Defra) revised guidelines and criteria for grading the quality of agricultural land¹, also in Natural England's Technical Information Note (TIN) 049² and "Specifications for Topsoil" British Standards Institute 2007³.
- 1.3 Agricultural land in England and Wales is graded between 1 and 5, depending on the extent to which physical or chemical characteristics impose long-term limitations on agricultural use. The principal physical factors influencing grading are climate, site and soil which, together with interactions between them, form the basis for classifying land into one of the five grades.
- 1.4 Grade 1 land is excellent quality agricultural land with very minor or no limitations to agricultural use. Grade 2 is very good quality agricultural land, with minor limitations which affect crop yield, cultivations or harvesting. Grade 3 land has moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield, and is subdivided into Subgrade 3a (good quality land) and Subgrade 3b (moderate quality land). Grade 4 land is poor quality agricultural land with severe limitations which significantly restrict the range of crops and/or level of yields. Grade 5 is very poor-quality land, with very severe limitations which restrict use to permanent pasture or rough grazing.
- 1.5 Land, which is classified as Grades 1, 2 and 3a in the ALC system is defined as 'best and most versatile' (BMV) agricultural land.
- 1.6 As explained in Natural England's TIN049, the whole of England and Wales was mapped from reconnaissance field surveys in the late 1960s and early 1970s, to provide general strategic guidance on agricultural land quality for planners.

¹ Defra (2025) - Agricultural Land Classification of England and Wales. Revised guidelines and criteria for grading the quality of agricultural land. MAFF Publications (Appendix 7)

² Natural England (2012) - Technical Information Note 049 - Agricultural Land Classification: protecting the best and most versatile agricultural land, Second Edition

³ "Specifications for Topsoil" British Standards Institute 2007³.

This Provisional Series of maps was published on an Ordnance Survey base at a scale of One Inch to One Mile (1:63,360).

The Provisional ALC map shows the site as Grade 3. However, TIN049 explains that:

"These maps are not sufficiently accurate for use in assessment of individual fields or development sites and should not be used other than as general guidance. They show only five grades: their preparation preceded the subdivision of Grade 3 and the refinement of criteria, which occurred after 1976. They have not been updated and are out of print. A 1:250 000 scale map series based on the same information is available. These are more appropriate for the strategic use originally intended ..."

1.7 TIN049 goes on to explain that a definitive ALC grading should be obtained by undertaking a detailed survey according to the published guidelines, at an observation density of one boring per hectare. This survey follows the detailed methodology set out in the ALC guidelines.

2.0 Site and Climatic Conditions

2.1 'The Site' is located immediately to the northeast of the A629 Birds Edge, centred on Ordnance Survey (OS) SE 2007 3385. The proposed development area covers approximately 4.0 ha. Appendix 1 shows the proposed development land location. The land is gently undulating with no grade restrictions.

Agro-climatic conditions

2.2 Agro-climatic data for the site have been interpolated from the Meteorological Office's standard 5km grid point data set, at a representative altitude of 180m AOD, and are given in Table 1. The site is wetter than average, moisture deficits are below average, and the number of Field Capacity Days is well above average (average for lowland England is 150) so there are limitations on the opportunities for agricultural field work. There is overriding climatic limitation to agricultural land quality. The Metropolitan Weather Office data for the Birds Edge area is shown below.

Table 1. Climatological Data

Altitude	189 m
Accumulated temperature January-June C°	1215
Average Annual Rainfall	850 mm
Field Capacity Days	210
Moisture Deficit Winter Wheat	71
Moisture Deficit Potato	52

Soil Parent Material and Soil Type

2.3 The main soil type for the site is described as RIVINGTON 1 (541f) a well-drained coarse loamy soil over sandstone. Locally, associated with similar soils affected by groundwater. The major land use on this association is defined as Dairying and stock rearing; some arable land in drier areas; coniferous woodland. The parent material is Carboniferous and Jurassic sandstone.

3.Agricultural land quality

Soil survey methods

Five soil profiles (Appendix 4 sampling point descriptions) were examined using a narrow gouge auger at an observation density of approximately one per hectare, in accordance with the established recommendations for ALC surveys². 1 soil pit was excavated to 50 cm depth, to examine soil structure. At each observation point the following characteristics were assessed for each soil horizon up to a maximum of 50cm or any impenetrable layer:

- soil texture.
- significant stoniness.
- colour (including localised mottling).
- Consistency.
- Structural condition.
- free carbonate.
- and depth.

⁴ British Geological Survey (2023). BGS Geology Viewer, <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer>

⁵ Soil Survey of England and Wales (1984).

- 3.2 Two soil samples were submitted for laboratory determination of particle size distribution, pH, organic matter content and nutrient contents (P, K, Mg). Results are in Appendix 2.
- 3.3 Soil Wetness Class (WC) is determined from the matrix colour, presence or absence of, and depth to, greyish and ochreous gley mottling, and slowly permeable subsoil layers at least 15cm thick, in relation to the number of Field Capacity Days at the location.
- 3.4 Soil droughtiness is investigated by the calculation of moisture balance equations (given in Appendix 2). Crop-adjusted Available Profile Water (AP) is estimated from texture, stoniness and depth, and then compared to a calculated moisture deficit (MD) for the standard crops wheat and potatoes. The MD is a function of potential evapotranspiration and rainfall. Grading of the land can be affected if the AP is insufficient to balance the MD and droughtiness occurs.

Soil types

- 3.5 Soil profiles have been described according to Hodgson⁵, which is the recognised source for describing soil profiles and characteristics according to the revised ALC guidelines. Appendix 3 has the soil profiles and Appendix 7 the pit descriptions.
- 3.6 The soils are broadly similar. A topsoil that was dark brown sandy loam. The subsoils were medium to coarse sands loam orange in colour.

Soils sandy loams leading to coarse medium sands and sandy loams

0-20 cm	Dark Brown (5 YR Value 4 Chroma 4) in the Munsell soil colour charts. Sandy loam. Stoneless throughout. Soil was very consistent with the slightly deeper soils being of the higher grade. Structure was coarse granular. Distinct boundary to subsoil. No calcareous material
20-50 cm	Distinct boundary. Medium to fine sand silty loam with occasional coal piece. Orange to light brown in colour (Value 7 Chroma 12). No calcareous material. Many stones and no calcareous material. Medium platy structures.

3.7 The soils are low in phosphorus, low in potassium and high in available magnesium (see Appendix 2). Soil organic matter levels to 25cm depth are above average for arable soils. The limited clay content would indicate a unstable soil with moderate fertility but prone to compaction. Appendix 5 shows the detailed ALC map.

Agricultural land classification and site limitations

3.8 Assessment of agricultural land quality has been carried out according to the revised ALC guidelines¹.

3.9 Given the soil depth, slope, stone content, rainfall and field capacity days of the site restricts agricultural land quality primarily to grade 4. The flatter area with slightly deeper soil in the northwest corner of the field is graded as 3b.

3.10 The ALC distribution of the site is shown in Appendix 6 and in Table 2 below.

Table 2 - Summary of ALC Grades

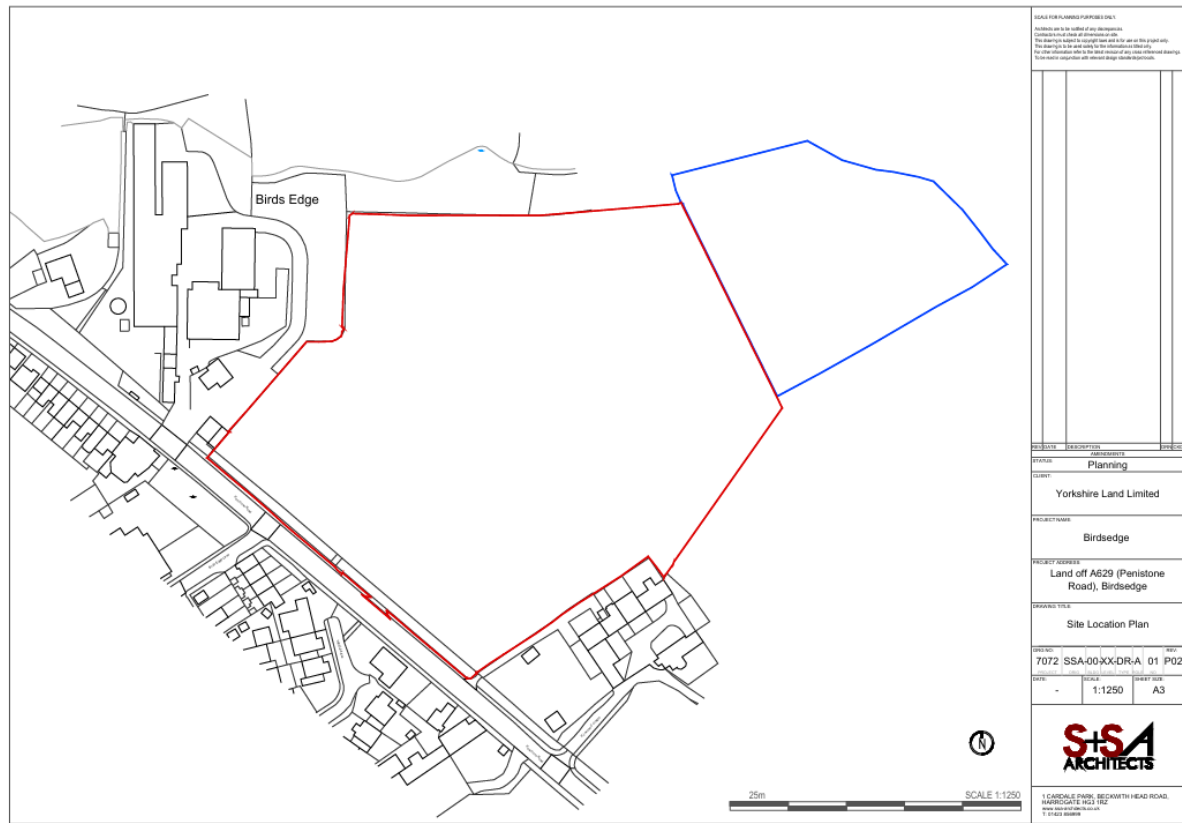
Grade/Subgrade	Approximate Area Ha	Area %
3b	0.8	20
4	3.1	77.5
Non-agricultural	0.1	2.5
Total	4.0	100

4.0 CONCLUSION

The area surveyed was approximately 4 ha and contained a majority of grade 4 land with a small proportion of 3b. The land was limited to grade 3b by its topsoil depth, stone content and wetness category. This assessment is in line with the information available on the Natural England data base.

Overall, the predominance of Grade 4 land (77.5%), means that the loss of this site would not be significant in agricultural terms at a local, regional or national level.

Appendix 1 - Site Location



Appendix 2 – Laboratory Results

A Topsoil

Analysis Results (SOIL)

Customer ARABLE ADVISOR
66 MIDDLETON RD
PICKERING
YO18 8NH

Distributor MR P STEPHENSON
BEECH LODGE
66 MIDDLETON ROAD
PICKERING
NORTH YORKSHIRE
YO18 8NH

Sample Ref BIRDSEDGE TOP

Date Received 02/07/2026 (Date Issued: 08/07/2026)

Sample No G254086/06 / ASTON BIRDS EDGE

Crop GRAZED GRASS (CATTLE)

Analysis	Result	Guideline	Interpretation	Comments
pH	6.1	6.0	Normal	Adequate level. Maintain pH to ensure optimum nutrient availability and ideal conditions for an active soil biology.
Phosphorus (ppm)	11	16	Low	(Index 1) 50 kg/ha P2O5 (40 units/acre).
Potassium (ppm)	37	121	Very Low	(Index 0) 60 kg/ha K2O (48 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.
Magnesium (ppm)	195	51	Very High	(Index 4) Possible interference with availability of Potassium.
Organic Matter (LOI) (%)	6.1	3.0	Normal	Good. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Ensure appropriate soil management practices are used to maintain organic matter levels.
Organic Carbon (LOI) (%)	3.6	1.7	Normal	Normal (See Organic Matter comment). Organic carbon is the measurable component of organic matter. Organic carbon and organic matter can be broken into distinct "pools". These pools include labile/active (particulate, almost entirely decomposed, readily available microbe foodsource), humus carbon (decomposing carbon) and recalcitrant organic carbon (resistant to decomposition). Each of these pools are involved in different soil processes (see: Active Carbon).

Analysis Results (SOIL)

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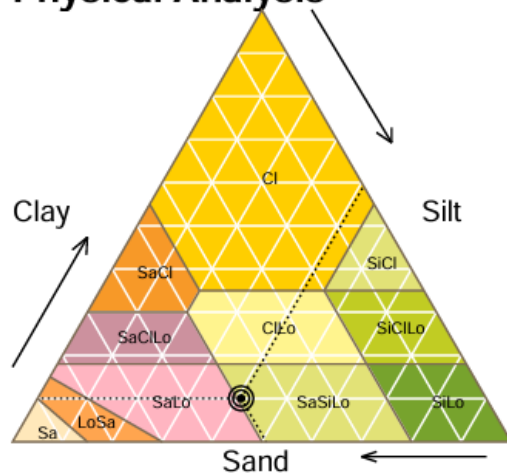
Sample Ref BIRDSEDGE TOP

Date Received 02/07/2026 (Date Issued: 08/07/2026)

Sample No G254086A/06

Crop NO CROP SPECIFIED

Physical Analysis



Analysis	Result (%)
Sand	49.14
Silt	40.82
Clay	10.04
Very Fine Sand	18.20
Fine Sand	22.65
Medium Sand	8.10
Coarse Sand	0.19
Very Coarse Sand	< 0.01
Stones >2mm	12.10
Soil Type	SaSiLo Sandy Silt Loam

Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

B Subsoil

Analysis Results (SOIL)

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PICKERING
YO18 8NH

Distributor MR P STEPHENSON
BEECH LODGE
66 MIDDLETON ROAD
PICKERING
NORTH YORKSHIRE
YO18 8NH

Sample Ref BIRDSEDGE SUB

Date Received 02/07/2026 (Date Issued: 08/07/2026)

Sample No G254086/07 / ASTON BIRDS EDGE

Crop GRAZED GRASS (CATTLE)

Analysis	Result	Guideline	Interpretation	Comments
pH	6.6	6.0	Normal	Adequate level. Maintain pH to ensure optimum nutrient availability and ideal conditions for an active soil biology.
Phosphorus (ppm)	15	16	Low	(Index 1) 50 kg/ha P2O5 (40 units/acre).
Potassium (ppm)	30	121	Very Low	(Index 0) 60 kg/ha K2O (48 units/acre). Avoid applications in spring if there is a history of Hypomagnesaemia.
Magnesium (ppm)	244	51	Very High	(Index 4) Possible interference with availability of Potassium.
Organic Matter (LOI) (%)	4.4	3.0	Normal	Good. Soils with medium to high levels of organic matter would generally be expected to have a good potential fertility and good structure, moisture retention and water infiltration. Ensure appropriate soil management practices are used to maintain organic matter levels.
Organic Carbon (LOI) (%)	2.6	1.7	Normal	Normal (See Organic Matter comment). Organic carbon is the measurable component of organic matter. Organic carbon and organic matter can be broken into distinct "pools". These pools include labile/active (particulate, almost entirely decomposed, readily available microbe foodsource), humus carbon (decomposing carbon) and recalcitrant organic carbon (resistant to decomposition). Each of these pools are involved in different soil processes (see: Active Carbon).

Analysis Results (SOIL)

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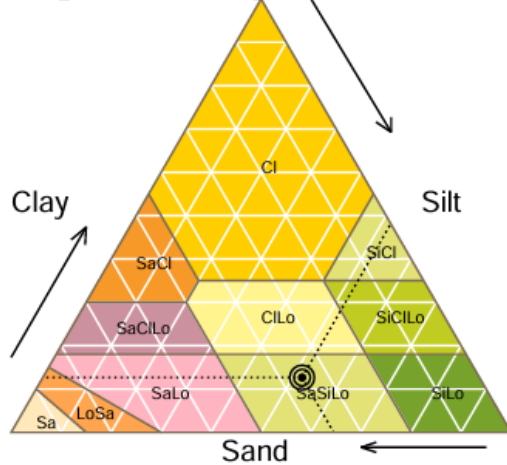
Sample Ref BIRDSEDGE SUB

Date Received 02/07/2026 (Date Issued: 08/07/2026)

Sample No G254086A/07

Crop NO CROP SPECIFIED

Physical Analysis



Analysis	Result (%)
Sand	35.49
Silt	51.87
Clay	12.64
Very Fine Sand	17.78
Fine Sand	13.81
Medium Sand	3.87
Coarse Sand	0.02
Very Coarse Sand	< 0.01
Stones >2mm	4.30
Soil Type	SaSiLo Sandy Silt Loam

Property	Assessment
Available Water	Low to Medium
Drainage Rate	Rapid
Inherent Fertility	Low to Medium
Potential C.E.C.	Low to Medium
Leaching Risk	High to Moderate
Warming Rate	Rapid

Appendix 3 - Soil Profile Summaries and Droughtiness Calculations

Soil pit details

Pit	Texture	Depth mm	Colour	Munsell	Comments	AP WW	AP Pots	Wetness	Grade
1 Top	Fine Sandy loam to sandy silty Loam	0-250	Dark Brown to light brown at depth	5YR Value 5 Chroma 2	Dark brown fine sandy silty loam. indistinct boundary limited pore space small to medium stones. Weak medium granular structures.	75	56	IV	3b
1 Sub	Sandy Silty loam	250-500	Light brown to Orange	5YR Value 6 Chroma 6	Sandy silty loam. Indistinct boundary many small, medium and large stones. Weak medium platy structure, some mottling, occasional coal piece.				

Appendix 4 - Sampling Point Descriptions

SOIL PROFILE SURVEY RESULTS: Birds Edge

Soil Type Key:

O- ORGANIC

C- CLAY

S- SAND

L- LOAM

Z- SILT

P- PEAT

Hole	Grid ref	Texture	Depth mm	Description	Wetness
1	N53 33 984	SZL	0-20	Lots of Stones	IV
270m	W001 41 672	Stones	20+	Impenetrable Hard Sandstone	
2	N53 34 025	SZL	0-20	Lots of Stones	IV
270m	W001 41 636	Stones	20+	Impenetrable Hard Sandstone	
3	N53 34 064	SZL	0-10	Lots of Stones	IV
258m	W001 41 666	Stones	10+	Impenetrable Steep Slope Drains Hard Sandstone	
4	N53 34 046	SZL	0-20	Lots of Stones	IV
264m	W001 41 689	Stones	20+	Impenetrable Hard Sandstone	
5	N53 34 019	SZL	0-25	Less Stones	IV
271m	W001 41 706	Stones	25+	Hard Sandstone 40+	

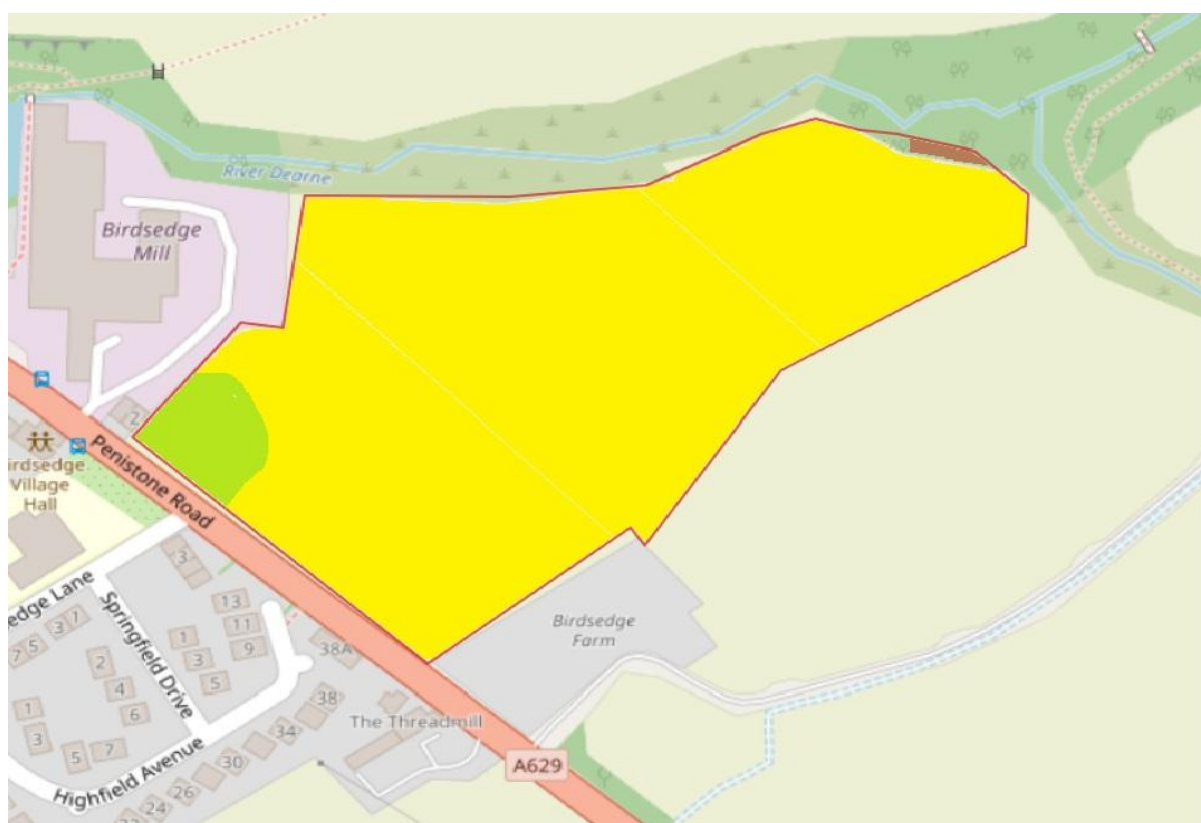
SITE: Birds Edge

SOIL PROFILE SURVEY RESULTS

Appendix 5 - Sampling points



Appendix 6 - Detailed ALC map



Key

Grade 3b	
Grade 4	
Non-Agricultural	

Appendix 7 – Pit Descriptions and Photographs

Soil Pit Location



Soil Pit Description

Pit Topsoil



5YR Value 5 Chroma 2 dark brown medium sandy silty loam. Indistinct boundary tight compacted pore space many stones small to medium hard sandstone. Weak medium granular structures.

Pit Sub soil



Indistinct boundary. Medium sandy clay loam with small medium and large stones present impenetrable below 50cm. Orange to light brown in colour (Value 6 Chroma 8). Medium platy structures dominate by hard sandstone.

Appendix 8 - Agricultural Land Classification

The quality of land is assessed using the ALC Scheme, established by Defra, which provides a method for assessing the quality of farmland, so informed choices can be made about its future use within the planning system. It also helps underpin the principles of sustainable development.

Definitions and Grades

The ALC system classifies land into 1 through to 5 Grades, with Grade 3 further subdivided into Grade 3a and 3b, see Table 1. Consistent with national guidance, Grades 1, 2 and 3a represents the 'best and most versatile' land.

The 'best and most versatile' land' is considered to be the most flexible, productive and efficient in response to inputs, and which can best deliver future crops for food and non-food uses such as biomass, fibres and pharmaceuticals. Current estimates are that Grade 1 and 2 together form about 21% of all farmlands in England; Sub-Grade 3a contains a similar amount.

The ALC system is used by Defra and others to give advice to local planning authorities, developers and the public if development is proposed on agricultural land or other 'Greenfield' sites that could grow crops. The General Development (Procedure) Order refers to the 'best and most versatile' land policy in requiring statutory consultations with Defra.

The ALC grading system is also used by commercial consultants to advise clients on land use and planning issues.

The classification is based on the long-term physical limitations of land for agricultural use. Factors affecting the Grade are climate, site and soil characteristics.

Climate: temperature and rainfall; aspects, exposure and frost risk

Site: gradient, micro relief and flood risk

Soil: texture, structure, depth and stoniness; chemical properties which cannot be corrected

The combination of climate and soil factors determines soil wetness and droughtiness. Wetness and droughtiness influence the choice of crops grown and the level and consistency of yields, as well as the use of land for grazing livestock. The Classification is also concerned with the inherent potential of land under a range of farming systems. The current agricultural use, or intensity of use, does not affect the ALC Grade.

Versatility and Yield

The physical limitations of land have four main effects on the way land is farmed.

These are:

- the range of crops which can be grown
- the level of yield
- the consistency of yield
- the cost of obtaining the crop

The ALC gives a high Grade to land which allows more flexibility in the range of crops that can be grown (its 'versatility') and which require lower inputs. These higher Grades (1, 2,3a) also take into account the ability to produce consistently high yields of a narrower range of crops.

Table 1- Definitions of Land Classification Grades

Grade	Definition
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.
Sub-Grade 3a – Good Quality Agricultural Land	Land capable of consistently producing moderate to high yields from a narrow range of arable crops, especially cereals, or moderate yields from a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.
Sub-Grade 3b – Moderate Quality Agricultural Land	Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields from 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, the yields of which are variable. The Grade 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.