



Land-Line[®]

User guide

Preface

This user guide contains information you need to make effective use of Land-Line®. It is designed to help you understand the information contained in the data, as well as providing detailed technical information and the data format specification.

This user guide has been checked and validated before issue and every reasonable endeavour made to ensure that the contents are accurate. However, if you find an error, omission, or otherwise wish to make a suggestion as to how this user guide can be improved, please contact us at customerservices@ordnancesurvey.co.uk or the address shown under contact details or use the product and service performance report form at [appendix B](#).

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Written notification of any deficiency in the data or damage to the goods must be given to us within 28 days of receipt of your Land-Line data.

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Chapter 1 Introduction

Using this user guide

Chapters 1, 2 and 3 of this user guide give an overview of Land-Line and a more detailed explanation of Land-Line as a product. The various specific categories of Land-Line information are outlined in [chapter 4](#) and [chapter 5](#). A glossary of technical terms is at [appendix A](#).

Extracts of map data in this user guide show DXF™ (Data Exchange Format) Land-Line or Land-Line.Plus® (reproduced in monochrome). They may contain fictitious detail. It should be remembered that colours, line styles, fonts, symbols and feature content of Land-Line can be customised by the user and are also software dependant. Land-Line and Land-Line.Plus in NTF (National Transfer Format) does not convey parameters for colour, line styles, fonts or symbols.

All aspects of Land-Line discussed in this user guide relate to Land-Line products in both BS 7567 (NTF v2.0) and DXF (AutoCAD® release 12 compatible) formats. If the two format versions differ in their treatment of a particular aspect, the specific differences are stated. Icons, as shown below, are used to denote these differences.

A further icon is used to denote any aspects of Land-Line information at 1:10 000 scale which are of special note.



For convenience, BS 7567 (NTF v2.0 Level 2) is referred to as NTF in this user guide.



Data Exchange Format (see above) is referred to as DXF in this user guide.



This is an example of a 1:10 000 scale specific aspect which does not relate to Land-Line at 1:1250 or 1:2500 scales.

General description of Land-Line

Land-Line is the family name for a range of Ordnance Survey digital map data products that provide detailed information about the topography of Great Britain, including features such as buildings, kerb-lines, hedges and fences, areas of woodland and even garages, telephone kiosks and Royal Mail letter boxes. Land-Line has been surveyed at one of three basic scales: 1:1250, 1:2500 and 1:10 000. The database which supports Land-Line is being continually updated by ground and photogrammetric surveys at these scales soon after changes are identified by our surveyors.

Currently there are two Land-Line products available:

- **Land-Line**
Derived from an established Ordnance Survey geographical dataset – TOPO-93. Land-Line represents the built environment in clear, concise detail.
- **Land-Line.Plus**
An option also derived from the TOPO-93 dataset, but offering the complete real-world picture with an extra 26 feature categories or layers, including man-made slope, cliffs, woodland and vegetation information.

Land-Line general specifications

The following gives details of the product specification identity and their relationship to Ordnance Survey parent geospatial datasets. Version details of these specifications are also stated.

Product	Product specification	Parent Ordnance Survey geospatial dataset
♦Land-Line	LSPS_1.5	TOPO-93
♦Land-Line.Plus	LSPS_1.6	TOPO-93
*Land-Line	LSPS_1.3	TOPO-93
*Land-Line.Plus	LSPS_1.4	TOPO-93
Land-Line	LSPS_1.1	TOPO-93
Land-Line.Plus	LSPS_1.2	TOPO-93

* indicates the upgraded product supplied from 1 June 1999. ♦ indicates the upgraded product supplied from 7 May 2001.

Transfer format specifications:

Name	BS 7567 (NTF v2.0)	DXF
Level	2	
Version	2	AutoCAD release 12 compatible
Issue date	November 1993	September 1997

Land-Line features

Land-Line represents the features (tangible or otherwise) of the topography as vector data.

Features are represented by:

- a point, a line or a text string;
- one or more pairs of National Grid coordinates, defining the geometry of the feature; and
- coded information defining its category within the feature classification system.



Complies with BS 7567 standard. Please see [chapter 7](#) for further details.



AutoCAD release 12 compatible data. Complies with *Layer Naming Convention for the Construction Industry Version 2* which is based upon guidelines in BS 1192: Part 5. Please see [chapter 9](#) for further details.

Applications of Land-Line

Because national cover of Land-Line is available, it spans wide areas of interest and has many uses.

Land-Line is intended for use within digital mapping systems, geographical information systems (GIS) and computer-aided design (CAD) software. There are many existing applications for Land-Line which show its versatility; these include:

- site access;
- properties in particular geological areas;
- asset management; and
- contracts for environmental maintenance.

[Chapter 2](#) gives some examples of these applications.

The National Grid reference system

All coordinates used in Land-Line are two-dimensional plane coordinates and are based on the National Grid coordinate referencing system.

National Grid coordinates are expressed as distances measured in metres east and north from the grid origin (which is located to the west of the Isles of Scilly).



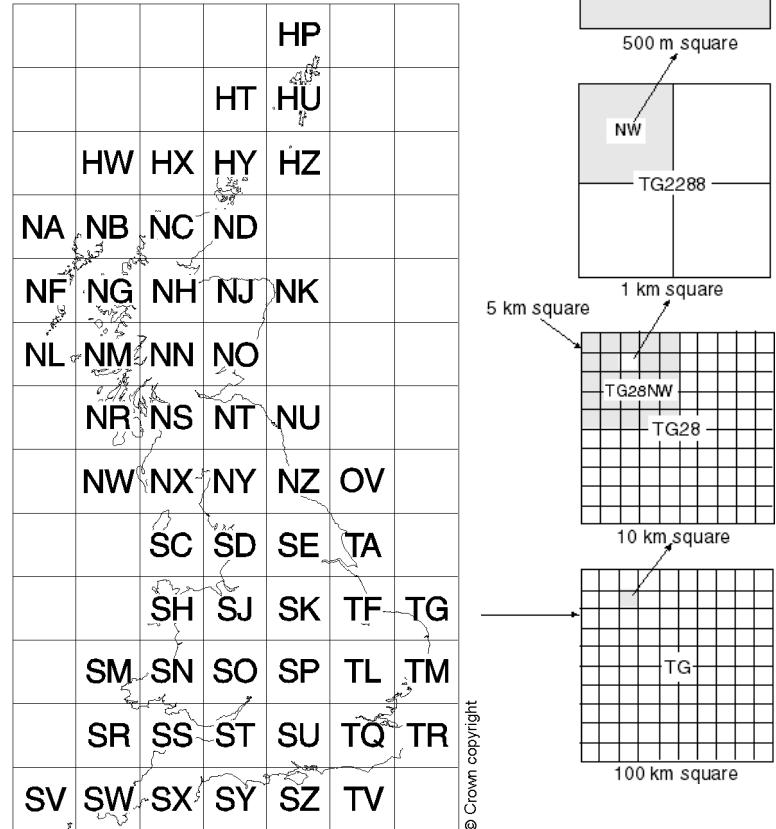
To reduce data volumes, map coordinates in Land-Line are given as relative coordinates expressed as distances east and north of the map tile origin (the south-west corner of the map). The method for obtaining full National Grid coordinates is explained on the [Ordnance Survey web site](#).



The coordinates of all features are quoted as full National Grid coordinates.

Land-Line tile numbering and the National Grid

Land-Line is supplied to customers in 500 m by 500 m, 1 km by 1 km or 5 km by 5 km tiles, depending upon the area of the country.



What you need to use Land-Line

Computer hardware

Providing sufficient memory and storage facilities are available there are no specific constraints on hardware platforms which can be used. The range of hardware which can typically be used varies from desktop PCs using GIS or CAD to mainframe computers with specialised translators and applications.

Computer software

Land-Line products are supplied as data only and do not include software for data viewing or manipulation. Land-Line supplied in NTF or DXF will require specific software such as GIS or CAD.

NTF is a nationally agreed standard for the transfer of geographical data. NTF allows users of GIS to customise their own definition of the data for display and/or plotting for their specific applications.

DXF is a transfer format designed for use with CAD software by Autodesk® Ltd, particularly AutoCAD.

Land-Line products can be used with a variety of CAD packages which can import DXF files. **Please check with your supplier if you are unsure of your CAD system's compatibility with Land-Line.**

Supply

Land-Line and Land-Line.Plus supply units (tiles)

General specification

Scale	Urban areas 1:1250	Rural areas 1:2500	Moorland areas 1:10 000
Standard tile coverage	500 m by 500 m	1 km by 1 km	5 km by 5 km
Data structure	Enhanced vector (point and line)		
Data specifications	TOPO-93		
Feature codes and layers	Land-Line = 31 detail + 6 text Land-Line.Plus = 57 detail + 6 text (6 additional layers for marginal information are included in DXF)		

Land-Line supply formats

General specification

Transfer formats	BS 7567 (NTF v2.0 Level 2) DXF (AutoCAD release 12 compatible)
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Storage volumes per tile

Land-Line		1:1250 scale	1:2500 scale	1:10 000 scale
Average	NTF	0.19 MB	0.11 MB	0.22 MB
	DXF	0.63 MB	0.43 MB	0.76 MB
Maximum	NTF	1.51 MB	1.09 MB	1.35 MB
	DXF	6.39 MB	4.53 MB	5.45 MB
Land-Line.Plus		1:1250 scale	1:2500 scale	1:10 000 scale
Average	NTF	0.22 MB	0.13 MB	0.25 MB
	DXF	0.72 MB	0.48 MB	0.80 MB
Maximum	NTF	1.51 MB	1.12 MB	1.50 MB
	DXF	6.40 MB	4.64 MB	5.91 MB

Land-Line supply media

Land-Line and Land-Line.Plus are supplied on the standard Ordnance Survey media, which currently is CD-ROM.

Content of Land-Line

Wherever possible within the limitations of depiction imposed by the scale of survey, Land-Line includes details of all the significant features of the real world; exceptions due to scale and specification are detailed in succeeding chapters of this user guide.

In the interests of national security, Ordnance Survey may omit or adjust the depiction of features within the perimeters of secure establishments such as HM Prisons, Ministry of Defence sites and UK Atomic Energy sites, in agreement with the site's owning authority and in accordance with guidelines set by government.

Land-Line coverage (as at May 2003)

Country	Map scale	No of maps
England	1:1250	49 875
	1:1250 Quadrant	7 239
	1:2500	112 066
	1:10 000 fully basic	159
	1:10 000 part basic	434
Scotland	1:1250	5 393
	1:1250 Quadrant	999
	1:2500	30 878
	1:10 000 fully basic	1 480
	1:10 000 part basic	1 580
Wales	1:1250	2 756
	1:1250 Quadrant	791
	1:2500	16 097
	1:10 000 fully basic	84
	1:10 000 part basic	274
Totals	1:1250	58 024
	1:1250 Quadrant	9 029
	1:2500	159 041
	1:10 000 fully basic	1 723
	1:10 000 part basic	2 288
	Fully/part basic 1:10 000	4 011
Grand total	229 281*	Land area of Great Britain, including islands: 230 034 sq km.

* As development extends urban or developed agricultural areas into rural and moorland areas respectively, the normal scale of survey and the tile size may change to reflect the requirements of mapping these changes. Hence the number of available tiles can change over time.

Country	Map scale	No of maps
England/Scotland border	1:1250	0
	1:1250 Quadrant	0
	1:2500	122
	1:10 000 fully basic	12
	1:10 000 part basic	13
	Total	147
England/Wales border	1:1250	9
	1:1250 Quadrant	4
	1:2500	500
	1:10 000 fully basic	0
	1:10 000 part basic	10
	Total	523
Within the M25	1:1250	7 279
	1:1250 Quadrant	289
	1:2500	528
	1:10 000 fully basic	0
	1:10 000 part basic	0
	Total	8 096

Chapter 2 Overview of Land-Line

Data overview

Land-Line is a representation in computer-readable form of a large-scale map. Real-world objects, which may be tangible (such as a hedge or the outline of a building) or intangible (such as a county boundary), are selected for inclusion in the map by our surveyors who use a comprehensive data capture specification.

The data has been digitised from published Ordnance Survey large-scale maps, or from ground or photogrammetric surveys made by, or for, Ordnance Survey. Any subsequent revision is also included.

Upgraded Land-Line

Land-Line underwent its latest upgrade on 7 May 2001. The change to the data was as a direct result of the Positional accuracy improvement programme (see www.ordnancesurvey.co.uk/positional); this relates to the 7/s/d upgrade. The previous Land-Line upgrade of 1 June 1999 delivered a number of enhancements in both NTF and DXF. These enhancements to both Land-Line products were a direct result of feedback from customers gathered since the availability of national coverage in 1995. The Land-Line upgrade was essentially a combination of several minor enhancements which included:

- Feature level date stamping in Land-Line NTF, an enabling tool for users to conduct searches and run queries on selected digital features added since a given date.
NOTE: In a small number of plans from early in the digitising programme, feature dates are not recorded.
- Introduction of the Upper level of communication seed in Land-Line NTF and DXF identifying where there is more than one active layer of access, for example, in shopping malls. Previously this feature was only available in Land-Line.Plus.
- Additional metadata field for Land-Line in NTF indicating where a tile has been through our cyclic revision programme. Also, a further metadata field has been added to display the date of the aerial photography used in the cyclic revision.
- Edgematch fields in NTF will be blanked as they are no longer necessary, as Land-Line has been a seamless dataset for some years. To avoid unnecessary record restructuring, the fields will be retained in their blank state.
- CHG_TYPE field supplied as a means of identifying why a feature had changed. This field is particularly useful when used in conjunction with CHG_DATE (feature level date stamping as mentioned above).

- The {Z_datum} field in NTF (Z datum being the mean sea level datum from which heights within tiles are based) will be populated by numbers ranging from 0 to 14 – each number representing the relevant datum used. See [Ordnance Survey datum](#) in chapter 3 for a full listing of the datums.
- Content indicator R is an existing value identifying tiles captured to 1:2500 scale resurvey or reformed accuracy standard. From 1 April 2001, as the positional accuracy improvement programme is implemented, improved tiles will have their content indicator changed from B to R. Rural towns that are resurveyed will have their content indicator changed from B to A.
- The field in NTF which displays the descriptions of each feature code will be amended to conform with other Ordnance Survey products. The changes will give more meaningful descriptions to some of the feature codes.
- All grid figures will now be located on one separate layer in Land-Line DXF, enabling them to be turned on or off as appropriate.
- All marginal text, such as boundary names, will be stored in a new specific layer in Land-Line DXF, enabling them to be turned on or off as appropriate.
- A new gothic style text font pointer to non-Roman antiquity text will be applied in Land-Line DXF, facilitating the differentiation between antiquity features ([see page 108](#)).

Improvements to detailed data content

To ensure Land-Line data continues to meet customer requirements changes are being made to the revision processes. The changes are divided into three categories:

- General improvements and additional content (such as the inclusion of some traffic calming features and improvements to the capture of parallel features and content within mountain and moorland areas).
- Clarification (such as named afforested areas, broken hedges, walls and banks, glasshouses and light rail networks).
- Features/descriptions no longer captured (such as drinking fountains, fire alarms, water troughs and mussel or oyster beds).

Where content is being added, the enhancements will appear gradually, as new detail is collected. Where features (such as water troughs) or descriptions (such as forge) are no longer being captured, this means that new water troughs or forges will not appear in the data. However, all the existing features or descriptions of these types will not be deleted from Land-Line unless they no longer appear in the real world and that change has been captured.

Where features are no longer captured and only maintained through deletion, they will be indicated within this user guide by '†'.

Basic principles

- Land-Line views the real world as series of point, line and text features making up a digital map.
- Each feature has associated geometry; this may be a single point for a symbol representing, for example, a mile post alongside a road or railway, or two pairs of coordinates representing, for example, each end of a straight fence.
- Each feature is a freestanding entity, the data contains no pointers to logically connect or relate any feature to any other feature.
- Each feature is classified by means of a feature code (FC). These feature codes are allocated as the data is captured and interpreted from the source information. A building outline is distinguished from a wall or fence and other kinds of features by the feature code assigned to it.
- When Land-Line is supplied in DXF, the feature codes are assigned to layers, for example, all water features with feature code 0059 appear on DXF layer G8010059.



All features having the same feature code are recorded on the same layer.



For ease of data management, each coded feature in the data is given a numeric identifier on creation. This is known as a feature serial number (FSN). These are supplied in Land-Line data to customers.

While continuity of FSNs is not guaranteed, they are disturbed as little as possible during routine update. However, the complex nature of update and improvement activities means that we strongly recommend that customers do not utilise FSNs as feature identifiers as they may be removed when the Ordnance Survey feature appears to continue to exist.

Application overview

Uses of Land-Line

Land-Line forms a nationally consistent dataset and is a standard link between:

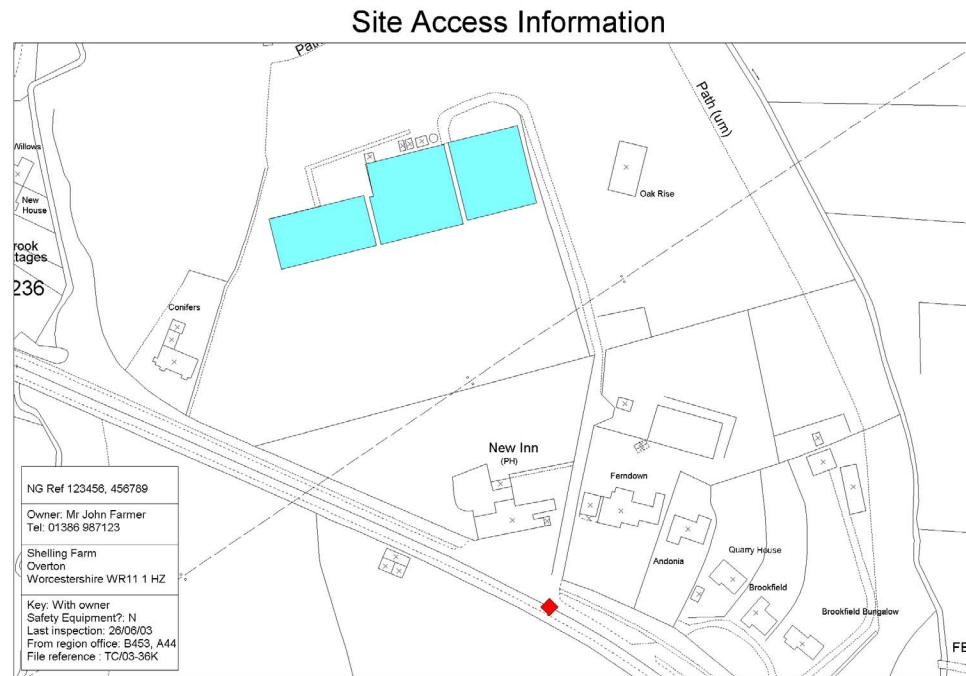
- Applications databases and GIS.
- Two or more applications databases.

The remainder of this chapter illustrates the functionality of Land-Line. It portrays common applications which use Land-Line information. These applications have added extra functionality to the Land-Line data for their own purposes. One example would be the internal shading of buildings.

NOTE: In these examples Land-Line data has been used and manipulated with appropriate software which is not included as part of the product.

Example: Land-Line being used in GIS to store information regarding site access.

Figure 2.1: Site access



Example: properties in particular geological areas

Linked with ADDRESS-POINT® (another Ordnance Survey product), Land-Line provides an effective business tool.

Scenario: an insurance company has been asked to quote structural insurance for a potential customer within the Southampton (SO) area. SO can be identified as having particular geological characteristics and may therefore attract special insurance rates, reflecting the potential risk of claims from buildings on this type of geology.

Land-Line records building information accurately so that houses within SO can be highlighted precisely and decisions regarding risk can be made confidently.

Figure 2.2: Land subject to subsidence



Example: asset management

'Do you need to record the precise location of pipelines, cable lines, valves, hydrants or junction boxes?'

Land-Line data may be displayed or plotted at a wide range of scales. Individual feature codes (layers) may be distinctively coloured, symbolised or omitted on customer plots or screen views.

Scenario: a broken water main is causing flooding in an inner city area. It is necessary to identify the precise position of water valves quickly.

Figure 2.3: Asset management

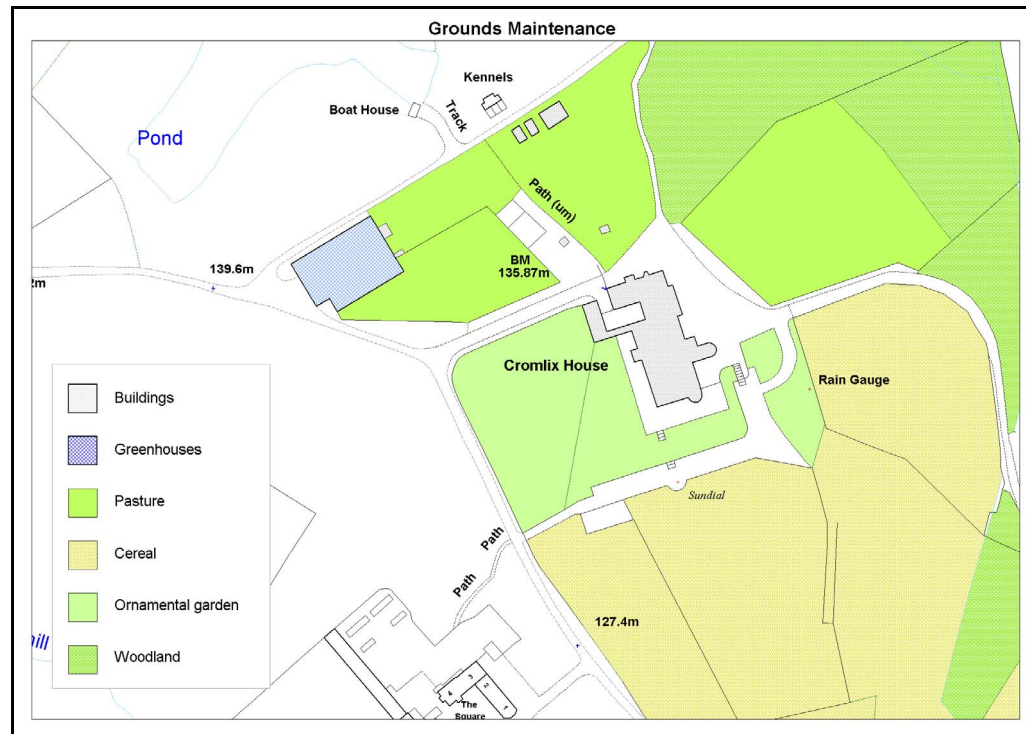


Example: contracts for environmental maintenance

Many organisations, such as local authorities, use contractors for environmental maintenance and periodically it is necessary to identify the areas involved and reappraise the terms and conditions of the contracts.

Scenario: the grounds of a large organisation are about to be changed and it is necessary to review the different types of horticulture and analyse the effect on grounds maintenance contracts. Land-Line provides a useful source of information on land areas, locations, access and for the planning of new works.

Figure 2.4: Grounds maintenance



Chapter 3 Land-Line explained

Land-Line family of products

There are two product specifications for Land-Line, which are:

- **Land-Line:** a digital representation of the built environment, made up of line features (links), point detail, and textual information contained in previously published large-scale maps, updated and full edgematched, incorporating unique junction coordinates. See figure 3.1.
- **Land-Line.Plus:** available as an option, Land-Line.Plus is identical to Land-Line, but with extra information (feature codes or layers) relating to features such as cliffs, vegetation types and man-made slopes. See figure 3.2.

Figure 3.1: An example from a typical 1:2500 scale Land-Line tile

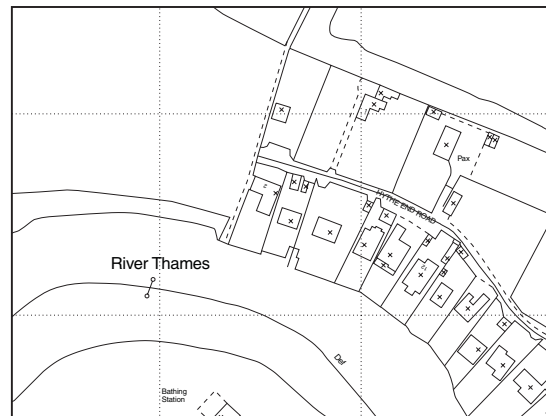
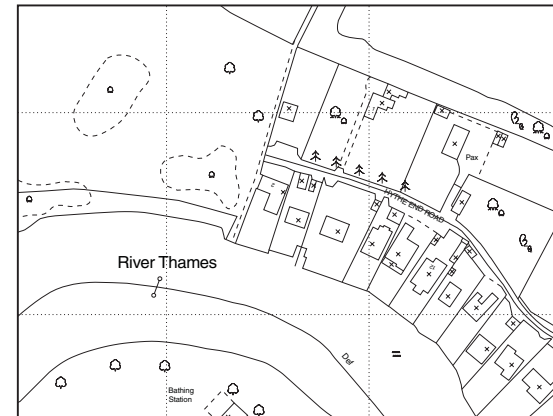


Figure 3.2: An example from a typical 1:2500 scale Land-Line.Plus tile



Principles of feature representation

Real-world objects, which may be tangible (such as a hedge, a river bank, the outline of a building) or intangible (such as a county boundary), are selected for inclusion in Land-Line if they are large enough or are important enough to be recorded and are permanent. Ordnance Survey defines permanence as expected to remain for at least ten years.

Whenever possible, detail is represented in its true surveyed position. For the sake of clarity of display or plotting, real-world objects may be generalised, for example, small juts in house fronts. The normal methods of generalisation which can be applied to features are:

- emphasis;
- selection for inclusion;
- simplification; and
- omission.

Generalisation may, in some cases, result in the modification of feature shape. In exceptional circumstances, the positions of features may also be changed. Generalisation as a process is less frequent at 1:1250 scale and 1:2500 scale.

1:10 000

Changes to data capture mean that areas of mountain and moorland will now be captured to the 1:2500 specification for content (not accuracy). This applies to new capture only, there is no retrospective improved capture of existing 1:10 000 Land-Line detail. Exceptions to this are vegetation, natural surface features and where capture at the larger scale would create a large amount of retrospective action to fit with existing detail.

Real-world objects may also be aggregated in Land-Line. For example, a small group of trees may be recorded as a single feature.

Land-Line represents real-world objects, portions of them or aggregations of them, as point, line or area features. It also names or describes them using freestanding text as appropriate.

Feature codes

Feature position

The geometry of map features is defined in terms of two-dimensional coordinates. All coordinates used in Land-Line are based on the National Grid coordinate referencing system, and are quoted to a 0.01 m resolution. Despite this, Land-Line data can be no more accurate than its source. See [chapter 6](#) for further explanation of this.

The National Grid as it applies to Land-Line is explained more fully in [chapter 1](#).

Feature attribute data

An attribute is the descriptive characteristic of a feature.

In Land-Line data an attribute can be a feature code (in NTF these are numeric codes), or a symbol size or orientation.

Attribute codes relevant to NTF and DXF are fully described below and within [chapter 7](#) for NTF and [chapter 9](#) for DXF. It is possible, with appropriate software, for you to add other names or values of your own choice as attributes of features.



The geometry of the lines, text and points within Land-Line data would be relatively meaningless if they were not assigned some distinguishing property. Each feature is classified by means of a feature code FC. These feature codes are allocated when each feature is initially interpreted and captured from source. Thus, underground detail is distinguished from overhead detail by the feature code allocated to it. All feature codes are listed in [chapter 7](#). There are up to 37 feature codes in Land-Line and up to 63 in Land-Line.Plus. The feature codes may be used individually or in combination as layers within your own data structure.



Each feature is classified as belonging to a specific feature layer. For example, spot height symbols are contained on layer G8010027. The layers range from G8010001 to G8011212, and are allocated using Layer Naming Convention for CAD in the Construction Industry Version 2 based on guidelines in BS 1192: Part 5. For the most part, the last four characters of the layer name are the NTF feature code. There are 43 layers in Land-Line and 69 in Land-Line.Plus. Six of these layers are for grid, neatline and footnotes. Every feature layer is listed in [chapter 9](#).

Land-Line attributes



Each line feature carries the following attribute:

- {FEAT_CODE} – feature code of the line, for example, 0059, water detail.

Each point feature carries the following attributes where relevant:

- {FEAT_CODE} – feature code of the point, for example, 0049, a pylon.
- OR – symbol orientation, anticlockwise from grid east in tenths of a degree. Used as a variable for bench mark, boundary half mereing, flow arrow and pylon symbols. A fixed value for spot height and triangulation point symbols. Not supplied for other point features.
- DT – pylon symbol size in centimetres. The distance given is that from the centre of the pylon symbol to the midpoint of any edge.

Each text feature carries the following attribute:

- {TEXT_CODE} – feature code of the text, for example, 1010, for water text.



The OR (orientation) and DT (distance) attributes are embedded within the DXF file defined entities section. The feature code attribute is conveyed within the DXF feature layer name. These consist of G801, suffixed by the equivalent NTF attribute. For example, DXF layer G8010027 contains spot heights which in NTF have feature code 0027.

Feature codes in Land-Line.Plus

Land-Line.Plus contains 26 more feature codes or layers, relating mainly to landscape features such as slopes and vegetation. They are listed in [chapter 7 for NTF](#) and [chapter 9 for DXF](#).

Land-Line specifications

Superseded specifications

Some Land-Line tiles have not required revision since they were first digitised and these may reflect elements of cartographic specification which have been subsequently modified.

Land-Line geometry

Land-Line and Land-Line.Plus are produced from data which has been enhanced to reflect the requirement of digital map users for improved geometry. Lines are snapped one to another, as described in more detail below, to remove the undershoots and overshoots that were present when the data was originally digitised.

When the processing of unique junction coordinates takes place, a selection of line features is made for the purpose of forming junctions. It would not be appropriate for unique junction coordinates to be formed where, for example, overhead power lines cross hedges or road edges.

Link extents

Land-Line data is enhanced point and line data; a link is therefore only constrained to terminate at its first intersection with another appropriate link.

A single map feature can represent more than one real-world object. For example, a single line with NTF feature code FC0030 (or DXF layer G8010030) may represent a hedge, fence and wall.

Link free ends

Where a link ends without joining another feature, the end generally has been verified as being a free end – the real-world object it represents does not join onto another real-world object.

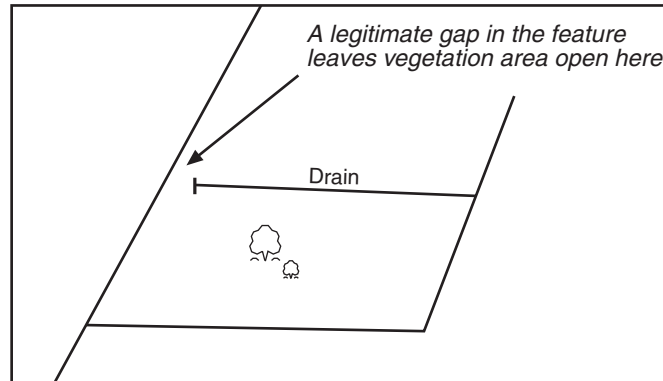
Area features – general

Land-Line does not handle area features explicitly. The presence of an area feature is implied by a seed. These seeds are treated as point features in NTF and as symbols in DXF. Each seed is placed within the area it represents. There is an implication that each seed is surrounded by a polygon whose bounding lines are formed by all or parts of a feature of one or more qualifying feature codes. However, no relationship is expressed in Land-Line between a seed and the feature or features which make up its bounding polygon. It is left to your own software to infer such a relationship.

Integrity of bounding features

Whilst line features are snapped to each other to form unique junction coordinates ([see page 33](#)), no attempt is made to verify that areas close, or that the boundaries of seeded areas are complete – see figure 3.3. As a result of this, it may be that leakage occurs when an area fill is applied within your mapping application.

Figure 3.3: Land-Line.Plus area feature



Area features in Land-Line

Land-Line shows three classes of area feature. Each is depicted by a feature code. Roofed areas are represented by the Building seed; constructions which are primarily horticultural and greater than 50 m² are now represented by the Glasshouse seed and the area of the upper level of public communication in complex multi-level structures is represented by the ULC seed.

NOTE: historically the Glasshouse seed was applied to buildings smaller than 50 m² and some still remain in the data with a Glasshouse seed.

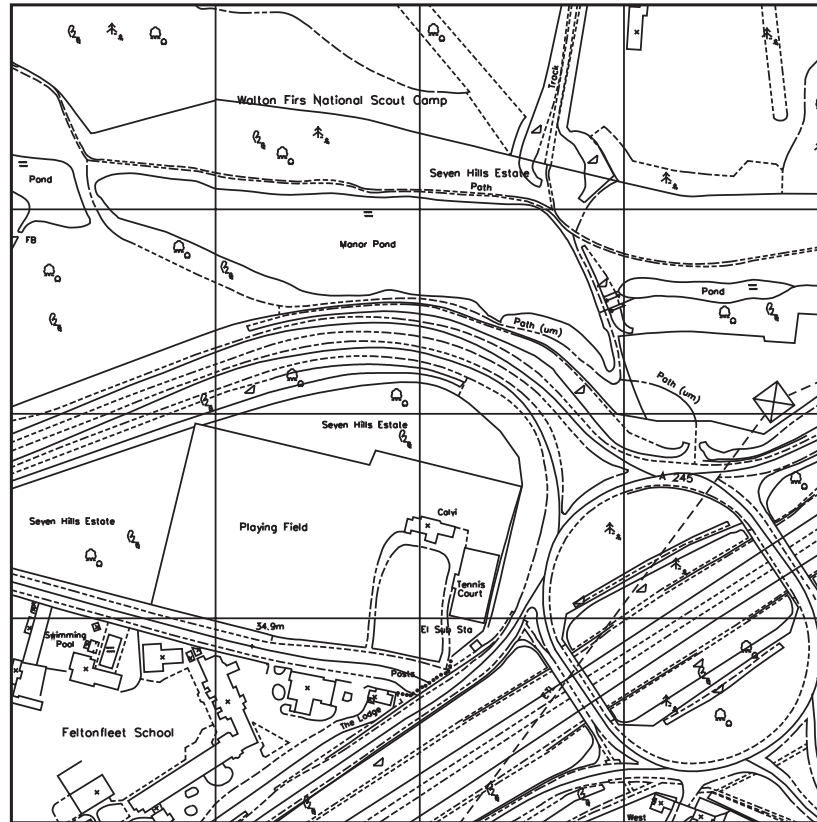
Area features in Land-Line.Plus

The majority of the extra information supplied in Land-Line.Plus is seeded. Areas of water, cliff, man-made slope, woodland, rough grass, orchard, marsh, boulders and so on are identified. For a full list of features in Land-Line.Plus, [see chapter 4](#).

Additional line features are included to provide bounding limits for these seeds where necessary. These links represent:

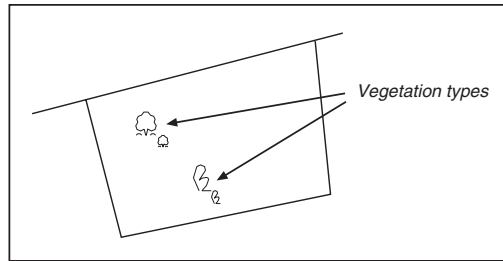
- top of cliff features;
- top of slope features;
- bottom of cliff or slope features; and
- edge of vegetation.

Figure 3.4: An example of a 1:2500 scale rural Land-Line.Plus tile



As with building and glasshouse seeds, the relationship of a seed to its bounding polygon is not expressed. It is possible for more than one seed to be placed within a single area, for example, where mixed vegetation occurs.

Figure 3.5: Land-Line.Plus

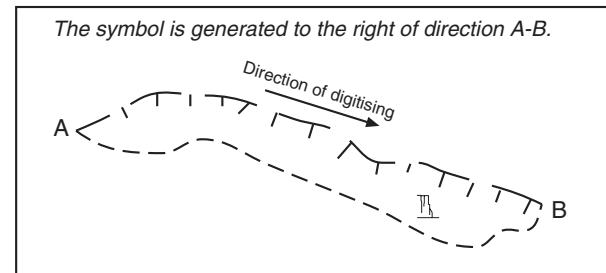


Additional line features in Land-Line.Plus

Land-Line.Plus includes additional features to represent the top of slope and the top of cliff. To enable asymmetric line symbols to be correctly plotted (by those having a facility to plot such symbols) a digitising convention is followed. By this convention, viewed from the start towards the end of the line, the right-hand side of the line is the downhill side (see figure 3.6).

Figure 3.6: Land-Line.Plus cliff alignments

BS 7567 NTF	The top of slope or cliff lines are defined by your system software.
DXF	The top of slope or cliff lines are shown as continuous polylines on the appropriate layer. There is no offset symbol applied.

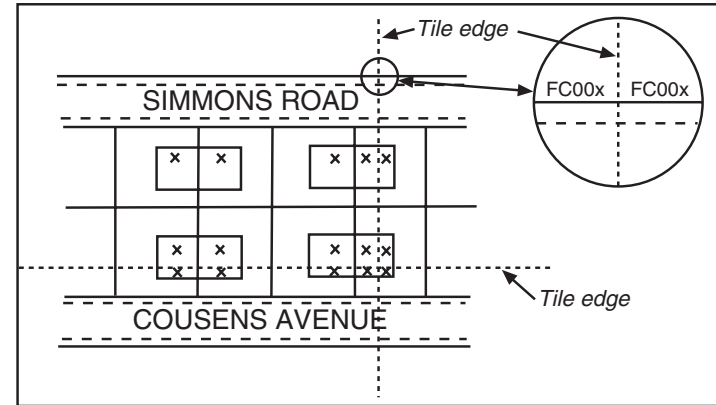


Edgematch

Where a line feature ends by intersecting the edge of the tile, it is matched with the corresponding feature on the adjacent tile, such that both features intersect the tile edge at the same unique coordinated point, and both features have the same feature code or layer – see figure 3.7.

Where a seeded area is split by the tile edge, matched area indicators (seeds) are included in each tile containing part of the applicable area.

Figure 3.7: Land-Line edge assimilation



Feature representation – line features (links)

A link is composed of a string of XY coordinate pairs, each pair being implicitly joined to its neighbours by straight line segments.



Each feature recorded in Land-Line should be considered as a DXF entity. Links are recorded as DXF line(s) or polyline(s).

Straight features

The geometry of a single straight feature, such as a garden fence, is shown in Land-Line by two pairs of coordinates, one pair at each end of the feature.

For ease of data capture, features which can be represented by a series of connected straight lines, such as the outline of a building, are shown in Land-Line as a series of coordinate points. Features which start and end in the data at the same point have coordinate pairs for the point at the beginning and end of the Land-Line feature.

Curved features

The geometry of curved features is established by digitising intermediate points along the regular arcs which make up any curve. If these curved features are joined to straight line sections then they become part of them and are not isolated. The normal process of capture is to record a point at the start, middle and end of each arc segment. Intermediate points are then calculated mathematically and married in the data.



The algorithm to calculate intermediate points on curved features is not scale dependant. In 1:10 000 scale Land-Line there are fewer intermediate points.

General line conventions

A line feature need not fully represent a real-world object; it may represent all or part of one real-world object, for example, a section of road casing, or it may represent all or part of a number of real-world objects, for example, the alignment of a boundary hedge which continues as a fence.

Feature representation – point features

Single point features in Land-Line fall into one of three types:

- Points the position of a point feature is described by a single coordinated point.
- Standard symbols features such as a water flow arrow have a coordinated point and an orientation to describe their geometry.
- Surveyed symbols features which need a size dimension as well as an orientation, such as a large electricity pylon on 1:1250 and 1:2500 scale tiles.



Each point feature is recorded as an INSERT or a defined BLOCK. Symbols are represented by BLOCKS in DXF.

Feature representation – text features

The treatment of text (names, descriptions and clarifying annotations) within Land-Line owes much to traditional cartographic practice, which influences the position, font, style, orientation and point size of text.

Each text feature can be considered as a block for the purpose of positioning – see figure 3.8. Each text block has nine location codes, numbered 0 to 8. One of these locations is digitised and hence carries the XY coordinates.

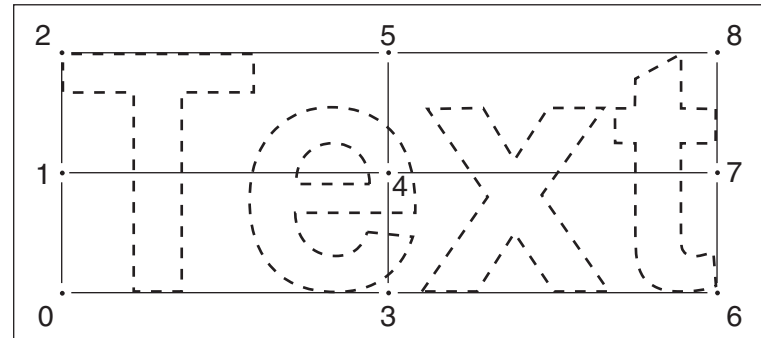
BS 7567
NTF

All text is given a coordinated position, quoted as X and Y coordinates relative to the map origin (south-west corner), in the same way as for point features. The coordinated position may be any one of the nine positions 0–8.

DXF

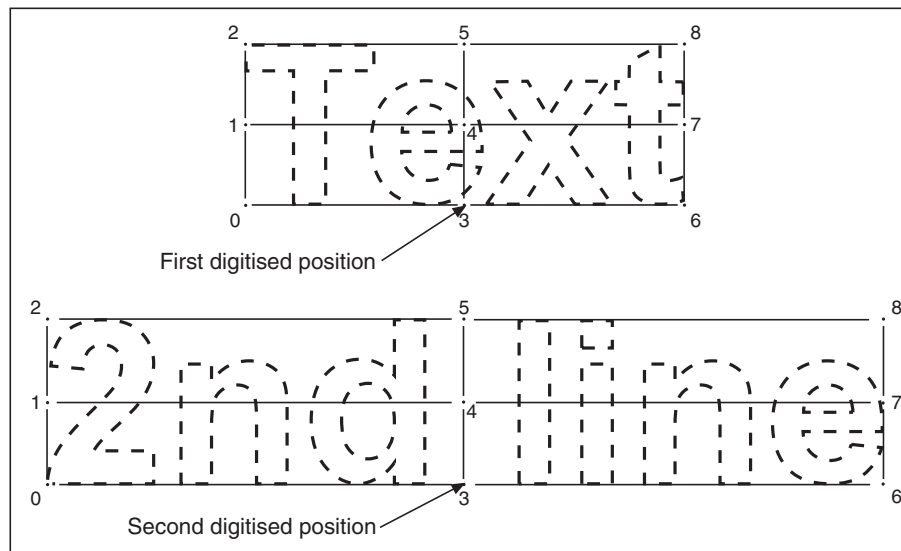
Whilst any one of the nine locations may be digitised originally, the coordinates of position 0 are calculated and supplied in DXF data. Text is positioned above and to the right of this position. All text is supplied in the STANDARD text style and Non-Roman antiquities carry an instruction to apply an AutoCAD text style of GOTHICE.SHX. Text heights are specified in multiples of *ground metres*.

Figure 3.8: Text block digitising positions – horizontal



In some cases, for example, where space is limited, it is necessary to place linked items of text one above the other; this is known as double-banked or treble-banked. In these cases each line of text is treated as a separate feature – see figure 3.9.

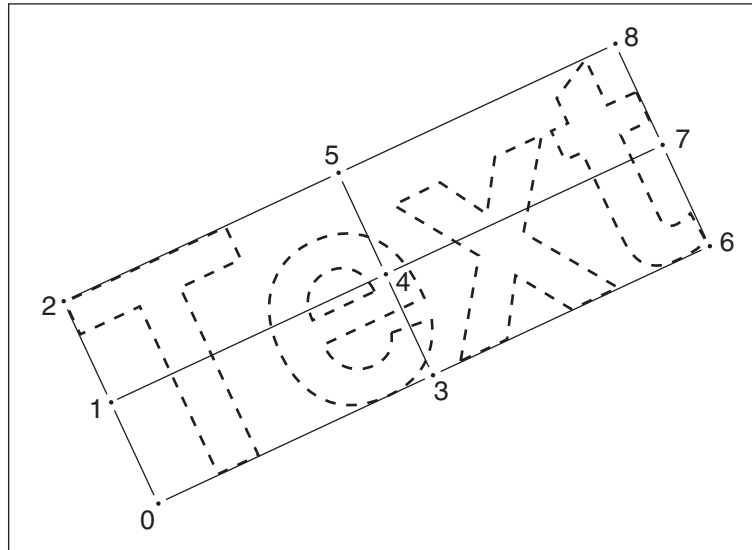
Figure 3.9: Double-banked text



Text orientation

Text is oriented, that is it may run from west to east across the map, or it may be plotted at some other angle, measured anticlockwise from grid east, to align it with some other feature.

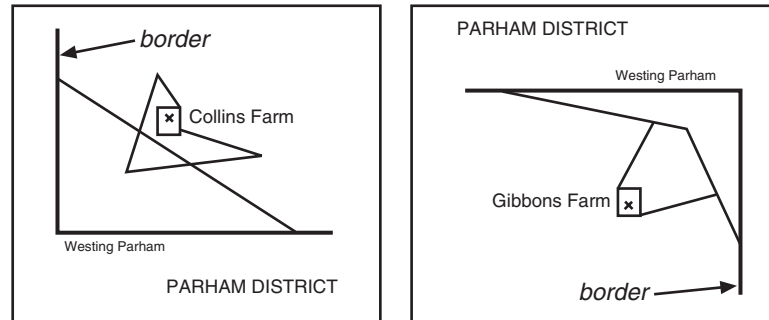
Figure 3.10: Text block digitising positions for oriented text



Marginal text

Marginal text is that text which by cartographic convention would be printed to appear outside the neat line (border) of the map.

Figure 3.11: Examples of marginal text features



BS 7567
NTF

A marginal name has the same feature code that is applied to a similar name which appears on the body of the map.

DXF

All marginal text is on layer G8010574. See [Name and text features](#) in chapter 9.

Principles of survey and digitising

Survey tolerances

Land-Line aims to portray an accurate survey of the features which comprise the detailed topography, so that each feature is correctly depicted in terms of shape, size, orientation and position relative to all the surrounding features.

However, the scales originally chosen as the basic scales of survey restrict the absolute achievement of this objective. For that reason Land-Line information was selected for inclusion so that display and graphic plotting of the data gives optimum results at the scale of survey. This requires there to be differing tolerances for data capture of similar features at different scales.

All information for Land-Line is surveyed and captured using the principles and definitions outlined below.

Permanent detail

This is defined as physical features, which it is reasonable to assume will remain in position for at least 10 years, taking into account the nature of construction or character. Land-Line digital maps show all permanent detail which can be shown at the scale of survey. Natural relief features are not normally shown. Detail which is too small to be digitised at scale but is sufficiently important or prominent is shown by a symbol. Administrative boundaries are shown. Archaeological information is shown using the equivalent feature type. There are **no** specific feature codes for archaeological information.

Indefinite detail

Indefinite detail is defined as physical features of sufficient importance and which have an outline which is either liable to change or not defined precisely by any surveyable feature. The nature of surface vegetation is shown, except for trees and scrub (bushes, brambles and undergrowth) standing in permanent water.

Indefinite detail is not surveyed precisely. The accuracy of survey is related to the degree of definition of the detail on the ground.

Depiction of relief features

Land-Line does not attempt to show general ground relief. Only those ground relief features which constitute a serious obstacle to passage on foot are included. These are features such as cliffs and man-made embankments and cuttings.

Non-physical features to be recorded

Names of all physical features, objects and areas are included. A selection of house numbers or house names (if no number has been allocated) are shown. See [chapter 5](#) for the rules on the positioning of names and numbers.

Road centrelines are created to indicate the public road network. They are captured to lie between the bounding features of public roads, but are not specifically surveyed.

Feature levels

Physical features are categorised as being at one of the following three height levels:

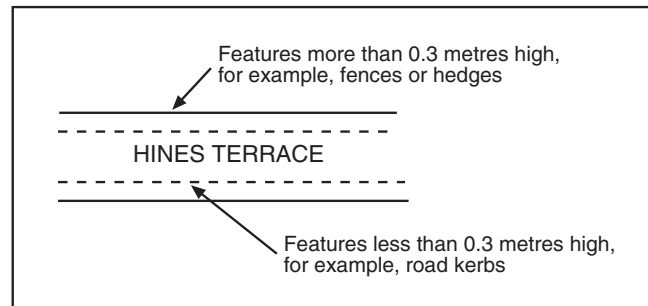
- 1 ground surface level;
- 2 overhead level; or
- 3 underground level.

Ground surface level

The definition of this term is usually self-evident. Where more than one level of detail exists, ground surface level is defined as the **upper level of through public communications**. Land-Line aims to show physical features by their outline at ground surface level.

Those features which are less than 0.3 metres in height are given different coding attributes to distinguish them from those above 0.3 metres. These are normally features which do not pose an obstruction to pedestrians, and are traditionally shown on Superplan® plots by broken (pecked) lines. Those above 0.3 metres in height are shown traditionally by solid lines on Superplan plots. These conventions are used in the illustrations of Land-Line in this user guide.

Figure 3.12: Feature heights



Permanent buildings and other objects whose plan outline covers an area of 8 m² or more are now shown, unless they are within a private garden, when the minimum criteria is 12 m².

Smaller buildings and objects covering an area of 4 m² or more and whose smallest dimension is 1 m or more are shown when they are in such a detached position as to be a relatively important topographical feature. Features are shown regardless of size when used to identify the alignment of or mere an administrative boundary or as a site for a bench mark.

Overhead level

This is simply defined as those features which are above ground surface level. Overhead detail is normally shown if it is of such size and character as to constitute a meaningful topographic feature.

Roofed structures are represented in Land-Line by an indicator. Buildings which have supporting pillars are recorded as overhead detail if they meet the permanent detail criteria described earlier in this chapter.

Overhead features which are less than 1 m wide (for 1:1250 scale) or 2 m wide (for 1:2500 or 1:10 000 scale) are not shown unless of particular importance, such as a motorway gantry.

NOTE: historically a 5.0 m minimum width was applied to 1:10 000 scale.

Overhead features, such as pipes within an industrial installation, are not shown where they form an integral part of that installation. Depiction of overhead features entering such installations is terminated at the first support or building within the perimeter.

Underground level

This is simply defined as those features which are below those at ground surface level. Underground features are not normally shown, except for some communications in tunnels or subways and specified features within complex multilevel structures.

The only underground features normally shown are the outlines of communications in tunnels and subways if these communications **usually** run on ground surface level.

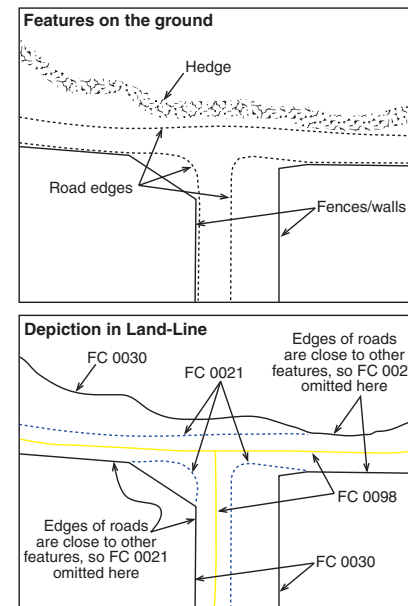
Because of their nature, tunnel alignments are not captured to the same accuracy as features on the surface.

Parallel features

Where a fence, hedge or wall runs approximately parallel to another feature and so close that they cannot both be plotted correctly at scale of survey then only one feature is shown in Land-Line. In determining which feature to include, the following hierarchy is used by the surveyor:

- 1 Include if the feature is used to mere an administrative boundary.
- 2 Include if the feature **appears** to define the extent of a property.
- 3 Include if the feature appears more important, for example, a hedge next to a cattle protection fence, show the hedge.

Figure 3.13: Parallel features in Land-Line.



Depiction of coincident alignments of features

Generally, Land-Line interprets the real world as a series of discrete features and the geometry of each feature appears only once in the data.

The same geometric alignment or position is not recorded more than once, even though a particular feature may serve more than one function, for example, a roadside wall may also be the edge of a pond.

The only exception to this principle is where, for example, an intangible feature such as an administrative boundary is mered along the centre of a hedge or fence.

Feature precedence for coincident features

As there are no dual or multiple feature codes or layers, where physical features are coextensive planimetrically the following hierarchy is used to determine the appropriate feature code or layer for those features:

- 1 Mean high water (springs).
- 2 Building.
- 3 Water detail.
- 4 Road detail.
- 5 Other detail.
- 6 Mean low water (springs).

An example is the Houses of Parliament in London. These are situated on the bank of the River Thames which at that point is tidal. The side of the building which is at the water's edge is represented by the mean high water and not the building's outline. The two examples in [figure 3.14](#) show the use of the precedence rule.

Figure 3.14: Feature precedence for coincident features

Example 1 shows the mean high water feature code taking precedence over the building outline feature code.

Example 2 shows the building outline feature code taking precedence over the water detail feature code.

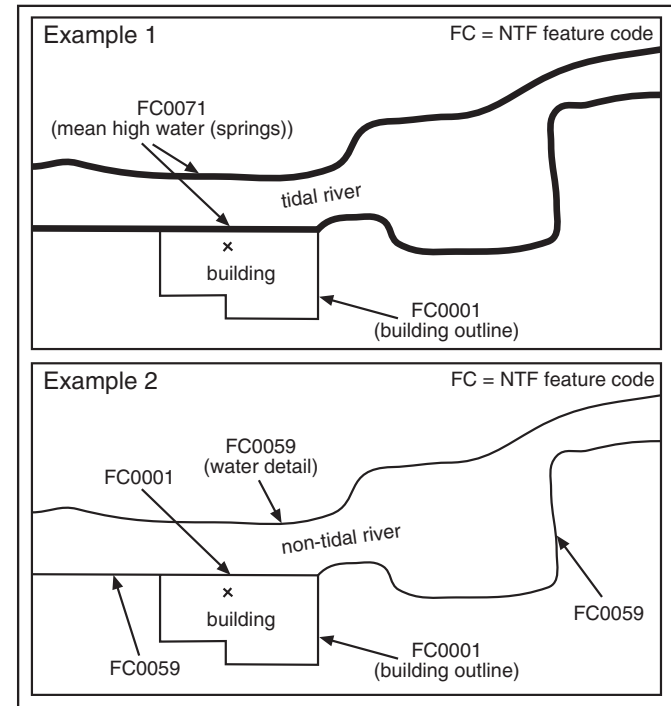
Substitute G801 for the FC in the examples above to obtain the appropriate DXF layer.

Two-dimensional coordinates

All coordinates in Land-Line are two-dimensional, that is:

- an easting, or X coordinate; and
- a northing, or Y coordinate.

Spot heights and bench mark heights in Land-Line occur only as text strings.



Ordnance Survey datum



Heights are normally measured in relation to mean sea level Newlyn Datum, with the exception of some offshore islands, where a local datum will have been used. The {Z_DATUM} field in the Section Header Record ([see chapter 8](#)) indicates which datum is used, by giving a numerical value from the list below.

List of datum values and the datum to which they refer

Newlyn	0	
Colonsay	1	
Isles of Scilly	2	
Lundy	3	
Orkney (Northern group)	4	not used, use 0
Outer Hebrides group	5	
St Kilda	6	not used, use 5
Shetland group	7	
Bardsey	8	not used, use 0
Canna	9	
Coll	10	
Eigg	11	
Rùm	12	
Tiree	13	
Unspecified	14	

The numerical value given to a tile indicates that part of the data on that tile is directly derived from one of the data listed. If a tile has no data directly derived from one of the listed data, it will be numbered 14 – unspecified.

There may be instances where a tile is numbered because part of the data on the tile is directly derived from one of the listed data, but some isolated islands on that tile may be unspecified.

Source data capture scales

The three survey scales for Land-Line data are:

Scale	Tile coverage (ground area)	Area type
1:1250	500 metres by 500 metres	Urban areas
1:2500	1 km by 1 km or 500 metres by 500 metres	Rural areas
1:10 000	5 km by 5 km	Mountain and moorland areas

Examples of Land-Line data at the different scales are shown in figures [3.15](#), [3.16](#) and [3.17](#).

1:10 000

In some areas on the fringes of mountain and moorland areas the 1:10 000 scale tiles incorporate blank areas. These blank areas are surveyed at 1:2500 and/or 1:1250 scales. The apparent incomplete 1:10 000 scale tile is then referred to as Part-basic.

Update of Land-Line

Intelligence (information about changes which have occurred on the ground) gathered from aerial photography, local knowledge and other documentary sources ensures that revision to the digital data is surveyed in digital format using the data capture specification for the recording of Land-Line features.

Figure 3.15: An example of urban 1:1250 scale Land-Line data

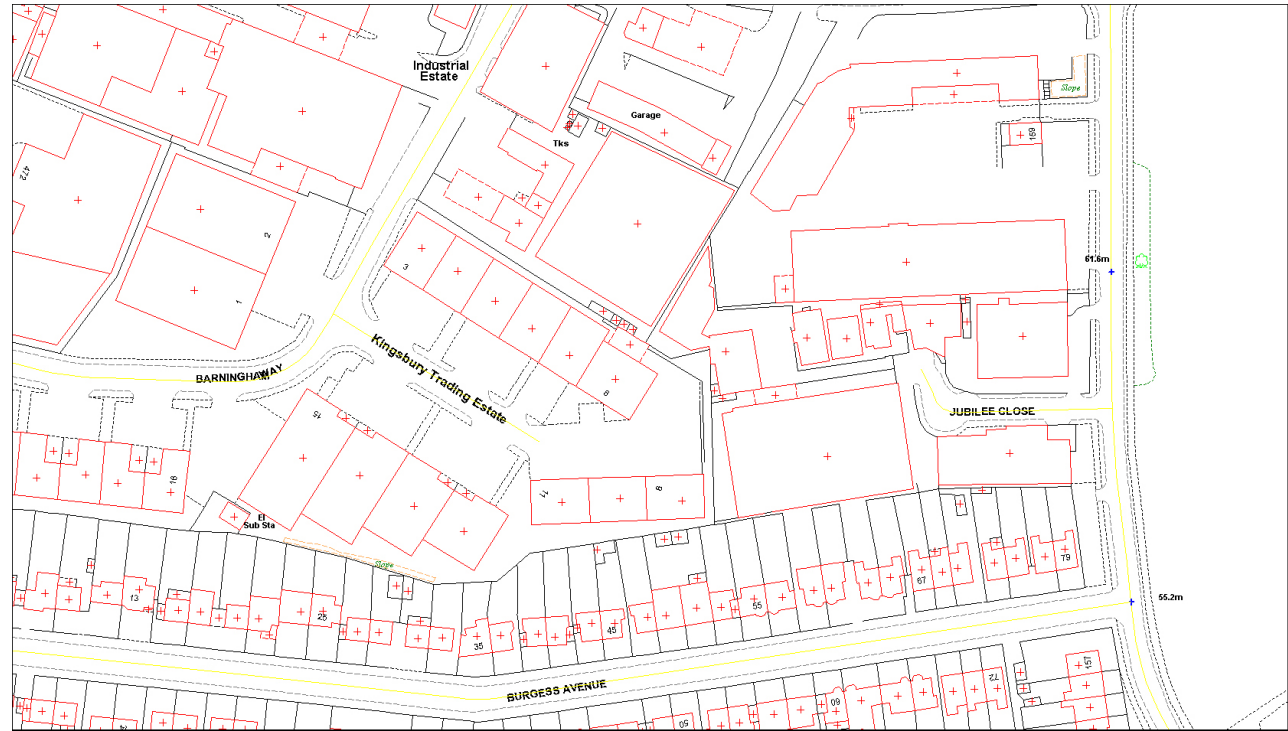


Figure 3.16: An example of rural 1:2500 scale Land-Line.Plus data

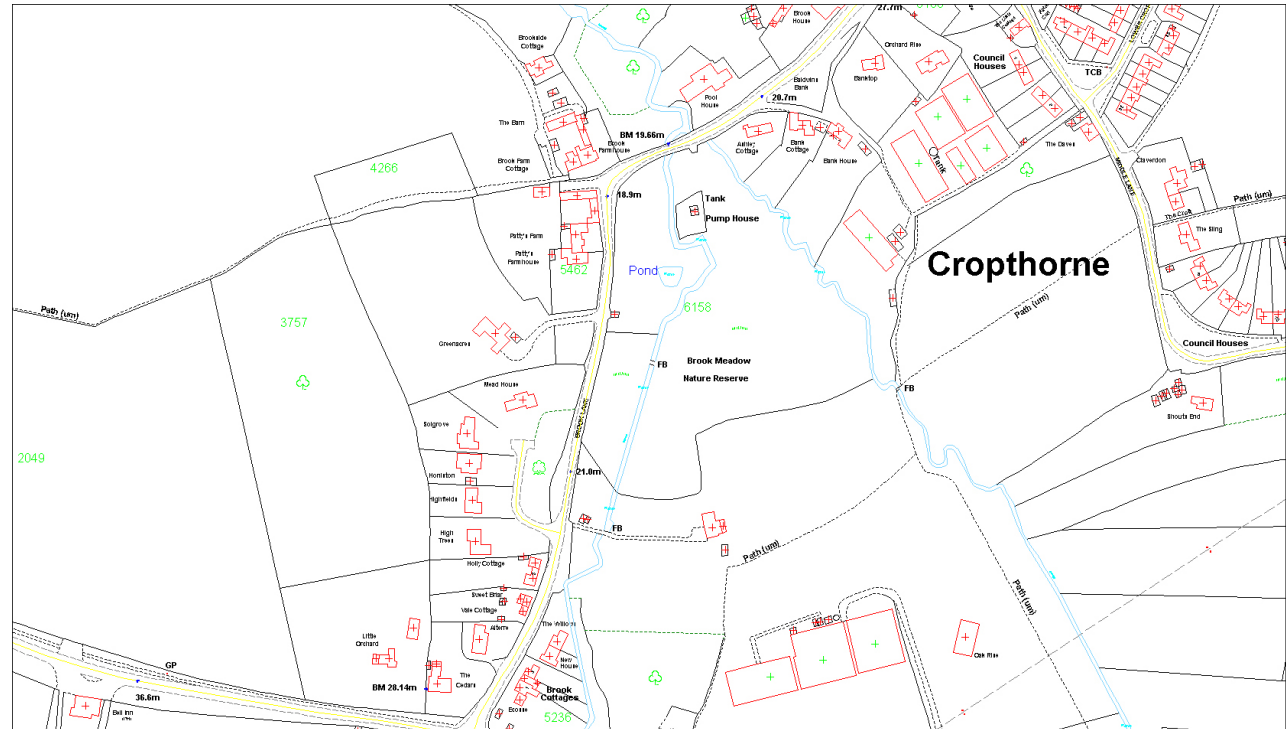
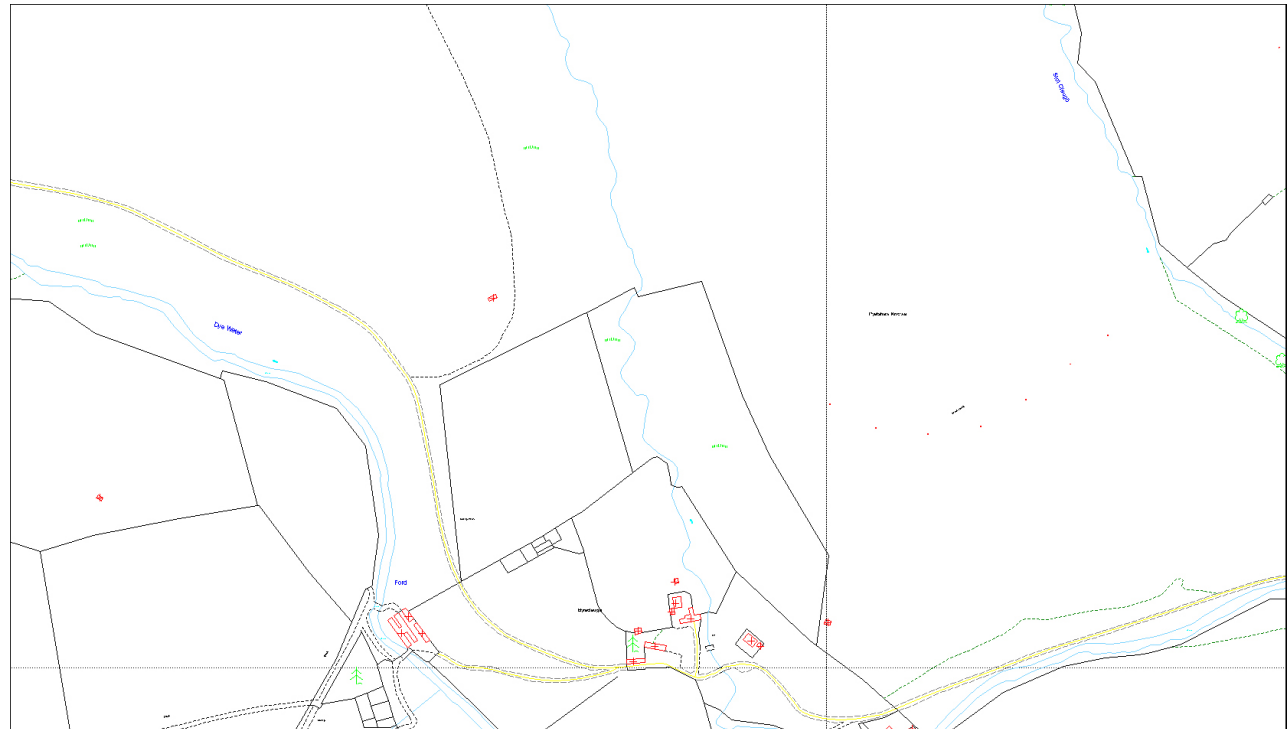


Figure 3.17: An example of moorland 1:10 000 scale Land-Line.Plus



Viewing and plotting Land-Line

Land-Line products are supplied as data only. They require software (provided by commercial companies but not by Ordnance Survey) to display on a screen, manipulate or plot as hard copy.



The parameters defining colours, line styles, text styles, symbols and so on, should be built into your software.



The parameters defining colours, line styles, text styles, symbols and so on, are embedded within the supplied DXF data file, as is customary with this CAD format; they can be customised once the data is imported.

Land-Line may be customised by viewing or plotting features in different colours, line styles and scales to suit different applications. Certain classes of features may be omitted from customised plans on the basis of selection by feature code or layer.

The resolution of Land-Line supports plotted or displayed output at a range of scales around the nominal scale of the source mapping.

Warning: plotting at too small a scale will result in a plan of cluttered appearance, with text too small to be legible. Similarly, plotting at a scale much larger than the original survey scale can result in misinterpretation of the precision of the data and excessively large text. A suggested output within 25% of a tile's source scale should allow all data to be meaningfully plotted or displayed.

Chapter 4 Real-world features in Land-Line

Introduction

Land-Line shows many real-world features, both tangible and intangible. For convenience in this chapter they are grouped into 12 main groups:

- Buildings and structures.
- Roads.
- Tracks and paths.
- Railways.
- Fences, hedges and walls.
- Water.
- Overhead features.
- Underground features.
- Landscape, surface features and landform.
- Administrative and electoral boundaries.
- Antiquities.
- Horizontal and vertical control.

Each group is separately described in this chapter.

For each of these 12 groups, the following aspects are described:

- general principles of selection and inclusion;
- features within the feature group – divided into physical and non-physical features;
- application of feature precedence;
- constraints imposed by survey tolerances and mapping scale; and
- a table of feature codes and/or layers relevant to the group.

Size limitations prevent this chapter of the user guide being a complete specification for the representation of the real world in Land-Line. Please refer queries to Ordnance Survey.

Following the descriptions for each group and at the end of this chapter, there are two tables which itemise most real-world objects and specify their treatment in Land-Line:

- real-world features shown in Land-Line ([page 113](#)); and
- real-world features **not** shown in Land-Line ([page 126](#)).

Roads

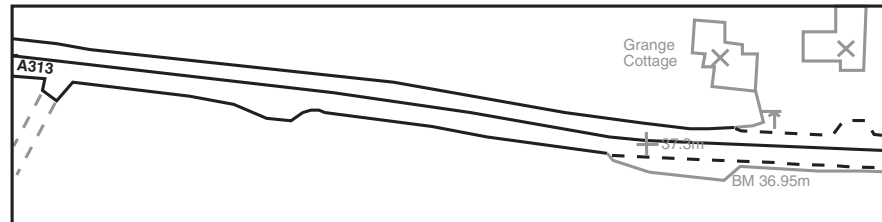
General principles

For Ordnance Survey purposes, a road is defined as a metalled way for vehicles.

Land-Line contains information relating to those roads which form the public road network and those in private property which are over 100 metres in length. No attempt is made to separately identify roads by their Department for Transport (DfT) classification. Certain DfT road numbers are recorded as textual features in Land-Line.

Names of roads are recorded. Unnamed roads are not normally described but in cases of ambiguity an annotation may be included.

Figure 4.1: Road features in Land-Line



Features in the roads feature group

Land-Line data relating to roads contain representations of physical and non-physical features.

Physical road features shown are:

Kerb lines or the limits of metalling representing:

- carriageway limits, including any hard shoulder or shallow drainage gullies forming the side of the road on dual carriageways or motorways;
- kerbed roundabouts;
- traffic islands in roads, except when very small (traffic islands must be 8 m² or more);
- Traffic calming measures forming a physical obstruction, including pinch points*;
- dedicated cycle lanes delineated by kerbstones;
- fords; and
- car parks.

Road furniture such as:

- mile posts †;
- guide posts (traditional finger posts only);
- kerb barriers;
- gates across roads;
- posts preventing vehicular access;
- weighbridges; and
- cattle grids.

Road bounding features such as:

- hedges, walls, fences and banks; and
- crash barriers (where they form the sole bounding feature of a carriageway).

Landscape features including:

- areas of vegetation within the curtilage of the road; and
- embankments and cuttings.

Minor road details (street furniture) such as drain covers, manholes, lamp posts and traffic control signs are not included.

* These features are recent additions to the specification and are being retrospectively captured as part of the revision process – [see chapter 6](#). There is not expected to be national coverage of such features within Land-Line for five years, dependant upon the progress of the revision programme.

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

Non-physical features shown are:

The central alignment extent of all roads which are accessible and normally used by the public. These are not surveyed, but inferred from surrounding features to simply lie within the bounding features of the carriageway.

The recognised text descriptions of all road features. These describe physical features such as:

- cycle tracks;
- mile posts and stones †;
- road names and some DfT classification numbers ([see chapter 5](#)); and
- lay-bys.

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

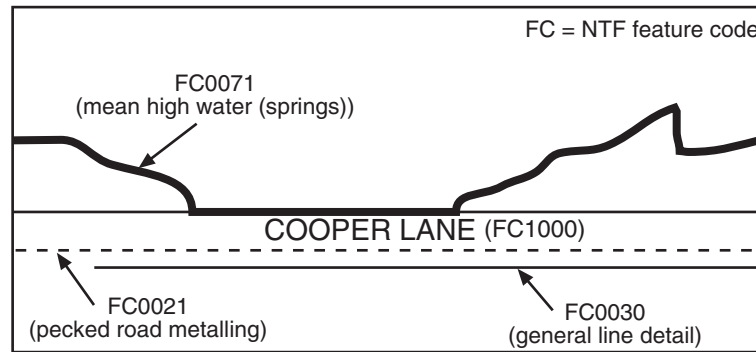
For more information on the selection and representation of text in Land-Line, [see chapter 5](#).

Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See Depiction of coincident alignments of features on [page 48](#).

A road-related example of the use of the precedence rule is shown in [figure 4.2](#).

Figure 4.2: Road feature code hierarchy



Substitute G801 for the FC in the examples above to obtain the appropriate DXF layer.

Building and structure features

General principles

Land-Line contains information relating to all permanent buildings and structures which are large enough to be included. The minimum ground area for a building shown true to scale is 8 m². For buildings in private gardens, the minimum size is 12 m². The main corners of buildings are shown in their correct positions and the outline of important buildings are recorded whenever practical.

Features in the building and structures group

Physical building features are:

- roofed buildings (of sufficient size to be included);
- mobile or park homes that are permanent, residential and have a postal address*;
- archways and covered passageways where the alignment can be surveyed from outside the building (indicated by diagonal lines and coded as minor line detail);
- horticultural glasshouses over 50 m² (other glass structures will now be shown as conventional buildings);
- detached monuments;
- cooling towers;
- tanks shown true to scale and described;
- ruined buildings (shown by their outer walls only); and
- bridges, viaducts, aqueducts and piers.

* These features are recent additions to the specification and are being retrospectively captured as part of the revision process – [see chapter 6](#). There is not expected to be national coverage of such features within Land-Line for five years, dependant upon the progress of the revision programme.

Certain buildings, such as detached monuments, cooling towers and tanks, are described by the addition of a freestanding text annotation.

With a few exceptions, for example, by describing government offices or hypermarkets, no distinction is made between residential, private, public, commercial or industrial buildings.

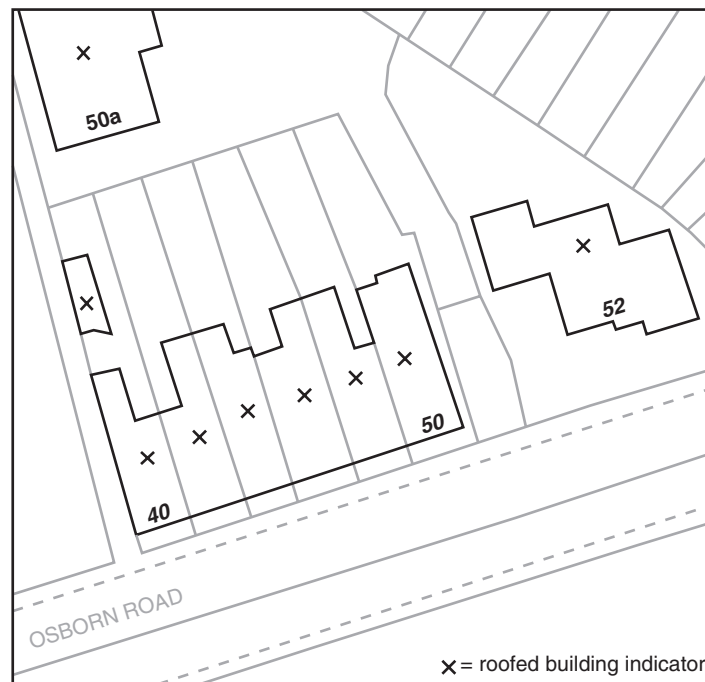
To ensure consistency of depiction for the many diverse complex multilevel structures which exist today, the upper level of through public communications (ULC) is the level to which survey is related. The main building outlines, overhead and underground detail, names and descriptions which provide information consistent with clarity, are also shown.

Non-physical aspects shown are:

- house numbers and distinctive names;
- roofed building indicator; and
- glasshouse building indicator.

For more information on the selection and representation of text associated with buildings and structures in Land-Line, please [see chapter 5](#).

Figure 4.3: Building features in Land-Line

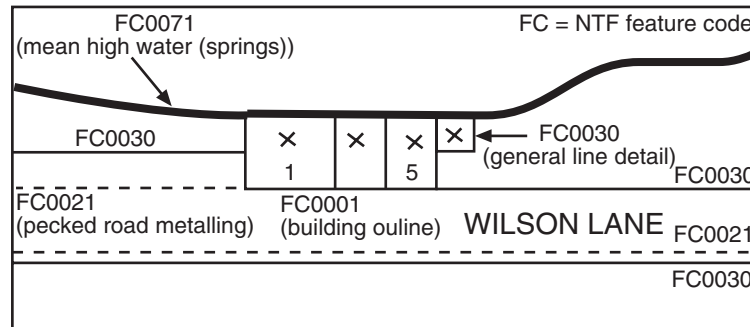


Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See [Depiction of coincident alignments of features](#) in chapter 3.

A building-related example of the use of the precedence rule is shown in figure 4.4.

Figure 4.4: Building feature code precedence



Constraints imposed by survey tolerances

Juts and porches which are an integral part of a building, bay windows and recesses are shown when their smallest dimension is not less than:

- 1.0 m 1:1250 scale Land-Line
- 2.0 m 1:2500 and 1:10 000 scale Land-Line

Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data captured to this specification.

Nevertheless, smaller juts and projections are shown when they abut onto a public thoroughfare or they carry height information.

Feature codes and layers relating to buildings and structures

A full list of NTF feature codes appears in [chapter 7](#) and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to buildings and structures detail are:

NTF feature code	DXF layer	Feature code name
0001	G8010001	Building outline
0004	G8010004	Building outline (overhead)
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
0321	G8010321	Roofed building indicator
0323	G8010323	Glasshouse indicator
0395	G8010395	Upper level of communication indicator
1006	G8011006	House number or building name

Further building and structure-related information is assigned to the following feature codes and layers:

NTF feature code	DXF layer	Feature code name
0052	G8010052	Minor detail
0057	G8010057	Point feature
1009	G8011009	Miscellaneous text



Related text may also be found in the marginal text layer G8010574.

Water

General principles

Continuous topographical water features which extend into private gardens are shown.

Linear water features (such as streams and rivers, and so on) are normally shown to scale. If, however, the width of such features is less than a certain size, then they are shown as a single line, ([see page 70](#)).

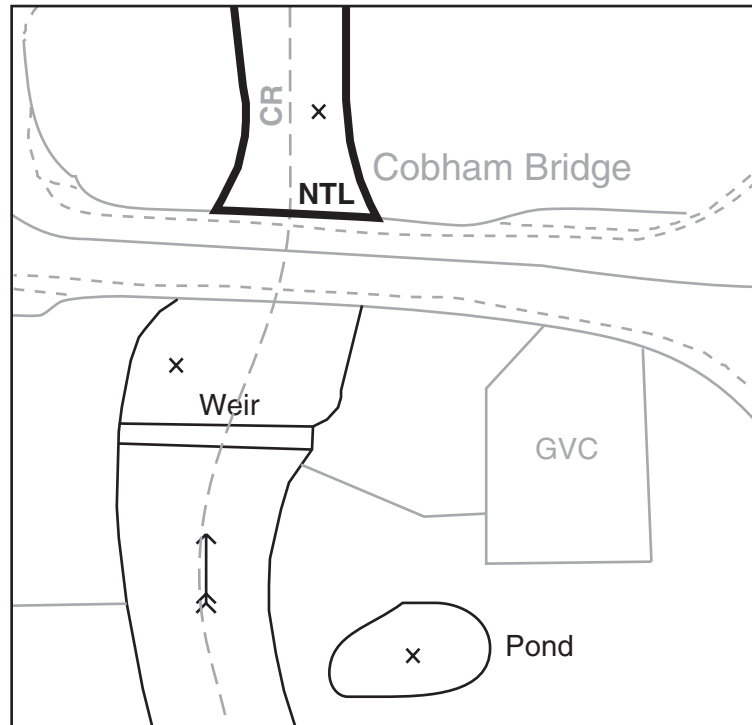
Ordnance Survey shows high and low water marks of a mean average tide, that is an average tide halfway between spring and neap tides, in England and Wales, and of average spring tides in Scotland. In tidal rivers the point to which mean tides (or spring tides in Scotland) flow at high or low water is included.

Lakes and ponds are surveyed at normal winter level; reservoirs are shown at top water level, that is spill-over level.

All water features are described.

The highest point in a river to which normal tides flow is described as normal tidal limit (NTL). Where the point coincides with a firm line feature across a river, for example, a weir, it is shown as mean high water (springs). Where there is no feature, the actual NTL is shown as general ground level or overhead detail.

Figure 4.5: Water features in Land-Line



Feature codes and layers relating to water features

A full list of NTF feature codes appears in [chapter 7](#) and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and/or layers relating to water detail are:

NTF feature code	DXF layer	Feature code name
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
0059	G8010059	Water detail
0069	G8010069	Flow arrow
0071	G8010071	Mean high water (springs)
0072	G8010072	Mean low water (springs)
0400	G8010400	Water indicator
1010	G8011010	Water text

Further water feature-related information is assigned to these feature codes and layers:

NTF feature code	DXF layer	Feature code name
0052	G8010052	Minor detail
0057	G8010057	Point feature
0382	G8010382	Marsh, saltmarsh or reeds
1009	G8011009	Miscellaneous text



Related text may also be found in the marginal text layer G8010574.

Features in the water group

Physical water features shown are:

- mean high water (springs) and mean low water (springs), except where passing beneath a permanent structure such as a jetty;
- canals;
- lakes and lochs;
- ponds;
- bridges and footbridges;
- moats;
- reservoirs;
- rivers;
- streams;
- drains and ditches;
- foreshore features;
- floating objects – only shown when they are fixed and attached to permanent detail;
- shake holes and swallow holes (at 1:10 000 scale, limits of numerous shake holes are shown and the area described as area of shake holes);
- sluices – except those found in sewage works;
- stepping stones;
- taps (which take the form of drinking fountains or which form the communal water supply) †;
- tidal gauges;
- waterfalls – only if formed by natural features;
- water troughs (public) †;
- weirs;
- bollards, capstans and mooring posts;
- breakwaters and groynes;
- culverts;
- perches, pilot beacons and navigational beacons;
- pumps, wells, spouts, springs and fountains;
- drinking fountains †;
- swimming pools;
- watercress beds;
- issues;
- sinks; and
- springs.

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

Non-physical features shown are:

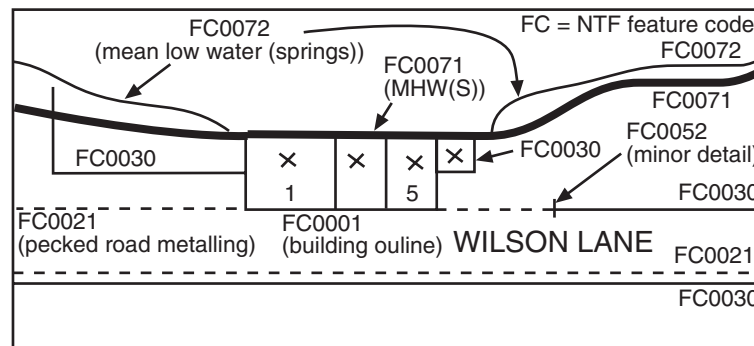
- NTL – the point inland to which mean tides (or mean spring tides in Scotland) flow at high water. The point is shown and annotated by text;
- low water level (LWL) – the point to which mean tides (or mean spring tides in Scotland) flow at low water. The point is shown and annotated by text;
- the text descriptions of all water features (for more information on text in Land-Line, [see chapter 5](#)); and
- flow arrows – a symbol used to indicate the direction of flow of non-tidal moving water.

Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See [Depiction of coincident alignments of features](#) in chapter 3.

A water-related example of the use of the precedence rule is shown in figure 4.6.

Figure 4.6: Water feature code precedence



Constraints imposed by survey principles

Rivers, streams and drains are shown at their true scale width or by a single line where their width is less than:

1.0 m	1:1250 scale Land-Line
2.0 m	1:2500 and 1:10 000 scale Land-Line

Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that have been captured to this specification.

Railway related features

General principles

Land-Line contains information relating to permanent railways that form communication between two specific points: this may be from railway station to railway station or from an industrial building to a private quarry. Land-Line includes the names of all stations, junctions and termini.

Standard gauge railways are shown to scale by a pair of lines, separated by the correct distance (1.435 m) as FC0015 or G8010015. Railways narrower than 1.435 m are deemed to be narrow gauge and the central alignment is shown by a single line as FC0014 or G8010014. Tramways and light rapid transit systems are treated as standard gauge railways.

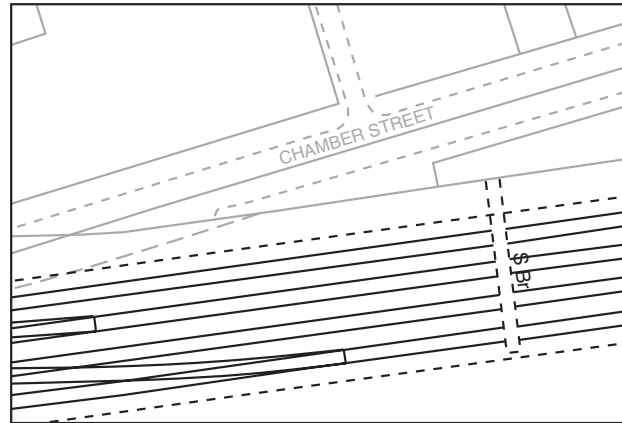
Where railways or tramways have closed but the rails exist in a usable state they are textually described. When the rails have been removed but the formation has not been converted to an alternative use, such as a road or a track, the remaining feature is described as *Dismantled railway* or *Dismantled tramway*. The extent of the permanent way (railway ballast) is also shown.

Privately owned railways or railways constructed solely for the transport of minerals are annotated to indicate the purpose for which the railway is used.

Underground portions of the Metropolitan and District railways in London are shown, except for the deep level tube sections. Where a deep level tube railway comes to the surface and continues as a normal railway it is shown as a normal standard gauge railway. In other cities only the sections of underground railways that are open to the sky are shown in Land-Line. The alignment of underground tunnels are not captured to the same level of accuracy as surface features, because of their nature.

For many years, Ordnance Survey has not been permitted to conduct surveys of railway-related features where it has been deemed to be a risk to the health and safety of surveyors. Several alternative methods for survey of railway-related features are now being investigated.

Figure 4.7: Railway features in Land-Line



Features in the railway features group

Physical railway features shown are:

- level crossings;
- lighting towers;
- loading gauges;
- turntables;
- some railway furniture (such as mile or kilometre posts and stones on 1:1250 and 1:2500 scales);
- sand drags;
- signal posts, bridges and gantries;
- switches and slips;
- retarders (shown 0.5 m (in 1:1250 scale Land-Line) or 1.0 m (on 1:2500 scale Land-Line) away from the rails);
- bridges and viaducts;
- tunnels;
- man-made slopes;
- mail pickups;
- rails;
- permanent way;
- station buildings and platforms; and
- areas of vegetation within the curtilages of the railway.

Physical railway features not shown are:

- minor railway related features such as:
 - telephones associated with level crossings;
 - conductor rails and overhead wires of electrified railways;
 - detail beneath the roofs of railway stations;
 - water troughs; and
 - repetitive features, such as signal lights within marshalling yards.

Non-physical railway feature shown is:

- text descriptions of all railway and associated railway features.

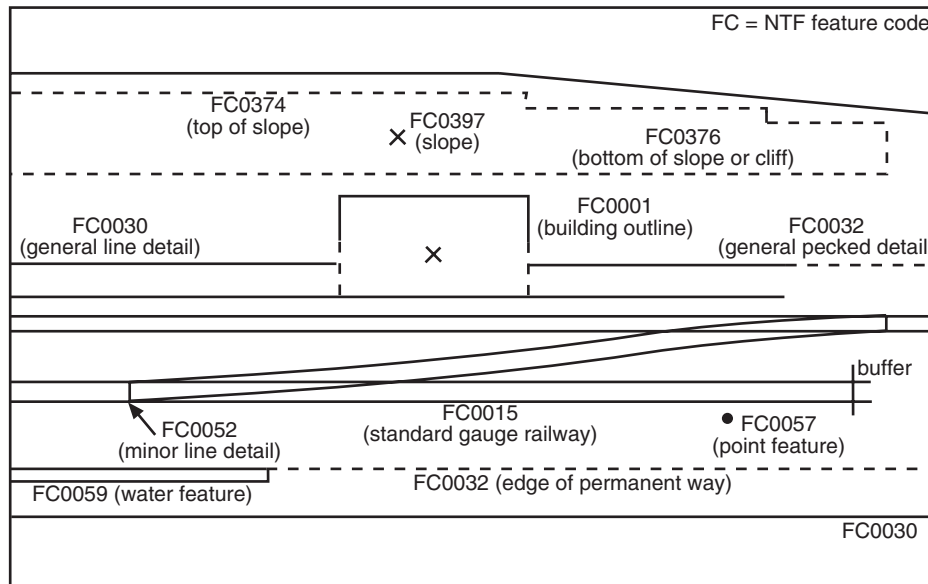
For more information on the selection and details of text in Land-Line, [see chapter 5](#).

Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See [Depiction of coincident alignments of features](#) in chapter 3.

A railway-related example of the use of the precedence rule is shown in [figure 4.8](#).

Figure 4.8: Railway feature code hierarchy



Constraints imposed by survey tolerances

Where a roof of a building overhangs the edge of a platform, the platform takes precedence over the roof overhang.

Feature codes and layers relating to railway features

A full list of NTF feature codes appears in [chapter 7](#), and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to railways are:

NTF feature code	DXF layer	Feature code name
0014	G8010014	Railway (narrow gauge)
0015	G8010015	Railway (standard gauge)and tramways (light rail networks)
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
0033	G8010033	Underground detail or course of antiquity
0057	G8010057	Point feature
0374	G8010374	Top of slope or cliff
0376	G8010376	Bottom of slope or cliff
1009	G8011009	Miscellaneous text

Further railway related information is assigned to the following feature codes and layers:

NTF feature code	DXF layer	Feature code name
0001	G8010001	Building outline
0004	G8010004	Building outline (overhead)
0052	G8010052	Minor detail
0321	G8010321	Roofed building indicator
0397	G8010397	Slope indicator



Related text may also be found in the marginal text layer G8010574.

Tracks and path related features

General principles

The alignments of tracks and paths are shown in Land-Line as line features. A textual description is also included, although there are some exceptions which are explained below. The text description is normally aligned centrally to the feature and parallel to it.

Tracks

For Ordnance Survey purposes, a track is defined as an unmetalled way which is clearly marked, permanent and used by vehicles. Tracks are only recorded in private gardens if they are 100 metres or more in length. They need not be all weather. The edges of such tracks are recorded in Land-Line as line features. All tracks are described as Track, or Tk if required to be abbreviated. Distinctively named tracks have their name recorded in Land-Line, for example, HICKS LANE (Track).

Paths

For Ordnance Survey purposes, a path (made or unmade) is defined as any established way other than a road or track. Paths are recorded in Land-Line as line features.

Made paths

Made paths are those whose surface is paved or metalled. Only major paths are shown in parks, public gardens, cemeteries and so on. Made paths are described in Land-Line by the annotation Path, except in the following circumstances:

- in built-up areas the description will not normally be recorded; and
- if the path has a distinctive name, such as Simmons Walk.

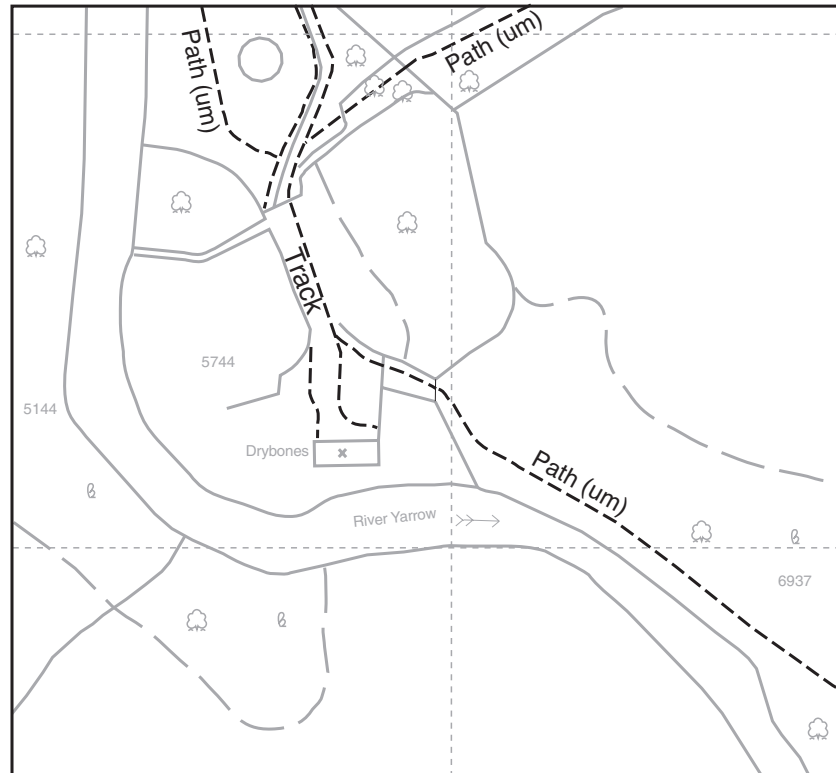
Rights of way

Rights of way are not identified in Land-Line. The representation in Land-Line of a road, track or path is no evidence of a right of way.

Unmade paths

Unmade paths are those which are neither paved nor metalled. An unmade path is included in Land-Line when its entire length is evident on the ground and it starts at a road, track or path and finishes at a similar feature or a specific place of interest. Unmade paths are described by the annotation Path (um) in 1:1250 and 1:2500 scale areas.

Figure 4.9: Track and path features in Land-Line



Features in the track and path feature group

Physical features shown are:

- edges or centre alignments of tracks and paths;
- the treads of steps; and
- posts preventing vehicular access, generally only when no kerb exists.

Non-physical aspect shown is:

- textual descriptions – whether they be descriptive or distinctive.

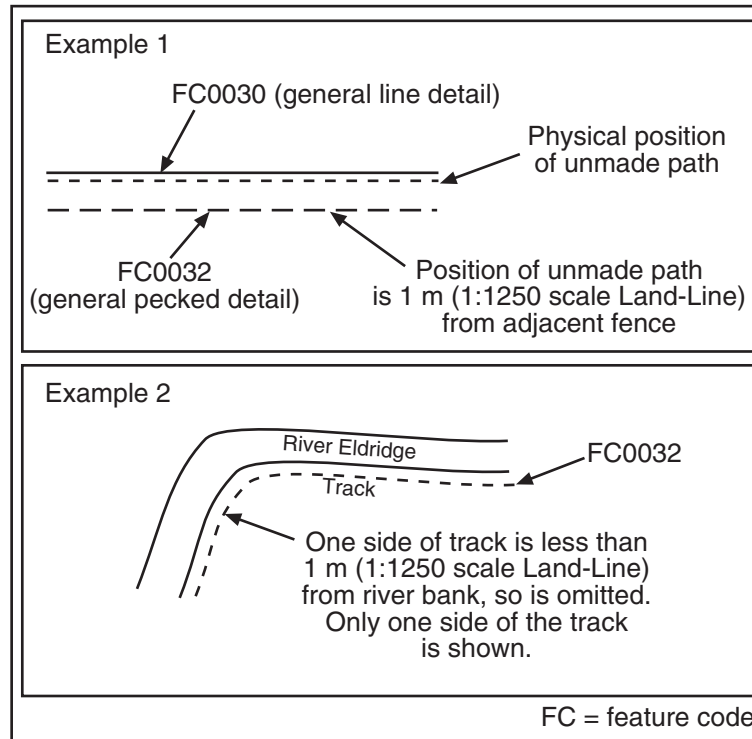
For more information on the selection and details of text in Land-Line, [see chapter 5](#).

Constraints imposed by survey tolerances

The following two situations are treated in the following ways:

- Where the central alignment of an unmade path is less than 1 m (1:1250 scale Land-Line) or 2 m (1:2500 scale and 1:10 000 scale Land-Line) from an adjacent building, fence, hedge or wall, the central alignment is shown at that minimum distance away from the feature. [See example 1 in figure 4.10](#). Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that were captured to this specification.
- Where one edge of a track is parallel and close to the bank of a water feature, the track edge nearest to the river is omitted. [See example 2 in figure 4.10](#).

Figure 4.10: Track and path features – survey constraints



Feature codes and layers relating to track and path features

A full list of NTF feature codes appears in [chapter 7](#), and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to tracks and paths are:

NTF feature code	DXF layer	Feature code name
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
1009	G8011009	Miscellaneous text

Further track and path feature related information is assigned to these feature codes and layers:

NTF feature code	DXF layer	Feature code name
0057	G8010057	Point feature
0052	G8010052	Minor detail



Related text may also be found in the marginal text layer G8010574.

Fences, hedges and walls

General principles

These features are normally those physical features which commonly divide open areas, for example, agricultural land, into fields or enclose private properties. Small gaps in these linear features are ignored. Grass or earth banks are shown. Permanent and clearly defined unploughed steps or ridges between fields are identified separately. Gates are shown in the closed position, and open gateways are shown as if they were gated.

Broken hedges, fences, walls and banks are shown when they are the only defining feature of a land parcel or in areas where there is little other detail, such as mountain and moorland areas.

The centre of the root alignment of all hedges are recorded regardless of the hedge width. Hedges which have frequent and significant breaks in their alignment are separately identified in Land-Line.

Vertical walls which are parts of buildings or other structures are shown in accordance with the principles outlined in [chapter 3](#). A typical extract of Land-Line, showing fences, hedges and walls is at [figure 4.11](#).

No attempt is made to distinguish between fences, hedges or walls in the data.

The following fence types are **not** shown:

- ring fences protecting single trees;
- some fences in afforested areas;
- protection fences for established hedges;
- crop rotation fences;
- crash and anti-dazzle road barriers, except where they form the only division between carriageways;
- non-bounding fences within private gardens; and
- fences under 0.3 m high.

All other walls are recorded in the following way:

- standard walls – the central alignment is shown for walls whose width is less than:
1 m (1:1250 scale Land-Line)
2 m (1:2500 and 1:10 000 scale Land-Line)

Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that were captured to this specification.

- very thick walls are shown by their outer faces. A textual description – Double Wall – is also included to distinguish such features.
- sloping masonry walls have their alignments recorded using the same criteria as standard walls, except that they have a textual description – Sloping Masonry – added if their horizontal width is greater than:
1 m (1:1250 scale Land-Line)
2 m (1:2500 and 1:10 000 scale Land-Line)

Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that were captured to this specification.

- The alignment of the top of the text is parallel to the top of the wall.

Sea walls which are made of concrete blocks in a regular pattern are treated in the same way as sloping masonry.

Figure 4.11: Fence, hedge and wall features in Land-Line



Physical features shown are:

- fences;
- hedges;
- broken hedges;
- walls;
- broken walls;
- banks;
- broken banks;
- gates (shown closed);
- sloping masonry;
- baulks; and
- lynchets (strips ploughed into a hilly landscape to create terraces suitable for farming).

Non-physical feature shown is:

- textual descriptions of double walls and sloping masonry.

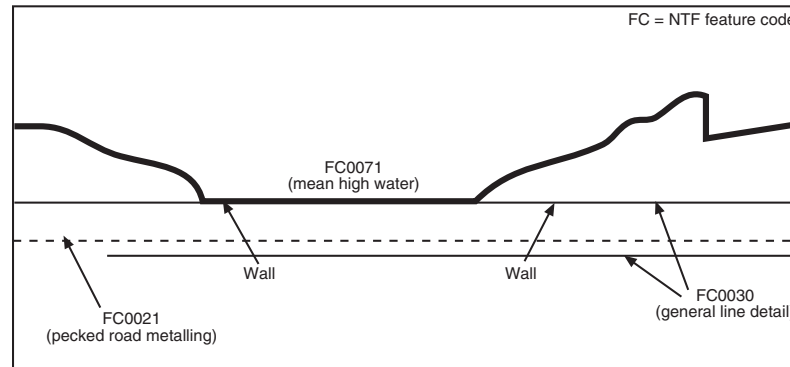
For more information on the selection and details of text in Land-Line, [see chapter 5](#).

Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See [Depiction of coincident alignments of features](#) in chapter 3.

An example of the use of precedence rule, relating to fences, hedges and walls is shown in figure 4.12.

Figure 4.12: Fence, hedge and wall feature code hierarchy



Constraints imposed by survey principles

As described in [chapter 3](#), parallel features which are too close together are shown as a single feature.

Feature codes and layers relating to fence, hedge and wall features

A full list of NTF feature codes appears in [chapter 7](#), and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to fences, hedges and walls are:

NTF feature code	DXF layer	Feature code name
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
1009	G8011009	Miscellaneous text

Further hedge, fence and wall feature related information is assigned to these feature codes and layers:

NTF feature code	DXF layer	Feature code name
0057	G8010057	Point feature



Related text may also be found in the marginal text layer G8010574.

Overhead features

General principles

Overhead features are simply defined as those features which are above ground surface level. Overhead detail is normally shown if it is of such size and character as to constitute a useful feature of Land-Line data. Ground surface features which are the fixing points of overhead detail are coded as appropriate to those features.

The limits of all overhead detail are shown.

Overhead features, such as pipes within an industrial installation, are not shown where they form an integral part of that installation. Overhead features shown entering such installations are terminated at the first support or building within the perimeter.

Cantilevered buildings, balconies and buildings supported on pillars are treated as overhead detail.

In general, no detail is shown beneath roads.

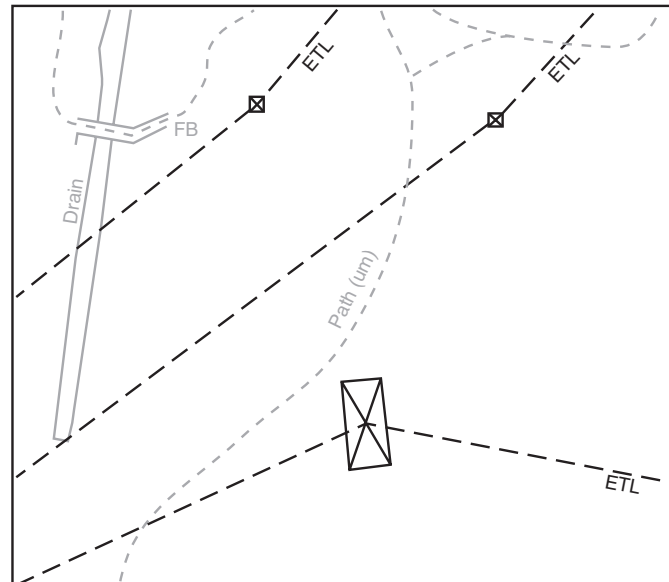
Electricity pylons, flare stacks, radio masts and lighting towers are shown by an oriented symbol when they are square in shape. Where these features are not square, their outline is shown as feature code 0030 in NTF or layer G8010030 in DXF.

Where pylons straddle a tile edge, the pylon is included on the tile containing its centre as a symbol if appropriate. The pylon is shown on the adjacent tile by feature code 0030 in NTF or layer G8010030 in DXF.

Only those pylons which are isolated and unconnected are textually annotated.

Other feature types existing within the limits of a pylon are shown using their appropriate feature code.

Figure 4.13: Overhead features in Land-Line



Features in the overhead features group

Physical features shown are:

- electricity transmission lines;
- pylons and poles;
- aerial ropeways;
- masts;
- chairlifts;
- flare stacks;
- gantries;
- pipelines;
- radar masts; and
- communication masts.

Non-physical feature is:

- textual descriptions for those features described above.

For more information on the selection and details of text shown in Land-Line, [see chapter 5](#).

Constraints imposed by survey tolerances

The symbol used for square pylons and similar features is shown oriented and true to scale, except where the feature is below the minimum size, in which case the minimum sized symbol is used. The minimum sizes are:

- 3 m² area (1:1250 scale Land-Line)
- 6 m² area (1:2500 and 1:10 000 scale Land-Line).

Historically a 10.0 m² dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that were captured to this specification.

Roof projections and overhead features less than the minimum width are not shown, unless of particular importance. The minimum projection widths are:

- 1 m (1:1250 scale Land-Line)
- 2 m (1:2500 and 1:10 000 scale Land-Line).

Historically a 5.0 m dimension was applied to 1:10 000 scale Land-Line, features will remain in the data that were captured to this specification.

Feature codes and layers relating to overhead features

A full list of NTF feature codes appears in [chapter 7](#), and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to overhead features are:

NTF feature code	DXF layer	Feature code name
0004	G8010004	Building outline (overhead)
0030	G8010030	General line or minor building detail
0043	G8010043	Overhead detail
0049	G8010049	Pylon
0052	G8010052	Minor detail
0057	G8010057	Point feature
0321	G8010321	Roofed building indicator
1006	G8011006	House number or building name
1009	G8011009	Miscellaneous text



Related text may also be found in the marginal text layer G8010574.

Underground features

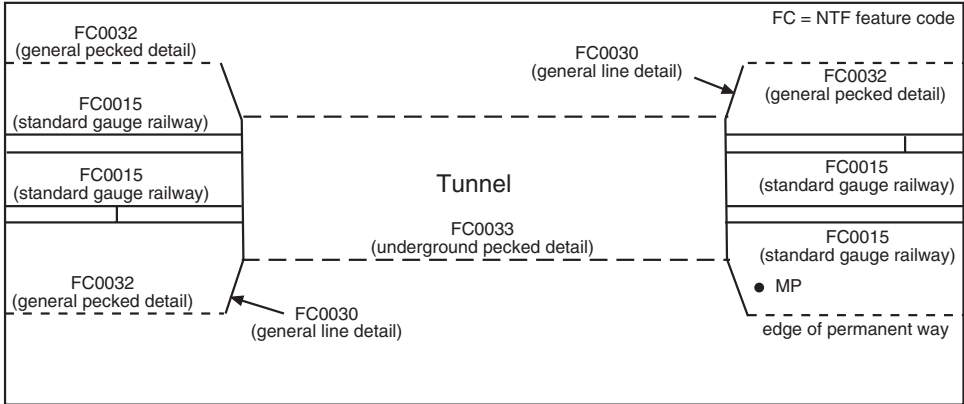
General principles

Land-Line contains information relating to underground communications in tunnels and subways; the limits of the underground features are shown. In complex multi-level constructions, additional underground features are shown to maintain clarity. The alignment of tunnels is approximate.

Subways that lead to tube or underground stations and subways that cannot be surveyed without entering a building are not normally shown.

Where one tunnel passes over another, the lower tunnel is broken where it passes under the upper tunnel.

Figure 4.14: Underground features in Land-Line



Features in the underground features group

Physical underground features shown are:

- the outline of tunnels and subways where they provide a thoroughfare connecting surface communications;
- underpasses beneath motorways and major roads;
- entrances and exits of underground car parks (these are indicated by an arrow and described as Car Park); and
- the inner faces of abutments and the outline of the intermediate piers of bridges, viaducts and so on which carry railways.

Non-physical underground feature shown is:

- textual descriptions for those features described above.

For more information on the selection and details of text shown in Land-Line, see [chapter 5](#).

Feature codes and layers relating to underground features

A full list of NTF feature codes appears in [chapter 7](#), and a full list of DXF layers in [chapter 9](#). The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to underground features are:

NTF feature code	DXF layer	Feature code name
0033	G8010033	Underground detail or course of antiquity
1009	G8011009	Miscellaneous text



Related text may also be found in the marginal text layer G8010574.

Landscape surface features and landform

General principles

Land-Line does not include many landscape features. These aspects are mainly shown in Land-Line.Plus.

Land-Line does include a line feature – vegetation or landform limit – which is used to bound various features.

Landscape features in Land-Line.Plus

Land-Line does not attempt to record the shape of the earth. The limits of geographical features such as hills and valleys are not recorded, although the distinctive names of these geographical features are shown.

Land-Line shows various aspects of the landscape with separate feature codes. These are grouped as either being of vegetation and surface features or landform types.

The majority of the landscape features in Land-Line.Plus are area polygon seeds. These cater for the definition of areas of:

- water;
- cliff;
- coastal slopes;
- man-made slopes; and
- vegetation and surface features such as woodland, rough grass, orchard, marsh (above the high tide line), boulders and so on.

Additional line features are included where necessary to provide bounding polygons for these areas. These line features represent the limits of:

- top of cliff;
- top of slope;
- bottom of cliff or slope; and
- vegetation or landform limit – surveyed and secondary (suppressed).

All areas of slope and cliff have a top and a bottom. The top of cliff or slope is consistently digitised in a certain direction to allow users to apply asymmetric line styles, software permitting. See [Additional line features in Land-Line.Plus](#) in chapter 3 for more information.

In Land-Line and Land-Line.Plus, features which might be thought of as area features are treated as linear outlines. For example, an unfenced orchard has an outline of feature code 0036 or layer G8010036 for vegetation or landform limit.

The nature of vegetation and certain other area features traditionally shown on printed maps by symbols are not recorded in Land-Line by an area fill pattern. Instead, point features called seeds are usually used. Each seed (indicated in DXF by a specific symbol), represents one element of land cover in each area. Generally, it can be assumed that the land cover type indicated by the seed(s) extends out to a notional polygon made up of the closest lines surrounding the seed(s). The bounding area may or may not be incompletely formed.

Some areas of surface features are not shown by seeds but are conventionally annotated with text.

These are areas of dunes, mud, sand, coastal slope and shingle, and also boulders, marsh (including saltings) and rock below the high tide line.

Figure 4.15: Landscape features in Land-Line.Plus

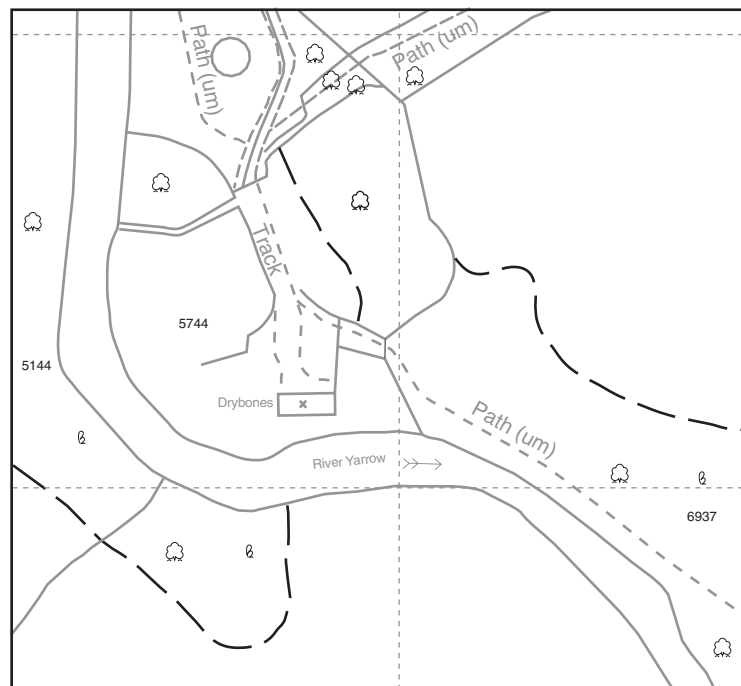
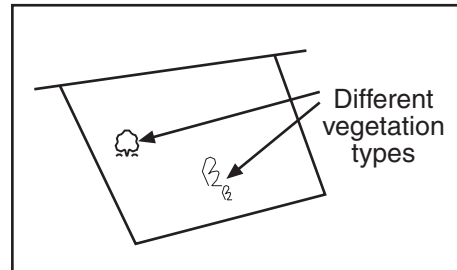


Figure 4.15 is an extract of Land-Line.Plus in DXF. It shows non-coniferous trees and scrub.

As with building and glasshouse seeds, the relationship of a seed to its bounding polygon is not explicit. It is possible for more than one seed to be placed within a single polygon, for example, where mixed vegetation occurs. See figure 4.16.

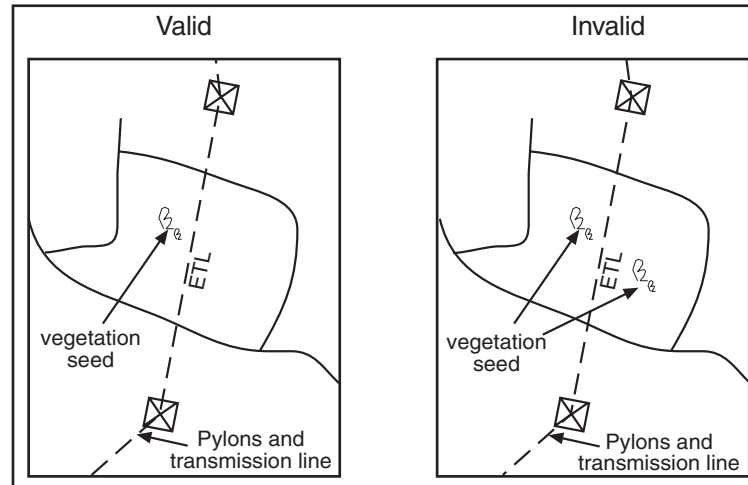
Figure 4.16: Multiple vegetation seeds for mixed vegetation



A seeded area which is crossed by any of the following is treated as a single area:

- boundaries (administrative or electoral – not property);
- road centreline;
- underground detail;
- overhead detail;
- top of cliff;
- top of slope;
- bottom of slope or cliff; or
- minor detail.

Figure 4.17: Linear features and landscape codes



Areas of vegetation regardless of size are included if they cross the edge of a Land-Line.Plus tile, provided that the total area meets the overall minimum size criteria.

Vegetation is not shown within cliff features.

To be classified as scattered trees, the trees must be spaced at more than 30 m apart.

Individual trees and trees in rows

Individual trees are not normally shown unless they are prominent landmarks, are of historical interest or are points defining an administrative or electoral boundary.

Rows and small groups of trees are not normally shown unless they are named. The individual trees within rows are shown in approximate surveyed positions, except when spaced closer than the minimum distance – in which case they are shown accurately to the scale of survey. The minimum distances are:

15 m	1:1250 scale Land-Line
15 m	1:2500 scale Land-Line
50 m	1:10 000 scale Land-Line.

Vegetation and surface features are shown only when of sufficient size. The minimum dimensions are:

Area	Width	Scale
0.1 ha	5 m	1:1250 Land-Line
0.1 ha	10 m	1:2500 Land-Line
1.0 ha	10 m	1:10 000 Land-Line.

Isolated areas of vegetation are not subdivided unless of sufficient size. The minimum dimensions are:

0.25 ha	1:1250 scale Land-Line
1.0 ha	1:2500 scale Land-Line
1.0 ha	1:10 000 scale Land-Line.

In wooded areas, any type of vegetation forming less than 10% of the whole area is ignored. In larger areas of vegetation, subdivisions less than a certain size are not made. The minimum sizes for subdivided areas are:

0.1 ha	1:1250 scale Land-Line
0.4 ha	1:2500 scale Land-Line
1.0 ha	1:10 000 scale Land-Line.

Features in the landscape features group

Physical vegetation, surface and landform features shown are:

- individual trees and trees in rows (in certain circumstances);
- woodland (coniferous trees, non-coniferous trees, coppice or osiers (new areas of coppice or osiers will now be captured as non-coniferous woodland)) †;
- scattered coniferous trees or non-coniferous trees;
- boulders and scattered boulders;
- rock and scattered rock;
- scree;
- scrub;
- marsh, bog, saltmarsh and reeds;
- rough grassland and bracken;
- heath;
- orchard;
- dunes;
- mud;
- sand;
- shingle;
- mussel and oyster beds †;
- the entrances to caves, grottoes, natural arches and pot holes;
- coastal slope;
- the top of cliff or man-made slope;
- the bottom of cliff or man-made slope;
- quarries, opencast workings, pits; and
- refuse tips, slag and spoil heaps.

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

Non-physical vegetation, surface and landform features shown are:

- land parcel numbers (only maintained by deletion where change has occurred); and
- textual descriptions for the features described above. Wooded areas may attract a name, which will generally only be captured if the wood is greater than 1 ha in extent. Wooded areas less than 1 ha in extent will only be named if they are publicly accessible or are of particular public interest.

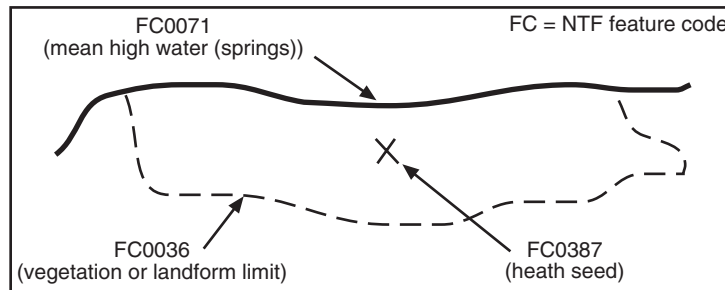
For more information on text in Land-Line, [see chapter 5](#).

Application of feature code precedence

Where the real-world object has more than one function, a precedence rule is used to determine the appropriate feature code or layer to be used in Land-Line. See [Depiction of coincident alignments of features](#) in chapter 3.

A landscape features-related example of the use of the precedence rule is shown in figure 4.18.

Figure 4.18: Landscape feature code precedence



Constraints imposed by survey tolerances

Where the limits of cliffs and slopes are coextensive with features such as fences, the limits of cliff or slope are offset by approximately 0.5 m at source scale for clarity.

Where areas of slope or cliff taper at their extremities, they cease to be shown when the minimum horizontal width is less than:

1 m 1:1250 scale Land-Line
2 m 1:2500 scale Land-Line
5 m 1:10 000 scale Land-Line.

Slopes are not normally shown when their vertical height is less than:

1 m 1:1250 scale Land-Line
1 m 1:2500 scale Land-Line
2 m 1:10 000 scale Land-Line.



Slopes less than 50 m in length along the top are not normally shown.

Feature codes and layers relating to landscape features

A full list of [NTF feature codes](#) appears in chapter 7, and a full list of [DXF layers](#) in chapter 9. The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to landform features are:

NTF feature code	DXF layer	Feature code name
0035	G8010035	Vegetation or landform limit (secondary)
0036	G8010036	Vegetation or landform limit
0057	G8010057	Point feature
0372	G8010372	Positioned coniferous tree
0373	G8010373	Positioned non-coniferous tree
0374	G8010374	Top of slope
0375	G8010375	Top of cliff
0376	G8010376	Bottom of slope or cliff
0377	G8010377	Boulders
0378	G8010378	Boulders (scattered)
0379	G8010379	Coniferous trees
0380	G8010380	Coniferous trees (scattered)
0381	G8010381	Coppice or osiers
0382	G8010382	Marsh, saltmarsh or reeds (above high tide line only)
0384	G8010384	Non-coniferous trees
0385	G8010385	Non-coniferous trees (scattered)
0386	G8010386	Orchard
0387	G8010387	Heath
0388	G8010388	Rock
0389	G8010389	Rock (scattered)
0390	G8010390	Rough grassland
0392	G8010392	Scrub
0396	G8010396	Cliff indicator
0397	G8010397	Slope indicator
1009	G8011009	Miscellaneous text
1013	G8011013	Land parcel number
1210	G8011210	Scree
1211	G8011211	Positioned boulder
1212	G8011212	Ridge or rock line

Further vegetation, surface and landform detail related information is assigned to these feature codes and layers:

NTF feature code	DXF layer	Feature code name
0030	G8010030	General line or minor building detail.
0032	G8010032	General ground level or minor overhead detail.
0033	G8010033	Underground detail or course of antiquity.
0059	G8010059	Water detail.

Administrative boundaries

General principles

Aspects of administrative boundaries which are shown in Land-Line are:

- the alignment;
- a boundary's relationship to real-world topographic features, that is its mereing; and
- descriptions of the boundary type, where necessary for clarification.

The following types of boundary are shown in Land-Line:

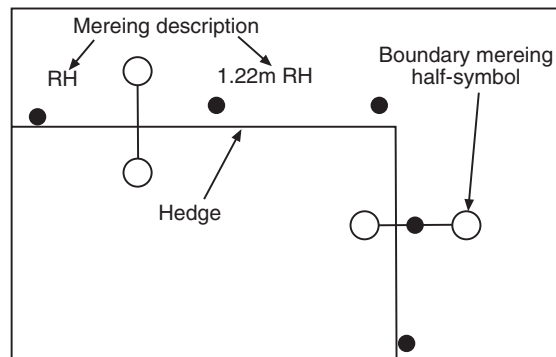
parliamentary boundaries:

- European electoral region;
- county constituency;
- borough constituency in England and Wales;
- burgh constituency in Scotland;
- assembly electoral region and assembly constituency in Wales; and
- parliamentary electoral region and parliamentary constituency in Scotland.

local government boundaries:

- In England:
 - county;
 - City and County of the City of London, district, London borough, unitary authority and metropolitan district;
 - civil parish and the Inner and Middle Temples;
 - electoral division; and
 - ward.
- In Wales:
 - unitary authority;
 - community; and
 - electoral division.
- In Scotland:
 - unitary authority; and
 - ward.

Figure 4.19: Boundary features in Land-Line



Boundary alignments

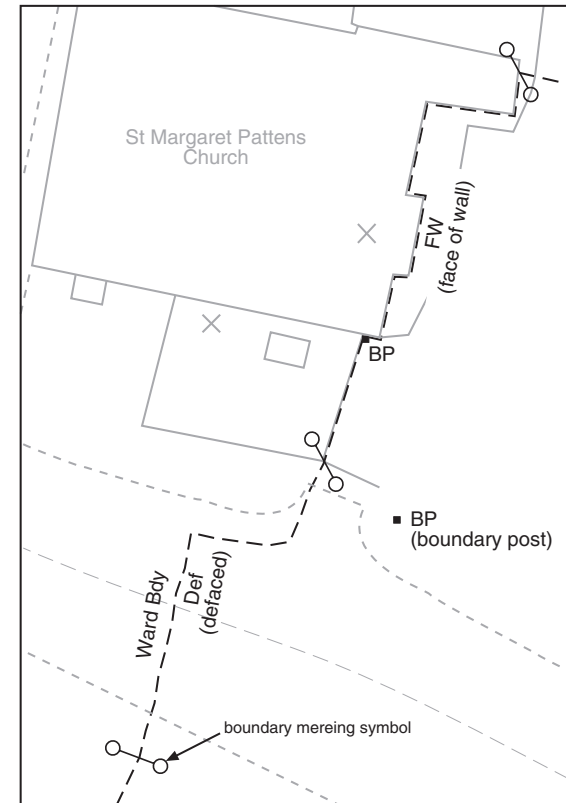
Historically boundary alignments may or may not have a predefined relationship with the topographical features in their locality. This relationship is known as a boundary mereing. This mereing relationship is recorded in Land-Line as a textual description. A list of the more common mereings is given later in this chapter, along with any normal abbreviations.

From October 2002 boundary mereing relationships for new or changed boundaries are no longer recorded by Ordnance Survey. The alignment is still recorded. Update to existing mereing relationships may occur where the original topographical feature is deleted, in such cases the description is changed to 'Defaced' (Def). Mereing relationship descriptions existing before October 2002 are retained in Land-Line.

When the mereing relationship of any boundary alignment changes or where a boundary changes from one side of a feature to the other, the point of change is shown by a boundary half-mereing symbol, usually in opposing pairs, [see figure 4.19](#). The location of the boundary half-mereing symbol is coincident with the boundary alignment and not the feature to which it may be mered.

In Land-Line, a county boundary is deemed to be the limit of the civil parish or community structure, whether or not a parish area adjoins.

Figure 4.20: Boundary alignments in Land-Line



Administrative area names

All administrative areas names are recorded in Land-Line. They are normally recorded as textual items outside the marginal limits of the tile, although they may appear on the body. Where these names are too large to be contained within the marginal extent of the administrative area, a reference letter is used. The administrative area name is then recorded in a nearby location along with the reference letter.

Physical features shown in Land-Line are:

- boundary posts;
- boundary stones; and
- boundary markers.

Non-physical features shown in Land-Line are:

- alignments of boundaries;
- named administrative areas; and
- text descriptions of:
 - boundaries;
 - boundary mereings; and
 - boundary posts and stones.

Application of feature code precedence

When two or more boundaries are coincident, a single alignment is shown using the feature code or layer of the most important boundary. A textual description is used for clarification.

If the alignment of an administrative boundary coincides with any other feature (other than another boundary), then both the boundary and the other feature are shown separately in their respective feature codes.

Constraints imposed by survey tolerances

None.

Feature codes and layers relating to administrative boundaries

A full list of [NTF feature codes](#) appears in chapter 7, and a full list of [DXF layers](#) in chapter 9. The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to administrative boundaries are:

NTF feature

code	DXF layer	Feature code name
0007	G8010007	Civil parish or community boundary
0008	G8010008	District, London borough or unitary authority boundary
0009	G8010009	County boundary
0010	G8010010	Electoral division or ward boundary
0011	G8010011	Boundary post or stone
0013	G8010013	Boundary half mereing symbol
0057	G8010057	Point feature
0079	G8010079	Parliamentary or European constituency boundary
1005	G8011005	Administrative boundary text



Related text may also be found in the marginal text layer G8010574.

Administrative name and boundary descriptions

These abbreviations are used in Land-Line:

Title or description	Abbreviation
Borough constituency	Boro Const or BC
Boundary	Bdy
Boundary mark	B Mk
Boundary mound	B Md
Boundary post or plate	BP
Boundary stone	BS
Burgh constituency	Burgh Const or BC
Civil parish (England)	CP
Community (Wales)	C
County (England)	Co*
County constituency	Co Const or CC
Detached	Det
District	
– body and margin	Dist*
– description	Dist
Electoral division	ED
European electoral region	EER
European parliamentary constituency	Euro Const
London borough	LB
Scottish parliamentary constituency	P Const
Scottish parliamentary electoral region	PER
Unitary authority	UA
Ward	Ward
Welsh assembly constituency	Asly Const
Welsh assembly electoral region	Assembly ER

*Abbreviated only where space is restricted.

Boundary mereing abbreviations

These abbreviations are used in Land-Line:

Object or mereing	Abbreviation
Baulk, bank, base, basin, bridge, broad	B
Cam, canal, causeway, centre of, channel, cliff, conduit, cop, course of, covered, culvert, cut	C
Dam, ditch, dock, double, down, drain	D
Double ditch or drain	DD
Double fence	DF
Defaced	Def
Edge of, eyot	E
Face of, fence, fleet, foot, freeboard	F
Feet	ft
Harbour, hedge	H
Inches	ins
Kerb	K
Lade, lake, lead, loch, lockspit, lynchet	L
Marsh, mere, moat	M
Mean high water	MHW
Mean high water springs (Scotland only)	MHWS
Mean low water	MLW
Mean low water springs (Scotland only)	MLWS
Metres	m
Old	O
Passage, path, plate, pond, post	P
Race, railway, ride, river, road, root of	R
Root of hedge	RH
Scar, sewer, side of, slope, sluice, stone, stream	S
Top of	T
Track	Tk
Undefined	Und
Wall, weir	W

The following are examples of combined abbreviations:

Object or mereing	Abbreviation
Centre of bank, basin, baulk, broad, and so on	CB
Centre of railway, river, road, and so on	CR
Centre of old course of stream	COCS
Centre of channel at low water	CCLW

NOTE: Special rules apply to boundary mereings and only the more common ones are listed.

Antiquity features

General principles

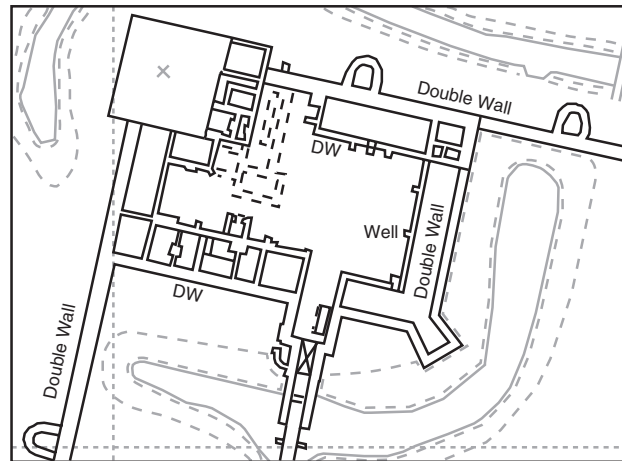
The investigation, recording and surveying of archaeological features is the responsibility of the three Royal Commissions on Historical Monuments (RCHMs), England, Scotland and Wales. The antiquities shown in Land-Line include:

- artificial features or their sites, and artificial portable objects and their find sites; and
- battlefields and natural features connected with important historical events.

Antiquity find sites are not shown in Land-Line.

Ordnance Survey has no responsibility for defining the authenticity of distinctive or descriptive names of antiquities.

Figure 4.21: Antiquity features in Land-Line



Antiquity names and text style

The distinction in age between antiquities is made in their descriptive and distinctive text.



The three distinctions are:

- Roman antiquities;
- non-Roman antiquities; and
- other antiquities.



Roman antiquity text is shown in capital letters in STANDARD text style.

Non-Roman antiquity text is shown in GOTHICE.SHX text style in AutoCAD related systems.

Other antiquities are shown in STANDARD upper and lower case text style.

For further information relating to text, [see chapter 5](#).

Conventions, symbols and ornament

Traditionally antiquities were portrayed by a number of conventions; the number of conventions used increased with the complexity of the site. Land-Line makes no attempt to reproduce these conventions, symbols or ornament; where an antiquity is shown, the most appropriate feature code is used. The plan position of an invisible antiquity (for example, the site of a battle) is digitised as a point and textually described.

Features in the antiquities features group

Physical antiquity features shown in Land-Line are:

Individual features are not listed here because they encompass a very wide range of real-world objects such as standing stones, earthworks, hill figures, ruined buildings and tombs. Generally, the features shown are existing artificial features, together with natural features connected with important historical events.

Non-physical antiquity features shown in Land-Line are:

- textual descriptions for the features described above (for more information on text in Land-Line, [see chapter 5](#)); and
- very important sites of battlefields and so on.

Application of feature code precedence

Land-Line does not set out to be a definitive record of antiquities. Modern day features take precedence over antiquities where a clash of information might occur. The feature code hierarchy applies.

Constraints imposed by survey principles

Many earthworks are of low relief and do not meet normal Ordnance Survey survey criterion, to depict the feature clearly it may be necessary to exaggerate antiquity detail.

1:10 000

At 1:10 000 scale most antiquity features are generalised without losing the essential characteristics of the depiction.

Feature codes and layers relating to antiquity features

A full list of [NTF feature codes](#) appears in chapter 7, and a full list of [DXF layers](#) in chapter 9. The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to antiquity features are:

NTF feature code	DXF layer	Feature code name
0001	G8010001	Building outline
0004	G8010004	Building outline (overhead)
0030	G8010030	General line or minor building detail
0032	G8010032	General ground level or minor overhead detail
0033	G8010033	Underground detail or course of antiquity
0052	G8010052	Minor detail
0057	G8010057	Point feature
0059	G8010059	Water detail
0321	G8010321	Roofed building indicator
0323	G8010323	Glasshouse indicator
0372	G8010372	Positioned coniferous tree
0374	G8010374	Top of slope
0375	G8010375	Top of cliff
0376	G8010376	Bottom of slope or cliff
0396	G8010396	Cliff indicator
0397	G8010397	Slope indicator
0400	G8010400	Water indicator
1009	G8011009	Miscellaneous text



Related text may also be found in the marginal text layer G8010574.

Horizontal and vertical control features

General principles

Ordnance Survey is able to provide more comprehensive information from its archive of horizontal and vertical control data than is included in Land-Line. This includes transformations, three-dimensional control from its national GPS (global positioning system) network (OSGPS93[®]) and higher resolution information.

For the latest information on transformations and control, visit the Ordnance Survey web site at: www.ordnancesurvey.co.uk.

Land-Line shows three types of control point:

- **triangulation stations** – these are physical marks which represent one point in the national triangulation scheme. The best known form is the triangulation pillar, often found on hill or mountain tops. Please note that more up-to-date and detailed information about a triangulation station may be held by Ordnance Survey. The coordinates of a triangulation station in the data are not usually the very accurate coordinates for the control point. The accurate coordinates of the control point can be obtained from Ordnance Survey.
All triangulation stations are shown except for buried and surface blocks.
- **bench marks** – these are physical marks, the altitude of which (relative to Ordnance Datum) has been determined by levelling. The best known form is an arrow cut into masonry, often found on building corners and bridges. All current bench marks (except for those on a triangulation pillar) are shown by a point feature or symbol. The altitude to two decimal places of a metre is shown by a textual description. Please note that more up-to-date and detailed information about a bench mark may be held by Ordnance Survey.
- **spot heights** – these are non-physical points, the altitude of which (relative to Ordnance Datum) has been determined by levelling. All current spot heights are shown by a point feature or symbol. The altitude to one decimal place of a metre is shown by a textual description.

Features in the horizontal and vertical control features group

Physical horizontal and vertical control features shown in Land-Line are:

- bench mark; and
- triangulation station.

Non-physical horizontal and vertical control features shown in Land-Line are:

- spot height; and
- textual descriptions for the features described above.

For more information on text in Land-Line, [see chapter 5](#).

Application of feature precedence

None.

Constraints imposed by survey tolerances

The bench mark symbol is usually oriented at 90° to the face of the object on which the mark is placed. It may be pivoted through up to 30° to avoid obscuring nearby detail.

Bench Marks

Ordnance Datum Newlyn (ODN) is the national height system for mainland Great Britain and forms the reference frame for heights above mean sea level. ODN is realised on the ground by a network of approximately 180 fundamental bench marks. From these fundamental bench marks, tens of thousands of lower order bench marks were emplaced. The network has had little maintenance for 30 years and in some areas, for example, mining areas, subsidence has affected the levelling values. In these regions the bench marks cannot be relied upon to accurately define ODN.

On some of the offshore islands there are *local* mean sea level datums. These have no link in to ODN and must be treated the same way as the mainland levelling.

Global Positioning System (GPS) and the OSGM02TM (the height transformation between ETRS 89 and the national height datums) is the preferred method of heighting used by Ordnance Survey. This method achieves the most accurate and uniform method of heighting. See www.gps.gov.uk for more information.

Triangulation Stations

OSGB36 National Grid is now defined by the ETRS89 (European Terrestrial Reference System 1989) coordinates of the Ordnance Survey National GPS Network plus the definitive OSTN02TM transformation. To obtain true OSGB36 National Grid Coordinates for a point it must be first coordinated in ETRS89 from the National GPS Network. The transformation to OSGB36 via OSTN02 is then considered error free. See www.gps.gov.uk/ for more detail.

The coordinates supplied for triangulation stations have not been realised via ETRS89 and OSTN02. They are the original archive coordinates and can, therefore no longer be considered as true OSGB36 National Grid Coordinates of the station. It is expected that agreement between ETRS89 / OSTN02 derived coordinates and the original archive coordinates of triangulation stations (down to 3rd order) will be at the 0.10 metre rms level.

Feature codes and layers relating to horizontal and vertical control features

A full list of [NTF feature codes](#) appears in chapter 7, and a full list of [DXF layers](#) in chapter 9. The following table lists the feature codes and layers to which the real-world objects shown in Land-Line and Land-Line.Plus are assigned.

The principal feature codes and layers relating to horizontal and vertical control are:

NTF feature code	DXF layer	Feature code name
0025	G8010025	Triangulation point
0026	G8010026	Bench mark
0027	G8010027	Spot height

Real-world features shown in Land-Line

The table below lists real-world features normally represented by each NTF feature code or DXF layer. The right hand column has useful notes and major exceptions. The list of real-world features is a guide only and not exhaustive. It is not a complete definition of the surveying and digitising specification for Land-Line. Exceptions to the list apply – for example, larger waterfalls are depicted on the cliff layers, smaller ones as general line or minor building detail. For some types of feature, depiction rules vary between the three scales of Land-Line.

Entries marked with an asterisk appear in Land-Line.Plus only – not Land-Line.

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
0001	G8010001	Building outlines	Generally, buildings under 50 m ² and blocks of garages regardless of size are coded as 0030 or G80100030; only buildings over 50 m ² or with a postal address are generally coded 0001 or G8010001.
		Internal building divisions	Internal divisions between buildings are coded 0001 or G8010001, or 0004 or G8010004.
0004	G8010004	Overhead building outlines	Used for the outline of open side buildings, canopies and so on. Also used for internal building divisions which cannot be surveyed from the outside.
0007	G8010007	Civil parish or community boundary alignment	
0008	G8010008	District, London borough or unitary authority boundary alignment	
0009	G8010009	County boundary alignment	
0010	G8010010	Ward or electoral division boundary alignment	
0011	G8010011	Boundary post or stone	
0013	G8010013	Boundary change of mereing symbol	
0014	G8010014	Narrow gauge railway track	Used for railway and tramway lines narrower than standard gauge. The centre alignment of the track is shown by a single line.
0015	G8010015	Standard gauge railway track	Each rail is shown by a separate line. Includes light rail systems (tramways) with a standard gauge track.

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
0021	G8010021	Edge of road metalling	The limit of public road surface where not defined by a solid feature, such as a building.
0025	G8010025	Triangulation station	Buried and surface blocks not shown.
0026	G8010026	Bench mark	The symbol is not shown on triangulation pillars.
0027	G8010027	Spot height	
0030	G8010030	Fence	Missing or open gates are shown as if closed and are not specifically identified.
		Hedge	Centre line of roots is shown.
		Bank (linear)	
		Wall	Thick walls are shown by a double line.
		Antiquity above ground level	
		Aqueduct	
		Breakwater	
		Bridge	Detail below bridges is not normally shown.
		Burial ground, cemetery, graveyard	
		Cairn	
		Chimney	Only those causing an obstruction at ground level are shown.
		Cistern	
		Cooling tower	
		Filter bed	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
		Groyne	
		Internal building divisions	Internal divisions between buildings are coded 0030 or G8010030.
		Loading gauge	
		Lock gate	
0030	G8010030	Minor building outline	The outlines of buildings over 50 m ² or with a postal address are generally coded 0001, except for blocks of garages.
		Pier	
		Retarder (railway)	
		Ruined building	Defined as a building partly or wholly de-roofed and in decay. Ruins do not carry a roofed building indicator.
		Sloping masonry, wall	
		Settling tank, sludge bed, slurry pit, tailing lagoon	
		Sluice	
		Solid objects	These do not carry a roof seed.
		Turntable (railway)	
		TV mast	
		Viaduct	
		Watercress bed (man-made)	
		Waterfall, weir	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
0032	G8010032	<p>Airfield identification mark Antiquity at ground level, for example, a hill figure outline</p> <p>Baulk</p> <p>Bowling green outline</p> <p>Broken bank, hedge, wall, fence</p> <p>Cattle grid</p> <p>Covered passageway (open sided)</p> <p>Cycle track</p> <p>Daymark (airfield)</p>	<p>This feature code and layer includes many linear aspects of the landscape that do not present an obstacle to a pedestrian.</p> <p>Only permanent and clearly defined baulks are shown.</p> <p>These features will be captured when they are the only defining features of a land parcel or in areas where there is little other detail, such as mountain and moorland.</p> <p>The limit of its surface where not defined by a solid features such as a building.</p>
0032	G8010032	<p>Ferry</p> <p>Fire tower</p> <p>Ford</p> <p>Level crossing</p> <p>Minor overhead building outline</p> <p>Normal tidal limit</p> <p>Path (unmade)</p>	<p>Vehicle ferries on short routes and floating bridges are shown by two lines joining the limits of the approaches on each side. Foot ferries on short routes are captured by a single line joining the terminals.</p> <p>The centre line only is shown, except where coincident with a boundary.</p>

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions	
0033	G8010033	Path and pavement	The limit of its surface where not defined by a solid feature such as a building.	
		Permanent way (railway)		
		Ramp		
		Range firing point		
		Signal bridge, gantry, square		
		Towing path		
		Traffic calming measures		On public roads (only) features that form a physical impediment to traffic such as speed bumps, raised junctions and pinch points will be shown.
		Track		
		Turntable (road)		
		Weighbridge		
		Antiquity (course of)	In complex multilevel structures.	
		Detail below level of through public communication		
		Railway bridge abutments		
		Subway alignment		
Tunnel alignment	No other detail is shown within the tunnel. Alignments are approximate.			
Underground railway				
Underpass alignment	Alignments are approximate.			
Underpass alignment	Alignments are approximate.			

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
*0035	G8010035	<p>Areas of scattered trees, rock, boulders</p> <p>Boulders, dunes, mud and rock (small areas and areas on foreshore)</p> <p>Changes of classifications within vegetated areas</p> <p>Limits of vegetation and surface features in: public parks, golf courses, cemeteries, works, roads, railways, residential properties, disused pits, quarries, and so on</p>	
0036	G8010036	<p>Smaller clearings in woods</p> <p>Boulders, dunes, mud and rock (larger inland areas)</p> <p>Coastal slope</p> <p>Division in named wood</p> <p>Firebreak, ride, linear clearing in woods</p> <p>Pit, quarry, opencast workings</p> <p>Refuse tip</p> <p>Spoil heap, slag heap</p> <p>Vegetation limits</p> <p>Waterfall</p>	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
0043	G8010043	Aerial ropeway Chairlift Electricity transmission lines Pipeline (suspended) Ski lifts, tows Telephone line	Only shown in sparsely populated areas where there is little surveyable detail.
0049	G8010049	Electricity pylon Flare stack Lighting tower Radio mast	
0052	G8010052	Archway symbol Buffer (railway) Culvert bar Fish ladder terraces Moveable greenhouse and travelling crane rails Pipeline (ground level) Slip, switch (railway) Step treads	Shown as diagonal lines across the archway. Ends of the rail pairs are joined by a line coded 0032 or G8010032.
0057	G8010057	Air light beacon	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
		Antiquity point feature	For example, a standing stone.
		Bollard, capstan	
		Cave	
		Chairlift standard	
		Crane	
		Electricity post, pole, telephone pole	
		Fish ladder	
		Flagstaff	
		Fountain, drinking fountain †	
		Grotto	
		Grouse butt	
		Gun	
		Royal Mail letter box, pillar box	Shown except when indoors or when built into a Post Office.
		Mail pickup (railway)	
		Memorial, monument, statue, sundial	Large objects shown to scale on G8010030.
		Milestone, post, kilometre post	
		Mooring post, dolphin	
		Natural arch	
		Navigational light, beacon,	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
0057	G8010057	<ul style="list-style-type: none"> perch, pilot beacon Post, pillar, pole, stone Pump, tap † Rescue kit, post Road guide post Runway approach light Signal light, post, water point (railway) Spring Stepping stones Swallow hole, pothole Telephone call box, post, pillar Tide gauge Well 	<ul style="list-style-type: none"> Only isolated finger posts shown. Shown outside airfield perimeter only. Not shown when very numerous.
0059	G8010059	<ul style="list-style-type: none"> Wind pump, tee, sock Bank of wider drain, canal, stream, river Centre line of narrow drain, stream Basin Dock Lock 	

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
		Moat (water filled)	
		Shore of lake, loch, pond, reservoir	
0069	G8010069	Flow arrow	Shows the direction of water flow.
0071	G8010071	Mean high water	In Scotland, mean high water springs.
0072	G8010072	Mean low water	In Scotland, mean low water springs.
0079	G8010079	European parliamentary or assembly constituency boundary	
0098	G8010098	Road network line	
0321	G8010321	Roofed area (seed)	
0323	G8010323	Horticultural glasshouse (seed)	Applied only to horticultural buildings composed of glass and over 50 m ² . All other buildings made predominantly of glass will now be seeded as conventional buildings. Glass buildings less than 50 m ² have been captured as Glasshouses and some may remain in Land-Line.
*0372	G8010372	Cartographically positioned coniferous tree Coniferous tree of historical interest or a prominent landmark Coniferous tree in named row, avenue or group Single named coniferous tree related to an administrative boundary	Generally, a cartographically positioned tree is an individual tree surveyed under superseded specifications.

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
*0373	G8010373	Cartographically positioned non-coniferous tree Non-coniferous tree of historical interest or a prominent landmark Non-coniferous tree in named row, avenue or group Single named non-coniferous tree related to an administrative boundary	
*0374	G8010374	Top limit of man-made slope landform	
*0375	G8010375	Top limit of cliff landform	
*0376	G8010376	Bottom limit of man-made slope or cliff landform	
*0377	G8010377	Area of boulders (seed)	
*0378	G8010378	Area of scattered boulders (seed)	
*0379	G8010379	Area of coniferous trees (seed)	
*0380	G8010380	Area of scattered coniferous trees (seed)	Trees over 30 m apart.
*0381	G8010381	Area of coppice, osiers (seed) †	
*0382	G8010382	Area of marsh, saltmarsh, reeds (seed)	
*0384	G8010384	Area of non-coniferous trees (seed)	Now includes newly captured areas of coppice or osiers.

NTF feature code	DXF layer	Real-world feature descriptions	Useful notes and exceptions
*0385	G8010385	Area of scattered non-coniferous trees (seed)	Trees over 30 m apart.
*0386	G8010386	Area of orchard (seed)	
*0387	G8010387	Area of heath (seed)	
*0388	G8010388	Area of rock (seed)	
*0389	G8010389	Area of scattered rock (seed)	
*0390	G8010390	Area of rough grassland, bracken (seed)	
*0392	G8010392	Area of scrub (seed)	
0395	G8010395	Area of upper level of through public communication (seed)	Shown only in complex multilevel structures.
*0396	G8010396	Area of cliff (seed)	
*0397	G8010397	Area of man-made slope (seed)	
*0400	G8010400	Area of water, lake, loch, pond, stream, drain, river, reservoir, water below mean low water level (seed)	
*1210	G8011210	Area of scree (seed)	
*1211	G8011211	Positioned boulder	
*1212	G8011212	Ridge, rock strata line	
1013	G8011013	Land parcel number	Included in this list, although not a real-world feature.

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

Real-world features not represented in Land-Line

This list summarises the main real-world features not normally shown in Land-Line.

Entries marked with an asterisk appear in Land-Line.Plus only – not Land-Line.

Real-world feature description

Rights of way

Notes

Rights of way as such are not identified in Land-Line. The representation of a road, track or path is no evidence of the existence of a right of way.

Non-permanent ground features

Detail which it is reasonable to assume will remain in position for less than 10 years.

Buildings below minimum size

Internal divisions in buildings and detail under roofs

Exceptions apply.

Small juts, porches, bay windows, roof projections, and so on, on buildings

Minimum projection sizes are:
1.0 m 1:1250 scale Land-Line tiles;
2.0 m 1:2500 and 1:10 000 scale Land-Line tiles.

Historically a 5.0 m dimension applied to 1:10 000 Land-Line.

House numbers

Historically house numbers were not captured in 1:10 000 areas. They will now be shown on newly captured properties in 1:10 000 scale areas.

Detail under bridges

Railway bridge abutments are shown.

Detail under elevated roads

Bench marks are shown, as are public roads and paths where they cannot otherwise be deduced.

Underground sewers, cables and pipes

Chimneys not an obstruction at ground level

Detail in private gardens

Exceptions apply.

Telephone lines and poles

Shown when of outstanding importance.

Real-world feature description

Electricity transmission lines on single poles

Overhead detail in industrial installations, pipelines, and so on

Minor detail in cemeteries

Minor detail in allotment gardens and disused camp sites

Bollards, capstans and mooring posts

Playing apparatus in playgrounds

Railway catch drains, overhead lines and conductor rails

Road crash barriers

Minor roadside detail, footpath posts, and so on

Roads, tracks and drives on private property

Features affected by security regulations

Fruit bushes, flower beds and rock gardens

Trees and scrub in permanent water

Golf course detail

Natural slopes and relief features

Ring fences protecting single trees, protection fences for established hedges

*Land parcel areas

*Land parcel numbers

Notes

Shown when of outstanding importance.

Especially important items are shown.

Shown on rivers, canals and small quays but not in docks and wharves.

Shown when they are the only division between carriageways.

Shown when over 100 m in length.

Natural features, and so on, are normally shown.

Exceptions apply.

Not shown in 1:1250 scale or 1:10 000 scale tiles.
Incomplete on 1:2500 scale tiles.

Chapter 5 Text features in Land-Line

Name features are treated as free-standing text data. There is no explicit relationship (in the data) between text features and the point or line feature or features to which they belong in the real world. The text feature has National Grid coordinates to position it close to the real-world object which it names or describes. Text may be oriented.

Text features coding and layering

All text items are assigned to one of six feature codes or layers. Each item of text, with its feature code or layer, may be related to one or more real-world objects. When choosing not to display or plot certain features (which may be suppressed on the basis of their feature code or layer), you can similarly suppress the related text on the basis of its feature code or layer.

The text categories in Land-Line and Land-Line.Plus are described in this chapter. They are:

	Feature code	DXF layer
• Road name or number	1000	G8011000
• Administrative boundary text	1005	G8011005
• House number or building name	1006	G8011006
• Miscellaneous text	1009	G8011009
• Water text	1010	G8011010
• Land parcel number	1013	G8011013



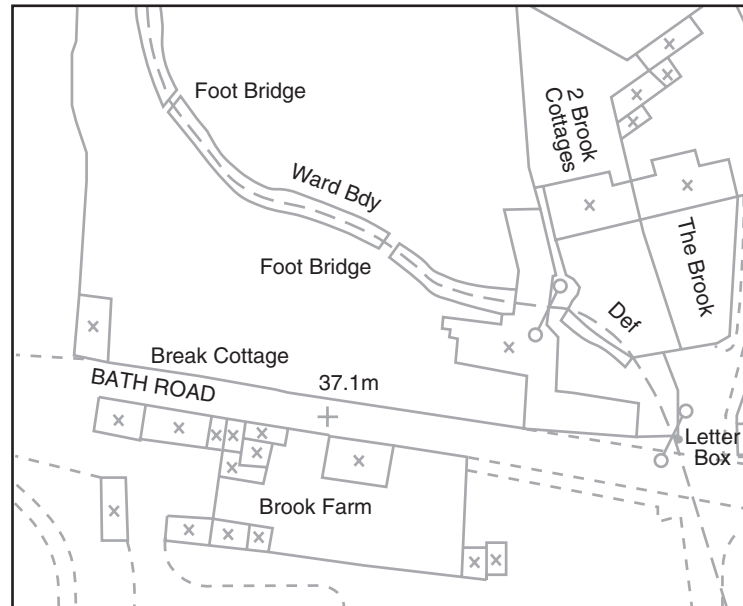
Textual information is supplied, as is normal with this format, with all embedded characteristics of size and style and colour. These can be customised, once imported into your CAD system.

In addition to the six text categories listed above, Land-Line in DXF has three layers containing text – layer G8010571 containing footnotes, layer G8010574 containing marginal names and layer G8010575 containing grid values.



Textual information is supplied with a code identifying typeface and a height in millimetres. It also has a text location code to indicate its position relative to its coordinate pair. See [chapter 7](#) for more information.

Figure 5.1: Text features in Land-Line



Policy on the inclusion of names in Land-Line

General

In Great Britain, except in the case of certain administrative names, there is no national body responsible for the names and spellings of places appearing on official maps or documents. Ordnance Survey has always therefore assumed the responsibility of deciding what place names are to appear on its maps and how they are to be spelt.

Authoritative sources

Place, natural feature and public thoroughfare names are authorised by the appropriate local authority.

Authority for a property name lies with the owner. Visual evidence from nameboards will be used as the evidence for this authority, whenever possible.

Ordnance Survey recommends that common usage, the preservation of historical form and the preferred language, should all be considered when defining the spelling of a name. This may include consultation with relevant organisations, such as the Board of Celtic Studies.

Postal address names in Ordnance Survey products are authorised solely by Royal Mail. These may vary from equivalent names in other Ordnance Survey products. Consultation with Royal Mail will continue, in order to minimise differences.

Statutory administrative area names are originally defined by Acts and Orders of Parliament. Names can be changed later by county, district and unitary authorities. The Office of the Deputy Prime Minister (ODPM) acts as supplier to Ordnance Survey in this regard.

Evidence for the spelling of any name will normally be recorded when either no authorised name is available, or where it differs from that supplied by an agreed authority. Verification will be sought where necessary.

We may abbreviate or omit names when necessary for map clarity.

The following are recorded in Land-Line:

- administrative names;
- distinctive names;
- descriptive names;
- house numbers – a selection of;
- house names in lieu of house numbers; and
- land parcel numbers, where present.

Ordnance Survey is responsible for the collection and recording of the names listed above.

Definitions

The following definitions apply within this section of the user guide:

- **administrative name** – a name given to a local government or parliamentary area;
- **authorisation** – the acceptance of a name for Ordnance Survey purposes.
- **descriptive name** – a textual description given to a feature to describe its use or character, for example, allotment gardens, a recreation ground or a boundary stone;
- **distinctive name** – a name given to a feature or place to distinguish it from other features or places of a similar nature, for example, River Thames, Park Lane Methodist Church, Leeds or New Forest;
- **recording** – the insertion of distinctive names, descriptive names and house numbers in Land-Line tiles; and
- **proper evidence** – recognised documentary sources of information on names.

Distinctive names

Recording

Ordnance Survey is responsible for the recording of new and altered distinctive names, and for the confirmation of old distinctive names. This work is carried out at the time of a revision or a new survey.

The forms of house, farm and other property names are changed from time to time and such alterations, if supported by the proper evidence, are usually accepted without question. Place names rarely change or become obsolete and they are not altered merely on a single opinion.

Names of geographical features, such as hills and valleys, are not considered obsolete merely because they are no longer generally known, unless there is good evidence that an error was made when the name was originally recorded.

Evidence

Evidence for distinctive names to be added to Land-Line is either visual or documentary.

The following types of evidence can be used as confirmation of name form and spelling:

- **visual evidence** is that which appears on nameplates, notice boards, billheads, printed stationery, official publications, and so on; and
- **documentary evidence** is that obtained by the signature of a responsible person who can vouch for the name and its spelling.

The evidence required is as follows:

- For names of extensive areas or features – **documentary** (signed) approval of two or more authoritative persons.
- For names which have more than one form or spelling – **all the documentary and visual evidence necessary** to decide which form and spelling is to be accepted. If important bodies are involved or the name is the subject of local controversy, the choice of form and spelling is determined by Ordnance Survey.
- For all other distinctive names which are to be recorded – **documentary** evidence is collected when no visual evidence is available.

Distinctive names which were included on the last published edition of a large-scale map have already been authorised. If confirmed visually or by verbal enquiry they are accepted.

Names of villages and areas of higher status are not changed solely on the evidence of visual authority.

Evidence for a name need only be collected once, even though the named feature extends into two or more Land-Line tiles.

Visual evidence

Visual evidence is obtained when the distinctive name is printed on a nameplate, notice board, item of stationery, official publication, and so on. If there is any doubt about the name or its spelling, for example, one name on the building and another on a notice board, Ordnance Survey obtains documentary evidence.

Documentary evidence

Documentary evidence is used to obtain the authorisation for a name when no visual evidence is available. No abbreviations are used in the compilation of the document. In normal circumstances (that is, when there is no reason to suspect that there are local differences of opinion), the written evidence of the following is accepted without further enquiry:

- for areas, objects and buildings **owned or administered by a local government authority** – the official directly responsible to the authority for the particular area or object;
- for areas, objects and buildings **administered by a nationalised corporation or board, or by central government** – the local official who is directly responsible to the head of the corporation, board or department;
- for areas, objects or buildings **owned by private or public companies or corporations** – the manager or agent directly responsible to the board of directors;
- for areas, objects or buildings **owned by private individuals** – the owner or a recognised agent. Where the owner of a private dwelling or his agent is not readily accessible, the evidence of the occupier may be accepted; and
- for **extensive natural features**, such as rivers, hills, valleys or moors – any responsible officials or private persons who possess the necessary local knowledge.

Name simplification

Where there is a lack of evidence to ascertain the mode of spelling, local usage forms a guide as to whether names should be simplified or not. Sometimes, however, local usage may not be certain or may be neutral, in which case the following guide is used:

Red Bridge is written to a bridge, not Redbridge, but Redbridge Wood is applied to a named wood near Red Bridge.

Recording

The name of any feature which falls on more than one Land-Line tile is recorded in each.

Descriptive names

Where important features do not possess a distinctive name, a descriptive term is recorded on the Land-Line tile.

Descriptive names are, wherever possible, taken from the standard list in this chapter.

A list of features which are included in Land-Line which are **not** named is included later in this chapter.

Fractions and decimal points

Fractions are not recorded as text in Land-Line and so appear as decimals, for example, $\frac{1}{2}$ is depicted as 0.5.

Road names and numbers

Distinctive road names are recorded, except for motorway names and long-distance trunk roads, unless they form part of a postal address and apply only to a relatively short length of the route.

DfT road classifications and numbers are recorded as follows:

- on Land-Line 1:1250 scale tiles, road classifications and numbers are not normally shown, but exceptionally **M** or **A** classifications are shown when a motorway or other major road is unnamed. When shown, the number is positioned centrally to the extent on the tile;
- on Land-Line 1:2500 scale tiles, **M**, **A** and **B** classifications are shown. The numbers are positioned on the body of the tile adjacent to the plan edge and, if necessary, at junctions; and
- on Land-Line 1:10 000 scale tiles, **M**, **A** and **B** classifications and numbers are recorded.

Where an **A** road is also part of a motorway, the number is followed by **(M)**.

Administrative boundary text

All administrative names are recorded. All boundary mereings and sufficient descriptions of boundary type are also recorded; see [Administrative boundaries](#) in chapter 4 for more information.

House numbers and names

The postal numbers of buildings and parts of buildings are recorded in Land-Line with the following exceptions:

- fractional numbers and suffixes which relate to parts of the same building; and
- temporary or plot numbers in developing housing estates.

House numbers and names are now recorded on 1:10 000 scale tiles. Historically they were not recorded so many will not be present in Land-Line.

Distinctive names of buildings which are of particular interest or importance are recorded whether or not a postal number has been allotted.

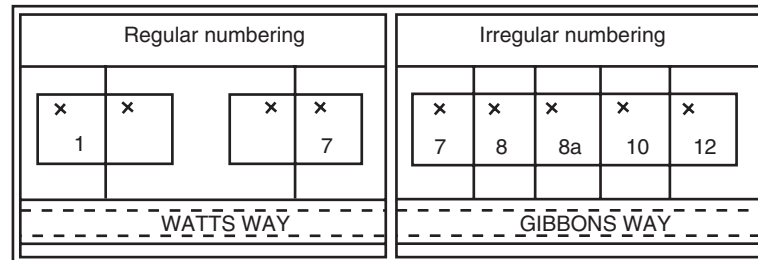
When recording numbers, each road or street is checked throughout its length to avoid missing irregularities in the numbering sequence. Within blocks of flats Land-Line does not identify irregularities, but simply records the first and last numbers.

Positioning names and numbers

The positioning of text features within Land-Line is influenced by the conventions of traditional cartographic depiction.

House numbers and names are positioned so that they are clearly legible and there is no doubt to which building the name refers. The ideal positioning for names and numbers is within the building concerned, or if more convenient, in the enclosure in which the building lies. Some examples of house numbering depiction are shown in figure 5.2.

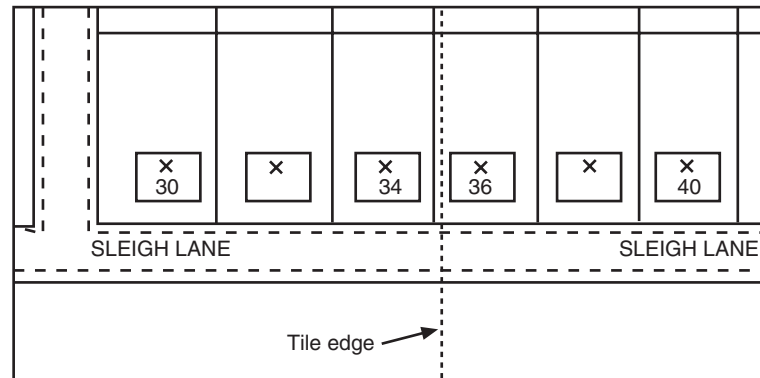
Figure 5.2: House numbers in Land-Line



Where house numbers follow a regular sequence Land-Line includes approximately every sixth number, provided it complies with the following rules:

- One number is shown:
 - at the tile edge ([see figure 5.3](#));
 - at the terminals of a road;
 - at either side of every road junction; and
 - on either side of a break in a regular numbering sequence.
- Numbers which are liable to cause confusion if read upside down do not stand alone, for example, 6, 9 and 18.

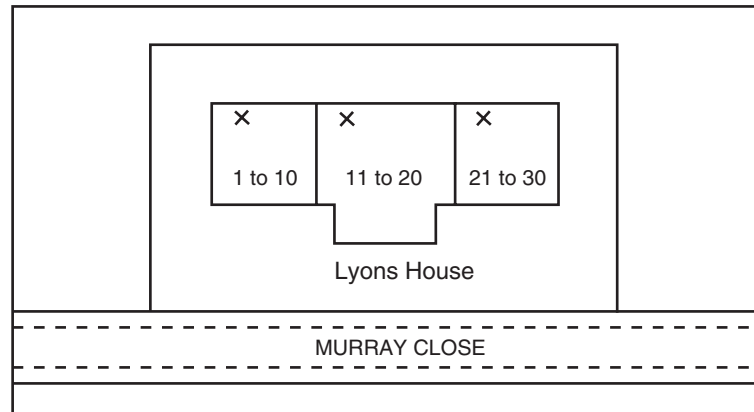
Figure 5.3: House numbers across tile edges



In the case of separately numbered shops or offices on the ground floor of a building which is recorded in Land-Line as a single structure, without internal dividing walls, the numbers are shown in the approximate positions and in the correct sequence along the street frontage. The name or description of the structure itself, for example, Cinema is also recorded.

Numbers of blocks of flats are recorded as shown in [figure 5.4](#). Numbers which apply to a subsidiary name or the name of a block of flats will be recorded and aligned to read to that name.

Figure 5.4: House numbers in flats



Suffixes

Where suffixes form part of postal addresses the following rules apply to determine inclusion in Land-Line:

- Suffixes which relate to parts of the same building are not recorded. Only the basic number is shown, for example if 93 and 93a, b and c apply to one house, only 93 is recorded.
- Suffixes which relate to separate buildings are recorded, for example, if two separate houses are numbered 93 and 93a, both numbers are recorded.
- Where purpose-built blocks of flats replace demolished property and they retain the original road numbering sequence but with the addition of suffixes, these are recorded.

Miscellaneous text

Land-Line shows many real-world features, both tangible and intangible. Most are described with either a distinctive name or a descriptive annotation. This classification for text is used for those items which do not fall into any of the others. Lists of the main real-world objects [shown](#) and [not shown](#) in Land-Line are in chapter 4. Lists of most descriptive names used in Land-Line and features not named in Land-Line are on pages [144](#) to [157](#).

Water text

Most water features are described with either a distinctive name or a descriptive annotation.

It is Ordnance Survey custom, except where in conflict with local practice, to describe all water leading to a water mill as *mill race* and all water leaving the mill as *mill stream*.

Canals are only annotated *disused* when authorised by the owning or governing body.

Major sea area names are only shown when no subsidiary name exists. For example, West Bay is subsidiary to Lyme Bay, which in turn is subsidiary to English Channel – therefore, West Bay would be shown on the relevant tiles.

Land parcel numbers

During the original digitising of Land-Line, most land parcel numbers that existed on the source documents were digitised. This was not a complete record.

There were never any land parcel numbers in 1:1250 or 1:10 000 scales Land-Line tiles, nor within built-up areas on 1:2500 scale tiles.

Currently, land parcel numbers are being updated by deletion only. In other words, if the extent of a numbered land parcel is changed, then the corresponding land parcel number is deleted.

Limitations

Large establishments or installations

With the exception of places of worship, the descriptive names of individual buildings within large establishments or installations such as barracks, hospitals and works, are not normally recorded.

In zoological and botanical gardens which are open to the public, names may be given to such features as *Lion House*.

Area names

The extent of the area to which a text feature applies may sometimes be unclear. In these cases the text feature is positioned as closely as possible to the centre of the area.

Distinctive area names are recorded as follows:

- the names of towns, villages and suburban areas are shown in the body of the Land-Line tile which contains the centre of the area and marginally on all other Land-Line tiles containing a portion of it. Marginal names are recorded in the margin nearest to the centre of the area;
- other area names such as land areas, water areas, hamlets and rural localities, are positioned at or as near as possible to the centre of the area of each Land-Line tile affected; and
- names of geographical areas measuring over 50 km² are not recorded on 1:1250 and 1:2500 scale Land-Line tiles.

Definite article

If the definite article *The* forms part of a distinctive name, it is shown.

Disused features

Where applicable, the term *disused* is shown in Land-Line in brackets after the name to which it applies.

Locality names

When the distinctive part of the name of an industrial installation, public utility, public office, public amenity, club or sports ground consists of the name of the locality and this already appears on the tile, only the descriptive part of the name is used. Street names are considered as localities in this context.

The above rule does not apply to:

- places of worship;
- hospitals;
- industrial and trading estates;
- railway stations; and
- schools.

Proprietary names

Purely proprietary names, trade names or the names of governing bodies are not normally shown unless there is no other means of identification, for example, a suitable descriptive name. The names of shops are not shown.

Scottish and Welsh place names

If the names of features in Scotland or Wales are subject to confusion as to their correct spelling, they will be submitted to the relevant body for confirmation of the correct Gaelic or Welsh spelling. We will not decide the spelling in isolation.

The version given by the Welsh and Gaelic experts may be used to resolve any ambiguity and to provide a written version of the name when this cannot be obtained in the locality, and, when no evidence about the name is obtained locally, to provide the version to be adopted in Land-Line.

Where a name has an alternative form in a different language and it is impossible to establish which of the two forms is most useful and acceptable in the locality, then both names may be recorded. The alternative form is enclosed by brackets; this is normally the English alternative in Wales and Scotland.

Subsidiary names

Where terraces of houses, parades of shops or blocks and pairs of houses have a subsidiary name in addition to the street name, the subsidiary name is only recorded if it is a necessary part of the postal address of the building concerned. For example, if a terrace of houses is numbered quite independently of the other houses in the road or street then the name of the terrace is recorded.

Marginal text

Marginal names are those names which appear outside the body of the map. Names in the north and east margins have large positive coordinate values, those in the west margin a negative indicator in the first character position of the X coordinate and those in the south margin a negative indicator in the first character position of the Y coordinate.

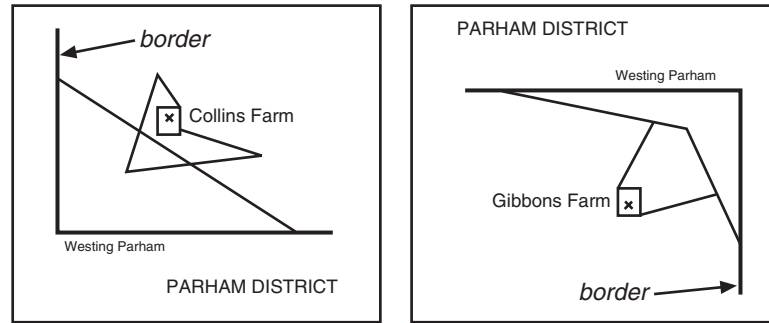


A marginal name has the same feature code as is applied to a similar name which appears on the body of the map.



All marginal names appear in layer G8010574, irrespective of the type of named feature.

Figure 5.5: Marginal text in Land-Line



The type of text features which are recorded in the margin of the Land-Line tile are:

- administrative names;
- city, town, suburban area and village names;
- road names or numbers – where there is insufficient space on the body of the tile;
- tidal line descriptions – where there is insufficient space on the body of the tile;
- administrative boundary mereings and descriptions – where there is insufficient space on the body of the tile;
- sea areas – except where the centre of the area falls on a tile;
- all grid values – as G8010575;
- all marginal text listed above – as G8010574;
- footnotes – as G8010571; and
- copyright and registered trademark symbols – as G8010570.

Descriptive names and their abbreviations

The following table gives a list of real-world features with their appropriate feature code and layer, and the normal abbreviation used in Land-Line.

Administrative names, boundary descriptions and boundary mereing abbreviations are listed in [chapter 4](#).

Real-world features which are listed in CAPITAL letters are recorded in the same capital letters in Land-Line.

Real-world feature	Abbreviation	NTF feature code	DXF layer
Air Light Beacon	ALB	1009	G8011009
Allotment Gardens	Allot Gdns	1009	G8011009
Ambulance Station	Amb Sta	1006	G8011006
AVENUE (named)	AVE or AV	1000	G8011000
Bank (building)	Bk	1006	G8011006
Barracks	Bks	1006	G8011006
Battery	Bty	1009	G8011009
Beer House	BH	1006	G8011006
Bench Mark	BM	1009	G8011009
Bollard	Bol	1009	G8011009
Bridge (named)	Br	1009	G8011009
Building (named)	Bldg	1006	G8011006
Capstan	Cn	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
Car Park	Car Pk	1009	G8011009
Cemetery	Cemy	1009	G8011009
Chapel	PW (for Place of Worship)	1006	G8011006
Chimney	Chy	1009	G8011009
Church	PW	1006	G8011006
Cinema	Cin	1006	G8011006
Cistern	Cis	1009	G8011009
CLOSE (named)	CL	1000	G8011000
Club House (Golf)	CH	1006	G8011006
Coastguard Station	CG Sta	1006	G8011006
College	Coll	1006	G8011006
Colliery (building)	Colly	1006	G8011006
Colliery (area)	Colly	1009	G8011009
Convalescent Home	Conv Home	1006	G8011006
Convent	Cvt	1006	G8011006
CORNER (road name)	CNR	1000	G8011000
Corporation Yard	Corp'n Yd	1009	G8011009
Cottage (named)	Cott	1006	G8011006

Real-world feature	Abbreviation	NTF feature code	DXF layer
COURT (road name)	CT	1000	G8011000
Court House	Ct Ho	1006	G8011006
Court of Law	Ct of Law	1006	G8011006
Crane	C	1009	G8011009
Crematorium	Crem	1006	G8011006
CRESCENT (named)	CRES or CR	1000	G8011000
Dismantled Railway	Dismtd Rly	1009	G8011009
Dock	Dk	1009	G8011009
Double wall	DW	1009	G8011009
Drinking Fountain †	D Fn	1009	G8011009
DRIVE (named)	DR	1000	G8011000
Dry Dock	Dry Dk	1009	G8011009
Ebenezer	PW	1006	G8011006
Electricity Generating Station	EI Gen Sta	1006	G8011006
Electricity Pole, Pillar	EI P	1009	G8011009
Electricity Sub-Station (building or yard)	EI Sub Sta	1009	G8011009
Electricity Transmission Line	ETL	1009	G8011009
Farm (named)	Fm	1006	G8011006

Real-world feature	Abbreviation	NTF feature code	DXF layer
Ferry – Vehicular	Ferry V	1009	G8011009
Ferry – Foot	Ferry F	1009	G8011009
Filter Bed	FB	1009	G8011009
Fire Alarm †	FA	1009	G8011009
Fire Station	F Sta	1006	G8011006
Flagstaff	FS	1009	G8011009
Flare Stack	FI Sk	1009	G8011009
Foot Bridge	FB	1009	G8011009
Fountain	Fn	1009	G8011009
Friends Meeting House, Room	PW	1006	G8011006
Fundamental Bench Mark	FBM	1009	G8011009
GARDENS (road name)	GDNS	1000	G8011000
Gas Governor	Gas Gov	1009	G8011009
Gas Valve Compound	GVC	1009	G8011009
Gospel Hall	PW	1006	G8011006
Government Offices	Govt Offices	1006	G8011006
Graveyard	G Yd	1009	G8011009
GROVE (road name)	GR	1000	G8011000

Real-world feature	Abbreviation	NTF feature code	DXF layer
Grove (wood name)	Gr	1009	G8011009
Guide Post (finger post)	GP	1009	G8011009
Guide Stones †	GS	1009	G8011009
Head (named)	Hd	1009	G8011009
Hospital	Hospl	1006	G8011006
House (named)	Ho	1006	G8011006
Infirmary	Infmy	1006	G8011006
Inshore Rescue Boat Station	IRB Sta	1006	G8011006
Institute	Inst	1006	G8011006
Institution	Instn	1006	G8011006
Island, Isle (named)	I	1009	G8011009
JUNCTION (road name)	JUNC	1000	G8011000
Junction (rail, named)	Junc	1009	G8011009
Kilometre Post	Km P	1009	G8011009
Kingdom Hall	PW	1006	G8011006
Lake (named)	L	1010	G8011010
LANE (road name)	LA	1000	G8011000
Leisure Gardens	Leisure Gdns	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
Letter Box	LB	1009	G8011009
Level Crossing	LC	1009	G8011009
Library (public)	Liby	1006	G8011006
Lifeboat House	LB Ho	1006	G8011006
Lifeboat Station	LB Sta	1006	G8011006
Lighthouse	L Ho	1006	G8011006
Lighting Tower	L Twr	1009	G8011009
Lime Kiln	LK	1009	G8011009
Loading Gauge	LG	1009	G8011009
Lock	L	1009	G8011009
Lodge	Lo	1006	G8011006
Manor	Mr	1006	G8011006
Market	Mkt	1009	G8011009
Mean High Water	MHW	1010	G8011010
Mean High Water Springs	MHWS	1010	G8011010
Mean Low Water	MLW	1010	G8011010
Mean Low Water Springs	MLWS	1010	G8011010
Mean High & Mean Low Water	MH & MLW	1010	G8011010

Real-world feature	Abbreviation	NTF feature code	DXF layer
Memorial	Meml	1009	G8011009
Meteorological Station	Met Sta	1006	G8011006
Mile Post (railway) †	MP	1009	G8011009
Mile Stone (railway) †	MS	1009	G8011009
Mission	Misn	1006	G8011006
Mission Church, Room	PW	1006	G8011006
Monument	Mon	1009	G8011009
Mooring Post	MP	1009	G8011009
Mortuary	Mort	1006	G8011006
Mosque	PW	1006	G8011006
Mountain (named)	Mt	1009	G8011009
Museum	Mus	1006	G8011006
Normal Tidal Limit	NTL	1010	G8011010
Observatory	Obsy	1006	G8011006
Oratory	PW	1006	G8011006
Palace	Pal	1006	G8011006
Pavilion	Pav	1006	G8011006
Pillar	P	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
PLACE (road name)	PL	1000	G8011000
Place of Worship (abbreviated only)	PW	1006	G8011006
Plantation (named)	Plantn	1009	G8011009
Point (named)	Pt	1009	G8011009
Police Call Box	PCB	1009	G8011009
Police House	Pol Ho	1006	G8011006
Police Station	Pol Sta	1006	G8011006
Post (preventing vehicular access) (abbreviated only)	P	1009	G8011009
Post Office	PO	1006	G8011006
Presbytery	Presby	1006	G8011006
Public Convenience	PC	1006	G8011006
Public House	PH	1006	G8011006
Pump	Pp	1009	G8011009
Pump House	Pp Ho	1006	G8011006
Pumping Station	Ppg Sta	1006	G8011006
Pylon	P	1009	G8011009
Recreation Centre	Recn Cen	1006	G8011006
Recreation Ground	Recn Gd	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
Rectory	Rec	1006	G8011006
Reservoir	Resr	1010	G8011010
Reservoir (covered)	Resr (covered)	1009	G8011009
Rifle Range	Range	1009	G8011009
River (named)	R	1010	G8011010
ROAD (named)	RD	1000	G8011000
Road House	RH	1006	G8011006
Roof Car Park	Roof Car Pk	1009	G8011009
Salvation Army Citadel	PW	1006	G8011006
Sanatorium	Sanatm	1006	G8011006
School	Sch	1006	G8011006
Sewage Pumping Station	Sewage Ppg Sta	1006	G8011006
Signal Box	SB	1006	G8011006
Signal Bridge	S Br	1009	G8011009
Signal Gantry	S Gantry	1009	G8011009
Signal Light	SL	1009	G8011009
Signal Post	SP	1009	G8011009
Signal Station	S Sta	1006	G8011006

Real-world feature	Abbreviation	NTF feature code	DXF layer
Single wall	SW	1006	G8011006
Sloping masonry	SM	1009	G8011009
Smithy (in rural areas)	Smy	1006	G8011006
Sound (named)	Sd	1010	G8011010
Spring	Spr	1010	G8011010
SQUARE (road name)	SQ	1000	G8011000
Station (railway)	Sta	1006	G8011006
Stone	S	1009	G8011009
STREET (named)	ST	1000	G8011000
Sundial	SD	1009	G8011009
Synagogue	PW	1006	G8011006
Tabernacle	PW	1006	G8011006
Tank	Tk	1009	G8011009
Technical College	Tech Coll	1006	G8011006
Telephone Call Box	TCB	1009	G8011009
Telephone Pillar or Post (public)	TCP	1009	G8011009
Telephone AA, and so on	TCB, TCP (AA) (RAC)	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
Telephone Exchange	Tel Ex	1006	G8011006
Telephone Pole	Tel P	1009	G8011009
Television Station	TV Sta	1006	G8011006
Temple	PW	1006	G8011006
Terrace (houses)	Terr	1006	G8011006
TERRACE (road name)	TERR	1000	G8011000
Territorial Army Centre	TA Centre	1006	G8011006
Toll Bridge	Toll	1009	G8011009
Toll Gate	Toll	1009	G8011009
Tower	Twr	1006	G8011006
Town Hall	TH	1006	G8011006
Track	Tk	1009	G8011009
Travelling Crane	Trav C	1009	G8011009
University	Univ	1006	G8011006
Valve House	V Ho	1006	G8011006
Vicarage	Vic	1006	G8011006
War Memorial	War Meml	1009	G8011009
Warning and Monitoring Post	WMP	1009	G8011009

Real-world feature	Abbreviation	NTF feature code	DXF layer
Waterfall	Fall	1010	G8011010
Water Point (railways)	Wr Pt	1009	G8011009
Water Tap (public)	Wr T	1009	G8011009
Water Tower	Wr Twr	1009	G8011009
Water Trough (public) †	Wr Tr	1009	G8011009
Water Works (building)	Wr Wks	1006	G8011006
Water Works (area)	Wr Wks	1009	G8011009
Weighbridge	WB	1009	G8011009
Well (non-antiquity)	W	1010	G8011010
Wind Electricity Generator	Wd El Gen	1009	G8011009
Wind Pump	Wd Pp	1009	G8011009
Works (building)	Wks	1006	G8011006
Works (area)	Wks	1009	G8011009
Yard (named)	Yd	1009	G8011009
Youth Hostel	Y	1006	G8011006

† These features are no longer captured under Land-Line specification and will only be maintained through deletion.

Distinctive names *not* recorded in Land-Line

Listed below are all those physical features whose distinctive names are **not** recorded in Land-Line:

- areas over 50 km²;
- extensive and indeterminate geographical features;
- features affected by security regulations;
- fields, unless of special importance;
- names of houses with postal numbers, unless of particular interest or importance;
- housing estates – unless roads within are not named;
- individual buildings within industrial and trading estates;
- individual buildings within large installations;
- long distance paths;
- major sea areas (shown in some cases);
- motorways and long distance trunk roads, for example, Maidstone bypass;
- railway tracks owned or administered by Network Rail;
- shops, cafés and restaurants;
- terraces of houses, parades of shops, and so on, identified by a subsidiary name unless this forms a necessary part of the postal address;
- some hotels, public houses, clubs, and so on; and
- national park names.

Descriptive names *not* normally recorded in Land-Line

Listed below are all those physical features which are **not** normally textually described in Land-Line:

- features affected by security regulations;
- graveyards and cemeteries adjacent to places of worship;
- minor ungated railway level crossings in industrial areas;
- shops, cafés and restaurants, with exceptions; and
- market gardens.

Chapter 6 Quality statements

Ordnance Survey is committed to continually improving the quality of its products, ensuring conformance to national standards.

One definition of the word quality is that it is a measure of performance against specification. Nevertheless, it is inevitable that quality will mean different things to different users of Land-Line.

Within the terms of this user guide, the quality of Land-Line products is related to:

- lineage;
- content;
- completeness;
- currency;
- geometric accuracy;
- geometric connectivity;
- attribute accuracy;
- logical consistency; and
- media.

Your comments on the style, content, accuracy and usefulness of these quality statements are always welcomed and help us to maintain and improve the quality of our products. Please use the Product performance report form at [appendix B](#) in this user guide.

Lineage

Great Britain was completely remapped between the years 1946 and 1983, and this mapping continues to be updated and upgraded. During the period since 1946 surveying and mapping techniques have changed and the specifications of the mapping have also changed to meet new user requirements. Consequently, maps have been produced by a number of different methods, producing a range of accuracies within the overall tolerances appropriate to the scale of the published map.

Land-Line was digitised from published Ordnance Survey topographic maps created from ground or photogrammetric surveys. Large-scale topographic maps were traditionally published at scales of 1:1250 (urban areas), 1:2500 (rural areas) and 1:10 000 (mountain and moorland areas). The survey practices and quality control procedures adopted during their production was designed to ensure that the resulting maps are true cartographic representations of the landscape, commensurate with the scale of publication. This is described in detail below. These maps were not intended to represent surveys of *engineering quality* or precision but represent a multipurpose series of general topographic maps.

The digitising programme began in May 1971, the specification being aimed at the requirements of automating graphic map production. The increasing demand for digital data in the 1980s led to an acceleration in the digitising programme and Land-Line coverage of Great Britain was completed in 1995. These digital maps have been constantly revised within a digital environment since their initial capture.

All Land-Line tiles digitised since June 1988 were tested during their initial production. The quality control procedure used was formulated in collaboration with the National Joint Utilities Group (NJUG). These were specified in *NJUG Paper 13 Quality Control procedure for Large Scale Maps Digitised to OS1988 – Version 1 – June 1988*.

There have been changes to both capture and feature coding specifications since digitising commenced. Such changes have not normally been implemented retrospectively.

Content

Content indicates what is included in a product. Content quality is therefore measured against the types of detail which should be shown in accordance with the capture and maintenance specification.

Completeness

Completeness is a measure of the correspondence between the real world and the specified data content.

At initial digitising stage, all Land-Line tiles were checked by eye against plotted output to ensure that no features included on the source map were omitted using the current product specification.

Subsequent revision of the Land-Line tiles includes local quality control procedures to ensure the data conforms to current specification.

Currency

Currency identifies how up to date Land-Line is. The timescales for surveying and for incorporating change into Land-Line products are derived from assessing different categories of real-world features and whether the change occurs in areas described as urban, rural or mountain and moorland. These areas are classified as follows:

- urban – all areas covered by 1:1250 scale mapping, and other areas of development greater than 20 hectares on 1:2500 scale mapping and having a population greater than 1 000 at the 1991 census;
- rural – all areas covered by 1:2500 scale mapping which are not classified as urban; and
- mountain and moorland – all areas covered by 1:10 000 basic scale mapping, that is those remote parts of Great Britain not supplied at 1:1250 or 1:2500 scales.

Changes to real-world features are categorised by Ordnance Survey as:

Category A

- Housing and associated features, including demolition, but excluding extensions to private dwellings*.
- Commercial, industrial, community and public sector buildings and associated features, including extensions to existing buildings greater than 0.25 ha and any demolitions of similar size.
- Communications networks (roads, including carriageway alterations due to traffic calming schemes, railways, airports, transmission lines and so on) and associated features, including demolition.
- Distinctive names associated with the above.
- Major sea and river defences designed to reduce the risk of flooding.
- Property boundary fences when part of a major refurbishment programme which make a significant impact on map data.
- Traffic calming measures*.
- Mobile/park homes that are permanent residential properties with a postal addresses*.

* Isolated houses, traffic calming measures and mobile/park homes will only fall under continuous revision once a catch up exercise as part of the National sweep programme has been completed.

Category B

- Agricultural and horticultural buildings.
- Quarries and other surface workings.
- Field boundaries.
- Water features (ponds, lakes and so on, rivers, canals, landing stages and jetties).
- Forestry and other vegetation.
- Tracks and paths.
- Extensions to commercial, industrial, community and public sector buildings less than 0.25 ha in extent.
- Apparent property boundary features not in category A, that is, those erected since the initial development and not part of refurbishment programmes.
- Mean high and low water when affected by change to other features in category A and B*.

* Significant change to tide lines noted either during Ordnance Survey revision or when informed by a customer will then be programmed for collection.

Category C

- Extensions to existing private residential buildings.
- Street furniture.
- Archaeological information.
- Private garages.

Summary of revision policy

Change category	Area classification	Revision category	Revision period
A	Urban and rural	Continuous	6 months
A	Mountain and moorland	Continuous*	6 months
B	Rural	Cyclic	5 years
B	Mountain and moorland	Cyclic	10 years
C	Urban, rural, and mountain and moorland	Continuous and cyclic	Only revised when required for sensible cat A and B completion

*See notes on the following pages.

Continuous revision of all areas

We will endeavour to capture any omitted category A change within three months of notification by a customer;

We will endeavour to survey and make available 95% of category A change within six months of the change occurring on the ground.

Cyclic revision of rural and remote areas

Great Britain is subject to a National sweep programme for revision of category B change. In urban and rural areas the target for completion of this cycle is five years, and ten years in moorland areas. This is undertaken using primarily photogrammetric survey methods.

The National sweep aims to collect any remaining category A change and at least 85% of category B change.

*Continuous revision of rural and remote areas

Continuous revision of rural and moorland areas will not commence until the area has been revised under the first cycle of the National sweep programme. In September 2003 only approximately 1.5% of rural areas had not been revised under the first cycle of the National Sweep programme, this was scheduled for completion in 2004.

The exception is:

- category A change occurring as developments over 1 hectare in extent, or 1 km in length for linear features. These changes are already subject to continuous revision.

Administrative boundary information

Administrative boundary information is normally incorporated into Land-Line by the operative date of the statutory instrument or within 10 months of receipt of the statutory instrument by Ordnance Survey, whichever is the latest.

Geometric accuracy

Geometric accuracy is concerned with tangible features whose planimetric position (that is, as if viewed from above) can be identified and surveyed unambiguously, for example, a fence or a building corner. Less well defined features, such as overgrown hedges, vegetation boundaries, some tide lines and river banks are surveyed as accurately as the nature of the physical feature allows. Tunnels and other underground features may also have a lower accuracy.

There are three measures of the geometric accuracy of a mapped feature:

- accuracy of shape or geometric fidelity;
- relative accuracy; and
- absolute or positional accuracy.

Accuracy of shape

Because of the differing scales of survey (1:1250, 1:2500 and 1:10 000), the accuracy of feature representation depends upon whether generalisation has been used. Accuracy of shape, or geometric fidelity, can be a matter for subjective judgement.

The principle of accuracy of shape is that any real-world alignment must be accurately replicated in Land-Line, for example:

- features that are square, rectangular or straight in the real world must be square, rectangular or straight in Land-Line; and
- adjacent features must be correctly separated, orientated and aligned to each other.

In the following figures, figure 6.1 is a true representation of the real world. Figure 6.2 may meet the relative and absolute accuracy requirement level but does not meet the accuracy of shape criteria. The guideline is that map detail must form a cartographically acceptable representation of real-world detail when plotted or displayed at a scale no larger than the source survey scale.

Figure 6.1

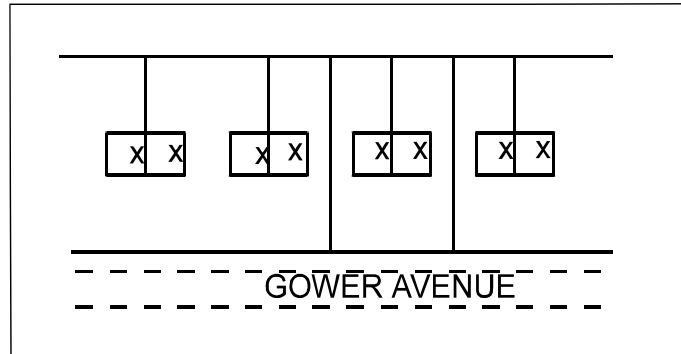
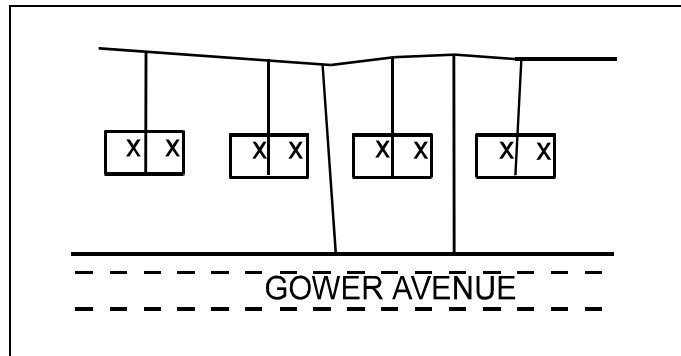


Figure 6.2



Relative accuracy

Relative accuracy is a measure of the positional consistency of a data point in relation to other local points of detail. Relative accuracy compares the scaled distance between features measured from the map data with distances measured between features on the ground.

Ordnance Survey is continually sampling data and testing the accuracy of well defined points of detail. Random samples are taken in different geographical areas for the various source survey scales and survey methods. The aggregated average results of this testing over the last 40 years show:

Scale	Relative error	95% confidence limit	99% confidence limit	Maximum measured distance
1:1250 (urban)	< ± 0.5 m	< ± 0.9 m	< ± 1.1 m	60.0 m
1:2500 resurvey or reformed (urban and rural)	< ± 1.0 m	< ± 1.9 m	< ± 2.5 m	100.0 m
1:2500 overhaul (urban and rural)	< ± 1.8 m	< ± 3.6 m	< ± 4.7 m	200.0 m
1:10 000 (mountain and moorland)	< ± 4.0 m	< ± 7.7 m	< ± 10.0 m	500.0 m

NOTE: Certain types of feature such as public road network lines (FC0098), vegetation and landform limits (FC0035 and FC 0036), tide lines (FC 0071 and 0072) and underground features (FC 0033) are surveyed to a lesser degree of accuracy due to the nature of the feature. Network lines, some tide lines and vegetation and landform limits may be poorly defined or subjective and thus cannot be accurately surveyed, while underground features may have been supplied by third parties.

Examples of relative accuracy

Land-Line urban map (1:1250 source scale and some large rural towns at 1:2500 source scale).

If the distances between two well defined points of detail 60.0 m apart were measured in the real world, there would be an expectation that 95% would be represented in Land-Line by a scaled distance of between 59.1 m and 60.9 m.

Land-Line rural map (1:2500 source scale) – resurvey or reformed survey methods.

If the distances between two well defined points of detail 100.0 m apart were measured in the real world, there would be an expectation that 95% would be represented in Land-Line by a scaled distance of between 98.1 m and 101.9 m.

Land-Line rural map (1:2500 source scale) – overhaul survey method.

If the distances between two well defined points of detail 200.0 m apart were measured in the real world, there would be an expectation that 95% would be represented in Land-Line by a scaled distance of between 196.4 m and 203.6 m.

Land-Line mountain and moorland map (1:10 000 source scale).

If the distances between two well defined points of detail 500.0 m apart were measured in the real world, there would be an expectation that 95% would be represented in Land-Line by a scaled distance of between 492.3 m and 507.7 m.

Absolute accuracy

Absolute accuracy is a measure which indicates how closely the coordinates (in a particular reference system) of a point in the dataset agree with the real coordinates of the same point on the ground.

Coordinates in different reference systems can only be compared when the necessary transformation parameters to convert between the two systems are known to a certain level of precision.

Land-Line is provided by Ordnance Survey in the National Grid coordinate reference system, which is defined by the OSGB36[®] triangulation. Comparison with coordinates given by GPS, which are in the WGS84 system, must take into account the necessary differences between the two reference systems.

Ordnance Survey statistics for absolute accuracy refer only to National Grid (Ordnance Survey can provide transformation parameters to other systems on request).

Ordnance Survey is continually sampling data and testing the accuracy of well defined points of detail. Random samples are taken in different geographical areas for the various source survey scales and survey methods. The aggregated average results of this testing over the last 40 years show:

Scale	RMSE*	95% confidence level	99% confidence level
1:1250 (urban)	< ± 0.5 m	< ± 0.8 m	< ± 1.0 m
1:2500 (rural) (resurvey or reformed)	< ± 1.1 m	< ± 1.9 m	< ± 2.4 m
1:2500 (rural)	< ± 2.8 m	< ± 4.7 m	< ± 5.8 m
1:10 000 (mountain and moorland)	< ± 4.1 m	< ± 7.1 m	< ± 8.8 m

* RMSE (root mean squared error) is the square root of the mean of the sum of the squares of the errors between the observations.

NOTE: Certain types of feature, for example, public road centrelines, underground features, and vegetation and landform limits, are surveyed to a lesser degree of accuracy ([see page 165](#)).

NOTE: It is important that with the onset of the positional accuracy improvement programme this table will change. The 1:2500 rural accuracy level (±2.8 m) will not exist by the end of the programme as most rural mapping will meet the resurvey/reformed accuracy level (±1.1 m).

There will be an addition to the table of 1:2500 selected rural towns which will have an accuracy of ±0.4m.

Geometric connectivity

Connectivity is the measure of how well feature representations relate to each other spatially and in comparison to the real world.

Coordinated T-junctions and some X-junctions in Land-Line data are defined by unique coordinate values; these appear within each feature defining the junction.

Linear features that cross the edges of tiles have common coordinates and identical attributes at the point of intersection with the tile edge.

Attribute accuracy

Attribute accuracy measures the correct interpretation and representation of the metadata elements within the data structures (that is, that the correct value of an attribute has been recorded). For example, attribute accuracy will identify that all buildings which should be feature code 0001 have the correct feature code, and that feature code 0001 has not been applied to a feature that it should not apply to.

Logical consistency

The logical consistency of Land-Line is a measure of how well the tiles supplied match the specification laid down, regardless of the content. This covers the logic within the data and the syntax of the files supplied.

The data is checked for conformance to the specification laid down in this user guide to ensure that syntax, referential integrity and feature code ranges are correct. No variation against the specification is permitted. However, the specification itself may allow for some variation in the way that particular features are represented.

You will normally receive Land-Line in either BS 7567 (NTF v2.0, Level 2) transfer format or DXF (AutoCAD release 12 compatible) format. All Land-Line data created and supplied by Ordnance Survey undergoes rigorous testing by software to ensure that the syntax of the files supplied conforms entirely to that defined for the format. You must ensure that the software you use conforms to the same standard format.

You should appreciate that the checks performed test how well the data conforms logically to the specifications of these formats, not the actual content. Files are tested to ensure that valid data is present within the file.

Media

Ordnance Survey supplies Land-Line data on media in predefined formats, for which two different types of quality measure are used – tests for the logical consistency of the data itself and the integrity of the supply media.

The media are new, from recognised, branded sources and are virus free. Error rates have been found to be very low.

Chapter 7 NTF explained

Introduction

The purpose of this chapter and [chapter 8](#) is to:

- Provide a brief description of the presentation of Land-Line in the BS 7567 (NTF v2.0 Level 2) transfer format. Data structure diagrams are used to give greater explanation where necessary.
- Provide licensed system suppliers with detail to enable Land-Line files in NTF to be easily understood and processed by application software.

The term data structure refers to the organisation and sequence of the records in the data file and not to the geographical topology of the data.

For convenience, BS 7567 (NTF v2.0 Level 2) is referred to as NTF.

This chapter describes the representation of Land-Line in Ordnance Survey's implementation of NTF. Land-Line is supplied to the large-scale product specifications version 1.5 LSPS_1.5 and Land-Line.Plus is supplied to the large-scale product specifications version 1.6 LSPS_1.6.

This user guide has been designed to be used as a guide to Land-Line in NTF version 2.0 Level 2. It is not intended as a complete definition either of NTF or of NTF Level 2.

The governing body for the industry standard NTF is now the British Standards Institution (BSI).

Their address is:
389 Chiswick High Road
LONDON
W4 4AL

Phone: 020 8996 9000
Fax: 020 8996 7001

NOTE: Full details of the British Standard can be accessed through the British Standards Institution's web site at <http://www.bsi-global.com>. Click here for the [NTF catalogue entry](#) at BS7567.

Any queries relating to the Land-Line product should be referred to the Sales Information team at the address shown at the beginning of this user guide.

Ordnance Survey standards

In addition to conforming to the published standards for NTF, Ordnance Survey has implemented the following local Ordnance Survey standards to ensure consistent supply of Ordnance Survey products:

Standard 1.2

The block size is 2 000 characters for transfers on unformatted media.

Standard 1.3

The data is written onto the transfer medium as either ASCII or EBCDIC characters in accordance with recipient's requirements.

Standard 1.4

Only variable length records are used.

NTF file structure for Land-Line

The following pages give a detailed breakdown of the data structure of Land-Line in NTF.

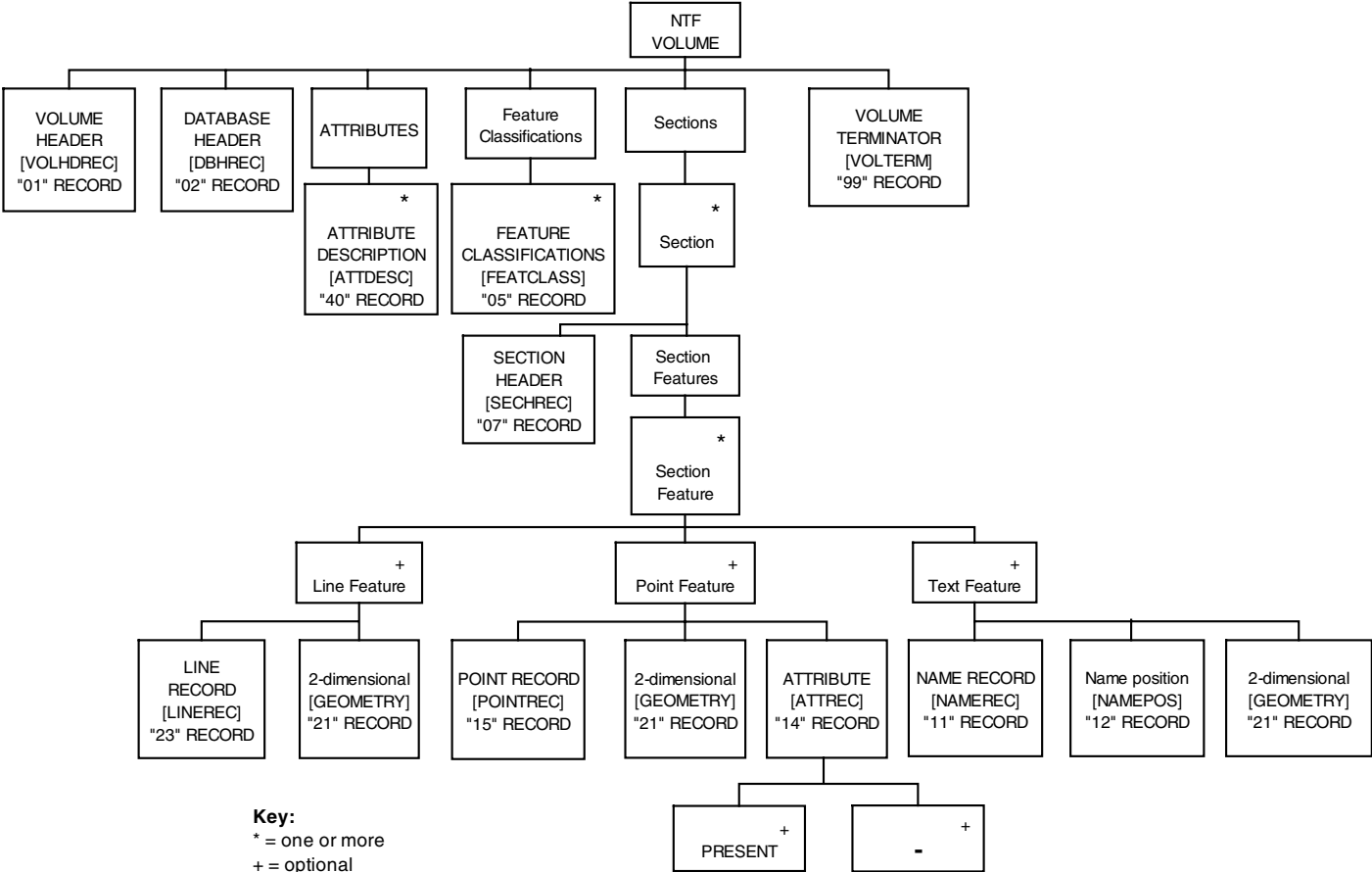
This is a three stage procedure which consists of:

- 1 Diagrammatic view of the data structure using Jackson Structured Programming conventions.
- 2 Outline description of the data structure.
- 3 A detailed breakdown of the record sequence and contents of the data structure.

There are certain conventions used in the record examples, which are:

- [] Square brackets are placed around record names, for example, [VOLHDREC].
- { } A pair of braces denote field names, for example, {REC_DESC} is the Record Descriptor field.
- [] 90 A two-digit number following square brackets denotes the Record Descriptor which uniquely identifies the record name between the brackets.
- <S> This is the space character (ASCII code 32).
- <3S> This denotes three successive space characters.
- % The percentage character (ASCII code 37). Indicates end of record.
- | Repeating group (ASCII code 124).

Data structures in NTF



An overview of the data in NTF

General

Record size

NTF data is written to the output device in variable length records, with a maximum record length of 80 characters, which includes continuation mark, {CONT_MARK} and {EOR}.

Continuation records are used where the maximum physical record length of 80 characters does not permit a logical record to be transferred wholly within one physical record. The presence of a continuation record is indicated by the value of the continuation mark {CONT-MARK}, which immediately precedes the record terminator {EOR}. The value of {CONT-MARK} is 1 if there is a continuation record present and 0 if there is not.

Record terminator {EOR}

The end of record terminator is the percent (%) (ASCII 37) character.

Transfer set

A transfer set will equate to a single file. The data the customer receives will be in one or more transfer sets. Each transfer set starts with a Volume Header Record [VOLHDREC] ([see page 221](#)) and terminates with a Volume Terminator Record [VOLTERM] ([see page 241](#)).

The beginning of each transfer set will be structured with the following introductory, or leading, records:

- Database Header Record [DBHREC] ([see page 222](#)) – this gives details of:
 - 1 The database name.
 - 2 NTF release date.
 - 3 Feature classification table name.
 - 4 Release date which applies to the whole of the transfer set.
- Attribute Description Record [ATTDESC] ([see page 240](#)) – this lists and gives a description of the attributes that can be applied to features within the transfer set.
- Feature Classification Record [FEATCLASS] ([see page 223](#)) – this lists and gives descriptions of all possible feature codes for the transfer set.

These introductory records are followed by the data section requested by the customer.

The section consists of two parts:

- 1 Section Header Record [SECHREC] – this gives the National Grid coordinates and various other data relating to the section.
- 2 Section body – this comprises all the features within the section.

Section header

Header information for each tile is supplied within the Section Header Record [SECHREC] 07, including five Continuation Records [CONTREC] 00. This will be in a standard format, and is provided once for each section.

Feature records

Feature structure

The structure of each different feature is as follows:

- 1 Points – these consist of:
 - a Point Record [POINTREC] 15 ([see page 235](#));
 - a Geometry Record [GEOMETRY1] 21 ([see page 237](#)); and
 - can have an associated Attribute Record [ATTREC] 14 ([see page 234](#)), which contains a measurement for variable sized symbols.
- 2 Lines – these consist of:
 - a Line Record [LINEREC] 23 ([see page 239](#));
 - and a Geometry Record [GEOMETRY1] 21; ([see page 238](#)); and
 - maybe one or more Continuation Records [CONTREC] 00 to extend the Geometry Record.
- 3 Text – this consists of:
 - a Name Record [NAMEREC] 11 ([see page 232](#));
 - a Name Position Record [NAMPOSTN] 12 ([see page 233](#)); and
 - a Geometry Record [GEOMETRY1] 21 ([see page 236](#)).

Coordinate referencing system

Abbreviated National Grid coordinates are supplied and are given in centimetres. The coordinates have a field width of 6, not the NTF default width of 10. Full National Grid coordinates in metres are calculated by using the {XY_MULT}, {X_ORIG} and {Y_ORIG} values in the Section Header Record [SECHREC] 07, and the conversion formulae below:

$$X = (\{XY_MULT\} \times \{X_COORD\}) + \{X_ORIG\}$$

$$Y = (\{XY_MULT\} \times \{Y_COORD\}) + \{Y_ORIG\}$$

where {X_ORIG} and {Y_ORIG} are additive constants, always added to {X_COORD} and {Y_COORD} respectively, whilst {XY_MULT} is a multiplication factor applied to coordinates before the addition of {X_ORIG} and {Y_ORIG}.

Negative coordinate values may be carried in {X_COORD}, {Y_COORD}. In each case, the minus sign appears as the first character of the field.

Attribute codes

Attribute codes provide supplementary information on a feature, providing such qualifying information as feature code, and so on. See also [Feature attribute data](#) in chapter 3.

The depiction of attributes is described in the Attribute Description Record [ATTDESC] ([see page 240](#)).

The following attributes are used in the supply of Land-Line data:

Mnemonic	Description
XFC	Feature code for the line, point or text feature.
OR	Symbol orientation.
DT	Pylon symbol size.

- Feature code

The feature code attribute of a line, point or text, is conveyed via the Line Record [LINEREC] ([see page 239](#)) or Point Record [POINTREC] ([see page 235](#)) or Name Record [NAMEREC] ([see page 232](#)) respectively.

- OR – symbol orientation

It represents the orientation anticlockwise from grid east in tenths of a degree. Used as a variable for bench mark, boundary half mereing, flow arrow and pylon symbols, a fixed value for spot height and triangulation point symbols. Not supplied for other point features. This attribute is conveyed via the Point Record [POINTREC] ([see page 235](#)).

- DT – pylon symbol size

The pylon symbol size attribute is conveyed via the Attribute Record [ATTREC] ([see page 234](#)). The value given is the real-world distance from the centre of the pylon symbol to the mid-point of any edge, in centimetres.

Text attributes

Text attributes, such as the type face, height of text, orientation of text are conveyed via the Name Position Record [NAMEPOSTN] ([see page 233](#)).

For the supply of data on formatted media

Data requested on CD-ROM will be written directly to the output device.

The transfer set will have one dataset and one section. One or more transfer sets will be put onto the medium.

If your order is larger than the capacity of the CD-ROM, it will be put onto two or more of CD-ROMs, although single tiles will **not** be split.

Formatted media

01 VOLUME HEADER RECORD 01
02 DATABASE HEADER RECORD
40 ATTRIBUTE DESCRIPTION RECORD
05 FEATURE CLASSIFICATION RECORD
07 SECTION HEADER RECORD
Tile 1 data
99 VOLUME TERMINATION RECORD
01 VOLUME HEADER RECORD 01
02 DATABASE HEADER RECORD
40 ATTRIBUTE DESCRIPTION RECORD
05 FEATURE CLASSIFICATION RECORD
07 SECTION HEADER RECORD
Tile 2 data
99 VOLUME TERMINATION RECORD
and so on
Tile n data
99 VOLUME TERMINATION RECORD

List of Land-Line feature codes

Feature code	Feature code name	Supplied in Land-Line	Supplied in Land-Line.Plus	Record name
0001	Building outline	✓	✓	[LINEREC]
0004	Building outline (overhead)	✓	✓	[LINEREC]
0007	Civil parish or community boundary	✓	✓	[LINEREC]
0008	District, LB or UA boundary	✓	✓	[LINEREC]
0009	County boundary	✓	✓	[LINEREC]
0010	Electoral division or ward boundary	✓	✓	[LINEREC]
0011	Boundary post or stone	✓	✓	[POINTREC]
0013	Boundary half mereing symbol	✓	✓	[POINTREC]
0014	Railway (narrow gauge)	✓	✓	[LINEREC]
0015	Railway (standard gauge)	✓	✓	[LINEREC]
0021	Road (public) edge of metalling	✓	✓	[LINEREC]
0025	Triangulation point	✓	✓	[POINTREC]
0026	Bench mark	✓	✓	[POINTREC]
0027	Spot height	✓	✓	[POINTREC]
0030	General line or minor building detail	✓	✓	[LINEREC]
0032	General ground level or minor overhead detail	✓	✓	[LINEREC]
0033	Underground detail or course of antiquity	✓	✓	[LINEREC]
0035	Vegetation or landform limit (suppressed)	X	✓	[LINEREC]
0036	Vegetation or landform limit	✓	✓	[LINEREC]
0043	Overhead detail	✓	✓	[LINEREC]
0049	Pylon	✓	✓	[POINTREC]
0052	Minor detail	✓	✓	[LINEREC]
0057	Point feature	✓	✓	[POINTREC]
0059	Water detail	✓	✓	[LINEREC]
0069	Flow arrow	✓	✓	[POINTREC]
0071	Mean high water (springs)	✓	✓	[LINEREC]
0072	Mean low water (springs)	✓	✓	[LINEREC]

Feature code	Feature code name	Supplied in Land-Line	Supplied in Land-Line.Plus	Record name
0079	European, parliamentary or assembly constituency boundary	✓	✓	[LINEREC]
0098	Road centreline	✓	✓	[LINEREC]
0321	Roofed building indicator	✓	✓	[POINTREC]
0323	Glasshouse indicator	✓	✓	[POINTREC]
0372	Positioned coniferous tree	X	✓	[POINTREC]
0373	Positioned non-coniferous tree	X	✓	[POINTREC]
0374	Top of slope	X	✓	[LINEREC]
0375	Top of cliff	X	✓	[LINEREC]
0376	Bottom of slope or cliff	X	✓	[LINEREC]
0377	Boulders	X	✓	[POINTREC]
0378	Boulders, scattered	X	✓	[POINTREC]
0379	Coniferous trees	X	✓	[POINTREC]
0380	Coniferous trees, scattered	X	✓	[POINTREC]
0381	Coppice or osiers	X	✓	[POINTREC]
0382	Marsh, saltmarsh or reeds (above high tide line)	X	✓	[POINTREC]
0384	Non-coniferous trees	X	✓	[POINTREC]
0385	Non-coniferous trees, scattered	X	✓	[POINTREC]
0386	Orchard	X	✓	[POINTREC]
0387	Heath	X	✓	[POINTREC]
0388	Rock	X	✓	[POINTREC]
0389	Rock, scattered	X	✓	[POINTREC]
0390	Rough grass	X	✓	[POINTREC]
0392	Scrub	X	✓	[POINTREC]
0395	Upper level of communication indicator	✓	✓	[POINTREC]
0396	Cliff indicator	X	✓	[POINTREC]
0397	Slope indicator	X	✓	[POINTREC]
0400	Water indicator	X	✓	[POINTREC]
1000	Road name or number	✓	✓	[NAMEREC]

Feature code	Feature code name	Supplied in Land-Line	Supplied in Land-Line.Plus	Record name
1005	Administrative boundary text	✓	✓	[NAMEREC]
1006	House number or building names	✓	✓	[NAMEREC]
1009	Miscellaneous text	✓	✓	[NAMEREC]
1010	Water text	✓	✓	[NAMEREC]
1013	Land parcel number	✓	✓	[NAMEREC]
1210	Scree	x	✓	[POINTREC]
1211	Positioned boulder	x	✓	[POINTREC]
1212	Ridge or rock line	x	✓	[LINEREC]

Content indicator values

The content indicator (also known as a capture standard) in the map header gives an overview of the scale of the source map from which the data was digitised initially, and a guide to the standards of survey which have been used to maintain the data subsequently. Hence, a dual accuracy file will generally contain data digitised from a 1:2500 scale source with some subsequent revision added using survey methods appropriate to 1:1250 scale mapping.

The following list details the meanings of the various alphanumeric strings which may occur in the {CONT_IND} field of the map header.

{CONT_IND} is found at character positions 71:78 of the third [CONTREC] following [SECHREC].

Value Description

<S>	Default. No capture standard information.
A	1:1250 scale accuracy standards (complete cover).
B	1:2500 scale overhaul accuracy standards (complete cover).
C	1:10 000 scale accuracy standards (complete cover).
R	1:2500 scale resurvey or reformed (including Positional Accuracy Improvement).
nnC	1:10 000 scale accuracy standards where nn is a value in the range 00–25 and indicates the number of km ² of map detail (the blank areas of the map being available at 1:1250 or 1:2500 scales).

The presence of more than one value indicates multi-accuracy, for example:

Value Description

AB	Detail captured to both 1:1250 and 1:2500 scales accuracy standards.
BC	Detail captured to both 1:2500 and 1:10 000 scales accuracy standards.
RBC	Detail captured at 1:2500 scale overhaul, 1:2500 scale resurvey and 1:10 000 scale accuracy standards.

NOTE: Where all four types of survey occur, the code ABC is used.

Parameters affecting text output

Text attributes

Record	Field	Content and description
[NAMEREC]	{FEAT_CODE}	TEXT CATEGORY:
	1000	Road names and numbers,
	1005	Boundary and administrative information,
	1006	House numbers and building names,
	1009	Miscellaneous names,
	1010	Water features names,
	1013	Land parcel numbers.
[NAMEPOSTN]	{FONT}	TYPE FACE:
	0	Lutheran type,
	1	Medium Roman type,
	2	Light Roman type.
[NAMEPOSTN]	{TEXT_HT}	In 0.1 mm units.
[NAMEPOSTN]	{ORIENT}	1/10 degree unit (measured anticlockwise from grid east).
[NAMEPOSTN]	{DIG_POSTN}	See below.

Name positions

As plotters normally require {DIG_POSTN} 0 to output names correctly, the following information may be required to calculate this point for text digitised with other values of {DIG_POSTN}.

All names are given map positions, quoted as X and Y coordinates relative to the map origin (SW corner), in the same way as point features and symbols.

The text string may be considered as occupying a rectangular space. The relationship between the position of this rectangle and the name's coordinate pair is given by an integer ({DIG_POSTN} in [NAMEPOSTN]). {DIG_POSTN} has a value between 0 and 8, which relates to one of the corners, to the mid point of one of the sides, or to the centre, of this rectangle, as in [figure 7.1](#).

Relative widths of text characters

This is the specification for standard Ordnance Survey style text characters:

Width L/C	Same as for upper case									
Width U/C	56	28	56	56	56	56	56	56	56	56
Character	0	1	2	3	4	5	6	7	8	9
Width L/C	Same as for upper case									
Width U/C	24	24	60	60	60	52	64	20	36	52
Character	:	;	<	=	>	?	space	!	"	#
Width L/C	Same as for upper case									
Width U/C	60	60	52	24	44	44	60	60	24	48
Character	£	%	&	'	()	*	+	,	-
Width L/C	24	60	60	60	56	56	56	56	40	56
Width U/C	24	60	60	64	64	64	64	64	64	64
Character	.	/	@	A	B	C	D	E	F	G
Width L/C	48	28	44	56	24	72	48	56	56	56
Width U/C	64	28	60	64	56	72	64	64	64	64
Character	H	I	J	K	L	M	N	O	P	Q
Width L/C	52	56	48	48	56	88	56	56	56	0
Width U/C	64	64	64	64	72	96	64	64	64	0
Character	R	S	T	U	V	W	X	Y	Z	[
Width L/C	Same as for upper case									
Width U/C	0	0	0	0						
Character	\$]	-	®						

Character widths are expressed in 1/60ths of text height. U/C = upper case. L/C = lower case

Conversion table from point size to millimetres

Point size	Height mm
24	5.0
22	4.4*
20	3.9*
18	3.6
16	3.2*
14	2.9
12	2.4*
11	2.2
10	2.0*
9	1.7*
8	1.6
7	1.4
6	1.2*
5	1.1
3	0.8*

NOTE: The height in millimetres is for a skeletal text font.

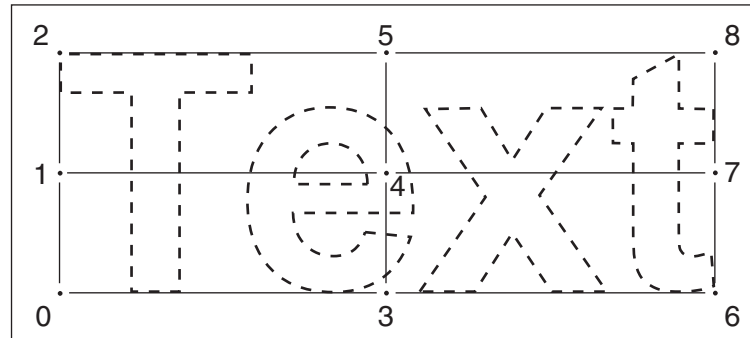
Calculating text length

* The height values marked with an asterisk require the addition of 0.05 mm when calculating text length.

To calculate the '0' position of a text block

The following section is included to help programmers manipulate textual data supplied in Land-Line.

Figure 7.1: Text block digitising positions



Information required:

- coordinate pair;
- scale of map;
- orientation;
- text height;
- text width; and
- characters.

Glossary of terms

X, Y	Given coordinates.
Xc, Yc	Calculated corrections to the given coordinates.
HT	Text height (mm).
L	Length of text block (to + or -1 mm).
q	Orientation of text.
SC	Scale of map.

Process

- 1 Calculate length of text string (excluding trailing spaces) from the tables of relative widths and heights on page [184](#) and [185](#).
- 2 Subtract 20 to allow for unwanted space.
- 3 Multiply by HT/60 to obtain length (L) in mm.
- 4 Multiply by map scale (taking care to express your answer in the same coordinate units employed in the map data – cm for Land-Line data in NTF).
- 5 Use the formulae in the table below to derive the corrections to be applied to the coordinates of the digitised position.

Digitised position	Xc (eastings)	Yc (northings)
0	= 0	= 0
1	= + HT/2.SINq	= – HT/2.COSq
2	= + HT.SINq	= – HT.COSq
3	= – L/2.COSq	= – L/2.SINq
4	= – L/2.COSq + HT/2.SINq	= – L/2.SINq – HT/2.COSq
5	= – L/2.COSq + HT.SINq	= – L/2.SINq – HT.COSq
6	= – L.COSq	= – L.SINq
7	= – L.COSq + HT/2.SINq	= – L.SINq – HT/2.COSq
8	= – L.COSq + HT.SINq	= – L.SINq – HT.COSq

Symbol definitions

NTF data does not contain information about the definition of any of the symbols that may be used to depict symbol features on the map. This allows users to use symbols of their choice.

Point symbols may be made to resemble standard Ordnance Survey symbols, if required, when presented to on screen or plot. The following part of this chapter contains detailed information about the construction of such symbol features and is included to help programmers manipulate symbol data supplied in Land-Line.

Point symbols are represented in both Land-Line and Land-Line.Plus as point features.

These point features may be attributed with size and orientation variables as appropriate.

The following features are defined on all Land-Line products:

Boundary post or stone	Point feature
Boundary mereing change	Flow arrow
Triangulation point	Building roof seed
Bench mark	Glasshouse seed
Spot height	Upper level of communication seed
Pylon	

The following defined features are available only in Land-Line.Plus:

Slope	Non-coniferous tree
Cliff	Orchard
Boulder	Heath
Coniferous tree	Rock
Coppice or osiers	Rough grass
Marsh, saltmarsh or reed	Scrub

The symbols on the following pages are available in comma separated value (CSV) format from our web site: www.ordnancesurvey.co.uk.

Definition of a boundary post or stone symbol – FC0011

NTF definition:

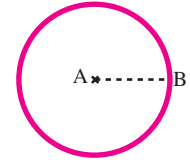
Coordinate hookpoint – point A.

Further information:

Radius AB = 0.03 plot cm @ 1:1250 and 1:2500 scales.

Symbol coordinates:

```
11
0.300,0.000
0.285,0.093
0.243,0.176
0.176,0.243
0.093,0.285
0.000,0.300
-0.093,0.285
-0.176,0.243
-0.243,0.176
-0.285,0.093
-0.300,0.000
-0.285,-0.093
-0.243,-0.176
-0.176,-0.243
-0.093,-0.285
0.000,-0.300
0.093,-0.285
0.176,-0.243
0.243,-0.176
0.285,-0.093
0.300,0.000
END
```



Definition of a boundary mereing symbol – FC0013

NTF definition:

Orientation – orientation of line AB in 1/10th degrees.

Coordinate hookpoint – point A.

NOTE: the symbol shown here is in fact two symbols, digitised at point A, orientated 180 degrees apart.

Further information:

Length AB = 0.18 plot cm @ 1:1250 and 1:2500 scales.

Radius BC = 0.05 plot cm @ 1:1250 and 1:2500 scales.

Symbol coordinates:

13/1	2.776, 0.155
0.000, 0.000	2.800, 0.000
1.800, 0.000	2.776, -0.155
END	2.705, -0.294
13/2	2.594, -0.405
1.800, 0.000	2.455, -0.476
1.824, 0.155	2.300, -0.500
1.895, 0.294	2.145, -0.476
2.006, 0.405	2.006, -0.405
2.145, 0.476	1.895, -0.294
2.300, 0.500	1.824, -0.155
2.455, 0.476	1.800, 0.000
2.594, 0.405	END
2.705, 0.294	



Definition of a triangulation point symbol – FC0025

NTF definition:

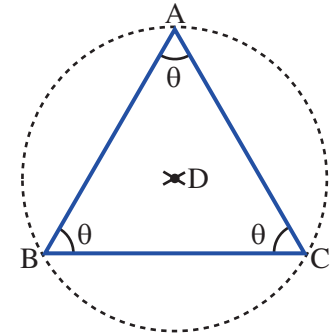
Orientation – always the same, that is, axis AD is vertical or 2 700 x 1/10th degrees.
Coordinate hookpoint – point D.

Further information:

Symbol is an equilateral triangle – all angles $\theta = 60$ degrees.
Length AB = BC = CA = 0.22 plot cm @1:1250 and 1:2500 scales.
Centre dot radius = 0.007 plot cm @1:1250 and 1:2500 scales.

Symbol coordinates:

25/1	0.022, -0.013
-0.850, -0.573	0.014, -0.021
-0.000, 1.127	0.005, -0.025
0.850, -0.573	-0.005, -0.025
-0.850, -0.573	-0.014, -0.021
END	-0.022, -0.013
25/2	-0.025, -0.003
0.000, 0.025	-0.024, 0.007
0.011, 0.023	-0.019, 0.016
0.019, 0.016	-0.011, 0.023
0.024, 0.007	0.000, 0.025
0.025, -0.003	END



Definition of a bench mark symbol – FC0026

NTF definition:

Orientation – orientation of line AB in 1/10th degrees.

Coordinate Hookpoint – point A.

Further information:

Length AB = 0.16 plot cm @ 1:1250 and 1:2500 scales.

Length AC = AD = 0.08 plot cm @1:1250 and 1:2500 scales.

Angle θ = 45 degrees.

Symbol coordinates:

26/1

0.000, 0.000

1.600, 0.000

END

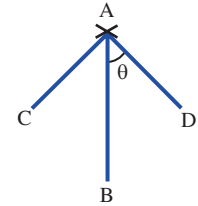
26/2

0.800, 0.800

0.000, 0.000

0.800, -0.800

END



Definition of a spot height symbol – FC0027

NTF definition:

Orientation – always the same, that is axis AC is vertical, or 2 700 x 1/10th degrees.

Coordinate hookpoint – point E.

Further information:

Angle $\theta = 90$ degrees.

AE = BE = CE = DE = 0.062 plot cm @ 1:1250 and 1:2500 scales.

Symbol coordinates:

27/1

0.000, -0.600

0.000, 0.600

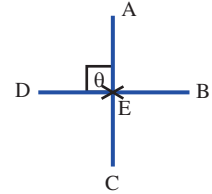
END

27/2

-0.600, 0.000

0.600, 0.000

END



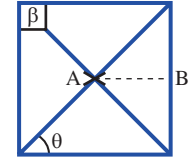
Definition of a pylon symbol – FC0049

NTF definition:

Orientation – orientation of line AB in 1/10th degrees.

Symbol length – length of line AB.

Coordinate hookpoint – point A.



Further information:

Angle θ = 45 degrees

Angle β = 90 degrees.

Length of line AB = 0.12 plot cm @ 1:1250 and 1:2500 scales (minimum standard size).

Symbol coordinates:

49/1

-5.000, -5.000

5.000, -5.000

5.000, 5.000

-5.000, 5.000

-5.000, -5.000

5.000, 5.000

END

49/2

-5.000, 5.000

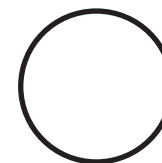
5.000, -5.000

END

Definition of a point feature

Symbol coordinates:

```
57          -0.285,-0.093
0.300,0.000 -0.243,-0.176
0.285,0.093 -0.176,-0.243
0.243,0.176 -0.093,-0.285
0.176,0.243 0.000,-0.300
0.093,0.285 0.093,-0.285
0.000,0.300 0.176,-0.243
-0.093,0.285 0.243,-0.176
-0.176,0.243 0.285,-0.093
-0.243,0.176 0.300,0.000
-0.285,0.093 END
-0.300,0.000
```



Definition of a flow arrow symbol – FC0069

NTF definition:

Orientation – orientation of line AD in 1/10th degrees.

Coordinate hookpoint – point A.

Further information

All dimensions given in plot centimetres @ 1:1250 and 1:2500 scales.

Length AB = 0.268 cm.

Length BC = 0.047 cm.

Length AD = AE = BD = BE = CD = CE = 0.034 cm.

Angle θ = 35 degrees.

Symbol coordinates:

69/1

0.000, 0.000

3.600, 0.000

END

69/2

0.500, 0.500

0.000, 0.000

0.500, -0.500

END

69/3

3.600, 0.500

3.100, 0.000

3.600, -0.500

END

69/4

4.100, 0.500

3.600, 0.000

4.100, -0.500

END



Definition of a building roof seed – FC0321

Symbol coordinates:

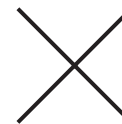
```
321/1  
-0.530,0.530  
0.530,-0.530  
END  
321/2  
-0.530,-0.530  
0.530,0.530  
END
```



Definition of a glasshouse seed – FC0323

Symbol coordinates:

```
323/1  
-0.530,0.530  
0.530,-0.530  
END  
323/2  
-0.530,-0.530  
0.530,0.530  
END
```



Definition of a coniferous tree symbol (positioned) – FC0372

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are shown below.



Symbol coordinates:

372/1	-0.342,1.150	0.909,0.734	-0.154,2.467
0.000,0.000	-0.246,1.253	1.037,0.674	-0.073,2.58
0.000,2.998	-0.156,1.363	1.168,0.621	0.000,2.698
END	-0.074,1.478	1.303,0.578	0.072,2.582
372/2	0.000,1.598	END	0.151,2.471
-1.303,0.578	0.074,1.478	372/3	0.236,2.364
-1.168,0.621	0.156,1.363	-0.890,1.844	0.328,2.263
-1.037,0.674	0.246,1.253	-0.769,1.912	0.427,2.168
-0.909,0.734	0.342,1.150	-0.652,1.988	0.530,2.079
-0.785,0.802	0.444,1.052	-0.541,2.071	0.639,1.997
-0.666,0.878	0.552,0.962	-0.435,2.161	0.753,1.922
-0.552,0.962	0.666,0.878	-0.335,2.257	0.871,1.854
-0.444,1.052	0.785,0.802	-0.241,2.359	END

Definition of a non-coniferous tree symbol (positioned) – FC0373

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are shown below.



Symbol coordinates:

373/1	1.127,1.798	-0.924,2.439
-0.230,0.771	1.159,1.975	-1.053,2.312
-0.028,0.000	1.134,2.154	-1.135,2.150
0.028,0.000	1.052,2.314	-1.159,1.970
0.233,0.783	0.923,2.440	-1.124,1.793
END	0.760,2.518	-1.034,1.636
373/2	0.581,2.539	END
0.233,0.783	END	373/6
0.369,0.652	373/4	-1.034,1.636
0.539,0.570	0.581,2.539	-1.170,1.508
0.725,0.546	0.504,2.723	-1.259,1.345
0.910,0.580	0.371,2.870	-1.294,1.162
1.076,0.670	0.196,2.966	-1.272,0.978
1.204,0.808	0.000,3.000	-1.193,0.809
1.284,0.978	-0.196,2.966	-1.066,0.673
1.307,1.165	-0.371,2.870	-0.904,0.582
1.270,1.350	-0.504,2.723	-0.721,0.546
1.178,1.514	-0.581,2.539	-0.536,0.567
1.039,1.641	END	-0.367,0.645
END	373/5	-0.230,0.771
373/3	-0.581,2.539	END
1.039,1.641	-0.761,2.517	

Definition of boulders symbol – FC0377

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:	377/3	377/6	377/8
377/1	-0.372, 0.494	0.947,	2.072, -0.926
-2.621, -0.523	-0.616, 0.684	1.175,	1.950, -0.831
-2.165, -0.475	-0.891, 0.826	1.237,	1.812, -0.760
-2.041, -0.471	-1.174, 0.912	1.528,	1.671, -0.717
-1.459, -0.473	END	1.818,	END
-0.880, -0.528	377/4	2.170,	377/9
-0.176, -0.560	-1.163, 0.532	2.520,	1.676, -0.907
0.525, -0.513	-1.120, 0.661	2.573,	1.698, -0.842
0.631, -0.508	-1.125, 0.797	2.631,	1.695, -0.774
0.746, -0.523	-1.174, 0.912	2.566,	1.671, -0.717
0.616, -0.293	-1.273, 1.020	2.449,	1.621, -0.663
0.383, -0.092	END	2.312,	END
0.108, 0.054	377/5	END	377/10
END	-1.500, 1.123	377/7	1.508, -0.611
377/2	-1.691, 1.185	1.909, -1.288	1.412, -0.580
-0.698, -0.230	-1.894, 1.196	2.013, -1.312	1.311, -0.575
-0.489, -0.277	-2.092, 1.154	2.119, -1.302	1.212, -0.596
-0.277, -0.258	-2.273, 1.063	2.218, -1.261	1.121, -0.641
-0.079, -0.176	-2.424, 0.927	2.302, -1.190	1.046, -0.709
0.088, -0.033	-2.530, 0.762	2.310, -1.174	0.993, -0.792
0.104, -0.002	-2.567, 0.495	2.312, -1.164	0.974, -0.925
0.107, 0.019	-2.547, 0.225	2.312, -1.146	0.984, -1.060
0.108, 0.054	-2.471, -0.033	2.307, -1.133	1.022, -1.190
0.099, 0.08	-2.342, -0.270	2.295, -1.116	1.087, -1.308
0.074, 0.114	-2.165, -0.475	2.280, -1.106	1.175, -1.411
0.045, 0.134	END	END	END
END			

Definition of boulders symbol (scattered) – FC0378

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:	1.030, -0.272	-0.065, 0.816
378/1	1.197, -0.129	-0.164, 0.924
-1.512, -0.619	1.213, -0.098	END
-1.056, -0.571	1.216, -0.077	378/5
-0.932, -0.567	1.217, -0.042	-0.391, 1.027
-0.350, -0.569	1.208, -0.016	-0.582, 1.089
0.229, -0.624	1.183, 0.018	-0.785, 1.100
0.933, -0.656	1.154, 0.038	-0.983, 1.058
1.634, -0.609	END	-1.164, 0.967
1.740, -0.604	378/3	-1.315, 0.831
1.855, -0.619	0.737, 0.398	-1.421, 0.666
1.725, -0.389	0.493, 0.588	-1.458, 0.399
1.492, -0.188	0.218, 0.730	-1.438, 0.129
1.217, -0.042	-0.065, 0.816	-1.362, -0.129
END	END	-1.233, -0.366
378/2	378/4	-1.056, -0.571
0.411, -0.326	-0.054, 0.436	END
0.620, -0.373	-0.011, 0.565	
0.832, -0.354	-0.016, 0.701	

Definition of coniferous trees symbol – FC0379

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

379/1	END	0.847, -1.867	1.181, -1.055
-0.910, 2.250	379/3	0.908, -1.833	1.224, -1.001
-0.910, -0.748	-1.800, 1.096	0.968, -1.795	1.265, -0.944
END	-1.679, 1.164	1.025, -1.753	1.301, -0.885
379/2	-1.562, 1.240	1.079, -1.708	1.337, -0.943
-2.213, -0.170	-1.451, 1.323	1.130, -1.659	1.377, -0.999
-2.078, -0.127	-1.345, 1.413	1.178, -1.608	1.419, -1.052
-1.947, -0.074	-1.245, 1.509	1.223, -1.553	1.465, -1.103
-1.819, -0.014	-1.151, 1.611	1.264, -1.495	1.514, -1.150
-1.695, 0.054	-1.064, 1.719	1.301, -1.435	1.566, -1.194
-1.576, 0.130	-0.983, 1.832	1.338, -1.495	1.621, -1.236
-1.462, 0.214	-0.910, 1.950	1.379, -1.553	1.678, -1.273
-1.354, 0.304	-0.838, 1.834	1.424, -1.608	1.737, -1.307
-1.252, 0.402	-0.759, 1.723	1.472, -1.659	END
-1.156, 0.505	-0.674, 1.616	1.523, -1.708	379/7
-1.066, 0.615	-0.582, 1.515	1.577, -1.753	0.328, -0.740
-0.984, 0.730	-0.483, 1.420	1.634, -1.795	0.217, -0.611
-0.910, 0.850	-0.380, 1.331	1.694, -1.833	0.062, -0.541
-0.836, 0.730	-0.271, 1.249	1.756, -1.867	-0.109, -0.541
-0.754, 0.615	-0.157, 1.174	1.820, -1.897	-0.264, -0.611
-0.664, 0.505	-0.039, 1.106	1.885, -1.923	-0.375, -0.740
-0.568, 0.402	END	1.952, -1.945	END
-0.466, 0.304	379/4	END	379/8
-0.358, 0.214	1.301, -0.735	379/6	1.920, -2.230
-0.244, 0.130	1.301, -2.234	0.856, -1.312	1.847, -2.154
-0.125, 0.054	END	0.917, -1.278	1.744, -2.126
-0.001, -0.014	379/5	0.975, -1.240	1.642, -2.154
0.127, -0.074	0.650, -1.945	1.031, -1.199	1.568, -2.230
0.258, -0.127	0.717, -1.923	1.084, -1.154	END
0.393, -0.170	0.783, -1.897	1.134, -1.106	

Definition of coniferous trees (scattered) symbol – FC0380

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

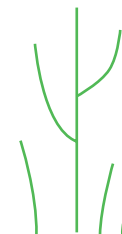
380/1	0.123, -0.147	-0.037, 0.516
0.000, 0.725	0.171, -0.199	0.000, 0.575
0.000, -0.774	0.222, -0.248	0.036, 0.517
END	0.276, -0.293	0.075, 0.461
380/2	0.333, -0.335	0.118, 0.408
-0.651, -0.485	0.393, -0.373	0.164, 0.358
-0.584, -0.463	0.455, -0.407	0.213, 0.310
-0.518, -0.437	0.518, -0.437	0.265, 0.266
-0.455, -0.407	0.584, -0.463	0.320, 0.225
-0.393, -0.373	0.651, -0.485	0.377, 0.187
-0.333, -0.335	END	0.436, 0.153
-0.276, -0.293	380/3	END
-0.222, -0.248	-0.445, 0.148	380/4
-0.171, -0.199	-0.384, 0.182	0.619, -0.770
-0.123, -0.147	-0.326, 0.220	0.545, -0.694
-0.078, -0.093	-0.271, 0.261	0.443, -0.666
-0.037, -0.035	-0.218, 0.306	0.341, -0.694
0.000, 0.025	-0.167, 0.354	0.267, -0.770
0.037, -0.035	-0.120, 0.405	END
0.078, -0.093	-0.077, 0.459	

Definition of coppice/osiers symbol – FC0381

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

381/1	381/3	0.586,1.516
0.000,-1.219	-0.547,-1.248	END
0.000,1.819	-0.567,-0.817	381/5
END	-0.639,-0.392	0.489,-0.291
381/2	-0.762,0.022	0.364,-0.768
-0.567,1.330	END	0.313,-1.258
-0.556,1.035	381/4	END
-0.492,0.746	0.010,0.627	381/6
-0.377,0.473	0.207,0.736	0.752,-0.789
-0.214,0.226	0.372,0.890	0.653,-1.009
-0.010,0.012	0.494,1.078	0.616,-1.248
END	0.567,1.292	END



Definition of marsh/saltmarsh/reeds symbol – FC0382

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

382/1	382/3	-1.440,0.269	382/8
-4.250,0.000	-1.318,-0.517	END	1.326,0.000
-0.444,0.000	1.317,-0.517	382/6	1.447,0.269
-0.534,1.008	END	-0.873,0.000	END
END	382/4	-1.110,0.675	
382/2	-0.001,0.013	END	
4.258,0.000	-0.001,1.177	382/7	
0.452,0.000	END	0.880,0.000	
0.541,1.008	382/5	1.118,0.675	
END	-1.318,0.000	END	



Definition of non-coniferous trees symbol – FC0384

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

384/1	-1.178, 2.240	0.163, -0.425	1.061, -0.850
-1.036, 0.143	-1.311, 2.092	-0.007, -0.425	1.061, -0.850
-0.835, -0.631	-1.389, 1.908	-0.162, -0.496	END
-0.780, -0.631	END	-0.273, -0.624	384/13
-0.574, 0.152	384/5	END	1.061, -0.850
END	-1.389, 1.908	384/9	0.937, -0.874
384/2	-1.568, 1.887	1.237, -1.733	0.836, -0.950
-0.574, 0.152	-1.732, 1.808	1.337, -2.120	0.779, -1.062
-0.438, 0.021	-1.861, 1.681	1.365, -2.120	0.779, -1.189
-0.269, -0.060	-1.942, 1.519	1.468, -1.729	0.834, -1.302
-0.082, -0.085	-1.967, 1.340	END	END
0.103, -0.051	-1.932, 1.162	384/10	384/14
0.268, 0.040	-1.842, 1.005	1.468, -1.729	0.834, -1.302
0.397, 0.177	384/6	1.566, -1.812	0.755, -1.381
0.477, 0.347	-1.842, 1.005	1.690, -1.847	0.705, -1.520
0.499, 0.534	-1.977, 0.877	1.817, -1.826	0.721, -1.649
0.462, 0.719	-2.067, 0.714	1.924, -1.753	0.790, -1.759
0.370, 0.883	-2.102, 0.531	1.990, -1.642	0.882, -1.822
0.231, 1.010	-2.079, 0.347	2.003, -1.514	0.972, -1.846
END	-2.000, 0.178	1.960, -1.392	1.135, -1.816
384/3	-1.874, 0.042	1.871, -1.299	1.237, -1.733
0.231, 1.010	-1.711, -0.049	END	END
0.319, 1.167	-1.529, -0.085	384/11	384/15
0.352, 1.345	-1.344, -0.063	1.871, -1.299	1.082, -2.117
0.326, 1.523	-1.175, 0.014	1.925, -1.186	1.009, -2.041
0.244, 1.683	-1.036, 0.143	1.923, -1.060	0.907, -2.013
0.115, 1.809	END	1.866, -0.949	0.804, -2.041
-0.047, 1.887	384/7	1.765, -0.873	0.731, -2.117
-0.226, 1.908	-1.345, -0.624	1.642, -0.850	END
END	-1.457, -0.496	END	384/16
384/4	-1.612, -0.425	384/12	1.970, -2.117
-0.226, 1.908	-1.782, -0.425	1.642, -0.850	1.896, -2.041
-0.303, 2.092	-1.937, -0.496	1.584, -0.732	1.794, -2.013
-0.437, 2.240	-2.049, -0.624	1.480, -0.649	1.692, -2.041
-0.611, 2.336	END	1.351, -0.620	1.618, -2.117
-0.807, 2.369	384/8	1.222, -0.649	END
-1.004, 2.336	0.430, -0.624	1.119, -0.732	

Definition of non-coniferous trees (scattered) symbol – FC0385

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

385/1	0.271, 0.539	-0.650, -0.259
-0.134, -0.344	END	-0.581, -0.369
-0.033, -0.731	385/4	-0.489, -0.433
-0.006, -0.731	0.271, 0.539	-0.362, -0.458
0.097, -0.339	0.213, 0.658	-0.236, -0.427
END	0.109, 0.740	-0.134, -0.344
385/2	-0.019, 0.769	END
0.097, -0.339	-0.148, 0.740	385/7
0.195, -0.423	-0.252, 0.658	-0.288, -0.727
0.320, -0.457	-0.310, 0.539	-0.362, -0.651
0.447, -0.436	END	-0.464, -0.623
0.553, -0.364	385/5	-0.566, -0.651
0.619, -0.253	-0.310, 0.539	-0.640, -0.727
0.632, -0.124	-0.434, 0.516	END
0.590, -0.003	-0.535, 0.440	385/8
0.500, 0.090	-0.592, 0.327	0.599, -0.727
END	-0.592, 0.201	0.526, -0.651
385/3	-0.537, 0.087	0.423, -0.623
0.500, 0.090	END	0.321, -0.651
0.554, 0.203	385/6	0.247, -0.727
0.552, 0.329	-0.537, 0.087	END
0.495, 0.441	-0.625, -0.007	
0.395, 0.516	-0.665, -0.131	



Definition of orchard symbol – FC0386



Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

386/1	-0.390,1.382	-4.185,0.332	-0.312,-0.891
-2.534,0.471	-0.543,1.245	-4.332,0.186	-0.136,-0.781
-2.469,0.666	-0.651,1.069	-4.431,0.005	0.000,-0.629
-2.463,0.872	-0.704,0.870	-4.473,-0.197	END
-2.516,1.071	-0.697,0.664	-4.456,-0.403	386/6
-2.624,1.247	-0.631,0.469	-4.380,-0.594	2.564,0.469
-2.778,1.383	END	-4.252,-0.756	2.361,0.428
-2.965,1.470	386/3	-4.083,-0.875	2.179,0.332
-3.169,1.500	3.830,0.471	-3.887,-0.939	2.032,0.186
-3.373,1.470	3.895,0.666	-3.680,-0.945	1.933,0.005
-3.559,1.382	3.901,0.872	-3.481,-0.891	1.891,-0.197
-3.713,1.245	3.848,1.071	-3.306,-0.781	1.908,-0.403
-3.821,1.069	3.740,1.247	-3.169,-0.629	1.984,-0.594
-3.873,0.870	3.586,1.383	END	2.112,-0.756
-3.866,0.664	3.399,1.470	386/5	2.282,-0.875
-3.801,0.469	3.195,1.500	-0.631,0.469	2.478,-0.939
END	2.991,1.470	-0.834,0.428	2.684,-0.945
386/2	2.805,1.382	-1.016,0.332	2.883,-0.891
0.635,0.471	2.651,1.245	-1.163,0.186	3.058,-0.781
0.700,0.666	2.544,1.069	-1.261,0.005	3.195,-0.629
0.706,0.872	2.491,0.870	-1.304,-0.197	END
0.653,1.071	2.498,0.664	-1.286,-0.403	386/7
0.545,1.247	2.564,0.469	-1.210,-0.594	-3.169,-0.629
0.391,1.383	END	-1.082,-0.756	-3.033,-0.780
0.204,1.470	386/4	-0.913,-0.875	-2.858,-0.889
0.000,1.500	-3.801,0.469	-0.717,-0.939	-2.659,-0.943
-0.204,1.470	-4.003,0.428	-0.511,-0.945	

Definition of orchard symbol – FC0386 (continued)

-2.454,-0.937	1.208,-0.594	4.497,-0.197
-2.258,-0.873	1.284,-0.402	4.456,0.004
-2.089,-0.755	1.303,-0.197	4.358,0.186
-1.961,-0.594	1.261,0.004	4.213,0.331
-1.885,-0.402	1.163,0.186	4.032,0.429
-1.867,-0.197	1.018,0.331	3.830,0.471
-1.908,0.004	0.837,0.429	END
-2.006,0.186	0.635,0.471	386/10
-2.151,0.331	END	-3.169,-0.629
-2.333,0.429	386/9	-3.169,-1.497
-2.534,0.471	3.195,-0.629	END
END	3.331,-0.780	386/11
386/8	3.506,-0.889	0.000,-0.629
0.000,-0.629	3.705,-0.943	0.000,-1.497
0.136,-0.780	3.911,-0.937	END
0.311,-0.889	4.106,-0.873	386/12
0.510,-0.943	4.275,-0.755	3.195,-0.629
0.716,-0.937	4.403,-0.594	3.195,-1.497
0.911,-0.873	4.479,-0.402	END
1.080,-0.755		

Definition of heath symbol – FC0387

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

387/1	-0.944,-2.274	END	-3.435,-2.402
1.400,1.066	-0.893,-1.034	387/12	-3.570,-1.597
1.400,2.334	END	2.896,0.989	END
END	387/7	3.021,1.997	387/18
387/2	0.402,1.031	END	0.549,-2.402
-1.443,-2.266	0.307,2.185	387/13	0.684,-1.597
-1.443,-0.997	END	-2.939,-2.343	END
END	387/8	-3.064,-1.334	387/19
387/3	2.398,1.031	END	-1.087,0.852
0.901,1.057	2.493,2.185	387/14	-1.201,1.394
0.850,2.297	END	0.053,-2.343	END
END	387/9	0.178,-1.334	387/20
387/4	-2.441,-2.300	END	3.887,0.852
1.899,1.057	-2.536,-1.147	387/15	4.001,1.394
1.950,2.297	END	-0.592,0.929	END
END	387/10	-0.727,1.734	387/21
387/5	-0.445,-2.300	END	-3.930,-2.479
-1.942,-2.274	-0.350,-1.147	387/16	-4.044,-1.937
-1.993,-1.034	END	3.392,0.929	END
END	387/11	3.527,1.734	387/22
387/6	-0.096,0.989	END	1.044,-2.479
	-0.221,1.997	387/17	1.158,-1.937
			END



Definition of rock symbol – FC0388

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

388/1	-2.037, 0.525	0.737, 0.157	2.254, -0.767
-2.749, -0.535	-2.063, 0.457	0.707, 0.101	2.263, -0.757
-1.711, -0.535	-2.065, 0.383	0.675, 0.063	2.282, -0.725
-1.487, -0.467	-2.033, 0.285	0.625, 0.023	2.287, -0.706
-1.299, -0.209	-1.965, 0.185	0.581, 0.001	2.287, -0.674
END	-1.927, 0.143	0.227, -0.139	2.280, -0.650
388/2	-1.867, 0.097	-0.237, -0.343	2.267, -0.628
-0.305, 0.703	-1.823, 0.071	-0.271, -0.355	2.212, -0.562
-0.263, 0.731	END	-0.461, -0.487	2.199, -0.551
-0.245, 0.751	388/3	END	2.172, -0.541
-0.207, 0.815	-0.913, 0.435	388/4	2.131, -0.547
-0.197, 0.853	-0.681, 0.535	-0.237, -0.343	2.035, -0.577
-0.197, 0.917	-0.305, 0.703	-0.119, -0.335	1.747, -0.683
-0.211, 0.965	0.157, 0.849	-0.011, -0.359	1.539, -0.779
-0.237, 1.009	0.221, 0.869	0.373, -0.481	1.413, -0.825
-0.347, 1.141	0.339, 0.865	0.925, -0.535	1.389, -0.842
-0.373, 1.163	0.387, 0.847	END	1.367, -0.870
-0.427, 1.183	0.417, 0.831	388/5	1.354, -0.904
-0.509, 1.171	0.469, 0.787	1.011, -1.400	1.353, -0.941
-0.701, 1.111	0.651, 0.567	1.530, -1.400	1.369, -0.990
-1.277, 0.899	0.685, 0.509	1.642, -1.366	1.403, -1.040
-1.693, 0.707	0.713, 0.449	1.736, -1.237	1.422, -1.061
-1.945, 0.615	0.725, 0.417	END	1.452, -1.084
-1.993, 0.581	0.747, 0.321	388/6	1.474, -1.097
	0.745, 0.189	2.233, -0.781	END

Definition of rock symbol – FC0388 (continued)

388/7	2.728,	2.267, -1.304
1.929, -0.915	2.742,	2.250, -1.310
2.045, -0.865	2.748,	2.155, -1.376
2.233, -0.781	2.759,	END
2.464, -0.708	2.758,	388/8
2.496, -0.698	2.754,	2.267, -1.304
2.555, -0.700	2.739,	2.326, -1.300
2.579, -0.709	2.723,	2.380, -1.312
2.594, -0.717	2.698,	2.572, -1.373
2.620, -0.739	2.676,	2.848, -1.400
2.711, -0.849	2.499,	END

Definition of scattered rock symbol – FC0389

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

389/1	-0.523, 0.158	0.806, 0.075
-0.925, -0.417	-0.547, 0.141	0.812, 0.059
-0.406, -0.417	-0.569, 0.113	0.823, 0.011
-0.294, -0.383	-0.582, 0.079	0.822, -0.055
-0.200, -0.254	-0.583, 0.042	0.818, -0.071
END	-0.567, -0.007	0.803, -0.099
389/2	-0.533, -0.057	0.787, -0.118
0.297, 0.202	-0.514, -0.078	0.762, -0.138
0.318, 0.216	-0.484, -0.101	0.740, -0.149
0.327, 0.226	-0.462, -0.114	0.563, -0.219
0.346, 0.258	END	0.331, -0.321
0.351, 0.277	389/3	0.314, -0.327
0.351, 0.309	-0.007, 0.068	0.219, -0.393
0.344, 0.333	0.109, 0.118	END
0.331, 0.355	0.297, 0.202	389/4
0.276, 0.421	0.528, 0.275	0.331, -0.321
0.263, 0.432	0.560, 0.285	0.390, -0.317
0.236, 0.442	0.619, 0.283	0.444, -0.329
0.195, 0.436	0.643, 0.274	0.636, -0.390
0.099, 0.406	0.658, 0.266	0.912, -0.417
-0.189, 0.300	0.684, 0.244	END
-0.397, 0.204	0.775, 0.134	
	0.792, 0.105	

Definition of rough grassland symbol – FC0390

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:

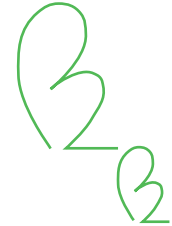
```
390/1          390/7
0.000,-0.349  1.342,-0.459
0.000,0.349   1.412,0.096
END           END
390/2          390/8
-0.416,-0.422 -1.769,-0.492
-0.444,0.261  -1.843,-0.049
END           END
390/3          390/9
0.416,-0.422  1.769,-0.492
0.444,0.261   1.843,-0.049
END           END
390/4          390/10
-0.883,-0.436 -2.187,-0.633
-0.935,0.199  -2.249,-0.334
END           END
390/5          390/11
0.883,-0.436  2.187,-0.633
0.935,0.199   2.249,-0.334
END           END
390/6
-1.342,-0.459
-1.412,0.096
END
```

Definition of scrub symbol – FC0392

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

392/1	-0.427, 2.061	1.005, -1.440
0.349, -0.735	-0.635, 2.205	0.860, -1.498
-0.727, -0.735	-0.881, 2.261	0.717, -1.609
END	-1.042, 2.243	END
392/2	-1.191, 2.179	392/6
-0.727, -0.735	-1.314, 2.074	0.717, -1.609
-0.199, -0.135	-1.517, 1.787	0.876, -1.445
-0.067, 0.075	-1.655, 1.462	0.999, -1.252
0.015, 0.309	-1.721, 1.116	1.082, -1.039
0.042, 0.556	-1.712, 0.764	1.082, -1.039
0.017, 0.670	-1.633, 0.375	1.083, -0.924
-0.055, 0.763	-1.500, 0.000	1.027, -0.824
-0.160, 0.816	-1.317, -0.353	0.923, -0.752
-0.367, 0.840	-1.047, -0.735	0.800, -0.725
-0.573, 0.804	END	0.751, -0.724
-0.760, 0.712	392/4	0.688, -0.743
-1.047, 0.490	1.415, -2.222	0.594, -0.805
END	0.877, -2.222	0.455, -1.013
392/3	END	0.387, -1.238
-1.047, 0.490	392/5	0.384, -1.472
-0.802, 0.731	0.877, -2.222	0.443, -1.731
-0.596, 1.006	1.141, -1.922	0.549, -1.973
-0.433, 1.308	1.231, -1.760	0.714, -2.222
-0.316, 1.631	1.261, -1.577	END
-0.301, 1.785	1.233, -1.494	
-0.340, 1.934	1.160, -1.446	



Definition of upper level of communication symbol – FC0395

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

```
395/1
-0.530,0.530
0.530,-0.530
END
395/2
-0.530,-0.530
0.530,0.530
END
```

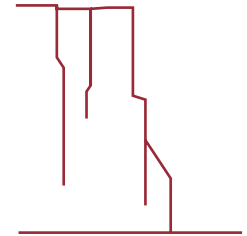


Definition of cliff symbol – FC0396

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

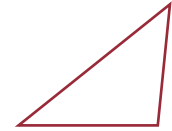
```
396/1          -0.008,0.196          396/5
-1.310,-1.367  -0.008,1.185      -0.797,-0.828
1.238,-1.367  -0.490,1.185  -0.797,0.514
END           END       -0.874,0.631
396/2          396/4          -0.874,1.226
0.423,-1.367  -0.536,-0.065  -1.341,1.226
0.423,-0.748  -0.536,0.242    END
0.136,-0.311  -0.490,0.314
END           -0.490,1.185
396/3          -0.874,1.185
0.136,-1.054  END
0.136,0.150
```



Definition of cliff symbol – FC0397

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:
 397
 0.850,1.250
 -1.650,-0.750
 0.650,-0.750
 0.850,1.250
 END

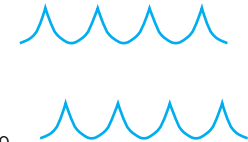


Definition of water symbol – FC0400

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:

400/1	-0.821,0.528	-0.428,0.449	-0.134,0.309
-1.129,0.300	-0.804,0.489	-0.408,0.486	-0.102,0.301
-1.112,0.301	-0.783,0.452	-0.389,0.525	-0.085,0.300
-1.080,0.309	-0.736,0.381	-0.373,0.564	-0.068,0.301
-1.065,0.315	-0.710,0.348	-0.343,0.656	-0.036,0.309
-1.051,0.324	-0.692,0.330	END	-0.021,0.315
-1.026,0.346	-0.678,0.321	400/3	-0.007,0.324
-0.998,0.379	-0.663,0.313	-0.343,0.656	0.018,0.346
-0.950,0.449	-0.656,0.309	-0.315,0.567	0.046,0.379
-0.930,0.486	-0.624,0.301	-0.299,0.528	0.094,0.449
-0.911,0.525	-0.607,0.300	-0.282,0.489	0.114,0.486
-0.895,0.564	-0.590,0.301	-0.261,0.452	0.133,0.525
-0.865,0.656	-0.558,0.309	-0.214,0.381	0.149,0.564
END	-0.543,0.315	-0.188,0.348	0.179,0.656
400/2	-0.529,0.324	-0.170,0.330	END
-0.865,0.656	-0.504,0.346	-0.156,0.321	
-0.837,0.567	-0.476,0.379	-0.141,0.313	



Definition of water symbol – FC0400 (continued)

400/4	0.910,0.309	-0.273,-0.578	0.443,-0.468
0.179,0.656	0.942,0.301	-0.225,-0.508	0.464,
0.207,0.567	0.959,0.300	-0.205,-0.471	0.511,
0.223,0.528	END	-0.186,-0.432	0.537,
0.240,0.489	400/6	-0.170,-0.393	0.555,
0.261,0.452	-0.926,-0.657	-0.140,-0.301	0.569,
0.308,0.381	-0.909,-0.656	END	0.584,
0.334,0.348	-0.877,-0.648	400/8	0.591,
0.352,0.330	-0.862,-0.642	-0.140,-0.301	0.623,
0.366,0.321	-0.848,-0.633	-0.112,-0.390	0.640,
0.381,0.313	-0.823,-0.611	-0.096,-0.429	0.657,
0.388,0.309	-0.795,-0.578	-0.079,-0.468	0.689,
0.420,0.301	-0.747,-0.508	-0.058,-0.505	0.704,
0.437,0.300	-0.727,-0.471	-0.011,-0.576	0.718,
0.454,0.301	-0.708,-0.432	0.015,-0.609	0.743,
0.486,0.309	-0.692,-0.393	0.033,-0.627	0.771,
0.501,0.315	-0.662,-0.301	0.047,-0.636	0.819,
0.515,0.324	END	0.062,-0.644	0.839,
0.540,0.346	400/7	0.069,-0.648	0.858,
0.568,0.379	-0.662,-0.301	0.101,-0.656	0.874,-0.393
0.616,0.449	-0.634,-0.390	0.118,-0.657	0.904,-0.301
0.636,0.486	-0.618,-0.429	0.135,-0.656	END
0.655,0.525	-0.601,-0.468	0.167,-0.648	400/10
0.671,0.564	-0.580,-0.505	0.182,-0.642	0.904,-0.301
0.701,0.656	-0.533,-0.576	0.196,-0.633	0.932,-0.390
END	-0.507,-0.609	0.221,-0.611	0.948,-0.429
400/5	-0.489,-0.627	0.249,-0.578	0.965,-0.468
0.701,0.656	-0.475,-0.636	0.297,-0.508	0.986,-0.505
0.729,0.567	-0.460,-0.644	0.317,-0.471	1.033,-0.576
0.745,0.528	-0.453,-0.648	0.336,-0.432	1.059,-0.609
0.762,0.489	-0.421,-0.656	-0.421,-0.393	1.077,-0.627
0.783,0.452	-0.404,-0.657	0.382,-0.301	1.091,-0.636
0.830,0.381	-0.387,-0.656	END	1.106,-0.644
0.856,0.348	-0.355,-0.648	400/9	1.113,-0.648
0.874,0.330	-0.340,-0.642	0.382,-0.301	1.145,-0.656
0.888,0.321	-0.326,-0.633	0.410,-0.390	1.162,-0.657
0.903,0.313	-0.301,-0.611	0.426,-0.429	END

Definition of scree symbol – FC1210

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:

Symbol coordinates:	0.834, -1.207	-0.266, -0.147	-1.254, -0.316
1210/1	0.690, -0.817	-0.199, -0.244	END
1.449, -1.302	0.460, -0.673	-0.323, -0.492	1210/8
1.777, -0.894	0.022, -0.867	-0.009, -0.716	-0.690, -0.763
1.582, -0.574	0.158, -1.005	END	-0.762, -0.731
1.445, -0.628	0.104, -1.235	1210/6	-0.853, -0.531
1.170, -0.400	0.273, -1.429	0.665, -0.616	-0.697, -0.271
0.895, -0.608	END	0.960, -0.387	-0.402, -0.341
0.803, -0.734	1210/4	1.008, -0.077	-0.433, -0.632
0.924, -1.075	-0.208, -1.302	0.949, 0.078	-0.690, -0.763
1.449, -1.302	-0.039, -0.986	0.652, 0.002	END
END	-0.235, -0.768	0.579, -0.161	1210/9
1210/2	-0.636, -0.831	0.408, -0.206	-0.428, -0.069
-1.033, -1.217	-0.844, -1.108	0.421, -0.529	-0.136, 0.125
-0.841, -0.786	-0.864, -1.296	0.665, -0.616	-0.266, 0.331
-1.085, -0.544	-0.555, -1.374	END	-0.408, 0.381
-1.195, -0.625	-0.392, -1.255	1210/7	-0.643, 0.214
-1.497, -0.488	-0.208, -1.302	-1.254, -0.316	-0.541, 0.151
-1.741, -0.865	END	-1.173, -0.016	-0.546, 0.017
-1.545, -1.136	1210/5	-0.809, 0.123	-0.428, -0.069
-1.033, -1.217	-0.009, -0.716	-0.634, 0.010	END
END	0.228, -0.562	-0.665, -0.154	
1210/3	0.315, -0.122	-0.814, -0.145	
0.273, -1.429	-0.050, 0.053	-1.006, -0.470	



Definition of scree symbol – FC1210 (continued)

1210/10	0.099,1.161	-0.304,1.086	-0.805,0.288
-0.147,0.459	0.334,0.825	-0.203,1.023	-0.742,0.247
0.049,0.547	END	END	END
0.122,0.457	1210/14	1210/18	1210/22
0.245,0.451	-0.521,0.432	0.372,-0.089	0.103,1.400
0.365,0.290	-0.320,0.480	0.546,-0.048	0.198,1.457
0.280,0.213	-0.304,0.705	0.550,0.132	0.164,1.569
0.079,0.159	-0.463,0.796	0.426,0.220	0.068,1.585
-0.135,0.283	-0.596,0.619	0.311,0.067	0.031,1.477
-0.147,0.459	-0.521,0.432	0.372,-0.089	0.103,1.400
END	END	END	END
1210/11	1210/15	1210/19	1210/23
0.656,0.150	0.345,0.486	-0.352,0.850	1.102,-0.328
0.953,0.220	0.570,0.575	-0.304,0.956	1.206,-0.301
0.877,0.387	0.426,0.791	-0.363,1.016	1.211,-0.186
0.758,0.419	0.243,0.712	-0.467,1.028	1.127,-0.141
0.714,0.518	0.306,0.653	-0.525,0.938	1.059,-0.228
0.505,0.477	0.275,0.561	-0.480,0.866	1.102,-0.328
0.480,0.308	0.345,0.486	-0.352,0.850	END
0.656,0.150	END	END	1210/24
END	1210/16	1210/20	0.239,1.339
1210/12	-0.012,1.409	0.041,1.759	0.246,1.411
-0.223,0.698	-0.021,1.589	0.097,1.853	0.408,1.386
-0.210,0.940	0.049,1.624	0.198,1.835	0.444,1.321
0.047,0.990	0.007,1.696	0.259,1.777	0.316,1.278
0.191,0.892	-0.084,1.696	0.212,1.669	0.239,1.339
0.137,0.671	-0.187,1.542	0.085,1.691	END
-0.029,0.683	-0.151,1.405	0.041,1.759	1210/25
-0.063,0.624	-0.012,1.409	END	0.032,1.923
-0.223,0.698	END	1210/21	-0.009,2.025
END	1210/17	-0.742,0.247	0.050,2.109
1210/13	-0.203,1.023	-0.650,0.283	0.147,2.063
0.334,0.825	-0.054,1.084	-0.614,0.371	0.139,1.950
0.392,0.881	-0.011,1.292	-0.622,0.410	0.032,1.923
0.376,1.152	-0.145,1.292	-0.704,0.414	END
0.131,1.317	-0.271,1.226	-0.783,0.369	

Definition of boulder (positioned) symbol – FC1211

Each line is made up of one or more straight lines. The coordinates of the ends of each straight line are:



Symbol coordinates:	0.859,0.347	-0.236,1.435
1211/1	1.026,0.490	-0.335,1.543
-1.683,0.000	1.042,0.521	END
-1.227,0.048	1.045,0.542	1211/5
-1.103,0.052	1.046,0.577	-0.562,1.646
-0.521,0.050	1.037,0.603	-0.753,1.708
0.058,-0.005	1.012,0.637	-0.956,1.719
0.762,-0.037	0.983,0.657	-1.154,1.677
1.463,0.010	END	-1.335,1.586
1.569,0.015	1211/3	-1.486,1.450
1.684,0.000	0.566,1.017	-1.592,1.285
1.554,0.230	0.322,1.207	-1.629,1.018
1.321,0.431	0.047,1.349	-1.609,0.748
1.046,0.577	-0.236,1.435	-1.533,0.490
END	END	-1.404,0.253
1211/2	1211/4	-1.227,0.048
0.240,0.293	-0.225,1.055	END
0.449,0.246	-0.182,1.184	
0.661,0.265	-0.187,1.320	

Chapter 8 Record definitions for the transfer of Land-Line in NTF

NTF record list

This list comprises the valid record types used in the Land-Line NTF transfer set.

Descriptor	Description	Record name
01	Volume Header Record – defines the donor and data type.	[VOLHDREC]
02	Database Header Record – transfers data about the database.	[DBHREC]
05	Feature Classification Record – defines feature codes.	[FEATCLASS]
07	Section Header Record – defines coordinate and structure types, unit scale, factors and so on.	[SECHREC]
11	Name Record – identifies a text feature.	[NAMEREC]
12	Name Position Record – defines attributes for a text feature	[NAMPOSTN]
14	Attribute Record – defines the attributes for line and point records.	[ATTREC]
15	Point Record – identifies the definition of a point feature.	[POINTREC]
21	Two-Dimensional Geometry Record – defines the two-dimensional geometry for a line , point or text feature .	[GEOMETRY1]
23	Line Record – identifies the definition of a line.	[LINEREC]
40	Attribute Description Record – defines attribute descriptions and their fields.	[ATTDESC]
99	Volume Terminator Record – defines the end of the transfer set.	[VOLTERM]

NOTE: REC_DESC = record descriptor

Volume Header Record [VOLHDREC] 01

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	01	Record descriptor.
DONOR	03:22	A20	ORDNANCE SURVEY<5S>	Supplier.
RECIPIENT	23:42	A20	<20S>	Not used.
TRANDATE	43:50	D8	YYYYMMDD	Date of creation of the transfer set.
SERIAL	51:54	I4	0000	Not used.
VOLNUM	55:56	I2	01	Volume sequential number (incremented for each volume).
NTFLEVEL	57:57	I1	2	NTF Level 2.
NTFVER	58:61	R4,2	0200	NTF version 2.0.
NTFOR	62:62	A1	V	Variable length records.
EOR	63:63	A1	% or <S>	Character used for EOR on unformatted media. Default: EOR is % on formatted media.
DIVIDER	64:64	A1	\	Divider used to terminate variable length text fields.
CONT_MARK	65:65	I1	0	No continuation record.
EOR	66:66	A1	%	Record terminator.

Record example:

01ORDNANCE SURVEY										1997093000000120200V%\0%																																																																																									
1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8		
1234567890123456789012345678901234567890123456789012345678901234567890																																																																																																			

Template

Database Header Record [DBHREC] 02

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	02	Record descriptor.
DBNAME	03:22	A20	Land-Line<11S> or Land-Line.Plus<6S>	Product name – Land-Line. or product name – Land-Line.Plus.
DDNAME	23:42	A20	DEFAULT_02.00<7S>	Standard NTF data dictionary name.
DDATE	43:50	D8	19920515	Date of standard data dictionary.
DDBASE	51:70	A20	<20S>	Not used.
DDBDATE	71:78	D8	00000000	Not used.
CONT_MARK	79:79	I1	1	Continuation record follows.
EOR	80:80	A1	%	Record terminator.

Continuation of database header record

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
FCNAME	03:22	A20	LSPS_1.5(NTF)<7S> or LSPS_1.6(NTF)>7S>	Product specification – Land-Line. or product specification – Land-Line.Plus.
FCDATE	23:30	D8	20010401	Product specification date.
DQNAME	31:50	A20	<20S>	Not used.
DQDATE	51:58	D8	00000000	Not used.
DATA_MODEL	59:60	I2	02	Simple line/point data model.
CONT_MARK	61:61	I1	0	No continuation record.
EOR	62:62	A1	%	Record terminator.

Record example:

```
02Land-Line           DEFAULT_02.00           19920515           000000001%
00LSPS_1.5(NTF)      20010401           00000000020%
```

	1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8	9
2	3	4	5	6	7	8	9	0
3	4	5	6	7	8	9	0	1
4	5	6	7	8	9	0	1	2
5	6	7	8	9	0	1	2	3
6	7	8	9	0	1	2	3	4
7	8	9	0	1	2	3	4	5
8	9	0	1	2	3	4	5	6
9	0	1	2	3	4	5	6	7
0	1	2	3	4	5	6	7	8

Template

Feature Classification Record [FEATCLASS] 05

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	05	Record descriptor.
FEAT_CODE	03:06	A4	See note 1	A feature code in the range 0000–9999.
CODE_COM	07:16	A10	<10S>	Not used.
STCLASS	17:36	A20	<20S>	Not used.
FEATDES	37:*	A*		The description of the feature code.
DIVIDER	*.*	A1	\	Divider used to terminate variable length text fields.
CONT_MARK	*.*	I1	0	No continuation record.
EOR	*.*	A1	%	Record terminator.

NOTE 1: Valid {FEAT_CODE} values appear in the record examples shown on pages [224](#) to [226](#).

Record example (the following listing applies to Land-Line; Land-Line.Plus contains both this list and the additional list):

```

050001      Building outline\0%
050004      Building outline (overhead)\0%
050007      Civil parish/community boundary\0%
050008      District/LB/UA boundary\0%
050009      County boundary\0%
050010      Electoral division/ward boundary\0%
050011      Boundary post/stone\0%
050013      Boundary half mereing symbol\0%
050014      Railway (narrow gauge)\0%
050015      Railway (standard gauge)\0%
050021      Road (public) edge of metalling\0%
050025      Triangulation point\0%
050026      Bench mark\0%
050027      Spot height\0%
050030      General line/minor building detail\0%
050032      General ground level/minor o'head detail\0%
050033      Underground detail/course of antiquity\0%
050036      Vegetation/landform limit\0%
050043      Overhead detail\0%
050049      Pylon\0%
050052      Minor detail\0%
050057      Point feature\0%
050059      Water detail\0%
050069      Flow arrow\0%

```

	1	2	3	4	5	6	7	8
1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890

Template

Record example continued:

050071 Mean High Water (Springs)\0%
 050072 Mean Low Water (Springs)\0%
 050079 Parliamentary/Euro constituency boundary\0%
 050098 Road centreline\0%
 050321 Roofed building indicator\0%
 050323 Glasshouse indicator\0%
 050395 Upper level of communication indicator\0%
 051000 Road name/number\0%
 051005 Administrative boundary text\0%
 051006 House number/building name\0%
 051009 Miscellaneous text\0%
 051010 Water text\0%
 051013 Land parcel number\0%

	1	2	3	4	5	6	7	8
1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890	1234567890

Template

Record example (this listing gives the additional feature codes of Land-Line.Plus which are not in Land-Line):

```

050035      Vegetation/landform limit (secondary)\0%
050372      Positioned coniferous tree\0%
050373      Positioned non-coniferous tree\0%
050374      Top of slope\0%
050375      Top of cliff\0%
050376      Bottom of slope or cliff\0%
050377      Boulders\0%
050378      Boulders (scattered)\0%
050379      Coniferous trees\0%
050380      Coniferous trees (scattered)\0%
050381      Coppice/osiers\0%
050382      Marsh/saltmarsh/reeds\0%
050384      Non-coniferous trees\0%
050385      Non-coniferous trees (scattered)\0%
050386      Orchard\0%
050387      Heath\0%
050388      Rock\0%
050389      Rock (scattered)\0%
050390      Rough grassland\0%
050392      Scrub\0%
050396      Cliff indicator\0%
050397      Slope indicator\0%
050400      Water indicator\0%
051210      Scree\0%
051211      Positioned boulder\0%
051212      Ridge/rock line\0%

```

	1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8

Template

Section Header Record [SECHREC] 07

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	07	Record descriptor.
SECT_REF	03:12	A10	SU4657SW<2S>	Tile reference.
COORD_TYP	13:13	I1	2	Defines rectangular coordinates.
STRUC_TYP	14:14	I1	1	Defines vector data.
XYLEN	15:19	I5	00006	Redefines length of {X_COORD} and {Y_COORD} to 6 digits.
XYUNIT	20:20	I1	2	Defines units as metres.
XY_MULT	21:30	R10,3	0000000010	Multiplies {X_COORD} and {Y_COORD} by 0.010.
ZLEN	31:35	I5	00006	Redefines length of {Z_COORD} to 6 digits.
Z_UNIT	36:36	I1	2	Defines units as metres.
Z_MULT	37:46	R10,3	0000000010	Multiplies {Z_COORD} by 0.010.
X_ORIG	47:56	I10	See note 2	Eastings of tile origin in metres.
Y_ORIG	57:66	I10	See note 2	Northings of tile origin in metres.
Z_DATUM	67:76	I10	0000000000	Vertical datum – see Ordnance Survey datum in chapter 3.
CONT_MARK	77:77	I1	1	Continuation record follows.
EOR	78:78	A1	%	Record terminator.

NOTE 2:

Valid {X_ORIG} values are in the range 0000000000 – 0070000000;

Valid {Y_ORIG} values are in the range 0000000000 – 0130000000.

First Continuation Record [CONTREC] 00

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
XMIN	03:12	I10	0000000000	Not used.
YMIN	13:22	I10	0000000000	Not used.
XMAX	23:32	I10	0000000000	Not used.
YMAX	33:42	I10	0000000000	Not used.
XY_ACC	43:47	R5,2	00000	Not used.
Z_ACC	48:52	R5,2	00000	Not used.
SURV_DATE	53:60	D8	00000000	Not used.
LAST_AMND	61:68	D8	YYYYMMDD	Date tile last amended.
COPYRIGHT	69:76	D8	YYYY0000	Effective copyright date.
CONT_MARK	77:77	I1	1	Continuation record follows.
EOR	78:78	A1	%	Record terminator.

Second Continuation Record [CONTREC] 00

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
SQNAME	03:22	A20	<20S>	Not used.
SQDATE	23:30	D8	00000000	Not used.
SCALE	31:39	I9	000001250 or 000002500 or 000010000	Tile stored at 1:1250 scale, or tile stored at 1:2500 scale, or tile stored at 1:10 000 scale.
GRID_OR_X	40:49	R10,3	0000000000	Not used.
GRID_OR_Y	50:59	R10,3	0000000000	Not used.
PROJ_OR_LAT	60:67	R8,1	00000000	Not used.
PROJ_OR_LNG	68:75	R8,1	00000000	Not used.
CONT_MARK	76:76	I1	1	Continuation record follows.
EOR	77:77	A1	%	Record terminator.

Third Continuation Record [CONTREC] 00

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
SPHER_NAME	03:12	A10	<10S>	Not used.
MAJOR_AXIS	13:22	R10,3	0000000000	Not used.
ECCENTRICITY	23:30	R8,2	00000000	Not used.
FLATTENING	31:35	R5,2	00000	Not used.
PROJECTION	36:45	A10	<10S>	Not used.
PARAMETER_1	46:53	I8	00000000	Not used.
P_TYPE	54:54	A1	<S>	Not used.
PARAMETER_2	55:62	I8	00000000	Not used.
DBANK_DATE	63:70	D8	YYYYMMDD	Initial databanking date.
CONT_IND	71:78	A8	RBC	Defines map content and accuracy.
CONT_MARK	79:79	I1	1	Continuation record follows.
EOR	80:80	A1	%	Record terminator.

Fourth Continuation Record [CONTREC] 00

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
BOUND_DATE	03:10	D8	YYYYMMDD	Administrative boundary date.
DIG_U_DATE	11:18	D8	YYYYMMDD	Date of last change to {HO_UNIT_COUNT}.
SPEC_REF	19:33	A15	See note 3	
EMATCH_N	34:35	A2	<2S>	Not used.
EMATCH_N_DATE	36:43	D8	00000000	Not used.
EMATCH_E	44:45	A2	<2S>	Not used.
EMATCH_E_DATE	46:53	D8	00000000	Not used.
EMATCH_S	54:55	A2	<2S>	Not used.
EMATCH_S_DATE	56:63	D8	00000000	Not used.
EMATCH_W	64:65	A2	<2S>	Not used.
EMATCH_W_DATE	66:73	D8	00000000	Not used.
HO_UNIT_COUNT	74:77	I4	See note 4	A cumulative count of the change to the map.
CONT_MARK	78:78	I1	1	Continuation record follows.
EOR	79:79	A1	%	Record terminator.

NOTE 3: SPEC_REF is the data capture specification current at Ordnance Survey when the map was digitised, for example, maps digitised at November 1992 would have a SPEC_REF of LSDS_OS1992v1.0; See [page 24](#) for details about renumbering of feature serial numbers.

NOTE 4: Valid {HO_UNIT_COUNT} range is 0000–9999.

Fifth Continuation Record [CONTREC] 00

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Record descriptor.
BOUND_TEXT	03:*	A*	Free text (see note 5)	Additional information on administrative boundaries status.
DIVIDER	*.*	A1	\	Divider used to terminate variable length text fields.
CR_COMPLETE	*.*	A1	Y or N	Indicates if a tile has been through cyclic revision.
CR_PHOTO_DATE	*.*	D8	YYYYMMDD	Date of photography used for cyclic revision.
CONT_MARK	*.*	I1	0 or 1	No continuation record or continuation record follows.
EOR	*.*	A1	%	Record terminator.

Record example:

```
07SU4518SE 210000620000000010000062000000001000004455000000118000000000000001%
00000000000000000000000000000000000000000000000000000000000000000000000019910531198500001%
00          0000000000000125000000000000000000000000000000000000000000000000000001%
00          000000000000000000000000          00000000 0000000019770922B          1%
001950110219930114LSDS_OS1992v1.0 00000000 00000000 00000000 000000000000000001%
00\N0000000000%
```

	1	2	3	4	5	6	7	8
12345678901234567890123456789012345678901234567890123456789012345678901234567890								

Template

NOTE 5: The maximum length of free text is 240 characters. If this text is longer than 65 characters, one or more continuation records are used.

Text feature structure

Text features in NTF are transferred using the [NAMEREC] (see this page), [NAMPOSTN] (see page 233) and [GEOMETRY1] (see page 236) records.

Name Record [NAMEREC] 11

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	11	Record descriptor.
NAME_ID	03:08	I6	000001–999999	Feature serial number.
TEXT_CODE	09:12	A4	1000–1013	Feature classification number.
NUM_CHAR	13:14	I2	01–80	Number of characters in text string.
TEXT	15:*	A*	The text string	See note 6.
SECURITY	*.*	A1	<S>	Not used.
CHG_TYPE	*.*	A1	2	Not used.
CHG_DATE	*.*	D6	YYMMDD	Date of digitising of feature or amendment. See note 7.
QLABEL	*.*	A1	<S>	Not used.
SVY_DATE	*.*	D6	000000	Not used.
CONT_MARK	*.*	I1	0 or 1	No continuation record or continuation record follows.
EOR	*.*1	A1	%	Record terminator.

Record example:

11000001100013MARKET STREET 980408 0000000%

	1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18
19	20	21	22	23	24	25	26	27
28	29	30	31	32	33	34	35	36
37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54
55	56	57	58	59	60	61	62	63
64	65	66	67	68	69	70	71	72
73	74	75	76	77	78	79	80	81
82	83	84	85	86	87	88	89	90

Template

NOTE 6: If the text string exceeds 64 characters a continuation record is used.

NOTE 7: Plans produced early in the Land-Line digitising process may have a CHG_DATE set at 000000.

Name Position Record [NAMPOSTN] 12

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	12	Record descriptor.
FONT	03:06	I4	See note 8	Text type face.
TEXT_HT	07:09	R3,1	See note 9	Text height.
DIG_POSTN	10:10	I1	See note 10	Text location code.
ORIENT	11:14	R4,1	See note 11	Orientation.
CONT_MARK	15:15	I1	0	No continuation record.
EOR	16:16	A1	%	Record terminator.

Record example:

120001014108020%

	1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6	7
8	9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4	5
6	7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2	3
4	5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0	1
2	3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8	9
0	1	2	3	4	5	6	7	8

Template

- NOTE 8: Valid {FONT} values are 0000, 0001 and 0002 – see pages 184–188.
- NOTE 9: Valid {TEXT_HT} values are in the range 008 to 050 – see pages 184–188.
- NOTE 10: Valid {DIG_POSTN} values are in the range 0 to 8 – see pages 184–188.
- NOTE 11: Valid {ORIENT} values are in the range 0000 to 3599 – see pages 184–188.

Point Record [POINTREC] 15

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	15	Record descriptor.
POINT_ID	03:08	I6	000001 to 999999	Feature serial number.
VAL_TYPE	09:10	A2	OR or <2S>	Specifies an orientation.
VALUE	11:16	A6	000000 to 003599 or <6S>	Tenths of degree. See note 13.
FEAT_CODE	17:20	I4	0001-9999	Feature classification number.
SECURITY	21:21	A1	<S>	Not used.
CHG_TYPE	22:22	A1	2	Reason for existence/change. See note 14.
CHG_DATE	23:28	D6	YYMMDD	Date of digitising of feature or amendment. See note 15.
QLABEL	29:29	A1	<S>	Not used.
SVY_DATE	30:35	D6	000000	Not used.
CONT_MARK	36:36	I1	0	No continuation record.
EOR	37:37	A1	%	Record terminator.

Record example:

15000233OR0020090026 2980408 0000000%

	1	2	3	4	5	6	7	8
12345678901234567890123456789012345678901234567890123456789012345678901234567890								

Template

NOTE 13: Orientation (OR) attribute is defined in the [ATTDESC] record as format R4.1. As a six-character field is being used to hold this value, it will be right-justified and padded with leading zeroes, therefore the first two characters of any value will always be 00.

NOTE 14: Attribute (CHG_TYPE) identifies the existence of an object or its reason for change in size, shape or position. The attribute values are:

- | | |
|--|---|
| 0 = New or unmodified feature | 5 = Feature recoded or reclassified |
| 2 = Positional accuracy improvement change | 6 = Text change |
| 3 = Moved due to real world change | 7 = New feature created by using parts of existing features |
| 4 = Adjusted by automatic software process | 8 = Attribute change |

NOTE 15: Plans produced early in the Land-Line digitising process may have a CHG_DATE set at 000000.

Two-dimensional Geometry Record [GEOMETRY1] 21 – as used with names

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	21	Record descriptor.
GEOM_ID	03:08	I6	000000	Not used.
GTYPE	09:09	I1	1	Defines as point geometry.
NUM_COORD	10:13	I4	0001	Number of coordinates.
X_COORD	14:19	I6	Easting	See note 16.
Y_COORD	20:25	I6	Northing	See note 16.
QPLAN	26:26	A1	<S>	Not used.
CONT_MARK	27:27	I1	0	No continuation record.
EOR	28:28	A1	%	Record terminator.

Record example:

2100000010001001355040275 0%

1		2		3		4		5		6		7		8															
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0

Template

NOTE 16: {X_COORD} and {Y_COORD} values fall in the following ranges:

1:1250 scale
-05000 to 055000

1:2500 scale
-10000 to 110000

1:10 000 scale
-50000 to 550000

Two-dimensional Geometry Record [GEOMETRY1] 21 – as used with points

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	21	Record descriptor.
GEOM_ID	03:08	I6	000000	Not used.
GTYPE	09:09	I1	1	Defines as point geometry.
NUM_COORD	10:13	I4	0001	Number of coordinates.
X_COORD	14:19	I6	Easting	See note 17.
Y_COORD	20:25	I6	Northing	See note 17.
QPLAN	26:26	A1	<S>	Not used.
CONT_MARK	27:27	I1	0	No continuation record.
EOR	28:28	A1	%	Record terminator.

Record example:

2100000010001022995018305 0%

1	2	3	4	5	6	7	8
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3	4	5	6
7	8	9	0	1	2	3	4
5	6	7	8	9	0	1	2
3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8
9	0	1	2	3			

Two-dimensional Geometry Record [GEOMETRY1] 21 – as used with lines

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	21	Record descriptor.
GEOM_ID	03:08	I6	000000	Not used.
GTYPE	09:09	I1	2	Defines as line geometry.
NUM_COORD	10:13	I4	0002 to 2500	Number of coordinates.
X_COORD	14:19	I6	Easting	See notes 18 and 19.
Y_COORD	20:25	I6	Northing	See notes 18 and 19.
QPLAN	26:26	A1	<S>	Not used.
X_COORD	27:32	I6	Easting	See notes 18 and 19.
Y_COORD	33:38	I6	Northing	See notes 18 and 19.
QPLAN	39:39	A1	<S>	Not used.
CONT_MARK	*.*	I1	0 or 1	No continuation record or continuation record.
EOR	*.*	A1	%	Record terminator.

Record example:

2100000020005037775000000 038200000575 038230000605 038265000625 038285000630 0%																			
	1	2	3	4	5	6	7	8											
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0

Template

NOTE 18: The group of fields {X_COORD}, {Y_COORD} and {QPLAN} may repeat {NUM_COORD} times to the end of physical record and through one or more continuation records.

NOTE 19: {X_COORD} and {Y_COORD} values fall in the following ranges:

1:1250 scale
000000 to 050000

1:2500 scale
000000 to 100000

1:10 000 scale
000000 to 500000

Line Record [LINEREC] 23

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	23	Record descriptor.
LINE_ID	03:08	I6	000001 to 999999	Feature serial number.
VAL_TYPE	09:10	A2	<2S>	Not used.
VALUE	11:16	A6	<6S>	Not used.
FEAT_CODE	17:20	A4	0001-9999	Feature classification number.
SECURITY	21:21	A1	<S>	Not used.
CHG_TYPE	22:22	A1	2	Reason for existence/change. See note 14.
CHG_DATE	23:28	D6	YYMMDD	Date of digitising of feature or amendment. See note 20.
QLABEL	29:29	A1	<S>	Not used.
SVY_DATE	30:35	D6	000000	Not used.
CONT_MARK	36:36	I1	0	No continuation record.
EOR	37:37	A1	%	Record terminator.

Record example:

23000331	0021	2980408	0000000%				
1	2	3	4	5	6	7	8
12345678901234567890123456789012345678901234567890123456789012345678901234567890							

Template

NOTE 20: Plans produced early in the Land-Line digitising process may have a CHG_DATE set at 000000.

Attribute Description Record [ATTDESC] 40

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	40	Record descriptor.
VAL_TYPE	03:04	A2	DT or OR	Attribute mnemonic, for example, distance or orientation.
FWIDTH	05:07	A3	001 - 999 or <3S>	Field width of attribute value.
FINTER	08:12	A5		Interpretation of field, for example, A12.
ATT_NAME	13:*	A*		Name given to attribute.
DIVIDER	*.*	A1	\	
FDESC	*.*	A*		Textual description of attribute.
DIVIDER	*.*	A1	\	
CONT_MARK	*.*	I1	0 or 1	No continuation record or continuation record follows.
EOR	*.*	A1	%	Record terminator.

Record example:

```
40OR004R4,1 ORIENTATION\ORIENTATION FROM GRID EAST (ANTI-CLOCKWISE)\0%
40DT005R5,2 DISTANCE\THE DISTANCE FROM THE CENTRE OF THE PYLON SYMBOL TO THE M1%
00IDPOINT OF ANY EDGE\0%
```

	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890								

Template

Volume Termination Record [VOLTERM] 99

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	99	Record descriptor.
FREE_TEXT	03:*	A*	*	See note 21.
CONT_VOL	*.*	I1	0 or 1	No further volumes or continuation volume.
EOR	*.*	A1	%	Record terminator.

* = variable

Record example:

```
99End Of Transfer Set0%
99End Of Volume 01. Transfer Set Continues On Volume 02 1%
```

	1	2	3	4	5	6	7	8
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890								

Template

NOTE 21: If there are further volume(s) to follow then the {FREE_TEXT} field will comprise the following message: '99End Of Volume nn. Transfer Set Continues On Volume nn+1 1%'; and if there are no further volumes then the {FREE_TEXT} field will comprise: 'End Of Transfer Set'.

Chapter 9 DXF explained

The purpose of this chapter and [chapter 10](#) is to:

- provide a brief description of the presentation of Land-Line in Data Exchange Format (DXF) (AutoCAD release 12 compatible); and
- provide licensed system suppliers with as much detail as necessary to enable Land-Line files in DXF to be easily understood and processed by application software.

The term *data structure* refers to the organisation and sequence of the records in the data file and **not** to the geographical topology of the data.

An overview of Land-Line data in DXF

Land-Line is supplied to the product specification LSPS_1.5 and Land-Line.Plus to LSPS_1.6. This chapter describes the representation of Land-Line and Land-Line.Plus in Ordnance Survey's implementation of DXF (AutoCAD release 12 compatible). Except where explicitly differentiated, the term Land-Line can be assumed to cover both Land-Line and Land-Line.Plus.

DXF is a data transfer format designed for use with most CAD software. The colour and line weights of some layers may differ from those in this user guide when Land-Line DXF data is used with certain software packages. The data structure of a Land-Line file in DXF is shown in diagrammatic form in [chapter 10](#).

Extended entity data is not used for the transfer of Land-Line in DXF.

Structure of Land-Line in DXF

Land-Line has a vector point and line data structure; within this structure a feature may be text, a point, or a polyline or line (or a series of lines forming a coherent unit). Each feature is freestanding; that is, its topological relationship to any other feature is **not** expressed in the data.

Land-Line tiles contain 43 layers. Land-Line.Plus tiles contain an extra 26 layers. See the AutoCAD publication *Layer Naming Convention for CAD in the Construction Industry Version 2* based on guidelines in BS 1192: Part 5.

Each layer name is an eight character string. The first four characters relate to the Autodesk User Group/Autodesk system, with G (GIS) as the source of the information, and 800–899 as the part code.

Land-Line and Land-Line.Plus layers all begin with G801. The remaining four digits are the Land-Line NTF feature code and are leading zero filled, where applicable.

Real-world features such as buildings are classified by type and each type is assigned to a separate DXF layer.

Example layers:

G8010001 – building outlines;

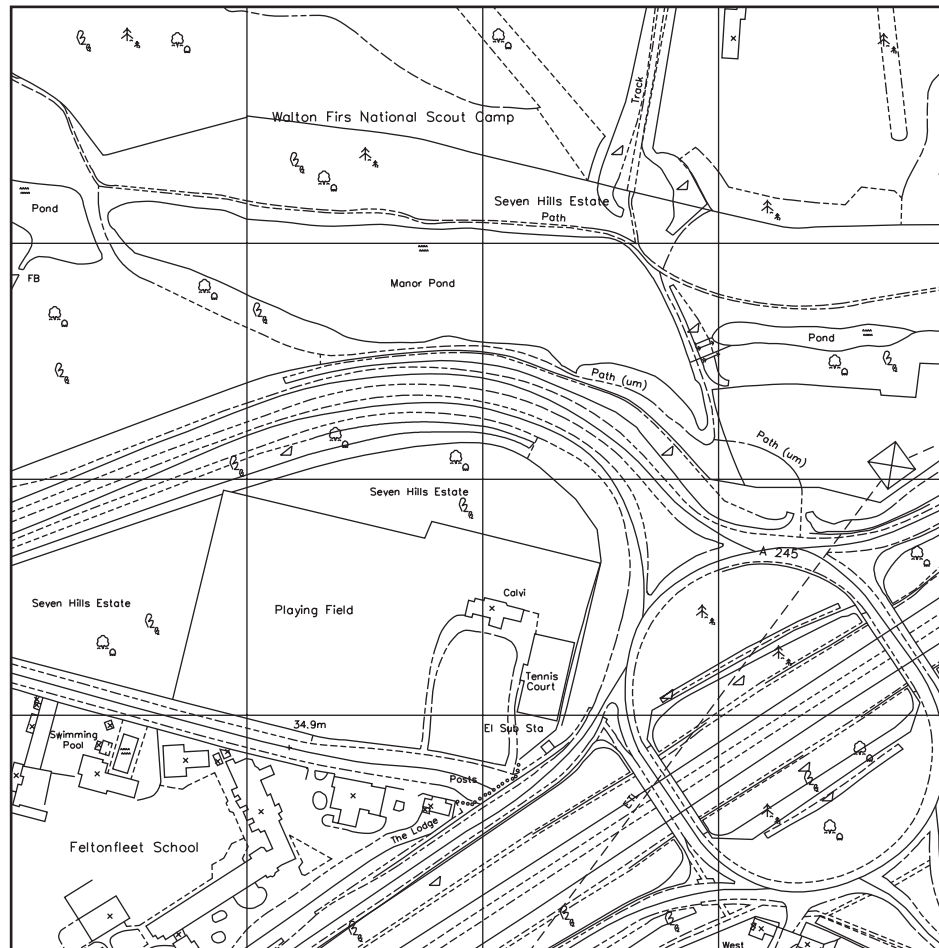
G8010069 – flow arrow symbol; and

G8011010 – water feature names.

A full list of layers is given in this chapter. This list includes layer names, line styles, line weights, entity types, default colours, and block names.

In any one Land-Line tile you are most unlikely to find features in every layer, simply because of the distribution of real-world features.

Figure 9.1: An extract of Land-Line.Plus in DXF data (part of a rural tile – TQ0960)



Feature representation

The following is a simplified generalisation of the way individual feature records are organised in Ordnance Survey's implementation of DXF:

Point or symbol	LAYER	Coordinate pair	Symbol size	Symbol type	Orientation
Line	LAYER	Coordinate pair	Coordinate pair		
Polyline	LAYER	Coordinate	Coordinate	Coordinate	
Text	LAYER	Coordinate	Height	Text	Orientation

Line features

A feature is a subjective entity; that is, so long as the constituent lines are of the same description (layer), a feature need not fully describe a logical piece of detail.

Each linear feature is composed of a string of XY coordinate pairs implicitly joined by straight lines.

Area (polygon) features

Area features are not explicitly defined in Land-Line DXF data. Features which might be thought of as area features (such as buildings or agricultural fields) are treated in the data as linear features – the building outlines or field boundaries are polylines on one or more layers. Land-Line does not show area features by fill patterns. Instead, symbolic point features (seeds) are used. For example, layer G8010321 contains seeds for roofed areas (that is buildings) and layer G8010386 (Land-Line.Plus only) contains seeds for orchard areas. Each represents one element of land cover in each area; complex cover is recorded by multiple seed points.

Seeds representing the different types of area feature are each allocated their own layer and symbols (blocks). See Land-Line Blocks on [page 252](#).

It can be assumed that, in most cases, any seed represented by a symbol represents an area extending to a notional polygon made up of the closest qualifying polylines bounding the seed. This principle is fully explained under [Area features](#) in chapter 3 and [Landscape features](#) in chapter 4.

Name and text features

Ordnance Survey distinguishes between name types – for example, road names and water feature names – by placing each name type in a separate DXF layer.

Text in Land-Line is treated as free-standing text data. There is no explicit relationship (in the data) between it and the points and lines that surround it. Text which is double- or treble-banked is treated as two or three separate features.

Each text string's bottom left corner has position, expressed as a single coordinate pair, held as X and Y offsets from the origin (SW corner) of the National Grid – a point west of the Isles of Scilly.

Marginal names appear as text beyond the neat line of the tile. Text in the north and east margin has slightly larger coordinate values relative to detail within the body of the tile, that in the west margin a smaller X coordinate value and that in the south margin a smaller Y coordinate value. All marginal names have a unique layer – G8010574.

Text is oriented. That is it may run from west to east across the tile, or it may be oriented at some other angle measured anticlockwise from grid east.

Text layers in Land-Line and Land-Line.Plus

Layer name	Description (name)
G8010571	Footnotes
G8010574	Marginal text
G8010575	Grid values
G8011000	Road names and numbers
G8011005	Administrative and/or electoral boundary text
G8011006	Building names and numbers
G8011009	Miscellaneous text
G8011010	Water feature names
G8011013	Land parcel numbers

Land-Line DXF layers

Layer names and descriptions

Line weights: 1 = light, 2 = medium, 3 = heavy

Layer name	Description	Line type or text font	Line weight	Entity	Colour	Block name
G8010001	Building outline	CONTINUOUS	2	POLYLINE	RED	-
G8010004	Building outline (overhead)	DASHED	2	POLYLINE	RED	-
G8010007	Civil parish or community boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010008	District, London borough or unitary authority boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010009	County boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010010	Electoral division or ward boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010011	Boundary post or stone	CONTINUOUS	-	INSERT	MAGENTA	BDYPOST
G8010013	Boundary half mereing symbol	CONTINUOUS	-	INSERT	MAGENTA	BDYMEREI
G8010014	Railway (narrow gauge)	CONTINUOUS	2	POLYLINE	BLUE	-
G8010015	Railway (standard gauge)	CONTINUOUS	2	POLYLINE	BLUE	-
G8010021	Road (public) edge of metalling	DASHED	2	POLYLINE	BLUE	-
G8010025	Triangulation point	CONTINUOUS	-	INSERT	BLUE	TRIGP
G8010026	Bench mark	CONTINUOUS	-	INSERT	BLUE	BENCHM
G8010027	Spot height	CONTINUOUS	-	INSERT	BLUE	SPOTH
G8010030	General line detail, hedges, fences, walls	CONTINUOUS	2	POLYLINE	WHITE	-
G8010032	General ground level or minor overhead detail	DASHED	2	POLYLINE	WHITE	-
G8010033	Underground alignments, course of antiquities	DASHEDX2	2	POLYLINE	BLUE	-
G8010036	Vegetation or landform limit	DASHED	2	POLYLINE	GREEN	-
G8010043	Overhead detail	DASHEDX2	2	POLYLINE	BLUE	-
G8010049	Pylon, tower, flare stack	CONTINUOUS	-	INSERT	BLUE	PYLON
G8010052	Minor detail	CONTINUOUS	2	POLYLINE	WHITE	-
G8010057	Point feature	CONTINUOUS	-	INSERT	WHITE	POINT
G8010059	Water detail	CONTINUOUS	2	POLYLINE	CYAN	-
G8010069	Flow arrow	CONTINUOUS	-	INSERT	CYAN	FLARROW
G8010071	Mean high water (springs)	CONTINUOUS	3	POLYLINE	CYAN	-

Layer name	Description	Line type or text font	Line weight	Entity	Colour	Block name
G8010072	Mean low water (springs)	CONTINUOUS	2	POLYLINE	CYAN	-
G8010079	European, parliamentary or assembly constituency boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010098	Centreline public road	CONTINUOUS	1	POLYLINE	YELLOW	-
G8010321	Roofed building indicator	CONTINUOUS		INSERT	RED	BUILDSED
G8010323	Glasshouse indicator	CONTINUOUS		INSERT	WHITE	GLASSEED
G8010395	Upper level of communication – seed	CONTINUOUS	-	INSERT	MAGENTA	ULC
G8010570	Copyright and registered trademark symbols	CONTINUOUS		INSERT	WHITE	COPY and REGTM
G8010571	Footnotes	STANDARD		TEXT	WHITE	-
G8010572	Grid lines	DOT	2	LINE	WHITE	-
G8010573	Neatline	CONTINUOUS	2	LINE	WHITE	-
G8010574	Marginal text	STANDARD		TEXT	MAGENTA	-
G8010575	Grid values	STANDARD		TEXT	WHITE	-
G8011000	Road names and numbers	STANDARD*		TEXT	BLUE	-
G8011005	Administrative boundary text	STANDARD		TEXT	MAGENTA	-
G8011006	Building names and numbers	STANDARD*		TEXT	RED	-
G8011009	Miscellaneous text	STANDARD*		TEXT	WHITE	-
G8011010	Water feature text	STANDARD*		TEXT	CYAN	-
G8011013	Land parcel number	STANDARD		TEXT	GREEN	-

* Non-Roman antiquity names in these layers are shown in GOTHICE text style ([see page 108](#)).

Land-Line.Plus DXF layers

Layer names and descriptions

Land-Line.Plus includes all layers in Land-Line, with an additional 26 layers containing information relating to features such as cliffs, vegetation types and man-made slopes. A comprehensive list of all layers in Land-Line.Plus follows below.

Line weights: 1 = light, 2 = medium, 3 = heavy

Layer name	Description	Line type or text font	Line weight	Entity	Colour	Block name
G8010001	Building outline	CONTINUOUS	2	POLYLINE	RED	-
G8010004	Building outline (overhead)	DASHED	2	POLYLINE	RED	-
G8010007	Civil Parish or community boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010008	District, London borough or unitary authority boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010009	County boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010010	Electoral division or ward boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010011	Boundary post or stone	CONTINUOUS	-	INSERT	MAGENTA	BDYPOST
G8010013	Boundary half mereing symbol	CONTINUOUS	-	INSERT	MAGENTA	BDYMEREI
G8010014	Railway (narrow gauge)	CONTINUOUS	2	POLYLINE	BLUE	-
G8010015	Railway (standard gauge)	CONTINUOUS	2	POLYLINE	BLUE	-
G8010021	Road (public) edge of metalling	DASHED	2	POLYLINE	BLUE	-
G8010025	Triangulation point	CONTINUOUS	-	INSERT	BLUE	TRIGP
G8010026	Bench mark	CONTINUOUS	-	INSERT	BLUE	BENCHM
G8010027	Spot height	CONTINUOUS	-	INSERT	BLUE	SPOTH
G8010030	General line detail, hedges, fences, walls	CONTINUOUS	2	POLYLINE	WHITE	-
G8010032	General ground level or minor overhead detail	DASHED	2	POLYLINE	WHITE	-
G8010033	Underground alignments, course of antiquities	DASHEDX2	2	POLYLINE	BLUE	-
G8010035	Vegetation or landform limit (secondary)	DASHED	1	POLYLINE	GREEN	-
G8010036	Vegetation or landform limit	DASHED	2	POLYLINE	GREEN	-
G8010043	Overhead detail	DASHEDX2	2	POLYLINE	BLUE	-
G8010049	Pylon, tower, flare stack	CONTINUOUS	-	INSERT	BLUE	PYLON


Layer name	Description	Line type or text font	Line weight	Entity	Colour	Block name
G8010052	Minor detail	CONTINUOUS	2	POLYLINE	WHITE	-
G8010057	Point feature	CONTINUOUS	-	INSERT	WHITE	POINT
G8010059	Water detail	CONTINUOUS	2	POLYLINE	CYAN	
G8010069	Flow arrow	CONTINUOUS	-	INSERT	CYAN	FLARROW
G8010071	Mean high water (springs)	CONTINUOUS	3	POLYLINE	CYAN	-
G8010072	Mean low water (springs)	CONTINUOUS	2	POLYLINE	CYAN	-
G8010079	European, parliamentary or assembly constituency boundary	CONTINUOUS	2	POLYLINE	MAGENTA	-
G8010098	Centreline public road	CONTINUOUS	1	POLYLINE	YELLOW	-
G8010321	Roofed building indicator	CONTINUOUS		INSERT	RED	BUILDSED
G8010323	Glasshouse indicator	CONTINUOUS		INSERT	WHITE	GLASSEED
G8010372	Positioned coniferous tree – seed	CONTINUOUS	-	INSERT	GREEN	TREEC
G8010373	Positioned non-coniferous tree – seed	CONTINUOUS	-	INSERT	GREEN	TREENC
G8010374	Top of slope	CONTINUOUS	2	POLYLINE	RED	-
G8010375	Top of cliff	CONTINUOUS	2	POLYLINE	RED	-
G8010376	Bottom of cliff or slope	DASHED	2	POLYLINE	BROWN (34)	-
G8010377	Area of boulders – seed	CONTINUOUS	-	INSERT	BROWN (34)	BOULDERS
G8010378	Area of scattered boulders – seed	CONTINUOUS	-	INSERT	BROWN (34)	BOULDSC
G8010379	Area of coniferous trees – seed	CONTINUOUS	-	INSERT	GREEN	TREESC
G8010380	Area of scattered coniferous trees – seed	CONTINUOUS	-	INSERT	GREEN	TREESCSC
G8010381	Area of coppice or osier – seed	CONTINUOUS	-	INSERT	GREEN	COPPICE
G8010382	Area of marsh, saltmarsh or reeds – seed	CONTINUOUS	-	INSERT	GREEN	MARSH
G8010384	Area of non-coniferous trees – seed	CONTINUOUS	-	INSERT	GREEN	TREESNC
G8010385	Area of scattered non-coniferous trees – seed	CONTINUOUS	-	INSERT	GREEN	TREENCSC
G8010386	Area of orchard – seed	CONTINUOUS	-	INSERT	GREEN	ORCHARD
G8010387	Area of heath – seed	CONTINUOUS	-	INSERT	GREEN	HEATH
G8010388	Area of rock – seed	CONTINUOUS	-	INSERT	BROWN (34)	ROCKS
G8010389	Area of scattered rock – seed	CONTINUOUS	-	INSERT	BROWN (34)	ROCKSCAT
G8010390	Area of rough grassland – seed	CONTINUOUS	-	INSERT	GREEN	ROUGHGR
G8010392	Area of scrub – seed	CONTINUOUS	-	INSERT	GREEN	SCRUB
G8010395	Upper level of communication – seed	CONTINUOUS	-	INSERT	MAGENTA	ULC
G8010396	Area of cliff – seed	CONTINUOUS	-	INSERT	BROWN (34)	CLIFF
G8010397	Area of slope – seed	CONTINUOUS	-	INSERT	BROWN (34)	SLOPE

Layer name	Description	Line type or text font	Line weight	Entity	Colour	Block name
G8010400	Water surface – seed	CONTINUOUS	-	INSERT	CYAN	WATER
G8010570	Copyright and registered trademark and symbols	CONTINUOUS	-	INSERT	WHITE	copy
G8010571	Footnotes	STANDARD	-	TEXT	WHITE	-
G8010572	Grid lines	DOT	2	LINE	WHITE	-
G8010573	Neatline	CONTINUOUS	2	LINE	WHITE	-
G8010574	Marginal text	STANDARD	-	TEXT	MAGENTA	-
G8010575	Grid values	STANDARD	-	TEXT	WHITE	-
G8011000	Road names and numbers	STANDARD*	-	TEXT	BLUE	-
G8011005	Administrative boundary text	STANDARD	-	TEXT	MAGENTA	-
G8011006	Building names and numbers	STANDARD*	-	TEXT	RED	-
G8011009	Miscellaneous text	STANDARD*	-	TEXT	WHITE	-
G8011010	Water feature text	STANDARD*	-	TEXT	CYAN	-
G8011013	Land parcel number	STANDARD	-	TEXT	GREEN	-
G8011210	Area of scree – seed	CONTINUOUS	-	INSERT	BROWN (34)	SCREE
G8011211	Positioned boulder	CONTINUOUS	-	INSERT	BROWN (34)	BOULDER
G8011212	Rock or ridge line	CONTINUOUS	2	POLYLINE	RED	-

* Non-Roman antiquity names in these layers are shown in GOTHICE text style ([see page 108](#)).

Land-Line blocks

















The blocks section of the Land-Line DXF file contains map symbol definitions for the following blocks. Most CAD systems enable you to insert them into a CAD drawing by use of the AutoCAD INSERT BLOCK command, or an equivalent.

Represented by symbol	Layer (not to scale)	Block name	Symbol	Colour
Boundary post or stone	G8010011	BDYPOST	○	MAGENTA
Boundary half mereing symbol	G8010013	BDYMEREI	○ 	MAGENTA
Triangulation point	G8010025	TRIGP	△	BLUE
Bench mark	G8010026	BENCHM	↑	BLUE
Spot height	G8010027	SPOTH	+	BLUE
Pylon	G8010049	PYLON	⊠	BLUE
Point feature	G8010057	POINT	○	WHITE
Flow arrow	G8010069	FLARROW		CYAN
Building – seed	G8010321	BUILDSED	×	RED
Horticultural glasshouse – seed	G8010323	GLASSEED	×	WHITE
Area of upper level of through communication indicator – seed	G8010395	ULC	×	MAGENTA
Copyright symbol	G8010570	COPY	©	WHITE
Registered trademark symbol	G8010570	REGTM	®	WHITE

Land-Line.Plus blocks

Land-Line.Plus includes all blocks in Land-Line (shown on the previous page), with additional ones containing symbols relating to features such as cliffs, vegetation types and man-made slopes. A comprehensive list of all blocks in Land-Line.Plus follows below.

Represented by symbol	Layer (not to scale)	Block name	Symbol	Colour
Boundary post or stone	G8010011	BDYPOST	○	MAGENTA
Boundary half mereing symbol	G8010013	BDYMEREI	⊙	MAGENTA
Triangulation point	G8010025	TRIGP	△	BLUE
Bench mark	G8010026	BENCHM	↑	BLUE
Spot height	G8010027	SPOTH	+	BLUE
Pylon	G8010049	PYLON	⊠	BLUE
Point feature	G8010057	POINT	○	WHITE
Flow arrow	G8010069	FLARROW		CYAN
Building – seed	G8010321	BUILDSED	×	RED
Horticultural glasshouse – seed	G8010323	GLASSEED	×	WHITE
Positioned coniferous tree – seed	G8010372	TREEC	♣	GREEN
Positioned non-coniferous tree – seed	G8010373	TREENC	♣	GREEN
Area of boulders – seed	G8010377	BOULDERS		BROWN (34)
Area of scattered boulders – seed	G8010378	BOULDSC		BROWN (34)
Area of coniferous trees – seed	G8010379	TREESC	♣	GREEN
Area of scattered coniferous trees – seed	G8010380	TREESCSC	♣	GREEN
Area of marsh, saltmarsh or reeds – seed	G8010382	MARSH		GREEN

Represented by symbol	Layer (not to scale)	Block name	Symbol	Colour
Area of non-coniferous trees – seed	G8010384	TREESNC		GREEN
Area of scattered non-coniferous trees – seed	G8010385	TREENCSC		GREEN
Area of orchard – seed	G8010386	ORCHARD		GREEN
Area of heath – seed	G8010387	HEATH		GREEN
Area of rock – seed	G8010388	ROCKS		BROWN (34)
Area of scattered rock – seed	G8010389	ROCKSCAT		BROWN (34)
Area of rough grassland – seed	G8010390	ROUGHGR		GREEN
Area of scrub – seed	G8010392	SCRUB		GREEN
Area of upper level of through communication indicator – seed	G8010395	ULC		MAGENTA
Area of cliff – seed	G8010396	CLIFF		BROWN (34)
Area of slope – seed	G8010397	SLOPE		BROWN (34)
Water surface – seed	G8010400	WATER		CYAN
Copyright symbol	G8010570	copy		WHITE
Registered trade mark symbol	G8010570	REGTM		WHITE
Area of scree – seed	G8011210	SCREE		BROWN (34)
Positioned boulder	G8011211	BOULDER		BROWN (34)

DXF scaling factors of symbol block features for Land-Line and Land-Line.Plus

Land-Line blocks

The blocks section of the Land-Line DXF file contains map symbol definitions for the following blocks. Most CAD systems enable you to insert them into a CAD drawing by the use of AutoCAD INSERT BLOCK command, or an equivalent.

NOTE: The X and Y scaling factors are the same in every case. The Z scaling factor is not used and always defaults to 1.0 in DXF, since it is never specified.

Represented by symbol	Layer	Block name	Colour		Scale factor 1:1250			Scale factor 1:2500			Scale factor 1:10 000		
					X	Y	Z	X	Y	Z	X	Y	Z
Boundary post or stone	G8010011	BDYPOST	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Boundary half mereing symbol	G8010013	BDYMEREI	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Triangulation point	G8010025	TRIGP	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Bench mark	G8010026	BENCHM	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Spot height	G8010027	SPOTH	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Pylon*	G8010049	PYLON	BLUE	DXF data	N/A	N/A	N/A	6.0	6.0	N/A	10.00	10.00	N/A
				AutoCAD value	N/A	N/A	1.0	6.0	6.0	1.0	10.0	10.0	1.0
Point feature	G8010057	POINT	WHITE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Flow arrow	G8010069	FLARROW	CYAN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Building – seed	G8010321	BUILDSED	RED	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Horticultural glasshouse – seed	G8010323	GLASSEED	WHITE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of ULC – seed	G8010395	ULC	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0

* This is a scaleable symbol and has a minimum size.

Land-Line.Plus blocks

Land-Line.Plus includes all blocks in Land-Line, with additional ones containing symbols relating to features such as cliffs, vegetation types and man-made slopes. A comprehensive list of all blocks in Land-Line.Plus follows below.

NOTE: The X and Y scaling factors are the same in every case. The Z scaling factor is not used and always defaults to 1.0 in DXF, since it is never specified.

Represented by symbol	Layer	Block name	Colour		Scale factor 1:1250			Scale factor 1:2500			Scale factor 1:10 000		
					X	Y	Z	X	Y	Z	X	Y	Z
Boundary post or stone	G8010011	BDYPOST	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Boundary half mereing symbol	G8010013	BDYMEREI	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Triangulation point	G8010025	TRIGP	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Bench mark	G8010026	BENCHM	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Spot height	G8010027	SPOTH	BLUE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Pylon*	G8010049	PYLON	BLUE	DXF data	N/A	N/A	N/A	6.00	6.00	N/A	10.00	10.00	N/A
				AutoCAD value	N/A	N/A	1.0	6.0	6.0	1.0	10.0	10.0	1.0
Point feature	G8010057	POINT	WHITE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Flow arrow	G8010069	FLARROW	CYAN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Building – seed	G8010321	BUILDSED	RED	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Horticultural glasshouse – seed	G8010323	GLASSEED	WHITE	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Positioned coniferous tree – seed	G8010372	TREETC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0

* This is a scaleable symbol and has a minimum size.

Represented by symbol	Layer	Block name	Colour		Scale factor 1:1250			Scale factor 1:2500			Scale factor 1:10 000		
					X	Y	Z	X	Y	Z	X	Y	Z
Positioned non- coniferous tree – seed	G8010373	TREENC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of boulders – seed	G8010377	BOULDERS	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scattered boulders – seed	G8010378	BOULDSC	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of coniferous trees – seed	G8010379	TREESC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scattered coniferous trees – seed	G8010380	TRECSC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of coppice or osier – seed	G8010381	COPPICE	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of marsh, saltmarsh or reeds – seed	G8010382	MARSH	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of non-coniferous trees – seed	G8010384	TREESNC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scattered non- coniferous trees – seed	G8010385	TREENCSC	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of orchard – seed	G8010386	ORCHARD	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of heath – seed	G8010387	HEATH	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of rock – seed	G8010388	ROCKS	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scattered rock – seed	G8010389	ROCKSCAT	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of rough grassland – seed	G8010390	ROUGHGR	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scrub – seed	G8010392	SCRUB	GREEN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of ULC – seed	G8010395	ULC	MAGENTA	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0

Represented by symbol	Layer	Block name	Colour		Scale factor 1:1250			Scale factor 1:2500			Scale factor 1:10 000		
					X	Y	Z	X	Y	Z	X	Y	Z
Area of cliff – seed	G8010396	CLIFF	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of slope – seed	G8010397	SLOPE	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Water surface – seed	G8010400	WATER	CYAN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Area of scree – seed	G8011210	SCREE	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0
Positioned boulder	G8011211	BOULDER	BROWN	DXF data	0.13	0.13	N/A	0.25	0.25	N/A	1.00	1.00	N/A
				AutoCAD value	0.1	0.1	1.0	0.3	0.3	1.0	1.0	1.0	1.0

Land-Line footnotes

Each Land-Line DXF file contains a set of footnotes. They provide information on the source and history of the geometric data (the features) contained in that map tile. The following footnotes are added as text strings in the entities section of the data file. The positions of the footnotes are indicated in [figure 9.2](#). All footnote text sizes shown are for Land-Line at 1:1250 scale. For 1:2500 scale text sizes are increased by a factor of 2, and for 1:10 000 scale text sizes are increased by a factor of 8. Explanatory notes are in brackets.

Note 1: Top margin centrally aligned. 14 ground metres, layers G8010571 and G8010570
Ordnance Survey®

Note 2: Top margin centrally aligned. 12 ground metres, layers G8010571 and G8010570
Land-Line®

Note 3: Lower left margin. 12 ground metres, layer G8010571
Tile reference _ _ _ _ _

Note 4: Lower left margin. 4 ground metres, layer G8010571
Translation date dd Mmmmmmmmm CCYY

(This is the date of translation at Ordnance Survey from native format to DXF.)

Note 5: Lower left margin. 4 ground metres, layer G8010571
Map storage scale 1:_ _ _ _ _

(The scale at which the tile is stored in the Ordnance Survey database.)

Note 6: Lower left margin. 4 ground metres, layer G8010571
Content indicator _ _ _ _ _

(Indicates the survey accuracy(ies) of the tile – see [content indicator values](#), in chapter 7.)

Note 7: Lower left margin. 4 ground metres, layer G8010571
Surveyed units of change _ _ _ _ _

(A cumulative count of surveyed change, used by Ordnance Survey to trigger the supply of updated tiles.)

Note 8: Lower left margin. 4 ground metres, layer G8010571

Date of last amendment dd Mmmmmmmmm CCYY

(Provides an indication of the currency of the data, that is when a digitising operation, perhaps capturing survey revision, was last completed.)

Note 9: Lower left margin. 4 ground metres, layer G8010571

Product specification _ _ _ _ _

(LSPS_1.5 for Land-Line, LSPS_1.6 for Land-Line.Plus.)

Note 10: Lower left margin. 4 ground metres, layer G8010571

Administrative and electoral boundary date mm/ccyy

(Date when boundary information was last checked.)

Note 11: Lower right margin. 4 ground metres, layers G8010571 and G8010570

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Note 12: Lower right margin. 4 ground metres, layer G8010571

This map is derived from surveys at one or more of the following scales: 1:1 250, 1:2 500, 1:10 000. It is the source scale that largely defines specification and accuracy.

Note 13: Lower right margin. 4 ground metres, layer G8010571

The representation of a road, track or path is no evidence of a right of way.

The alignment of tunnels is approximate.

Note 14: Lower right margin. 4 ground metres, layer G8010571

Altitudes of bench marks and spot heights are given in metres above applicable Ordnance Survey Datum.

Land-Line.Plus footnotes

Two footnotes vary slightly on Land-Line.Plus:

Note 2: Top margin centrally aligned. 12 ground metres, layer G8010571

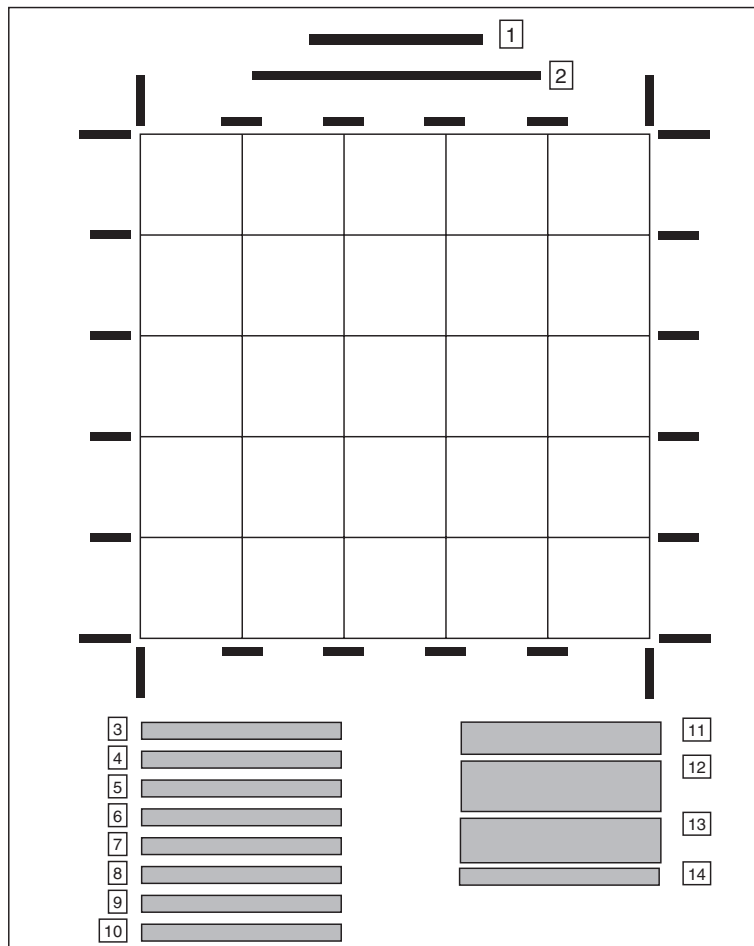
Land-Line.Plus®

Note 11: Lower right margin. 4 ground metres, layers G8010571 and G8010570

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Figure 9.2: Layout of footnotes



Land-Line information specific to DXF

Coordinate system

The coordinate system used is the National Grid (NG). The coordinates of each point in the data correspond to their full National Grid coordinates.

The NG coordinates are to a resolution of 0.01 of a metre. This is the resolution of the source data.

Local coordinates are not used.

Grid

A grid is added as lines in the entities section (layer G8010572). The line type, weight and colour of the grid is described in the [layer table](#) earlier in this chapter.

Grid values

Full National Grid easting and northing values to a resolution of one metre are added as text strings in the entities section (layer G8010575) at each corner of the tile extent, either horizontal or vertical, to read from the lower left corner of the tile. This text is displayed in the STANDARD font at a size of 6.25 ground metres.

Intermediate grid values are shown as multiples of 100 m from the lower left corner of the tile (layer G8010575). These are horizontal. This text is displayed in the STANDARD font at a size of 4.0 ground metres.

Height

No height attributes are applied to any feature. The only height information in the file is text entities associated with heighted points – bench marks and spot heights.

Neatline

A neatline around the extent of the tile is added as lines in the entities section (layer name G8010573). The line type, weight and colour of the neatline is described in the [layer table](#) earlier in this chapter.

DXF layer names in Land-Line

Description	Pre-1993 layer name	Post-1993 layer name
Building outline	BUILDOUT	G8010001
Building outline (overhead)	BUILDPK	G8010004
Civil parish or community boundary	PARISH	G8010007
District, London borough or unitary authority boundary	DISTRICT	G8010008
County boundary	COUNTY	G8010009
Electoral division or ward boundary	ELECTBDY	G8010010
Boundary post or stone	BDYPOST	G8010011
Boundary mereing symbol	MEREING	G8010013
Railway (narrow gauge)	RAILNG	G8010014
Railway (standard gauge)	RAIL	G8010015
Road (public) edge of metalling	ROAD	G8010021
Triangulation point	TRIGPT	G8010025
Bench mark	BENCHMK	G8010026
Spot height	SPOTHT	G8010027
General line detail, hedges, fences, walls	GENLINE	G8010030
General alignments	GENPECK	G8010032
Underground alignments, course of antiquities	UNDER	G8010033
Vegetation or landform limit (secondary)	VEGSUP	G8010035
Vegetation or landform limit	VEG	G8010036
Overhead alignments	OVER	G8010043
Pylon	PYLON	G8010049
Minor line detail	MINLINE	G8010052
Point feature	POINT	G8010057
Water detail	WATER	G8010059
Flow arrow	FARROW	G8010069
Mean high water (springs)	MHW	G8010071
Mean low water (springs)	MLW	G8010072
European, parliamentary or assembly boundary	PARLBDY	G8010079
Centreline public road	ROADCEN	G8010098
Building – seed	BUILDS	G8010321
Horticultural glasshouse – seed	GLASSS	G8010323
Positioned coniferous tree – seed	PCONTR	G8010372
Positioned non-coniferous tree – seed	PNCONTR	G8010373
Top of cliff	TOPCLF	G8010375

Description	Pre-1993 layer name	Post-1993 layer name
Top of slope	TOPSLO	G8010374
Bottom of cliff or slope	BOTT	G8010376
Area of boulders – seed	BOULDS	G8010377
Area of scattered boulders – seed	BOULDSCTS	G8010378
Area of coniferous trees – seed	CONS	G8010379
Area of scattered coniferous trees – seed	CONSCTS	G8010380
Area of coppice or osiers – seed	COPPS	G8010381
Area of marsh, saltmarsh or reeds – seed	MARSHS	G8010382
Area of non-coniferous trees – seed	NCONS	G8010384
Area of scattered non-coniferous trees – seed	NCONSCTS	G8010385
Area of orchard – seed	ORCHARDS	G8010386
Area of heath – seed	HEATHS	G8010387
Area of rock – seed	ROCKS	G8010388
Area of scattered rock – seed	ROCKSCTS	G8010389
Area of rough grassland – seed	ROUGHGS	G8010390
Area of scrub	SCRUBS	G8010392
Upper level of communication – seed	ULCOMMS	G8010395
Area of cliff – seed	CLIFFS	G8010396
Area of slope – seed	SLOPES	G8010397
Area of water – seed	WATERS	G8010400
Copyright and registered trademark symbols	COPYRIGHT	G8010570
Footnotes	HEADER	G8010571
Grid lines	GRID	G8010572
Neatline	NEATLINE	G8010573
Marginal text	-	G8010574
Grid values	-	G8010575
Road names and numbers	ROADTXT	G8011000
Boundary text	BDYTXT	G8011005
Building names and numbers	BUILDTXT	G8011006
Miscellaneous text	MISCTXT	G8011009
Water feature text	WATERTXT	G8011010
Land parcel numbers	LANDTXT	G8011013
Area of scree – seed	SCREE	G8011210
Positioned boulder	-	G8011211
Rock or ridgeline	-	G8011212

Chapter 10 DXF file structure for Land-Line

General

The following paragraphs describe the DXF group and section structure for the transfer of Land-Line and Land-Line.Plus.

It is assumed that you are familiar with the DXF documentation published (within the AutoCAD manuals) by:
Autodesk Ltd,
1 Meadowgate Avenue
Farnborough Business Park
Farnborough
Hampshire
GU14 6FG

Or if a CAD package other than AutoCAD is being used, an equivalent document published by your software supplier.

The following section gives a detailed breakdown of the data structure of Land-Line and Land-Line.Plus in DXF.

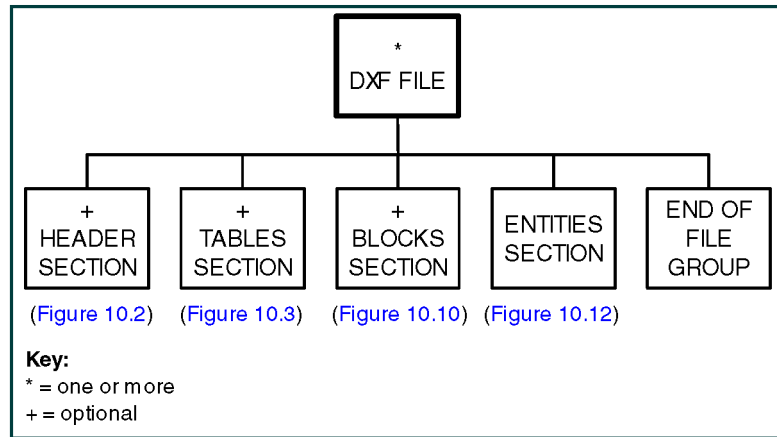
Data structure

The DXF file is structured into a number of sections, each of which holds specific information relating to the drawing.

The following diagrams ([figures 10.1–10.17](#)) represent the data structure of Land-Line in DXF. Where one element of a figure is the starting point for another figure, this is indicated beneath the relevant box.

DXF files comprise many groups. In general terms, a DXF group consists of a pair of lines; the first line of a group is a group code and the second is a group value. For details of the specification for the DXF group, see the AutoCAD documentation.

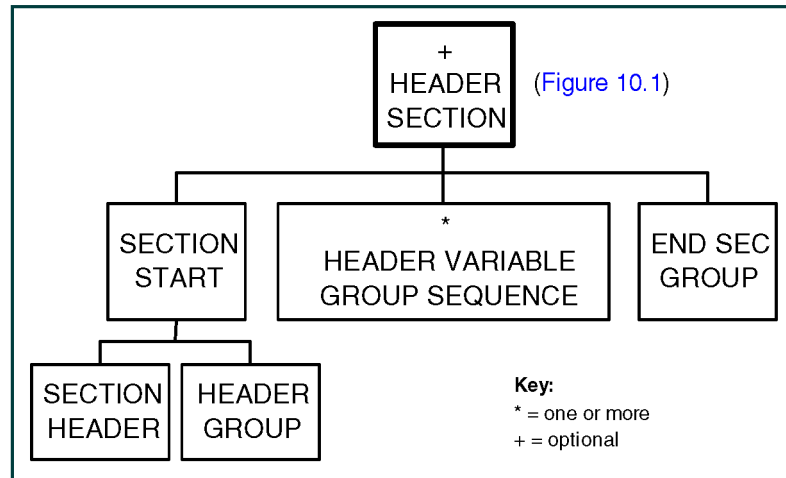
Figure 10.1: Level 1 – overall organisation



Header

The header is constructed as follows, with only those fields being supplied.

Figure 10.2: Header section (level 2)



The header is structured in the following order:

```
0
SECTION
2
HEADER
9
$ACADVER      AutoCAD drawing database version number.
1
AC1009       This indicates release 11 or 12.
9
$EXTMIN      X and Y drawing extents, lower left corner.
10
nnnnnnn.nn  Minimum eastings (National Grid coordinates).
20
nnnnnnn.nn  Minimum northings (National Grid coordinates).
9
$EXTMAX      X and Y drawing extents, upper right corner.
10
nnnnnnn.nn  Maximum eastings (National Grid coordinates).
20
nnnnnnn.nn  Maximum northings (National Grid coordinates).
9
$LIMMIN      X and Y drawing limits, lower left corner.
10
nnnnnn.n    X drawing limit, lower left corner (in the AutoCAD World Coordinate System (WCS)).
20
nnnnnn.n    Y drawing limit, lower left corner (in WCS).
9
$LIMMAX      X and Y drawing limits, upper right corner.
10
nnnnnn.n    X drawing limit, upper right corner (in WCS).
20
```

nnnnnn.n 9	Y drawing limit, upper right corner (in WCS).
\$LTSCALE 40 5.0 9	Global linetype scale.
\$ATTMODE 70 1 9	Attribute visibility. This sets attributes to on when the tile is open.
\$FILLMODE 70 1 9	Fill mode on if non-zero.
\$TEXTSIZE 40 1.0 9	Default text height.
\$TEXTSTYLE 7 STANDARD 9	Current text style name.
\$CELTYPE 6 BYLAYER 9	Entity line type name.
\$CECOLOR 62 256 9	Entity colour number. Indicates colour id BYLAYER.
\$LUNITS	Units format for coordinates and distances.

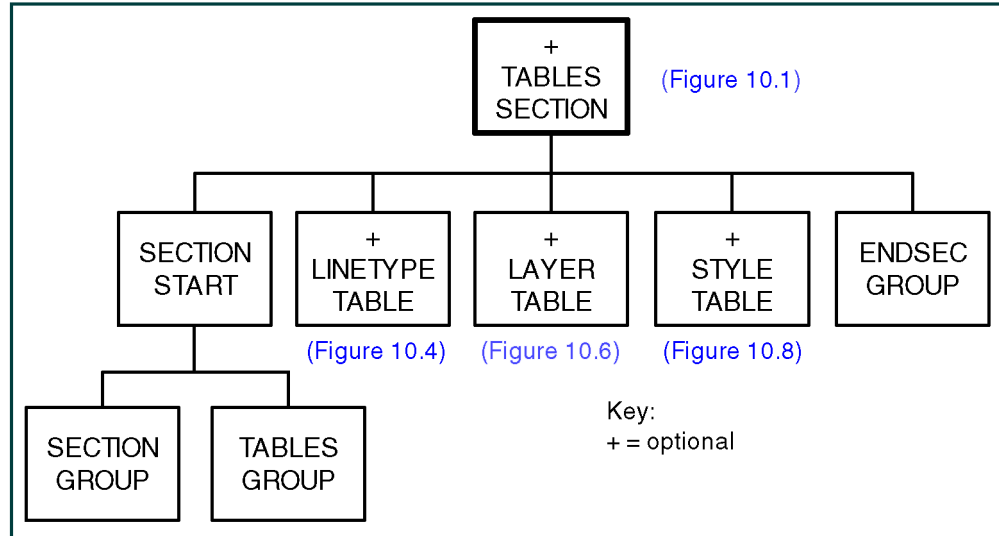
```

70
    2
    9
$LUPREC    Units precision for coordinates and distances.
70
    1
    9
$AUPREC    Units precision for angles.
70
    1
    9
$ANGBASE   Angle zero direction.
50
0.0
    9
$ANGDIR    Angle rotation.
70
    0      1 = clockwise angles, 0 = anticlockwise angles.
    9
$PDMODE    Point display mode.
70
    1
    9
$PDSIZE    Point display size.
40
0.0
    9
$PLINEGEN  Sets the linetype pattern generation around the vertices of a 2-D polyline.
70
    1
    0
ENDSEC     End of section.

```


Tables

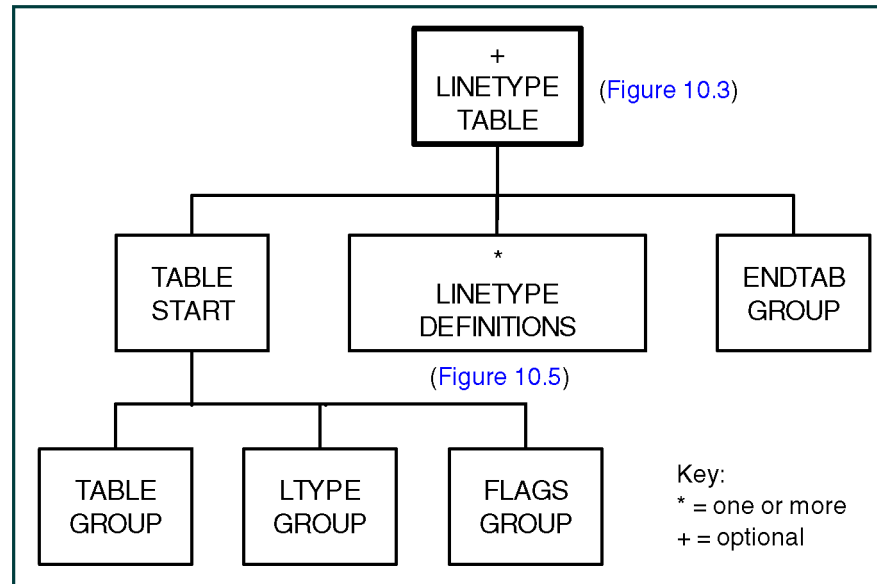
Figure 10.3: Tables section (level 2)



The tables section follows the header section and contains three tables:

- Linetype table.
- Layer table.
- Style table.

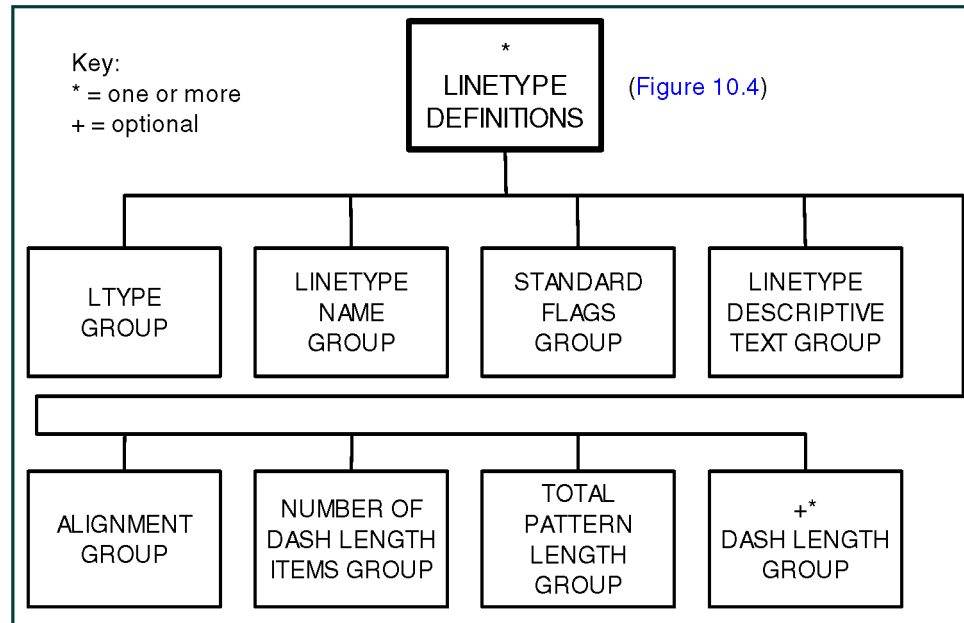
Figure 10.4: Linetype table (level 3)



The linetype table contains definitions for the following line types:

- solid line (CONTINUOUS)
- dashed line (DASHED)
- dotted line (DOT)
- extended dashed line (DASHEDX2)

Figure 10.5: Linetype definitions(level 4)



Thus:

```

0
TABLE          Start of table.
  2
LTYPE         Type of table – Ltype.
  70
    5         Flags – maximum number of table entries.
    0
LTYPE         Start of linetype definition.
  2
CONTINUOUS    Linetype name.
  70
    64        Standard flags.
    3
Solid Line    Linetype description.
  72
    65        Alignment.
  73
    0         Number of dash length items.
  40
    0.0       Total pattern length.
    0
LTYPE
  2
DASHED        Linetype name.
  70
    64        Standard flags.
    3
- - - - -
72

```

65	Alignment.
73	
2	Number of dash length items.
40	
0.75	Total pattern length.
49	
0.5	Dash length.
49	
-0.25	Dash length (negative indicates a gap).
.	
.	
.	
0	
ENDTAB	End of table.

Figure 10.6: Layer table (level 3)

Details of the layers are given in [chapter 9](#).

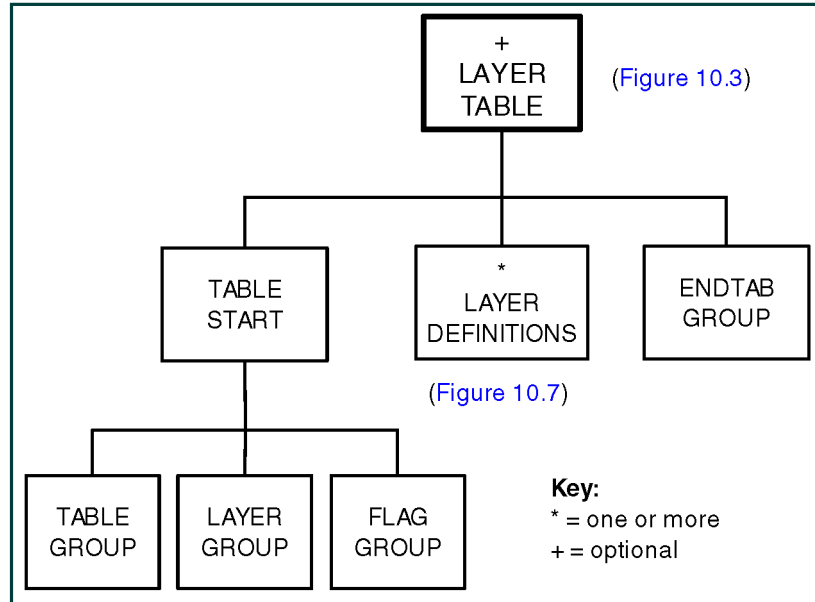
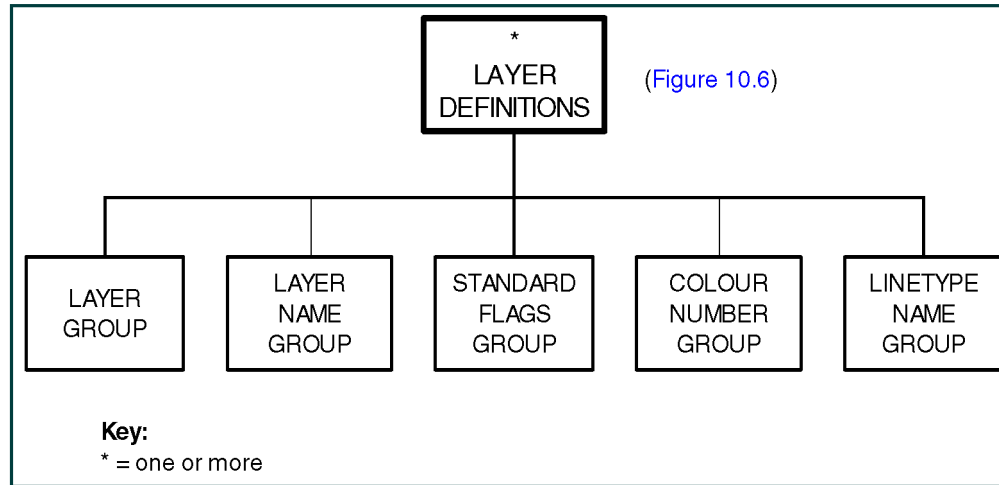


Figure 10.7: Layer table (level 4)

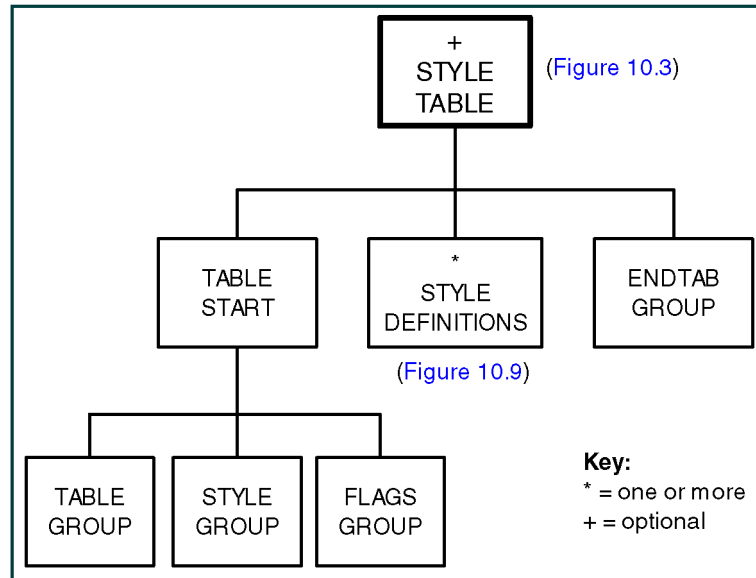


```

Thus:
0
TABLE          Start of table.
2
LAYER          Type of table – layer.
70
305           Maximum number of table entries.
0
LAYER          Start of layer definition.
2
G8010001      Layer name.
70
0             Standard flags.
62
1             Colour number.
6
CONTINUOUS    Linetype name.
0
LAYER          Start of next layer definition.
2
G8010004
70
0
62
1
6
DASHED
.
.
.
0
ENDTAB        End of table.

```

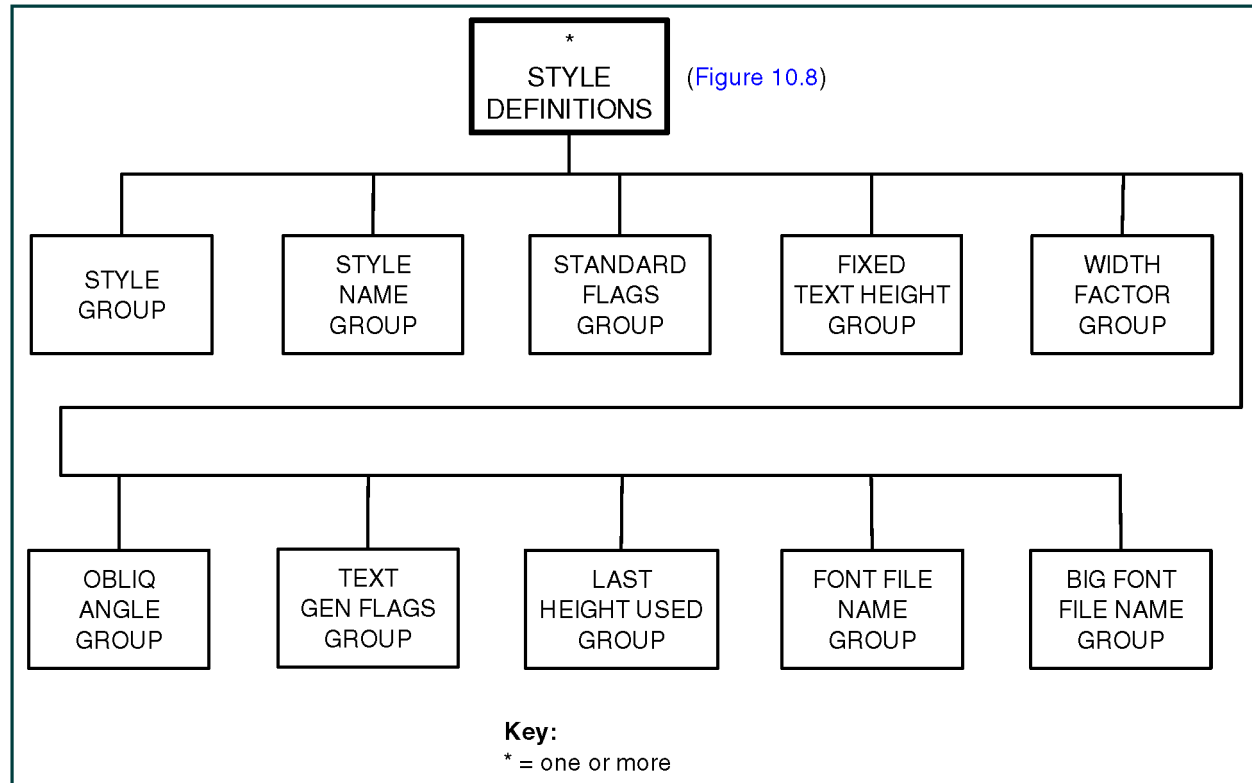

Figure 10.8: Style table (level 3)



The style table contains the text file load instructions for:

- SIMPLEX.SHX
- GOTHICE.SHX.

Figure 10.9: Style definitions(level 4)



Thus:

0	
TABLE	Start of table.
2	
STYLE	Type of table – style.
70	
5	Flags – maximum number of table entries.
0	
STYLE	Start of style definition.
2	
STANDARD	Style name.
70	
64	Standard flags.
40	
0.00	Fixed text height.
41	
1.00	Width factor.
50	
0.00	Oblique angle.
71	
0	Text generation flags.
42	
1.00	Last height used.
3	
SIMPLEX.SHX	Font file name.
4	
	Big font file name (not used).
0	
STYLE	Start of next style definition.
2	
ANTIQUITY	

```
70
  64
  40
  .
  .
  .
GOTHICE.SHX
  4

  0
ENDTAB      End of table.
```

Blocks

This section contains block definition entities describing the entities that make up each block in the drawing. Land-Line and Land-Line.Plus blocks are described in [chapter 9](#).

Figure 10.10: Blocks section (level 2)

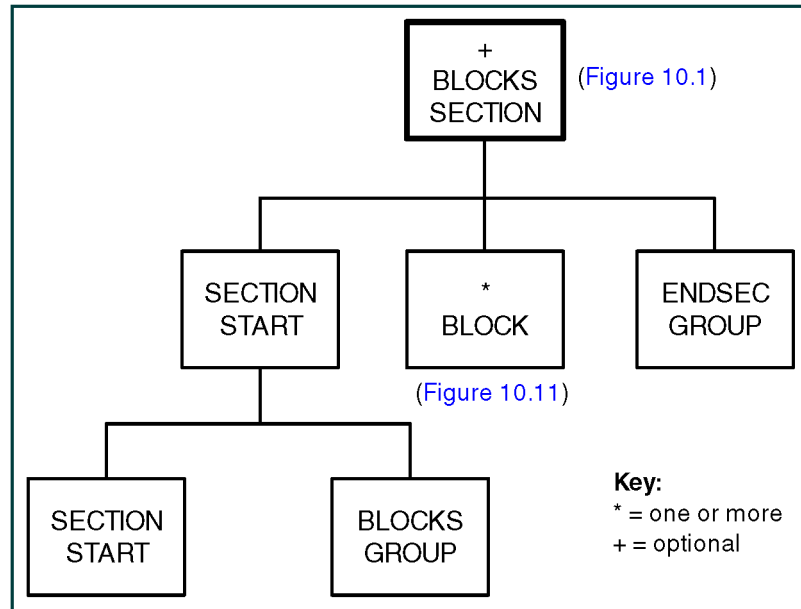
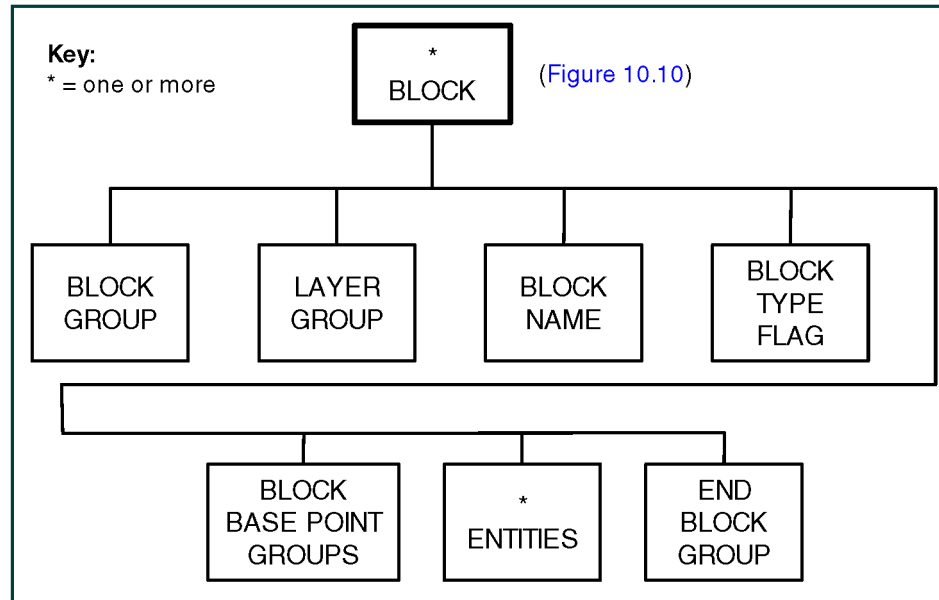


Figure 10.11: Blocks (level 3)



Thus:	
0	
SECTION	Start of section.
2	
BLOCKS	Type of section – blocks .
0	
BLOCK	Start of block definition.
8	
0	Layer – not used.
2	
SPOTH	Block name.
70	
64	Block type flag.
10	
0.0	Block base point – X.
20	
0.0	Block base point – Y.
30	
0.0	Block base point – Z.
3	
SPOTH	Block name (repeated).
0	
LINE	There then follow any number of entities (of any
8	type) that make up the symbol to be drawn.
0	Coordinates are referenced from the block base
10	point defined above.
0.0	The structure of entities is described following
20	this example.
-4.6	
30	
0.0	
11	
0.0	
21	
4.6	

```

31
0.0
  0
LINE
  8
  0
ENDBLK      End of block definition.
  8
0
.
.
.
  0
ENDSEC      End of blocks section

```

Entities

The entities section contains DXF entities for:

- Ordnance Survey tile footnote data (text entities).
- Grid and neatline (text and line entities).
- Ordnance Survey map features (text, polyline and insert entities).

The structure of each different entity is as follows:

- **Insert entities** – these consist of:

	Group code	
● Insert entity type group	(0)	
● Attributes follow flag	(66)	[optional if 0]
● Layer name group	(8)	
● Block name group	(2)	
● X coordinate group	(10)	
● Y coordinate group	(20)	
● Z coordinate group	(30)	[optional]
● X scale factor	(41)	[optional if 1]
● Y scale factor	(42)	[optional if 1]
● Z scale factor	(43)	[optional if 1]
● Rotation angle	(50)	[optional if 0]

- **Line entities** – these consist of:

	Group code	
● Line entity type group	(0)	
● Layer name group	(8)	
● Start X coordinate group	(10)	
● Start Y coordinate group	(20)	
● Start Z coordinate group	(30)	[optional]
● End X coordinate group	(11)	
● End Y coordinate group	(21)	
● End Z coordinate group	(31)	[optional]

- **Polyline entities** – these consist of:

	Group code	
• Polyline entity type group	(0)	
• Layer name group	(8)	
• Vertices follow flag	(66)	
• X elevation	(10)	[optional – if given, is always set to 0]
• Y elevation	(20)	[optional – if given, is always set to 0]
• Z elevation	(30)	[optional]
• Default starting width	(40)	[optional if 0]
• Default ending width	(41)	[optional if 0]
• A number of vertex entities		[shown below]
• Seqend group	(0)	

- **Vertex entities** – these consist of:

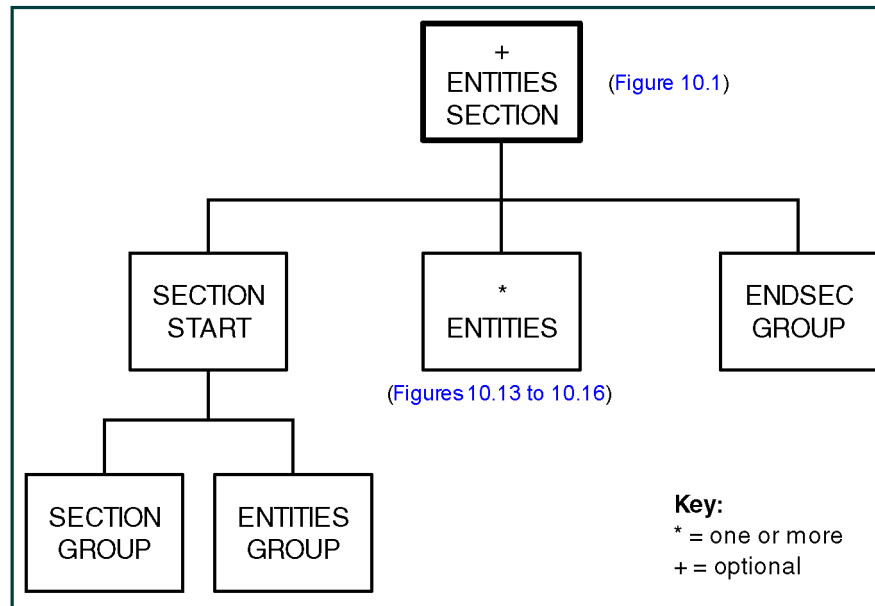
	Group code	
• Vertex entity type group	(0)	
• Layer name group	(8)	
• X coordinate group	(10)	
• Y coordinate group	(20)	
• Z coordinate group	(30)	[optional]
• Starting width	(40)	[optional]
• Ending width	(41)	[optional]
• Bulge	(42)	[optional if 0]
• Vertex flags	(70)	[optional if 0]
• Curve fit tangent direction	(50)	[optional]

- **Text entities** – these consist of:

Group code

- | | | |
|---------------------------------|------|-----------------|
| • Text entity type group | (0) | |
| • Layer name group | (8) | |
| • X coordinate group | (10) | |
| • Y coordinate group | (20) | |
| • Z coordinate group | (30) | [optional] |
| • Text height group | (40) | |
| • Text value | (1) | |
| • Rotation angle group | (50) | [optional if 0] |
| • Relative X scale factor | (41) | [optional if 1] |
| • Oblique angle | (51) | [optional if 0] |
| • Text style name | (7) | [optional] |
| • Text generation flags | (71) | [optional if 0] |
| • Horizontal justification type | (72) | [optional if 0] |
| • Vertical justification type | (73) | [optional if 0] |

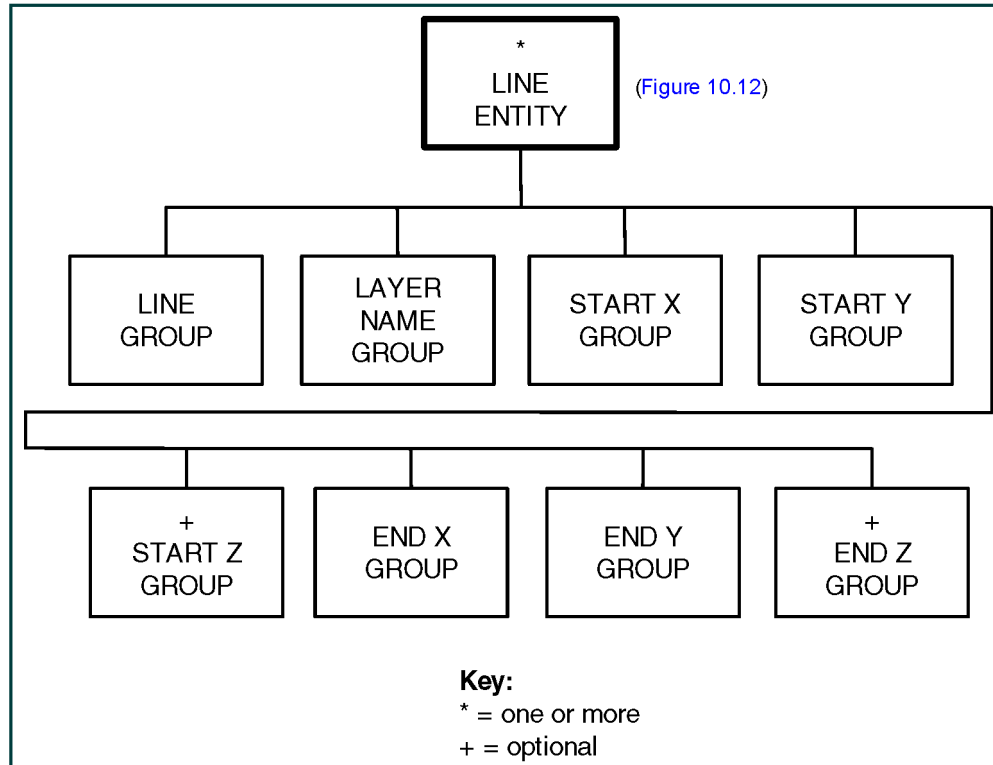
Figure 10.12: Entities section (level 2)



Entities can be:

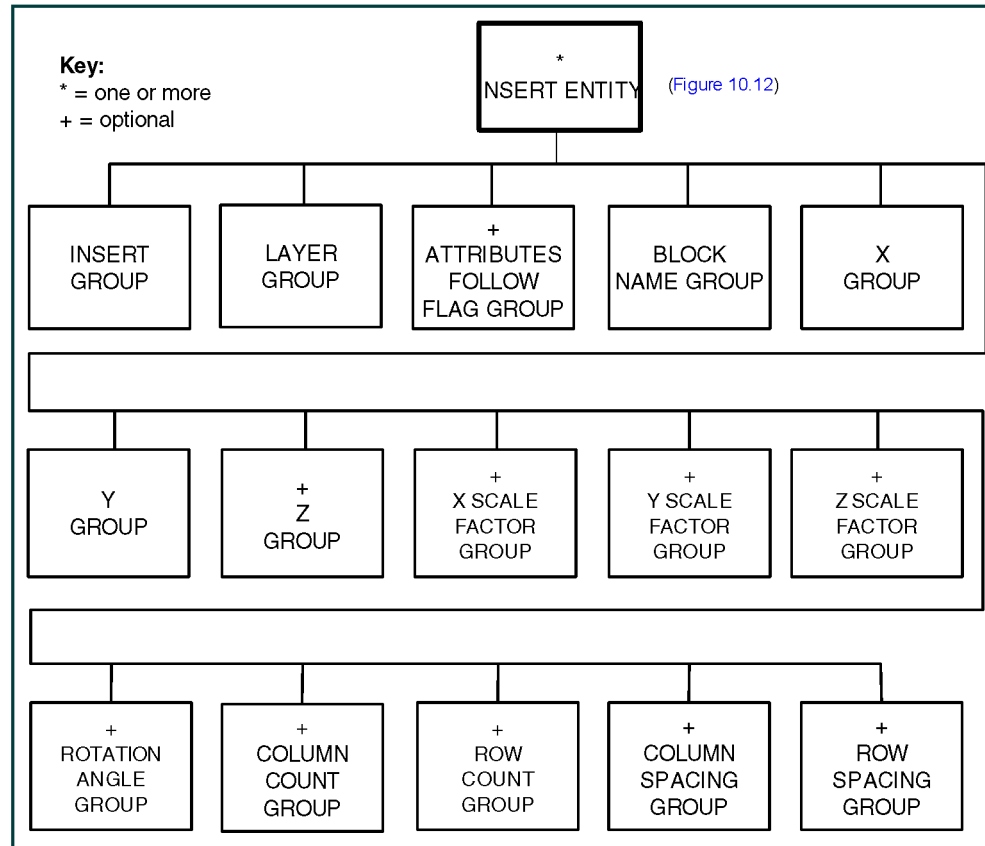
- line (figure 10.13)
- insert (figure 10.14)
- text (figure 10.15)
- polyline (figure 10.16)

Figure 10.13: Line entity (level 3)



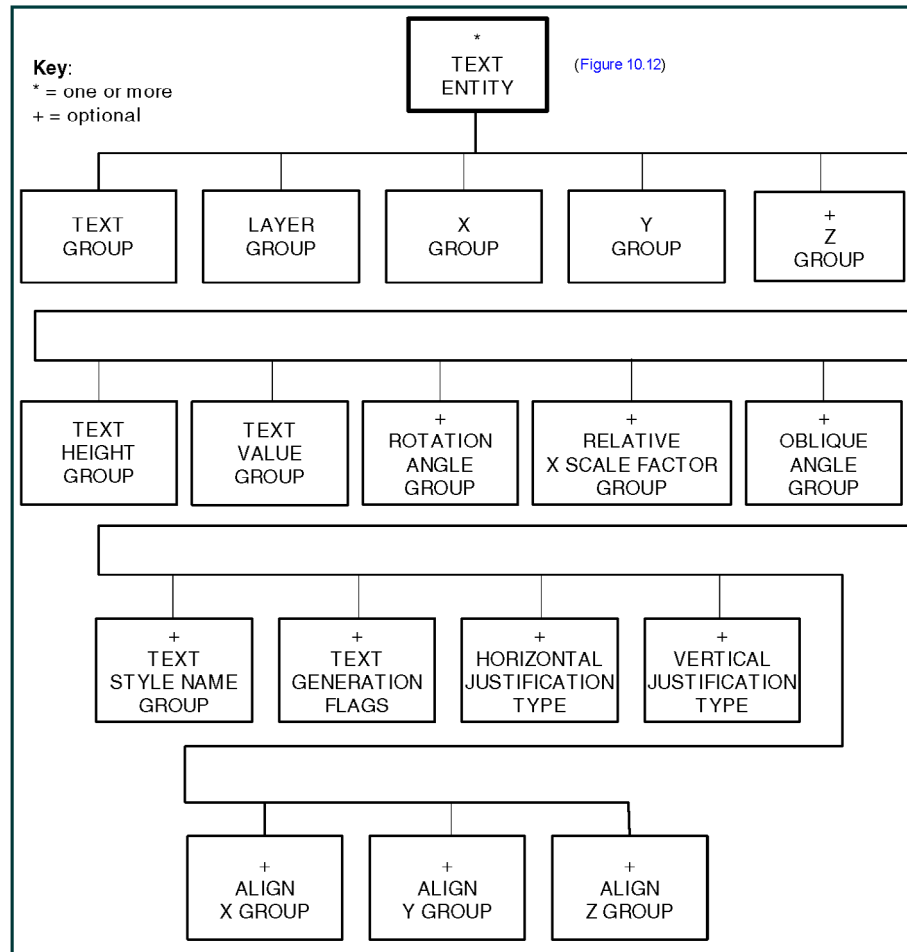
Thus:
0
LINE Entity type – line.
8
G8010573 Layer name.
10
320000.00 Start X coordinate.
20
560000.00 Start Y coordinate.
11
325000.00 End X coordinate.
21
560000.00 End Y coordinate.

Figure 10.14: Insert entity (level 3)



Thus:
0
INSERT Entity type – insert.
8
G8010570 Layer name.
2
REGTM Block name.
10
323140.00 X coordinate.
20
565670.00 Y coordinate.
41
3.13 X scale factor.
42
3.13 Y scale factor.

Figure 10.15: Text entities (level 3)



Thus:	
0	
TEXT	Entity type – text.
8	
G8010571	Layer name.
10	
321580.00	X coordinate.
20	
566000.00	Y coordinate.
40	
140.00	Text height.
1	
Ordnance Survey	Text value.
7	
STANDARD	Text style name.

Figure 10.16: Polyline entity (level 3)

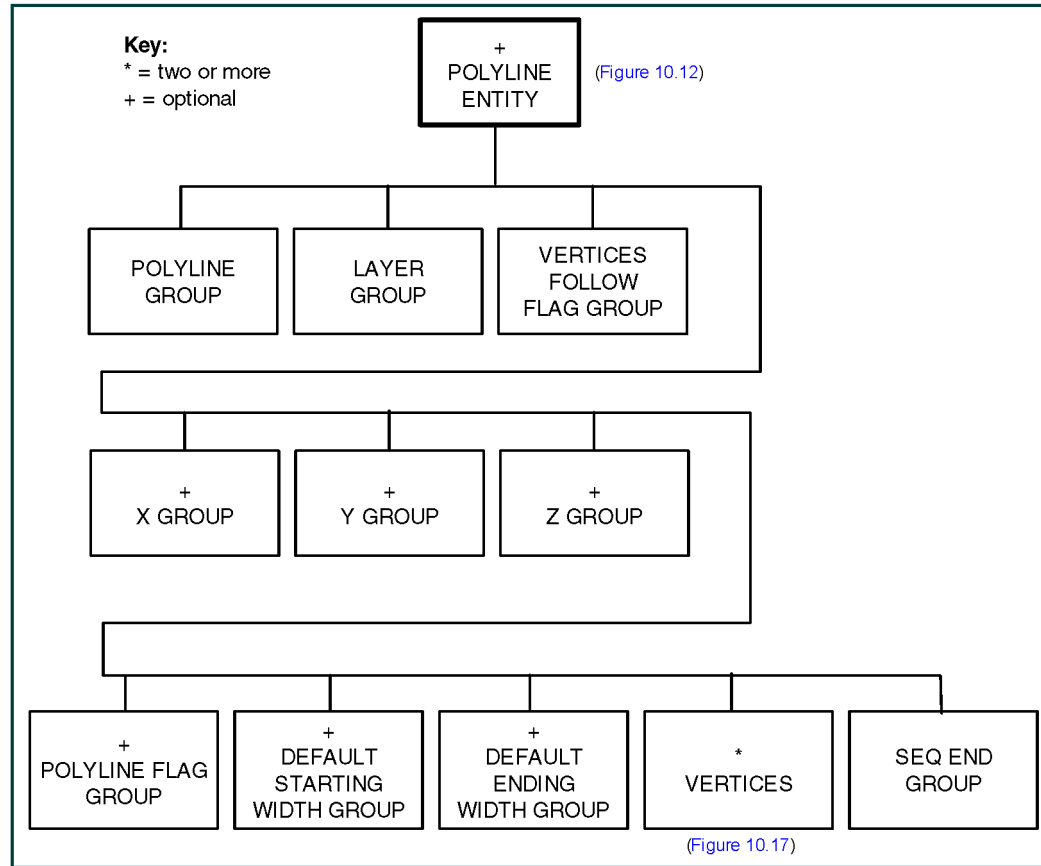
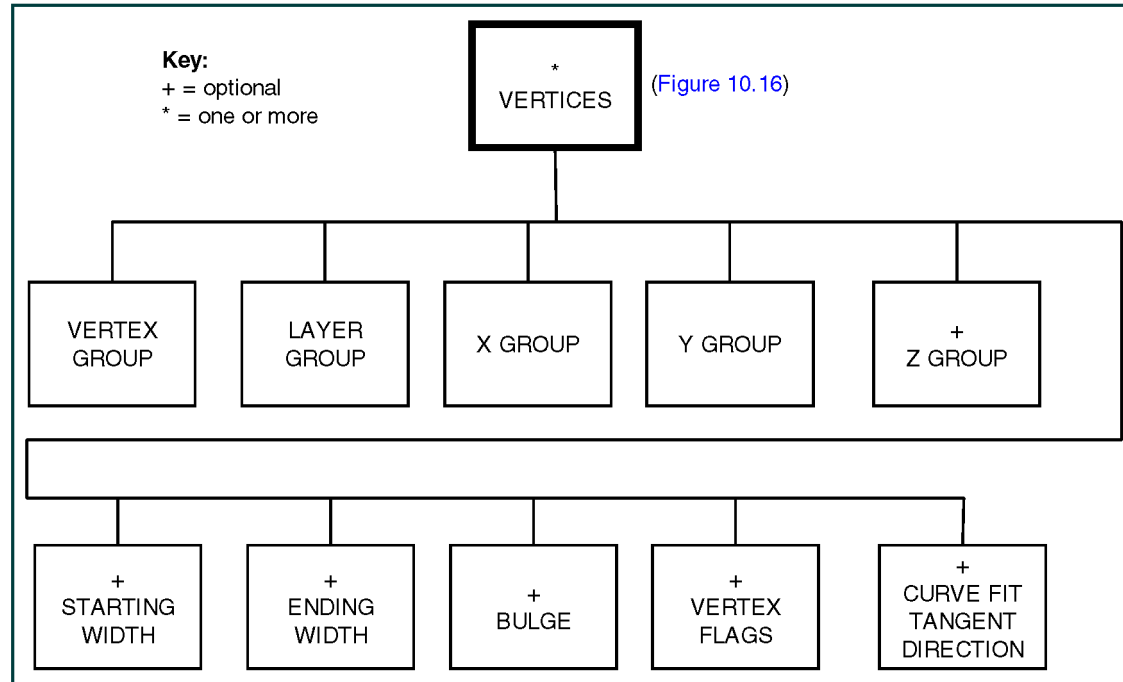


Figure 10.17: Vertex entity (level 4)



Thus:	
0	
POLYLINE	Entity type – polyline.
8	
G8010030	Layer name.
66	
1	Vertices follow flag.
70	
8	Polyline flag group.
0	
VERTEX	Entity type: Vertex.
8	
G8010030	Layer name.
10	
324298.91	X coordinate.
20	
564845.67	Y coordinate.
70	
0	Vertex flags.
0	
VERTEX	Next vertex entity.
8	
G8010030	
10	
324298.20	
20	
564843.60	
70	
0	
.	
.	Any number of vertex entities may be included.
.	
0	
SEQEND	No more vertices.

End of file group

This group ends with DXF EOF (end of file group):

```
0  
EOF
```

Appendix A Glossary

The following is a list of technical terms used in this user guide, together with a fuller definition.

absolute accuracy

A measure which indicates how closely the coordinates of a point in Ordnance Survey map data agree with the true National Grid coordinates of the same point on the ground.

As the true position can never be known exactly, the statistic is quoted relative to the best known position determined by precise survey methods.

absolute coordinates

A coordinate pair or triplet measured directly from the origin of the coordinate system in which it lies and not to any other point in the system.

accuracy

The closeness of the results of observations, computations or estimates to the true values or the values accepted as being true. Accuracy relates to the exactness of the result, and is a measure of the exactness of the operation by which the result is obtained.

administrative area

A blanket term used by Ordnance Survey to refer to all public administrative areas, specifically, local government management and electoral areas.

aggregation

The grouping together of a selected set of like entities to form one entity. For example, grouping sets of adjacent area units to form larger units, often as part of a spatial unit hierarchy, for example, wards grouped into districts. Any attribute data is also grouped or is summarised to give statistics for the new spatial unit.

alignment

A data construction segment; a line of sight between two real-world features or features shown in Land-Line; or a tape line; by definition a straight line; and delimited by points; construction points; or a temporary point and a construction point, used in the construction of a survey of the real world from which Land-Line data can be produced.

alphanumeric

Information in character form.

arc

A locus of points that forms a curve that is defined by a mathematical function.

area

A spatial extent defined by circumscribing lines that form a closed perimeter that does not intersect itself.

area feature

The abstraction of an object as a clearly bounded space in two dimensions. Areas are represented and bounded by a series of adjoining lines and may contain other areas and be contained within other areas. They may intersect with a line and thereby create two or more areas. Areas may contain lines or points or a single seed point (isolated node).

area seed

A point within an area that can be used to carry the attributes of the whole area, for example, ownership, address and use type. In Land-Line an example would be landscape features such as vegetation.

ASCII (American Standard Code for Information Interchange)

It is a 7-bit code for encoding a standard character set.

basic scale

The scale at which the survey is undertaken. For Ordnance Survey mapping, three scales (1:1250 – urban, 1:2500 – urban and rural, 1:10 000 – mountain and moorland) are used (see [page 160](#)).

basic scale file and/or unit tile (sheet)

A grouping of topographic information relating to a specific spatial extent, in the form of a map either held as a data file or realised on paper.

basic scale tile

A discrete area of spatial data stored as a separate unit on a databank. The area of the digital map unit is determined by the scale of its graphic output, either 1:1250 scale (urban areas), 1:2500 scale (for rural areas) or 1:10 000 scale (for mountain and moorland areas). Current tile sizes used for basic scales are: 1:1250 scale data tile: 500 m by 500 m; 1:2500 scale data tile: 1 km by 1 km; 1:10 000 scale data tile: 5 km by 5 km.

bearing

Bearings are angles measured against the National Grid in degrees. They are measured clockwise from grid north.

bench mark

A survey point, on a fixed object, the altitude of which has been surveyed in relation to Ordnance Datum or the applicable local datum, which in turn is related to mean sea level.

block

A DXF term used to describe annotated or grouped lines, for example, defined symbols in Land-Line.

boundary

A boundary is the limit of a pre-defined and established area whose limit is determined by one or more lines, for example, county area boundary and reservoir boundary.

boundary symbol

Conventional signs used for depicting the alignment of different types of local government and parliamentary constituency boundaries.

building

A physical, walled structure connected to foundations which has, or will have a roof, that is, this definition includes buildings surveyed at foundation stage.

byte

A unit of computer storage of binary data usually comprising 8 bits, equivalent to a character. Hence megabyte, one million bytes, and gigabyte, one thousand million bytes.

cartography

The organisation and communication of geographically related information in either graphic or digital form. It can include all stages from data acquisition to presentation and use.

CD-ROM

A data storage medium. A 12 cm disc similar to an audio CD.

centred symbol

A pre-defined symbol held in the user's software and generated from a point feature in Ordnance Survey digital map data. The data point may not be plotted nor is it necessarily the centre of the symbol.

character

A distinctive mark; an inscribed letter; one of a set of writing symbols.

character code

The binary representation of a single element of a character set. For example, EBCDIC, ASCII.

character set

A set of letters, numerals, punctuation marks, mathematical and other symbols. Standard sets have been drawn up such as ANSI, ISO and others.

character string

A one-dimensional array of characters held either in memory or in another storage medium.

coded string data

A type of vector data in which the strings of coordinates have been feature coded.

coding

Allocation of a feature code to a feature being created from constituent construction data (points and/or segments); with optional linking to an existing feature of the same feature code.

coincident line feature

A feature derived from the merging of vectors from the same or different features, having coincident or near coincident alignments (as determined by a set tolerance) and feature code. Coincident features carrying certain feature codes constituting different thematic layers are not merged, for example, boundaries and landform.

contiguous

Literally adjacent, touching. In the context of digital mapping, the word has a special meaning and implies a connected entity.

continuation mark

A logical record may contain more data than can be held in a single physical record. The physical record contains a continuation mark (the penultimate character of the record in NTF) to indicate whether more data is to be found in a continuation record.

continuation record

A specific NTF term. A continuation record is used where space does not allow one logical record to be contained wholly within one physical record.

conventional archive

Map information stored in non-digital form, for example, on paper. The conventional archive exists in a very wide range of formats which reflect differences in the methods used to gather the information, differences in the product items which are produced from the archival information and also differences in production techniques which have been adopted over the years.

coordinate pair

An X and Y value measured with reference to Cartesian axes. In mapping, a coordinate pair normally consists of an easting and a northing.

coordinates

Pairs of numbers expressing horizontal distances along orthogonal axes. Alternatively, triplets of numbers measuring horizontal and vertical distances. Row and column numbers of pixels from raw imagery are not considered coordinates for the purpose of this convention. (See coordinate pair.)

copyright

Copyright is a legal property right which enables the creator of an original work to protect it from unauthorised use. Through the *Copyright, Designs and Patents Act 1988*, Crown copyright continues to subsist in all Ordnance Survey products until the end of the period of 50 years from the end of the year in which they were published, and in the case of digital data from the end of the year in which it was extracted from the Ordnance Survey database. Crown copyright is vested in The Controller of Her Majesty's Stationery Office, who has delegated powers to the Director General, Ordnance Survey for the administration of copyright in publications and data, including the determination of rules and terms under which permission for their reproduction is given.

currency

An expression of the up-to-dateness of data.

data

A representation of facts, concepts or instructions in a formalised manner suitable for communication, interpretation or processing.

data capture

The encoding of data. In the context of digital mapping this includes map digitising, direct recording by electronic survey instruments, and the encoding of text and attributes by whatever means.

data format

A specification that defines the order in which data is stored or a description of the way data is held in a file or record.

data model

A data model indicates what information is to be contained in a database, how the information will be used, and how the items in the database will be related to each other.

data point

A coordinate pair which defines the position of a point feature, or one of a series of coordinate pairs which defines a line feature.

data quality

Attributes of a dataset which define its suitability for a particular purpose, for example, completeness, positional accuracy, currency, logical structure and so on.

data structure

The defined logical arrangement of data as used by a system for data management; a representation of a data model in computer form.

data transfer medium

This is the means by which computer files are transferred from one computer to another. Transfer media may be subdivided into communications media and physical media.

data type

This defines the structure of a data item. This in turn determines the range of values it can take and the range of operations that can be applied to it. Integer, real and character string are examples of data type. Some modern programming languages allow user-defined types.

databank

A collection of data in a common location relating to a given set of subjects.

database

An organised, integrated collection of data stored so as to be capable of use by relevant applications with the data being accessed by different logical paths. Theoretically it is application-independent, but in reality it is rarely so.

dataset

An identifiable collection of related data.

derived map

A map which has been produced by reference to other source data, rather than directly from a survey.

descriptive name

A sub-type of name; positioned by a coordinate pair.

detached part

A term applying to a part of a local government or parliamentary area which is completely surrounded by other local government or parliamentary areas, and is not connected to the parent area by direct access on the ground.

digital

Data which is expressed as numbers (digits) in computer-readable form is said to be digital.

digital archive

Archival map data stored in digital format.

digital map

A term used by Ordnance Survey to describe a particular tile of digital map data.

digital map data

The digital data required to represent a map. The data includes not only map detail but also feature header data, map header data and management data.

digital map file

The digital map data comprising a map sheet unit.

digital map unit (DMU)

Synonymous with digital map file.

digitising

The process of converting analogue (hand drawn) maps and other sources to a computer-readable form. This may be point digitising, where points are only recorded when a button is pressed on a cursor, or stream digitising where points are recorded automatically at preset intervals of either distance or time as the cursor is traced along a map feature.

distinctive name

A name given to a feature or place to distinguish it from other features or places of a similar nature, for example River Thames, Park Lane Methodist Church, Leeds or New Forest;

double water feature

A water feature such as a river or canal which appears on a map at a basic scale and whose limits are defined by two surveyed lines.

DXF (Data Exchange Format)

A proprietary data format, devised by Autodesk, by which digital drawings may be transferred between users of CAD (computer-aided design) systems. DXF has become an industry standard data format and is an option for the transfer of Ordnance Survey Land-Line.

eastings

See [rectangular coordinates](#).

EBCDIC (extended binary coded decimal interchange code)

An 8-bit character encoding scheme.

edgematch

The process of ensuring that data along the adjacent edges of map sheets, or some other unit of storage, matches in both positional and attribute terms.

edit

The process of validating and correcting errors in digital map data. See also [update](#).

encoding

The process of converting information to a computer-readable form, for example, digitising maps.

entity

Something about which data is stored in a databank or database, for example, building or tree. The data may consist of relationships, attributes, positional and shape information and so on. Often synonymous with feature.

entity type

A grouping of entities with common characteristics.

extent of the realm (EOR)

The external bounding lines of Land-Line data is the extent of the realm. The *Territorial Waters Jurisdiction Act 1878* and *the Territorial Waters Order in Council 1964* confirm that the extent of the realm of Great Britain as used by Ordnance Survey is properly shown to the limit of mean low water (mean low water springs in Scotland) for the time being (except where extended by parliament).

feature

An item of detail within a digital map which can be represented by either a point, symbol, text or line.

feature classification record

A specific, named NTF record which lists the feature codes in use in the current database.

feature code (FC)

A numeric attribute used in digital map data to describe each feature in terms either of the object surveyed or its representation on the map (or both). A feature code is equivalent to a layer in DXF.

feature identifier

A unique code to identify an individual feature. (See also feature serial number.)

feature serial number (FSN)

A number used as a feature identifier usually allocated on a sequential basis. For example, the order in which features are digitised.

field

A specified part of a record containing a unit of data, such as the date of digitising. The unit of data may be a data element or a data item. In NTF a field is a subdivision of a physical record. Every field has a name and a pre-defined interpretation.

file

An organised collection of related records. The records on a file may be related by a specific purpose, format, or data source, and the records may or may not be arranged in sequence. A file may be made up of records, fields, words, bytes, characters or bits.

font

The style of text character used by a printer or plotter.

footnotes

Supplementary or explanatory notes pertaining to a map sheet which are normally included below the southern neatline of a printed map and supplied with DXF data.

foreshore

The foreshore is taken to be the area of land between mean high water (MHW), or mean high water springs (MHWS) in Scotland, and the extent of the realm (EOR).

format

The specified arrangement of data. For example, the layout of a printed document, the arrangement of the parts of a computer instruction, the arrangement of data in a record.

free end

The end of a line feature which does not intersect or connect with any other line feature, that is, the point defining the free end does not share a coordinate pair with any other feature.

NOTE: It may be coincident with a point feature, for example, a post box or the end of a wall.

generated lines

Lines created by means of an algorithm from several coordinate pairs and/or construction points, for example, arc, circle, rectangle and curve.

geographical information system (GIS)

A system for capturing, storing, checking, integrating, analysing and displaying data that is spatially referenced to the Earth. This is normally considered to involve a spatially referenced computer database and appropriate applications software.

geographical coordinates

These are coordinates, usually expressed as latitudes and longitudes which define position on the Earth's surface.

geometric data

Data about position within an absolute or relative coordinate system.

geometric structure

The relationships, implied or explicit, between the points and lines and text forming the dataset and representing the real world.

Global Positioning System (GPS)

A system of coordinating a ground position in three-dimensions using radio transmissions from a pattern of US defence satellites.

grid

The planimetric frame of reference, for example, the National Grid.

hard copy

A print or plot of output data on paper or some other tangible medium.

header

See [map header](#).

indicator

See [seed](#) or [seed point](#).

junction

A connection between two or more links at a common node. Junctions may be X-junctions or T-junctions.

kilobyte (Kb)

1 024 bytes; a measure of data storage capacity.

land parcel

An area of land, usually bounded by real-world features or implied alignments and usually with some implication for land ownership or land use.

layer

A subset of digital map data, selected on a basis other than position. For example, one layer might consist of all features relating to roads, and another to buildings.

line

A series of connected coordinated points forming a simple feature with homogeneous attribution.

line feature

The spatial abstraction of an object in one dimension. Lines may intersect with other lines. They are defined as a series of two or more coordinate pairs and may be curved or straight. Curved lines consist of a series of very short straight line segments. Lines may be concurrent with other lines under certain conditions. As an object abstraction a line has no width.

line segment

A vector connecting two coordinated points.

linear feature

Map feature in the form of a line, for example, a road centreline, that may or may not represent a real-world (extant) feature.

link or edge

Links are the representation of line features. They are made up of one or more consecutive non-intersecting link segments with common attributes between two terminating nodes. Links have no connection with other links except at the start or end, via common (shared) terminating nodes (points). All links contain their terminating coordinates. Links may form the boundaries of polygons and may be shared between polygons.

logical record

A logical record contains all the information relating to a data entity, for example, a feature record. A logical record may comprise one or more physical records.

map

A graphical or digital representation of the landscape including natural and/or man-made features.

map generalisation

The process of reducing the complexity of the detail on a map when reducing the map scale.

map header

Data at the start of the digital map file describing that data. It may contain information on the source and history of the geometric data within the map and the coordinate system in use.

map projection

The systematic arrangement of meridians and parallels portraying the curved surface of the sphere or spheroid upon a plane. In many cases it is sufficient to regard the Earth as a perfect sphere.

map scale

The ratio between the extent of a feature on the map and its extent on the ground, normally expressed as a representative fraction, for example, 1:1250 scale or 1:50 000 scale.

map sheet unit

The ground area covered by a single map.

marginal name

A text feature whose position is such that it plots or displays entirely outside the neatline of a plotted or printed map.

mean high water/springs (MHW or MHWS)

Depiction of the encroachment of land by tidal waters at mean highest levels – spring tides in Scotland.

mean low water/springs (MLW or MLWS)

Depiction of limits of tidal waters at mean lowest ebb – spring tides in Scotland.

megabyte (Mb)

1 048 576 bytes, a measure of data storage capacity.

mereing

A medieval term which defines the relationship of a boundary to topographic features on the ground at time of survey. If at a later date the ground detail changes or disappears, then that section is not re-mered, but the mereing changes to defaced.

model

See [data model](#).

name

The proper name, or label, of an object abstraction or object (real-world).

name or text feature

The proper name or label of an object (real-world) or feature (object abstraction) consisting of one or more text strings. A name position is defined by a coordinate pair.

National Grid

The metric grid on a Transverse Mercator projection used by Ordnance Survey on all post-war mapping to provide an unambiguous spatial reference in Great Britain for any place or entity, whatever the map scale.

neatline

The outer grid lines, forming the boundary of the map sheet.

node

An object representation of a point which either does not form any part of a link (isolated node or polygon seed point); or is the representation of a point at the start or end of a link (terminating node). The position of a node is defined by a single coordinate pair, which is repeated within all links logically connected at that node and/or containing it.

normal tidal limit (NTL)

The point at which the level of a river ceases to be affected by the tidal flow of mean high tides. This point may be an artificial barrier such as a lock or weir.

northings

See [rectangular coordinates](#).

NTF (National Transfer Format)

A format designed in 1988 specifically for the transfer of spatial information. Administered by the British Standards Institution (BSI), its present version (2.0) conforms to BS 7567. NTF is used to supply Land-Line (see also [DXF](#)).

object

A collection of entities which form a higher level entity within a specific data model. For example, a group of entities defining a drainage system.

orientation

Orientation of a point or a text feature, measured in degrees anticlockwise from grid east.

overhaul

The process of refashioning the old County Series 1:2500 scale maps to adequate National Grid standards. It included the adjustment of the detail on the old maps to the control points of the 1936 retriangulation, the recompilation of the maps on the national Transverse Mercator projection and with sheet lines corresponding to the National Grid, the elimination of errors (particularly those caused by distortion of materials and inadequacy of old revision methods), the revision of detail and, finally, the fair drawing of all maps to a new specification. Early experiments were carried out in the Cotswolds and, therefore, the method is often referred to as the Cotswold Adjustment. Overhaul was carried out between 1948 and 1980.

origin

The zero point in a system of rectangular Cartesian coordinates.

parcel

See [land parcel](#).

parity

The practice of appending a check-bit to binary values to make the sum of the 1-bits always odd or always even. A mechanism for error detection.

pecked line

A line drawn on a map as a series of dashes, for example, - - - - -.

photogrammetry

The science, art and technology of obtaining reliable measurements and maps from aerial photographs.

physical record

In NTF, a physical record may be fixed length (in which case it contains 80 characters) or variable length (which contains up to 80 characters). (See also [logical record](#).)

point

A zero-dimensional spatial abstraction of an object represented as a coordinate pair.

point and line data structure

A form of vector data structure designed for map production in which all map features are designated as points or lines or text. Point and line data does not carry the topological relationships between features.

point digitising

A method of digitising in which a cursor is placed over any position which is to be recorded and a button pressed to send that position to the computer. Contrasted with stream digitising.

point feature

A zero-dimensional spatial abstraction of an object with its position defined by a coordinate pair. Points may also be represented by symbols which may have attributes such as orientation and size.

polygon

Polygons are representations of areas. A polygon is defined as a closed line or perimeter which completely encloses a contiguous space and is made up of one or more links. At least one node occurs on the perimeter of a polygon where the bounding link completes the enclosure of the area. There may be many nodes connecting the bounding links of a polygon. Links may be shared between polygons. Polygons may wholly contain other polygons; or be contained within other polygons. Each may contain a single isolated node (seed point) which identifies the polygon.

polygon boundary

The link or links which enclose a polygon, projected into the horizontal plane.

polygon point

See [representative point](#).

polygon seed

See [seed](#).

Portable Revision Integrated Survey Module (PRISM™)

Ordnance Survey editing system used for digitising the latest survey information and economic maintenance of the currency of digital mapping.

positional accuracy

The degree to which the coordinates define a point's true position in the world, directly related to the spheroid and/or projection on which the coordinates system is based.

Positional accuracy improvement programme

A programme, started in April 2001 to improve the accuracy of 1:2500 scale map detail when measured against the National Grid. The programme is due to take five years.

precision

The exactness with which a value is expressed, whether the value be right or wrong.

real-world object

Something which exists either physically, legally or conceptually in the real world. Examples include: buildings, roads, rivers and so on, as well as rights of way, administration areas and boundaries, postcode sectors and so on. Non-physical real-world objects are located spatially with reference to other, physical, objects. Real-world objects may contain or be part of another real-world object, for example, a housing estate may contain a number of houses and be part of a town.

record

A set of related data fields grouped for processing.

recording format

The logical and/or physical levels of the protocol governing the laying down of data on the physical transfer medium.

rectangular coordinates

Also known as x-y coordinates and as eastings and northings. These are two-dimensional coordinates which measure the position of any point relative to an arbitrary origin on a plane surface, for example, a map projection, a digitising table or a VDU screen.

reformed mapping

Reformed mapping is a method of improving the accuracy of overhaul mapping. It consists of a partial resurvey, based on air triangulation and completion by fit-and-trace methods of pockets of old detail to match the new.

relative accuracy

Relative accuracy compares the distance between features measured on the ground to the corresponding information contained in the map data.

When measuring between data points represented on the map it is worth noting that some distortion may occur due to the materials and process used to produce the map.

relative coordinates

A coordinate pair or triplet measured relative to another point in the coordinate system in which it lies, rather than from the origin. (See also [absolute coordinates](#).)

representative point

A point within a polygon that can be used to carry the attributes of the whole polygon. For example, owner or land use type. Also called area seed, peg point, point label, polygon point, polygon seed.

resolution

A measure of the ability to detect quantities. High resolution implies a high degree of discrimination but has no implication as to accuracy. For example, in a collection of data in which the coordinates are rounded to the nearest metre, resolution will be 1 metre, but the accuracy may be ± 5 metres or worse.

resurvey

Resurvey is the complete survey of detail based directly on National Grid control (OSGB36). It may be completed wholly on the ground or by a combination of aerial and ground survey methods.

road network line

An implied and imaginary line depicting the alignment of a road carriageway (represented by FC0098 in Land-Line in NTF or G8010098 in Land-Line in DXF). They are not specifically surveyed or precisely positioned within the data. They are digitised to fall between kerb lines, but will not necessarily fall equidistantly between them.

roof seed (or roofed building indicator)

A coordinated point anywhere within a building which is used to identify that structure as a roofed area.

rotation

Movement of a vector through an angle.

section

In NTF terminology, a subdivision of a database. In Ordnance Survey terms this equates to a single map sheet, that is a digital map file or a tile.

seed

A seed is a digitised point within an area, often a defined polygon, for example, a lake or woodland, but not always, for example, a geographical seed such as the South Downs. (See also [representative point](#).)

seed point

A coordinated point within an area to which alphanumeric information may be attached.

segment

A link or line defined by two consecutive coordinates in a line string.

sheet

See [map sheet unit](#).

source scale

The scale of the source information from which the map was digitised, that is the scale of survey for a basic scale map, or the scale of the source map for a derived map.

spot height

A point on the Earth's surface for which the height, above a reference datum, is known and which has been fixed by observation.

straight

The extended alignment of any straight piece of ground detail (link or construction segment), for example, a wall, a fence or the side of building.

string (1)

A set of items which can be arranged into a sequence according to a rule. (See [character string](#).)

string (2)

A sequence of coordinate pairs or triplets making up a line or a link.

structure

See [data structure](#).

structured data

Data within which collections of features (of any type) form objects. Topographically structured data also contains topological information defining the relationships between features and objects.

structured node

The topological expression of any point, whether isolated or at the end of a link.

surveying

The determination of the absolute and relative positions of points, on or near the Earth's surface, by means of measurement in the three elements of space – distance, direction and elevation – and hence their subsequent representation onto a plane surface, exhibiting them in their correct horizontal and vertical relationships.

symbol feature

A feature represented by a graphical sign with a specific meaning, for example, a triangulation pillar or a bench mark.

T-junction

A junction created at the intersection between two (or more) line features, where one of the line features does not extend beyond the other feature (or features). A special case of a T-junction occurs where a feature intersects with itself and one or both of the feature ends do not extend beyond the junction, for example, a closed building.

terminator

A character, or character string, or field or record used to signal the end of a record or section or volume or database.

text categories

Subsets of text defined in data by a code according to the class of object to which the text relates. In NTF there are no text categories; separate feature codes are used for text relating to different classes of objects.

text coordinates

Each text feature has a start-of-text coordinate which is digitised.

text feature

A free-standing text string in the digital data describing a feature, or particular instance of a feature, for example, Factory or ACACIA AVENUE.

text height

The height at which a text string is plotted and/or displayed. This information is included in the feature header of the text feature.

text position

See [text coordinates](#). Also known as original digitised position.

text string

The set of characters to be plotted as a text feature; it is indivisible in the data.

tile

See [basic scale tile](#).

topographic database

A database in which data relating to the physical features and boundaries on the Earth's surface is held.

topography

Topography is the study of the physical features of the earth. A topographic map's principal purpose is to portray and identify the features of the earth.

transfer format

The format used to transfer data consistently between computer systems. In general usage this can refer not only to the organisation of data but also to the associated information, such as attribute codes, which are required in order to successfully complete the transfer.

transfer medium

The physical medium on which digital data is transferred from one computer system to another. For example, CD-ROM.

transfer set

A specific NTF term for the data, together with its supporting information, which the customer receives.

triangulation station

A permanently marked and fully documented control station whose position on the earth's surface has been established to a high accuracy, both absolutely and in relative terms to other adjacent stations, by means of angular or electronic distance measurement. Triangulation stations form the framework on which all survey and mapping techniques are based.

unique junction coordinates (UJC)

The unique coordinate value of a line feature junction; data points having this unique value are present along each of the intersecting features.

update

The process of adding to and revising existing digital map data to take account of change.

upper level of through public communication (ULC)

The area of the upper level of public communication in complex multilevel structures – represented in Land-Line data by the ULC seed.

vector

A straight line joining two data points.

vector data

Positional data in the form of coordinates of the ends of line segments, points, text positions and so on.

volume

A physical unit of the transfer medium, that is, a single disk, a single DAT, a single CD-ROM and so on.

word

A group of characters representing a unit of data and occupying one storage location. A word is usually long enough to contain one computer instruction or one integer, for example, 16 or 32 bits.

Appendix B Product and service performance report form

Ordnance Survey welcomes feedback from its customers about Land-Line.

If you would like to share your thoughts with us, please print a copy of this form and when completed post or fax it to the address below.

Your name: Phone:.....

Organisation: Fax:

Address: Email:

.....

.....

Postcode:

Please record your comments or feedback in the space below. We will acknowledge receipt of your form within 3 working days and provide you with a full reply or a status report within 21 working days.

If you are posting this form, please send it to:

Customer Contact Centre, Ordnance Survey, Romsey Road, SOUTHAMPTON, SO16 4GU.

Fax: 023 8079 2615