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Strategi®

User guide v5.2

Preface

This user guide contains all the information you need to make effective use of Strategi®. 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 endeavour made to ensure that the contents are accurate. If you find an error or omission, or otherwise wish to make a suggestion as to how this user guide can be improved, please contact us at the address shown under Contact details.

The contents of this user guide will be updated by the release of replacement chapters.

Contact details

Sales Information will be pleased to deal with your enquiries:

Sales Information Helpdesk
Phone: 08456 05 05 05
Fax: 023 8079 22615
Email: enquiries@ordsvy.gov.uk

or write to:

Sales Information
Ordnance Survey
Romsey Road
SOUTHAMPTON
United Kingdom
SO16 4GU

Visit the Ordnance Survey web site at: www.ordnancesurvey.co.uk

Product performance

If you have any problems with or identify any errors in the data, or this user guide, please complete the Product performance report form at appendix B and return it to us.

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A full description of the terms and conditions of supply and use of Strategi is detailed in the signed *Customer contract* held by you or your organisation.

Ordnance Survey makes every effort to ensure that data supplied is free from errors and omissions. We will remedy, as soon as reasonably practicable, errors and omissions that the customer notifies to us in writing. It is the customer's responsibility to ensure that data ordered is suitable for the intended purpose. We will not be liable to the customer or any other party for any loss, damage, inconvenience or expense resulting from the use of, or reliance upon, the data.

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User guide copyright

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Contents

Chapter 1 Introduction

Using this user guide

This chapter and chapter 2 provide an introduction to Strategi, describe the data structure and illustrate potential uses. Chapter 3 contains details of the content of the data. These chapters are designed to enable users to make effective use of Strategi. Please refer to the glossary if you are unfamiliar with the terms used.

For information on specific Strategi data formats, please refer to chapters 6 to 9 of this user guide.

All aspects of Strategi discussed in this user guide relate to Strategi 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 will be stated. Icons, as shown below, will be used to denote these differences.

For convenience BS 7567 (NTF v2.0 Level 3) is referred to as NTF in this user guide.

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

Strategi – an introduction

Strategi is detailed digital map data, ideal for applications requiring an overview of geographical information on England, Scotland and Wales. It supports a wide range of applications, including planning or environmental analysis. Users can geographically link their business information with Strategi to analyse national trends or to provide a planning overview, for example, the provision of a framework for road scheme planning.

Full technical information on Strategi data transfer formats is contained in the chapters 6 to 9 of this user guide.

The purpose of chapters 6 to 9 is to:

- Provide a brief description of the presentation of Strategi in the two transfer formats in which it is supplied:
  - BS 7567 (NTF v2.0 Level 3).
  - Data Exchange Format (DXF) (conforming to AutoCAD release 12 with extended entity data).

  As part of this description, data structure diagrams are used to give greater explanation where necessary.
- Provide Licensed Partners with as much detail as necessary to enable Strategi files in either NTF or DXF to be easily understood and processed by application software.

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

Because of the fundamental differences in the data format of Strategi supplied in NTF and DXF, this user guide devotes separate chapters to these transfer formats.

Chapters 6 to 9 should be read in conjunction with chapters 1 to 3, which describe the content of Strategi.

Strategi features

- Coded features which give each feature a specific category, allowing users to group like features for search, display and output routines.
- Strategi is defined as a limited *link and node* structure. It contains points, lines and nodes. Nodes have pointers to lines (links) that join at the node but there is no explicit topology within the data. Similarly, there are lines (links) that enclose an area containing a point (seed), and again there is no explicit topology between the lines (links) and point (seed). Some points (seeds) are not contained within areas enclosed by lines (links).
- Annual updating and Ordnance Survey's comprehensive intelligence gathering ensures that high standards of currency and integrity are maintained. Version 02.00 is revised to July 2001, with major roads advanced to December 2002.
- Names are stored in attribute records and are applied to features, such as rivers and roads, as attributes of these features. Names applying to geographical names include the cartographic position for screen display. These may also be included in the attribute record of the appropriate point or line feature.

Strategi benefits

The high specification of Strategi offers a number of benefits:

- National coverage.
- The definitive 1:250 000 scale dataset for Great Britain suited to multiple applications using a geographical information system (GIS), computer-aided design (CAD) and digital mapping systems.
- Structured vector format, offering maximum functionality and allowing you to build closed polygons.
- Annually updated from maintained data source.
- Supplied as seamless data.

Strategi applications

Strategi provides a comprehensive national database of geographical (spatial) information designed to support a wide range of applications. Strategi is intended as a limited basis for an in-depth national resource for strategic planning and analytical processes.

The list of potential applications is by no means exhaustive; some examples are:

- Route planning and network analysis – such as shortest path computations.
- What if? – analysis.
- Statistical analysis for social, environmental or marketing decision making.
- Linking and integrating user's own information with spatial data.
- Customised graphic output.

What you need to use Strategi

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

Strategi is supplied as data only and does not include software for data viewing or manipulation. Strategi 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 format 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.

Strategi in DXF also conforms to the National Economic Development Office (NEDO) standard for the exchange of two-dimensional CAD drawings. Strategi can therefore 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 Strategi.

Strategi supply

Supply unit

Strategi is supplied as seamless data files. Great Britain is supplied as two files – GB north and GB south. Country coverages are hardcut to 5 km from the national border.

Supply options

The options for data supply are as follows for both NTF and DXF formats:

- A complete database of Great Britain
- Country datasets:
  - England
  - Scotland
  - Wales

Transfer formats

This user guide supports the following formats:

- BS 7567 (NTF v2.0 Level 3).
- DXF conforming to AutoCAD release 12 with extended entity data.

Media

Strategi is supplied on CD-ROM only.

Update

Updates are provided for each operative year of your licence.

Strategi version numbering (or specification)

The following gives details of the product specification identity and their relationship to Ordnance Survey data capture specifications. This user guide reflects the product specification current at the time of its production. Version details of these specifications are also stated.

Product	Product specification
Strategi	Strategi_02.00

Transfer format specifications:

Name	BS 7567 (NTF v2.0)	DXF (release 12)
Level	3	
Version	2	1
Issue date	15 May 1992	1 January 1997

NTF release

The current release is NTF v2.0 and will be supplied until further notice. The NTF version is indicated by the {NTFVER} field of the Volume Header Record [VOLHDREC]. The effective date of the definition of NTF v2.0 in Strategi is 15 May 1992 and is indicated by the {DDATE} field of the Database Header Record.

Strategi output options

Strategi is inert data. It requires software (not provided by Ordnance Survey) to display it on a screen or to plot it out as hard copy.

BS 7567 NTF

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

Strategi 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 and attributes.

DXF

The parameters defining colours, line styles, text styles, symbols and so on are embedded within the DXF file, as is customary with this CAD format.

The resolution of Strategi will support plotted or displayed output at a range of scales around the nominal scale of the source mapping.

User warning:

Plotting at too small a scale will result in a map of cluttered appearance, with text too small to be legible.

A suggested output within 25% of a map's source scale should allow all data to be sensibly plotted or displayed.

Chapter 2 Strategi data structure

Data overview

Basic principles

Lines and/or links represent all linear features, for example, roads, railways, rivers, lakes and so on.

Points represent individual map entities and may be either free standing or enclosed by line features.

Nodes represent intersections and direction changes between links.

Each feature has associated geometry; this may be a single coordinate pair for a single point feature for a railway station or two or more coordinate pairs for a linear feature.

Each feature is classified by means of a feature code which may have one or more associated attributes.

Seed points are representative points which have attributes describing an area feature. They may fall within a polygon or be freestanding.

Data structure

Strategi data is defined as a geometrically structured *link and node* (see figure 2.1) database. Geographical features are represented as: **points** – these are fixed positionally by one coordinate pair, for example, a roundabout feature; or **lines** – a series of connected coordinated points to represent, digitally, linear map features such as roads, rivers, settlement boundaries and so on. Points and lines within the data model determine the **geometric** (positional) characteristics of the data.

Lines and points within the data model also have associated **attributes** – these give the point or line entities meaning, that is they represent the descriptive characteristic of an entity such as a feature code, a name or a numerical value.

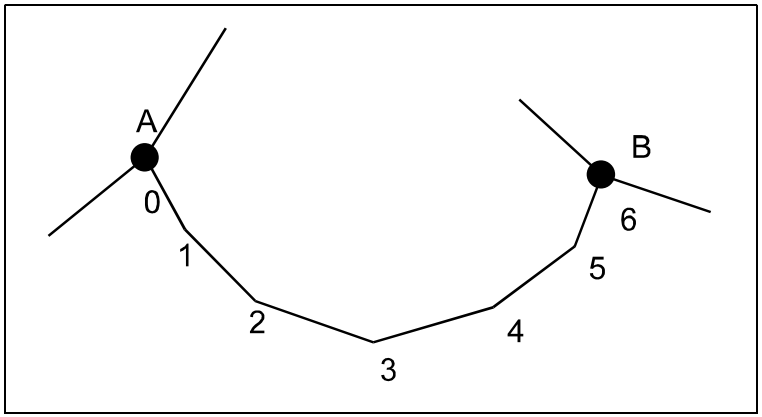
DXF

All features having the same feature code will be recorded on the same layer. DXF has a limited *link and node* structure; within this structure a feature may be a name, point or line. Each feature is free-standing, (its topological relationship to any other feature is not expressed in the data).

Other important data structural concepts include:

Networks are interconnecting linear features structurally related by means of an explicit point described as a **node**. Between the nodes are series of non-intersecting line segments described as **links**; hence, link and node – see figure 2.1. This is of special interest in GIS for network analysis processes such as shortest path computations. Proprietary GIS software is used to build and maintain networks for linear features such as roads, railways and so on. However, not all data with the potential to be a network is structured into one.

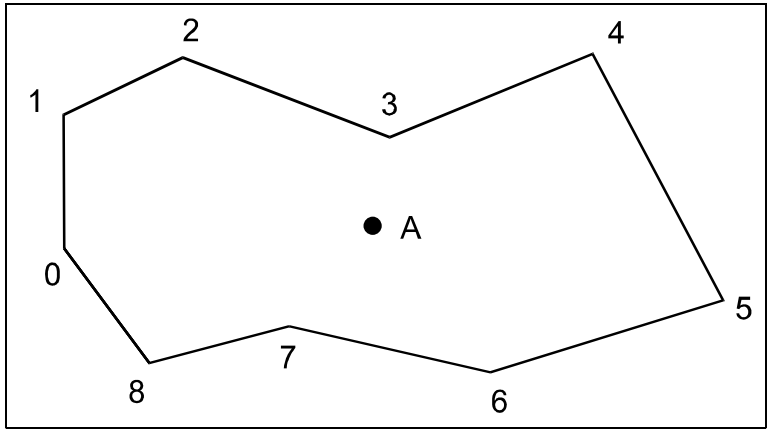
Figure 2.1: Link and node



Points A and B are nodes, as they intersect with other features. The line A–B is the link and, in this example, is made up of 6 individual line segments.

Polygons are continuous areas defined by sets of bounding closed lines. These are implicit within the data, but can be explicitly created with appropriate software. Stored within recognisable polygons are **seed points**, sometimes described as centroids, which hold information about that polygon, for example, a town name. Unnamed polygons have a seed point which exists simply to represent the polygon feature, for example, an unnamed woodland area.

Figure 2.2: Polygon



Point A is the polygon seed point for the area; attached to this point will be attributes such as the feature code, which defines it, and its definitive name – if it is named on the map. The polygon in this example comprises nine individual line segments.

There are also free-standing seed points which are not associated with a defining polygon. An example of such free-standing seed points is a geographical seed such as the *South Downs*.

GIS software provides the functionality to store, manage and manipulate this digital map data. The properties of Strategi make it suitable as the basis for users wishing to develop such applications.

Features

Strategi has two feature classes:

- point features; and
- line features.

These are arranged into recognisable map entities such as: roads, rivers, railways and lakes for line features; roundabouts, windmills, motorway junctions, and airports for point features. A full listing of individual features is given in chapters 6 and 8 for NTF and DXF, respectively.

Each feature has two components:

- feature position; and
- attribute data.

DXF

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

Point features will be recorded in the data as INSERT BLOCKS. Certain standard symbols are defined in the BLOCKS section of the data file. Attributes are stored as extended entity data.

Lines and points

Real-world geographical features are represented in the digital map data as geometric structures of lines and points. Each line or point has a geometric and attribute component.

The geometric component defines the positional characteristic of the feature, and implicit relationships exist between the lines and points based on relative position. The attribute component defines the descriptive characteristics of the feature.

Points may exist independently of lines.

An example of a geometric structure is shown in figure 2.3a.

Figure 2.3a: A geometric structure of lines and points and nodes

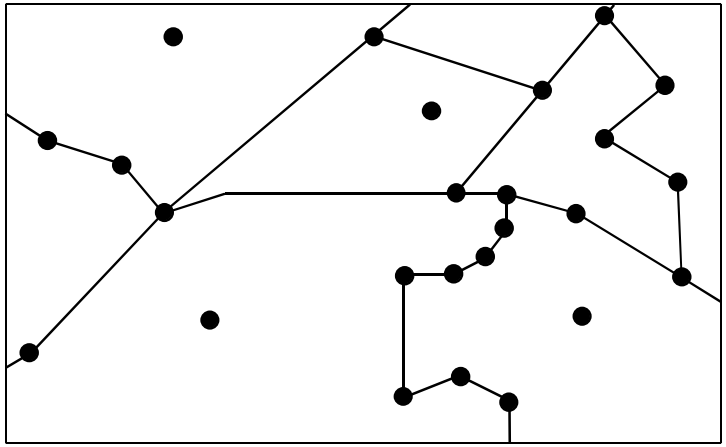
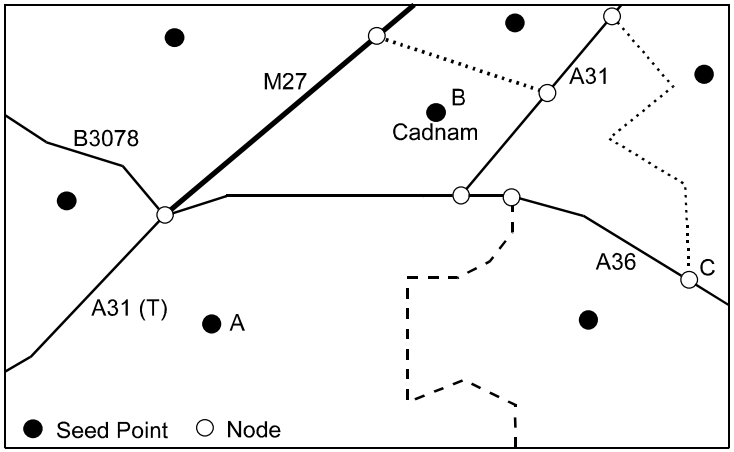


Figure 2.3b: The same geometric structure as map features



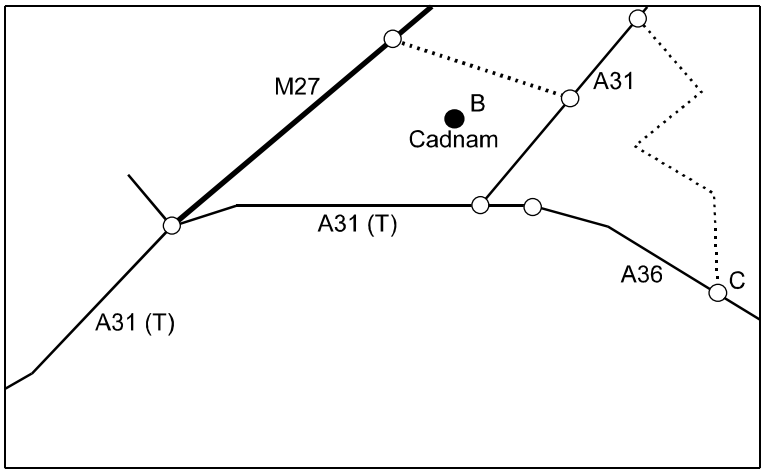
Lines and points from the geometric structure become features when a meaning, the feature code, has been added – for example, roads are created from lines, or settlements from points.

In figure 2.3b:

- Point A is a seed point which has attached to it a feature code identifying it – in this case, a woodland area.
- Point B is a seed point with a feature code that identifies it as an urban area, the seed will also carry its distinctive name attribute – Cadnam.
- Point C is a special case of a point feature which shares a unique coordinate junction between intersecting features – in this case, where the A36 intersects with the urban area. This is an example of a node.

Some lines and points are common to more than one map feature; as shown in figure 2.4a the area – Cadnam – shares its boundaries with the M27, A31(T), A31 and A36.

Figure 2.4a: Overlapping features



These overlapping features are stored separately within the data, as shown in figures 2.4b and 2.4c.

Figure 2.4b: Separate storage of overlapping features

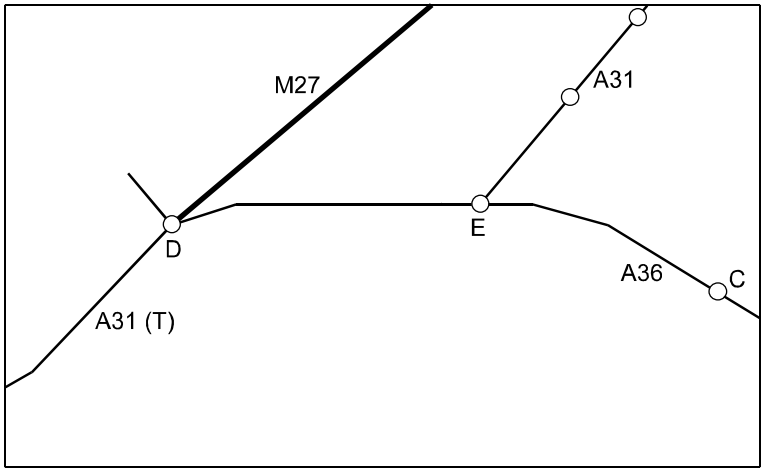
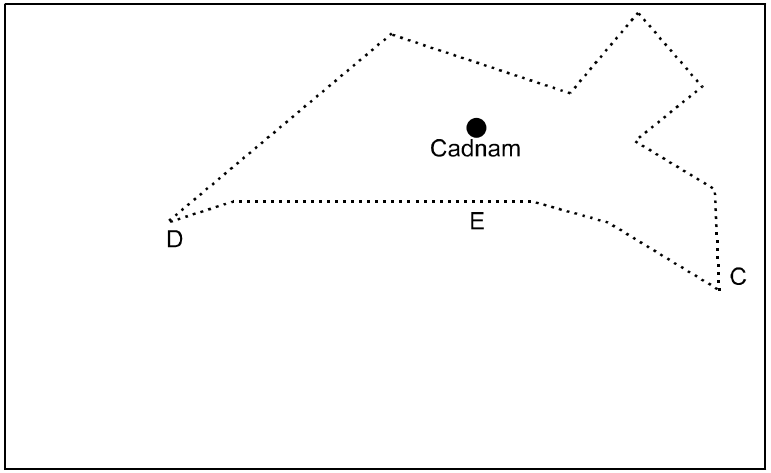


Figure 2.4c: Separate storage of overlapping features



The common line (D–E) to the A31(T) and the settlement polygon, and the common line (EC) to the A36 and the settlement polygon, each represent two lines. The geometry of each feature is stored separately in the data.

Note: Within these examples, road numbers are attributes of the features.

Feature position

The geometry of map features is defined in terms of coordinates. All coordinates used in Strategi are based on the National Grid coordinate referencing system, and are quoted to a 1 m resolution.

Due to limitations of the map scale, features are generalised to give the clearest representation of the real ground position. Certain features will take priority over others according to their importance and their contribution to the usefulness of the map data. As a result of this process features may be omitted or moved to aid clarity and avoid unnecessary clutter.

The National Grid as it applies to Strategi is explained more fully in chapter 5.

Feature attribute data

An attribute is the descriptive characteristic of a feature, that is a non-spatial element.

The geometry of the lines and points within the data would be meaningless unless they are assigned some distinguishing property. In Ordnance Survey map data terms, an attribute can be a feature code (in NTF these are numeric codes), or a distinctive name or number such as Birmingham or M40.

Attribute codes relevant to NTF and DXF are described more fully within chapters 6 to 9.

Feature codes

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 the map base. Thus an A road dual carriageway is distinguished by the feature code allocated to it from a B road single carriageway and other kinds of line feature.

DXF

Each feature is classified as belonging to a specific feature layer. These layers range in value from G8060570 to G8065901, using the *Layer Naming Convention for CAD in the Construction Industry Version 2,* which is based upon the guidelines laid down in BS 1192: Part 5 – *Guide for structuring of computer graphic information*. These feature layers are listed in chapter 8.

A further four text feature codes for layout of footnotes are included. These feature codes are listed in chapter 8.

In order to display the attributes stored as extended entity data, the following two scripts are required. These two files – `Showeed.lsp` and `Showeed.dcl` – are contained in the EXE directory on the Ordnance Survey supplied CD-ROM and should be placed in a directory in the AutoCAD preferences search string. This should include the directory containing the map data files in DXF.

To utilise the scripts, type the following at the AutoCAD command line prompt within a drawing session:

```
AutoCAD: (load "showeed")
AutoCAD: eedd
```

Selecting a map feature will now display the allied attributes of that feature in a dialogue box. To interrogate other features, the *Re-Select* option on the user dialogue box should be chosen. The *Cancel* option will return the user to a normal AutoCAD session.

If the *eedd* command is repeated at the command prompt, the facility will again be available to the user.

The visibility of extended entity data to software other than AutoCAD release 12 will be constrained by the functionality of those individual software applications.

BS 7567
NTF

Each feature is classified as belonging to a specific feature code. These feature codes are listed in chapter 6.

These differences in the data are inferred during translation from Ordnance Survey's internal data format to the required customer transfer format.

Names as attributes

The criteria for names attribute attachment are as follows:

Rivers and roads – each portion of the line, where named in the data.

Place names – a chosen seed point in the urban area.

Other names – freestanding seed points.

Not all stored data is named.

It is possible, with appropriate software, for users to add other names or values of their own choice as attributes of features.

Over codes

The *over* code allows you to give priority to features that go over other features. This code can apply to roads, canals and railways. In NTF this information is explicitly transferred in the node record, and relative levels of the links on the ground are assigned 1 for a level feature or 2 for a feature that crosses over the level feature. However, in Strategi the node record identifies all links as at level 1, and the *over* information is contained within the feature code for that feature.

Strategi application overview

Typical user scenarios

Strategi is a national database of Great Britain, and can form the geographical information base for use with a GIS. Here are two examples:

Example 1 – site research for a large-scale multiple retail outlet

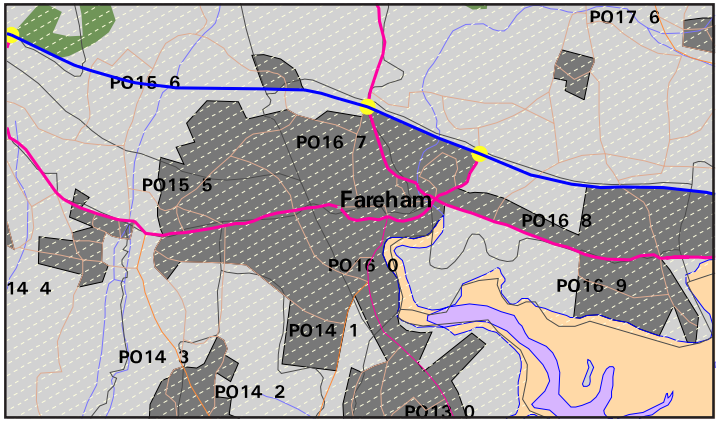
Increasingly retail businesses are looking for competitive advantage; therefore, investment in retail outlets requires careful, efficient, objective and quantified approaches to planning. Where are the ideal locations to site these? What is the local infrastructure like? What is the demographic profile of the local population?

Scenario:

A retailer is looking for a site in Hampshire. The company's criteria for selection are as follows:

- the site must be within a 3 km buffer of a motorway junction;
- the site must be within a catchment area of a large urban settlement; and
- the nearest competitor should not be within 5 km – information derived from the retailer's own competitor database.

Figure 2.5: Site research



GEOPLAN® postcode data supplied courtesy of Geoplan (UK) Ltd.
Note: Postcode data is **not** supplied with Strategi.

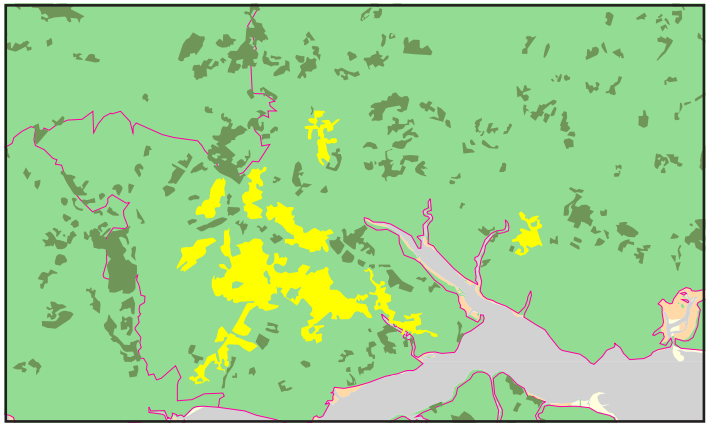
Additionally, the researcher needs to know which postcodes are contained within this settlement area to enable the company to link to their own demographic database.

Example 2 – environmental analysis

Scenario:

Within the county of Hampshire, an environmental authority needs to know which woodland parcels (land areas) of 500 hectares or more are contained wholly within the county, to assist them in their woodland management programme.

Figure 2.6: Woodland parcels – light areas indicate woodlands of 500 hectares or more



Chapter 3 Strategi content

Feature theme description

On the following pages, the feature codes are grouped into themes for easy reference, with explanatory notes where appropriate.

Strategi feature codes are numerically listed in detail in Chapter 6 for NTF format and Chapter 8 for DXF format.

Note: Names, where recorded as attributes, appear in all themes.

Feature codes are prefaced with G806 for DXF format.

1 – Communications

Feature description	Feature code
Motorways	
– normal	5310
– over other feature	5312
– under construction	5300
– under construction, over	5301
– planned	5311
Motorway tunnel	5313
Motorway junction	
– full access	5370
– limited access	5371
– under construction	5372

Feature description	Feature code
Motorways (continued)	
Motorway multi-level junction	
– normal	5379
– under construction	5378
Primary routes	
Dual carriageway	5320
– over other feature	5322
– under construction	5302
– under construction, over	5303
– planned	5321
– roundabout	5355
Single carriageway	5323
– over other feature	5325
– under construction	5304
– under construction, over	5305
– planned	5324
– roundabout	5375
Narrow	5326
– over other feature	5327
Tunnel	5373
Services (motorway and primary routes)	
– full access	5360
– limited access	5361
A roads	
Dual carriageway	5330
– over other feature	5332
– under construction	5306
– under construction, over	5307
– planned	5331
– roundabout	5356

Feature description	Feature code
A roads (continued)	
Single carriageway	5333
– over other feature	5335
– under construction	5308
– under construction, over	5309
– planned	5334
– roundabout	5376
Narrow	5336
– over other feature	5337
– tunnel	5358
B roads	
Dual carriageway	5340
– over other feature	5342
– roundabout	5357
Single carriageway	5343
– over other feature	5345
– roundabout	5377
Narrow	5346
– over other feature	5347
Tunnel	5359
Minor roads – over 4 m wide	
Normal	5350
– over other feature	5351
– roundabout	5374
– tunnel	5353
Minor roads – under 4 m wide	
Normal	5405
– over other feature	5406
– roundabout	5408
– tunnel	5407

Feature description	Feature code
Dead end roads	5403
Dead end roads, over	5404
Other track or road	5384
Other track or road, over	5385
Roundabout – under construction (all roads)	5381
Gradient – 1 in 7 (14%) or steeper	5380
Road tunnel end symbol (all tunnels)	5314
Toll bar	5382
Railways	
Standard gauge	5510
– over other feature	5511
Narrow gauge	5512
– over other feature	5513
Railway tunnel	5514
Railway tunnel end symbol	5515
Railway line under construction	5519
Railway station	5520
Rapid transit station	5521
Rapid transit line	5522
Rapid transit line, over	5523
Rapid transit tunnel	5524
Rapid transit line (U/C)	5525
Level crossing	
– classified roads	5530
– unclassified roads	5531
Airport	
– with customs, no schedule flights	5839
– without customs facilities	5840
– with permanent customs facilities	5841
Heliport	5845

Feature description	Feature code
Ferries	
– vehicular ferry route	5390
– ferry route link	5393
National trails, long distance path and route	5825

- All roads classified by the Department of the Environment, Transport and Regions (DETR) are represented in the data, and identified as dual carriageway, single carriageway or narrow roads with passing places. Please note however, that for clarity, a selection of classified roads have been omitted.
- Vehicular ferries are included within the data and form part of the road network via links.
- Roads are broken at junctions with other roads and at road classification changes.
- Railway information includes all standard gauge railways and their associated infrastructure such as stations and tunnels. However, again please note that for clarity a selection of railway stations have been omitted.
- Narrow gauge railways are included where space permits.

2 – Water features

Feature description	Feature code
Coastline	
– natural and offshore rocks above mean high water (MHW)	5110
– man-made	5111
Sea area seed (below MHW)	5115
Foreshore area	
– sand, outer limit	5120
– sand, inner limit	5494
– sand seed	5121
– other, outer limit	5122
– other, inner limit	5495
– other seed	5123

River (primary)	
– source	5211
– middle	5212
– lower	5213
River (secondary)	
– source	5221
– middle	5222
Other river and drains	5230
Canal	
– normal	5240
– over other feature	5242
– tunnel	5241
– tunnel end symbol	5243
Inland water (lake, reservoir, loch, pond, shoreline and so on)	
– outer limits	5250
– inner limit	5490
– area seed	5251
Lighthouse	
– in use	5140
– disused	5142
Lightship	5141

- Rivers and canals are broken at intersections and do not pass through lakes and reservoirs.
- All rivers are stored as single lines from the source to high water mark. A point is identified where a river enters an estuary. From the estuary point to the sea, the banks are coded as coastline, with the river name as an attribute of a geographical area seed point.
- Lake and reservoir shorelines are broken where a river or canal enters or exits. A dam or barrage is not distinguished from the shore.

- Coastal foreshore detail identifies differences between natural and man-made coastline. Foreshore detail is identified as sand or other, which makes sand areas easily identifiable.
- Information on lighthouses and lightships is also included and is represented by a point feature.
- Sea areas are identified with an unbounded sea seed point, its precise position is not important. Examples of sea seed points include those which denote the Bristol Channel and Falmouth Bay.

3 – Settlements

Feature description	Feature code
Settlement attribute points	
– city	5427
– town	5413
– village	5416
– landmark feature (retail/industrial estates and so on)	5419
Urban area	
– large, outer limit	5420
– large, inner limit	5492
– large, seed	5421
– small, outer limit	5422
– small, inner limit	5493
– small, seed	5423

- Settlements show outer limits and open spaces within urban area outer limits.
- Primary and non-primary route destinations are held as an attribute of the settlement feature codes.

4 – Boundaries

Feature description	Feature code
National boundary	5710
National primary attribute point	5715
County boundary	5720
County primary attribute point	5725
Unitary authority boundary	5740
Unitary authority primary attribute point	5744
District boundary	5730
District primary attribute point	5733
Associated area boundary (arbitrary boundary, for example between islands)	5750
Administrative area detached attribute point	5734
National, forest park boundary	5820
National, forest park attribute point	5821

- Effective date – 1 April 2000.
- The data associated with administrative area seed points contains the name of the administrative area . This is the means by which separated areas of the same administrative area unit are linked together.
- Seed points have associated boundary codes. In the case of national seed points there are coastline and boundary. In the case of county seed points there are coastline, national and county boundaries. In the case of district seed points there are coastline, national, county and unitary boundaries. Any number of separated areas of the same administrative area unit may carry the seed point code.
- Offshore islands will carry administrative area seed points but not the national seed point. Small islands and rocks, coded as point features, do not have area seed points. There is no logical connection in the data between them and ceremonial units.

5 – Land use

Feature description	Feature code
Wood, forest	
– outer margin	5610
– inner limit	5491
– seed	5611
Marsh	5612
Island area attribute point	5621
Geographical area attribute point (parks, moors, woodland, headland, fens, commons, plains, large hills and summits, small hills and other physical features)	5620

- Woodland margins and clearings are included in the land use category along with woodland area seeds.

6 – Other features

Feature description	Feature code
Antiquities	
– Roman road	5810
– antiquity line detail (dyke, wall and so on)	5812
– hillfort	5815
– battlefield	5816
Landmark/antiquity dot (hotel, ruin, castle and so on)	5838
Telephone dot	5837
Television or radio mast	5835
Wind powered generator	5843
Windmill	5844

Feature description	Feature code
Tourist	
abbey, cathedral, priory (open to the public)	5860
aquarium (open to the public)	5875
camping and caravanning combined site	5805
camp site	5861
caravan site	5862
castle (open to the public)	5877
cave (open to the public)	5876
country park (open to the public)	5867
craft centre (open to the public)	5873
ferry box outline	5890
ferry boat	5887
ferry catamaran	5892
ferry hovercraft	5888
garden (open to the public)	5886
golf course	5863
historic house (open to the public)	5878
motor racing circuit	5879
museum (open to the public)	5864
nature or forest trail	5869
nature reserve	5880
other tourist attraction (open to the public)	5883
park and ride	5806
picnic site	5865
preserved railway	5871
racecourse	5885
ski slope	5884
telephone (motoring organisation)	5849
telephone (public)	5847
theme park (open to the public)	5851
tourist information centre (open all year)	5866
tourist information centre (seasonal)	5889
viewpoint (360 degrees)	5882
viewpoint (limited)	5881

Feature description	Feature code
Tourist (continued)	
wildlife centre (open to the public)	5874
youth hostel	5868
zoo (open to the public)	5870
Height	
Spot height dots	5901

7 – Miscellaneous

Feature description	Feature code
100 km accentuated grid line	5397
10 km grid line	5398

8 – Geographic text

Font styles apply only to NTF; text for DXF is STANDARD

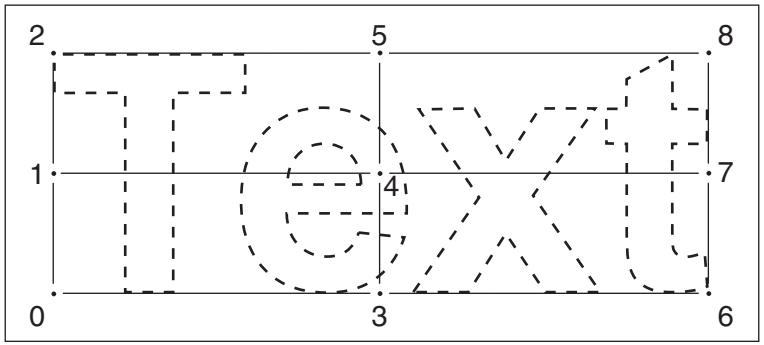
Feature description	Feature code	Font
Primary route destination		
– city	5025	Helvetica Narrow Bold
– town	5041	Helvetica Narrow Bold
– village	5049	Helvetica Narrow Bold
Non-primary route destination		
– city	5026	Helvetica Narrow Bold
– town	5006	Helvetica Narrow Bold
– village	5040	Helvetica Narrow
Road numbers		
– motorway	5031	Helvetica
– primary route	5032	Helvetica
– A road	5033	Helvetica
– B road	5034	Helvetica Oblique
Dual junction divider line	5109	–

Feature description	Feature code	Font
Motorway junction numbers		
– full access	5042	Helvetica Narrow
– limited access	5043	Helvetica Narrow
Toll	5038	Helvetica Bold
Road distance mileage		
– motorway	5036	Helvetica Bold
– primary and A road	5037	Helvetica Bold
Road distance marker		
– motorway	5108	–
– primary and A road	5107	–
Geographical area names (parks, moors, woodlands, commons, moors, plains)	5060	Helvetica Narrow Oblique
Large hills, ranges and summits	5061	Helvetica Bold Oblique
Named hills, islands and rocks	5062	Helvetica Narrow Oblique
Other text (airports without customs facilities, heliport, hotel, oil refinery and so on)	5016	Helvetica Narrow
Water features (river, lake, loch, reservoir, bay, sea, ocean and so on)	5020	Helvetica Narrow Oblique
Tourist feature	5044	Helvetica Light
Ferry annotation	5039	Helvetica
National trails, long distance path and route	5045	Helvetica Bold
National park, forest park	5046	Helvetica Bold

Feature description	Feature code	Font
Spot height values	5090	Helvetica Light
Antiquities		
– Roman (AD43–AD420)	5081	Helvetica Light
– Non-Roman	5082	Zapf Chancery Bold
County name	5721	Helvetica
Unitary authority name	5741	Helvetica
District name	5731	Helvetica

- Includes all cartographically positioned names from the Road Map series (previously Travelmaster®). Names have been transferred in their stored map positions. In addition, an extra 3000 names have been included which did not appear on the Travelmaster series.
- The font and point size of the text is transferred which enables the user to define the appearance of the text.
- Ordnance Survey convention for the digitising of names is as follows: all names are digitised as point features, given as X and Y National Grid coordinates. The point has been digitised relative to the map feature it describes, and the actual point will represent one of the standard positions as illustrated in figure 3.1 on the next page.

Figure 3.1: Standard Ordnance Survey text positions (position 9 represents *no data*)



Names are normally placed on the printed map parallel to the horizontal grid. However, names of linear features are orientated to appear parallel to them, for example, rivers.

BS 7567 NTF

The text string may start, end or be centred on this coordinate pair; the relationship of the text to its coordinate pair is expressed as an *original digitised position*. When the position of text features are recorded, one of these positions is digitised.

DXF

Position 0 is supplied.

Chapter 4 Quality statement

Source of Strategi

Strategi data has been digitised from Ordnance Survey's published mapping at 1:250 000 scale. Originally the data was derived from the Routemaster series of mapping; Routemaster was subsequently superseded by Travelmaster and the Road Map series, Ordnance Survey's current 1:250 000 scale printed map series. There has also been some reference, where necessary, to Ordnance Survey's Landranger® (1:50 000 scale) map series.

Currency

Strategi updates are released annually. Each update is a replacement dataset for all Strategi data held. The updates represent Strategi features as at a date that falls, typically, during the preceding July, with major roads information advanced to the end of that year.

A replacement dataset for all Strategi data held under your contract will be supplied annually.

Accuracy and resolution

The resolution of the coordinate system is 1 m. However, it is not possible to calculate meaningful accuracy limits for this data, due to both the graphic nature and scale of the source 1:250 000 scale mapping.

Such mapping is subject to map *generalisation* – information is cartographically represented in areas where accurate positional representation would cause confusing clutter on the map. Features are selected and positioned according to a predefined specification criteria, adjusting or omitting detail where appropriate.

Nevertheless, the original data was digitised to an accuracy of 0.1 mm, at scale, of the line centre of the original document. The shape of any feature is not altered within this tolerance. When the original centreline is regenerated from the original data by joining coordinates with straight lines, no point on the line should deviate from the original centre by more than 0.2 mm.

All updates of the data are carried out by an experienced cartographer using intelligence documents maintained by Ordnance Survey. New data is input using *best fit* techniques and is subject to map generalisation as with the original data.

Completeness

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

During digitising all source data is checked against source documents to ensure conformance to specification.

Chapter 5 The National Grid

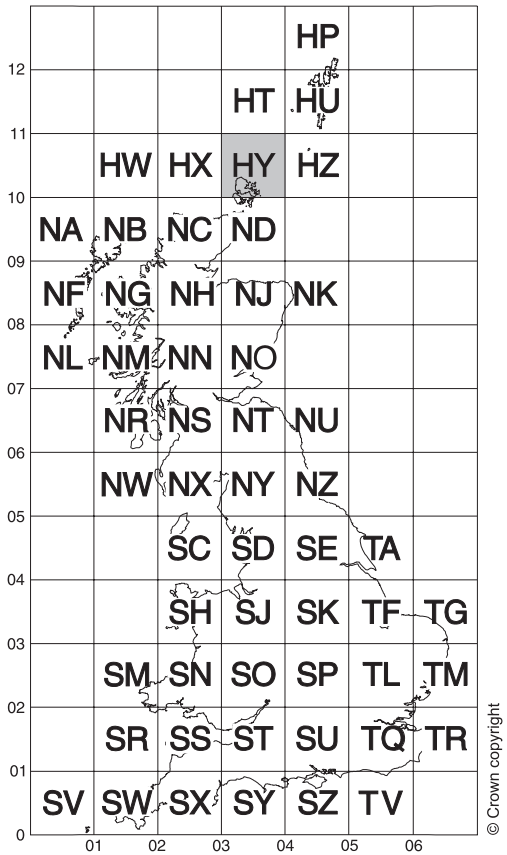
Strategi features are identified by a National Grid reference relative to the National Grid origin.

The National Grid divides Great Britain into squares 100 km by 100 km. Each of the squares has a unique two-letter reference, for example, HY in the diagram alongside .

To convert the absolute coordinates given in Strategi data to a 100 m grid reference, use the first number of the x and y coordinates to determine the reference letter (in the example below 03 and 10 equate to HY) and add this to the combined second, third and fourth coordinate numbers. For example:

absolute x coordinate: 03**234**444
and
absolute y coordinate: 10**678**888

equate to HY234678.



Chapter 6 NTF explained

For convenience, BS 7567 (NTF v2.0 Level 3) is referred to as NTF.

An overview of Strategi in NTF

Strategi data is supplied in the British Standard national format common to most of Ordnance Survey's digital map data products, namely NTF, and is transferred in Level 3 as variable length records. An overview of the data structure of a Strategi data file is shown in diagrammatic form on pages 6.20 and 6.21. The convention used for the diagrams is in the industry standard adopted for Jackson Structured Programming (JSP).

The British Standard for NTF stipulates the following for Level 3:
'This level supports a variety of data models that may include network data, polygons, semantic relationships and complex features – for example, a school consisting of its buildings, boundaries, playing fields.'

This level is designed for:

- Transferring basic geometry and simple features through the use of geometry and feature records.
- Relating basic geometrical and topological elements to one or more features through the use of chain, polygon and complex line records.
- Combining features to form complex features through the use of collection and complex polygon records.
- Using text records both to relate text strings to features and cartographic output.
- Referencing and positioning external features, for example, raster data.

The record structure at this level may also be defined to be compatible with data in Levels 1 and 2.

Chapters 6 and 7 should be read in conjunction with chapters 1, 2 and 3, which describe the structure and content of Strategi.

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

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

Phone: 020 8996 9000
Fax: 020 8996 7400

Any queries relating to the Strategi product should be referred to our Sales Information Helpdesk at the address shown at the beginning of this user guide.

The following pages give a detailed breakdown of the data structure of Strategi in NTF. This is a two-stage procedure which consists of:

- detailed listings of feature codes, descriptions and attributes; and
- descriptions of the data record structure.

Attribute codes for Strategi

Attributes which are used in the supply of Strategi are:

Abbreviation:	Description:	Explanation and examples:
CM	County name	Administrative area county name, for example, KENT COUNTY.
DE	Date	The date of the last amendment, for example, 20001128.
DN	District name	Administrative area district name, for example, THANET DISTRICT.
FC	Feature code	Feature number
FE	Ferry access	Shows method of vehicular access to ferry, for example, roll-on or roll-off.
FF	Ferry from	Shows ferry departure location.
FI	Ferry time	Shows normal crossing time.
FM	Feature name	Feature name, for example Southampton, River Test.
FP	Ferry type	Shows type of ferry, for example, boat or catamaran.
FR	Ferry restrictions	For example, all year or seasonal.
FT	Ferry to	Shows ferry destination.
GS	GIS	Intelligence unique identifier, for example, 33596.
HI	Height – imperial	Shows height as an imperial measurement.
HM	Height – metric	Shows height as a metric measurement.
LO	Location	Identifies location, for example, on motorway, primary/non-primary route.
NU	Numbered feature	Numbered feature, for example, M27 or junction number.
OR	Orientation	Used to describe the orientation of a point feature from grid east, anticlockwise. If absent the feature is not deemed to have an orientation.
OW	Owner	Property owner, for example ENGLISH HERITAGE.
RB	Point (bounded)	Point bounded by line features, for example, a lake.
RJ	Restriction north	Restricted junction – northbound.
RL	Restriction south	Restricted junction – southbound.
RM	Restriction east	Restricted junction – eastbound.
RQ	Restriction west	Restricted junction – westbound.
RU	Point (unbounded)	Point not bounded by line features, for example, SOUTH DOWNS.
RW	Restriction clockwise	Restricted junction – clockwise.
RZ	Restriction anticlockwise	Restricted junction – anticlockwise.
TX	Text	Graphic text associated with a name.
UE	Usage	Indicates status, for example under construction, open 24 hours and so on.
UN	Unitary name	Administrative area unitary authority name, for example, FIFE.

Attribute values for Strategi

Feature	Code	Attribute	Value	Description
Park and Ride	5806	UE	1	Operates all year with a minimum open time Monday – Saturday
Park and Ride	5806	UE	2	Seasonal or Saturday only.
Service station	5360 & 5361	UE	3	Open 24 hours, under construction.
Service station	5360 & 5361	UE	4	Open 24 hours, operational.
Service station	5360 & 5361	UE	5	Not open 24 hours, under construction (from 2002)
Service station	5360 & 5361	UE	6	Not open 24 hours, operational (from 2002).
Service station	5360 & 5361	LO	1	Motorway.
Service station	5360 & 5361	LO	2	Primary route.
Service station	5360 & 5361	LO	3	A-class road.
Settlement attribute points	5413, 5416, 5427	LO	4	Primary route destination.
Settlement attribute points	5413, 5416, 5427	LO	5	Non primary route destination.
Airport	5839, 5840, 5841	UE	7	GB only.
Airport	5839, 5840, 5841	UE	8	European.
Airport	5839, 5840, 5841	UE	9	Worldwide.

NTF feature codes for Strategi

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5006	Non-primary route destination town graphic text	NPR Destination Town Graphic Text	Text	DE, TX	-
5016	Other graphic text	Other Graphic Text	Text	DE, TX	-
5020	Water feature graphic text	Water Feature Graphic Text	Text	DE, TX	-
5025	Primary route destination City graphic text	PRD City Graphic Text	Text	DE, TX	-
5026	NonTextprimary route destination City graphic text	NPR Destination City Graphic Text	Text	DE, TX	-
5031	Motorway number graphic text	Motorway Number Graphic Text	Text	DE, TX	-
5032	Primary route number graphic text	Primary Route Number Graphic Text	Text	DE, TX	-
5033	A road number graphic text	A Road Number Graphic Text	Text	DE, TX	-
5034	B road number graphic text	B Road Number Graphic Text	Text	DE, TX	-
5036	Road distance mileage (motorway) graphic text	Road Distance Mileage (Motorway) Graphic Text	Text	DE, TX	-
5037	Road distance (primary and A) graphic text	Road Distance (Primary & A) Graphic Text	Text	DE, TX	-
5038	Toll graphic text	Toll Graphic Text	Text	DE, TX	-
5039	Ferry annotation graphic text	Ferry Annotation Graphic Text	Text	DE, TX	-
5040	NonTextprimary route village graphic text	NPR Village Graphic Text	Text	DE, TX	-
5041	Primary route destination town graphic text	PRD Town Graphic Text	Text	DE, TX	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5042	Motorway junction number (full access) graphic text	Motorway Junc No (Full Access) Graphic Text	Text	DE, TX	-
5043	Motorway junction number (limited access) graphic text	Motorway Junc No (Ltd Access) Graphic Text	Text	DE, TX	-
5044	Tourist feature graphic text	Tourist Feature Graphic Text	Text	DE, TX	
5045	National trail, long distance path and route graphic text	Long Distance Footpath Graphic Text	Text	DE,TX	-
5046	National park/forest park graphic text	National Park/Forest Park Graphic Text	Text	DE, TX	-
5049	Primary route destination village graphic text	PRD Village Graphic Text	Text	DE, TX	-
5060	Geographic area graphic text	Geographic Area Graphic Text	Text	DE, TX	-
5061	Large hills, ranges and summits graphic text	Large Hills and Ranges Graphic Text	Text	DE, TX	-
5062	Named hills, islands and rocks graphic text	Hills, Islands and Rocks Graphic Text	Text	DE, TX	-
5081	Roman antiquity graphic text (AD43 – AD420)	Roman Antiquity Graphic Text	Text	DE, TX	-
5082	Non-Roman antiquities graphic text	Non-Roman Antiquities Graphic Text	Text	DE, TX	-
5090	Spot height values	Spot Height Values Metric/Imperial	Text	DE, TX	-
5107	Road distance marker (primary and A)	Road Distance Marker (Primary & A)	Point	DE, OR	-
5108	Road distance marker (motorway)	Road Distance Marker (Motorway)	Point	DE, OR	-
5109	Dual junction graphic text divider line	Dual Junction Graphic Text Divider Line	Point	DE	-
5110	Coastline	Coastline (Natural)	Line	DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5115	Sea seed below mean high water	Sea Seed Below Mean High Water	Point	DE, RU	-
5120	Foreshore (sand, outer limit)	Foreshore (Sand, outer limit)	Line	DE	-
5121	Foreshore (sand) seed	Foreshore (Sand) Seed	Point	DE, RB	-
5122	Foreshore (other) and offshore rocks exposed at mean low water, outer limit)	Foreshore (Other, outer limit)	Line	DE	-
5123	Foreshore (other) and offshore rocks exposed at mean low water seed	Foreshore (Other) Seed	Point	DE, RB	-
5140	Lighthouse (in use)	Lighthouse (in use)	Point	GS, FM, DE	-
5141	Lightship	Lightship	Point	GS, FM, DE	-
5142	Lighthouse (disused)	Lighthouse (disused)	Point	GS, FM, DE	-
5200	Unspecified node				
5211	River (primary), source	River (Primary), Source	Line	FM, DE	-
5212	River (primary), middle	River (Primary), Middle	Line	FM, DE	-
5213	River (primary), lower	River (Primary), Lower	Line	FM, DE	-
5221	River (secondary), source	River (Secondary), Source	Line	FM, DE	-
5222	River (secondary), middle	River (Secondary), Middle	Line	FM, DE	-
5230	River (other and drains)	River (Other and Drains)	Line	DE	-
5240	Canal	Canal	Line	FM, DE	-
5241	Canal tunnel	Canal Tunnel	Line	FM, DE	-
5242	Canal (over)	Canal (Over)	Line	FM, DE	-
5243	Canal tunnel (end symbol)	Canal Tunnel (end symbol)	Point	DE, OR	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5250	Inland water (outer limit)	Inland Water (outer limit)	Line	DE	-
5251	Inland water seed	Inland Water Seed	Point	DE, RB	-
5300	Motorway (under construction)	Motorway (U/C)	Line	DE, NU	-
5301	Motorway (under construction, over)	Motorway (U/C, over)	Line	DE, NU	-
5302	Primary route, dual carriageway (under construction)	Primary Route, DC (U/C)	Line	DE, NU	-
5303	Primary route, dual carriageway (under construction, over)	Primary Route, DC (U/C, over)	Line	DE, NU	-
5304	Primary route, single carriageway (under construction)	Primary Route, SC (U/C)	Line	DE, NU	-
5305	Primary route, single carriageway (under construction, over)	Primary Route, SC (U/C, over)	Line	DE, NU	-
5306	A road, dual carriageway (under construction)	A Road, DC (U/C)	Line	DE, NU	-
5307	A road, dual carriageway (under construction, over)	A Road, DC (U/C, over)	Line	DE, NU	-
5308	A road, single carriageway (under construction)	A Road, SC (U/C)	Line	DE, NU	-
5309	A road, single carriageway (under construction, over)	A Road, SC (U/C, over)	Line	DE, NU	-
5310	Motorway	Motorway	Line	DE, NU	-
5311	Motorway, planned	Motorway, Planned	Line	DE, NU	-
5312	Motorway (over)	Motorway (over)	Line	DE, NU	-
5313	Motorway tunnel	Motorway Tunnel	Line	DE, NU	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5314	Road tunnel (end symbol)	Road Tunnel (end symbol)	Point	DE, OR	-
5320	Primary route, dual carriageway	Primary Route, D/C	Line	DE, NU	-
5321	Primary route, dual carriageway planned	Primary Route, D/C Planned	Line	DE, NU	-
5322	Primary route, dual carriageway (over)	Primary Route, D/C (over)	Line	DE, NU	-
5323	Primary route, single carriageway	Primary Route, S/C	Line	DE, NU	-
5324	Primary route, single carriageway planned	Primary Route, S/C Planned	Line	DE, NU	-
5325	Primary route, single carriageway (over)	Primary Route, S/C (over)	Line	DE, NU	-
5326	Primary route, narrow	Primary Route, Narrow	Line	DE, NU	-
5327	Primary route, narrow (over)	Primary Route, Narrow (over)	Line	DE, NU	-
5330	A road, dual carriageway	A Road, D/C	Line	DE, NU	-
5331	A road, dual carriageway planned	A Road, D/C Planned	Line	DE, NU	-
5332	A road, dual carriageway (over)	A Road, D/C (over)	Line	DE, NU	-
5333	A road, single carriageway	A Road, S/C	Line	DE, NU	-
5334	A road, single carriageway planned	A Road, S/C Planned	Line	DE, NU	-
5335	A road, single carriageway (over)	A Road, S/C (over)	Line	DE, NU	-
5336	A road, narrow	A Road, Narrow	Line	DE, NU	-
5337	A road, narrow (over)	A Road, Narrow (over)	Line	DE, NU	-
5340	B road, dual carriageway	B Road, D/C	Line	DE, NU	-
5342	B road, dual carriageway (over)	B Road, D/C (over)	Line	DE, NU	-
5343	B road, single carriageway	B Road, S/C	Line	DE, NU	-

Feature code	Feature name	NTF Abbreviated Feature Name	Graphic type	NTF attribute	Value
5345	B road, single carriageway (over)	B Road, S/C (over)	Line	DE, NU	-
5346	B road, narrow	B Road, Narrow	Line	DE, NU	-
5347	B road, narrow (over)	B Road, Narrow (over)	Line	DE, NU	-
5350	Minor road over 4 metres wide	Minor Road over 4 metres Wide	Line	DE	-
5351	Minor road over 4 metres wide (over)	Minor Road over 4 metres Wide (over)	Line	DE	-
5353	Minor road over 4 metres wide tunnel	Minor Road over 4 metres wide Tunnel	Line	FM, DE	-
5355	Roundabout (primary route, dual carriageway)	Roundabout (Primary Route, D/C)	Point	DE	-
5356	Roundabout (A road, dual carriageway)	Roundabout (A Road, D/C)	Point	DE	-
5357	Roundabout (B road, dual carriageway)	Roundabout (B Road, D/C)	Point	DE	-
5358	A road tunnel	A Road Tunnel	Line	DE, NU	-
5359	B road tunnel	B Road Tunnel	Line	DE, NU	-
5360	Service station (full access)	Service Station (Full Access)	Point	GS NU UE LO DE OR	- - 3, 4, 5, 6 1, 2, 3 - -

Feature code	Feature name	NTF Abbreviated Feature Name	Graphic type	NTF attribute	Value
5361	Service station (limited access)	Service Station (Limited Access)	Point	GS FM UE LO RJ RM RL RQ RW RZ DE OR	- - 3, 4, 5, 6 1, 2, 3 - - - - - - - -
5370	Motorway junction (full access)	Motorway Junction (Full Access)	Point	GS, DE, NU	-
5371	Motorway junction (limited access)	Motorway Junction (Limited Access)	Point	GS, RJ, RM, RL, RQ, RW, RZ, DE NU	-
5372	Motorway junction (under construction)	Motorway Junction (U/C)	Point	GS, DE, NU	-
5373	Primary route tunnel	Primary Route Tunnel	Line	DE, NU	-
5374	Roundabout (minor road over 4 metres wide)	Roundabout (Minor Road over 4 m Wide)	Point	DE	-
5375	Roundabout (primary route, single carriageway)	Roundabout (Primary Route, S/C)	Point	DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5376	Roundabout (A road, single carriageway)	Roundabout (A Road, S/C)	Point	DE	-
5377	Roundabout (B road, single carriageway)	Roundabout (B Road, S/C)	Point	DE	-
5378	Multi-level junction (under construction)	Multi-Level Junction (U/C)	Point	GS, DE	-
5379	Multi-level junction	Multi-Level Junction	Point	GS, DE	-
5380	Gradient 1 in 7 (14%) or steeper on primary, A and B roads	Gradient 1 In 7 Or Steeper	Point	GS, DE, OR	-
5381	Roundabout (under construction)	Roundabout (U/C)	Point	DE	-
5382	Toll bar	Toll Bar	Point	DE, OR	-
5384	Other track or road	Other Track or Road	Line	DE	-
5385	Other track or road (over)	Other Track or Road (over)	Line	DE	-
5390	Vehicular ferry route	Vehicular Ferry Route	Line	GS, FE, FR, FP, FF, FT, FI, DE	-
5393	Ferry route link	Ferry Route Link	Line	GS, FE, FR, FP, FF, FT, FI, DE	-
5397	100 km accentuated grid line	100 Km Accentuated Grid Line	Line		-
5398	10 km grid line	10 Km Grid Line	Line		-
5403	Dead end road	Dead End Road gen under 4m wide	Line	DE	-
5404	Dead end road (over)	Dead End Road gen under 4m wide (over)	Line	DE	-
5405	Minor road under 4 metres wide	Minor Road under 4 metres wide	Line	DE	-
5406	Minor road under 4 metres wide (over)	Minor Road under 4 metres wide (over)	Line	DE	-
5407	Minor road under 4 metres wide tunnel	Minor Road under 4 metres wide Tunnel	Line	FM, DE	-
5408	Roundabout (minor road under 4 metres wide)	Roundabout (Minor Road under 4 m wide)	Point	DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5413	Town attribute point	Town Attribute Point	Point	FM CM or UN DE, LO	- 4, 5 -
5416	Village attribute point	Village attribute point	Point	FM, DE CM or UN LO	- - 4, 5
5419	Landmark attribute point	Landmark Attribute Point	Point	FM CM or UN DE	-
5420	Large urban area (outer limit)	Large Urban Area (outer limit)	Line	DE	-
5421	Large urban area seed	Large Urban Area Seed	Point	DE, RB	-
5422	Small urban area (outer limit)	Small Urban Area (outer limit)	Line	DE	-
5423	Small urban area seed	Small Urban Area Seed	Point	DE, RB	-
5427	City attribute point	City Attribute Point	Point	FM, DE CM or UN LO	- - 4, 5
5490	Inland water (inner limit)	Inland Water (inner limit)	Line	DE	-
5491	Wood/forest (inner limit)	Wood/Forest (inner limit)	Line	DE	-
5492	Large urban area (inner limit)	Large Urban Area (inner limit)	Line	DE	-
5493	Small urban area (inner limit)	Small Urban Area (inner limit)	Line	DE	-
5494	Foreshore (sand, inner limit)	Foreshore (Sand, inner limit)	Line	DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5495	Foreshore (other) and offshore rocks exposed at mean low water, inner limit	Foreshore (Other inner limit)	Line	DE	-
5510	Railway, standard gauge	Railway, Standard Gauge	Line	DE	-
5511	Railway, standard gauge (over)	Railway, Standard Gauge (over)	Line	DE	-
5512	Railway, narrow gauge	Railway, Narrow Gauge	Line	DE	-
5513	Railway, narrow gauge (over)	Railway, Narrow Gauge (over)	Line	DE	-
5514	Railway tunnel	Railway Tunnel	Line	DE	-
5515	Railway tunnel (end symbol)	Railway Tunnel (end symbol)	Point	DE, OR	-
5519	Railway line under construction	Railway, Standard Gauge (U/C)	Line	DE	-
5520	Railway station	Railway Station	Line	GS, FM, DE	-
5521	Rapid transit station	Rapid Transit Station	Line	DE	-
5522	Rapid transit line	Rapid Transit Line	Line	DE	-
5523	Rapid transit line (over)	Rapid Transit Line (over)	Line	DE	-
5524	Rapid transit tunnel	Rapid Transit Tunnel	Line	DE	-
5525	Rapid transit line (U/C)	Rapid Transit Line (U/C)	Line	DE	-
5530	Level crossing on classified road	Level Crossing on Classified Road	Point	GS, DE, OR	-
5531	Level crossing on unclassified road	Level Crossing on Unclassified Road	Point	GS, DE, OR	-
5610	Wood/forest (outer limit)	Wood/Forest (outer limit)	Line	DE	-
5611	Wood/forest seed	Wood/Forest Seed	Point	DE, RB	-
5612	Marsh	Marsh	Point	DE	-
5620	Geographic area attribute point	Geographic Area Attribute Point	Point	FM, DE, RU	-
5621	Island area attribute point	Island Area Attribute Point	Point	FM, DE, RB	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5710	National boundary	National Boundary	Line	DE	-
5715	National primary attribute point	National Primary Attribute Point	Point	FM, DE, RU	-
5720	County boundary	County Boundary	Line	DE	-
5721	County name graphic text	County Name Graphic Text	Text	DE, TX	-
5725	County primary attribute point	County Primary Attribute Point	Point	CM, DE, RU	-
5730	District boundary	District Boundary	Line	DE	-
5731	District name graphic text	District Name Graphic Text	Text	DE, TX	-
5733	District primary attribute point	District Primary Attribute Point	Point	DN, CM, DE	-
5734	Administrative detached attribute point	Administrative Detached Attribute Point	Point	DN and CM or UN, DE, RB	-
5740	Unitary authority boundary	Unitary Boundary	Line	DE	-
5741	Unitary authority name graphic text	Unitary Name Graphic Text	Text	DE, TX	-
5744	Unitary authority primary attribute point	Unitary Primary Attribute Point	Point	UN, DE	-
5750	Associated area boundary	Associated Area Boundary	Line	DE	-
5805	Camping and caravanning combined site	Camping and Caravanning Combined Site	Point	GS, DE	-
5806	Park and ride	Park and Ride	Point	GS UE DE	- 1, 2 -
5810	Roman road	Roman Road	Line	FM, DE	-
5812	Antiquity line detail (dyke, wall, and so on)	Antiquity Line Detail (dyke, wall, etc)	Line	FM, DE	-
5815	Hill fort	Hill Fort	Point	GS, FM, DE	-
5816	Battlefield	Battlefield	Point	GS, FM, DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5820	National park/forest park	National Park/Forest Park	Line	DE	-
5821	National park/forest park attribute point	National Park/Forest Park Attrib Point	Point	FM, DE, RB	-
5825	National trail, long distance path and route	Long Distance Footpath	Line	FM, DE	-
5835	Television, radio mast or tower	Television, Radio Mast or Tower	Point	GS, DE	-
5837	Telephone dot	Telephone Dot	Point	DE	-
5838	Landmark/antiquity dot	Landmark/Antiquity dot	Point	GS, FM, DE	-
5839	Airport with customs but no schedule flights	Airport Non Sch with Perm cust facilities	Point	GS, FM, DE	7,8,9
5840	Airport without customs facilities	Airport without customs facilities	Point	GS, FM, DE	7,8,9
5841	Airport with permanent customs facilities where no prior notification is necessary	Airport with Perm customs facilities	Point	GS, FM, CM or UN, DE	7,8,9
5843	Wind powered generator	Wind Powered Generator	Point	GS, DE	-
5844	Windmill	Windmill	Point	GS, DE	-
5845	Heliport	Heliport	Point	GS, FM, AO, DE	-
5847	Public telephone	Public Telephone	Point	DE	-
5849	Motoring organisation telephone	Motoring Organisation Telephone	Point	DE	-
5851	Theme park (open to the public)	Theme Park (open to the public)	Point	GS, FM, DE	-
5860	Abbey, cathedral, priory (open to the public)	Abbey, Cath, Priory (open to the public)	Point	GS, FM, OW DE	-
5861	Camp site	Camp Site	Point	GS, DE	-
5862	Caravan site	Caravan Site	Point	GS, DE	-
5863	Golf course	Golf Course	Point	GS, DE	-
5864	Museum (open to the public)	Museum (open to the public)	Point	GS, FM, OW, DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5865	Picnic site	Picnic Site	Point	GS, DE	-
5866	Tourist information centre (open all year)	Tourist Info Centre (open all year)	Point	GS, DE	-
5867	Country park (open to the public)	Country Park (open to the public)	Point	GS, FM, DE	-
5868	Youth hostel	Youth Hostel	Point	GS, DE	-
5869	Nature or forest trail	Nature Or Forest Trail	Point	GS, DE	-
5870	Zoo (open to the public)	Zoo (open to the public)	Point	GS, FM, DE	-
5871	Preserved railway	Preserved Railway	Point	GS, FM, DE	-
5873	Craft centre (open to the public)	Craft Centre (open to the public)	Point	GS, FM, DE	-
5874	Wildlife centre (open to the public)	Wildlife Centre (open to the public)	Point	GS, FM, DE	-
5875	Aquarium (open to the public)	Aquarium (open to the public)	Point	GS, FM, DE	-
5876	Cave (open to the public)	Cave (open to the public)	Point	GS, DE	-
5877	Castle (open to the public)	Castle (open to the public)	Point	GS, FM, OW, DE	-
5878	Historic house (open to the public)	Historic House (open to the public)	Point	GS, FM, OW, DE	-
5879	Motor racing circuit	Motor Racing Circuit	Point	GS, FM, DE	-
5880	Nature reserve	Nature Reserve	Point	GS, FM, OW, DE	-
5881	Viewpoint (limited)	Viewpoint (Limited)	Point	GS, DE	-
5882	Viewpoint (360 degrees)	Viewpoint (360 degrees)	Point	GS, DE	-
5883	Other tourist attraction (open to the public)	Other Tourist Attract (open to the public)	Point	GS, FM, OW, DE	-

Feature code	Feature name	NTF abbreviated feature name	Graphic type	NTF attribute	Value
5884	Ski slope	Ski Slope	Point	GS, DE	-
5885	Racecourse	Racecourse	Point	GS, FM, DE	-
5886	Garden (open to the public)	Garden (open to the public)	Point	GS, FM, OW, DE	-
5887	Ferry boat	Ferry Boat	Point	DE	-
5888	Ferry hovercraft	Ferry Hovercraft	Point	DE	-
5889	Tourist information centre (seasonal)	Tourist Info Centre (seasonal)	Point	GS, DE	-
5890	Ferry box outline	Ferry Box Outline	Line	DE	-
5892	Ferry catamaran	Ferry Catamaran	Point	DE	-
5901	Spot height dots	Spot Height Dots	Point	HI, HM, DE	

Conventions used in this user guide

Certain conventions are adopted as an aid to interpretation. In some cases the convention is dropped where the context is self-evident.

[ ] 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).

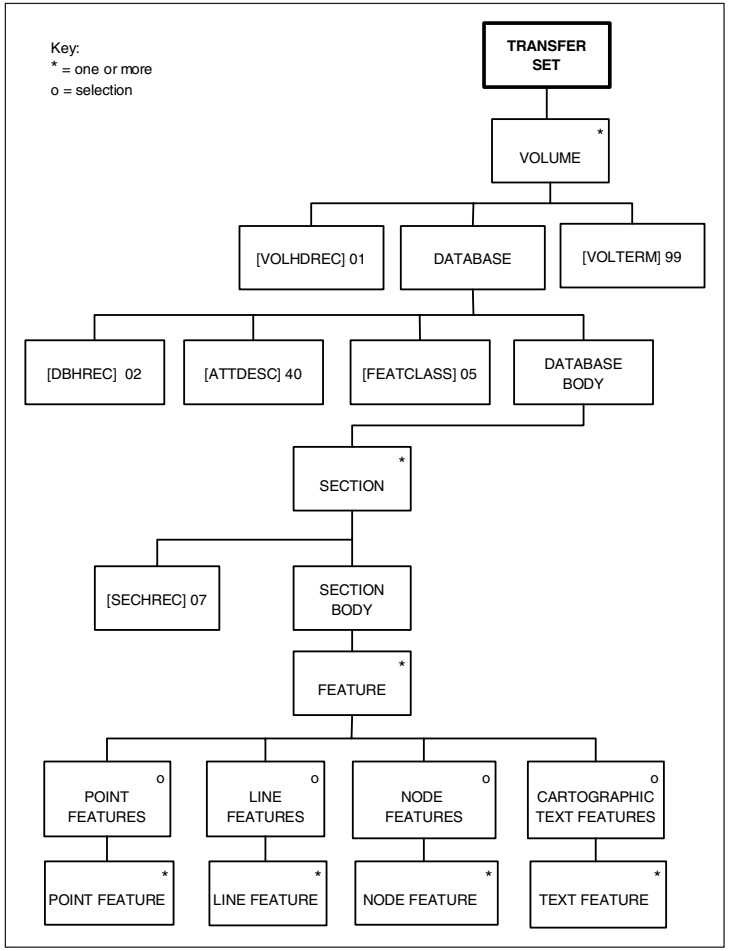
<3S> This denotes three successive space characters.

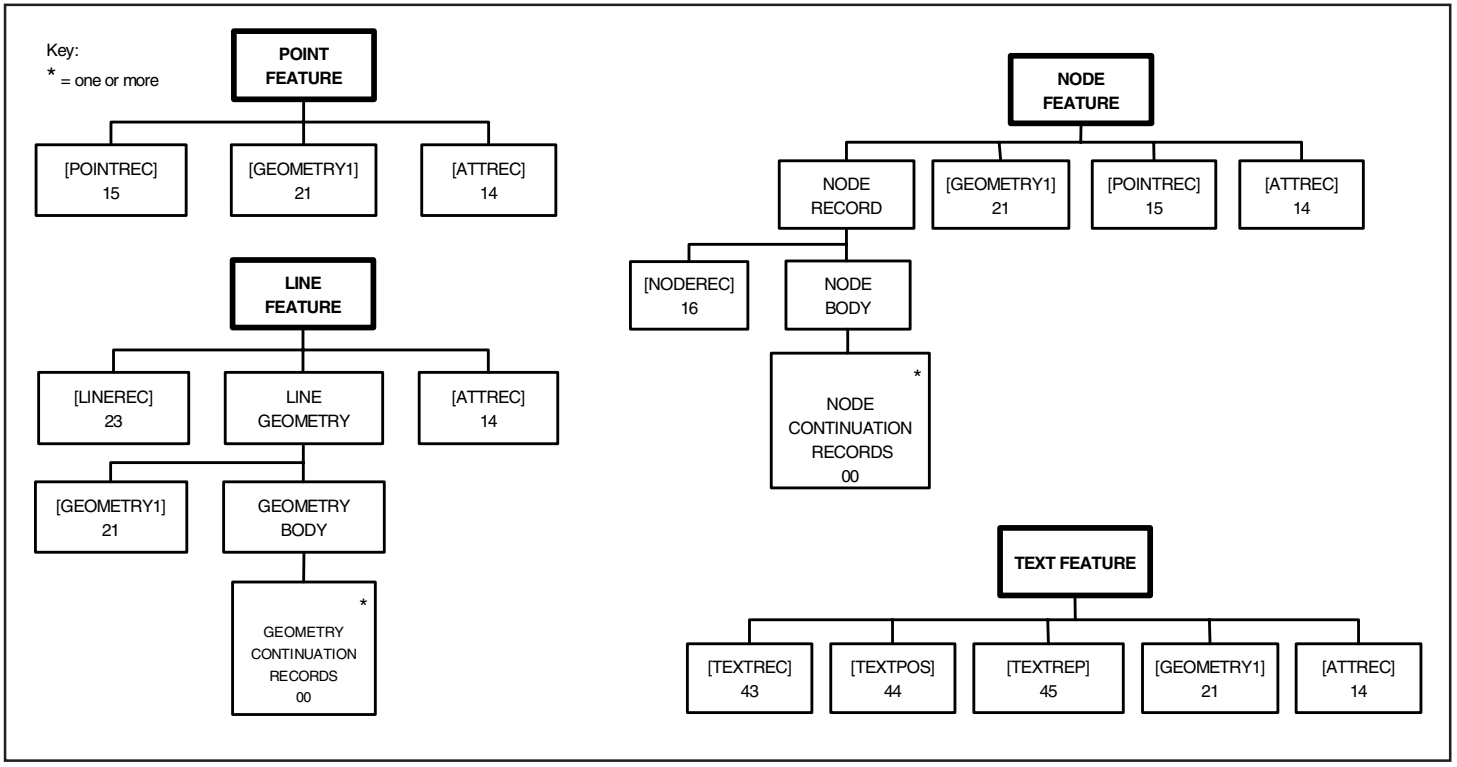
% The percentage character (ASCII code 37).

Jackson structure

Data supplied in this format has variable length records. An overview of the data format of a Strategi file in NTF is shown in the adjacent two diagrams. The convention used for diagramming data files is the industry standard adopted for Jackson Structured Programming (JSP).

The diagrams are examples of Strategi files and no fixed record sequence or relationship is implied.




Key:
* = one or more
POINT FEATURE
[POINTREC] 15
[GEOMETRY1] 21
[ATTREC] 14
LINE FEATURE
[LINEREC] 23
LINE GEOMETRY
[ATTREC] 14
[GEOMETRY1] 21
GEOMETRY BODY
* GEOMETRY CONTINUATION RECORDS 00
NODE FEATURE
NODE RECORD
[GEOMETRY1] 21
[POINTREC] 15
[ATTREC] 14
[NODEREC] 16
NODE BODY
* NODE CONTINUATION RECORDS 00
TEXT FEATURE
[TEXTREC] 43
[TEXTPOS] 44
[TEXTREP] 45
[GEOMETRY1] 21
[ATTREC] 14

Version management

The product version number and the release number are specified in the Database Header Record [DBHREC], as supplied in NTF.

Product version

Each version of all Strategi products are defined by a unique **product version number** and relates to the specification of the data being supplied. The product version number takes the form **xx.yy**, where xx is the major product number and yy is the minor change number. Thus version 02.04 would indicate that this is the major product version 02, and that this is the fourth minor amendment to the product specification.

The product specification can be found in Strategi data in the {FCNAME} field of the Database Header Record [DBHREC]. This user guide reflects the product specification current at the time of its production, that is Strategi_02.00. The effective date of this product specification is 1 September 2000 and is indicated by the {FCDATE} field of the Database Header Record [DBHREC].

Product release

The **release number** takes the form **xx.yy**, where xx is the sequential release within a year and yy is the year of the release. Thus release 01.01 would indicate that this is the first data release in 2001 and is indicated by the {DBNAME} field of the Database Header Record [DBHREC].

Product releases do not necessarily include a change of product version (specification).

NTF version

The current version is NTF v2.0 Level 3 and will be supplied until further notice. The NTF version is indicated by the {NTFVER} field of the Volume Header Record [VOLHDREC]. The effective date of the definition of NTF v2.0 in Strategi is 15 May 1992 and is indicated by the {DDATE} field of the Database Header Record [DBHREC].

Information relevant to NTF

Coordinates

Coordinate values and the number of coordinate pairs in a feature are transferred in the Two-dimensional Geometry Record [GEOMETRY1].

All coordinates within the data are expressed as strings of seven numeric characters. Leading zeros are present to complete the seven characters.

All coordinates are full National Grid coordinates, measured from the absolute origin (0,0).

Bearings

Bearings are transferred in the {ORIENT} field of the Node Record [NODEREC].

Bearings are National Grid bearings, in degrees, measured clockwise from grid north.

The start of line bearing, indicated by a value of 1 in the {DIR} field of the Node Record [NODEREC], is the bearing of the first segment of the line. The direction is from the start of the line to the next pair of coordinates or, if there are only two coordinate pairs, from the start to the end of the line.

The end of line bearing, indicated by a 2 in the {DIR} field, is the bearing of the last segment of the line. The direction is from the end of the feature to the last-minus-one pair of coordinates.

Attribute codes

Attribute codes provide supplementary information on a feature, providing such qualifying information as feature code, feature name, orientation and so on.

In NTF the structure of user defined attributes is described in the Attribute Description Record [ATTDESC].

The actual attribute detail of a record is written in the Attribute Record [ATTREC].

Transfer set structure

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

Database Header Record [DBHREC]: 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]: this lists and gives a description of the attributes that can be applied to features within the transfer set.

Feature Classification Record [FEATCLASS]: this lists and gives descriptions of all possible feature codes for the transfer set.

These *introductory* records are followed by the data requested by you, which are contained in the section.

The section consists of two parts:

1. Section Header Record [SECHREC]: this gives the National Grid coordinates of the section and on unformatted media informs you that a new section is starting.
2. Section body: this comprises all the features within the section.

General

The following are the record definitions for the transfer of Strategi data in NTF:

- Volume Header Record [VOLHDREC];
- Database Header Record [DBHREC];
- Feature Classification Record [FEATCLASS];
- Attribute Description Record [ATTDESC];
- Section Header Record [SECHREC];
- Section body (see Point and line features below):
  - Name detail
  - Node detail
- Volume Terminator Record [VOLTERM].

Section body

This comprises all the features within the tile that correspond to the feature types selected by you.

Point and line features

Point feature

Each point feature is depicted by the use of the following records:

	Description in NTF
POINT RECORD	[POINTREC]
GEOMETRY RECORD	[GEOMETRY1]
ATTRIBUTE RECORD	[ATTREC]

Line feature

Each line feature is depicted by the use of the following records:

	Description in NTF
LINE RECORD	[LINEREC]
GEOMETRY RECORD	[GEOMETRY1]
GEOMETRY CONTINUATION RECORDS	
ATTRIBUTE RECORDS	[ATTREC]

Geometry records

Geometry records contain the coordinate position(s) in metres of the feature. Point features contain one coordinate pair; line features contain two or more coordinate pairs. Geometry continuation records are used where required. {X_COORDS}, {Y_COORDS} and {QPLAN} are treated as separate fields.

Name detail

Each cartographically positioned name is depicted by the use of the following records:

	Description in NTF
TEXT RECORD	[TEXTREC]
TEXT POSITION RECORD	[TEXTPOS]
TEXT REPRESENTATION RECORD	[TEXTREP]
GEOMETRY RECORD	[GEOMETRY1]
ATTRIBUTE RECORD	[ATTREC]

Records

Text details are only given when a name has been cartographically positioned. The Attribute Record [ATTREC] contains the definitive name and is pointed to by the Text Record [TEXTREC].

The Text Record points to the Attribute Record [ATTREC] and also points to the Text Position Record [TEXTPOS].

The Text Position Record refers back to the Text Record and points to the Geometry Record, containing the coordinates of the digitised position. The Text Position Record also points to the Text Representation Record [TEXTREP], which contains the standard digitising position and orientation of the text.

All other names are held as attributes only.

Node detail

Node feature

Each node feature is depicted by the use of the following records:

	Description in NTF
NODE RECORD	[NODEREC]
NODE CONTINUATION RECORD	
GEOMETRY RECORD	[GEOMETRY1]
POINT RECORD	[POINTREC]
ATTRIBUTE RECORD	[ATTREC]

Records

Node record transfers details of the bearings and number of lines that meet at a point or node.

The Node Record contains references to each Line Record that meets at that node and to the Geometry Record. The Geometry Record is referenced by the Point Records containing the feature attributes of the node.

Where lines do not meet at a previously specified point feature, a special point feature, with an attribute FC of 5200 – *unspecified node*, is created.

The Node Record can contain details of up to five line features that meet at a node. Further lines meeting at that node are written to the node continuation record.

It is important to note that, although the Node Record contains references to its appropriate point and line features, the point and line features do not contain references to the node.

Data supply structure

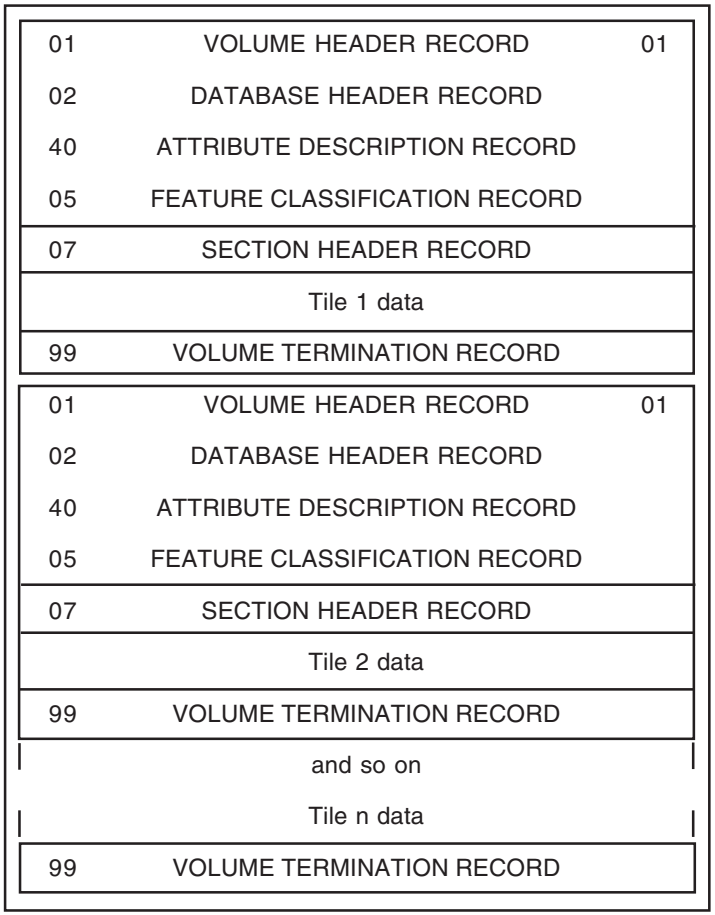
Record size

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

Record terminator {EOR}

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

Formatted media (transfer set less than media capacity)



Chapter 7 Record structures for the transfer of Strategi in NTF

NTF record list

This list comprises the valid record types used in the Strategi 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 data classifications.	[FEATCLASS]
07	Section Header Record – coordinate and structure types, unit scale, factors and so on.	[SECHREC]
14	Attribute Record – defines the attributes for line and point records.	[ATTREC]
15	Point Record – identifies the definition of node points.	[POINTREC]
16	Node Record – defines the topological relationship between links and nodes.	[NODEREC]
21	Two-dimensional Geometry Record – defines the two-dimensional geometry for a link or node.	[GEOMETRY1]
23	Line Record – identifies the definition of a link.	[LINEREC]
40	Attribute Description Record – defines attribute descriptions and their fields.	[ATTDESC]
43	Text Record – identifies the Text Position Record and Attribute Record.	[TEXTREC]
44	Text Position Record – identifies the Text Representation Record and Geometry Record.	[TEXTPOS]
45	Text Representation Record – defines the font, text height and digitised position.	[TEXTREP]
99	Volume Terminator Record – defines the end of the transfer set.	[VOLTERM]

Volume Header Record [VOLHDREC] 01

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	01	
DONOR	03:22	A20	ORDNANCE SURVEY<5S>	
RECIPIENT	23:42	A20	<20S>	Not used.
TRANDATE	43:50	DATE	yyyymmdd	Date of processing.
SERIAL	51:54	I4	0000	Not used.
VOLNUM	55:56	I2		Volume number 01–99.
NTFLEVEL	57:57	I1	3	
NTFVER	58:61	R4.2	0200	Version 2.0.
NTFOR	62:62	A1	V	Variable length records.
EOR	63:63	A1	% <S>	(%) on unformatted media or default % on formatted media.
DIVIDER	64:64	A1	\	Divider used in [ATTREC].
CONT_MARK	65:65	I1	0	No continuation record.
EOR	66:66	A1	%	Record terminator.

Record example:

```
01ORDNANCE SURVEY                       20011112000000130200V \0%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Database Header Record [DBHREC] 02

Record 1

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	02	
DBNAME	03:22	A20	Strategi_01.02<6S>	Database name.
DDNAME	23:42	A20	DEFAULT 02.00<7S>	
DDATE	43:50	DATE	19920515	Release date of NTF version being used.
DDBASE	51:70	A20	<20S>	Not used.
DDBDATE	71:78	DATE	00000000	Not used.
CONT_MARK	79:79	I1	1	Continuation record follows.
EOR	80:80	A1	%	Record terminator.

Record 2

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Continuation record.
FCNAME	03:22	A20	Strategi_02.00<6S>	Data specification.
FCDATE	23:30	DATE	20010901	Date of data specification.
DQNAME	31:50	A20	<20S>	Not used.
DQDATE	51:58	DATE	00000000	Not used.
DATA_MODEL	59:60	I2	00	
CONT_MARK	61:61	I1	0	No continuation record.
EOR	62:62	A1	%	Record terminator.

Record example:

```
02Strategi_01.02      DEFAULT_02.00       19920515                    000000001%
00Strategi_02.00      20010901                    00000000000%
     |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
     |         |         |         |         |         |         |         |         |
```

Template

Feature Classification Record [FEATCLASS] 05

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	05	
FEAT_CODE	03:06	A4	5310	Four-character feature code.
CODE_COM	07:16	A10	<10S>	Not used.
STCLASS	17:36	A20	<20S>	Not used.
FEATDES	37:*	A*		Feature description.
DIVIDER	*+1:*+1	A1	\	
CONT_MARK	*+2:*+2	I1	0	No continuation record.
EOR	*+3:*+3	A1	%	Record terminator.

* = variable integer.

Record example:

```
055310                                  Motorway\0%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Section Header Record [SECHREC] 07

Record 1

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	07	
SECT_REF	03:12	A10	WALES<5s>	File name.
COORD_TYP	13:13	I1	2	Rectangular.
STRUC_TYP	14:14	I1	1	Vector.
XYLEN	15:19	I5	00007	Seven-character coordinate fields.
XY_UNIT	20:20	I1	2	Metres.
XY_MULT	21:30	R10.3	0000001000	Default.
Z_LEN	31:35	I5	00000	Not used.
Z_UNIT	36:36	I1	0	Not used.
Z_MULT	37:46	R10.3	0000001000	Default.
X_ORIG	47:56	I10	0000000000	X coordinate of SW corner of unit (not used).
Y_ORIG	57:66	I10	0000000000	Y coordinate of SW corner of unit (not used).
Z_DATUM	67:76	I10	0000000000	Not used.
CONT_MARK	77:77	I1	1	Continuation record follows.
EOR	78:78	A1	%	Record terminator.

Record 2

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	00	Continuation record.
XMIN	03:12	I10	0000000000	
YMIN	13:22	I10	0000000000	
XMAX	23:32	I10	0000700000	
YMAX	33:42	I10	0001300000	
XY_ACC	43:47	R5.2	00000	Not used.
Z_ACC	48:52	R5.2	00000	Not used.
SURV_DATE	53:60	DATE	00000000	Not used.
LAST_AMND	61:68	DATE	yyyymmdd	Date last amended.
COPYRIGHT	69:76	DATE	yyyymmdd	Copyright date.
CONT_MARK	77:77	I1	0	No continuation record.
EOR	78:78	A1	%	Record terminator.

Record example:

```
07WALES     2100007200000010000000000000001000000000000000000000000000000001%
00000000000000000000000007000000013000000000000000000000200111122001111 20%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Attribute Record [ATTREC] 14

All records will have FC and DE attributes. All others are optional.

Point Record example:

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	14	
ATT_ID	03:08	I6	000001	

First attribute: Feature code

Field	Position	Format	Value example	Description
VAL_TYPE	09:10	A2	FC	Feature code.
VALUE	11:14	I4	5611	Woodland seed.

Second attribute: Date

Field	Position	Format	Value example	Description
VAL_TYPE	15:16	A2	DE	Date.
VALUE	17:24	DATE	YYYYMMDD	Date of last change.

Third attribute: Bounded representative point

Field	Position	Format	Value example	Description
VAL_TYPE	25:26	A2	RB	Representative point.
VALUE	27:27	A1	0	

Fourth attribute: Feature name

Field	Position	Format	Value example	Description
VAL_TYPE	28:29	A2	FM	Representative point.
VALUE	30:44	A15	SHERWOOD FOREST	
DIVIDER	45:45	A1	\	
CONT_MARK	46:46	I1	0	No continuation record.
EOR	47:47	A1	%	Record terminator.

Would appear as:

```
14000001FC5611DE19980107RB0FMSHERWOOD FOREST\0%
```

Other examples of use of ATTREC for point features:

```
14000002FC5115DE00000000RU00%
```
This indicates {ATT_ID} 2, feature code 5115: the sea, which is a representative point of an unbounded area.

```
14000003FC5520DE19940718FMSOUTHAMPTON PARKWAY\0%
```
This indicates {ATT_ID} 3, feature code 5520: a railway station, with the proper name of Southampton Parkway.

```
14000015FC5380DE19990404OR08500%
```
This indicates {ATT_ID} 15, feature code 5380: a gradient 1 in 7 or steeper, symbol orientated at 85.0 degrees.

Attribute Record: Line
The following attributes are optional:
FM**: Feature name**
NU**: Numbered feature**

Line record example:

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	14	
ATT_ID	03:08	I6	000001	

First attribute: Feature code

Field	Position	Format	Value example	Description
VAL_TYPE	09:10	A2	FC	Feature code.
VALUE	11:14	I4	5810	Roman road.

Second attribute: Date

Field	Position	Format	Value example	Description
VAL_TYPE	15:16	A2	DE	Date.
VALUE	17:24	DATE	YYYYMMDD	Date of last change.

Third attribute: Feature name

Field	Position	Format	Value example	Description
VAL_TYPE	25:26	A2	FM	Proper name.
VALUE	27:40	A14	WATLING STREET	
DIVIDER	41:41	A1	\	
CONT_MARK	42:42	I1	0	No continuation record.
EOR	43:43	A1	%	Record terminator.

Would appear as:
14000001FC5810DE00000000FMWATLING STREET\0%

Other examples of use of ATTREC for line features:

14000002FC5310DE19952611NUM27\0%
This indicates {ATT_ID} 2, feature code 5310: Motorway with road number M27.

14000003FC5825DE00000000FMDORSET COAST PATH\0%
This indicates {ATT_ID} 3, feature code 5825: Long-distance footpath named Dorset Coast Path.

Text record example:

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	14	
ATT_ID	03:08	I6	000001	

First attribute: Feature code

VAL_TYPE	09:10	A2	FC	Feature code.
VALUE	11:14	I4	5040	Positioned name.

Second attribute: Date

Field	Position	Format	Value example	Description
VAL_TYPE	15:16	A2	DE	Date.
VALUE	17:24	DATE	YYYYMMDD	Date of last change.

Third attribute: Independent text

VAL_TYPE	25:26	A2	TX	Independent text.
VALUE	27:38	A12	CUDDER POINT	
DIVIDER	39:39	A1	\	
CONT_MARK	40:40	I1	0	No continuation record.
EOR	41:41	A1	%	Record terminator.

Record example:

```
14000001FC5040DE19991118TXCUDDER POINT\0%
```

```
     |    1     |    2     |    3     |    4     |    5     |    6     |    7     |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |
```

Template

Point Record [POINTREC] 15

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	15	
POINT_ID	03:08	I6	000488	Sequential number of Point Record – starting at 000001.
GEOM_ID	09:14	I6	004804	Sequential number of [GEOMETRY1] record – starting at 000001.
NUM_ATT	15:16	I2	01	
ATT_ID	17:22	I6	004804	Sequential number of [ATTREC] record – starting at 000001. If the point feature has no associated [ATTREC], then {ATT_ID} is set to 000000.
CONT_MARK	23:23	I1	0	No continuation record.
EOR	24:24	A1	%	Record terminator.

Record example:

```
150004880048040100480 40%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Node Record [NODEREC] 16

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	16	
NODE_ID	03:08	I6	002896	Sequential number of Node Record, starting at 000001.
GEOM_ID_OF_POINT	09:14	I6	004804	Identity of a [GEOMETRY1] record containing the position of the node.
NUM_LINKS	15:18	I4	0004	Number of links that meet at the node, on Ordnance Survey 1:250 000 scale data the maximum is 9.

The following fields are the detail pertaining to each link – they are repeated as many times as the value of {NUM_LINKS}. Node records with {NUM_LINKS} greater than 5 require a continuation record starting with 00 {REC_DESC}.

Field	Position	Format	Value example	Description
DIR	19:19	I1	2	1 if the start of a line, 2 if the end of a line.
GEOM_ID_OF_LINK	20:25	I6	004921	{GEOM_ID} of linked feature.
ORIENT	26:29	R4,1	2260	Bearing, measured clockwise from grid north, of the first or last segment of the linked feature.
LEVEL	30:30	I1	1	Relative levels of the links on the ground; always 1 (default) for level features; *over* information by feature code.

At the record end:

Field	Position	Format	Value example	Description
CONT_MARK	*:*	I1	0	No continuation record or
			1	continuation record follows.
EOR	*+1:*+1	A1	%	Record terminator.

* = variable integer.

Record example:

```
1600289600480400042004921226012005034320011005035045011005210165010%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
      |         |         |         |         |         |         |         |         |
```

Template

Geometry Record [GEOMETRY1] 21

GEOMETRY1 associated with [POINTREC] 15 and [TEXTREC]43

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	21	
GEOM_ID	03:08	I6	002199	Sequential number of [GEOMETRY1] record – starting at 000001.
GTYPE	09:09	I1	1	Point feature.
NUM_COORD	10:13	I4	0001	Point has 1 coordinate pair.
X_COORD	14:20	I7	0039077	X coordinate.
Y_COORD	21:27	I7	0011067	Y coordinate.
QPLAN	28:28	A1	<S>	Not used.
CONT_MARK	29:29	I1	0	No continuation record.
EOR	30:30	A1	%	Record terminator.

Note: {X_COORD} and {Y_COORD} are given in metres from the National Grid origin.

Record example:

```
 2100219910001003907700110 67 0%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

GEOMETRY1 associated with LINEREC

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	21	
GEOM_ID	03:08	I6	015671	Sequential number of [GEOMETRY1] record – starting at 000001.
GTYPE	09:09	I1	2	Line feature.
NUM_COORD	10:13	I4		Number of coordinates pairs, in the range 0002–9999.
l X_COORD	14:20	I7		X coordinate.
l Y_COORD	21:27	I7		Y coordinate.
l QPLAN	28:28	A1	<S>	Not used.
CONT_MARK	*:*	I1	0	No continuation record or
			1	continuation record follows.
EOR	*+1:*+1	A1	%	Record terminator.

This record may contain many CONTINUATION 00 records.
* = variable integer.

Notes:
{X_COORD} and {Y_COORD} are given in metres from the origin of the National Grid.
l {X_COORD}, {Y_COORD} and {QPLAN} are repeated until {NUM_COORD} has been transferred.

Record example:

```
2101567120015003759000099900 00376400009940 00376800009840 00376400009740 1%
0000376000009650 00376100009570 00376000009520 00375100009530 00374500009510 1%
0000373600009510 00373000009560 00373300009670 00374700009840 00375100009950 1%
0000375900009990 0%
```

```
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Line Record [LINEREC] 23

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	23	
LINE_ID	03:08	I6	004804	Sequential number of [LINEREC] record – starting at 000001.
GEOM_ID	09:14	I6	005369	Sequential number identifier of attached [GEOMETRY1] record – starting at 000001.
NUM_ATT	15:16	I2	01	
ATT_ID	17:22	I6	005369	Sequential number of attached [ATTREC] record – starting at 000001. If the line feature has no associated [ATTREC] then {ATT_ID} is set to 000000.
CONT_MARK	23:23	I1	0	No continuation record,
EOR	24:24	A1	%	Record terminator,

Record example:

```
2300480400536901005369 0%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
      |         |         |         |         |         |         |         |         |
```

Template

Attribute Description Record [ATTDESC] 40

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	40	
VAL_TYPE	03:04	A2		See table on following page.
FWIDTH	05:07	A3		See table on following page.
FINTER	08:12	A5		See table on following page.
ATT_NAME	13:*	A*		See table on following page.
DIVIDER	*:*	A1	\	
FDESC	*:*	A*		See table on following page.
DIVIDER	*:*	A1	\	
CONT_MARK	*:*	I1	0	No continuation record.
EOR	*:*	A1	%	Record terminator.

*** = variable integer**

Record example:

```
 40NU   A*   NUMBERED FEATURE\ROAD & ROAD JUNCTION NUMBERS\0%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Valid contents of ATTDESC for Strategi

```
40DE008I8     DATE\DATE\0%
40LO001I1     LOCATION\LOCATION\0%
40UE001I1     USAGE\USAGE\0%
40HI004I4     HEIGHT_IMPERIAL\HEIGHT IMPERIAL\0%
40HM004I4     HEIGHT_METRIC\HEIGHT METRIC\0%
40OR004R4,1   ORIENTATION\ORIENTATION\0%
40FC004A4     FEATURE CODE\NUMERIC FEATURE CODE\0%
40NU   A*     NUMBERED FEATURE\ROAD & ROAD JUNCTION NUMBERS\0%
40RB001A1     BOUNDED REPRESENTATION POINT\POINT SEEDING BOUNDED FEATURES\0%
40RU001A1     UNBOUNDED REPRESENTATION POINT\POINT SEEDING UNBOUNDED FEATURES\0%
40TX   A*     TEXT\INDEPENDENT TEXT\0%
40GS   A*     GIS\GIS\0%
40FM   A*     FEAT_NAM\FEATURE NAME\0%
40OW   A*     OWNER\OWNER\0%
40CM   A*     COUNTY_NAME\COUNTY NAME\0%
40UN   A*     UNITARY_NAME\UNITARY AUTHORITY NAME\0%
40DN   A*     DISTRICT_NAME\DISTRICT NAME\0%
40RJ   A*     RESTRICT_NORTH\RESTRICTIONS NORTH\0%
40RM   A*     RESTRICT_EAST\RESTRICTIONS EAST\0%
40RL   A*     RESTRICT_SOUTH\RESTRICTIONS SOUTH\0%
40RQ   A*     RESTRICT_WEST\RESTRICTIONS WEST\0%
40RW   A*     RESTRICT_CLOCK\RESTRICTIONS CLOCK\0%
40RZ   A*     RESTRICT_ANTICLOCK\RESTRICTIONS ANTICLOCK\0%
40FE   A*     FERRY_ACCESS\FERRY ACCESS\0%
40FR   A*     FERRY_RESTRICT\FERRY RESTRICTIONS\0%
40FP   A*     FERRY_TYPE\FERRY TYPE\0%
40FF   A*     FERRY_FROM\FERRY FROM\0%
40FT   A*     FERRY_TO\FERRY TO\0%
40FI   A*     FERRY_TIME\FERRY TIME\0%
```

Text Record [TEXTREC] 43

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	43	
TEXT_ID	03:08	I6	000003	Sequential number of [TEXTREC] starting at 000001.
NUM_SEL	09:10	I2	01	
SELECT	11:12	A2	00	
TEXT_CODE	13:16	A4	0000	
TEXP_ID	17:22	I6	000003	Sequential number of [TEXTPOS] starting at 000001.
NUM_ATT	23:24	I2	01	
ATT_ID	25:30	I6	000267	Next sequential number of [ATTREC].
CONT_MARK	31:31	I1	0	No continuation record.
EOR	32:32	A1	%	Record terminator.

Record example:

```
43000003010000000000030100026 70%
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Text Position Record [TEXTPOS] 44

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	44	
TEXP_ID	03:08	I6	000003	Cross reference from [TEXTREC].
NUM_TEXR	09:10	I2	01	
TEXR_ID	11:16	I6	000003	Sequential number of [TEXTREP] starting at 000001.
GEOM_ID	17:22	I6	000267	Field contains the {GEOM_ID} of the [GEOMETRY1] record that contains the coordinates of the digitised position of the name.
CONT_MARK	23:23	I1	0	No continuation record
EOR	24:24	A1	%	Record terminator

Record example:

```
44000003010000030002670%
```

```
      |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
```

Template

Text Representation Record [TEXTREP] 45

Field	Position	Format	Value example	Description
REC_DESC	01:02	A2	45	
TEXR_ID	03:08	I6	000003	Cross reference from [TEXTPOS].
FONT	09:12	I4	0004	0001–0009.
TEXT_HT	13:15	R3,1	018	Height in millimetres 018–085.
DIG_POSTN	16:16	I1	3	Standard Ordnance Survey digitising position 0–8.
ORIENT	17:20	R4,1	0000	Measured anticlockwise from grid east in the range 0000–3599.
CONT_MARK	21:21	I1	0	No continuation record.
EOR	22:22	A1	%	Record terminator.

Record example:

```
450000030004008300000%
```

```
     |    1    |    2    |    3    |    4    |    5    |    6    |    7    |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
     |         |         |         |         |         |         |         |         |
```

Template

Volume Terminator Record [VOLTERM] 99

Field	Position	Format	Value example	Description
_DESC	01:02	A2	99	
FREE_TEXT	03:*	A*		See note below.
CONT_VOL	*+1:*+1	I1	0	No continuation volume or
			1	continuation volume follows.
EOR	*+2:*+2	A1	%	Record terminator.

Notes:
If there are further volume(s) to follow then the FREE_TEXT field comprises the following message:

```
End Of Volume (nn). Transfer Set Continues On Volume (nn+1)
```

If there are no further volumes then the FREE_TEXT field will READ:

```
End Of Transfer Set
```

* = variable integer

Record examples:

```
99End Of Volume 01 Transfer Set Continues On Volume 021%
     |    1     |    2     |    3     |    4     |    5     |    6     |    7     |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |
```

Template

```
99End Of Transfer Set0%
     |    1     |    2     |    3     |    4     |    5     |    6     |    7     |    8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
     |    |     |    |     |    |     |    |     |    |     |    |     |    |     |
```

Template

Chapter 8 DXF explained

Introduction

The purpose of this chapter and chapter 9 is to:

- Provide a brief description of the presentation of Strategi in the DXF transfer format.
  - Data Exchange Format (DXF) (conforming to AutoCAD release 12 with extended entity data).

  As part of this description, data structure diagrams are used to give greater explanation where necessary.
- Provide Licensed Partners with as much detail as necessary to enable Strategi files in DXF to be easily understood and processed by application software.

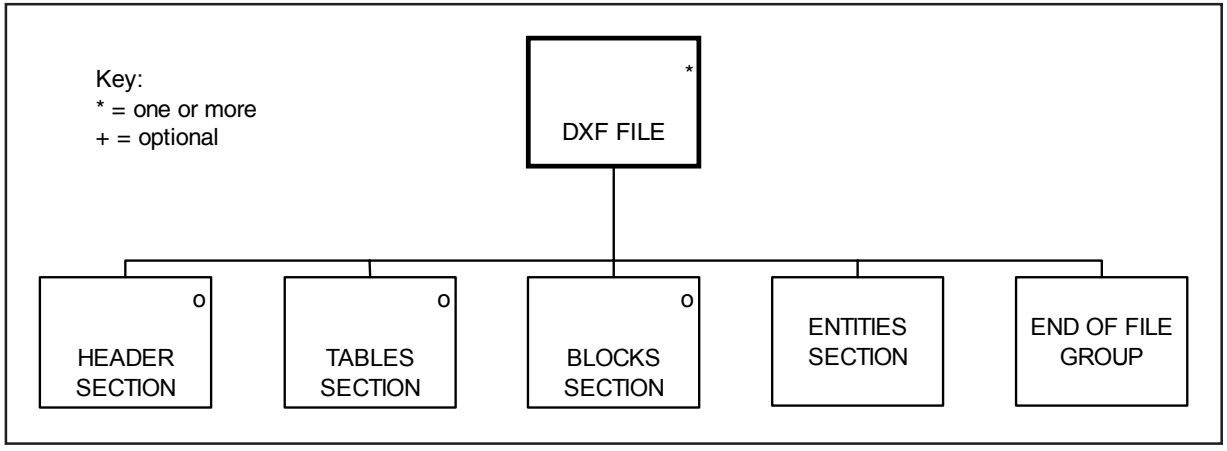
The term *data structure* used in these chapters refers to the organisation and sequence of the records in the data file and **not** to the geographical topology of the data.

These chapters should be read in conjunction with chapters 1, 2 and 3 which describe the content of Strategi.

An overview of Strategi in DXF

Data Exchange Format (DXF)

Strategi is available in DXF, conforming to AutoCAD release 12 using extended entity data to store attributes. The transfer format is that defined by the NEDO Working Party for the exchange of two-dimensional drawings in the construction industry. An overview of the data structure of a Strategi file in DXF is shown below.



Structure of Strategi in DXF

Strategi has a limited *link and node* data structure; within this structure a feature may be a name, a point or a line (or series of lines forming a coherent unit). Each feature is free-standing; that is, its topological relationship to any other feature is **not** expressed in the data.

Feature representation

Features are classified by type and each type is placed in a separate DXF layer.

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.

The extent of a feature is determined by digitising conventions and does not always coincide with the topology. Each linear feature is composed of a string of XY coordinate pairs implicitly joined by straight lines.

The colour and line weights of some layers may differ when DXF is used with certain software packages.

Area features

Area features are not defined within vector link and node data. Features which might be thought of as *areas* are treated in the data as linear features, for example, a woodland outline is treated as a polyline in layer G8065610.

Name features

Name features are treated as free-standing text data. There is no explicit relationship (in the data) between a text feature and the point or line feature to which it belongs.

Ordnance Survey distinguishes between layer name types – for example, motorway numbers and water names – by placing each name type in a separate DXF layer.

Text has position, expressed as a single coordinate pair, held as X and Y National Grid coordinates. Text which is double- or treble-banked is treated as two or three separate features. The text string may be considered to be contained within an *envelope* whose bottom left corner is positioned on this coordinate pair. 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.

Information specific to DXF

Coordinate system

The coordinate system is the National Grid.

The coordinates are to a resolution of 0.01 m. This is the resolution of the source data.

Height

No height attributes are applied to any feature.

Layer names

Layer Naming Convention for CAD in the Construction Industry Version 2, which is based upon the guidelines laid down in BS 1192: Part 5 – *Guide for structuring of computer graphic information* has been adopted.

Each layer name is an eight character string. The first four characters relate to the AUG/Autodesk® system, with G (GIS) as the source of the information, and 800–899 as the part code. This product is **G806**.

The remaining four digits relate to existing Ordnance Survey digital map data in their own NTF system and are leading zero-filled.

For example, G8065310 – Motorways.

Neatline

Neatlines around the extent of the map data are added as lines in the ENTITIES section, (Layer name G8060572).

Grid

A grid is added as lines in the ENTITIES section (layer name G8060572). The grid is created by the translator and therefore must be specified before the translation takes place.

Copyright

© Crown copyright is inserted at the origin of the data (0,0).

Strategi DXF layers

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8060571	Footnotes	STANDARD		TEXT	WHITE	ST_FOOTNO
G8060572	Grid lines and values	CONTINUOUS	1	INSERT/ TEXT	WHITE	
G8060573	Grid values	STANDARD	1		WHITE	
G8060575	Default	CONTINUOUS	1	POLYLINE	WHITE	
G8065006	Non-primary route destination town graphic text	STANDARD		TEXT	WHITE	
G8065016	Other graphic text	STANDARD		TEXT	WHITE	
G8065020	Water feature graphic text	STANDARD		TEXT	CYAN	
G8065025	Primary route destination City graphic text	STANDARD		TEXT	GREEN	
G8065026	NonTextprimary route destination City graphic text	STANDARD		TEXT	WHITE	
G8065031	Motorway number graphic text	STANDARD		TEXT	BLUE	
G8065032	Primary route number graphic text	STANDARD		TEXT	GREEN	
G8065033	A road number graphic text	STANDARD		TEXT	RED	
G8065034	B road number graphic text	STANDARD		TEXT	ORANGE	
G8065036	Road distance mileage (motorway) graphic text	STANDARD		TEXT	WHITE	
G8065037	Road distance (primary and A) graphic text	STANDARD		TEXT	WHITE	
G8065038	Toll graphic text	STANDARD		TEXT	WHITE	
G8065039	Ferry annotation graphic text	STANDARD		TEXT	ORANGE	
G8065040	NonTextprimary route village graphic text	STANDARD		TEXT	WHITE	
G8065041	Primary route destination town graphic text	STANDARD		TEXT	GREEN	

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065042	Motorway junction number (full access) graphic text	STANDARD		TEXT	BLUE	
G8065043	Motorway junction number (limited access) graphic text	STANDARD		TEXT	WHITE	
G8065044	Tourist feature graphic text	STANDARD		TEXT	WHITE	
G8065045	National trail, long distance path and route graphic text	STANDARD		TEXT	GREEN	
G8065046	National park/forest park graphic text	STANDARD		TEXT	GREEN	
G8065049	Primary route destination village graphic text	STANDARD		TEXT	GREEN	
G8065060	Geographic area graphic text	STANDARD		TEXT	WHITE	
G8065061	Large hills, ranges and summits graphic text	STANDARD		TEXT	WHITE	
G8065062	Named hills, islands and rocks graphic text	STANDARD		TEXT	WHITE	
G8065081	Roman antiquity graphic text (AD43 – AD420)	STANDARD		TEXT	WHITE	
G8065082	Non-Roman antiquities graphic text	STANDARD		TEXT	WHITE	
G8065090	Spot Height value graphic text	STANDARD		TEXT	WHITE	
G8065107	Road distance marker (primary and A)	CONTINUOUS		INSERT	GREEN	R_MARK
G8065108	Road distance marker (motorway)	CONTINUOUS		INSERT	BLUE	M_MARK
G8065109	Dual junction graphic text divider line	CONTINUOUS		INSERT	WHITE	DUTXDIVL
G8065110	Coastline (natural) and offshore rocks above mean high water	CONTINUOUS	3	POLYLINE	BLUE	
G8065111	Coastline (man-made)	CONTINUOUS	3	POLYLINE	BLUE	
G8065115	Sea seed below mean high water	CONTINUOUS		INSERT	BLUE	SEEDPOINT
G8065120	Foreshore (sand, outer limit)	CONTINUOUS	1	POLYLINE	YELLOW	
G8065121	Foreshore (sand) seed	CONTINUOUS		INSERT	YELLOW	SEEDPOINT

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065122	Foreshore (other) and offshore rocks exposed at mean low water, outer limit)	CONTINUOUS	1	POLYLINE	CYAN	
G8065123	Foreshore (other) and offshore rocks exposed at mean low water seed	CONTINUOUS		INSERT	CYAN	SEEDPOINT
G8065140	Lighthouse (in use)	CONTINUOUS		INSERT	BLUE	LHINUSE
G8065141	Lightship	CONTINUOUS		INSERT	BLUE	LIGHTSHIP
G8065142	Lighthouse (disused)	CONTINUOUS		INSERT	BLUE	LHDISUSE
G8065200	Unspecified node	CONTINUOUS		INSERT	MAGENTA	CIRCLE (small)
G8065211	River (primary), source	CONTINUOUS	1	POLYLINE	CYAN	
G8065212	River (primary), middle	CONTINUOUS	1	POLYLINE	CYAN	
G8065213	River (primary), lower	CONTINUOUS	1	POLYLINE	CYAN	
G8065221	River (secondary), source	CONTINUOUS	1	POLYLINE	CYAN	
G8065222	River (secondary), middle	CONTINUOUS	1	POLYLINE	CYAN	
G8065230	River (other and drains)	CONTINUOUS	1	POLYLINE	CYAN	
G8065240	Canal	CONTINUOUS	1	POLYLINE	CYAN	
G8065241	Canal tunnel	DASHED	1	POLYLINE	CYAN	
G8065242	Canal (over)	CONTINUOUS	1	POLYLINE	CYAN	
G8065243	Canal tunnel (end symbol)	CONTINUOUS		INSERT	CYAN	C_TUN_E
G8065250	Inland water (outer limit)	CONTINUOUS	1	POLYLINE	CYAN	
G8065251	Inland water seed	CONTINUOUS		INSERT	CYAN	SEEDPOINT

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065300	Motorway (under construction)	DASHED		POLYLINE	BLUE	
G8065301	Motorway (under construction, over)	DASHED		POLYLINE	BLUE	
G8065302	Primary route, dual carriageway (under construction)	DASHED		POLYLINE	GREEN	
G8065303	Primary route, dual carriageway (under construction, over)	DASHED		POLYLINE	GREEN	
G8065304	Primary route, single carriageway (under construction)	DASHED		POLYLINE	GREEN	
G8065305	Primary route, single carriageway (under construction, over)	DASHED		POLYLINE	GREEN	
G8065306	A road, dual carriageway (under construction)	DASHED		POLYLINE	RED	
G8065307	A road, dual carriageway (under construction, over)	DASHED		POLYLINE	RED	
G8065308	A road, single carriageway (under construction)	DASHED		POLYLINE	RED	
G8065309	A road, single carriageway (under construction, over)	DASHED		POLYLINE	RED	
G8065310	Motorway	CONTINUOUS	3	POLYLINE	BLUE	
G8065311	Motorway, planned	DASHED	3	POLYLINE	BLUE	
G8065312	Motorway (over)	CONTINUOUS	3	POLYLINE	BLUE	
G8065313	Motorway tunnel	DASHED	1	POLYLINE	WHITE	
G8065314	Road tunnel (end symbol)	CONTINUOUS		INSERT	WHITE	
G8065320	Primary route, dual carriageway	CONTINUOUS	2	POLYLINE	GREEN	
G8065321	Primary route, dual carriageway planned	DASHED	2	POLYLINE	GREEN	
G8065322	Primary route, dual carriageway (over)	CONTINUOUS	2	POLYLINE	GREEN	
G8065323	Primary route, single carriageway	CONTINUOUS	1	POLYLINE	GREEN	

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065324	Primary route, single carriageway planned	DASHED	1	POLYLINE	GREEN	
G8065325	Primary route, single carriageway (over)	CONTINUOUS	1	POLYLINE	GREEN	
G8065326	Primary route, narrow	CONTINUOUS	1	POLYLINE	GREEN	
G8065327	Primary route, narrow (over)	CONTINUOUS	1	POLYLINE	GREEN	
G8065330	A road, dual carriageway	CONTINUOUS	2	POLYLINE	RED	
G8065331	A road, dual carriageway planned	DASHED	2	POLYLINE	RED	
G8065332	A road, dual carriageway (over)	CONTINUOUS	2	POLYLINE	RED	
G8065333	A road, single carriageway	CONTINUOUS	1	POLYLINE	RED	
G8065334	A road, single carriageway planned	DASHED	1	POLYLINE	RED	
G8065335	A road, single carriageway (over)	CONTINUOUS	1	POLYLINE	RED	
G8065336	A road, narrow	CONTINUOUS	1	POLYLINE	RED	
G8065337	A road, narrow (over)	CONTINUOUS	1	POLYLINE	RED	
G8065340	B road, dual carriageway	CONTINUOUS	2	POLYLINE	ORANGE	
G8065342	B road, dual carriageway (over)	CONTINUOUS	2	POLYLINE	ORANGE	
G8065343	B road, single carriageway	CONTINUOUS	1	POLYLINE	ORANGE	
G8065345	B road, single carriageway (over)	CONTINUOUS	1	POLYLINE	ORANGE	
G8065346	B road, narrow	CONTINUOUS	1	POLYLINE	ORANGE	
G8065347	B road, narrow (over)	CONTINUOUS	1	POLYLINE	ORANGE	
G8065350	Minor road over 4 metres wide	CONTINUOUS	1	POLYLINE	WHITE	
G8065351	Minor road over 4 metres wide (over)	CONTINUOUS	1	POLYLINE	WHITE	

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065353	Minor road over 4 metres wide tunnel	DASHED		POLYLINE	WHITE	
G8065355	Roundabout (primary route, dual carriageway)	CONTINUOUS		INSERT	GREEN	RBOUT
G8065356	Roundabout (A road, dual carriageway)	CONTINUOUS		INSERT	RED	RBOUT
G8065357	Roundabout (B road, dual carriageway)	CONTINUOUS		INSERT	ORANGE	RBOUT
G8065358	A road tunnel	DASHED		POLYLINE	RED	
G8065359	B road tunnel	DASHED		POLYLINE	ORANGE	
G8065360	Service station (full access)	CONTINUOUS		INSERT	BLUE	SERVICES
G8065361	Service station (limited access)	CONTINUOUS		INSERT	BLUE	SERV_LTD
G8065370	Motorway junction (full access)	CONTINUOUS		INSERT	BLUE	JUNCTION
G8065371	Motorway junction (limited access)	CONTINUOUS		INSERT	BLUE	JUNCTION
G8065372	Motorway junction (under construction)	CONTINUOUS		INSERT	WHITE	JUNCTION
G8065373	Primary route tunnel	DASHED		POLYLINE	GREEN	
G8065374	Roundabout (minor road over 4 metres wide)	CONTINUOUS		INSERT	WHITE	RBOUT
G8065375	Roundabout (primary route, single carriageway)	CONTINUOUS		INSERT	GREEN	RBOUT
G8065376	Roundabout (A road, single carriageway)	CONTINUOUS		INSERT	RED	RBOUT
G8065377	Roundabout (B road, single carriageway)	CONTINUOUS		INSERT	ORANGE	RBOUT
G8065378	Multi-level junction (under construction)	CONTINUOUS		INSERT	GREY	MULT_JUNC
G8065379	Multi-level junction	CONTINUOUS		INSERT	WHITE	MULT_JUNC
G8065380	Gradient 1 in 7 (14%) or steeper on primary, A and B roads	CONTINUOUS		INSERT	WHITE	GRADIENT

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065381	Roundabout (under construction)	CONTINUOUS		INSERT	BLUE	RBOUT_UNC
G8065382	Toll bar	CONTINUOUS		INSERT	WHITE	TOLL
G8065384	Other track or road	CONTINUOUS		POLYLINE	WHITE	
G8065385	Other track or road (over)	CONTINUOUS		POLYLINE	WHITE	
G8065390	Vehicular ferry route	DASHED	1	POLYLINE	WHITE	
G8065393	Ferry route link	DASHED	1	POLYLINE	WHITE	
G8065397	100 km accentuated grid line	CONTINUOUS		POLYLINE	BLACK	
G8065398	10 km grid line	CONTINUOUS		POLYLINE	BLACK	
G8065403	Dead-End Road gen under 4m wide	CONTINUOUS		POLYLINE	WHITE	
G8065404	Dead-End Road gen under 4m wide (over)	CONTINUOUS		POLYLINE	WHITE	
G8065405	Minor road under 4 metres wide	CONTINUOUS		POLYLINE	WHITE	
G8065406	Minor road under 4 metres wide (over)	CONTINUOUS		POLYLINE	WHITE	
G8065407	Minor road under 4 metres wide tunnel	DASHED		POLYLINE	WHITE	
G8065408	Roundabout (minor road under 4 metres wide)	DASHED		INSERT	WHITE	RBOUT
G8065413	Town attribute point	CONTINUOUS		INSERT	GREEN	SEEDPOINT
G8065416	Village attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065419	Landmark attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065420	Large urban area (outer limit)	CONTINUOUS	3	POLYLINE	GREY	
G8065421	Large urban area seed	CONTINUOUS		INSERT	GREY	DLUASEED
G8065422	Small urban area (outer limit)	CONTINUOUS	3	POLYLINE	GREY	
G8065423	Small urban area seed	CONTINUOUS		INSERT	GREY	DLUASEED
G8065427	City attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065490	Inland water (inner limit)	CONTINUOUS		POLYLINE	CYAN	
G8065491	Wood/forest (inner limit)	DASH-DOT	1	POLYLINE	GREEN	
G8065492	Large urban area (inner limit)	CONTINUOUS	3	POLYLINE	GREY	
G8065493	Small urban area (inner limit)	CONTINUOUS	3	POLYLINE	GREY	
G8065494	Foreshore (sand, inner limit)	CONTINUOUS	1	POLYLINE	YELLOW	
G8065495	Foreshore (other) and offshore rocks exposed at mean low water, inner limit	CONTINUOUS	1	POLYLINE	CYAN	
G8065510	Railway, standard gauge	CONTINUOUS	3	POLYLINE	WHITE	
G8065511	Railway, standard gauge (over)	CONTINUOUS	3	POLYLINE	WHITE	
G8065512	Railway, narrow gauge	CONTINUOUS	1	POLYLINE	WHITE	
G8065513	Railway, narrow gauge (over)	CONTINUOUS	1	POLYLINE	WHITE	
G8065514	Railway tunnel	DASHED	1	POLYLINE	WHITE	
G8065515	Railway tunnel (end symbol)	CONTINUOUS		INSERT	WHITE	RY-TUN_E
G8065519	Railway line under construction	CONTINUOUS		POLYLINE	WHITE	
G8065520	Railway station	CONTINUOUS		POINT	WHITE/RED	STATION
G8065521	Rapid Transit Station	CONTINUOUS		POLYLINE	WHITE	
G8065522	Rapid Transit Line	CONTINUOUS		POLYLINE	WHITE	
G8065523	Rapid Transit Line (over)	CONTINUOUS		POLYLINE	WHITE	
G8065524	Rapid Transit Tunnel	DASHED		POLYLINE	WHITE	
G8065525	Rapid Transit Line (U/C)	CONTINUOUS		POLYLINE	WHITE	

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065530	Level crossing on classified road	CONTINUOUS		INSERT	WHITE	LEVCROSS
G8065531	Level crossing on unclassified road	CONTINUOUS		INSERT	WHITE	LEVCROSS
G8065610	Wood/forest (outer limit)	DASH-DOT	1	POLYLINE	GREEN	
G8065611	Wood/forest seed	CONTINUOUS		INSERT	GREEN	WOODSEED
G8065612	Marsh	CONTINUOUS		INSERT	GREEN	MARSH
G8065620	Geographic area attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065621	Island area attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065710	National boundary	DASH-DOT	1	POLYLINE	WHITE	
G8065715	National primary attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065720	County boundary	DASHED	1	POLYLINE	WHITE	
G8065721	County name graphic text	STANDARD		TEXT	WHITE	
G8065725	County primary attribute point	CONTINUOUS		INSERT	WHITE	SEEDPOINT
G8065730	District boundary	DASHED		POLYLINE	WHITE	
G8065731	District name graphic text	STANDARD		TEXT	WHITE	
G8065733	District primary attribute point	CONTINUOUS		INSERT	WHITE	DIS_AP
G8065734	Administrative detached attribute point	CONTINUOUS		INSERT	WHITE	ADM_AP
G8065740	Unitary authority boundary	DASHED		POLYLINE	WHITE	
G8065741	Unitary authority name graphic text	STANDARD		TEXT	WHITE	
G8065744	Unitary authority primary attribute point	CONTINUOUS		INSERT	WHITE	UNI_AP
G8065750	Associated area boundary	DASHED		POLYLINE	WHITE	

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065805	Camping and caravanning combined site	CONTINUOUS		INSERT	WHITE	CAMPCAR
G8065806	Park and ride	CONTINUOUS		INSERT	WHITE	PANDR
G8065810	Roman road	CONTINUOUS	1	POLYLINE	WHITE	
G8065812	Antiquity line detail (dyke, wall, and so on)	CONTINUOUS	1	POLYLINE	WHITE	
G8065815	Hill fort	CONTINUOUS		INSERT	WHITE	HILLFORT
G8065816	Battlefield	CONTINUOUS		INSERT	WHITE	BATTLE
G8065820	National park/forest park	CONTINUOUS	1	POLYLINE	YELLOW	
G8065821	National park/forest park attribute point	CONTINUOUS		INSERT	YELLOW	SEEDPOINT
G8065825	National trail, long distance path and route	DASHED	1	POLYLINE	GREEN	
G8065835	Television, radio mast or tower	CONTINUOUS		INSERT	WHITE	MAST
G8065837	Telephone dot	CONTINUOUS		INSERT	WHITE	PHONEDOT
G8065838	Landmark/antiquity dot	CONTINUOUS		INSERT	WHITE	LANDOT
G8065839	Airport with customs (no scheduled flights)	CONTINUOUS		INSERT	WHITE	AIRCUST
G8065840	Airport without customs facilities	CONTINUOUS		INSERT	RED	AIRNOCUST
G8065841	Airport with permanent customs facilities where no prior notification is necessary	CONTINUOUS		INSERT	GREEN	AIRCUST
G8065843	Wind powered generator	CONTINUOUS		INSERT	WHITE	WINDGEN
G8065844	Windmill	CONTINUOUS		INSERT	WHITE	WINDMILL
G8065845	Heliport	CONTINUOUS		INSERT	WHITE	HELIPORT
G8065847	Public telephone	CONTINUOUS		INSERT	WHITE	PUBTEL
G8065849	Motoring organisation telephone	CONTINUOUS		INSERT	WHITE	MOTTEL

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065851	Theme park (open to the public)	CONTINUOUS		INSERT	WHITE	THEMEPK
G8065860	Abbey, cathedral, priory (open to the public)	CONTINUOUS		INSERT	WHITE	ABBEY
G8065861	Camp site	CONTINUOUS		INSERT	WHITE	CAMP
G8065862	Caravan site	CONTINUOUS		INSERT	WHITE	CARAVAN
G8065863	Golf course	CONTINUOUS		INSERT	WHITE	GCOURSE
G8065864	Museum (open to the public)	CONTINUOUS		INSERT	WHITE	MUSEUM
G8065865	Picnic site	CONTINUOUS		INSERT	WHITE	PICSITE
G8065866	Tourist information centre (open all year)	CONTINUOUS		INSERT	WHITE	TICA
G8065867	Country park (open to the public)	CONTINUOUS		INSERT	GREEN	CTPARK
G8065868	Youth hostel	CONTINUOUS		INSERT	WHITE	YHOST
G8065869	Nature or forest trail	DASHED		INSERT	GREEN	NTRAIL
G8065870	Zoo (open to the public)	CONTINUOUS		INSERT	WHITE	ZOO
G8065871	Preserved railway	CONTINUOUS		INSERT	WHITE	PRESRLY
G8065873	Craft centre (open to the public)	CONTINUOUS		INSERT	WHITE	CRAFTC
G8065874	Wildlife centre (open to the public)	CONTINUOUS		INSERT	GREEN	WILDC
G8065875	Aquarium (open to the public)	CONTINUOUS		INSERT	CYAN	AQUAM
G8065876	Cave (open to the public)	CONTINUOUS		INSERT	WHITE	CAVE
G8065877	Castle (open to the public)	CONTINUOUS		INSERT	WHITE	CASTLE
G8065878	Historic house (open to the public)	CONTINUOUS		INSERT	WHITE	HISHSE
G8065879	Motor racing circuit	CONTINUOUS		INSERT	WHITE	MRCIRC

Feature code	Feature name	Linetype	Line	Entity	Colour	Block
G8065880	Nature reserve	CONTINUOUS		INSERT	GREEN	NATRES
G8065881	Viewpoint (limited)	CONTINUOUS		INSERT	WHITE	VIEW
G8065882	Viewpoint (360 degrees)	CONTINUOUS		INSERT	WHITE	VIEW360
G8065883	Other tourist attraction (open to the public)	CONTINUOUS		INSERT	WHITE	OTOURA
G8065884	Ski slope	CONTINUOUS		INSERT	WHITE	SKISL
G8065885	Racecourse	CONTINUOUS		INSERT	WHITE	RACEC
G8065886	Garden (open to the public)	CONTINUOUS		INSERT	GREEN	GARDEN
G8065887	Ferry boat	CONTINUOUS		INSERT	CYAN	FERRY
G8065888	Ferry hovercraft	CONTINUOUS		INSERT	CYAN	HOVER
G8065889	Tourist information centre (seasonal)	CONTINUOUS		INSERT	WHITE	TICS
G8065890	Ferry box outline	CONTINUOUS		POLYLINE	CYAN	
G8065892	Ferry catamaran	CONTINUOUS		INSERT	CYAN	CATAM
G8065901	Spot Height Dots	CONTINUOUS		INSERT	WHITE	SEEDPOINT

Chapter 9 DXF file structure for Strategi

General

The following paragraphs describe the DXF group and section structure for the transfer of Strategi.

It is assumed that the reader of this chapter is familiar with the AutoCAD reference manual, which is published by Autodesk Ltd, Cross Lane, GUILDFORD, GU1 1UJ, or an equivalent document published by the reader's software supplier if a CAD package other than AutoCAD is to be used.

The following section gives a detailed breakdown of the data structure of Strategi in DXF.

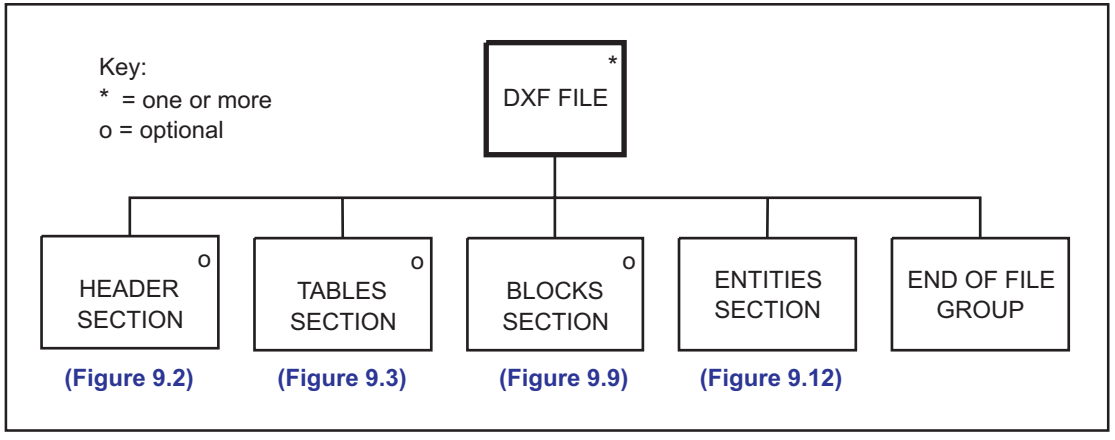
This is a two stage procedure which consists of:

1. Diagrammatic view of the data structure with a preceding outline description of that part of the data structure.
2. Detailed examples of the record sequence and contents of the data structure. A diagram of the record group precedes each example.

Data structure

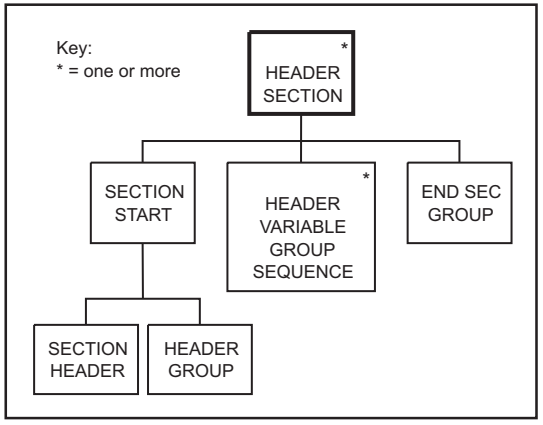
The following diagrams (figures 9.1 – 9.17) represent the data structure of DXF. Where one element of a figure is the starting point for another figure, this is indicated beneath the relevant box.

Figure 9.1: Level 1



Header

Figure 9.2: Level 2



The Header section will begin as:

```
0
SECTION
 2
HEADER
 9
$ACADVER        AutoCAD drawing database version number.
 1
AC1009          This indicates release 11 or 12 (not 9).
 9
```

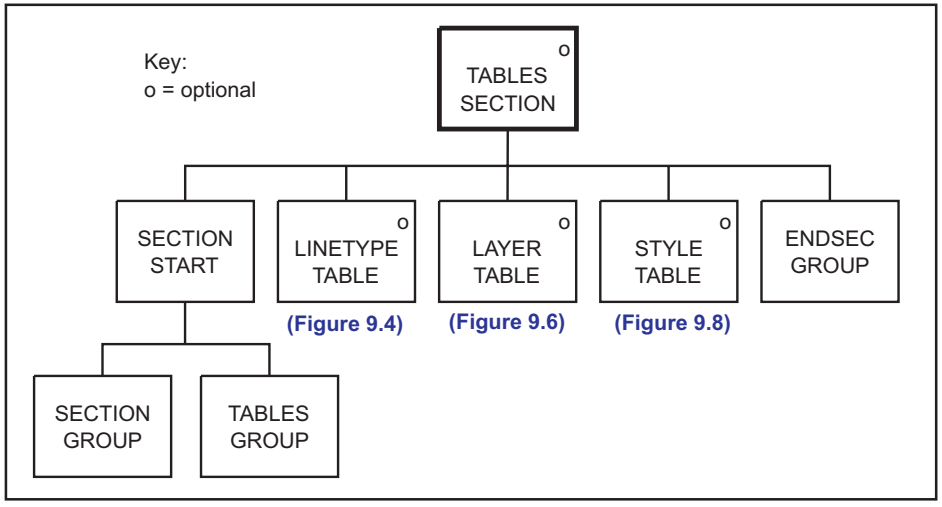
The information that follows contains settings of variables associated with the drawing. These are set with various commands and are the type of information displayed by the STATUS command. Each variable is specified in the Header section by a 9-group giving the variable's name, followed by the groups that supply the variable's value. Descriptions of all Header information can be found in the AutoCAD reference manual.

The Header information will end with the following variable:

```
0
ENDSEC          End of section.
```

Tables

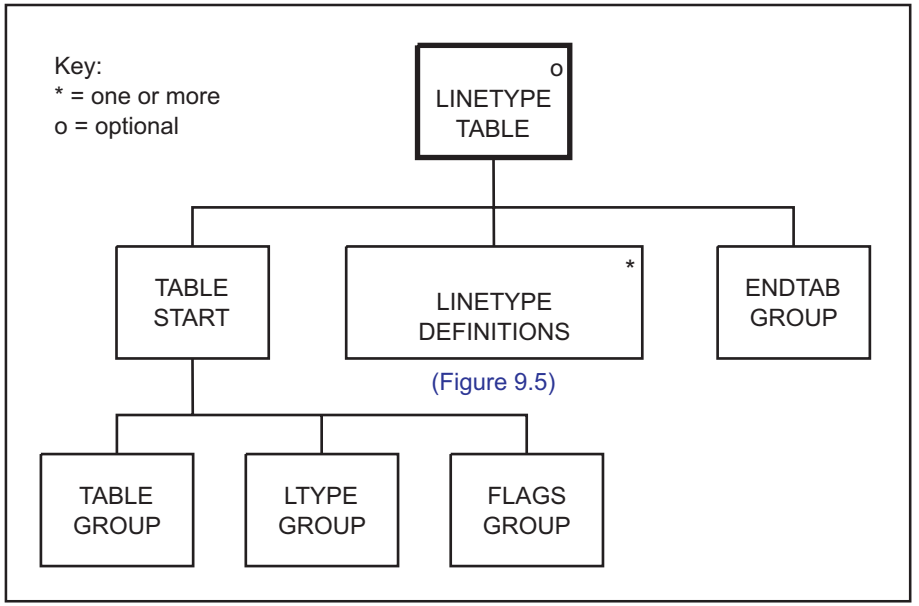
Figure 9.3: Level 2



The tables section will follow the header section and will contain three tables:

- Linetype table
- Layer table
- Style table

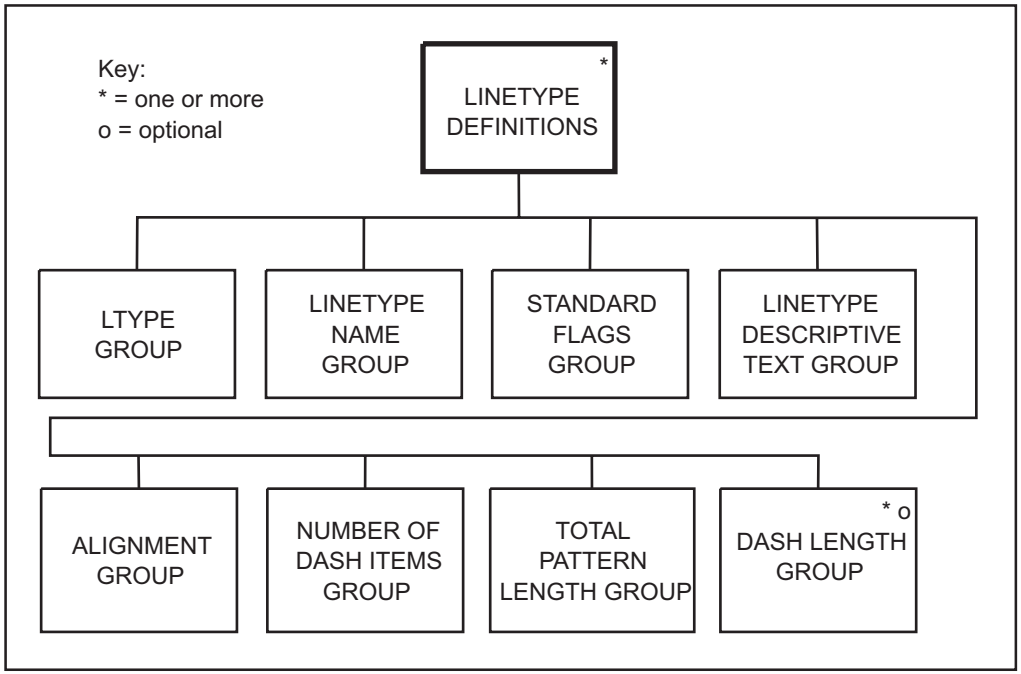
Figure 9.4: Linetype table level 3



The linetype table will contain definitions for the following line types:

- solid line (CONTINUOUS)
- dashed line (DASHED)
- dash-dot line (DASH-DOT)

Figure 9.5: Level 4



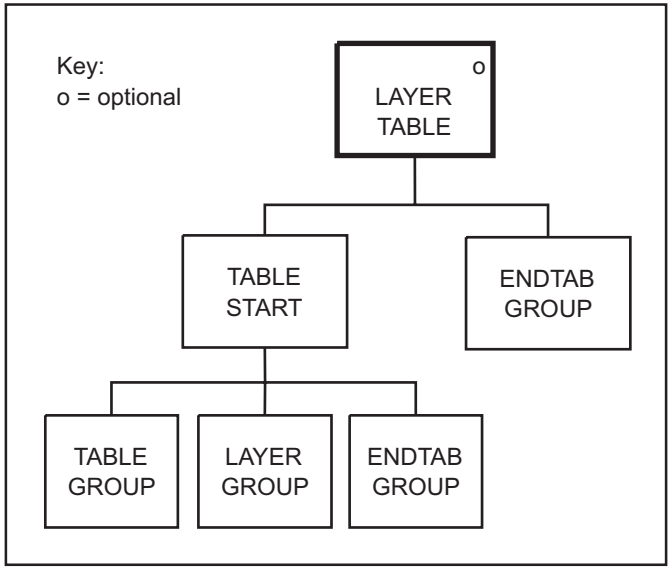
Thus:

```
 0
TABLE
 2
LTYPE
 70
    5
 0
LTYPE
 2
```

```
CONTINUOUS
 70
    64
 3
Solid Line
 72
    65
 73
    0
 40
 0.0
 0
LTYPE
 2
DASHED
 70
    64
 3
_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
 72
    65
 73
    2
 40
 0.75
 49
 0.5
 49
 -0.25
 0
LTYPE
 2
DASHDOT
 70
    0
```

```
 3
_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_·_
 72
    65
 73
    4
 40
 1.0
 49
 0.5
 49
 -0.25
 49
 0.0
 49
 -0.25
 0
ENDTAB
```

Figure 9.6: Level 3



Details of the layer table can be seen in chapter 8.

Figure 9.7: Level 4

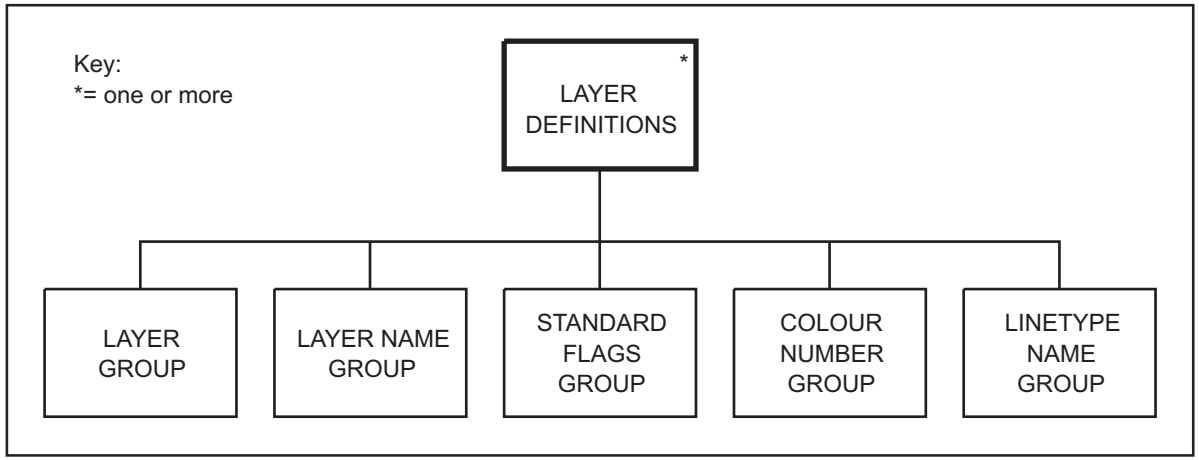
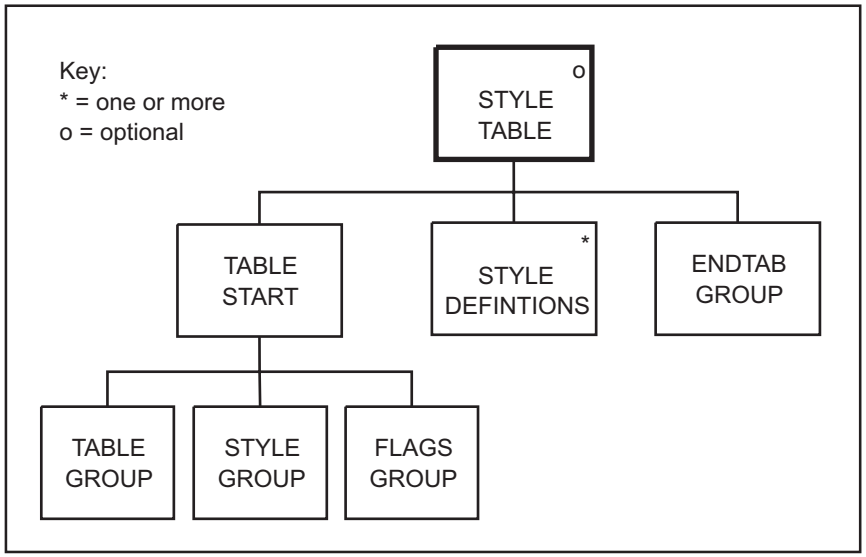


Figure 9.8: Style table level 3



The style table will contain the text file load instructions for:

- SIMPLEX.SHX
- MONOTEXT.SHX

Figure 9.9: Level 4

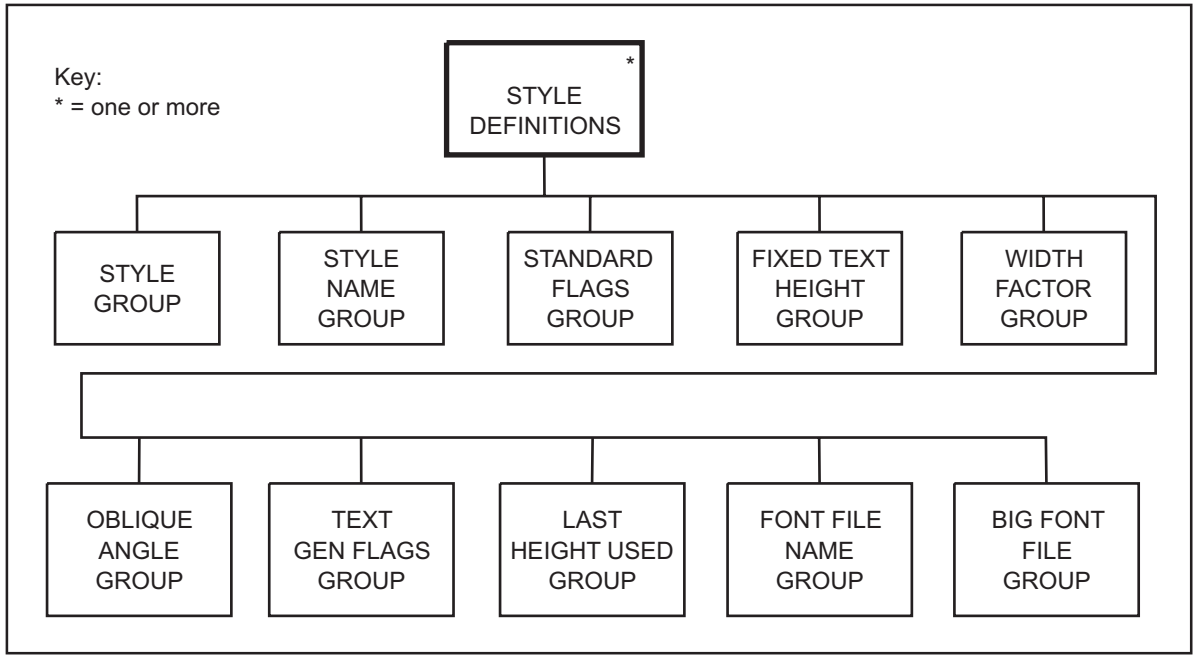


Figure 9.10: Level 2

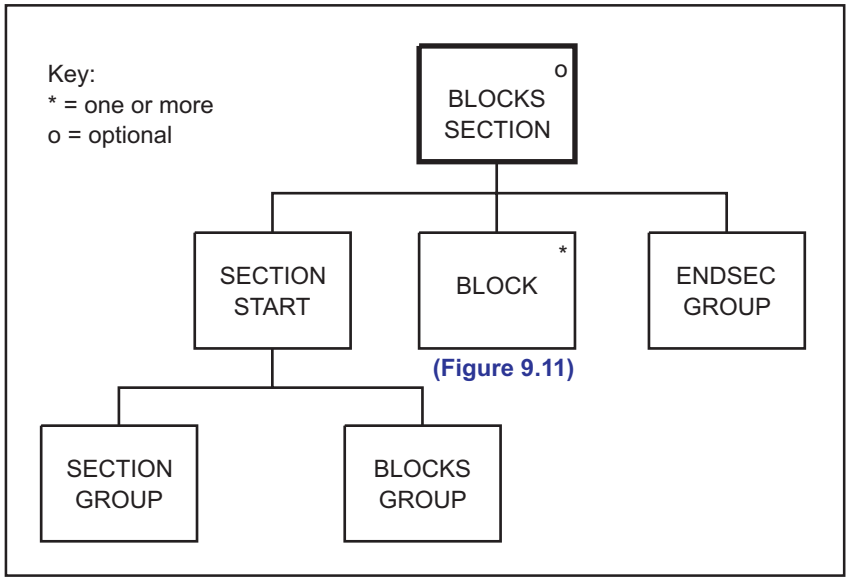
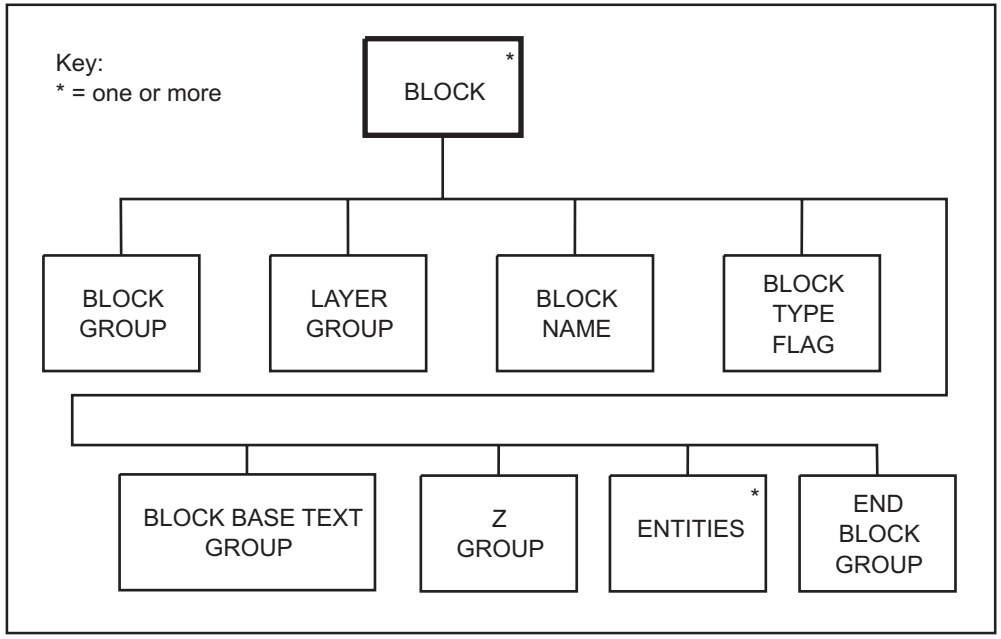


Figure 9.11: Level 3



Entities section

The entities section will contain DXF entities for:

- Ordnance Survey map footnotes data (INSERT entities);
- grid and neatline (TEXT and LINE entities);
- Ordnance Survey features (TEXT, POLYLINE and INSERT entities); and
- extended entity data to store attributes.

The structure of each different entity is as follows:

a. INSERT entities – these consist of:

- INSERT entity type group (attribute number 0)
- Layer name group (8)
- Block name group (2)
- X coordinate group (10)
- Y coordinate group (20)
- Z coordinate group (30)
- X scale factor (41) *optional*
- Y scale factor (42) *optional*
- Z scale factor (43) *optional*
- Rotation angle (50) *optional if 0*

b. LINE entities – these consist of:

- LINE entity type group (0)
- Layer name group (8)
- Start X coordinate group (10)
- Start Y coordinate group (20)
- Start Z coordinate group (30)
- End X coordinate group (11)
- End Y coordinate group (21)
- End Z coordinate group (31)

c. POLYLINE entities – these consist of:

- POLYLINE entity type group (0)
- Layer name group (8)
- Vertices follow flag (66)
- X elevation (10) *set to 0*
- Y elevation (20) *set to 0*
- Z elevation (30)
- Default starting width (40) *optional if 0*
- Default ending width (41) *optional if 0*
- A number of VERTEX entities *shown below*
- SEQEND group (0)

d. VERTEX entities – these consist of:

- VERTEX entity type group (0)
- Layer name group (8)
- X coordinate group (10)
- Y coordinate group (20)
- Z coordinate group (30)
- Starting width (40) *optional*
- Ending width (41) *optional*
- Bulge (42) *optional if 0*
- Vertex flags (70) *optional if 0*
- Curve fit tangent (50) *optional*

e. TEXT entities – these consist of:

- TEXT entity type group (0)
- Layer name group (8)
- X coordinate group (10)
- Y coordinate group (20)
- Z coordinate group (30)
- 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*

f. EXTENDED entities – these consist of:

- Application name (1001)
- Control string (1002)
- String (1000) *one or more*
- Control string (1002)

Figure 9.12: Level 2

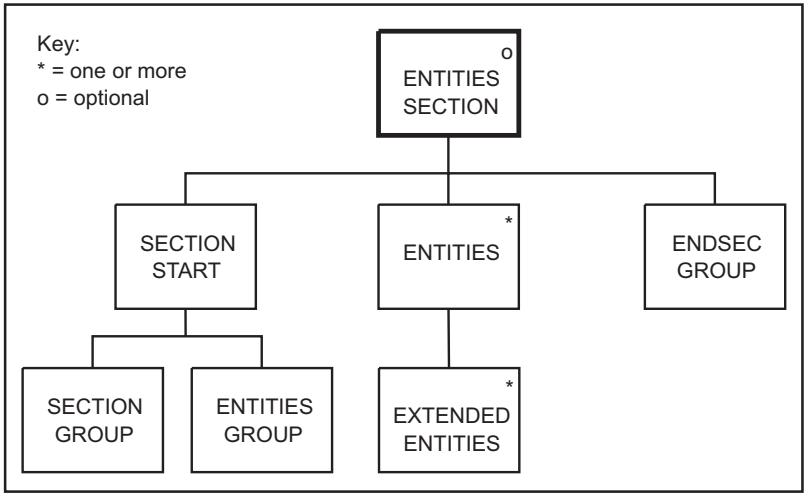


Figure 9.13: Level 3

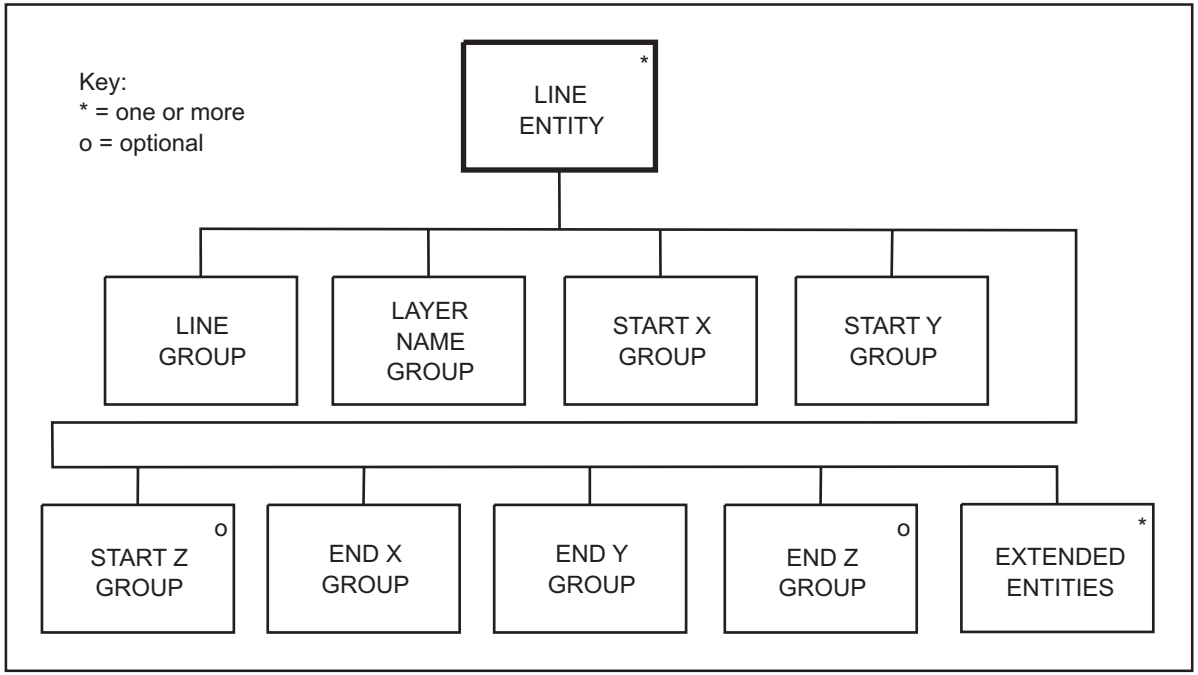


Figure 9.14: Level 3

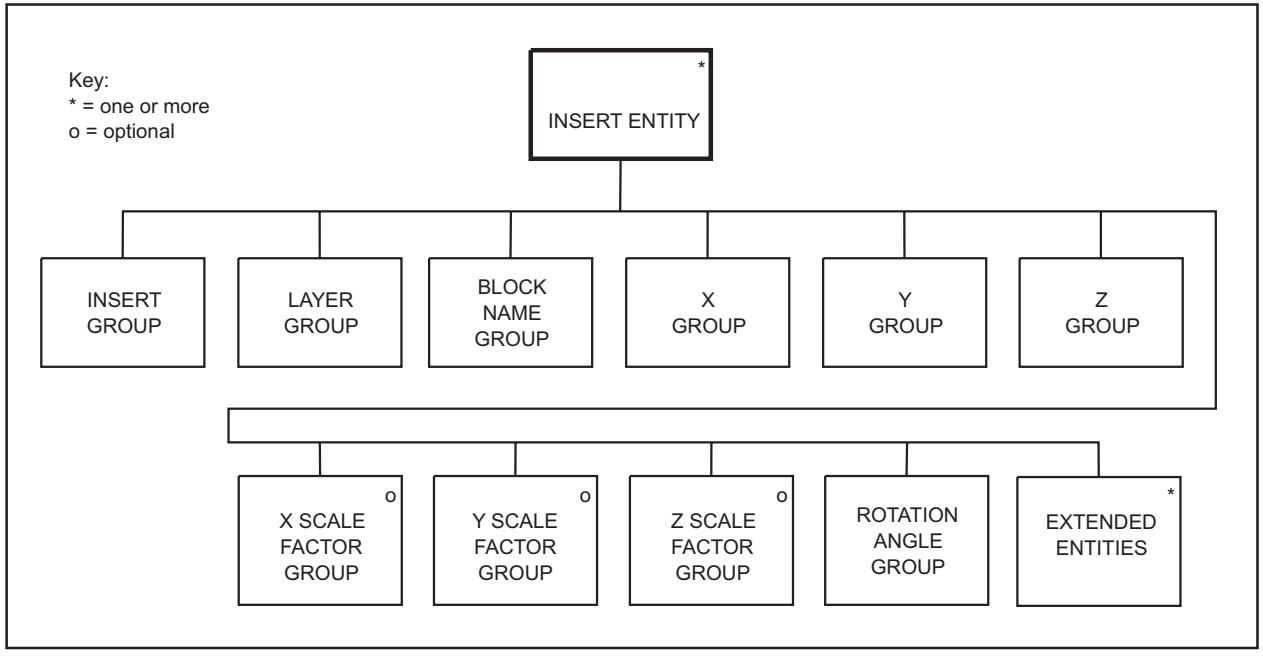


Figure 9.15: Level 3

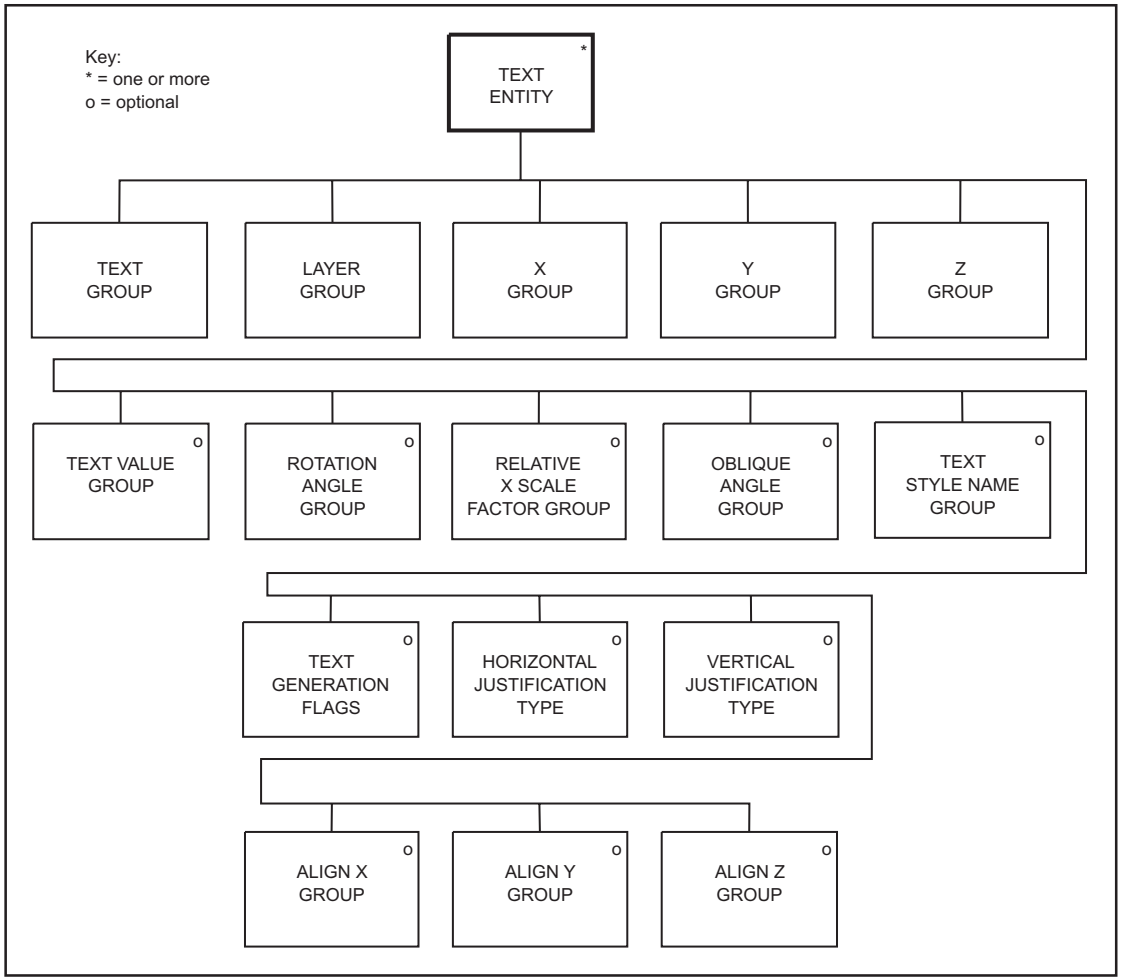


Figure 9.16: Level 3

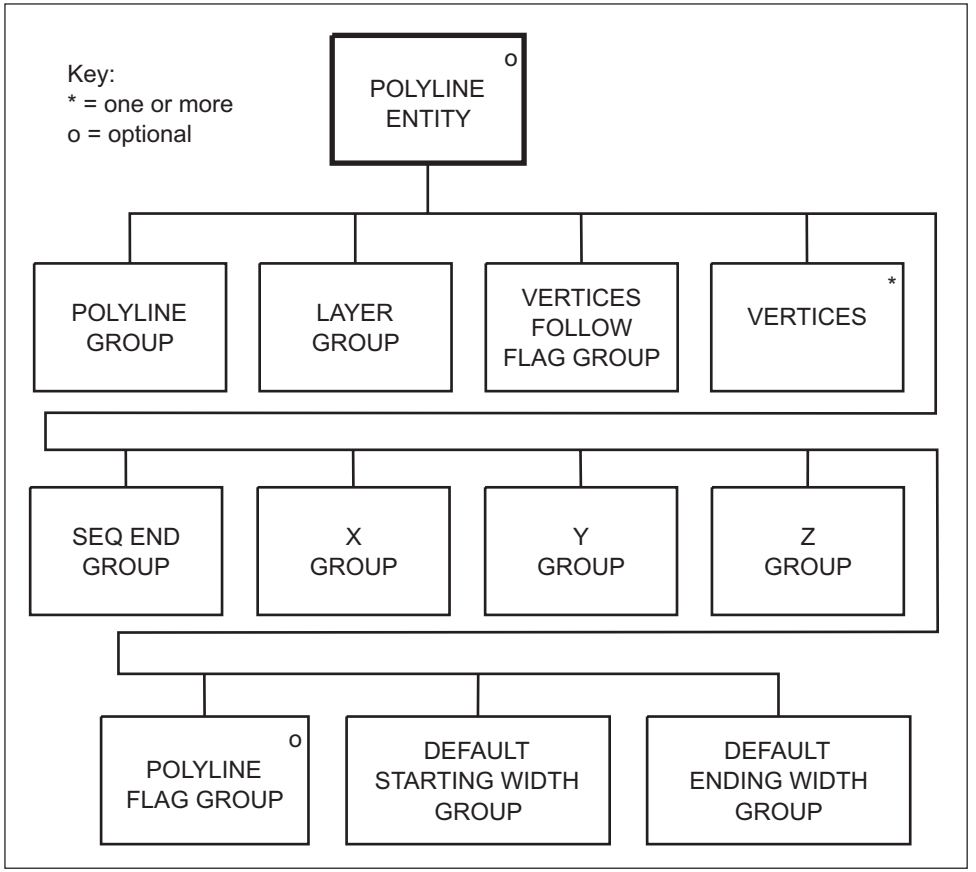
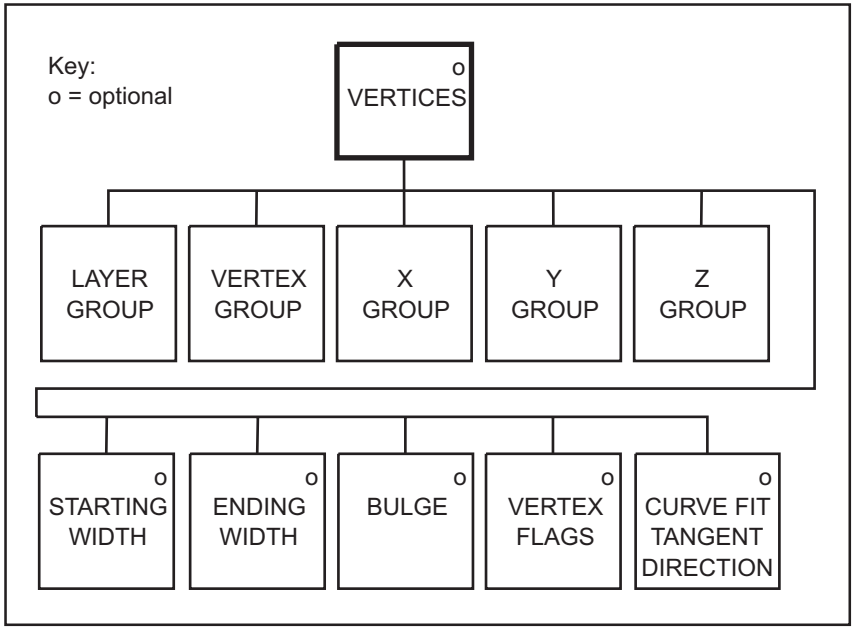


Figure 9.17: Level 4



End of file group

This group will end with DXF EOF (end of file) group.

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 term used by Ordnance Survey to refer to all public administrative areas, specifically, local government management and electoral areas.

area
A spatial extent defined by circumscribing lines that form a closed perimeter that does not intersect itself.

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.

ASCII (American Standard Code for Information Interchange)
It is a 7-bit code for encoding a standard character set.

attribute
An attribute is a property of an entity, usually used to refer to a non-spatial qualification of a spatially referenced entity. For example, a descriptive code indicating what an entity represents or how it should be portrayed.

attribute class
A specific group of attributes, for example those describing measure, serviceability, structure or composition.

attribute code
An alphanumeric identifier for an attribute type.

attribute value
A specific quality or quantity assigned to an attribute.

bearing
Bearings are angles measured against the National Grid in degrees. They are measured clockwise from grid north.

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.

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.

character
A distinctive mark; an inscribed letter; one of a set of writing-symbols.

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**.

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.

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 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.

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.

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.

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.

DXF (Data Exchange Format)
A proprietary data format, devised by Autodesk Ltd, by which digital drawings may be transferred between users of CAD 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**.

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**.

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**.

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.

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.

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**.

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.

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
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.

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 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.

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.

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.

northings
See **rectangular coordinates**.

NTF (National Transfer Format)
A format designed in 1988 specifically for the transfer of spatial information. Administered by the Association for Geographic Information (AGI), its present version (2.0) conforms to BS 7567 (see also **DXF**).

orientation
Orientation of a **point** or a **text feature**, measured in degrees anticlockwise from grid east.

origin
The zero point in a system of rectangular Cartesian coordinates.

pecked line
A **line** drawn on a map as a series of dashes, for example, – – – – – –).

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).

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 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**.

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.

precision
The exactness with which a value is expressed, whether the value be right or wrong.

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.

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.

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.

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.

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**.

symbol feature
A feature represented by a graphical sign with a specific meaning, for example, a triangulation pillar or a bench mark.

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 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.

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.

update
The process of adding to and revising existing digital map data to take account of change.

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.

Appendix B Product performance report form

Please photocopy and send completed to:

Ordnance Survey
Small Scale Vector Products Manager
Romsey Road
SOUTHAMPTON
SO16 4GU

Problem description or suggestion:

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Quotation or order reference: .....

Your name: .....

Company: .....

Address: .....

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Postcode: .....

Phone: .....

Fax: .....

Email: .....

Appendix C Text classifications

Font identity	Font description
0001	Helvetica
0002	Helvetica Bold
0003	Helvetica Narrow
0004	Helvetica Light
0005	Helvetica Oblique
0006	Helvetica Narrow Oblique
0007	Helvetica Bold Oblique
0008	Helvetica Narrow Bold
0009	Zapf Chancery Bold

The above apply only to NTF; text for DXF is STANDARD.