



PRODUCT GROUP/DEPARTMENT

OS MasterMap Topography Layer

Product guide

Responsibility for this document

The Product Strategy and Management team is responsible for the content of this document.

Change history

Version	Date	Summary of change
2.0	08/2017	First issue
2.1	05/2018	Reintroduced information table on page 29
2.2	07/2018	Clarification on capture rules for private property on page 20

The impacts of the project, described in this document have been assessed and where appropriate, changed, in accordance with the requirements set out in Ordnance Survey's Equality scheme.

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Preface

This user guide (hereafter referred to as the guide) is designed to provide an overview of OS MasterMap Topography Layer (hereafter referred to as the product) and it gives guidelines and advice on how a user might derive the maximum benefit from the products. It assumes a general knowledge of geographic information.

If you find an error or omission in this guide, or otherwise wish to make a comment or suggestion as to how we can improve the guide, please contact us at the address shown below under contact details or complete the product and service performance report form at [annexe F](#) and return it to us.

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The documentation is supplied in portable document format (PDF) only. Free Adobe® Reader® software, which displays the guide, incorporates search and zoom facilities and allows you to navigate within. Hyperlinks are used to navigate between associated parts of the guide and to relevant Internet resources by clicking on the blue hyperlinks and the table of contents.

Chapter 1 Introduction to OS MasterMap Topography Layer

Introduction

OS MasterMap is a consistent and maintained framework for the referencing of geographic information (GI) in Great Britain. It comprises four separate but complementary layers that provide detailed topographic, cartographic, administrative, photographic and network features positioned on the National Grid. This guide specifically covers the OS MasterMap Topography Layer.

The key characteristics and benefits of the Topography Layer are;

- Individual real-world topographic features represented by points, lines, and polygons, each with their own unique reference, called a TOID®.
- Employing a scale of data capture appropriate to the density of features – the higher the number of features within an area, the larger the scale used to survey them – ensuring the detail of individual features can be shown and with coordinates delivered in British National Grid.
- Developed, managed, and maintained by Ordnance Survey within one of the world’s largest spatial databases.
- The data is delivered as a seamless, geographically contiguous area. This means that the user receives only the area they order without additional, unwanted data, as may happen with tile-based products.
- Each feature is uniquely referenced and has attributes that record the feature’s life cycle. The feature’s life cycle is linked to the life cycle of the real-world object it represents. The life cycle records certain types of changes to the feature that occur over time.

Figure 1 (below) shows the OS MasterMap Topography layer.



Figure 1: the OS MasterMap Topography layer

These characteristics mean that user may use the Topography Layer in a wide variety of ways, including:

- improving the accuracy of a user's own derived data
- improving a user's data capture processes
- creating consistency and achieving maintainable standards within geographic data holdings
- establishing a common reference between a user's own datasets and data they may wish to share with other organisations
- improving the visual clarity of data and aiding the visual interpretation of data
- using the products in an integrated manner to derive additional information
- identifying and managing change in their area of interest
- creating historical views of their area of interest
- enhancing the queries that can be run on their data and so providing better information for decision making

System requirements

The OS MasterMap Topography Layer data is designed for use as a digital map within [geographical information systems](#) (GIS) and database systems.

For details of Ordnance Survey's Licensed Partners who can incorporate OS MasterMap in their systems please see the [technical support page](#) on the Ordnance Survey website.

Ordnance Survey does not recommend either suppliers or software products. The most appropriate system will depend on many factors, such as the amount of data being taken, resources available within the organisation, and the existing and planned information technology infrastructure or last but by no means least, the applications in which OS MasterMap is to be used.

However, as a minimum, the following elements will be required in any system:

- a means of reading the data in its native format, or by translating into a file format, or for storage in a database.
- a means of storing and distributing the data, perhaps in a database or through a web-based service.
- a way of visualising and querying the data, typically a GIS.

Ordnance Survey has produced a list of questions for [system suppliers](#) that may help users in choosing their system. There is also more information on handling OS MasterMap in [chapter 4](#) on the supply of OS MasterMap.

Currently, national cover is available for the Topography. The format for most of the data is Geography Mark-up Language (GML).

Table 1: OS MasterMap Topography data volume

Layer	Size
Topography	43.5 Gb

Additional space should be allowed for metadata and registration files. Gaelic or Welsh names are also supported.

The data model

The Topography Layers Is grouped into feature themes. Within each theme there will be features deemed to belong to that theme. A feature can belong to more than one theme.

Each feature will have one or more versions of itself which can be tracked as a means of demonstrating change over time. New versions of features will replace existing features through [change only updates](#) (COU) and features that no longer exist can be deleted as a result.

The rest of this chapter introduces the concepts of themes, features, and attributes.

Themes

A theme is a set of features that have been grouped together for the convenience of users and to provide a high-level means of dividing the data on the layer in a logical and user-friendly fashion. A feature can be a member of any number of themes but must belong to at least one theme as a minimum requirement.

A theme is created by applying rules based on the attributes of features. A theme rule can depend on the common values contained in the feature attributes. A feature is considered a member of each theme to which it passes a theme rule.

Themes are not part of the classification system of features for OS MasterMap. Because of this, a new theme can be created, for the convenience of our users, without in any way affecting either the existing themes, or the classification of OS MasterMap features. The themes for OS MasterMap Topography are discussed in more detail later in this document in [Chapter 3](#).

Features

In this user guide the term real-world object is used to describe a geographic entity that can be captured and represented in the data. A real-world object is represented by a feature in OS MasterMap data. A complete list of the real-world objects and their feature representations is given in the [OS MasterMap Real-world Object Catalogue](#).

Each feature has one of three geometrical structures – a point, a line, or a polygon. A line feature will have a start and end node that reflects the start and end of the real-world object it represents. Where the start and end node is coincident, the feature created is structured as a polygon. Lines and polygons represent both the location and the geometry of the real-world object. Points do not necessarily represent the exact geometry of the real-world object, just the centroid of its location. Text features are used to provide additional information and context about real-world objects represented by point, line, or polygon features. They are represented as a point, which indicates the location where the text should be displayed.

Polygon features, fit with each other topologically within structuring layers. This means that polygons sit adjacent to each other like pieces of a jigsaw puzzle, rather than on top of each other. In figure 2 below it can be seen that a building, if ‘removed’, leaves its footprint in the land feature; the land feature does not exist below the building.

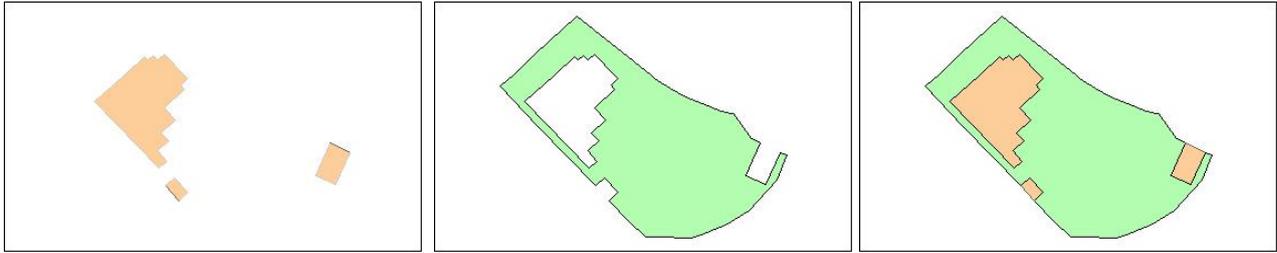


Figure 2: OS MasterMap Topography Polygons

Attributes

Each feature comes with an extensive set of attributes that provide information about the feature, for example, its identity, its relationship to other features, geometry, and the kind of real-world object it purports to represent. Each type of feature has a different set of attributes.

There are two types of attribute information; attributes that provide data about the real-world object the feature represents, such as its area or its nature. Or attributes that provide additional information about the feature, such as its life cycle and quality. Three of the most important pieces of additional information for the vector layers – the TOID, version and version date – are discussed in more detail in [chapter 5](#).

OS MasterMap Topography provides attribution that can be searched for and queried within a GIS. Attribution makes it possible to select parcels of land with common features, for example, a polygon attributed as having coniferous tree cover.

This chapter has outlined the main features of the OS MasterMap product and the data models that underpin the layers. It has explained the role OS MasterMap Topography Layer plays and within the wider vision Ordnance Survey has of providing a framework for users to create and derive additional value from their GI. The following chapter looks at OS MasterMap Topography Layer in more detail.

Chapter 2 Introduction to OS MasterMap Topography Layer

The OS MasterMap Topography Layer contains features that represent objects in the physical environment such as buildings, fields, fences, and letter boxes. It also includes intangible objects such as county boundaries and the lines of mean high or low waters. There are over 450 million features in the current product. It is available for all of Great Britain (England, Scotland, and Wales). Figure 3, below, shows an extract of OS MasterMap Topography Layer. Geographic features are modelled in such a way as to make it easy to identify buildings, roads, water, and land at a glance. The data has been collected by Ordnance Survey and is based on the British National Grid.

The basic unit of OS MasterMap Topography Layer data is a point, line or polygon that represents a real-world feature. A feature may also have text or a symbol that accompanies it. Both are considered a feature within the OS MasterMap products. Each feature comes with a set of attribution that provides information, about the real-world object it represents and metadata that helps track changes to the feature. The structure of OS MasterMap Topography Layer, combined with its rich attribution, provides the scope to undertake quite complex geographic analyses, and to enhance users' data-capture processes. Attribution provides the opportunity to use the data as far more than a map. Using the product within a GIS, attribution can be used to analyse, sort, query and visualise the data in many different ways.

Each feature in OS MasterMap Topography Layer has a unique reference called a TOID. The clear majority of database systems used within organisations rely on the use of unique referencing for the efficient management of the data stored within them. Each feature also has a version number and a version date. As the real-world feature that it represents changes during its life, so the feature within the OS MasterMap Topography Layer will also change in terms of its shape or its attribution. Whilst it remains the same feature – essentially occupying the same space and having the same function – the TOID will not change, but the version number will increment and the version date will change. This allows an instance of a feature to be identified in both space and time.

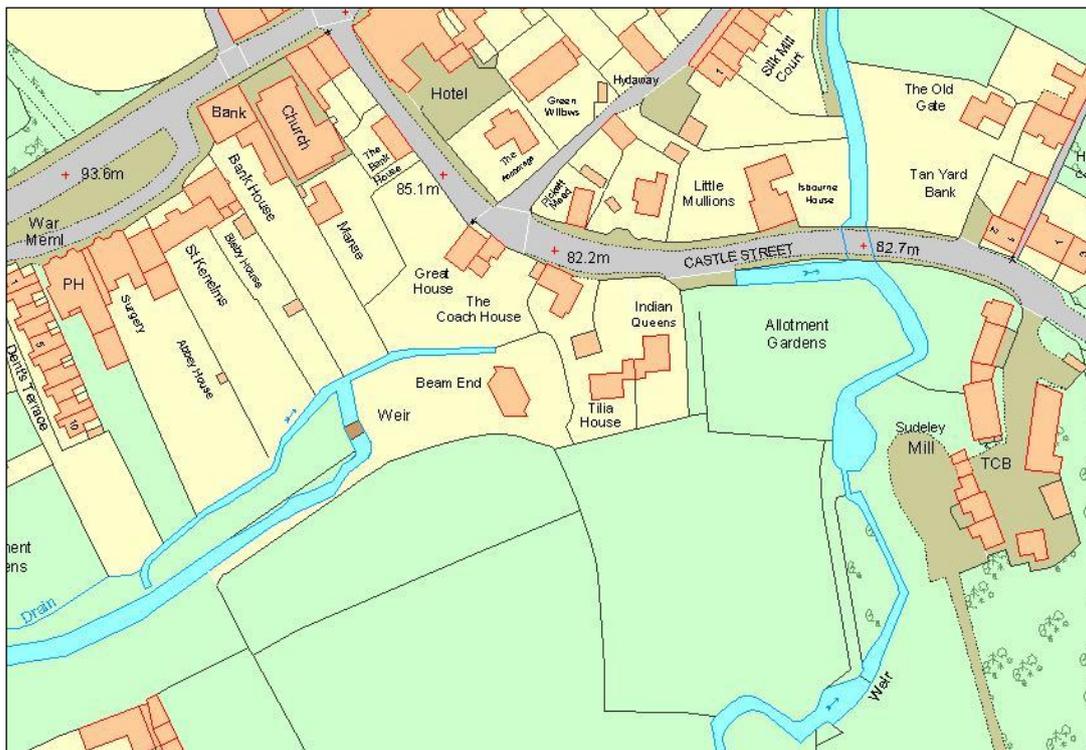


Figure 3: extract of OS MasterMap Topography Layer

OS MasterMap Topography Layer is supplied in an open, tabular GML. An online ordering system has been developed for users to place and manage their orders. The data can be delivered electronically or on digital media.

When ordering OS MasterMap Topography Layer, there are no artificial divisions in the data caused by a tile-based [unit of supply](#). OS MasterMap Topography Layer is supplied as a seamless dataset.

In the following chapters of this user guide, these new concepts are explained in more detail. The reasons behind the concepts, where appropriate, are given along with indications of the benefits they may bring and the possible considerations for a user's use of the product. Firstly, the purpose for introducing this type of product and some typical applications for the product are outlined in the rest of this chapter. We have a number of live [user cases](#) detailing a variety of live applications.

Purpose and Application

OS MasterMap Topography Layer was developed in response to the need for a national topographic dataset that offers users a more sophisticated type of data that represented the world in a more realistic way and was more aligned to the increasing use and functionality of GIS and spatial database technology within organisations.

Its primary purpose is to provide the most detailed topographic data available of the physical environment of Great Britain. It is regularly updated by ground and aerial survey to a regular schedule, and captured and published to a consistently high standard.

Many users apply geographic products as a starting point to derive their own data, which can be time consuming and inefficient. This is particularly true where features in the data are amalgamations of more than one real-world feature, or even individual parts of a real-world feature. Where the feature represents a real-world feature that has an 'area', such as a building or a parcel of land, the feature is represented in the data as a polygon. This should provide opportunities for users to derive their data with greater efficiency and ease as features can be selected either singularly or in groups. The way, and, largely, the extent of a user's ability to take advantage of the polygonised structure will depend, on the systems in use. However, most GIS have the necessary 'data capture' tools to analyse and interrogate the topography features.

OS MasterMap Topography Layer provides detailed attribution, through its descriptive terms, relating to the real-world object and the group of features it represents. This means certain types of analysis can be performed, without the user having to manually add their own attribution to the data. The themed attribution also means the user can apply their own criteria to refine the data into groups of features that meet their own specific requirements. An example of this would be finding buildings of a certain size, using the calculated area provided as one of the attributes.

It is important for many applications of GI, to be able to identify where changes have taken place and the history of a features changes. This is important because users may need to learn how the landscape has altered, and reflect those changes in their own data. Ordnance Survey updates OS MasterMap Topography Layer on a regular basis, and these changes are passed on to the users through a dataset called [change-only update \(COU\)](#). This supplies just the features that have changed since the last update or customer user order. This should normally result in much less data needing to be processed and uploaded to the user's holdings upon the arrival of each update. This is, however, dependent on how frequently the COU data is applied. Furthermore, OS MasterMap Topography Layer is the first product from Ordnance Survey to introduce the concept of feature life cycles and unique referencing. This makes it possible to relate change in the real world to features in the digital environment, and to identify and manage that change to OS MasterMap so that users can, if they wish, keep their own data holdings up to date. This will also enable the user to assess the consequences of feature changes. It may even be possible, depending on the systems used, for users to roll back their holdings of OS MasterMap Topography Layer to a specific point in time. However, Ordnance Survey does not supply previous versions of any feature or dataset.

One of the most common uses for GI is to produce maps that are coloured to highlight a particular value or property that a real-world feature may have. These are often called thematic maps. An example is given below in figure 4. The figure was created by grouping the calculated area value attribute of each unit on an industrial park into one of five categories. Each category is 'themed' with its own colour. The ranges and colours are shown in the legend. Most computer systems offer the ability for features to be assigned a colour or style based on the value of an attribute; OS MasterMap Topography Layer has both the structure and attribution to make it relatively quick to produce such maps. The result is data that is easier to customise, easier to interpret and more eye-catching.



Figure 4: thematic mapping with OS MasterMap Topography Layer

One of the barriers to users is linking datasets together and sharing this data with other Ordnance Survey users, making greater use of both their own data. To be able to link or 'associate' datasets together normally requires each dataset to have a common reference – one piece of information that is in all datasets. OS MasterMap Topography Layer can help to create links between users' own datasets and OS MasterMap features by using the TOID as a common reference. In this way, OS MasterMap Topography Layer provides a foundation dataset for a Digital National Framework that aims to help users of spatial data to derive more value by associating datasets together. Using a common reference can also provide such benefits to an organisation as removing ambiguity over a feature's identity and allowing the faster retrieval of data when querying or analysing the data.

Applications

OS MasterMap Topography Layer is used extensively by businesses and organisations that need to relate their activities and/or their assets to the physical environment.

One of the most common uses for the product is by organisations, who have their own GI, and wish to examine it in relation to the real world around them. An example would be utility companies that have assets both at surface and below surface level. They frequently need to visit these assets, either for repair, maintenance or to add new assets. By viewing their infrastructure against the features in OS MasterMap Topography Layer, it will help their crews locate the assets, become familiar with the area before they leave their depot and allows them to provide a better user service by identifying those nearby premises that need to be notified about the works.

Taking this a stage further, many organisations need to derive their own GI from the OS MasterMap Topography Layer. They use the individual features that Ordnance Survey provide, to form the building blocks for their own sets of GIs'. Many local- and central-government organisations use the data in this way. A local authority, for example, may use it to maintain a register of land and buildings in their ownership. Once they have the physical feature or group of features they are interested in, they can attach their own attribution to that already provided with the product. When this kind of data association takes place, it can lead to efficiencies in storing and using data. It can also enable data to be shared more easily between and within organisations.

As more GI is created, it is possible to analyse the spread and distribution of features or activities and learn from their relationship to other physical features. For example, a police force might plot the locations of certain types of street crimes, and by analysing the pattern and the timing of the incidents against the local topography, they may be able to target their resources more efficiently.

The OS MasterMap Topography Layer can also be used as part of a data modelling or a predictive modelling tool. In addition, OS MasterMap Topography Layer is also used by organisations looking for areas where specific physical conditions exist. A retailer, for example, may use OS MasterMap Topography Layer to help it find a site for a new store by using the attribution to find land parcels of a certain size and distance from a settlement or main road and cross referencing the information contained within OS AddressBase to identify an ideal catchment area. Emergency planners may use OS MasterMap Topography Layer to assist in planning and preparing for emergencies, by identifying the area's most likely to be affected. It can also be used to model the sequence of events in any given type of emergency, so that their own resources and command centres are unlikely to be cut off or taken out of action by the emergency itself.

It is possible to customise OS MasterMap Topography Layer styling as a way of clearly communicating GI in reports and presentations. GI can be conveyed more meaningfully in a map, than by text or tables, making it easier to get points across too many different types of audience, whether they are key decision-makers, people inside the organisation, or members of the public. OS maintains a [GitHub](#) page with predesigned, schema specific styling guides.

It should be noted that the ability of an organisation to develop any or all the applications listed above will depend in part on the systems they use. Most GIS are capable of performing, to a greater or lesser degree, the applications listed above. Table 2 below gives examples of other applications that frequently use OS MasterMap Topography Layer.

Table 2

Land management and property development	Environmental monitoring
Site planning	Tourism and promotional material
Citizen services	Risk assessment
Location-based services on mobile devices	User service centres

This chapter has provided a detailed introduction to OS MasterMap Topography Layer, including its main features, the reasons behind its development and some of the many applications in which it may be used. The next chapter looks at the concept of the layer themes and how this feature can be used to improve your analysis processes.

Chapter 3 OS MasterMap Topography Layer themes

This chapter describes in more detail the content of each theme. This will aid users' understanding of which features they can find in the data and the most likely theme or themes that the feature will be found in. OS MasterMap Topography Layer comprises nine themes. These are:

- Administrative boundaries
- Buildings
- Heritage and antiquities
- Land
- Rail
- Roads, tracks, and paths
- Structures
- Terrain and height
- Water

The main features of each theme are described below. As stated earlier in [chapter 2](#), there are rules that govern which theme or themes are assigned to a feature. These are discussed later in this chapter.

Wherever possible, real-world objects are represented in their true surveyed position. However, for the sake of clarity of display or plotting, real-world objects may be generalised. For example; small juts in house fronts may not be shown. The normal methods of generalisation that can be applied to features are:

- emphasis
- selection for inclusion
- simplification
- omission

Real-world objects may also be simplified in the OS MasterMap Topography Layer, for example, a small group of trees may be recorded as a single point or polygon feature. The following is a breakdown, by feature type, of the themes in greater detail, including regional and cultural special designations.

Administrative boundaries

These are defined as showing the limits of responsibility and representation for electoral and administrative purposes. Boundary alignments are shown within the administrative boundaries theme. As well as the boundary's relationship to real-world objects, its mereing and boundary descriptions, where needed for clarification, are also supplied.

The following types of boundary are shown within the administrative boundary theme:

Parliamentary Boundaries

GB Wide:

- European Electoral Region
- County Constituency
- Borough Constituency (England and Wales)
- Burgh Constituency (Scotland)
- Assembly Electoral Region and Assembly Constituency (Wales)
- Parliamentary Electoral Region and Parliamentary Constituency (Scotland)

Local Government Boundaries

In England:

- County
- City and County of London, District, London borough, Unitary Authority, and Metropolitan District
- Civil Parish and the Inner and Middle Temples
- Electoral Division
- Ward

In Wales:

- Unitary Authority
- Community
- Electoral Division

In Scotland:

- Unitary Authority
- Ward

Physical features shown in the administrative boundaries theme:

- Boundary Posts
- Boundary Stones
- Boundary Markers

Non-physical features shown in the administrative boundaries theme:

- Alignments of Boundaries
- Textual Descriptions of Boundaries, Mereings and Posts and Stones.

Application of Precedence

Where two or more boundaries are coincidental, a single alignment is shown by the most important boundary in the following order;

In England and Wales:

- County, City and County of London, Unitary Authority, District, London Borough and Metropolitan District, Civil Parish, Community, Inner and Middle Temples
- European Electoral Regions, County/Borough Constituencies
- Welsh Assembly Electoral Region
- Electoral Division and/or Ward

In Scotland:

- Unitary Authority
- European Electoral Regions, County/Burgh Constituencies
- Scottish Parliamentary Electoral Region
- Ward

A textual description often accompanies this occurrence and is used for clarification. If the alignment of an administrative boundary coincides with any other feature (other than another boundary) then both will be shown in their respective themes. More information on administrative boundary alignments can be found in [annexe A](#).

Buildings

Buildings are defined as permanent roofed constructions, usually with walls. This includes permanent roofed-constructions that exceed 8.0 m² in area (12.0 m² in private gardens). Exceptions are made to this area rule for smaller buildings that, due to their detached position, form relatively important topographic features. These are shown at minimum size as stated above. With a few exceptions, for example, by describing government offices or hypermarkets, no distinction is currently made between residential, private, public, commercial, or industrial buildings.

Physical features shown in the buildings theme:

- Roofed Buildings (identified as of sufficient size or importance to be shown)
- Mobile or Park Homes that are permanent, residential and have a postal address
- Archways and Covered Passageways, where the alignment can be determined from outside the building
- Horticultural Glasshouses over 50 m²
- Covered Tanks

Features such as cooling towers, uncovered tanks, bridges, and monuments are shown within the [structures](#) theme.

Only glasshouses over 50 m² that serve a horticultural purpose will continue to be captured as glass structures. Other glass structures, such as office buildings and conservatories, exist within OS MasterMap and will be recorded as buildings. There are some non-physical features shown in the buildings theme, represented as the following text features:

- House Numbers
- Descriptive Building Names
- Distinctive Building Names

Detail in private gardens attached to residential buildings such as sheds, pathways and ornamental ponds are not captured as part of the specification. Where possible, all gardens of this type are generalised and represented by a single garden polygon.

Heritage and Antiquities

For Ordnance Survey purposes, Antiquities are defined as existing artificial features of a date not later than AD 1714 (the date of the accession of George I). These are captured along with very important battlefield sites and natural features connected with important historic events. Features and sites of a date later than AD 1714 may be treated as Antiquities as an exception if they are of national importance.

The investigation, recording and surveying of archaeology is the responsibility of English Heritage® and Royal Commissions on Ancient and Historical Monuments (RCAHMs) for Scotland and Wales. Antiquity find sites are not shown in OS MasterMap. Ordnance Survey has no responsibility for defining the authenticity of distinctive or descriptive names of antiquities.

Due to the variety of physical features in the heritage and antiquities theme, an exhaustive list is not provided, but they do include:

- Standing Stones
- Earthworks
- Hill Figures
- Ruined Buildings
- Tombs
- Stone Circles

Some non-physical features are shown in the heritage and antiquity theme. These include:

- Textual Descriptions for the real-world objects
- Battle Sites, as either text or symbol.

There are some limitations on what can be shown, imposed by survey principles. Many earthworks are of low relief and do not meet Ordnance Survey's minimum criteria. To depict the feature clearly, it may be necessary to exaggerate antiquity detail. In mountain and moorland areas, some antiquity features may be generalised, without losing the essential characteristics of the depiction.

Land

The Land theme is defined as either a man-made or a natural polygon feature that describes the surface cover and area to which it is applied. This includes both natural and man-made slopes and cliffs. All general features are also placed in the land theme. There are some exceptions to this such as routes of communication and buildings.

Landform features, such as slopes and cliffs, behave slightly differently from other features, in the instances that they are represented as line features, they can cross other line features without being broken at the intersection of the line. Additionally, when they are polygon features, they can overlap other polygon features instead of sitting adjacent to them.

Rail

These are defined as features related to travel by railway or tramway. The exception to this are railway tunnels, which are currently in the structure theme. The OS MasterMap Topography Layer contains information relating to permanent railways that form the network between two points, for example, from railway station to railway station or from an industrial building to a private quarry.

Standard-gauge railways are shown to scale by a pair of rails and represent tracks 1.435 m apart. Railways narrower than 1.435 m are deemed to be narrow gauge, and are shown by a single line representing the central alignment. Tramways, metros, and light-rapid-transit systems are treated as railways.

Underground portions of the Metropolitan and District lines in London that are close to surface level are shown. Where a deep-level tube railway comes to the surface and continues as a normal railway, it is shown as a standard-gauge railway. In other cities, only the sections of underground railways that are open to the sky are currently shown.

The physical features shown in the rail theme include:

- Level Crossings
- Lighting Towers
- Loading Gauges
- Turntables
- Mile or Kilometre Posts and Stones
- Sand Drags
- Signal Posts, Bridges, and Gantries
- Switches and Slips
- Retarders
- Bridges and Viaducts
- Mail pick-ups
- Rails
- Permanent Ways
- Station Buildings and Platforms

Some physical features are not shown in the rail theme. These include:

- Telephones associated with Level Crossings
- Conductor Rails and Overhead wires for electrified trains
- Detail beneath the roofs of Railway Stations
- Water Troughs
- Repetitive Features, such as signal lights within marshalling yards

Some non-physical features are shown in the rail theme. These are text descriptions of railway and associated railway features.

Roads, Tracks, and Paths

Roads

For Ordnance Survey purposes, a road is defined as a metalled way for vehicles. Roads that form part of the public network and driveways to private properties that are over 100 metres in length are normally included within the OS MasterMap Topography Layer.

Tracks

A track, for Ordnance Survey purposes, is defined as an unmetalled way that is clearly marked, permanent and used by vehicles. Tracks are only normally recorded in private gardens if they are 100 metres or more in length. They need not be 'all weather'. All tracks are described as '*Track*', or '*Tk*' if required to be abbreviated. Distinctively-named tracks have their name recorded, for example, *HICKS LANE (Track)*.

Paths

For Ordnance Survey purposes, a path is defined as any established way other than a road or track. They can be considered as either 'made' or 'unmade'.

Made paths

Made paths are those whose surface is paved or metalled. Only major paths are shown in parks, public gardens, cemeteries and so on. Made paths are described by the annotation '*Path*', except in built-up areas, where the description will not normally be recorded. Distinctive names, such as '*Simmons Walk*', are also included as part of the OS MasterMap Topography Layer.

Unmade paths

Unmade paths are those that are neither paved nor metalled. An unmade path is included in the Topography Layer when its entire length is evident on the ground and it starts at a road, track or path and finishes at a similar feature or a specific place of interest. Unmade paths are described by the annotation *Path (um)* in urban and rural areas.

The physical features shown in the roads, tracks and path theme are listed below:

- Kerb lines or the limits of metalling:
 - Carriageway Limits, including any hard shoulder or shallow drainage gullies forming the side of the road on dual carriageways or motorways
 - Kerbed Roundabouts
 - Traffic Islands in roads (usually 8 m² or more)
 - Traffic-calming measures forming a physical obstruction, including pinch points
 - Dedicated Cycle Lanes
 - Fords
 - Car Parks
 - Edges or centre alignments of tracks and paths
 - Step treads

- Road furniture:
 - Mile Posts
 - Guideposts (traditional fingerposts only)
 - Kerb Barriers
 - Gates across roads
 - Posts preventing vehicular access
 - Weighbridges
 - Cattle Grids

- Road-bounding features:
 - Hedges, Walls, Fences, and Banks
 - Crash Barriers (where they form the sole bounding feature of a carriageway)

Non-physical features shown in this theme are represented as distinctive and descriptive text and inferred links.

There are two situations where constraints on how the features are depicted are normally imposed by survey tolerances:

- Where the central alignment of an unmade path is less than 1 m (urban areas) or 2 m (rural and moorland) from an adjacent building, fence, hedge or wall, the central alignment is shown at that minimum distance away from the feature.
- Where one edge of a track is parallel and close to the bank of a water feature, the track edge nearest to the river is omitted.

It is important to note that rights of way are not identified in the Topography Layer. The representation of a road, track or path cannot be used as evidence of a right of way.

Structures

These are defined as features that are man-made constructions but do not qualify as buildings. These may or may not obstruct passage at ground level. The Topography Layer contains information relating to all permanent structures that are considered large enough to be included. Figure 6, below, gives some examples, highlighted in black, of structures.

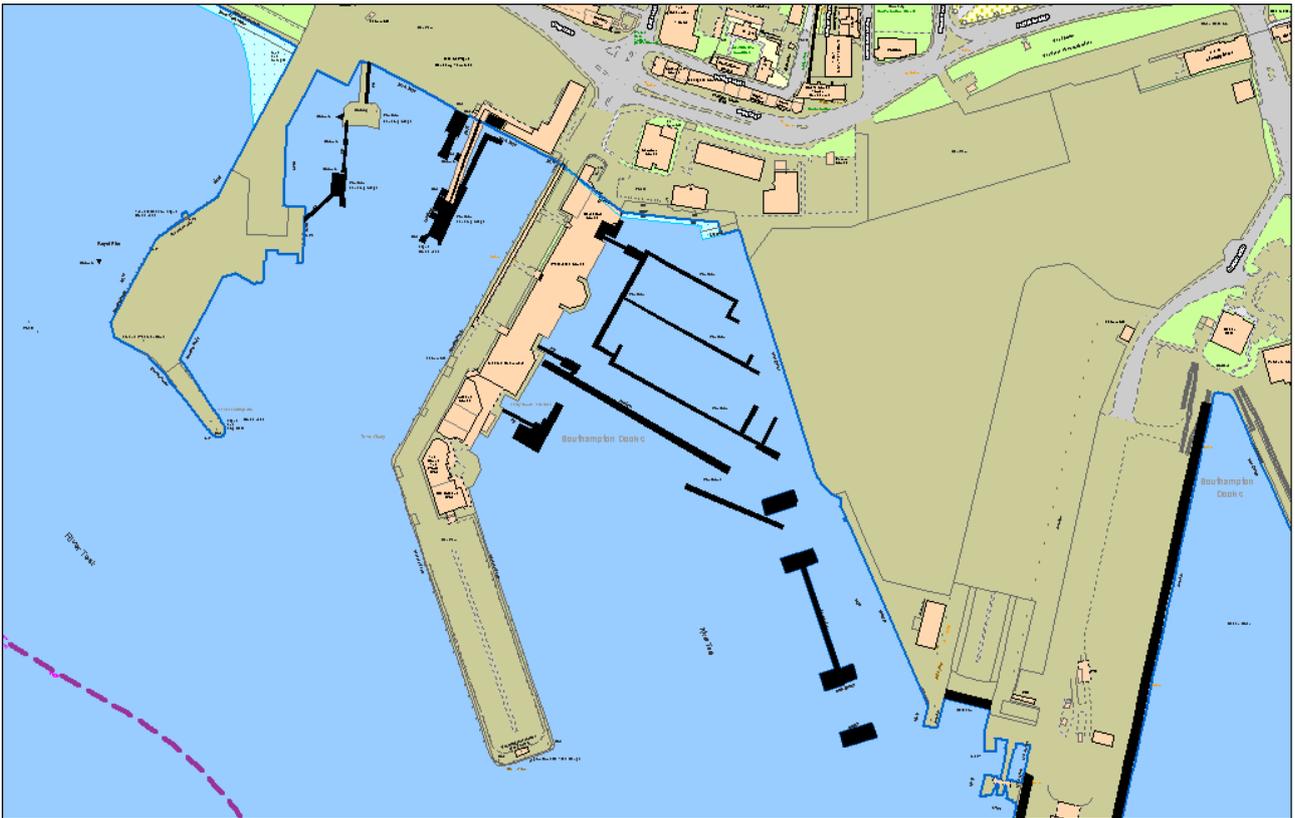


Figure 6: examples of real-world objects in the structure theme

The physical features in the structure theme include:

- Stand-Alone Monuments
- Fountains
- Covered Reservoirs
- Pylons
- Weirs and Sluices
- Gas Holders
- Double Walls
- Pontoons
- Uncovered Tanks
- Conveyors
- Cooling Towers
- Upper Levels of Communication
- Bridges, Viaducts, Aqueducts, and Piers

Non-physical features, are represented by text.

Terrain and height

These are features that denote the ground level at any given point. OS MasterMap Topography Layer does not contain height contours, instead it contains height information point features of known height.

Triangulation stations

These are physical marks that represent points in the national triangulation scheme. The best-known form is the triangulation pillar, often found on hill or mountain tops. Other forms include triangulation points placed on church towers and flagpoles. The coordinates of a triangulation station in the data are not usually the very accurate coordinates for the control point. The accurate coordinates of the control point can be obtained from Ordnance Survey (see below). All triangulation stations are shown, except for buried and surface blocks.

Spot height

These are non-physical points, the altitude of which (relative to Ordnance Datum) has been determined by levelling. All current spot heights, are shown by a point feature or symbol. The altitude to one decimal place of a metre is shown by a textual description. The latest information on Ordnance Survey's GPS, triangulation and control points can be found at <http://www.ordnancesurvey.co.uk/oswebsite/gps/>.

Bench marks are represented in the Topography Layer as a symbol to mark their position. The values for these bench marks are available from <http://benchmarks.ordnancesurvey.co.uk/> It should be noted that the bench mark information is historic, and Ordnance Survey cannot guarantee its accuracy.

Water

Water features are defined as features that contain, delimit, or relate to real-world objects containing water. The physical water features shown in the OS MasterMap Topography Layer include:

- Mean High Water (springs) and Mean Low Water (springs)
- Swimming Pools, Ponds, Lakes, and Lochs
- Moats, Bridges, and Footbridges
- Reservoirs, Rivers, Canals, and Streams
- Drains and Ditches
- Foreshore Features
- Floating Objects (they are only shown when they are fixed and attached to permanent detail)
- Shake Holes and Swallow Holes (in mountain and moorland areas; limits of numerous shake holes are shown and the area described as 'area of shake holes')
- Sluices (except those found in sewage works) and Culverts
- Stepping Stones
- Taps (which take the form of drinking fountains or that form the communal water supply)
Drinking Fountains and Water Troughs (public)
- Tidal Gauges
- Waterfalls (only if formed by natural features) and Weirs
- Bollards, Capstans, and Mooring Posts

- Breakwaters and Groynes
- Perches, Pilot Beacons, and Navigational Beacons
- Pumps, Wells, Spouts, Springs, and Fountains

Taps, water troughs and drinking fountains are no longer captured under the current specification.

Figure 7 shows a sample of real-world objects in the water theme, including a pond, a river, flow arrows, sluices, and drains.

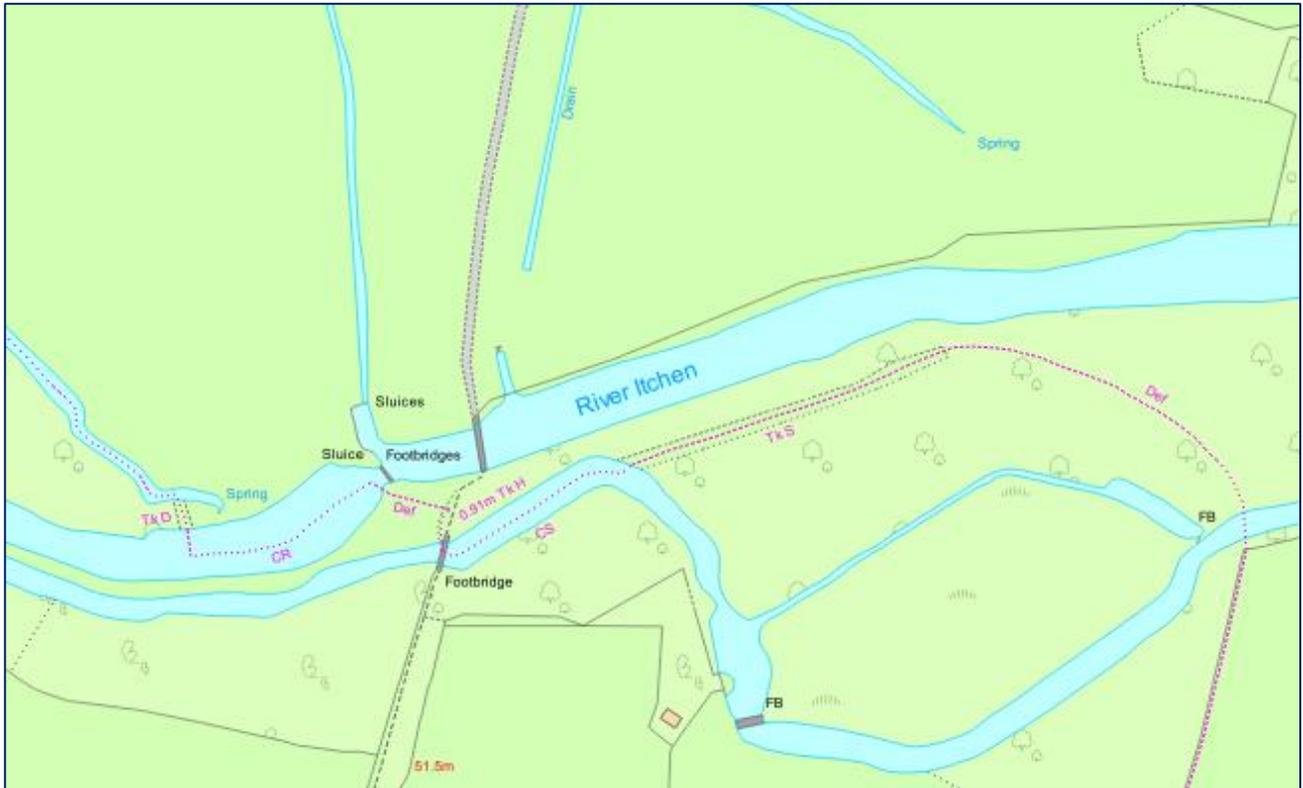


Figure 7: examples of features within the water theme

The non-physical features shown in the water theme are:

- the highest point in a river to which normal tides flow is described as Normal Tidal Limit (NTL). The point is shown and annotated with text
- Low Water Level (LWL) is the point to which mean tides (or mean spring tides in Scotland) flow at low water. The point is shown and annotated with text
- Textual descriptions of all water features
- Flow arrows, which are symbols used to indicate the direction of flow of non-tidal moving water

As water is a dynamic element within the landscape, certain survey principles and constraints are imposed on the representation of water within the OS MasterMap Topography Layer.

Rivers, streams, and drains are shown at their true scale width. A single line is normally used where their width is less than:

- 1.0 m in urban areas; and
- 2.0 m in rural, mountain and moorland areas.

OS MasterMap Topography Layer does not contain polygons of the open sea. Where inland water bodies meet the sea, the following principles are applied:

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

Lakes and ponds are surveyed at normal winter level; reservoirs are shown at top water level, that is, spillover level. All water features are described. Continuous topographical water features that extend into private gardens are shown. Where a river flows under another object, typically a bridge, the part of the river beneath the object is not supplied. This is why there are gaps in rivers when the theme is viewed on its own. This is shown in figures 8 and 9 below.

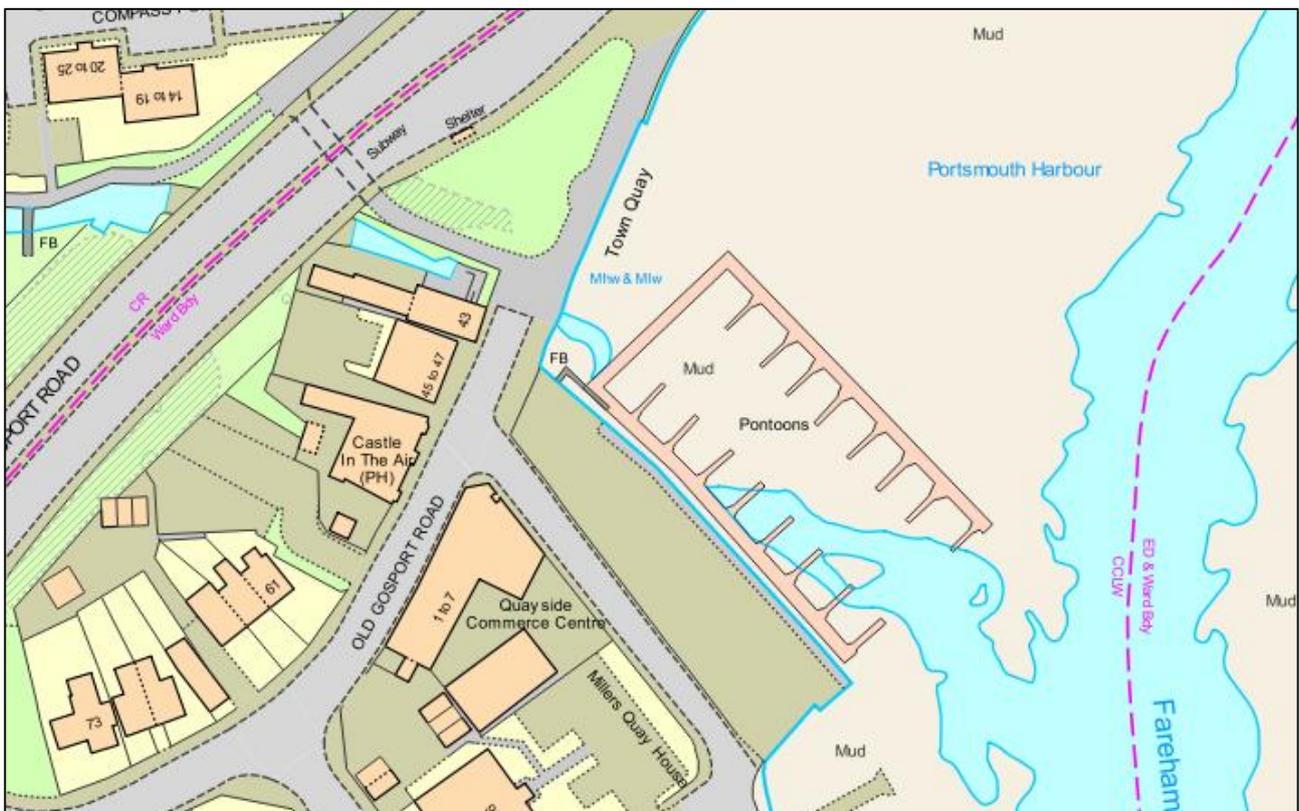


Figure 8: the depiction of water and bridges (all themes)

Theme rules

There are several rules that govern what theme or themes are assigned to a feature. These rules give the data consistency so that the same kind of real-world objects is assigned to the same themes as far as possible.

There is one attribute – called the descriptive group attribute – that has a major bearing on the theme rules. The value in the descriptive group is the key determinant of which theme(s) the feature is assigned. Table 3, below, relates the value of descriptive group (of which there are 21) to the theme. If the feature has the value listed in the first column, it will be assigned into the theme listed in the third column.

Table 3

Descriptive Group	Theme	Real World Examples	Description
Buildings	Building	Factories, Houses, Public Convenience, Tank	Features representing buildings (not including glasshouses).
Built Environment	Land	Residential land and car parks	Geographic areas and extents of man-made environments, terrain and communication links.
General Feature	Land	Cattle Grid, Conduit, Conveyor, Line of Posts, Lock Gate, Slipway, Sloping Masonry	General topographic features and minor detail.
General Surface	Land	Agricultural Land, Slag Heap, Slipway, Sloping Masonry, Spoil Heap, Tank	Features that denote surfaces that are man-made, though not specifically in man-made environments.
Glasshouse	Buildings	Greenhouses	Features representing glasshouses
Height Control	Terrain and height	Bench marks	Features with height information
Historic Interest	Heritage and antiquities	Site Of Heritage such as a Battlefield	Features of heritage value often depicted as text indicating the site of a historic event or an actual physical historical structure such as Hadrian's Wall
Inland Water	Water	Canals, Collects, Drain, Fords, Issues, Lakes, Leats, Reservoirs, Rivers, Sinks, Spreads, Springs, Static Water, Streams, Watercourses and Waterfalls	Features representing, describing or limiting areas of water that are not tidal
Landform	Land	Caves, Mineral Workings, Slopes, Cliffs and Quarries	Features representing, describing or limiting areas of landform, for example, slopes or cliffs
Natural Environment	Land	Marsh, Mud, Saltmarsh, Sand, Shingle, Scrub, Woodland	Features representing geographic areas and extents of natural environments and terrain
Network or Polygon Closing Geometry	Land and road, tracks and paths	Road junctions and gardens	Features used to close network polygons at their termination
Path	Roads, Tracks and Paths	Paths and cycle paths	Features representing and limiting the extent of pathways
Political or Administrative	Administrative Boundary	County, district, ward and civil parish boundaries and markers	Features representing political or electoral boundaries
Rail	Roads, Tracks and Paths	Railway Land, Tracks and Signals	Features representing, describing or limiting the extents of railways
Road or Track	Roads, Tracks and Paths	Road sections of varying surfaces, roundabouts and central reservations	Features representing, describing or limiting the extents of roadways and tracks
Roadside	Roads, Tracks and Paths	Verges and Pavements	Features representing, describing or limiting the extents of roadside detail

Terrain and Height	Terrain and Height	Spot height marks	Features giving information about the altitude at a location or changes of level of the ground surface
Structure	Structures	Bridges, Chimneys, Groynes, Lighting Gantries, Lock Gates, Sluices, Telecommunications Masts, Weirs and Wind Turbines	Features representing, describing or limiting areas of water that are tidal
Tidal Water	Water	Tidelines including MHW/MLW, MHWS/MLWS, NTL/MST	Features representing, describing or limiting areas of water that are tidal
Unclassified	Land	Areas under temporary development	Features representing developing or undesignated attributes in the process of being captured.

There are some additional rules for assigning lines to themes. Lines serve two purposes in OS MasterMap Topography Layer. There are lines that are coincident with the boundaries of polygon features, these are called bounding lines and they are the most common type of line. However, some lines, do not form boundaries to features, but are a feature in their own right. These are called non-bounding line features.

In addition to being a member of each theme rule, a line feature that is part of the boundary of one or more polygon features is also considered a member of the theme of those polygon features which it bounds. For example, any line feature that bounds a polygon feature that is a member of the roads, tracks and paths theme is also a member of the roads, tracks, and paths theme, in addition to any other themes to which it belongs. Figure 10, below, gives examples of the application of theme rules.

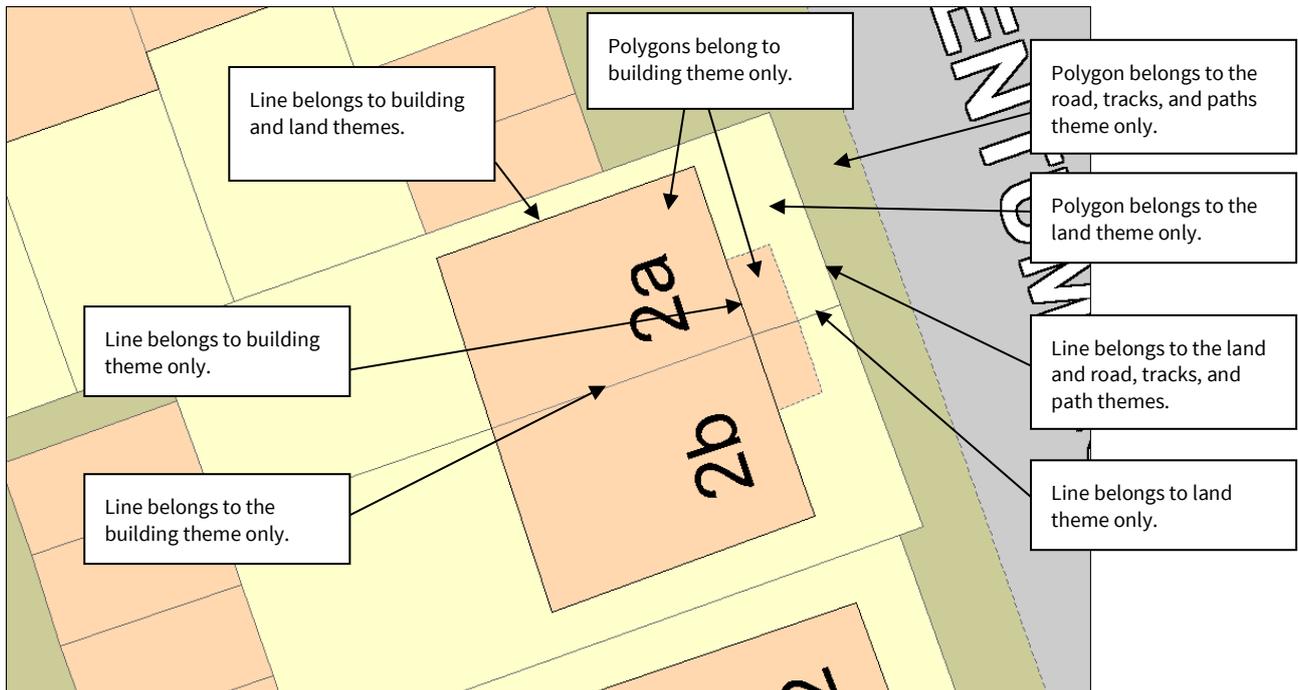


Figure 10: application of theme rules

This chapter has discussed the themes of OS MasterMap Topography Layer and outlined the contents of each theme. It explained how Ordnance Survey allocates a feature to one, or more themes. This helps the user to understand which theme a feature is likely to be found in, and why some features may appear in a theme that may not seem logical on first appearance.

Chapter 4 OS MasterMap supply

There is an [online ordering system](#) available from which you can select and download a range of OS products. All OS MasterMap Topography Layer orders are supplied from a master copy held in a database by Ordnance Survey. The information the user submits through the online service to define the area and supply options form the criteria for a database query. This query is run on the database to extract the data the user requires. The main features of the supply system are outlined in this section. The OS MasterMap Topography Layer themes cannot be purchased separately. Users may opt to have a theme excluded from the supply.

Initial and COU supply

Initial supply refers to the first order of OS MasterMap that a user makes and will contain all features for all the layers selected for the area covered by the order. Updates, which contain the latest changes to the features, are not automatically sent out. A user must either place an order for Change Only Updates (COU) or download it from our online portal. COU data contains new and updated versions of features, and information about departed features. Any feature within the area covered by the order that has not undergone any of the change will not be supplied.

The advantages of supplying COU rather than a complete resupply is that, if applied regularly, the amount of data that has to be processed and loaded is much smaller. Users may request updates of the latest changes in their area of interest, at any time, using the online service. It is also possible to set up a schedule for a supply of regular updates either through physical media, or by data downloads from our online portal.

Updates can either be for specified areas of interest, or for GB wide. It is advisable to apply COU updates for all the OS MasterMap layers to which you have subscribed at the same time to ensure you are getting the correct data for your needs, please contact our [customer service team](#).

Updating data holdings

The OS MasterMap database is live and undergoes continuous revision. Period licence users have unlimited access to COU and can order updates or resupplies at any time. When a user orders COU, a 'change-since' date is specified, and all features that have changed since midnight on the date specified are supplied. This will normally be the date the data was last extracted from the Ordnance Survey main holding, but could be a previous date. The last extraction date can be found on the [Ordnance Survey website](#) along with the update history and release notes for your OS MasterMap product.

To be able to resolve changes to the data holding, the system used to translate or load the data must check the TOID and version of every feature in the update against the current data holding, to determine whether it should be loaded, and if so, what existing feature(s) it replaces. This makes it possible to request and load COU with a date preceding the last data supply date without damaging the data holding. This process can be used to correct a data holding if inconsistencies have occurred due to partially loaded or non-sequential COU, by ordering a single COU with a change-since date that precedes the problem updates.

More [information on ordering](#) COU is available from Ordnance Survey's website.

Managed Great Britain (GB) Sets

For those users with full Great Britain coverage contracts of OS MasterMap there is a Managed GB Sets service. The Managed GB Set is available for all vector layers of OS MasterMap.

The Managed GB Sets service is a means of processing identical orders faster, thus improving delivery times, with benefits for Great Britain users and partners. Subscribers to this service will automatically receive their updates (full supply or COUs) on DVD or hard drive, either quarterly or every six weeks.

With this option, users and Ordnance Survey Licensed Partners that take Great Britain coverage can benefit from:

- data arriving faster and in a more predictable and timely manner
- seeing the same version of features as other organisations
- easier data management
- Feature Validation Data Set (FVDS) with all COU orders or with Full Supplies on request.

Further information on the Managed GB Sets service, including the release dates, are available on the [Ordnance Survey website](#).

Supply options

There are several options available to users when ordering data that provide additional metadata or aid data management.

Chunk files

To make the management of large areas easier, data is split into chunks, each of which covers a nominal square area. It can also be supplied as part of a squared area to complete a predefined area as part of a nominated file size. Two types of chunks are available: geographic and non-geographic chunks. Chunk boundaries are imposed purely for the purpose of dividing large supply areas into pieces of a manageable size in a geographically meaningful way. Both full supply and updates (whether COU or full resupply) are chunked.

Geographic chunking option

As OS MasterMap data is seamless, GML files containing large areas could be very data intensive. In order to provide files of a manageable size, data supplies are divided into chunks of user-specified size, each of which is supplied in a separate GML file. Figure 11 below illustrates how geographic chunks work.

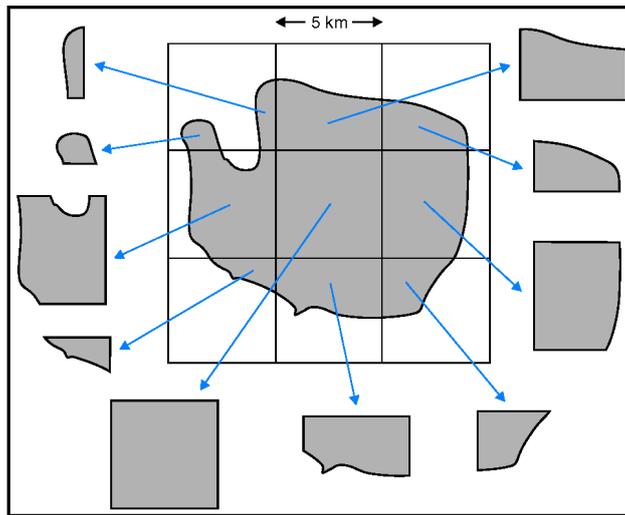


Figure 11: chunking

The process of Chunking has several steps. These are;

- 1 The user submits an area or area of interest and specifies a size for the chunks – 2 km by 2 km, 5 km by 5 km or 10 km by 10 km.
- 2 The online ordering system creates a grid covering the entire area based on the specified size.
- 3 Each square within the grid forms a chunk file.
- 4 Each feature that intersects that square goes into the chunk file.
- 5 National cover of OS MasterMap Topography Layer is supplied in 5 km by 5 km chunks.

In the case shown in figure 11, ten chunks are created. The central chunk is a complete grid square; the others are partly bounded by the data selection polygon. The upper-left square shows the effect when the data selection polygon crosses a grid square twice – two or more separate chunks are created.

System suppliers can advise the best chunk rates for their systems.

A consequence of chunking is that some features are supplied in more than one chunk. Systems reading OS MasterMap data must identify and provide the option to remove these duplicated features.

If a chunk contains no information relating to a user's selected themes then it is not supplied.

Chunks cannot be treated as persistent data management units; as it is a floating grid, the origin of the chunking grid may differ between orders, particularly if the contract area changes or if they order a different chunk size.

Supply of OS MasterMap Topography Layer features in chunk files

The packaging of a seamless dataset into chunks means that where a feature lies across, or touches the boundary of several chunks, it is supplied in all the related chunks. This is because an individual feature is the smallest unit within the OS MasterMap Topography Layer and it cannot be physically split into two or more parts.

When a polygon falls across a chunk edge but its bounding line or lines lie outside it may not be included in that chunk. It will be included in the adjacent chunk, unless the polygon is at the edge of the contract area, in which case the line will not be supplied at all.

When a polygon changes so that it no longer falls in the same chunk, for instance, when a Topography Layer feature used to lie partly inside a chunk and instead is now reduced in size so it is wholly within an adjacent chunk, it is reported as a departed feature in one chunk and as a modified feature (new version) in the adjacent chunk. This is shown in figure 12 below. For more on departed features see the section below.

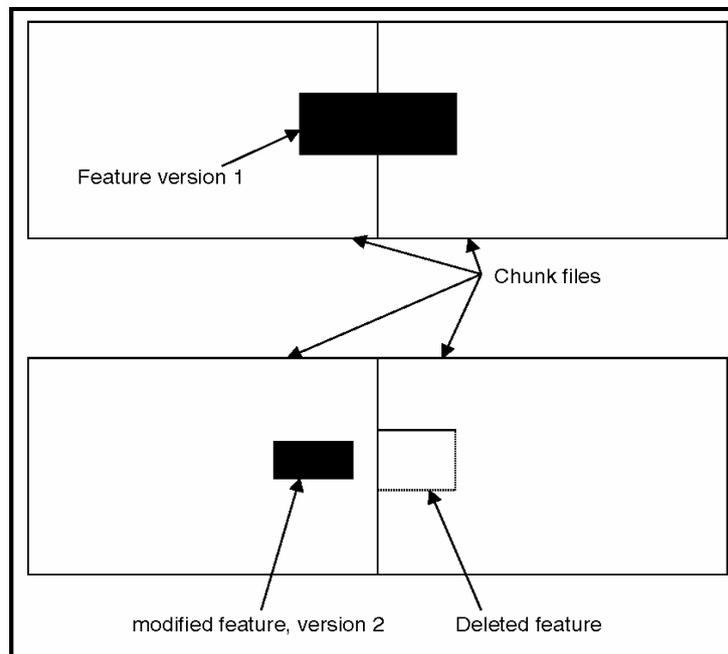


Figure 12: feature types and chunk boundaries

It is possible for OS MasterMap features with point geometry to be included in multiple adjacent chunk files. This is because the query used to populate a chunk file includes all features that touch its boundary, and this boundary is shared with adjacent chunks. Therefore, loading software must be able to identify and remove duplicate point features across multiple files in the same way as features represented by lines and polygon geometries.

Non-geographic chunking option

This supply format delivers OS MasterMap vector layer data for the Topography, ITN, and Address 2 Layers. The files can have a fixed nominal size, as opposed to a given geographic area depending on user preference.

Unlike in Geographic chunking, each feature in non-Geographic chunking appears in only one chunk file. It is possible for features from various geographic locations to appear in a single file, and for adjacent features to appear in different files. Non-geographic chunk files are designed for use as a set to load spatial databases, but can be used in a file format as long as all chunks are translated or imported into the system at the same time. It is not possible to tell in which file a particular feature will be found before reading the files. With non-geographic chunks, there are no duplicate features lying across chunk edges; this speeds up the translation process.

The features shown in red in figure 13 can end up in the same non-geographic chunk even though they are not adjacent to each other.

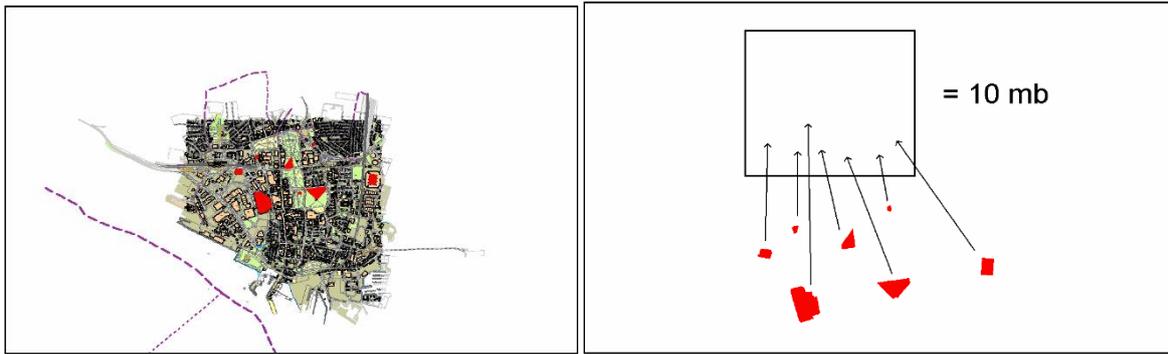


Figure 13: non-geographic chunking

Feature validation dataset (FVDS)

The FVDS is a new set of files that can optionally be supplied with either a full supply, or a COU, OS MasterMap order. The FVDS can be ordered with the Topography, Address and ITN Layers and must be supplied together with an OS MasterMap data order as it cannot be produced on its own. FVDS allows a user to validate that the data holding contains the correct set of features after loading. It does this by reporting on all the data it expects to find in the holding after the application of the supply, **not just what is contained in the supply**. It is intended to be used for periodic checks on data holdings maintained by a COU regime. It is not necessary for users to order it with every supply, as processing it will slow you're your translating process. It can also be used to check that an initial supply of OS MasterMap data has been correctly loaded. FVDS can be used with both geographic and non-geographic chunk file options. FVDS is itself, divided into files on a non-geographic basis, using a 10 Mb nominal file size.

The FVDS is a comma-separated value (.csv) text file format that gives the TOID, version number and version date of every feature that should exist in the current data holding, based on the polygon extent, themes, polygon format and extraction date of the current order. Each .csv file is compressed to a .gz file using the same compression algorithm as for OS MasterMap GML files.

GML summary file

An order summary file in GML format will be supplied with all OS MasterMap vector data orders, containing the order information specified by the user. This information includes:

- the order number
- query extent polygon(s) of the order
- the order type: 'Full supply' or 'COU' (for COU orders; the change-since date)
- the themes requested
- the chunk type: 'Non-geographic' or 'Geographic'
- the chunk size (in Mb for non-geographic chunks, in km² for geographic chunks)

Chapter 5 Change management and data association

This chapter introduces two aspects of deriving additional value from the OS MasterMap Topography Layer. The first is utilising the referencing and change-tracking attributes to identify and manage the impact of change on a user's data. It discusses the process of applying change and the implications for archiving data. The second aspect, is associating user data and OS MasterMap Topography Layer using the TOID as a common reference. This creates the potential to share data between departments and organisations. It explains what data association is and it gives examples of how data association can bring benefits to organisations. As both these subjects have quite complex issues surrounding them in terms of the systems needed to support them, they are discussed in finer detail in a number of topic-specific documents that are available from this [link](#).

Change management

The feature-reference and change-tracking attributes provide the opportunity for users to put in place a change-management regime. The system that the user uses to translate and load OS MasterMap Topography Layer should use the TOID and version information to update their local holding when a COU is taken onboard.

The software used to manage the holding needs to handle three types of situation; features that have been departed, features that are new and features that have changed. The software should resolve departed features as a priority.

Departed features

- In the COU there is a list of features that have been departed since the last time the user took data. There are some additional considerations with departed features, but in essence, the software should find all the TOIDs and versions on the departed features list in the COU, and locate them in the main holding and remove those features.
- In the case of superseded and departed features, these could be removed totally from the user's holding but it may better suit the requirements of the user to archive them for future reference.

New features

- With a new feature, the software compares each TOID in the COU against the TOIDs in the existing holding. If the TOID exists in the COU but not in the main holdings, it is considered a new feature and the software should insert it into the holding.

Changed features

- If the TOID already exists in the holding, the software needs to compare the version number in the existing holding against the version number in the COU. If the version number in the COU is higher than in the existing holding, the software needs to take out the existing version of the feature and replace it with the version contained in the COU. If, on the other hand, the COU version is lower than the COU version, the feature should be ignored.

Archiving the OS MasterMap data holding

As OS MasterMap features progress through their life cycles, it is possible to develop snapshots of the features by holding superseded versions in a local data archive. By holding and maintaining a local data archive, users will be able to interrogate previous views of the world straight from their local data holding.

It is important to consider carefully how to archive OS MasterMap features, and what requirements the applications and users will have to access the older information. Archiving may be done by simply writing older versions of the data to hard media, or by a more sophisticated system of keeping historical data live. It is important for users to recognise their own unique requirements (be they user, statutory or regulatory requirements) as archiving can become a significant overhead in terms of storage.

Before designing or implementing an archive of the OS MasterMap Topography Layer, it is advisable for a user to discuss requirements with their system supplier.

Annexe A Administrative boundary alignments

Administrative boundaries may or may not have a predefined relationship with the topographic features in their locality. This relationship is known as a *boundary mereing*. This relationship is recorded within OS MasterMap as a textual description. A list of the most common abbreviations is given below.

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

The following are examples of combined abbreviations:

Object or mereing	Abbreviation
Centre of bank, basin, baulk, broad and so on	CB

Centre of railway, river, road and so on	CR
Centre of old course of stream	COCS
1.22 metres root of hedge	1.22 m RH

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

Where the mereing relationship of any boundary alignment changes or where a boundary changes from one side of a real-world object to another, the point of change is shown by a boundary half-mereing change symbol, usually in opposing pairs. The location of the boundary half-mereing symbol is coincident with the boundary alignment and not the feature to which it is mered.

Annexe B Associating data to OS MasterMap features

As stated previously, one of the key reasons behind providing this level of reference attribution is to provide a mechanism for users to link their data to other Ordnance Survey data and share it with other organisations. Data association can be a complex undertaking, as the extent to which an organisation can implement it depends on many factors, including the systems they have in place, the number of different sets of data within the organisation and the manner in which they have created that data in the first place.

This chapter concentrates on the key concepts of data association and serves as an introduction to the subject from the OS MasterMap Topography Layer point of view.

To start this topic off, here is a relatively simple example of how data association might work. In figure 14 below, there is a car park owned and operated by the local authority. Within the local authority, there are several different datasets that contain information about that car park. The finance department holds information on the number of spaces it has, the opening times, and the parking rates. The maintenance department has details on when it was last resurfaced, how much it cost, and who undertook it. The tourism department has it on a list of car parks that it makes available to visitors. Each department has a different way of referencing the car park and none of them hold the same piece of information as any other department. It is not easy to match the data to the real-world object, as no single piece of information clearly and uniquely identifies the physical location of the car park. If the TOID is introduced as a unique reference and the data is stored within a GIS and/or spatial database system, the data can be queried using the TOID as the search criteria. Each department would be able to find all the available information on the car park in any record that had the same TOID as an attribute.

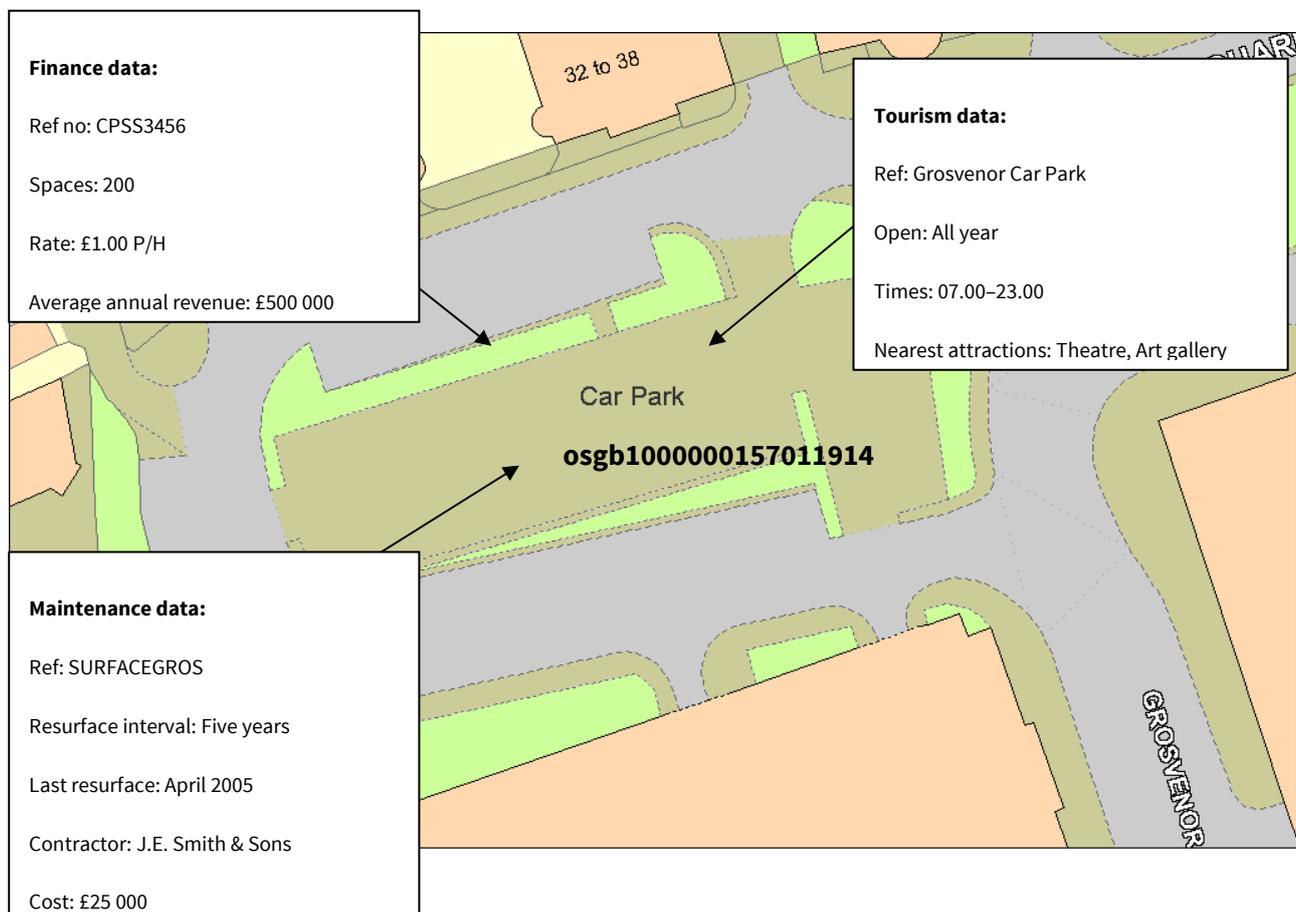


Figure 14: data association

This demonstrates a more efficient way of storing and accessing data, as it requires only one attribute to be known, and, given the correct database structure, may only require the TOID to be stored once. It also means that any update to the information by one department will be immediately cascaded and be made accessible to all other departments. In the above example, for instance, if the parking rates were raised by finance, the tourism department would be able to access and provide the correct rate to visitors as soon as this increase was implemented. This reduces the likelihood of out-of-date information being passed onto users. It also reduces the need to duplicate data across departments, enabling data to be stored once but reused many times.

To be able to associate datasets together, a user needs to understand what the relationship is between the datasets; relationships can be categorised as spatial or a-spatial.

An example of a spatial relationship is when the user uses the individual features to construct, or derive, their own geometry data. An example would be a planning department wishing to record the exact extent of the area submitted in a planning application.

An example of an a-spatial relationship is where the geometry is either always going to be the same as a single feature or, at the opposite end of the spectrum, the geometry is unimportant to the application within which the features are used. An example of this would be the recording of buildings that have received improvement grants for energy efficiency. It does not matter what shape the house is, just that it has received funding for its improvements. It is important to note that relationships are principally created polygon-to-polygon, however, it is possible that users may wish to include point and line data to OS MasterMap polygons as well. Tabular or text-based data, that has no geometry currently, and can also be associated by introducing the relevant TOID as one of the attributes.

In addition to the documents mentioned at the beginning of this chapter on data association, further assistance on change management and data association is available from Ordnance Survey's [user service team](#) that can be contacted via the numbers given in the preface to this document.

This chapter has provided an introduction to managing change and utilising the unique reference to gain more value from the data by associating datasets together. Both these subjects are covered in more depth in the documents referred to in this chapter, and users are encouraged to explore these issues more fully through these resources and to liaise with system suppliers about how they might adopt some of these practices.

Annexe C Metadata

ISO 19115 compliant UK GEMINI discovery level metadata is provided for the data and can be found on the Glgateway® (www.glgateway.org.uk)

The following is a detailed description of the metadata elements that are provided on the Glgateway:

Title: The title of the product.

Abstract: The abstract gives a brief description of the product.

Currency: The currency takes the form of date of last update for the feature.

Lineage: The lineage metadata takes the form of product specification name and date of product specification.

Spatial extent: The spatial extent is supplied in the form of geographic identifiers (for example, England, Scotland, and Wales) and in the form of geographic coordinates.

Spatial reference system: The spatial reference system for all products takes the form of a British National Grid system, namely OSGB36®.

Data format: Data format takes the form of the name of the format or formats the product is supplied in.

Frequency of updates: Frequency of update takes the form of a stated period of time.

Distributor contact details: Distributor contact details include with postal address, phone number, fax number, email address and website.

Data originator: Given as the company having primary responsibility for the intellectual content of the data source; in all cases this will be Ordnance Survey.

Other metadata available includes keywords, start date of data capture, access constraints, use constraints, level of spatial data, supply media and presentation details.

Annexe D Descriptive Terms

Following a change to the MasterMap schema in Early 2017, we are in the process of rolling out enhanced Descriptive Terms attribution. This is due to complete in Spring 2018.

Once complete this enhancement will add an additional 76 descriptive terms to improve the attribution of tidal, inland water, land use and structure features. It will also improve existing terms by separating previously amalgamated surfaces and by providing distinctive groups for previously homogenous features. This will greatly increase the analytical capabilities of the OS MasterMap Topography data by adding in additional descriptive groups as well as the 76 terms. An example of this is the Descriptive Term 'footbridge'. Previously a footbridge would have had the descriptive term 'Structure', with the cartographic text 'FB' next to it. Now it will have the descriptive term 'Footbridge' within the descriptive group of 'Structure'.

The full list of additional Descriptive Terms are;

- Agricultural Land
- Aqueduct
- Bridge
- Canal
- Canal Feeder
- Capstan
- Cattle Grid
- Cave
- Chimney
- Collects
- Conduit
- Conveyor
- Crane
- Cross
- Distance Marker
- Drain
- Electricity Sub Station
- Emergency Telephone
- Flagstaff
- Footbridge
- Ford
- Fountain
- Gantry
- Gas Governor
- Groyne
- Guide Post
- Issues
- Landfill
- Landfill (Inactive)
- Letter Box
- Level Crossing
- Lighting Gantry
- Line Of Mooring Posts
- Line Of Posts
- Lock
- Lock Gate
- Marsh
- Mast
- Mill Leat
- Mine Leat
- Mineral Workings
- Mineral Workings (Inactive)
- Mooring Post
- Mud
- Normal Tidal Limit
- Pole
- Post
- Public Convenience
- Public Telephone
- Rail Signal Gantry
- Reeds
- Reservoir
- Saltmarsh
- Sand
- Shingle
- Signal
- Sinks
- Slag Heap
- Slag Heap (Inactive)
- Slipway
- Sloping Masonry
- Sluice
- Spoil Heap
- Spoil Heap (Inactive)
- Spreads
- Spring
- Static Water
- Swimming Pool
- Tank
- Telecommunications Mast
- Watercourse
- Waterfall
- Waterfall (Vertical)
- Weir
- Well
- Wind Turbine

Annexe E BAU change value descriptions

OS MasterMap COU updates contain a change history attribution

Value	Description
New	This is a new feature in the database.
Position <i>(Note: this is no longer used in current revision process.)</i>	Feature has changed geometry and/or position due to an improvement in its absolute accuracy; that is, its relationship to the National Grid (relevant for the positional accuracy improvement programme which is now complete). This type of feature change is not associated with real-world change.
Modified	The feature has been edited by an operator. Used in the following cases: <ol style="list-style-type: none"> 1. The geometry of a topographic feature is changed following real-world change. 2. The geometry of a non-topographic feature, for example, inferred link or BoundaryLine feature is changed. 3. A cartographic symbol feature is repositioned. 4. A CartographicText feature is repositioned.
Software	Feature has been adjusted by an automatic software process. Includes geometric adjustment, cleaning, squaring, paralleling (text and lines) and reversing direction of digitising.
Reclassified	The descriptive attributes of a feature have changed. The feature code may have changed.
TextChange	Text string of text feature has changed. Applied to text features where the text string has been: <ol style="list-style-type: none"> 1. Modified for a minor change in spelling, due to original error or name change, where text string is a distinctive name. 2. Modified for changes to a descriptive name due to original error or change of specification. 3. Modified by the addition or removal of an accent
Restructured	New line feature(s) have been created from parts of existing feature(s). Applied to line features where: <ol style="list-style-type: none"> 1. The feature is split into two or more features. 2. Two or more features are joined together.
Attributes	Applied to features that have had only attributes changed, except those covered by TextChange and Reclassified values.
Incomplete <i>(Note: this is no longer used in current revision process.)</i>	The feature is incomplete. Identifies an incomplete line feature or an area that relates to the incomplete feature returning from a revision process. Incomplete line features are not used to construct polygons.

Annexe F Product and service performance report form

Ordnance Survey welcomes feedback from its users about OS MasterMap Topography Layer.

If you would like to share your thoughts with us, please print and post or email a copy of this form to one of the address' below.

Your name:

Organisation:

Address:

.....

.....

Postcode:

Phone:

Fax:

Email:

Quotation or order reference:

Please record your comments or feedback in the space below. We will acknowledge receipt of your form within three (3) working days and provide you with a full reply or a status report within 21 working days.

If you are posting this form, please send it to:

OS MasterMap Topography Layer Product Manager, Ordnance Survey, Adanac Drive, SOUTHAMPTON, SO16 0AS.

If you wish to return it by fax, please dial +44 (0)8450 990494.

Any personal information that you supply with this report form will be used by Ordnance Survey only in the improvement of its products and services. It will not be made available to third parties.