ORDNANCE SURVEY GB

CODE-POINT WITH POLYGONS™ – TECHNICAL SPECIFICATION

Ordnance Survey

Version history

Version	Date	Description
1.1	10/2021	Addition of vector tiles format to the product.
1.2	06/2022	Addition of GeoPackage format to the product.
1.3	06/2023	Minor updates to Section 2.2.2 GeoPackage format product structure.

Purpose of this document

This document provides information about and insight into the Code-Point with Polygons product and its potential applications. For information on the contents and structure of Code-Point with Polygons, please refer to the Overview and Getting Started Guide.

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Contact details

OS website 'Contact us' page (https://www.ordnancesurvey.co.uk/contact-us).

Contents

1. Introduction

This technical specification provides detailed technical information that is designed to help you fully understand the data structure of Code-Point with Polygons.

Code-Point with Polygons is a dataset that contains the notional area of postcode units, allowing customers to display and analyse any data collected at the postcode level. The polygons within the product are derived from georeferenced Royal Mail Postal Address File (PAF) delivery addresses.

For full details on the Code-Point product data structure, see the Code-Point Technical Specification, which is available on the 'Code-Point Product Support' page on the OS website (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

1.1 What you need to use Code-Point with Polygons

1.1.1 Hardware

Code-Point with Polygons is a data product and does not include software for analysis but can be used with a variety of programs. Code-Point with Polygons can be loaded into a GIS (geographical information system) for display and analysis of the data. Consult your GIS documentation to establish actual system requirements.

1.1.2 Software

Most proprietary GIS packages will suffice, for example, MapInfo, ESRI or QGIS products.

1.2 Code-Point with Polygons supply

The polygon data coverage is Great Britain, the associated Code-Point coverage is for United Kingdom, as it includes Northern Ireland postcodes.

1.2.1 Update currency

Updates will normally be quarterly in January, April, July, and October and are a complete resupply of the national dataset.

1.2.2 Supply formats

Code-Point with Polygons is available in the following formats, the preferred choice of which will be influenced by the software used:

ESRI Interchange format Shapefile

ESRI Shapefile is a simple, non-topological format for storing the geometric location and attribute information of geographic features. A Shapefile is one of the spatial data formats that can be utilised in ArcGIS.

The Shapefile format defines the geometry and attributes of geographically referenced features in as many as six files with specific file extensions that should be stored in the same project workspace.

They are:

• **.shp** – the file that stores the feature geometry.

• **.shx** – the file that stores the index of the feature geometry.

• **.dbf** – the dBASE file that stores the attribute information of features.

• **.prj** – the projection file that provides the information on the coordinate reference system.

• When a Shapefile is added as a theme to a view, this file is displayed as a feature table.

• **.sbn** and **.sbx** – the files that store the spatial index of the features.

The last two files will only exist if you perform theme on theme selection, spatial joins, or create an index on a theme's SHAPE field.

Note: The shapefile has two attributes (FID and SHAPE) that are virtual columns created by ArcGIS when accessing the table contents but are not visible in the attribute table. The FID column uniquely identifies each object stored in the table. The SHAPE column provides information about the feature geometry.

MapInfo Interchange format (MID / MIF)

The transfer format is as defined by the MapInfo Professional User's Guide: MIF Export. MapInfo Interchange Format (MIF) is an ASCII file format that can fully describe a MapInfo database. Both graphic and tabular data are exported into MIF files. The graphic data is in a file with a .mif extension, and the tabular data is in a file with a .mid extension.

MapInfo Table file format (TAB)

TAB files (MapInfo tables) are the native format of MapInfo. They consist of a number of files with extensions such as .DAT, .ID, .MAP and .TAB; all of these files need to be present and kept together for the table to work.

Vector tiles format (MBTiles)

Code-Point with Polygons is supplied as a national vector tiles set in a single MBTiles file (combined from individual PBF tiles). This is a lightweight set of tiles that are efficient to render in supported software, provide high-resolution data and give a seamless experience when zooming in and out. The data is supplied in Web Mercator projection (ESPG: 3857).

GeoPackage

Code-Point with Polygons is also supplied as GeoPackage. This is an open, standard, platform-independent, portable, self-describing, compact format for the transfer of geospatial data. GeoPackage is an SQLite container, the contents of which are governed by GeoPackage Encoding Standards.

Since a GeoPackage is a database container it supports direct use. This means that the data in the GeoPackage can be accessed and updated in a 'native' storage format without the need for intermediate format translations. It will effectively 'plug and play' in most GIS packages.

1.2.3   Supply options

Code-Point with Polygons is supplied via the following options:

- Shapefile, MID / MIF and TAB formats are available either on DVD or downloaded via the OS Data Hub (https://osdatahub.os.uk/).
- Vector tiles and GeoPackage are only available through download via the OS Data Hub.

1.2.4   File sizes

File sizes for Great Britain are approximately:

- Shapefile: 610MB

- TAB: 524MB

- MID / MIF: 564MB

- Vector tiles (MBTiles): 457MB

- GeoPackage (GPKG): 708MB

1.3   Code-Point with Polygons version numbering

Each edition of Code-Point with Polygons will have a version number showing the release month for the year (for example, April) followed by the release year (for example, 2023).

The version for each quarterly release will be in this format:

- April_2023

- July_20223

- October_2023

- January_2024

The Code-Point data packaged alongside the postcode polygon data will be the data from the most recent Code-Point product release. Typically, this is the Code-Point release from two months prior. For example, the October 2023 release of Code-Point with Polygons will be supplied alongside the August 2023 release of Code-Point.

2. Specification

2.1 Content

Code-Point with Polygons contains:

- The OS Code-Point product which contains georeferenced postcode unit data, alongside associated metadata such as address counts and quality indicators. Also provided are the health and administrative area codes related to each postcode. The coverage of the Code-Point data is the whole of the UK and it is provided in both comma-separated values (CSV) format and GeoPackage format.

- Also provided, in association with the Code-Point data, is a text file that provides the full text equivalents of the administrative area codes, and another that provides the numbers of postcode units in each postcode area.

- Postcode unit polygons depicting notional boundaries around each postcode unit in Great Britain. This data is supplied in either Shapefile, TAB, MID / MIF, vector tiles, or GeoPackage formats

- Also provided, in association with the polygon data, are two sets of CSV text files containing Vertical Street, and Discard data.

2.2 Product structure

2.2.1 Shapefile, MID / MIF, TAB and vector tiles

The Code-Point with Polygons product contains two sets of data in two different folders:

- **Code-Point** – This contains the OS Code-Point product, details of which can be found in the Code-Point Overview, Getting Started Guide, and Technical Specification documents, which are available on the [Code-Point Product Support page on the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

- **Polygons** – The Polygons folder contains the following text file:

  - Licence.txt – Licence, copyright and specification change information

And two sub-folders: *Docs* and *Data*.

- The **Docs** folder contains the following file:

  - Order Details.txt – Notes about the data

- The **Data** folder contains the following sub-folders:

  - Polygons – Contains polygon data in 120 postcode area files for Shapefile, MID / MIF and TAB formats, or one national file for vector tiles format.

  - Discard_files – A lookup list of 120 text files of the postcodes that have not been included in the polygon creation process because either there are no AddressBase records of sufficient PQ classification, or they are PO Box postcodes.

  - Vertical_streets – A lookup table of 120 text files of vertical street reference codes and the postcodes contained in them.

2.2.2   GeoPackage

The Code-Point with Polygons GeoPackage format contains the following text files:

- Codepoint Licence.txt – Licence information.

- Codepoint with Polygons Licence.txt – Licence information.

And three sub-folders: Codepoint_Resources, Data and Docs:

- The **Codepoint_Resources** folder contains text files relating to the Code-Point product, details of which can be found in the Code-Point Overview, Getting Started Guide, and Technical Specification, which are available on the ['Code-Point Product Support' page on the OS website](https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support) (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

- The **Data** folder contains the following sub-folders:

  - Data – Code-Point with Polygons GeoPackage (following the convention Geopackage_MMM_YYYY.gpkg, where MMM_YYYY are the month and year of release, respectively).

  - DISCARD_FILES – A lookup list of 120 text files of the postcodes that have not been included in the polygon creation process because either there are no AddressBase records of sufficient PQ classification, or they are PO Box postcodes.

  - VERTICAL_STREETS – A lookup table of 120 text files of vertical street reference codes and the postcodes contained in them.

- The **Docs** folder contains the following text file:

  - Order Details.TXT – Notes about the data (this file).

2.3   Data specification

2.3.1   Polygons

The file contains polygon data in 120 postcode area files in the chosen format.

The following table represents the structure of the data in Shapefile, TAB and MID / MIF formats:

Field name	Type	Width	Description
FID *	N/A	N/A	Feature identifier added by the software.
Shape *	Polygon	N/A	Feature geometry.
POSTCODE	Char	8	Full postcode from Code-Point.
UPP	Char	20	Unique polygon identifier (including 4 leading zeros).
PC_AREA	Char	2	The Postcode area, for example, SO.

Note: For information, the attribute headers in GeoPackage are lowercase; the data structure is the same.

Example in TAB and MID / MIF: "TA15 1PL",0000400000001389232","TA"

Example of Shapefile "0","Polygon","TA15 1PL",0000400000001389232","TA"

The vector tiles format contains a single file with a national set of postcode polygons in vector tiles format. The vector tiles schema is detailed in the table below. In the zoom levels columns within the table, the letter *N* indicates that the specified layer and attribute is not mapped within that zoom level, whereas the letter *Y* indicates that the specified layer and attribute is mapped within that zoom level.

Attribute	Zoom levels						
	0–8	9	10	11	12	13	14
Postcode	N	N	N	N	N	Y	Y
UPP	N	N	N	N	N	Y	Y
PC_Area	N	N	N	N	N	Y	Y

2.3.2   Vertical street lookup

Vertical streets is a list of polygons, identified by a serial number that is prefixed by the letter *V*, which contain more than one postcode. This situation can occur in, for example, blocks of flats where there is more than one postcode within a single building.

The Vertical Street lookup contains 120 postcode area text files of vertical street reference codes and the postcodes contained in them.

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 * Denotes presence in Shapefile format only.

Field name	Type	Width	Description
POSTCODE	Char	8	Full postcode from Code-Point.
ID	Char	8	Unique polygon identifier (including four leading zeros).

Example: "UB1 1ET","VUB00001"

2.3.3   Discard files

Discard files is a list of the postcodes for which polygons have not been included because there is no data of sufficient quality to use in the polygon creation, or because their constituent addresses lie outside the extent of the realm (coastline). Also in the discard file are PO Boxes – a list of the PO Box postcodes, none of which will have been used in the creation of the polygon set.

The Discard File lookup contains 120 postcode area text files of the postcodes.

Field name	Type	Width	Description
POSTCODE	Char	8	Full postcode from Code-Point
REASON	Char	7	The reason for the postcode not having representative polygon geometry. This will either be POBOX or QUALITY.

Example: "CB1 0AH","POBOX"

2.4   Data coverage

The Code-Point product contains a point reference for every postcode unit in England, Scotland, Wales, and Northern Ireland that is contained in Royal Mail's PAF product at the time of creation of the dataset. For further information about the Code-Point product, please refer to the Code-Point Overview, Getting Started Guide, and Technical Specification, which are available on the 'Code-Point Product Support' page on the OS website (https://www.ordnancesurvey.co.uk/business-government/tools-support/code-point-support).

The polygon set contains a polygon for every postcode in England, Scotland, and Wales that is contained in Royal Mail's PAF product, with the following exceptions:

•   Postcodes for which there are no delivery point addresses of sufficient quality.

•   Postcodes for which there are no delivery point addresses that lie within the extent of the realm coastline.

•   Postcodes that relate to PO Boxes.

•   Postcodes that are vertically stacked, i.e. two or more postcodes within a single building that are represented by a single large-scale building seed. In these situations, a single square polygon represents all the postcodes attributed to the single building seed.