



NGA.STND.0071-1_1.0_DPSJOG
(2018-08-01)

NGA STANDARDIZATION DOCUMENT

DATA PRODUCT SPECIFICATION (DPS)

1:250,000 Scale

Joint Operations Graphic – Ground (JOG-G)

Joint Operations Graphic – Air (JOG-A)

(2018-08-01)

Version 1.0

Author: NGA/Foundation GEOINT Group

Distribution: Approved for public release; distribution is unlimited.

Usage: This JOG Data Product Specification, along with the JOG DPS Portrayal Catalog and JOG DPS Annotation Catalog, has been approved for use by the NSG Community to produce 1:250,000 Joint Operations Graphics.

Foreword

The purpose of this document is to describe the content and arrangement of a Joint Operation Graphic (JOG) for 1:250,000 scale. A JOG is a hardcopy map characterized by a moderate level of planimetric detail and quantitative representation of relief using elevation contour lines. The various features shown on the map are represented by standard symbols. These symbols are explained in the margin of the map along with other information about the map and its content. JOG content includes symbolization of transportation and cultural features, vertical obstructions, land aerodromes, airspace boundaries, navigational aids, hydrography, hypsography, vegetation, boundaries, and geographic place-names, along with a Military Grid Reference System (MGRS) grid. The Data Product Specification (DPS) for Joint Operations Graphics consists of three parts:

- **NGA.STND.0071-1_1.0_DPSJOG** - This Joint Operations Graphic Data Product Specification (JOG DPS), which defines the requirements for a Joint Operations Graphic product at 1:250,000 scale.
- **NGA.STND.0071-2_1.0_DPSJOGPC** - The Joint Operations Graphic Data Product Specification Portrayal Catalog (JOG DPS PC), which defines requirements for the portrayal of feature data on Joint Operations Graphics.
- **NGA.STND.0071-3_1.0_DPSJOGAC** - The Joint Operations Graphic Data Product Specification Annotation Catalog (JOG DPS AC), which defines requirements for the portrayal of non-feature (marginalia) data on Joint Operations Graphics.

Note: *All three of the above documents are required to produce a Joint Operations Graphic product.*

The format of these documents is based on the International Organization for Standardization (ISO) 19131, Geographic information - Data product specifications. This international standard defines a standard format and structure for specifications for geospatial data products. The standard also considers a hardcopy map or chart to be a data product.

This DPS utilizes the GEOINT Structure Implementation Profile (GSIP) as the “language” to express the information requirements for Joint Operations Graphics. The GSIP is a series of artifacts that define the data model for GEOINT data that is used in the National System for Geospatial Intelligence (NSG). This DPS is a replacement for the DOD specifications (MILSPECs) for 1:250,000 scale Joint Operations Graphic products (MIL-J-89100A). The legacy Feature and Attribute Coding Standard (FACS) defined in MIL-STD-2408, Glossary of Feature and Attribute Definitions (1995) that was used to define topographic map features, aeronautical information and attribute requirements in the MILSPECs has been replaced in this DPS with GSIP artifacts. The Joint Operations Graphic Feature Catalog (JOG FC) is a subset of the NSG Entity Catalog (NEC) version 7.0, which in turn is the NSG version of the International Defence Geospatial Information Working Group (DGIWG) Feature Data Dictionary (DFDD).

Comments, questions, or suggestions to improve this document should be addressed to the National Geospatial-Intelligence Agency, Foundation GEOINT Group, Standards Branch, Mail Stop N22, 7500 GEOINT Drive, Springfield, VA 22150-7500 or e-mail: DataProductSpecs@nga.mil

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1 Overview

There are two versions of a Joint Operations Graphic which can be produced. The 1501 Joint Operations Graphic-Ground (JOG-G) is primarily used by land forces for: the planning and support of ground operations and navigation; to provide basic terrain analysis information to assist in the Intelligence Preparation of the Battle space through a standardized graphical representation.

The 1501A Joint Operations Graphic-Air (JOG-A) is primarily used by air forces for: the planning and support of low altitude air operations and navigation; tactical air-to-ground operations; the support to other aircraft activities including training, intelligence briefings, and moving map displays.

This product specification describes the content and arrangement of both versions of a Joint Operations graphic.

1.1 DPS Title

Data Product Specification (DPS), 1:250,000 Scale, Joint Operations Graphic – Ground (JOG-G); Joint Operations Graphic – Air (JOG-A)

1.2 DPS Version

1.0

1.3 DPS Reference Date

01 August 2018

1.4 DPS Language

English

1.5 DPS Classification

Unclassified

1.6 DPS Contact

Comments, questions, or suggestions to improve this document should be addressed to the National Geospatial-Intelligence Agency, Foundation GEOINT Group, e-mail: DataProductSpecs@nga.mil.

1.7 DPS URL

This product specification is available at: <https://nsgreg.nga.mil/>

1.8 DPS Identifier

JOG DPS

1.9 DPS Maintenance

There is no regular maintenance/update schedule for this product specification. It will be updated as requirements dictate.

1.10 DPS Keywords

Aeronautical, topographic, hardcopy, map, graphic, chart

1.11 DPS Topic Categories

010: Imagery/Base Maps/Earth Cover

1.12 DPS Distribution Format

This document is distributed in Portable Document Format (PDF).

1.13 Terms and Definitions

1.13.1 Data product

Dataset or dataset series that conforms to a data product specification.

1.13.2 Data product specification

A geospatial data product specification is a precise technical description which characterizes a geospatial data product. It includes general information for data identification as well as information on data content and structure, reference systems, data quality aspects, data capture, maintenance, delivery and metadata.

1.13.3 Dataset

Identifiable collection of data

NOTE: A dataset may be a smaller grouping of data which, though limited by some constraint such as spatial extent or feature type, is located physically within a larger dataset. Theoretically, a dataset may be as small as a single feature or feature attribute contained within a larger dataset. A hardcopy map or chart may be considered a dataset.

1.13.4 Dataset series

Collection of datasets sharing the same product specification.

1.14 Abbreviations

AC Annotation Catalog

AS Application Schema

CADRG Compressed Arc Digitized Raster Graphic

CSD CADRГ Supplemental Discs

DPS Data Product Specification

GCES GEOINT Content Extraction Specification

FC Feature Catalog

JOG Joint Operations Graphic

JOG-A Joint Operations Graphic – Air

JOG-G Joint Operations Graphic – Ground

MEF Maximum Elevation Figure

MGRS Military Grid Reference System

MTM MGCP Topographic Map

NMF NSG Metadata Foundation

NOTAM Notice to Airmen

NSG National System for Geospatial Intelligence

OCF Obstruction Change File

PC Portrayal Catalog

PDF Portable Document Format

TM Topographic Map

1.15 Informal description of the data product

1.15.1 Title

Joint Operations Graphic (JOG)

1.15.2 Acronym

JOG-A; JOG-G

1.15.3 Abstract

A Joint Operations Graphic (JOG) is a medium scale map characterized by a moderate level of planimetric detail and quantitative representation of relief using elevation contour lines. The various features shown

on the map are represented by standard symbols. These symbols are explained in the margin of the map along with other information about the map and its content.

1.15.4 Content

Joint Operations Graphic content includes symbolization of transportation and cultural features, vertical obstructions, land aerodromes, airspace boundaries, navigational aids, hydrography, hypsography, vegetation, boundaries, and geographic place-names. Examples of marginalia annotation include: a map legend to illustrate and define symbols used on the map, a glossary of geographic terms, location diagram, bar scales, aeronautical caution notes, notes on geographic reference system, datum, elevation contour interval, and sheet identification.

The ground JOG (JOG-G) is primarily for ground forces. Vertical measurements (elevation contours, spot elevations, vertical obstructions, etc.) are shown in meters to match those on larger scale maps such as the Topographic Map (TM) and the Multinational Geospatial Co-Production Program (MGCP) Topographic Map (MTM).

The air JOG (JOG-A) is primarily for low altitude or rotary-winged aircraft pilots. Vertical measurements are shown in feet and specific aeronautical information is added (airspace boundaries, maximum elevation figures (MEFs), elevation tints, navigational aids, air warning notes, etc.).

Since the JOG utilizes the UTM coordinate system, the Transverse Mercator projection, and a Military Grid Reference System (MGRS) grid, all horizontal measurements for both the Ground and Air versions are based in meters (land aerodrome runway lengths, labeled on JOG-A only, are shown in hundreds of feet).

1.15.5 Spatial extent

Joint Operations Graphics are produced at 1:250,000 scale. JOG map sheets normally cover one degree in the north-south dimension, and one and a half degrees in the east-west dimension at the equator (with variations of two degrees east-west where appropriate). Exceptions may be made when required by the producing organization or nation.

1.15.6 Specific purpose

Although historically a “paper” product, a JOG may also be produced as digital versions of paper maps, such as Portable Document Format (PDF), or Compressed Arc Digitized Raster Graphic (CADRG). Producing digital copies of Joint Operations Graphics is outside the scope of this DPS.

2 Scopes

The scope of this DPS is to define the product requirements for 1:250,000 scale Joint Operations Graphic. The Joint Operations Graphic has unique scopes for the following topics of information.

2.1 Scope Identification – Series version

2.1.1 Scope Level

Dataset (map sheet)

2.1.2 Level Names

Series 1501 Joint Operations Graphic – Ground; Series 1501A Joint Operations Graphic - Air

2.1.3 Level Description

Two versions of a Joint Operations Graphic may be produced based on the applicable series. Series 1501, Joint Operations Graphic – Ground is primarily used by ground forces. Series 1501A Joint Operations Graphic – Air is primarily used by air forces. Variations exist based on vertical measurement systems and aeronautical information. See section 1.15.4 for more information.

2.1.4 Coverage

Not Applicable.

2.1.5 Extent

The variations related to both series are applicable to the entire map sheet, including margin information.

2.2 Scope Identification – Languages

2.2.1 Scope Level

Dataset (map sheet)

2.2.2 Level Names

Single Language; Multi-Lingual

2.2.3 Level Description

Joint Operations Graphics can be produced in one language, or in multiple languages. See section 3.10 for multi-lingual map requirements.

2.2.4 Coverage

Not Applicable.

2.2.5 Extent

The language or languages applied to the map are applicable to the entire map sheet, including margin information.

2.3 Scope Identification – Expurgation

2.3.1 Scope Level

Dataset (map sheet)

2.3.2 Level Name

Expurgated area

2.3.3 Level Description

In certain cases (based on supplementary project instructions), the topographic detail on one side of an international boundary on a map may be omitted (expurgated) if the map sheet is primarily intended to support operations on the other side of the boundary. See JOG PC section 2.6.5 for additional information.

2.3.4 Coverage

Not Applicable.

2.3.5 Extent

The extent of the expurgated area normally extends from the boundary (or the river bank if the countries are separated by a water body). In the expurgated area, no topographic detail shall be shown except for Administrative Boundary, Land Water Boundary and Tidal Water. Grid and graticule information is shown for the entire map sheet.

3 Data product identification

3.1 Title: Product Name_series_sheet_edition identification numbers

Each Joint Operations Graphic shall be identified primarily by a unique combination of the product name, series identification number, map sheet identification number, and edition number.

Series, sheet, and edition numbers shall be constructed according to the definitions and principles in section 3.14.

3.2 Alternate title (1): Sheet name

Each Joint Operations Graphic shall also be identified by a sheet name.

Sheet names shall be constructed according to the definitions and principles in section 3.14.2.4.

3.3 Alternate title (2): NATO/National Stock Number (NSN)

Each Joint Operations Graphic shall also be identified by a NATO/ National Stock Number (NSN).

The NSN shall be constructed according to the definitions and principles in section 3.14.4.

3.4 Alternate title (3): Reference Number (RN)

Each Joint Operations Graphic shall also be identified by a Reference Number (RN).

The RN shall be constructed according to the definitions and principles in section 3.14.5.

3.5 Abstract

The 1:250,000 scale Joint Operations Graphics are medium-scale maps used for tactical and planning operations. Joint Operations Graphic content includes symbolization of transportation and cultural features, vertical obstructions, land aerodromes, airspace, navigational aids, hydrography, hypsography, vegetation, boundaries, geographic place-names, along with a Military Grid Reference System (MGRS) grid. Annotation in the margin of the map provides basic metadata about the information shown on the map, as well as additional non-feature related information, such as a location diagram, map legend, glossary, etc.

3.6 Purpose

The 1501 Joint Operations Graphic-Ground (JOG-G) is primarily used by land forces for: the planning and support of ground operations and navigation; to provide basic terrain analysis information to assist in the Intelligence Preparation of the Battle space through a standardized graphical representation.

The 1501A Joint Operations Graphic-Air (JOG-A) is primarily used by air forces for: the planning and support of low altitude air operations and navigation; tactical air-to-ground operations; the support to other aircraft activities including training, intelligence briefings, and moving map displays.

3.7 Topic category

Not applicable

3.8 Spatial resolution

1:250,000

3.9 Geographic extent

The geographic extent of a Joint Operations Graphic shall correspond to a specification of sheet lines. This DPS prescribes no positional limitations for a JOG map sheet in terms of geographic location (i.e. this DPS is valid worldwide).

Sheet lines for 1:250,000 scale Joint Operations Graphics shall follow an established format as described in section 3.14.2.

3.10 Language

A maximum of two languages shall be employed in the creation of a Joint Operations Graphic data product. One of the languages shall always be English. The selection of the languages other than English or the use of US or UK English spelling shall be governed by the provisions of map standardization agreements and/or map agreements applying to specific projects, and shall be specified in supplemental instructions for the project.

3.11 Security Constraints

3.11.1 Classification

The degree of classification is determined in accordance with the provisions of Department of Defense Regulation 5200.1.R, "Information Security Program Regulation." The appropriate classification shall be indicated in the security classification guidance for the project.

Other Nations producing Joint Operations Graphics may have their own authorities for determining the degree of classification.

The security classification of the products generated by the use of this specification should be the lowest category practicable – normally UNCLASSIFIED with some form of restricted dissemination.

3.11.2 Classification Policy

Each map bearing a security classification marking shall also identify the classifier, and shall also contain downgrading or declassification instructions. The appropriate note or statement shall be determined in accordance with the provisions of DoD Regulation 5200.1.R. The specific note shall be indicated in pertinent security classification guidance for the project.

3.11.3 Handling Description

Certain maps, classified or unclassified, require notes which restrict their distribution. When required, the appropriate note shall be specified in the security classification guidance pertaining to the project.

3.11.3.1 Restricted dissemination / LIMITED DISTRIBUTION note

A Restricted Dissemination or LIMITED DISTRIBUTION note is normally required on unclassified maps of areas outside the United States. The exact wording of this note is subject to change. Refer to current guidance and/or supplementary project instructions for the text of this note.

3.11.3.2 Caveat or special handling note

A Caveat or Special Handling Note may be required. Examples:

NOT RELEASABLE TO FOREIGN NATIONALS *[maps classified CONFIDENTIAL or higher]*

RELEASABLE TO NATO

RELEASABLE TO [COUNTRY] AND [INTERNATIONAL ORGANIZATION]

3.12 Point of contact

The point of contact for Joint Operations Graphic data products shall be contained in a “users note”. See JOG Annotation Catalog (AC) section 3.1.6.2 for more details.

Since the point of contact information contained in the users note changes frequently, the Point of Contact for this data product specification (see section 1.6) should be contacted to obtain the latest information.

3.13 Identification scope

Dataset (map sheet)

3.14 Supplemental information

3.14.1 Map series

A series consists of a group of maps which are common to one another in that they:

- Cover a particular geographic area.
- Are on the same sheet line system.
- Are of the same scale or within the same scale group.
- Are prepared under the same cartographic specifications.

A map series is used to facilitate the preparation, identification, indexing, storage, and distribution of a map.

3.14.1.1 Series number

The series number indicates the scale and series designation of the series. Joint Operations Graphics are grouped into two different worldwide map series whose designations are:

- Series 1501 for the ground version
- Series 1501A for the air version

3.14.2 Map sheets

Sheet lines are the means by which a geographic area is divided to establish the limits of individual sheets. Sheet lines shall generally be formed by parallels of latitude and meridians of longitude. The sheet lines of individual maps are also referred to as neatlines.

3.14.2.1 Establishment of standard JOG sheet lines

The geographical area of coverage for each individual JOG sheet shall be based on subdivisions of the "International Map of the World (IMW)" 1:1,000,000 scale sheet numbering system. The number of 1:250,000 scale graphics contained within each IMW sheet will vary from 12 to 16, depending on the geographic latitudes or the established width of sheets over certain areas. Shifting of the geographic limits of a graphic from its standard IMW position is permissible to avoid unnecessary production of

graphics. However, the elimination of a graphic is not the sole criterion. Other considerations are the effect on the sheet lines of surrounding graphics, the coverage on the affected graphics, and the continuity of information.

3.14.2.2 Departures from standard JOG sheet lines

Where the elimination of a graphic would require the shifting of the sheet lines of several graphics, the graphic should not be eliminated unless the new sheet lines of the other graphics are an improvement in the coverage; i.e., the major related features are shown on one graphic. The coverage should always be considered to avoid separating related features which, if possible, should be presented as a whole. The continuity of information should not be disrupted by the elimination of a water area where the relationship between land masses is important for planning or flying purposes. Insets shall not be shown.

The following are examples of departures from standard sheet lines. NOTE: the dashed lines in the figures represent where the standard JOG sheet lines would exist if unadjusted.

3.14.2.2.1 Border break extensions

A border break extension (“bump-out”) permits an adjustment to a sheet neatline to accommodate islands of an adjoining area, small points of land, or offshore features (see Figure 1 and Figure 2). When there is a choice of sheets which may contain a border break extension, the sheet which requires the least rearrangement of margin data shall be selected. The neatline is extended around the protruding land mass and incorporates all applicable features within.

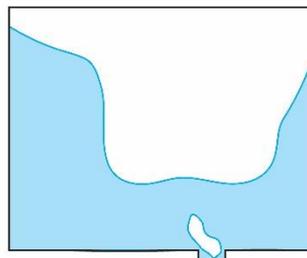


Figure 1. Border break for island.

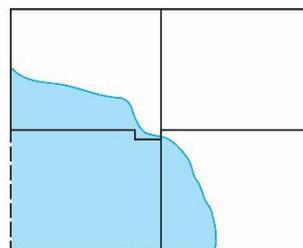


Figure 2. Border break for coastal land.

3.14.2.2.2 Extensions

An extension (Figure 3) is the enlargement of a sheet by moving one or more sheet lines to include adjoining land areas.

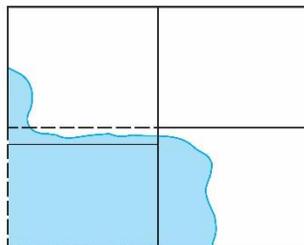


Figure 3. Sheet line extension.

3.14.2.2.3 Shifts

A shift is a change in continuity of sheet lines to accommodate a landmass (Figure 4). Sheets that are shifted usually retain the defined sheet dimensions for the area. A shift may involve more than one sheet. Overlapping sheets are permitted only if the overlapped area does not contain land, as shown in the example on the right.

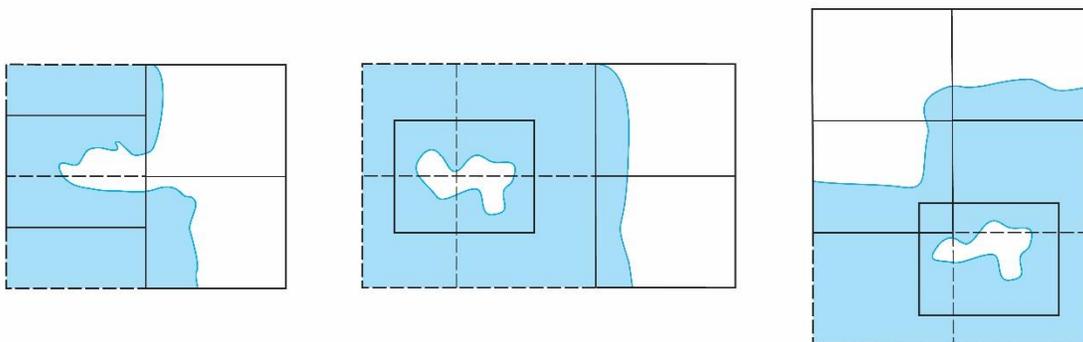


Figure 4. Various sheet line shifts.

3.14.2.2.4 Reproportionment

Reproportionment (Figure 5) permits the adjustment of the latitudinal and longitudinal limits of the defined sheet lines.

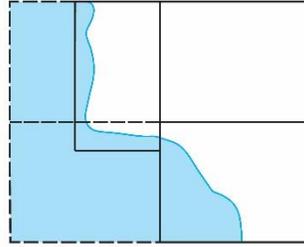


Figure 5. Reproportionment.

3.14.2.3 Numbering of JOG sheets

3.14.2.3.1 Sheet numbering basis

The sheet number is based on the worldwide numbering system established for the International Map of the World (IMW) at 1:1,000,000 scale. Sheet numbers for Joint Operations Graphics are developed from established subdivisions of the 1:1,000,000 scale maps (normally 4° latitude by 6° longitude) as found on the “Standard Index Chart for Series 1501/1501 Air, 1:250,000” (see Figure 6).

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|-----------|-----------|----|----|----|----|----|----|----|------------|----|----|----|----|----|----|----|-----------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| | | 0° | | | | | | | | 16° | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 31 | | | | | | | | 32 | | | | | | | | 33 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 32° | NH | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | |
| | | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | |
| | | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | |
| | | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | | | | |
| 16° | NG | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 |
| | | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | |
| | | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | |
| | | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | | | | | | | | |
| NE | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | |
| | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | | |
| | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | 9 | 10 | 11 | 12 | | | | | |
| | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | 13 | 14 | 15 | 16 | | | | | | | | | |

Figure 6. Basic development sample of the sheet number for 1:250,000 scale maps.

The first digit (letter) of a sheet number indicates which hemisphere the sheet falls within. Sheets in the northern hemisphere begin with the letter “N”; sheets in the southern hemisphere begin with the letter “S”. The second digit (letter) indicates the relative distance from the equator. Sheets with the letter “A” are closest to the equator; sheets with the letter “U” are farthest from the equator. The following two digits (numbers) indicate the relative distance eastward from the 180° longitude line and are the same as the JOG sheet’s primary UTM grid zone. The last two digits (numbers) indicate the designated sheet number with the IMW subdivision.

The amount of 1:250,000 scale graphics within each IMW sheet varies from 12 to 16, depending on the geographic latitudes or the established width of sheets over certain areas. The JOG sheet number is the number of the basic IMW sheet within which it lies, together with the number of the numerically designated position it occupies within the IMW sheet (Figure 7).

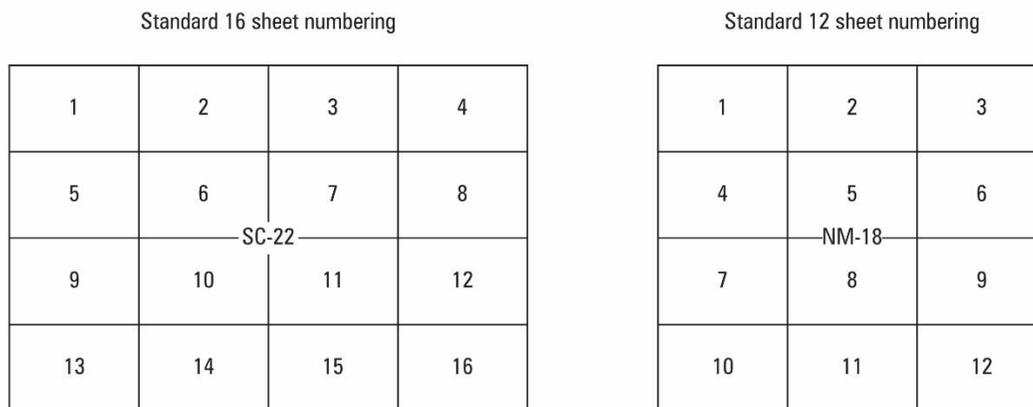


Figure 7. System for numbering 1:250,000 scale maps.

3.14.2.3.2 Sheet number format

The six digit alpha-numeric sheet number shall be comprised of three pairs of digits, separated by a hyphen with no character spaces (e.g. NH-32-12 rather than NH 32-12, NH 32 12, NH 3212, etc.).

Leading zeroes shall be added to single digit numbers so that sheet designations are the same length for all sheets (e.g. NH-02-01 rather than NH-2-1, NH-2-01, etc.).

3.14.2.3.3 Sheet numbering with changes from standard sheet lines

A sheet number shall not be affected by an extension of or a break in a sheet line which is made to include adjacent land areas. For graphics shifted from the standard IMW position, the sheet number is that which, in the standard system, relates to the greater part of the graphic.

3.14.2.4 Naming of JOG sheets

3.14.2.4.1 Normal sheet naming practices

A map should normally be named after its most outstanding cultural or natural feature. Names of cultural features are preferred over natural features; however, if a natural feature is better known than any cultural feature appearing on the map, the name of the natural feature should be chosen.

The names of rivers, valleys, mountain ranges and other features extending over several sheets should be avoided when selecting a sheet name. In addition, area, locality and tribal names should not be used as a sheet name. Names of destroyed populated places or features should not be used as a sheet name when a natural feature is more prominent.

When the feature is divided by the neatline(s) separating two or more sheets and is the best known feature on each of the sheets, the feature name is followed by the geographic term (in parenthesis) describing the portion of the feature for which the sheet is being named. Examples:

“STUTTGART (NORTH)” and “STUTTGART (SOUTH)”

“KABOL (NORTHWEST)”, “KABOL (NORTHEAST)”, “KABOL (SOUTHWEST)” and “KABOL (SOUTHEAST)”

3.14.2.4.1.1 Spelling of sheet name

The sheet name shall be spelled to correspond exactly to the name of the outstanding feature as it is shown in the map interior. Diacritics, hyphens, and apostrophes shall only be shown if they appear with the name in the interior of the map.

3.14.2.4.2 Alternate sheet naming practices

The use of alternate names is discouraged and is used only when the alternate name is well known. When used, it is enclosed in parentheses after the sheet name.

3.14.2.4.3 Sheet names for copied maps

When a map is copied from or based on a foreign map, and uses the same sheet lines, the name of the original map should usually be retained.

3.14.2.4.4 Uniqueness of sheet names

Sheet names shall not be duplicated within a map series. Individual maps should be given distinct sheet names wherever possible.

3.14.3 Edition numbering

The edition number shall identify the publication sequence of an individual map. Edition numbers shall run consecutively. A map bearing a higher edition number in the same series is assumed to contain more recent information than the same map bearing a lower edition number. "EDITION 1" is always applied to maps in a given series which are produced for the first time.

3.14.3.1 Standard edition designation

The standard edition designation shall consist of the word “EDITION”, a [space], and a three digit cardinal number (with leading zeroes), a hyphen, and the coded initial of the mapping agency responsible for the edition. Examples:

EDITION 001-NGA

EDITION 012-MCE

EDITION 003-GSGS

3.14.3.2 Advancement of edition number

The edition number shall be advanced in the following instances:

- Any map on which an alteration or revision is made to the factual data shown on the map, or any alteration that affects the operational soundness of the map. Examples would be the addition of a new grid or the revision of boundary information.
- A newly constructed map which is to replace an existing map.
- The aeronautical overprint information which is unique to the 1501A air version may be revised without revision of the companion ground version. In this instance, the air edition will be advanced if the criteria above are met. The revision of the basic information which is common to both versions of the JOG shall be the basis for advancing the edition number of both versions.

The advancement of an edition number constitutes authority to destroy stock and reproduction materials of the preceding edition.

3.14.3.2.1 Digital versions and facsimile reprints

The edition number shall not be advanced for digital versions and facsimile reprints on which no changes are made to map content or margin data.

The only authorized modifications to the digital versions or facsimile reprints are:

- The addition of the NATO/National Stock Number (NSN), the Reference Number (RN) and bar code to introduce map products of other national mapping agencies into the NGA distribution system;
- The addition, deletion, or change of the coded initials or agency seal of the printing element or the printing date;
- The update of any security note (i.e. Limited Distribution);
- The update of the users note.

3.14.3.3 Edition numbering for provisional, emergency, special, and temporary printings

The word "edition" shall be used only in conjunction with the edition number. The words "provisional," "emergency," "special," "temporary," etc., shall not be used as prefixes to the word "edition." Such prefixes may be used in conjunction with the word "printing," in which case an edition number is not shown.

3.14.4 NATO/National Stock Number

The NATO/National Stock Number (NSN) consists of a 13 digit number and is used to uniquely identify the map in the Defense Logistics Information Service (DLIS).

The NSN shall be displayed on the map in human-readable and bar-code forms. See JOG AC section 3.1.4.1 for details.

3.14.5 Reference Number

The Reference Number (RN) shall consist of an alphanumeric designation not to exceed 15 characters. The NRN shall be constructed as follows:

- The first five units shall be reserved for the JOG series identification.
- The letter "X" is added as a suffix to the 1501 series number on the ground version.
- The letter "A" is added as a suffix to the 1501 series number on the air version.
- The 6th through 15th units shall be reserved for the sheet number. The hyphens in 1:250,000 scale sheet numbers are not included in the reference number.
- When displayed on the map, the NRN shall be prefixed by "REF. NO." See the JOG AC section 3.1.4.2 for details.

Examples of Reference Numbers used with JOGs are as follows:

- For Sheet NF-48-12, Series 1501:

REF. NO. 1501XNF4812

- For Sheet ND-56-01, Series 1501A:

REF. NO. 1501AND5601

- For Sheet SD-03-08, Series 1501:

REF. NO. 1501XSD0308

For combination sheet numbers which cannot be accommodated within the 10 character limitation, the second and third zone references are omitted and the stock numbers shall appear as indicated:

- For Sheet NT-13, 14, 15, 16-10, Series 1501:

REF. NO. 1501XNT131610

- For Sheet NT-13, 14, 15, 16-10, Series 1501A:

REF. NO. 1501ANT131610

3.14.5.1 Modification of reference numbers for classified maps

When a modification of reference numbers is required for classified maps, guidance shall be included in the pertinent classification guide.

3.14.6 Expurgated Sheets

On map sheets containing expurgated areas (areas where map information is not shown) the fifth element of the series number is shown with a “Z” to distinguish it from a map sheet of the same area which is not expurgated. The sheet name shall also be changed to reflect the most outstanding feature within the non-expurgated area of the sheet. See section 2.6.5 of the JOG PC for additional information on the treatment of sheets containing expurgated areas.

4 Data content and structure

The 1:250,000 scale Joint Operations Graphics are feature-based hardcopy map products, based on the graphic symbolization of geospatial features contained within the map sheet limits.

4.1 Feature-based data

The Joint Operations Graphic Feature Catalog (JOG FC) Annex A.1 shall be a subset of the NSG Entity Catalog (NEC) version 7.0 consisting of those features relevant for portrayal on a 1:250,000 scale Joint Operations Graphic. Likewise, the Joint Operations Graphic Application Schema shall be a subset of the NSG Application Schema (NAS) consisting of those features relevant for portrayal on a 1:250,000 scale JOG. Features not listed in Annex A.1 shall not be portrayed.

Features shall be portrayed based on the symbol criteria contained in JOG PC. However, not every instance of a feature may be symbolized on a JOG. Some feature geometries or combinations of feature attributes and enumerants are not to be portrayed.

4.2 Feature-based application schema

The NSG Application Schema (NAS) is available from the NSG Standards Registry at:

NAS (UML):

<https://nsgreg.nga.mil/doc/view?i=81039>

NAS (Excel workbook):

<https://nsgreg.nga.mil/doc/view?i=81045>

4.3 Feature catalog

See Annex A for the Joint Operations Graphic Feature Catalog (JOG FC).

5 Reference systems (DPS_ReferenceSystemInformation)

5.1 Spatial reference system

World Geodetic System 1984 (WGS 84).

5.1.1 Ellipsoid

The ellipsoid for 1:250,000 Joint Operations Graphics shall be World Geodetic System 1984 (WGS 84).

5.1.2 Horizontal datum

The horizontal datum for 1:250,000 Joint Operations Graphics shall be World Geodetic System 1984 (WGS 84).

5.1.3 Vertical datum

The vertical datum for 1:250,000 Joint Operations Graphics shall be Mean Sea Level (MSL) as determined by the appropriate WGS 84 Earth Gravity Model (EGM).

The EGM clarifier may be added to the Vertical Datum note in the margin if it is known. An example is as follows:

"VERTICAL DATUM.....MEAN SEA LEVEL (EGM96)"

5.1.4 Projection

The projection for 1:250,000 scale Joint Operations Graphics shall be the Transverse Mercator between 84 degrees north latitude and 80 degrees south latitude. The Polar Stereographic projection shall be used for maps north of 84 degrees north latitude and south of 80 degrees south latitude. Any requirement for any projection other than those mentioned here should be specified in supplementary instructions provided as part of the project assignment.

Full lines of latitude shall be shown at 15-minute intervals with 1-minute ticks shown thereon. The sheet lines of standard 1:250,000 scale maps shall show the meridians (lines of longitude) as straight lines, and parallels (lines of latitude) which effect curvature through the connection of straight line segments between successive intermediate projection lines.

Between latitudes 0° and 76°, full lines of longitude shall be shown at 15-minute intervals with 1-minute ticks shown thereon. Between latitudes 76° to 84° North, and between 76° to 80° South, full lines of longitude shall be shown at 30-minute intervals with 1-minute ticks shown thereon.

The 1-minute ticks shall be directed away from Greenwich and away from the Equator. Ticks shall cross full lines at 0° and 180° longitude and at the Equator.

The basic projection layout must be digitally accurate within ± 0.50 mm diagonal measurement.

The use of geographic coordinates as a system of reference is based on the expression of position by latitude and longitude in degrees, minutes and decimal minutes.

5.1.5 Grid

The Universal Transverse Mercator (UTM) or Universal Polar Stereographic (UPS) grid shall be shown on 1:250,000 Joint Operations Graphics. The Military Grid Reference System (MGRS) shall be used to express positions in terms of UTM and UPS grid coordinates. Between 84 degrees north latitude and 80 degrees south latitude, the standard grid shall be the UTM grid. The UPS grid shall be used for maps north of 84 degrees north latitude and south of 80 degrees south latitude.

The grid interval on 1:250,000 scale maps shall be 10,000 meters in both northing and easting direction. The grid shall be constructed on a given sheet so that the distances between adjacent grid lines shall not vary more than 0.15 mm from the computed grid interval. The overall distances between the first full grid lines, complementing those of adjoining sheets, shall not vary more than 0.15 mm from their computer measurements.

If more than one grid zone falls within the area of the map, the divisions between grids shall be indicated by grid zone junction lines.

5.1.6 Resources

Explanatory data and specifications can be found in: NGA.STND.0037_2.0.0_GRIDS, NGA Standardization Document "Universal Grids and Grid Reference Systems (28 February 2014) Version 2.0.0" and NGA.RP.0002_2.0.0_UTMUPS, NGA Standardization Document "The Universal Grids Based on the Transverse Mercator and Polar Stereographic Map-Projections (25 March 2014) Version 2.0.0". These documents pertain to:

- Descriptive data and parameters for worldwide application of datums, ellipsoids, projections, and grids.
- Explanations on the use of the Military Grid Reference System and Geographic Coordinate Reference Systems.

- Definitions, specifications, and illustrations of treatments of grid(s) and graticule(s) for 1:250,000 scale maps.
- Treatment of grid zone junctions.
- Figures (diagrams) with definitive illustrations delimiting worldwide coverage of geodetic datums, ellipsoids, grids and grid reference systems.
- Appropriate sheet margin guidance for all subject related requirements.

These geomatic standards are available from the NSG Standards Registry at:

NGA.STND.0037_2.0.0_GRIDS:

<https://nsgreg.nga.mil/doc/view?i=4057>

NGA.RP.0002_2.0.0_UTMUPS:

<https://nsgreg.nga.mil/doc/view?i=4056>

5.2 Temporal reference system

Temporal reference systems are not applicable to Joint Operations Graphics.

6 Data quality

6.1 Accuracy

Series 1501 (Ground) and 1501A (Air) JOGs are required to meet the accuracies prescribed below.

6.1.1 Horizontal accuracy

Horizontal accuracy shall be within 0.5 mm at hardcopy map scale (125 meters or 410 feet) circular error (CE) at the 90% confidence level.

- *Circular error is an accuracy figure representing the stated percentage of probability that any point expressed as a function of two linear components (e.g., horizontal position) will be within the given figure.*

6.1.2 Vertical accuracy

Vertical accuracy shall vary in accordance with the contour interval used for the terrain being mapped. Vertical accuracy shall be one elevation contour interval linear error (LE) at 90% confidence level.

- *Linear error is a one dimensional error (such as an error in elevation) defined by the normal distribution function.*

6.1.3 Displaced features

The accuracies stated above shall be for well-defined points such as drainage confluences, major transportation crossing points, survey points, or the equivalent. Feature symbols which are displaced shall be excluded from the accuracy requirement stated above.

6.2 Quality scope

Data quality measures are applicable to the entire map sheet. Source classification and attribution will be retained to the extent possible for the scale.

7 Data product delivery

7.1 Delivery medium information

Joint Operation Graphics at 1:250,000 scale shall be delivered as paper map sheets and as a digital file.

Joint Operations Graphics are also produced as digital “copies” of paper maps for further production into formats such as Portable Document Format (PDF), GeoPDF, GeoTIFF, or Compressed Arc Digitized Raster Graphic (CADRG), or Enhanced Compressed Raster Graphic (ECRG). How digital copies of Joint Operations Graphics are produced is outside of the scope of this DPS, but is addressed in format-specific specifications, for example, U.S. MIL-PRF-89038 or NATO STANAG 7098 for CADRG, or U.S. MIL-PRF-32283 for Enhanced Compressed Raster Graphic (ECRG).

7.2 Delivery format information

7.2.1 Format name

Hardcopy map and digital versions.

7.2.2 Language

The languages of the delivery format shall be the languages for the Joint Operations Graphic data product as a whole. See 3.10 for a discussion of the languages of delivery for Joint Operations Graphics sheets.

7.2.3 Work limits

Work limits define the area available for a map to be plotted or printed on a roll or sheet of paper. Dimensions are expressed in linear units of measure.

The normal preferred work limits shall be 546.1 mm (21.5 inches) north-south and 723.9 mm (28.5 inches) east-west.

If necessary, these limits may be increased (primarily in the east-west dimension) in order to accommodate:

- wider sheet areas located at latitudes between 14°N and 14°S;
- sheets that are 2 degrees or wider (see 3.14.2.1);
- extended marginalia/legend due to bi-lingual translations; or
- departures from standard sheet lines (see 3.14.2.2)

Any variance beyond these maximum work limits shall be specified in supplemental project instructions.

7.2.4 Paper size and dimensions

Paper/trim size pertains to the overall dimensions on which a map may be plotted and/or cut after printing. Dimensions are expressed in linear units of measure.

The paper/trim size shall be a total of 12.7 mm (0.5 inches) greater in each direction than the work limits, or 6.35 mm (0.25 inches) around each edge.

The normal preferred paper/trim size shall be 558.8 mm (22 inches) north-south and 736.6 mm (29 inches) east-west.

If necessary, the maximum paper/trim size may be increased (primarily in the east-west dimension) in order to accommodate the special circumstances related to work limits listed above in 7.2.3.

Figure 8 illustrates sheet lines, preferred work limits, and preferred paper/trim size pictorially (see also JOG AC, Annex B - Style Sheets).

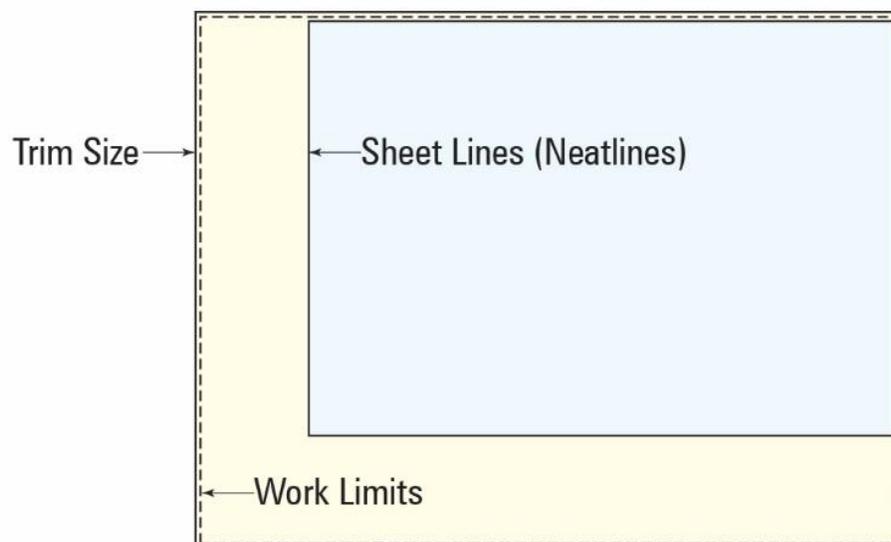


Figure 8. Sheet lines, work limits and paper/trim size.

7.2.5 Folding

1:250,000 Joint Operations Graphics (JOGs) are normally issued as folded stock. Unless a specific requirement exists for distribution of flat stock to support certain agencies or users, all JOGs shall be folded as described below.

The map shall be folded in such a way as to display the Bar Code (lower right corner of the map margin) and classification (when applicable). The classification shall be indicated on both the front (bottom right margin) and back (top left margin) of the same front fold.

The normal preferred folded dimensions shall be 184.15 mm by 279.4 mm (see also Annex B Style Sheets).

8 Metadata

8.1 Overview/Guidance

Metadata for the NSG is defined in the NSG Metadata Foundation (NMF). The NMF defines both mandatory and optional metadata elements for a resource or data product.

In addition to the metadata elements included in the NMF, additional metadata elements have been identified that are applicable to/required for the production of a Joint Operations Graphic sheet.

This section lists the NMF and non-NMF metadata elements applicable to a Joint Operations Graphic. Many of these elements are described more fully elsewhere in this document; this section is meant to be a complete listing for reference purposes.

8.1.1 Metadata and the Map Display/Annotation Catalog

Annotations on a Joint Operations Graphic sheet (Map Display) are the primary vehicle for conveying metadata values for that map sheet (Joint Operations Graphic) or the product as a whole. Both Annotation Symbols and Annotation Rules may be parameterized, using the values of metadata elements as input. See the JOG Annotation Catalog for more details.

8.2 NMF Metadata Applicable to the JOG

Table 1 describes those Joint Operations Graphic metadata elements that correspond to mandatory or optional NMF metadata elements. In many cases, more than one JOG metadata element may correspond to a NMF equivalent.

The structure of the table is as follows:

- Name: The name of the metadata element.
- NMF Element Correspondence: The NMF metadata element to which this corresponds.
- Mandatory/Optional: Denotes M (for mandatory) or O (for optional) NMF Metadata. Describes whether population of this element is mandatory to be NMF compliant.
- Multiplicity (Mult.): The number of values this element may represent.

- Description: Description of how the element.
- Data Type: The UML data type of the element is populated from the map sheet.
- Ref.: The section of the JOG DPS (or associated Catalog) that describes this metadata element and its use in more detail.

| Name | NMF Element Correspondence | Mandatory (M) or Optional (O) | Mult. | Description | Data Type | Ref. |
|------------------------------|--------------------------------|-------------------------------|-------|--|-----------------------|------------|
| JOG Series Version | Resource Version | M | 1 | The series version of JOG being produced (1501 or 1501-Air). | Character String | DPS 2.1 |
| Sheet Scale | Resource Spatial Resolution | M | 1 | The scale (representative fraction) of the map sheet. (1:250,000). | MD_Resolution | DPS 3.8 |
| Sheet Name | Resource Title | M | 1 | The unique name of the map sheet. | CharacterString | DPS 3.2 |
| Sheet Production Date | Resource Date | M | 1 | The production date (YYYY) of the map sheet. | Date | AC 3.1.6.1 |
| File Preparation Date | Resource Date | M | 1 | The preparation date (MM-YYYY) of the file used to make the map sheet. | Date | AC 3.1.6.3 |
| Copyright Date | Resource Date | M | 1 | The copyright date (YYYY) of the map sheet. | Date | AC 3.1.6.4 |
| Air Information Date | Resource Date | M | 1 | The date (DD Month YYYY) of currency of air information retrieval. | Date | AC 3.8.1 |
| Abstract | Resource Abstract | M | 1 | An abstract describing the product. | CharacterString | DPS 3.5 |
| Display Language | Resource Language | M | 1..* | The language(s) of presentation of the map sheet. | LanguageCode | DPS 3.10 |
| Topic Category | Resource Topic Category | M | 1..* | The main theme(s) of the dataset. | CharacterString | DPS 3.7 |
| Sheet Extent | Geographic Location | M | 1 | The geographic extent of the map sheet. | EX_Extent | DPS 3.9 |
| Classification (Code) | Security Classification | M | 1 | The security classification of the map sheet. | MD_ClassificationCode | DPS 3.11 |
| Classification System | Security Classification System | M | 1 | The classification system used to derive the security | CharacterString | DPS 3.11 |

| | | | | | | |
|---|---------------------------|---|------|---|---------------------|------------|
| | | | | classification of the map sheet. | | |
| Product Name | Product Name | M | 1 | The name of the product. | CharacterString | DPS 1.15.1 |
| Sheet Number | Resource Identifier | M | 1 | The sheet number identifying a map sheet. | CharacterString | DPS 3.1 |
| Series Number | Resource Identifier | M | 1 | The series number identifying a map series. | CharacterString | DPS 3.1 |
| Edition Number | Resource Identifier | M | 1 | The edition number of the map sheet. | CharacterString | DPS 3.1 |
| Reference Number (RN) | Resource Identifier | M | 1 | The unique Reference Number (RN) of the map sheet. | CharacterString | DPS 3.4 |
| NATO/National Stock Number (NSN) | Resource Identifier | M | 1 | The unique NATO/National Stock Number (NSN) of the map sheet. | CharacterString | DPS 3.3 |
| Producing Agency | Resource Originator | M | 1 | The agency responsible for producing the map sheet. | CharacterString | AC 3.1.6.1 |
| Producing Agency Code | Resource Originator | M | 1 | The abbreviation for the producing agency. | CharacterString | AC 3.1 |
| Point of Contact | Resource Point of Contact | M | 1 | The point of contact for the map sheet. | CI_ResponsibleParty | AC 3.1.6.2 |
| Data Content Lineage | Lineage | O | 1..* | The lineage of the data content represented on the map sheet. | LI_Lineage | AC 3.4.2 |
| Ellipsoid | Reference System | M | 1 | The ellipsoid to be used for the map sheet. | CharacterString | DPS 5.1.1 |
| Horizontal Datum | Reference System | M | 1 | The horizontal datum to be applied to the map sheet. | CD_Datum | DPS 5.1.2 |
| Vertical Datum | Reference System | M | 1 | The vertical datum to be applied to the map sheet. | CD_VerticalDatum | DPS 5.1.3 |
| Projection | Reference System | M | 1 | The projection to be used for map sheets. | CharacterString | DPS 5.1.4 |
| Grid System | Reference System | M | 1 | The grid system to be used for map sheets. | CharacterString | DPS 5.1.5 |

| | | | | | | |
|-------------------------------------|---|---|---|--|-----------------|----------|
| Declassification Information | Declassification Date, Declassification Event | 0 | 1 | Declassification information for a classified map sheet. | CharacterString | DPS 3.11 |
|-------------------------------------|---|---|---|--|-----------------|----------|

Table 1. NMF metadata applicable to a JOG.

8.3 NMF Metadata Not Applicable to a Hardcopy Map Product

The following mandatory NMF metadata elements have been identified as not applicable to a hardcopy product:

- Resource character set
- Resource category
- Metadata point of contact
- Metadata date stamp
- Metadata standard name
- Metadata standard version
- Keywords
- Hierarchy level
- Hierarchy level name

8.4 Additional Metadata for Joint Operations Graphics

The tables in this section list additional categorized metadata elements that have been identified as mandatory for constructing a Joint Operations Graphic, and thus may appear in the criteria of Annotation Rules or as parameters for Annotations.

8.4.1 Additional Presentation Information

Table 2 describes additional metadata elements needed to drive textual annotations on the JOG sheet.

| Name | Multiplicity | Description | Data Type | Reference |
|---------------------------------------|--------------|---|-----------------|------------|
| Glossary Terms and Definitions | 0..* | The terms and definitions to be displayed in the glossary. | CharacterString | AC 3.6 |
| Miscellaneous Note Text | 0..* | The text of the miscellaneous notes to appear on the map. | CharacterString | AC 3.7 |
| Users Note Text | 1 | The text of the Users Note as required by supplementary instructions. | CharacterString | AC 3.1.6.2 |
| Copyright Note Text | 1 | The text of the Copyright Note as required by supplementary instructions. | CharacterString | AC 3.1.6.4 |

Table 2. Additional metadata related to presentation.

8.4.2 Additional Security Constraint Information

Table 3 describes information about the security classification and constraints of a Joint Operations Graphic that are not otherwise covered by NMF metadata elements.

| Name | Multiplicity | Description | Data Type | Reference |
|---|--------------|--|-----------------|------------|
| Limited Distribution Note Required | 1 | Whether or not a limited distribution note is required for this map sheet. | Boolean | DPS 3.11.3 |
| Limited Distribution Note Text | 1 | The text of the Limited Distribution Note as required by supplementary instructions. | CharacterString | DPS 3.11.3 |
| Special Handling Information | 0..1 | Any security caveats or special handling instructions related to the map sheet. | CharacterString | DPS 3.11.3 |

Table 3. Additional security constraint metadata.

8.4.3 Data Content-Derived Information

Table 4 describes metadata elements representing information derived from the data content portrayed on the Joint Operations Graphic.

| Name | Multiplicity | Description | Data Type | Reference |
|--|--------------|--|-----------------|------------|
| Data Content | 1 | The data content represented on the map sheet. | CharacterString | DPS 4 |
| Data Content – Countries Depicted | 1..* | The countries shown on the map sheet. | CharacterString | DPS 4 |
| Data Content - Intermediate Elevation Contour Interval | 1 | The primary (intermediate) elevation contour interval represented by the elevation contour data for the map sheet. | Integer | AC 3.3.3.2 |
| Data Content – Supplementary Elevation Contour Interval | 0..* | The supplementary elevation contour interval(s) represented by the elevation contour data for the map sheet. | Integer | AC 3.3.3.2 |
| Data Content – Maximum Elevation | 1 | The maximum elevation value over the geographic extent of the map sheet. | Integer | AC 3.3.3.2 |
| Data Content – Minimum Elevation | 1 | The minimum elevation value over the geographic extent of the map sheet. | Integer | AC 3.3.3.2 |
| Data Content - MEF maximum value | 1 | The maximum MEF value over the geographic extent of the map sheet. | Integer | AC 3.8.2 |

Table 4. Additional metadata related to data content.

8.4.4 Additional Spatial Reference Information

8.4.4.1 Sheet-Level Spatial Reference Information

Table 5 describes additional spatial reference-related metadata elements applicable to a Joint Operations Graphic sheet as a whole.

| Name | Multiplicity | Description | Data Type | Reference |
|--|--------------|--|-----------------|------------|
| Epoch Date | 1 | The standard epoch year (divisible by five, such as 2010, 2015, etc.) of latest isogonic data. | Date | AC 3.3.1.4 |
| Sheet Line System | 1 | The sheet line system used to define the borders of the map sheet. | CharacterString | DPS 3.14.2 |
| 100,000m Grid Square Identifier | 1..* | The 100,000m grid square identifier(s) overlapping this map extent. | CharacterString | AC 3.3.1.3 |
| ONC Index | 1..* | The ONC index sheet(s) overlapping the Location Diagram extent. | CharacterString | AC 3.3.4.3 |
| WAC Index | 1..* | The WAC index sheet(s) overlapping the Location Diagram extent. | CharacterString | AC 3.3.4.3 |

Table 5. Additional sheet-level spatial reference metadata.

8.4.4.2 Map-Specific Spatial Reference Information

Table 6 describes spatial reference metadata elements that are specific to one or more of the Maps within the Map Display (see section 12.6).

| Name | Multiplicity | Description | Data Type | Reference |
|--------------------------------------|--------------|--|-----------------|------------|
| Map Extent | 1 | The geographic extent of the map (as distinct from the overall extent depicted on the map sheet). | EX_Extent | DPS 3.9 |
| Map Grid Zone | 1..* | The major grid zone(s) to be shown on the map. | CharacterString | AC 3.3.1.3 |
| Map Grid Zone Designation | 1..* | The full designation, including latitude band, of the major grid zone(s) to be shown on the map. | CharacterString | AC 3.3.1.3 |
| Map Magnetic Declination Info | 1 | The magnetic declination value for the geographic extent of the map. | CharacterString | AC 3.3.1.4 |
| Map Magnetic Variation Info | 1 | The magnetic variation value (including annual rate of change) for the geographic extent of the map. | CharacterString | AC 3.3.1.4 |

Table 6. Additional map-level spatial reference metadata.

9 Data capture

9.1 Data capture statement

Geospatial information portrayed on NGA Joint Operations Graphics at 1:250,000 scales shall be taken from NGA's GEOINT foundation, which includes topographic, maritime, aeronautical, boundaries, elevation and geographic names.

Extraction guides shall define the criteria and circumstances under which each feature is collected. The GEOINT Content Extraction Specification (GCES) is available at:

<https://www.nga.mil/ProductsServices/Pages/GEOINT-Content-Extraction-Specification-.aspx>

Capture criteria for Joint Operations Graphics geospatial features are referenced in the Regional level extraction criteria in the GEOINT Content Extraction Specification (GCES). The Regional level is based on a 1:250,000 scale capture criteria. However, the Local level is the most commonly utilized scale for extracted data and is usually collected at the 1:50,000 scale. In order to properly portray certain feature geometries from Local level data on a 1:250,000 scale JOG, a conversion of dimensional attributes (area, length, and width) shall be used as a basis for generalizing and rendering applicable symbols. See JOG Portrayal Catalog, sections 1.1.5 and 4.1.2.1 for additional information.

10 Data maintenance

Hardcopy Joint Operations Graphics do not have an established maintenance/update cycle. Digital JOG-A are updated by the user for safety of flight critical changes. Vertical Obstructions are updated by CADRG Supplemental Discs (CSD) and an Obstruction Change File (OCF) both disseminated monthly. OCF is defined in NGA Product Specification for Vertical Obstruction (Aeronautical). Other critical updates are disseminated via Notice to Airmen (NOTAM) as required. Production and dissemination of CSD, OCF and NOTAMs are outside the scope of this DPS. The data currency is indicated in the margin (see JOG AC 3.4.2 for details).

11 Portrayal

The portrayal of geospatial features and annotations shown on 1:250,000 scale Joint Operations Graphics shall be defined in the JOG PC and JOG AC. The ISO 19131, Data Product Specification allows for multiple portrayal and annotation catalogs to exist, the use of which will result in different portrayals, depending on delivery format and/or user needs.

11.1 Portrayal catalog

The JOG PC presents symbol descriptions, symbol rules, labeling rules, generalization rules, finishing rules and additional informative guidance associated with feature portrayal on hardcopy Joint Operations Graphics. Features portrayed on a JOG include topographic, aeronautical, boundary, elevation, and maritime.

The JOG PC (NGA.STND.0071-2_1.0_DPSJOGPC) is available from the NSG Standards Registry at:

<https://nsgreg.nga.mil/>

11.2 Annotation catalog

The JOG AC presents rules for including, composing, and placing annotations (marginalia) in the map display on hardcopy Joint Operations Graphics. The JOG AC incorporates information currently found in text and map style sheets.

The JOG AC (NGA.STND.0071-3_1.0_DPSJOGAC) is available from the NSG Standards Registry at:

<https://nsgreg.nga.mil/>

12 Additional information

12.1 DPS Organization

This DPS is organized in accordance with ISO 19131, Data Product Specification. Several of the sections in this DPS refer to external resources to document product requirements, including:

- NSG Application Schema (NAS)
- GEOINT Content Extraction Specification (GCES)
- Joint Operations Graphic Portrayal Catalog (JOG PC)
- Joint Operations Graphic Annotation Catalog (JOG AC)

These external resources are available from the National System for Geospatial Intelligence (NSG) Standards Registry.

Because ISO 19131 allows for multiple portrayals of a JOG dataset, the possibility exists to have more than one portrayal catalog, and more than one annotation catalog, for a dataset. Figure 9 illustrates the relationship between the components of this DPS.

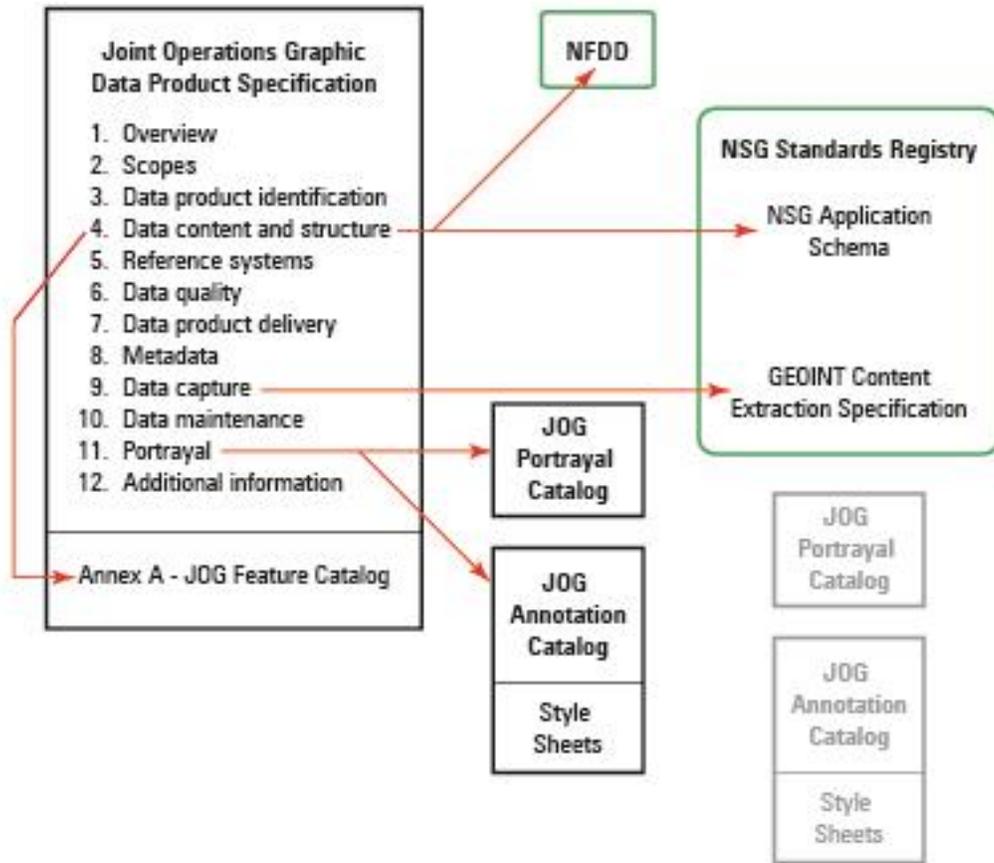


Figure 9. DPS Components

12.2 Supersession

This NGA Data Product Specification supersedes: MIL-J-89100, 1:250,000 SCALE, JOINT OPERATIONS GRAPHICS, SERIES 1501A AND 1501 (JOG AIR/GROUND).

12.3 Standardization agreements

This specification implements the international standardization agreements listed below. When amendment, revision, or cancellation of this specification is proposed, the preparing activity must coordinate the action with the U.S. National Point of Contact for the international standardization agreement, as identified in the ASSIST database at <https://assist.dla.mil>

12.3.1 NATO Standardization Agreements (STANAGs)

- 2211 JSB/IGOE Geodetic Datums, Spheroids, Grids and Grid References
- 2215 JSB/IGOE Evaluation Of Land Maps, Aeronautical Charts And Digital Topographic Data
- 3675 JSB/IGOE Symbols on Land Maps, Aeronautical Charts and Special Naval Charts
- 3676 JSB/IGOE Marginal Information on Land Maps and Aeronautical Charts
- 3677 JSB/IGOE Standard Scales for Land Maps and Aeronautical Charts
- NATO AGeoP-8, NATO Geospatial Metadata Profile (NGMP)
- 7136 JSB/IGOE Identification of Land Maps, Aeronautical Charts, Digital Geographic Datasets and Media Containing Datasets (Excluding Hydrographic Products)
- NATO STANAG 7164 / AGeoP-23 Special Aeronautical Charts (SAC)
- NATO AGeoP-9 NATO Specifications for Identification of Hard Copy Land Maps, Aeronautical Charts and Image Plans

12.4 Background on development of the Joint Operations Graphic DPS

The official specifications pertaining to Joint Operations Graphics for the U.S. military, and also used by partners in NGA's co-production programs, have been U.S. Department of Defense Specifications (MILSPEC) MIL-J-89100, 1:250,000 Scale Joint Operations Graphics. These specifications were published in 1995 and referenced MIL-STD-2408, Mapping, Charting & Geodesy Glossary of Feature and Attribute Definitions, which specifies the since superseded Feature/Attribute Coding Standard (FACS) for encoding the data that was used to produce these maps.

Over the past several years NGA has transitioned to a content centric environment based upon the NSG Foundation GEOINT Data Strategy, which maintains data through a standard data model. Service partners are integrating this concept in their geospatial production systems. An example of this are the modern NGA datasets, which are based on the GEOINT Structure Implementation Profile (GSIP) family of standards, to include the NSG Feature Data Dictionary (NFDD) (*NGA's standards compliant extension of the NATO standard Defense Geospatial Information Working Group Feature Data Dictionary (DFDD)*) and accompanying NSG Entity Catalog (NEC). These GSIP standards are second generation successors to FACS. The new DPS is based on the GSIP, which is the current data model for the NSG. The JOG DPS is GSIP

compliant, *e.g.*, the JOG DPS FC is a profile of the NSG Entity Catalog (NEC). The new DPS provides integrated support for 1:250,000 scale Joint Operation Graphics.

12.5 Cartographic process

The following concepts describe a cartographic process for creating a map display (hardcopy or digital) that accurately and effectively portrays feature data and associated metadata (as annotation). Information on the cartographic process is provided in this DPS to provide a general understanding of the process and to illustrate the terminology used in this DPS. The international standard for portrayal of geospatial information is ISO 19117, Geographic information portrayal. That standard indicates that typically there are two types of information included in a geospatial dataset: geographic information (the data) and metadata. Metadata is depicted by annotations.

12.6 Map Display

The highest level concept present in a Joint Operations Graphic is the map display (Figure 10). The current section describes the anatomy of a map display, as well as the maps within.

A Map consists of:

- Feature Portrayal (geographic information / feature data)
- Annotation (metadata)

A Map Display consists of 1 or more maps:

- Primary Map (~ map sheet)
- Margin mini-maps (Annotations)

Each Map in the Map Display has:

- Map Interior (inside neatline)
- Map Margin (outside neatline)

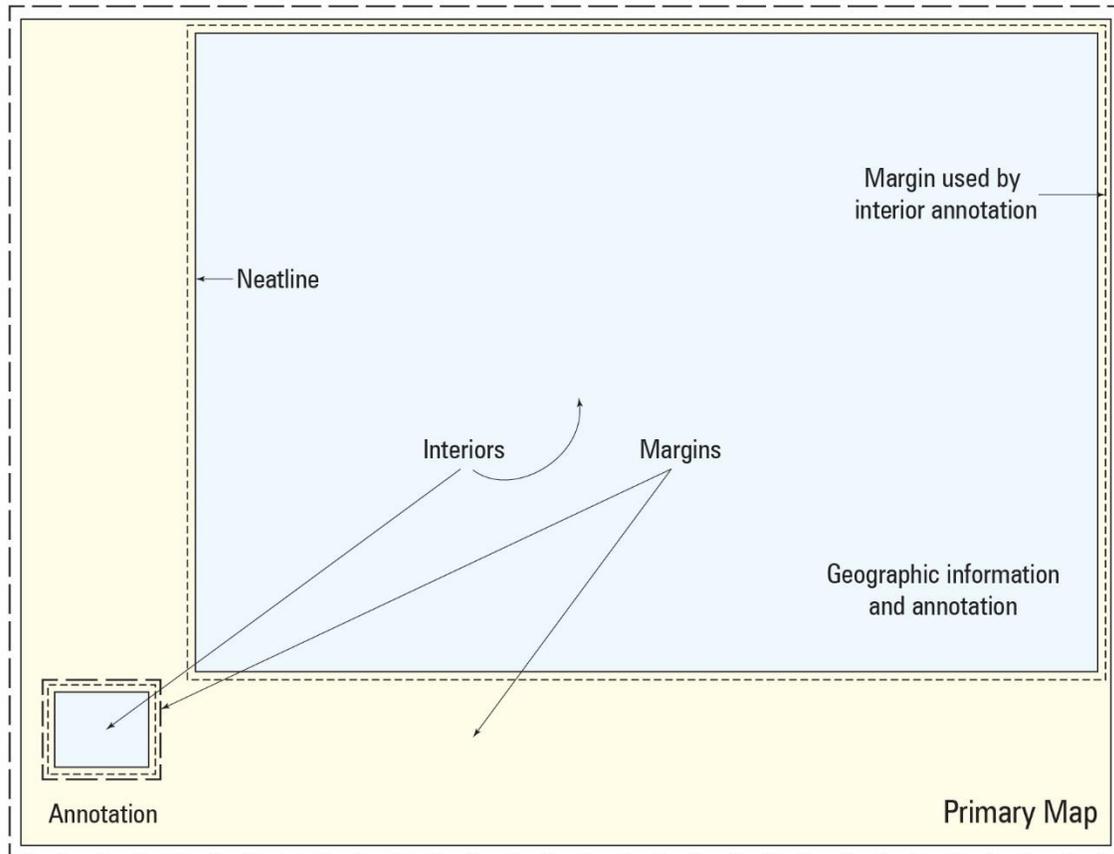


Figure 10. Anatomy of a Map Display.

The Map Interior (Figure 11) contains:

- Geographic Information (Feature data)
- Annotation (Interior Annotation within the neatline) – see blue outlines:
 - Georeferencing annotations (e.g. grids, graticules)
 - Geo-oriented annotations (e.g. grid labels)

The Map Margin contains:

- Annotation (Interior Annotations related to the neatline)
 - Geo-oriented annotations (e.g. grid and graticule ticks and labels)
- Annotation (other)
 - Geographic annotations (e.g., "mini-maps" like a location diagram)
 - Geo-oriented annotations (e.g., magnetic variation note, scale bar)
 - Non-geographic orientations (e.g. symbol legend, copyright notice)

Map Display Design (Style Sheet):

Specifies content and placement of maps, including the arrangement of interior and other annotations

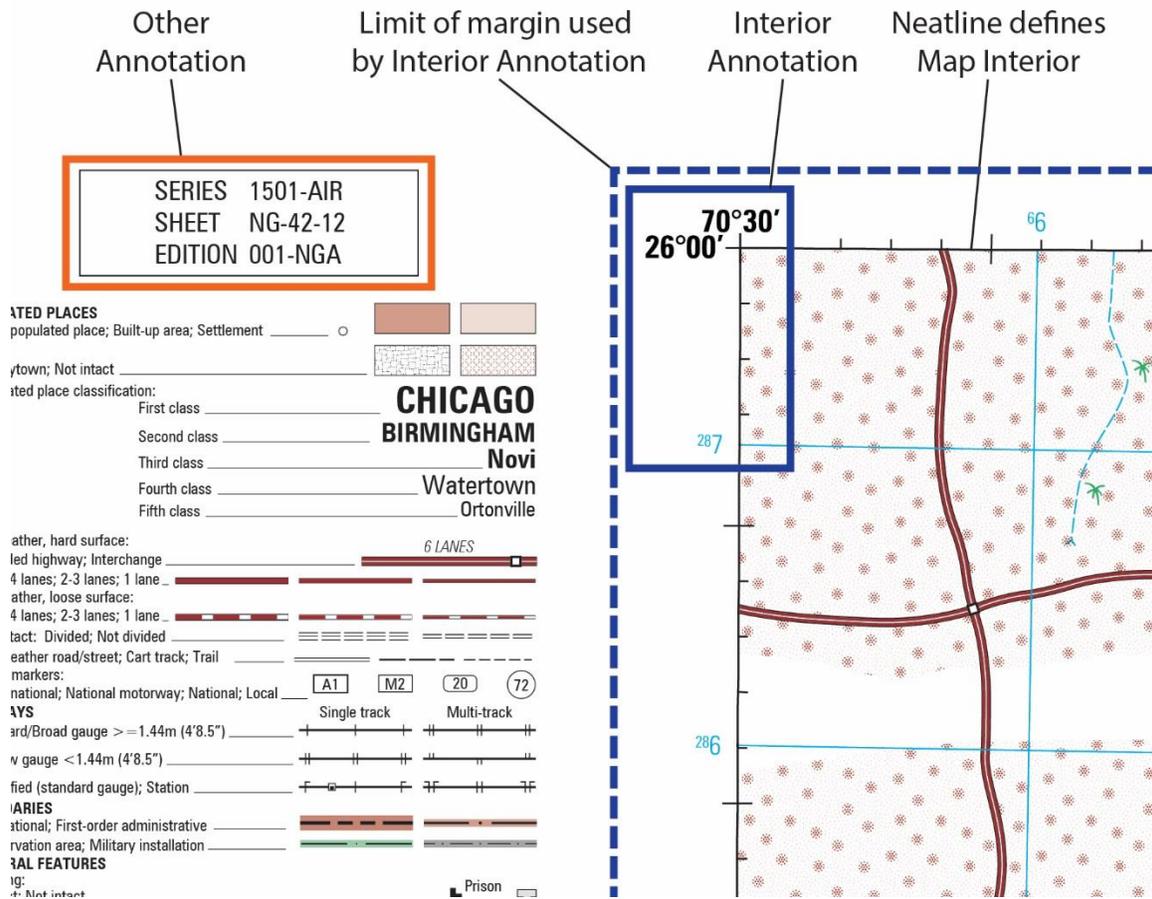


Figure 11. Interior Annotation and Other Annotation.

12.7 Geographic Portrayal Process

Whether automated, hand-crafted, or a combination thereof, the process of portraying geospatial information, i.e., attributed geospatial features, can be depicted as shown in Figure 12.

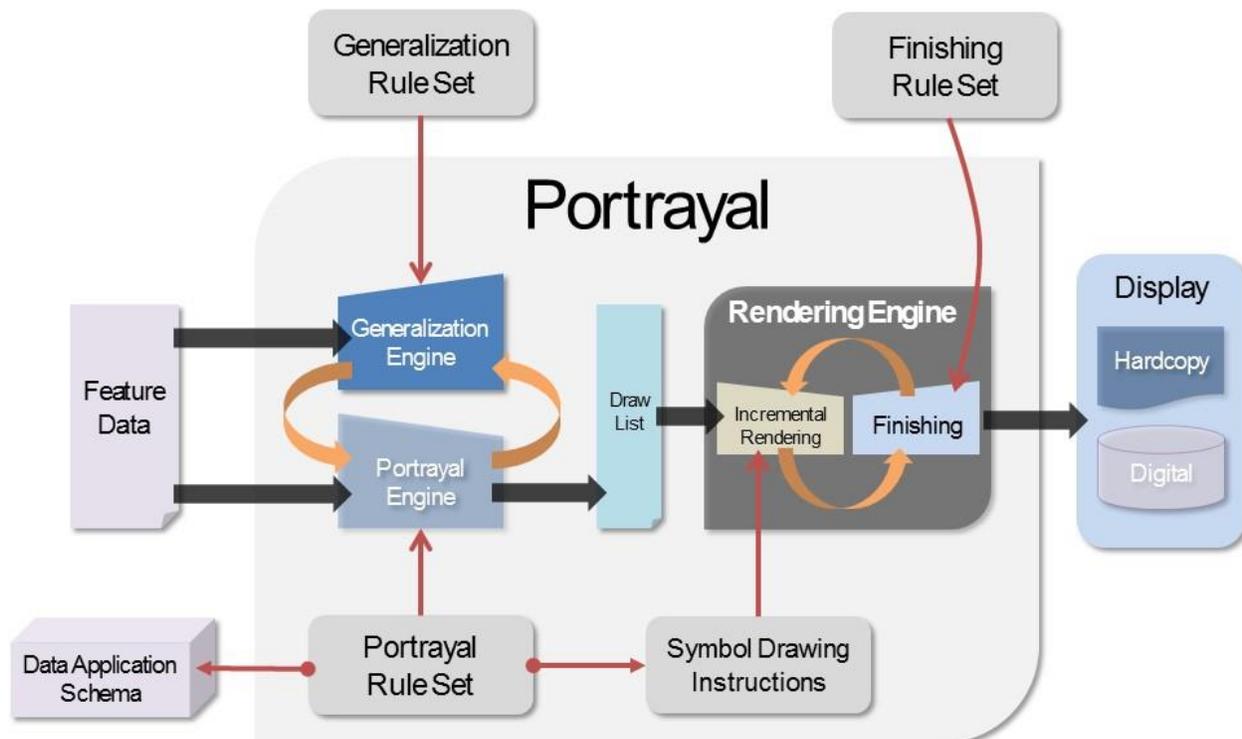


Figure 12. Geographic Portrayal Process as conceptualized in ISO/FDIS 19117.

Figure 12 can be summarized as follows. Feature data that is managed according to a well-defined schema (encoding model) feeds a portrayal process whose first step is to apply generalization rules that guide any changes in the aggregation or delineation of a feature.

Generalization may result in assigning different display geometry to the feature as it is represented on the portrayal draw list. The portrayal engine coordinates with the generalization engine to determine which portrayal function (portrayal rule) applies to the feature – resulting in the assignment of a symbol code and progressing to the portrayal draw list along with labeling instructions.

The rendering engine takes features from the draw list and applies the associated symbol definitions along with geographic display geometries. To this point, each feature, now represented as a symbol, has been manipulated as an individual entity – with no consideration for other features/symbols on the draw list. The function of the finishing process is to consider sets of features/symbols that must be made to co-exist in the display space and make adjustments that yield the desired cartographic result. Finishing rules provide a structured way for specifying finishing adjustments. Some symbols must be geospatially displaced to ensure readability when otherwise multiple symbols would “overprint” one another. Finishing rules will indicate which type of feature stays geospatially accurate and which type of feature gets displaced. Some rules apply to labeling.

It is the geographic portrayal finishing process that most heavily involves the skill and experience of a cartographer. Automated methods can achieve various levels of success for the generalization and displacement of features, but for the most demanding projects there is no better solution than the cartographer's judgment and experience.

The end result of the geographic portrayal process is the map interior (minus annotation) for a map display – hardcopy or digital.

12.8 Overall Cartographic Process

The overall cartographic process addresses both geographic feature portrayal and annotation to create a complete map display. Figure 13 builds on the geographic feature portrayal process to illustrate this point.

All the rules and symbol definitions important to geographic feature portrayal are managed in a portrayal catalog. Also in the portrayal catalog is a representation for portrayal context – the conditions not associated with features and their attributes for invoking a particular rule, e.g., whether the map is red-light readable.

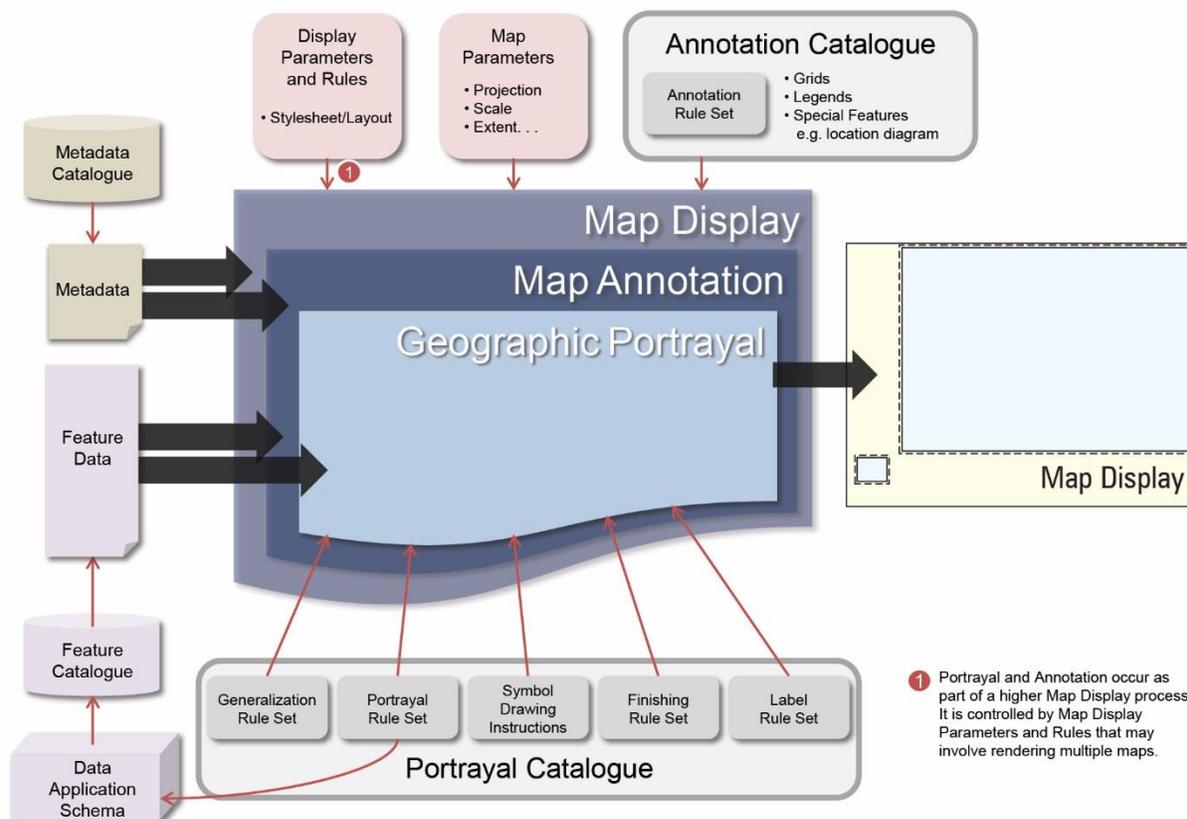


Figure 13. The cartographic process for a complete map display.

Working clockwise from the portrayal catalog, the figure acknowledges a feature catalog for maintaining the semantics for encoding features and attributes (on which the application depends). As well as feature data, metadata is a crucial aspect of any geospatial dataset and map display. For example, portrayal context consists of metadata (though that subtlety is not depicted). Just as there is a feature catalog, there is a metadata catalog that defines the structure for metadata. This structure informs the definition and content of display parameters and rules, which is how metadata drives the layout and content of the map

display, to include map parameters and annotation. Very similar to the portrayal catalog there is an annotation catalog. The annotation catalog manages rules for presenting metadata in the map display.

The greater map display process encompasses the geographic portrayal process and the annotation process, all of which feed on feature data and metadata as depicted. Certain annotations are georeferenced (e.g., graticule and grids), while certain others are geo-oriented (e.g., declination diagram, road objective). For this reason the map annotation process includes the geographic portrayal process in order to help place such annotations in the map display and even facilitate finishing, e.g., grid ladder labeling or applying annotation over “open water” of the primary map’s interior.

The end result of the cartographic process is a map display. A hardcopy Joint Operations Graphic represents an extensive application of the cartographic process.

Annex A - Feature Catalog

This Feature Catalog contains only a subset of descriptive information for each feature contained in the JOG DPS. The NSG Entity Catalog (NEC) version 7.0 should be referenced for all other applicable information (to include pertinent enumerant values, definitions and descriptions). The NEC (Excel workbook format) is available from the NSG Standards Registry at:

<https://nsgreg.nga.mil/doc/view?i=80534>

Annex A.1 - lists the feature name and feature code, followed by a definition and description (when applicable) of that feature. Following the feature information is a listing of all of the attributes used in the symbol, labeling, finishing and/or generalization rules for the respective feature. Also listed are “No Code” cartographic features. These are cartographic elements necessary for the production of the JOG product that are not actual data model features. A river flow arrow (directional) is an example of a “No Code” feature.

Annex A.2 - lists all of the attributes shown in Annex A.1, followed by the definition and description of that attribute. A <DESC> identifier (when applicable) is used to denote when the attribute’s definition ends and the attribute’s description begins.

Administrative Boundary (FA000)

Definition: A boundary between administratively controlled regions.

Attributes: Boundary Status [BST], Geopolitical Entity : Geographic Name Information (1) : Full Name (first side) [ZI005_FNAA], Geopolitical Entity : Geographic Name Information (2) : Full Name (second side) [ZI005_FNAB], Geopolitical Line Type [LSP]

Administrative Division (FA003)

Definition: An administratively subordinate division of a geopolitical entity.

Description: A geopolitical entity (country) is typically divided into first-, second-, and lower-order administrative divisions. First-order administrative divisions are immediately subordinate to the government of the geopolitical entity, with second- and lower-order divisions subordinate to those above them. Examples: (first-order) a United States state, a German Land, a French region; a Canadian province; (second-order) a U.S. county, a French department; (third-order) a U.S. township, a French arrondissement; (lower-levels) a French commune.

Attributes: BGN Administrative Level [BAL], Geographic Name Information : Full Name [ZI005_FNA]

Aerial Farm (AT012)

Definition: A collection of aeriels that are collocated and serve a common purpose.

Description: They may be organized either to function as a single larger virtual device (for example: a phased array) or function relatively independently of each other (for example: pointed in different directions and operating at different frequencies as at a satellite communication ground station).

Attributes: Angle of Orientation [AOO], Area [ARA], Physical Condition [PCF]

Aerodrome Beacon (GB013)

Definition: A beacon used to indicate the location of an aerodrome from the air.

Description: Aerodrome beacons may consist of either a rotating light source or a strobe light.

Attributes: Navigation Light Characteristic [CHA]

Airspace (GA005)

Definition: A defined three dimensional region of space relevant to air traffic.

Attributes: Airspace Identifier [AIA], Airspace Name [NAA], Airspace Type [ATY], FIPS 10-4 Country Code [FI1]

Amusement Park (AK030)

Definition: A predominantly man-made facility equipped with recreational devices.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Annotated Location (ZD045)

Definition: A location at which text pertaining to that location is annotated.

Description: For example, a characteristic or activity pertaining to the location may be described.

Attributes: Note : Memorandum [ZI006_MEM]

Aqueduct (BH010)

Definition: A pipe or artificial channel that is designed to transport water from a remote source, usually by gravity, for freshwater supply, agricultural, and/or industrial use.

Description: It may be supported by a bridge.

Attributes: Aqueduct Type [ATC], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Supported by Bridge Span [SBB], Width [WID]

Archeological Site (AL012)

Definition: A site where remains of past civilizations or human activity have been discovered.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Astronomical Observatory (AL142)

Definition: A building designed and equipped (for example: with a telescope) for making observations of celestial objects (including the earth in relation to them), of space, and of the universe as a whole.

Description: Typically incorporates a dome-shaped covering that may be opened in order to expose instruments to the sky or closed to protect them from the weather.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Bog (BH015)

Definition: A permanently wet area of land consisting of incompletely decayed organic material and mainly stagnant fresh water.

Description: It is generally too soft to bear the weight of any heavy body. A subtype of the more generalized wetland.

Attributes: Area [ARA], Bog Type [BOC]

Bridge (AQ040)

Definition: A structure that connects two locations and provides for the passage of a transportation route (for example: a road or a railway) over a terrain obstacle (for example: a waterbody, a gully, and/or a road).

Description: A bridge consists of a set of two abutments and/or zero or more bridge piers joined by bridge spans. A bridge may serve, for example, as an overpass or a viaduct. In the context of a bridge, the scope of the term 'transportation route' includes the transportation of liquids or gases by means of either pipelines or aqueducts.

Attributes: Angle of Orientation [AOO], Bridge Opening Type [BOT], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Length [LZN], Physical Condition [PCF], Transportation System Type [TRS]

Bridge Superstructure (AQ050)

Definition: A superstructure of a bridge, above the lowest deck, not including pylons or towers.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Bridge Tower (AQ055)

Definition: A tower and/or pylon from which the deck of a bridge is suspended.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Building (AL013)

Definition: A free-standing self-supporting construction that is roofed, usually walled, and is intended for human occupancy (for example: a place of work or recreation) and/or habitation.

Description: For example, a dormitory, a bank, and a restaurant.

Attributes: Angle of Orientation [AOO], Area [ARA], Feature Function [FFN], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Religious Information : Religious Designation [ZI037_REL], Religious Information : Religious Facility Type [ZI037_RFA], Width [WID]

Building Superstructure (AL018)

Definition: A supplemental portion of a building which rises from the roof but is not considered to be a portion of the roof.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Built Up Area (AL020)

Definition: A tract containing a concentration of buildings and/or other structures.

Attributes: Built-up Area Density Category [BAC], Geographic Name Information : Full Name (first) [ZI005_FNA1], Geographic Name Information : Full Name (second) [ZI005_FNA2], Physical Condition [PCF]

Cable (AT005)

Definition: A single continuous rope-like bundle consisting of multiple strands.

Description: The strands may be individually insulated and/or protected and the cable as a whole sheathed. Cables may be used for load bearing (for example, supporting or suspending equipment and/or structures), transmitting electrical power, and/or communicating signals (for example, by electrical or optical means).

Attributes: Cable Type [CAB], Height Above Surface Level [HGT], Highest Elevation [ZVH], Length [LZN], Physical Condition [PCF], Vertical Relative Location [LOC]

Cableway (AT041)

Definition: A suspended transportation system consisting of one or more load cables, supporting pylons, carrier units (for example: cars or buckets intended to transport people, material, and/or equipment) and usually stations.

Description: A cableway consists of carrier units attached to load cables which are strung between pylons and/or stations. For example, a ski-lift.

Attributes: Cableway Type [CAT], Height Above Surface Level [HGT], Highest Elevation [ZVH], Length [LZN]

Cart Track (AP010)

Definition: An unimproved road.

Description: The surface is usually rough (for example: rutted) and minimally prepared (for example: packed earth or thinly covered with gravel).

Attributes: Route Pavement Information : Road Weather Restriction [ZI016_WTC]

Castle (AL375)

Definition: A single large fortified building that has thick walls, battlements, and often the presence of a moat, and is commonly of some historical significance.

Description: Historically castles were designed and constructed as defensive structures situated so as to dominate the surrounding countryside. With advancing technology, especially artillery, they have become obsolete for military defensive purposes and are now valued primarily for their historical significance. In more recent times elaborate country houses were built incorporating many design elements of a castle but which were not fully capable of being used as defensive structures. Examples of castles of both types include Doue-la-Fontaine and Neuschwanstein.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Castle Complex (AL376)

Definition: A fortified complex of buildings and related structures that consists principally of a central keep with surrounding thick walls, battlements, and often the presence of a moat, and is commonly of some historical significance.

Description: A castle complex may be quite extensive, including multiple distinct buildings of diverse function. Historically castle complexes were designed and constructed as defensive structures situated so as to dominate the surrounding countryside. With advancing technology, especially artillery, they have become obsolete for military defensive purposes and are now valued primarily for their historical significance. Examples of castle complexes include Prague and Windsor Castles.

Attributes: Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Causeway Structure (AQ063)

Definition: A solid raised way across a terrain obstacle (for example: a wetland or a body of shallow water) that is intended to support a transportation route (for example: a road or a railway).

Description: The causeway structure is often constructed from local fill supplemented by other materials (for example: rocks, boulders or gravel) and consists of a solid linear structure in the configuration of an embankment. Causeway structures are built just high enough to insure that the transportation route will remain passable during periods of flooding, tides and seasonal rainfall. Culverts may occur along the length of the causeway structure and individual sections of the causeway structure may be interrupted by bridges.

Attributes: Geographic Name Information : Full Name (first) [ZI005_FNA1]

Cave Mouth (DB029)

Definition: The entrance to an interconnected series of naturally occurring subterranean chambers.

Description: Typically located in limestone, and often open to the Earth's surface either vertically or horizontally. Alterations may have been made to the cave mouth.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Cemetery (AL030)

Definition: A site and associated structures devoted to the burial of the dead.

Description: Examples of structures that may be found in a cemetery include graves, grave markers, tombs, funerary urns, and columbaria.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Religious Information : Religious Designation [ZI037_REL]

Checkpoint (AH070)

Definition: A location to control passage and/or to register, declare and/or inspect goods, vehicles and/or people.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Cistern (BI010)

Definition: A man-made container used for the collection and/or storage of water.

Attributes: Angle of Orientation [AOO]

Conservation Area (FA210)

Definition: An area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means.

Description: As determined, for example, by the International Union for Conservation of Nature and Natural Resources (IUCN).

Attributes: Conservation Area Management Category [CAM], Geographic Name Information : Full Name [ZI005_FNA]

Conveyor (AF020)

Definition: A device for conveying articles or materials from one location to another during manufacture or processing using a continuously moving mechanism.

Description: Usually long, thin, and rectangular, and located above ground surface. It can be situated horizontally, vertically, at a slope between flat and upright, or in a combination of these postures. In general, conveyor systems consist of the bucket, screw (auger), apron, or flight conveyors to load silos or bunkers. Other systems use a series of rollers to move a range of products from relatively lightweight luggage and cargo packages at transportation terminals, up to heavyweight plate steel and ingots in industrial mills. The most common system is the belt conveyor. Some systems use a combination of these designs such as shallow buckets (or flat plates) attached to a belt conveyor. Conveyors can be used for long distance transportation (ifor example, kilometres) of materials. Long distance conveyor systems are usually constructed in segments to accommodate changes in direction where needed.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Cooling Tower (AF030)

Definition: A tall tower for cooling hot water from an industrial process before reuse.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF]

Crane (AF040)

Definition: Equipment for lifting, shifting, and lowering objects or materials by means of a swinging boom or with the lifting apparatus supported on an overhead track.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Crevasse (BJ031)

Definition: A deep crack or fissure in a glacier that results from differential movement of ice.

Crevice (DB061)

Definition: A narrow opening or fissure produced by a crack in the land, especially in rock.

Description: May also describe a deep vertical opening in the terrain that appears after an earthquake.

Cut Line (DB071)

Definition: The demarcation line between a cut and the surrounding land surface.

Dam (BI020)

Definition: A barrier constructed to hold back water and raise its level to form a reservoir or to prevent flooding.

Attributes: Angle of Orientation [AOO], Dam Crest Length [LDC], Dam Crest Width [WOC], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Structural Material Type [MCC], Transportation System Type [TRS]

Disposal Site (AB000)

Definition: A prepared or reserved site on land for the collection and/or deposition of waste, refuse or discarded material.

Attributes: By-product [PBY], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Distance Measuring Equipment (DME) (GA041)

Definition: Ultra High Frequency (UHF) ground equipment, with its supporting structure, that is used in conjunction with airborne equipment to determine distance between the airborne and ground equipment.

Attributes: Aeronautical Radio Navigation Installation Point : Aeronautical Radio Navigation Service Name [GA032_NSX]

Ditch (BH030)

Definition: An artificial waterway with no flow, or a controlled flow, usually unlined, used for draining or irrigating land.

Attributes: Water Resource Information : Hydrologic Persistence [ZI024_HYP]

Electric Power Station (AD010)

Definition: A facility including one or more buildings and equipment used for electric power generation.

Description: An electric power station consists of one or more power generating units, each consisting of the full set of equipment required to generate power and capable of independent operation. The power generating units are located on one or more contiguous or adjacent properties, are under the common control of the same entity and supply power through a common connection to the electric grid. Electric power stations most commonly are used to generate electricity for long distance transmission.

Attributes: Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Power Source [POS]

Elevation Contour (CA010)

Definition: A line connecting points having the same elevation value relative to a vertical datum.

Attributes: Elevation Surface Category [ESC], Highest Elevation [ZVH], Hypsography Portrayal Type [HQC]

Elevation Tint Band (No Code)

Definition: A color/pattern fill that represents a specified range of elevations within a world-wide hypsometric scheme.

Embankment (DB090)

Definition: A man-made raised long mound of earth or other material.

Attributes: Embankment Type [FIC], Transportation System Type [TRS]

Engineered Earthwork (AH025)

Definition: An excavation and/or embankment created by remolding the natural configuration of the terrain for the purpose of enhancing the defense of a site from armed attack.

Description: The earthwork may include ancillary elements (for example: a palisade) or reinforcements (for example: a concrete facing).

Attributes: Engineered Earthwork Type [EET]

Extraction Mine (AA010)

Definition: An excavation made in the terrain for the purpose of extracting and/or exploiting natural resources.

Attributes: Area [ARA], Extraction Mine Type [MZN], Feature Function [FFN], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Physical Product [PPO]

Facility (AL010)

Definition: An area that has been developed to perform a specific principal function, consisting of one or more vertical constructions (for example: structures or buildings), horizontal constructions (for example: pavements, roads, rail tracks, or bridges), and/or supporting utilities (for example: power lines, water supply, or sewerage), plus the underlying land.

Description: For example, an industrial plant consisting of building(s), shipping dock(s), storage area(s), power transformer(s), heating and/or cooling equipment, vehicle parking, roads, railroad tracks, and perimeter fences and gates.

Attributes: Angle of Orientation [AOO], Feature Function [FFN], Geographic Name Information : Full Name [ZI005_FNA], Manufacturing Information : Product [ZI014_PPO], Physical Condition [PCF]

Fairground (AK090)

Definition: An area where permanent facilities exist to hold outdoor fairs, circuses or exhibitions.

Attributes: Angle of Orientation [AOO], Area [ARA], Physical Condition [PCF]

Fence (AL070)

Definition: A man-made barrier of relatively light structure used as an enclosure or boundary.

Description: Similar structures that are constructed of heavy materials (for example: stone, rock or masonry) are classified as walls.

Ferry Crossing (AQ070)

Definition: A route where a ferry crosses from one shore to another.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Length [LZN], Transportation System Type [TRS]

Ferry Station (AQ080)

Definition: A location where a ferry takes on or discharges its load.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Fish Farm Facility (BH051)

- Definition:** A facility involved in the breeding (hatching and associated activities) and cultivation (raising for release or harvesting) of fish in tanks or landlocked enclosures.
- Description:** Fish species raised on fish farms include, for example, salmon, catfish, tilapia, cod, carp, and trout.
- Attributes:** Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]
-

Flare Pipe (AF070)

- Definition:** An open-ended pipe at which waste gases are burned.
- Attributes:** Height Above Surface Level [HGT], Highest Elevation [ZVH]
-

Flood Control Structure (BI044)

- Definition:** An artificial structure or gate that is utilized as a defense against flooding or storm surges.
- Description:** Consideration should be given to using the more specific Dam or Embankment features where appropriate in lieu of Flood Control Structure.
- Attributes:** Flood Control Structure Type [FCS], Length [LZN], Width [WID]
-

Ford (BH070)

- Definition:** A shallow place in a body of water used as a crossing.
- Attributes:** Length [LZN]
-

Foreshore (BA023)

- Definition:** The part of the shore or beach which lies between the low water mark and the upper limit of normal wave action.
-

Forest (EC015)

- Definition:** A tract of land primarily covered by trees and undergrowth.
- Description:** The area is sometimes mixed with pasture.
- Attributes:** Area [ARA], Canopy Cover [DMT], Geographic Name Information : Full Name [ZI005_FNA]
-

Fortified Building (AH055)

- Definition:** A building that is specifically designed or reinforced to provide for defense from armed attack.
- Attributes:** Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]
-

Fuel Storage Facility (AM075)

- Definition:** A facility for the storage of fuel (for example: jet fuel, gasoline, or diesel oil).
- Description:** The fuel is typically stored in large tanks that may be partially or wholly buried and is accompanied by metering and dispensing equipment. Facilities may range in size from a small stockpile of drums (sometimes termed a 'fuel dump') to a large perimeter-controlled site with multiple permanent surface tanks, in-ground pipelines and associated equipment (sometimes termed a 'fuel depot').
- Attributes:** Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]
-

Geologic Fault (DB110)

- Definition:** A fracture or zone of fractures in a rock formation, marked by the relative displacement on either side of the plane of the fracture.
- Description:** The intersection of a geologic fault with the ground surface is termed the 'fault trace' and is commonly plotted on maps to represent a fault. Since geologic faults do not usually consist of a single, clean fracture, the term 'fault zone' (or 'distributed fault') is often used when referring to the zone of complex deformation and numerous small fractures that is associated with the fault plane.
- Attributes:** Geographic Name Information : Full Name [ZI005_FNA]
-

Geopolitical Entity (FA002)

Definition: A region controlled by a political community having an organized government and possessing internal and external sovereignty, most often as a State but sometimes having a dependent relationship on another political authority or a special sovereignty status.

Description: The degree of sovereignty may be limited in specific areas (for example: matters of economic, administrative, legislative, judicial, military and/or foreign policy). The region controlled by a sovereign geopolitical entity is commonly referred to as a 'country'.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Geopolitical Entity Type [GEC]

Glacier (BJ030)

Definition: A large mass or river of ice formed by accumulation and compaction of snow on higher ground that is moving slowly down a slope or valley from above the snowline.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA]

Golf Course (AK100)

Definition: A tract of land on which golf is played.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Grain Elevator (AM030)

Definition: A tall structure, equipped for loading, unloading, processing, and/or storing grain.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Grassland (EB010)

Definition: A tract covered mainly by grasses that have little or no woody tissue.

Description: For example, pasture, meadow, and steppe.

Attributes: Vegetation Characteristic [VEG]

Hazardous Rock (BD130)

Definition: An isolated rocky formation or a single large stone or coral, usually one constituting a danger to navigation.

Description: May be either dry, awash, or below the water surface.

Attributes: Hydrographic Vertical Positioning Information : Water Level Effect [ZI025_WLE]

Helipad (GB030)

Definition: A designated area, usually with a prepared surface, used for the take-off, landing, or parking of helicopters.

Description: This prepared surface could either be located on land or on a platform over water. It may or may not be associated with an aerodrome. For example: a hospital helipad, and an offshore rig helipad.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Helipad Associated Facility [HAF], Physical Condition [PCF]

Heliport (GB035)

Definition: An aerodrome intended to be used for the arrival, landing, takeoff or departure of vertical takeoff and landing aircraft/helicopters.

Attributes: Aerodrome Elevation [ZVA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Hop Field (EA055)

Definition: A tract covered by the systematic planting of hop vines.

Attributes: Crop Information : Farming Pattern [ZI013_FFP], Geographic Name Information : Full Name [ZI005_FNA]

Hulk (BD181)

Definition: A vessel, either stranded aground or permanently moored, that is no longer seaworthy due to an inoperable propulsion plant or compromised vessel integrity.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Hydrocarbons Field (AA052)

Definition: An area where the presence of recoverable petroleum, oil, and/or natural gas has been identified.

Description: The field can exist regardless of current exploitation activities.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Product [PPO]

Ice Cap (BJ099)

Definition: A permanent layer of ice covering a tract of land (especially a polar region) or the top of a mountain. Usually includes a surface layer of snow.

Ice Cliff (BJ040)

Definition: The vertical face of a glacier or ice shelf.

Ice Peak (BJ060)

Definition: A rocky peak projecting above a surrounding ice field that may be perpetually covered with ice.

Attributes: Structural Material Type [MCC]

Ice Route (AQ075)

Definition: A route over a frozen watercourse.

Description: Usually marked and intended to support substantial vehicle traffic. Often designed as an alternate to a seasonally-closed ferry crossing.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Ice Shelf (BJ065)

Definition: A floating ice sheet of considerable thickness that is normally attached to the land along its landward edge.

Description: Ice shelves are the seaward extension of land glaciers. Limited areas of the ice shelf may be aground where the glacier first enters the water and possibly in other places offshore. Ice shelves are usually of great horizontal extent and have a level or gently undulating surface. The seaward edge of an ice shelf is termed an 'ice cliff'.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Industrial Farm (AL270)

Definition: An estate or large farm operating on the plantation economy model in which the farm operates as a single economic unit whose operations are based on agricultural mass production of a few staple crops (for example: cotton, tobacco, sugar cane, bananas, and/or rubber) that are typically not indigenous to the region.

Description: Plantation economies are often dependent on distant (for example: export) markets as the crops are harvested in large quantities. Historically, industrial farms were often found in former European colonies and termed 'plantations'.

Attributes: Area [ARA], Crop Information : Crop Species [ZI013_CSP], Crop Information : Farming Pattern [ZI013_FFP], Geographic Name Information : Full Name [ZI005_FNA]

Inland Waterbody (BH082)

Definition: A body of water that is entirely surrounded by land.

Description: It may occur in a natural terrain depression in which water collects, or may be impounded by a dam, or formed by its bed being hollowed out of the soil, or formed by embanking and/or damming up a natural hollow (for example: by a beaver dam). Inland waterbodies have many uses such as: a source of water for irrigation, industrial processes, human consumption, and recreation. Impounded inland waterbodies may also be used for flood control.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Man-made Shoreline [MNS], Physical Condition [PCF], Water Resource Information : Hydrologic Persistence [ZI024_HYP]

Installation (AL011)

Definition: A grouping of facilities, located in the same vicinity, which support particular functions.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

International Date Line (FA110)

Definition: A line designated as the place on the Earth where each calendar day begins.

Description: This line generally coincides with the 180th meridian but is modified to avoid land.

Island (BA030)

Definition: A land mass, other than a continent, surrounded by water.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Isogonic Line (ZC050)

Definition: An isopleth that connects locations of equal magnetic variation.

Attributes: Magnetic Variation [MAG]

Land Aerodrome (GB005)

Definition: An aerodrome on land intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Attributes: Aerodrome Elevation [ZVA], Airfield Symbol Type [ASY], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], ICAO Location Indicator [IKO], Physical Condition [PCF]

Land Subject To Inundation (BH090)

Definition: A tract periodically covered by flood water, excluding tidal waters.

Attributes: Inundation Type [INU]

Land Water Boundary (BA010)

Definition: The line where a land mass is in contact with a body of water and the tide state or river stage are unspecified.

Description: It may be in either the littoral or inland waters. In the littoral, consideration should be given to using the more specific high water or low water lines based on the nature of the source data collection.

Attributes: Shoreline Type [SLT]

Launch Pad (GB040)

Definition: A designated site or structure from which a rocket or missile is launched.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF]

Leader Line (No Code)

Definition: A line leading from a location point or symbol to the supporting information or text label.

Description: The color of the leader line matches the color of the corresponding feature it is pointing to.

Light Vessel (BC070)

Definition: A distinctively marked vessel anchored or moored at a charted point, to serve as an aid to navigation.

Description: By night, it displays a characteristic light(s) and is usually equipped with other devices (for example: a fog signal, a submarine sound signal, and/or a radio-beacon) to assist navigation.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Lighthouse (BC050)

Definition: A distinctive structure on or off a coast exhibiting a major light designed to serve as an aid to navigation.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Lock (BI030)

Definition: An enclosure with a pair or series of gates used for raising or lowering vessels as they pass from one water level to another.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Length [LZN], Physical Condition [PCF], Width [WID]

Mariculture Site (BH050)

Definition: A site where marine organisms are cultivated for food and other products in either the open ocean, in an enclosed section of the ocean, or in tanks, ponds or raceways that are filled with seawater (for example: the farming of marine fish, prawns, or oysters in saltwater ponds).

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Maritime Navigation Light (BC040)

Definition: A fixed luminous or lighted device intended for the purpose of aiding maritime navigation.

Attributes: Navigation Light Characteristic [CHA]

Marsh (ED010)

Definition: A soft, poorly drained wetland that is characterized by the growth of only non-woody plants (for example: grasses) and often forms a transition region between a waterbody and land.

Description: It is subject to frequent or tidal inundations, but not considered to be continually under water. It lacks trees. A subtype of the more generalized wetland.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA]

Memorial Monument (AL130)

Definition: A marker erected and/or maintained as a memorial to a person and/or event.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Military Installation (SU001)

Definition: An installation designed for military use.

Description: For example, used to perform military operations, initiate forward movements, and/or furnish supplies. Often protected by fortifications or natural advantages.

Attributes: Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Moraine (BJ020)

Definition: An accumulation of soil and stone debris deposited by a glacier.

Mountain Pass (DB150)

Definition: A narrow route through a mountainous region or over a mountain range.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Highest Elevation [ZVH]

Munition Storage Facility (AM065)

Definition: A facility for the storage of munitions (for example: bombs, missiles, warheads, mines or ammunition).

Description: Specifically, storage of weapons charged with: explosives; propellant; pyrotechnics; initiating composition; or nuclear, chemical, or biological material for use in military operations. Facilities may range in size from a small stockpile of munitions (sometimes termed an 'ammo dump') that may be revetted to a large perimeter-controlled site with multiple dispersed bunkers laid out to minimize the effect of accidental detonation (sometimes termed a 'munitions depot').

Attributes: Angle of Orientation [AOO], Located Underground [LUN], Physical Condition [PCF]

Named Location (ZD040)

Definition: A location that normally does not appear as a specific, characterized object but that has a name that is required to be displayed in association with that location.

Description: For example, the name of the Alps or the Sahara.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Named Location Type [NLT]

Natural Pool (BH170)

Definition: A naturally formed pool of water.

Description: It is usually fed by surface drainage from the surrounding region and/or water arising from an underground source (for example: a spring or a resurgence).

Attributes: Direction of Flow [DOF], Geographic Name Information : Full Name [ZI005_FNA], Water Resource Information : Hydrologic Persistence [ZIO24_HYP], Water Resource Information : Water Type [ZIO24_SCC]

Navigable Canal (BH020)

Definition: An artificial waterway with no flow, or a controlled flow, usable or built for navigation.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Water Resource Information : Hydrologic Persistence [ZIO24_HYP]

Non Water Well (AA054)

Definition: A shaft sunk into the ground to reach and tap a supply of liquids and/or gases other than water intended for use in agriculture or domestic consumption.

Description: Typically drilled to tap underground reservoirs of hydrocarbons (for example: petroleum or natural gas). May also, for example, yield geothermally heated liquids for use in power generation or heating, or brine for use in the extraction of salt.

Attributes: Physical Product [PPO]

Non-Directional Radio Beacon (GA038)

Definition: A low or medium radio navigation service transmitting signals whereby the pilot of a suitably equipped aircraft can determine bearings, 'home in' on, and/or track to or from the station.

Description: The radio frequencies assigned to an NDB shall be selected from those available in that portion of the spectrum between 190 and 1750 kilohertz (kHz).

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Oasis (EC020)

Definition: A fertile tract of land that occurs in a desert wherever a permanent supply of fresh water is available.

Description: Oasis vary in size from a pond with a group of date palms around small springs to the oasis cities of the deserts with extended agricultural cultivation.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA]

Offshore Construction (BD115)

Definition: An artificial structure that is located offshore.

Description: It usually has a surface that is raised above the sea and may be used as a working stage for conducting offshore operations (for example: drilling for petroleum and/or natural gas, loading and/or unloading vessels, or navigation support).

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Offshore Construction Primary Structure [OCS], Physical Condition [PCF]

Orchard (EA040)

Definition: A tract covered by systematic plantings of trees that yield fruits (including nuts).

Attributes: Area [ARA], Crop Information : Farming Pattern [ZI013_FFP], Geographic Name Information : Full Name [ZI005_FNA]

Park (AK120)

Definition: An area of defined limits which is set aside for human recreation and enjoyment and/or for historic preservation purposes, and is usually maintained in a natural, semi-natural, or ornamentally planted state.

Description: Parks may be in urban areas such as Central Park in New York City or in less developed areas such as Poplar Forest in Forest, Virginia, where Thomas Jefferson's plantation and plantation house are located.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Particle Accelerator (AL140)

Definition: An apparatus for imparting high velocities to charged particles.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Width [WID]

Pipeline (AQ113)

Definition: A connected set of pipes for conveying liquids, slurries, or gases.

Description: Usually for long distances and often located underground.

Attributes: Physical Condition [PCF], Physical Product [PPO], Vertical Relative Location [LOC]

Point of Change (No Code)

Definition: A graphic indication of a change in an attribute of a feature that is not otherwise depicted symbolically.

Description: For example, the change in the number of lanes along a Road.

Polar Ice (BJ080)

Definition: Sea ice that is more than one year old and more than 3 meters thick.

Port (BB009)

Definition: A place provided with terminal and transfer facilities for loading and/or discharging cargo or passengers, usually located in a harbour.

Description: A port and its related waters together comprise a harbour.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Power Substation (AD030)

Definition: A facility, along a power transmission line, in which electric current is switched, transformed, and/or converted.

Attributes: Angle of Orientation [AOO], Area [ARA], Physical Condition [PCF]

Pumping Station (AQ116)

Definition: A facility to move solids, liquids or gases by means of pressure or suction.

Attributes: Angle of Orientation [AOO], Physical Condition [PCF], Physical Product [PPO]

Pylon (AT042)

Definition: A pylon or pole used to support one or more cables.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Racetrack (AK130)

Definition: A ground or tract marked out for racing.

Description: The track may be banked to facilitate high-speed racing, either by grading of the terrain or the use of structures. The bank angle may exceed 30 arc degrees and such structures can reach significant heights.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Length [LZN]

Radar Station (AT045)

Definition: A facility utilizing radar to detect and analyze objects (for example: aircraft, artificial satellites, asteroids, and/or missiles) and/or environmental phenomena (for example: tornadoes).

Description: May include both a radar aerial as well as a structure housing radar equipment.

Attributes: Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Railway (AN010)

Definition: One or more railway tracks comprising a network that is operated for the conveyance of passengers and/or goods.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Railway Use [RRC], Track Information : Railway Gauge [ZI017_GAW], Track Information : Railway Gauge Classification [ZI017_RGC], Track Information : Railway in Road [ZI017_RIR], Track Information : Railway Power Method [ZI017_RRA], Track or Lane Count [LTN], Vertical Relative Location [LOC]

Railway Sidetrack (AN050)

Definition: A stretch of railway track connected to a main railway and used for temporary storage, passing, loading, and/or unloading.

Attributes: Physical Condition [PCF], Track Information : Railway Gauge Classification [ZI017_RGC], Track Information : Railway Power Method [ZI017_RRA], Vertical Relative Location [LOC]

Railway Yard (AN060)

Definition: A system of railway tracks and associated structures that are located within defined limits and that provide for loading, unloading, and/or assembling trains.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Rapids (BH120)

Definition: Portions of a stream with accelerated current where it descends rapidly but without a break in the slope of the bed sufficient to form a waterfall.

Description: The surface is usually broken by boulders and rocks.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Length [LZN], Width [WID]

Recycling Site (AB010)

Definition: A site engaged in the wrecking, dismantling, storage, recycling, and/or disposal of discarded or scrap products.

Description: For example, a wrecking yard or a scrap yard.

Attributes: Physical Condition [PCF]

Reef (BD120)

Definition: A mass of rock or coral which either reaches close to the sea surface or is exposed at low tide, posing a hazard to navigation.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Hydrographic Vertical Positioning Information : Water Level Effect [ZI025_WLE], Length [LZN]

Rice Field (BH135)

Definition: A tract that is periodically covered with water and is used for growing rice.

Attributes: Area [ARA], Crop Information : Farming Pattern [ZI013_FFP]

Rig (AA040)

Definition: A superstructure fitted for drilling or lifting operations for extraction and/or exploitation of natural resources.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Product [PPO]

River (BH140)

Definition: A natural flowing watercourse.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Water Resource Information : Hydrologic Persistence [ZI024_HYP], Width [WID]

River Flow Arrow (No Code)

Definition: A graphic indication of the direction of the flow of water of perennial rivers when not apparent from relief portrayal.

Road (AP030)

Definition: A route with a specially prepared surface that is intended for use by wheeled vehicles.

Attributes: Centerline Spacing [MWG], Divided [SEP], Geographic Name Information : Full Name [ZI005_FNA], Median Present [MES], Physical Condition [PCF], Roadway Type [RTY], Route Pavement Information : Road Weather Restriction [ZI016_WTC], Route Pavement Information : Route Surface Composition [ZI016_ROC], Through Route [THR], Track or Lane Count [LTN], Vertical Relative Location [LOC]

Road Interchange (AP020)

Definition: A system of interconnecting roads (sometimes called ramps) located at a road junction that provides for the free movement of traffic between two or more routes on different levels.

Description: A road interchange utilizes grade separation and bridges to permit traffic on at least one road to pass through the junction without directly crossing any other traffic stream.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Road Route Marker (No Code)

Definition: A graphic indication of the official numbered designation of international, national motorway, national, and secondary routes.

Attributes: Route Identification <route designation type> [RIN_ROI], Route Identification <route designation> [RIN_RTN]

Rock Formation (DB160)

Definition: A significant outcropping of exposed bedrock.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Roundhouse (AN076)

Definition: A circular or semicircular building, with a railway turntable in the centre, used for storing and/or repairing railway locomotives.

Description: The railway turntable may be either completely covered, partially covered or not covered, and partially or completely surrounded by the building.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Width [WID]

Ruins (AL200)

Definition: The deteriorated remains of an unspecified structure.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Runway (GB055)

Definition: A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

Attributes: Aerodrome Pavement Information : Aerodrome Movement Area Surface Composition [ZI019_ASU], Length [LZN], Physical Condition [PCF], Width [WID]

Sabkha (BH160)

Definition: A natural depression in arid or semi-arid regions whose bed is covered with salt encrusted clayey soil.

Description: Found especially in North Africa and Arabia.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA]

Salt Evaporator (BH155)

Definition: Shallow pools, normally man-made, used for the natural evaporation of water for the collection of salt.

Attributes: Area [ARA]

Salt Flat (BH150)

Definition: A flat area of natural surface salt deposits.

Description: May also be used to describe smaller areas; these are commonly termed salt pans.

Attributes: Area [ARA], Geographic Name Information : Full Name [ZI005_FNA]

Sand Dunes (DB170)

Definition: One or more mounds or ridges of sand usually formed by the wind.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Sand Dune Orientation [SDO], Sand Dune Stabilized [SAD], Sand Dune Type [SDT]

Settlement (AL105)

Definition: A continuously occupied concentration of tents or lightweight fixed structures (for example: huts) serving as residences.

Description: May also include supporting non-residential (for example: commercial) structures.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Shaded Relief (No Code)

Definition: A graphic simulation of a cast shadow to highlight relief portrayal.

Description: A darkened area applied to the southern and eastern slopes of terrain simulating the shadow cast by sunlight originating from the northwest.

Shanty Town (AL208)

Definition: A section of a built-up area consisting chiefly of densely packed shacks and having few, if any, streets and no public facilities.

Description: Usually located on the outskirts of the built-up area. The shacks are generally crude, improvised, and made from salvaged materials.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Ship Elevator (BI006)

Definition: A device used to raise ships vertically between water bodies with different elevations.

Description: Normally ship elevators consist of water filled chambers which can be raised or lowered by means of mechanical devices. Commonly used to move ships between navigable canals where locks would be impractical.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Shoreline Construction (BB081)

Definition: An artificial structure attached to land bordering a body of water and fixed in position.

Description: It is usually fixed to the waterbody bottom (for example: a mole) but may occasionally be fixed in position (for example: attached to the shore at one end and held between pilings at the other), but floating. Shoreline constructions are normally used for berthing and/or protection.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Shoreline Construction Type [PWC], Water Level Effect [WLE]

Ski Jump (AK150)

Definition: A man-made structure consisting of a steep ramp levelling off at the end and built on a natural slope, used in ski-jumping.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Smokestack (AF010)

Definition: A vertical structure containing a passage or flue for discharging smoke and gases of combustion.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Snow Ice Field (BJ100)

Definition: A large area permanently covered by snow and/or ice.

Description: May cover land and/or water.

Attributes: Area [ARA], Frozen Cover Type [SIC], Geographic Name Information : Full Name [ZI005_FNA]

Soil Surface Region (DA010)

Definition: A region of the land that is homogeneous with respect to a soil characteristic.

Attributes: Area [ARA], Terrain Morphology [SRD], Terrain Surface Material [TSM]

Solar Farm (AD025)

Definition: An extensive collection of solar panels that are collocated and serve a common purpose (for example: the generation of electricity or the generation of heating steam and/or water).

Description: The collection is often organized as an array covering many hundreds of square metres in area and it may be controlled so as to track the direction of the sun throughout the day.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Space Facility (AL351)

Definition: A facility that is used to support space related activities (for example: services such as assembly, launching or recovery of spacecraft or managing flight operations).

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Sports Ground (AK040)

Definition: An open area where sporting events, exercises, and/or games occur.

Description: For example, an athletic field, a playing field, and/or a sports field.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Spot Elevation (CA030)

Definition: A designated location with an elevation value relative to a vertical datum.

Attributes: Elevation Surface Category [ESC], Highest Elevation [ZVH]

Stadium (AK160)

- Definition:** A field and/or stage partly or completely surrounded by a structure designed to allow spectators to stand or sit while viewing an event.
- Description:** The field and/or stage may be enclosed in a building or be outdoors. Stadiums are surrounded on most or all sides by tiered seating for spectators. Often designed in size and shape to accommodate specific sports (for example: baseball, football, basketball or ice hockey), theater or musical performances.
- Attributes:** Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF]
-

Steep Terrain Face (DB010)

- Definition:** A steep, vertical, or overhanging face of rock and/or soil.
- Description:** For example, an escarpment, a bluff, or a cliff.
- Attributes:** Geographic Name Information : Full Name [ZI005_FNA]
-

Storage Depot (AM010)

- Definition:** A tract used for the storage of products and/or supplies.
- Attributes:** Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Located Underground [LUN], Physical Condition [PCF]
-

Storage Tank (AM070)

- Definition:** A container used for the storage of liquids and/or gases that is not supported by a tower.
- Attributes:** Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Physical Product [PPO], Structure Shape [SSC]
-

Survey Point (ZB050)

- Definition:** A location where horizontal and/or vertical control has been determined by surveying methods.
- Description:** Surveys are used to establish positions (horizontal or vertical) of selected points. The points are then used to reference other survey observations or measurements.
- Attributes:** Base Elevation [BEL], Survey Point Type [SUY]
-

Swamp (ED020)

- Definition:** A seasonally flooded, poorly drained wetland with more woody plants than a marsh and better drainage than a bog.
- Description:** It is covered with water all or most of the year, and accumulating dead vegetation does not rapidly decay. It can exist on flat-lying areas created by certain geomorphic environments. The vegetation mainly consists of hydrophytic trees and/or scrubs whose roots are adapted to wet conditions, with an open to very dense canopy closure. A subtype of the more generalized wetland.
- Attributes:** Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Vegetation Species [VSP]
-

Tactical Air Navigation Aid (TACAN) Beacon (GA037)

- Definition:** A military Ultra High Frequency (UHF) radio navigation service able to provide continuous bearing and Distance Measuring Equipment (DME) distance to a selected station.
- Description:** A navigation system developed by military and naval forces providing, as far as the navigating pilot is concerned and for suitably equipped aircraft, the same indication as a VOR/DME system. DME Distance is defined as the line of sight distance (slant range) from the source of a DME signal to the receiving antenna.
- Attributes:** Aeronautical Radio Navigation Installation Point : Aeronautical Radio Navigation Service Name [GA032_NSX], Tactical Air Navigation Aid (TACAN) Beacon : Tactical Air Navigation (TACAN) Channel Code [GA037_TAC]
-

Tank Farm (AM071)

Definition: A tract of land occupied by large-capacity tanks in which petroleum, natural gas, or liquid petrochemicals are stored.

Description: The tanks are usually round, constructed from metal plates, and separated from each other by berms intended to contain any leakage.

Attributes: Angle of Orientation [AOO], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Physical Product [PPO]

Tidal Water (BA040)

Definition: Any water the level of which changes periodically due to tidal action.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Tower (AL241)

Definition: A relatively tall, narrow structure that may either stand alone or may form part of another structure.

Description: Usually of a square, circular, or rectangular cross-section.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH], Tower Type [TTC]

Trail (AP050)

Definition: A path worn by the passage of people or animals.

Attributes: Route Pavement Information : Road Weather Restriction [ZI016_WTC]

Training Site (FA165)

Definition: A site reserved for training.

Attributes: Controlling Authority [CAA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Transportation Route Protection Structure (AL211)

Definition: A structure built over and/or along a transportation route designed to prevent damage to, or blockage of, the route from rock slides, snow slides and/or weather phenomena.

Description: For example, a snow shed, a rock shed or a gallery. These structures are usually located in rugged mountainous regions.

Attributes: Length [LZN], Width [WID]

Transportation Station (AQ125)

Definition: A station, usually having associated structures, which serves as a place for disembarking or taking on passengers or freight along a transportation route.

Description: Transportation routes may include railway, pipeline, road, water or air. Transportation stations may have associated structures for vehicle parking or ticket sales.

Attributes: Angle of Orientation [AOO], Area [ARA], Feature Function [FFN], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF], Transportation System Type [TRS], Width [WID]

Tundra (BJ110)

Definition: A vast, nearly level, treeless arctic region usually with a marshy surface and underlying permafrost.

Tunnel (AQ130)

Definition: An underground passage that is open at both ends and usually contains a land transportation route (for example: a road and/or a railway).

Description: Commonly used to pass through a hill or mountain, or under a river or road. May also provide underground passage in a mine.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Length [LZN], Transportation System Type [TRS], Transportation System Type [2] [TRS2] [TRS2], Width [WID]

Tunnel Mouth (AQ095)

Definition: The opening of a tunnel into a larger space (for example: onto the terrain surface).

Description: A tunnel is usually open to the terrain surface at both ends, but may sometimes lead to an enclosed space, for example: leading to an underground bunker, into an underground mine (termed an 'adit') or into an underground railway station.

UNESCO World Heritage Site (No Code)

Definition: A site which has been officially recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as being unique or exceptional for its cultural, historical or scientific significance.

Description: May be a cultural, natural or mixed site which UNESCO regards as being important to the collective interests of humanity.

Vanishing Point (BH145)

Definition: The location at which a watercourse disappears into the terrain.

Attributes: Direction of Flow [DOF], Watercourse Sink Type [WST]

Vertical Obstruction (No Code)

Definition: A graphic symbol that indicates a feature that extends 46 meters or more above the surrounding terrain.

Description: The normal symbol for the feature is replaced by the vertical obstruction symbol and labeled, indicating the feature name/description of the obstruction and its applicable heights.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

VHF Omnidirectional Radio (VOR) Beacon (GA036)

Definition: A Very High Frequency (VHF) radio navigation service which uses phase comparisons of a ground transmitted signal to determine bearing.

Description: This term is derived from the expression 'very high frequency omnidirectional radio range'.

Attributes: Aeronautical Radio Navigation Installation Point : Aeronautical Radio Navigation Service Name [GA032_NSX]

Vineyard (EA050)

Definition: A tract covered by the systematic planting of grape vines.

Attributes: Area [ARA], Crop Information : Farming Pattern [ZI013_FFP], Geographic Name Information : Full Name [ZI005_FNA]

Void Collection Area (ZD020)

Definition: A data collection region lacking suitable source coverage and/or where data is not required.

Attributes: Area [ARA]

Volcano (DB180)

Definition: A hill or mountain situated over an opening or openings in the Earth's crust through which lava, cinders, steam, and/or gases, are or have been expelled.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Wall (AL260)

Definition: A solid man-made barrier of generally heavy material used as an enclosure, boundary, or for protection.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Water Aerodrome (GB065)

Definition: An aerodrome intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft on water.

Attributes: Aerodrome Elevation [ZVA], Airfield Symbol Type [ASY], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

Water Intake Tower (BI050)

Definition: A tower-like structure associated with a dam or water source and used for the intake of water.

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH]

Water Tower (AM080)

Definition: A tower supporting an elevated storage tank of water.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Water Well (BH230)

Definition: A shaft sunk into the ground to reach and tap a supply of water intended for uses other than power generation, heating or the extraction of minerals.

Description: May be, for example, drilled to tap deep underground reservoirs or dug to reach a shallow water table. Dug wells are typically circular, lined with masonry, have a stone border and a structure built above then for lowering and raising a bucket.

Attributes: Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF], Water Resource Information : Hydrologic Persistence [ZI024_HYP], Water Resource Information : Water Type [ZI024_SCC]

Waterfall (BH180)

Definition: A vertically descending part of a watercourse where it falls from a height (for example: over a rock or a precipice).

Description: In place names, commonly shortened to 'fall' or 'falls', for example, 'Niagara Falls'.

Attributes: Geographic Name Information : Full Name [ZI005_FNA]

Wind Farm (AD060)

Definition: A collection of windmotors that are collocated and are organized as a single power generation unit.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF]

Wind Turbine (AJ051)

Definition: A tower and associated equipment that generates electrical power from wind.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH]

Windmill (AJ050)

Definition: A system of vanes attached to a tower and driven by wind (excluding wind turbines).

Attributes: Area [ARA], Height Above Surface Level [HGT], Highest Elevation [ZVH], Physical Condition [PCF]

Wreck (BD180)

Definition: The ruined remains of a stranded or sunken vessel that has been rendered useless.

Attributes: Height Above Surface Level [HGT], Highest Elevation [ZVH], Hydrographic Vertical Positioning Information : Water Level Effect [ZI025_WLE]

Zoo (AK180)

Definition: A site where wild animals are kept for exhibition to the public, that may also support breeding and/or study.

Attributes: Angle of Orientation [AOO], Area [ARA], Geographic Name Information : Full Name [ZI005_FNA], Physical Condition [PCF]

| Attribute | Definition and/or Description |
|---|--|
| Aerodrome Elevation [ZVA] | The vertical distance above Mean Sea Level (MSL) of the highest point of the landing area. |
| Aerodrome Pavement Information : Aerodrome Movement Area Surface Composition [ZI019_ASU] | The type of the predominant material of which a surface of the movement area is composed. [DESC] Example surfaces include: asphalt, concrete, or grass. |
| Aeronautical Radio Navigation Installation Point : Aeronautical Radio Navigation Service Name [GA032_NSX] | A structured text value specifying an aeronautical radio navigation service name designation. |
| Airfield Symbol Type [ASY] | The type of airfield symbol designation. |
| Airspace Identifier [AIA] | A published sequence of characters allowing the unique identification of the airspace. [DESC] For example, the identifier of the Danger Area, Prohibited Area, or Temporary Segregated Area. |
| Airspace Name [NAA] | A structured text value specifying an airspace name designation. |
| Airspace Type [ATY] | A coded domain type whose specified values individually denote an airspace type. |
| Angle of Orientation [AOO] | The angular distance in the horizontal plane measured from true north (0 degrees) clockwise to the major axis of the feature. [DESC] If the feature is square, the axis 0 up to 90 degrees is recorded. If the feature is circular, 360 degrees is recorded. |
| Aqueduct Type [ATC] | The type of an aqueduct based on its structure. |
| Area [ARA] | The area within the delineation of the feature. |
| Base Elevation [BEL] | The vertical distance from a specified vertical datum to the terrain surface of or at the base of the feature. |
| BGN Administrative Level [BAL] | The level of an administrative division of a country as established by the U.S. Board on Geographic Names (BGN). [DESC] The BGN is a management body established to maintain uniform geographic name usage throughout the U.S. Government. |
| Bog Type [BOC] | The type of a bog or fen based on its morphology and/or dominant vegetation. |
| Boundary Status [BST] | The status of delimitation of a boundary. |
| Bridge Opening Type [BOT] | The type of structure or mechanism by which a bridge or bridge span is moved to allow passage of a vessel. |
| Built-up Area Density Category [BAC] | A general evaluation of the density of a built-up area, as a category. |
| By-product [PBY] | The principal by-product(s) of a production, mining, or agricultural activity. [DESC] If multiple by-products are specified then they are usually listed in descending order of importance. |
| Cable Type [CAB] | The type of a cable based on its use. |
| Cableway Type [CAT] | The type of a cableway based on structure and/or function. |
| Canopy Cover [DMT] | The fraction of canopy cover within a defined area during the season of maximum foliage. [DESC] The canopy is formed by the upper branches of the trees in a forest forming a more or less continuous layer. |
| Centerline Spacing [MWG] | The distance between the centrelines of the two travelled ways of a divided highway. |

| Attribute | Definition and/or Description |
|---|--|
| Conservation Area Management Category [CAM] | The category of a protected area based on level of protection and the enabling laws of the controlling entity (for example: State) or rules of international organization (for example: as determined by the International Union for Conservation of Nature and Natural Resources (IUCN)). |
| Controlling Authority [CAA] | The controlling authority responsible for a facility or site. [DESC] Controlling authorities may be distinguished by organizational level (for example: national, sub-national, or military district) and/or type (for example: private or public). |
| Crop Information : Crop Species [ZI013_CSP] | The predominant species of a crop land. |
| Crop Information : Farming Pattern [ZI013_FFP] | The general arrangement(s) and/or pattern(s) of farming fields. |
| Dam Crest Length [LDC] | The centreline distance measured along the crest of a dam, and in the horizontal plane. |
| Dam Crest Width [WOC] | The average distance across the crest of a dam. [DESC] The width is measured perpendicular to the crest centreline. |
| Direction of Flow [DOF] | The bearing of movement or direction of the flow. |
| Divided [SEP] | An indication that the lanes or tracks in a land transportation route (for example: a road or a railway), are horizontally separated (for example: by a median strip) and not adjoining. |
| Elevation Surface Category [ESC] | The category of surface for which an elevation is determined. |
| Embankment Type [FIC] | The type of an embankment based on its use and/or relationship to the surrounding terrain. |
| Engineered Earthwork Type [EET] | The type of an excavation and/or embankment created for the purpose of enhancing the defense of a site from armed attack. |
| Extraction Mine Type [MZN] | The type of an extraction mine. |
| Feature Function [FFN] | The purpose(s) of, or intended role(s) served by, the feature. |
| FIPS 10-4 Country Code [FI1] | The Federal Information Processing Standards (FIPS) 10-4 code that designates a geopolitical entity (for example: a State). |
| Flood Control Structure Type [FCS] | The type of a flood control structure based on its structure and/or intended use. |
| Frozen Cover Type [SIC] | The type of a covering of snow and/or ice based on its composition and structure. |
| Geographic Name Information : Full Name (first) [ZI005_FNA1] | A complete name that is used to designate the entity as that designation would normally be written by the originating culture on a map or chart. [DESC] It is generally considered to consist of a specific part, a generic part, and any articles or prepositions. The order of the parts may vary with the generic part appearing at the beginning, middle or end. |
| Geographic Name Information : Full Name (second) [ZI005_FNA2] | A complete name that is used to designate the entity as that designation would normally be written by the originating culture on a map or chart. [DESC] It is generally considered to consist of a specific part, a generic part, and any articles or prepositions. The order of the parts may vary with the generic part appearing at the beginning, middle or end. |
| Geographic Name Information : Full Name [ZI005_FNA] | A complete name that is used to designate the entity as that designation would normally be written by the originating culture on a map or chart. [DESC] It is generally considered to consist of a specific part, a generic part, and any articles or prepositions. The order of the parts may vary with the generic part appearing at the beginning, middle or end. |

Attribute

Definition and/or Description

| | |
|--|--|
| Geopolitical Entity : Geographic Name Information (1) : Full Name (first side) [ZI005_FNAA] | A complete name that is used to designate the entity as that designation would normally be written by the originating culture on a map or chart. [DESC] It is generally considered to consist of a specific part, a generic part, and any articles or prepositions. The order of the parts may vary with the generic part appearing at the beginning, middle or end. |
| Geopolitical Entity : Geographic Name Information (2) : Full Name (second side) [ZI005_FNAB] | A complete name that is used to designate the entity as that designation would normally be written by the originating culture on a map or chart. [DESC] It is generally considered to consist of a specific part, a generic part, and any articles or prepositions. The order of the parts may vary with the generic part appearing at the beginning, middle or end. |
| Geopolitical Entity Type [GEC] | The type of a legally recognized geopolitical entity (for example: a State or a zone). |
| Geopolitical Line Type [LSP] | The type of a geopolitical dividing line (for example: a boundary or a line of separation) based on the nature of its establishment and/or recognition. |
| Height Above Surface Level [HGT] | The vertical distance measured from the lowest point of the base of the feature at ground or water level (downhill/downstream side) to the tallest point of the feature. |
| Helipad Associated Facility [HAF] | The type of facility or building that is associated with a freestanding helipad. |
| Highest Elevation [ZVH] | The elevation from a specified vertical datum to the highest point on a feature. |
| Hydrographic Vertical Positioning Information : Water Level Effect [ZI025_WLE] | The relationship between the feature and surrounding (including covering and/or underlying) water. |
| Hypsography Portrayal Type [HQC] | The type of a hypsographic portrayal line (for example: a contour line) based on the topography represented and/or portrayal interval. |
| ICAO Location Indicator [IKO] | The identifier that is assigned to a location in accordance with rules prescribed by the International Civil Aviation Organization (ICAO) in Document 7910. [DESC] If available this indicator shall be used as primary for identification. |
| Inundation Type [INU] | The type of an inundation based on the cause of the flooding. |
| Length [LZN] | The dimension of a feature taken along its primary alignment of use and generally in the horizontal plane. |
| Located Underground [LUN] | The feature (for example: a parking garage, storage tank, or a transportation station) is located underground. |
| Magnetic Variation [MAG] | The angular difference between True North and Magnetic North measured at a given position and date. |
| Man-made Shoreline [MNS] | An indication that a body of water is completely surrounded by a man-made shoreline. |
| Manufacturing Information : Product [ZI014_PPO] | The principal product(s) resulting from a production, mining, or agricultural activity. [DESC] If multiple products are specified then they are usually listed in descending order of importance. |
| Median Present [MES] | An indication that the lanes or tracks of a divided land transportation route (for example: a road or a railway) are separated by a vertical median barrier. |
| Named Location Type [NLT] | The type of a location that normally does not appear as a specific, characterized object but that has a name that is required to be displayed in association with that location. |
| Navigation Light Characteristic [CHA] | The sequence, grouping, and/or distinctive character (rhythm and colour or colours) of a navigation light. |

| Attribute | Definition and/or Description |
|--|--|
| Note : Memorandum [ZI006_MEM] | A narrative or other textual description that records observation(s) and/or event(s) associated with a particular subject (for example: a data instance, a data set or a data processing activity). [DESC] No restriction is placed on its length. |
| Offshore Construction Primary Structure [OCS] | The type of primary structure of an offshore construction upon which various pieces of operation-specific equipment are affixed. |
| Physical Condition [PCF] | The physical condition of a man-made structure, as a whole, including the inside and/or outside of the structure and any contained and/or associated equipment. |
| Physical Product [PPO] | The principal tangible good(s) resulting from a production, mining, or agricultural activity. |
| Power Source [POS] | The energy source(s) employed to generate power for off-site distribution. |
| Railway Use [RRC] | The use(s) to which a railway is put as part of a transportation system. |
| Religious Information : Religious Designation [ZI037_REL] | A designation denoting a religion or system of belief. |
| Religious Information : Religious Facility Type [ZI037_RFA] | The type of a facility, building, structure or site that is designed or designated to be used for religious activities, based on its structure and/or the principal activity for which it was designed. |
| Roadway Type [RTY] | The type of a roadway based on its design and/or location. |
| Route Identification <route designation type> [RIN_ROI] | The type of designation(s) of a road network according to the nature of service that it is intended to provide, as designated by international, national and/or other administrative authorities. [DESC] The type(s) of route designation may continue along ferry crossing or ice routes in order to provide continuity with the transportation network. |
| Route Identification <route designation> [RIN_RTN] | The official designation assigned to a route. [DESC] For example, 'I-95', 'A-1', 'E-6', or 'M-5'. The route designation may continue along ferry crossing or ice routes in order to provide continuity with the transportation network. |
| Route Pavement Information : Road Weather Restriction [ZI016_WTC] | The type of weather conditions under which a road is usable. |
| Route Pavement Information : Route Surface Composition [ZI016_ROC] | The composition(s) of a durable surface (for example: a pavement) intended to sustain ground traffic (for example: vehicular traffic or foot traffic). [DESC] Depending on the traffic situation (for example: on a floor, in a courtyard, or on a road) different compositions may be used, however in general such surfaces are composed of pieces of a hard material fitted closely together (for example: cobble-stone or brick) or of an undivided hard layer (for example: concrete) so as to give a compact, uniform, and smooth surface. |
| Sand Dune Orientation [SDO] | The characteristic direction of the steep slope face from the crest of a sand dune. [DESC] Normally, the angular distance measured from true north (0 degrees) clockwise to the direction of the steep slope face in the downwind direction (0-360 degrees). |
| Sand Dune Stabilized [SAD] | An indication that the height and location of a sand dune, or area of sand dunes, is unchanging. [DESC] The dune(s) are usually vegetated and in consequence they are relatively unaffected by the scouring action of local winds. |
| Sand Dune Type [SDT] | The type of a sand dune based on its shape and/or structure. |
| Shoreline Construction Type [PWC] | The type of a shoreline construction (for example: a pier, a wharf, or a quay). [DESC] May be used as a means of subtyping Feature: 'Shoreline Construction'. |
| Shoreline Type [SLT] | The physical characteristics of a shoreline. |

Attribute

Definition and/or Description

| | |
|---|--|
| Structural Material Type [MCC] | The primary type(s) of material composing a feature, exclusive of the surface. [DESC] The basis for 'primary' may be, for example, compositional dominance or structural organization. |
| Structure Shape [SSC] | The geometric form, appearance, and/or configuration of the feature as a whole. |
| Supported by Bridge Span [SBB] | The object is at least partially supported by, or passes across, a bridge span. [DESC] For example, an aqueduct carried across a valley by one or more bridge spans. |
| Survey Point Type [SUY] | The type of a survey point based on the purpose for which it is established. |
| Tactical Air Navigation Aid (TACAN) Beacon : Tactical Air Navigation (TACAN) Channel Code [GA037_TAC] | A coded domain type whose specified values individually denote a tactical air navigation aid channel. |
| Terrain Morphology [SRD] | The type of terrain morphology based on composition and/or configuration. [DESC] Terrain morphology influences military operations such as mobility prediction, mining of construction materials, and identification of potential landing sites. |
| Terrain Surface Material [TSM] | The type(s) of material that compose the surface layer of the terrain. |
| Through Route [THR] | An indication that a ground transportation route (for example: road, cart track or trail) is the most direct way through (both into and then out of) a built-up area or populated place. |
| Tower Type [TTC] | The type of a tower based on its intended use(s). |
| Track Information : Railway Gauge [ZI017_GAW] | The distance between a single pair of rails of a railway, measured along the shortest distance from inside rail to inside rail. |
| Track Information : Railway Gauge Classification [ZI017_RGC] | The classification of a railway based on the distance between a single pair of rails, measured along the shortest distance from inside rail to inside rail. |
| Track Information : Railway in Road [ZI017_RIR] | An indication that a railway track is located within the bounds of a roadbed. [DESC] For example, an infrequently used railway spur in a roadway or a carline running (regularly) in a roadway. |
| Track Information : Railway Power Method [ZI017_RRA] | The method by which electrical power is distributed on a railway, if any. |
| Track or Lane Count [LTN] | The total number of independent, parallel paths (for example: a railway track and/or a road lane) in both directions within a route. |
| Transportation System Type [2] [TRS2] [TRS2] | The type of a transportation system based on the type(s) of vehicles employed and/or the nature(s) of the objects transported. |
| Transportation System Type [TRS] | The type of a transportation system based on the type(s) of vehicles employed and/or the nature(s) of the objects transported. |
| Vegetation Characteristic [VEG] | The type of a vegetated area based on species, biome, physiography and/or structural organization. |
| Vegetation Species [VSP] | The predominant species of a tract of vegetation. |
| Vertical Relative Location [LOC] | The relationship between the feature and the underlying ground (terrain) or waterbody bottom. |
| Water Level Effect [WLE] | The relationship between the feature and surrounding (including covering and/or underlying) water. |

Attribute**Definition and/or Description**

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| Water Resource Information : Hydrologic Persistence [ZI024_HYP] | The degree of persistence of water in an inland water body (for example: a spring, a flowing stream, a lake or a pond). [DESC] Inland water bodies may also include, for example, crevices, ditches, fountains, and water troughs. |
| Water Resource Information : Water Type [ZI024_SCC] | The type of available water based on its composition. |
| Watercourse Sink Type [WST] | The type of the sink of a watercourse. |
| Width [WID] | The dimension of a feature taken perpendicular to its primary alignment of use and generally in the horizontal plane. [DESC] The primary alignment of a feature is its established direction of flow or use (for example: a road, a power line right-of-way, a [DESC] The primary alignment of a feature is its established direction of flow or use (for example: a road, a power line right-of-way, a river, rapid, and/or a bridge). A feature-specific rule may apply. In the case of a bridge, the width is the distance perpendicular to the bridge centre-line and generally in the horizontal plane. In the case of a dam, the width is the distance perpendicular to (across the) the dam crest. If no such direction of flow or use exists then (1) if the feature is irregular in shape its width is taken perpendicular to the direction of its greatest horizontal dimension (see Attribute: 'Greatest Horizontal Extent'), else (2) if the feature is regular in shape then a shape-specific rule may apply: for a rectangular feature, the length of the shorter axis; for a round feature, the diameter. |