Data Product Specification

for

Fundamental Geospatial Data (Scale 1/25,000)

Prototype Ver.0.1

This Data Product Specification was prepared by referring to the following documents

- Product specification for creation of 2500 level digital topographic map (ver. 1.1)
  April 2014, Geospatial Information Authority of Japan (GSI), Ministry of Land, Infrastructure, Transport and Tourism
- Manual for creation of geospatial data product specification
  April 2014, Geospatial Information Authority of Japan (GSI), Ministry of Land, Infrastructure, Transport and Tourism

August 2017

XXXXX
JICA Project Team (PASCO CORPORATION)
(Updated by PASCO CORPORATION: 12 October 2021)

Table of Contents

1. Overview

1.1. Information of this Data Product Specification

Provide general information about this Data Product Specification, such as tittle, date, preparer, language, sphere, type of document etc.

Title	Data Product Specification for Geospatial data of XXXXX
Date	DD MM YYYY
Preparer	JICA Project Team
Language:	English
Sphere	National Database
Type of Document	PDF

1.2. Objective

Describe specifically the purpose and usage of the geospatial data. The purpose and usage must match requirements and application schema of the geospatial data product.

The Geospatial Data created based on this product specification shall contribute to the formulation of agricultural and infrastructure development programs.
In addition, this data is fundamental data of XXXXX

1.3. Geographic Scope

Describe geographic scope of the geospatial data product.

East	?????.????? m	West	?????.????? m
South	?????.????? m	North	?????.????? m

(On a specified coordinate reference system)

Southern region of XXXXX

(map of the target area)

1.4. Temporal Scope

Describe temporal scope of the geospatial data product.
This is required in case temporal data is included in the data. (This is not the period of data creation)

Start	20xx-04-01
End	20xx-03-31

1.5. Reference Standard

Provide the information of standards (e.g. governing laws, survey operation manuals, map symbols regulations etc.,) to be referred to create the geospatial data product.

Governing Law	n/a
Survey Operation Manual	Survey Operation Manual of JICA (for National Base Map) (December 2006 Japan International Cooperation Agency)
Map Symbols Regulation	Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
Others (if any)	

1.6. Terms and Definitions

Provide the source of a quote of a glossary of technical terms.

The terminology used in this specification refers to the *******

1.7. Abbreviations

Provide a list of abbreviations used in this Data Product Specification.

Abbreviation	Description
UML	Unified Modeling Language
XML	Extensible Markup Language
GML	Geography Markup Language

2. Specification Scope

2.1. Specification Scope Identification

Provide a name that describes the scope of this Data Product Specification. Usually the same name as this document's title can be used.

Data Product Specification for Geospatial data of XXXXX

2.2. Hierarchical Level

Dataset

3. Data Product Identification

3.1. Name of Product

Provide the name of the geospatial data product.

Fundamental Geospatial data (Scale 1/25,000)

3.2. Date

Provide the creation date of the geospatial data product.

2017-08-31 (Date of creation)

3.3. Contact

Provide the contact information of the geospatial data product.

XXXXX (name of the responsible organization)
TEL:
FAX:
e-mail:

3.4. Geographic Description

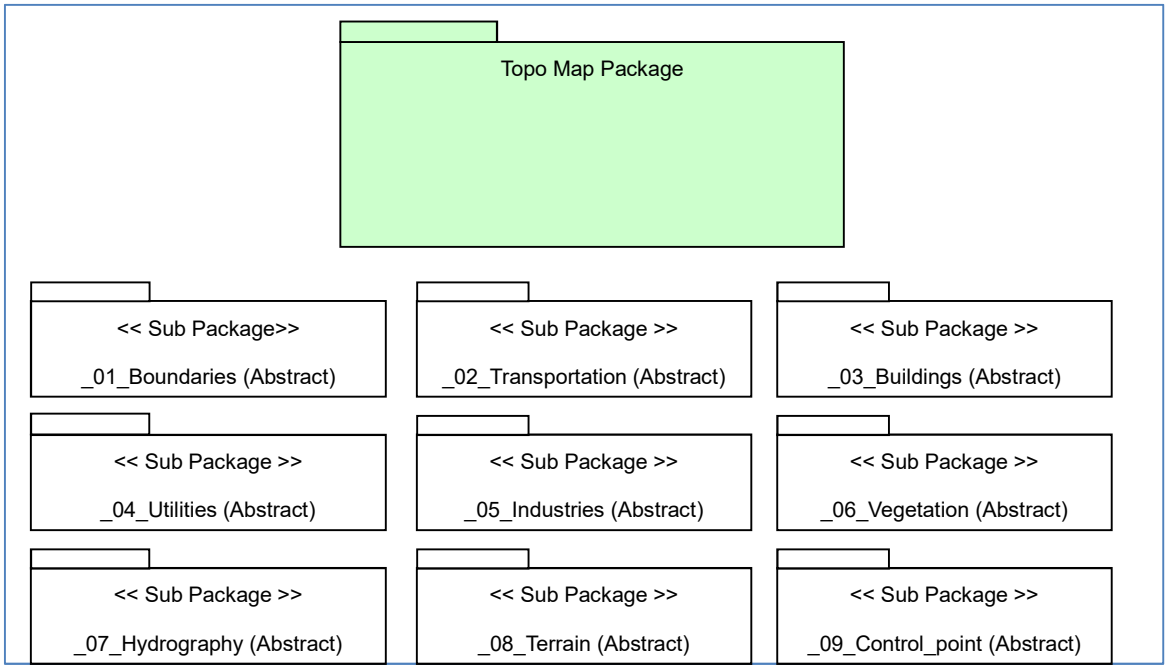
Describe the geographical coverage of the geospatial data product.

Southern region of XXXXX

4. Data Content and Structure

4.1. Application Schema UML Class

1) Fundamental Geospatial data (Scale 1/25,000)



Package Name	Class Name Belonging to the Package
01_Boundaries	Boundary_Line, Boundary_Pillars
02_Transportation	AirField, Bridge_Line, Bridge_Point, Km_Stone_Point, Pithead, Road_Line, Ropeway_Line, Tunnel
03_Buildings	Buildings_Point, Buildings_Polygon, Buildings_Religion, Built_up_Area, Facilities, Recreation_Point, Recreation_Polygon
04_Utilities	Electrical_Line, Electrical_Point
05_Industries	Industrial_Point
06_Vegetation	Vegetation_Point, Vegetation_Polygon
07_Hydrography	Hydro_Artificial_Line, Hydro_Artificial_Point, Hydro_Artificial_Polygon, Hydro_Line, Hydro_Point, Hydro_Polygon, Hydro_Utility_Line, Hydro_Utility_Point, River_Flow
08_Terrain	Contour_Earth, Contour_Ice, Contour_Rock, Geography_Line, Geography_Point, Geography_Polygon
09_Control_point	Control_Point
Annotation	Annotations

2) Fundamental Geospatial data (Scale 1/25,000)

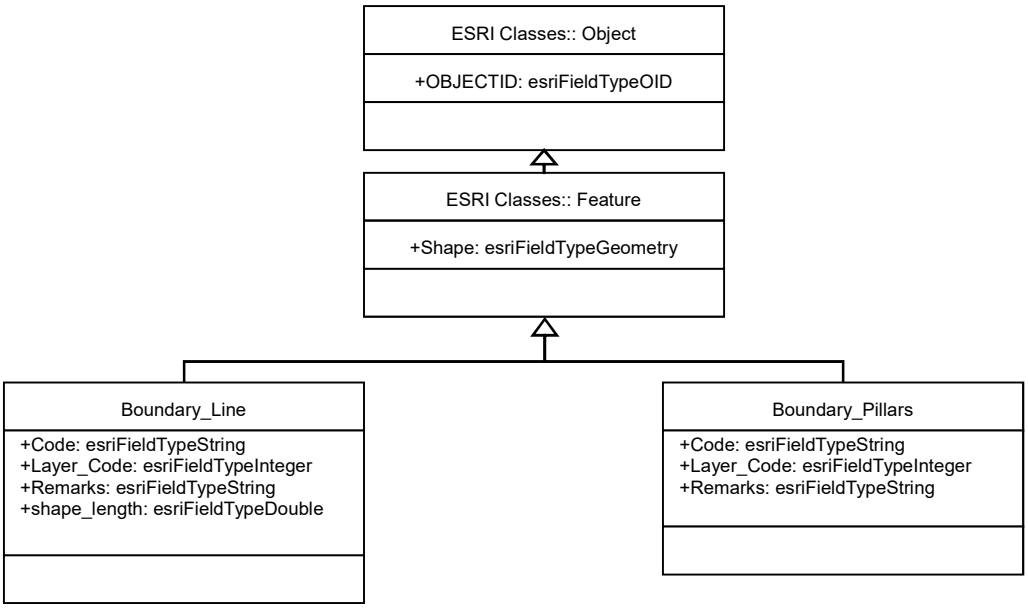


Figure 1 UML of Boundaries

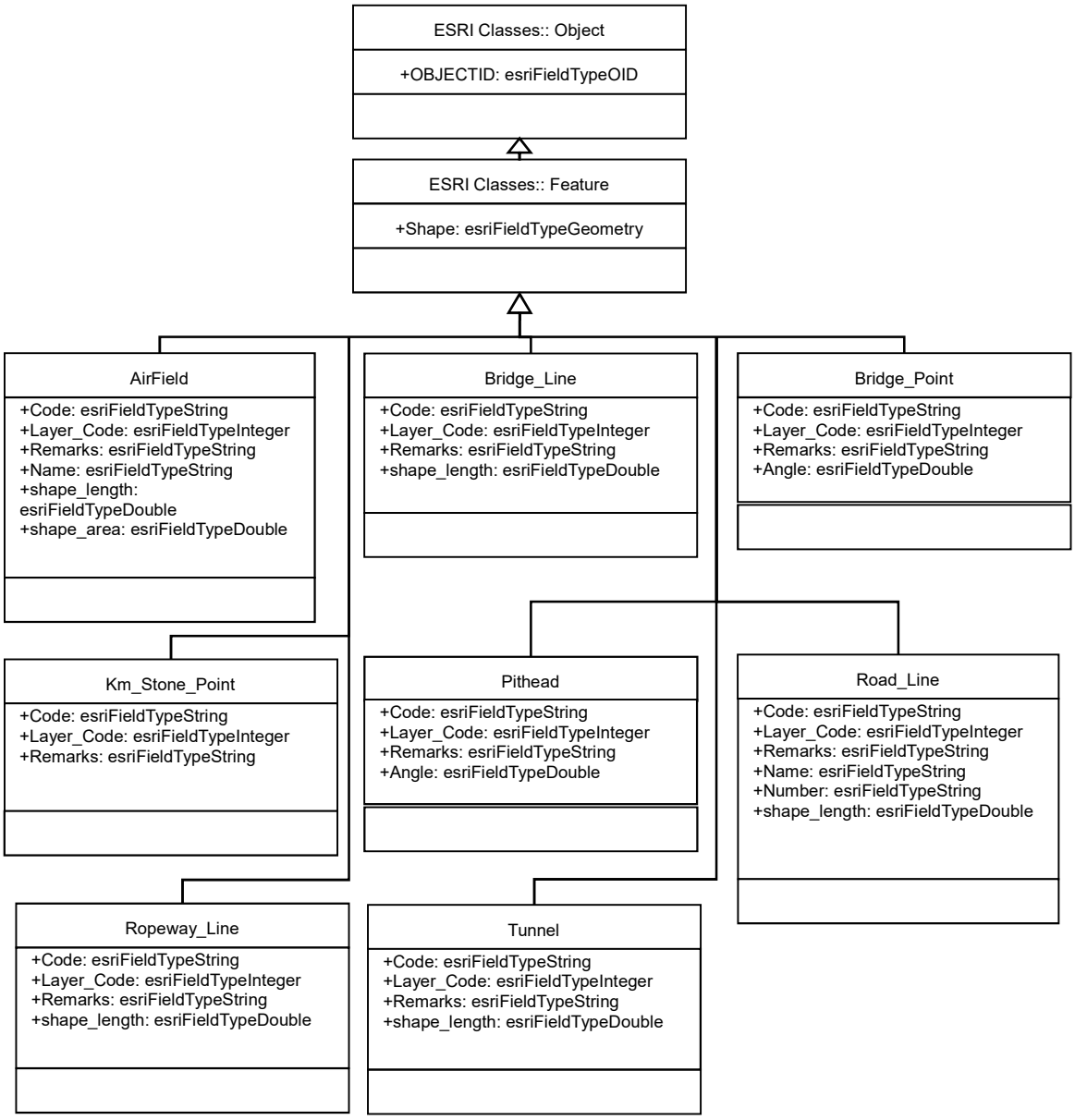


Figure 2 UML of Transportation

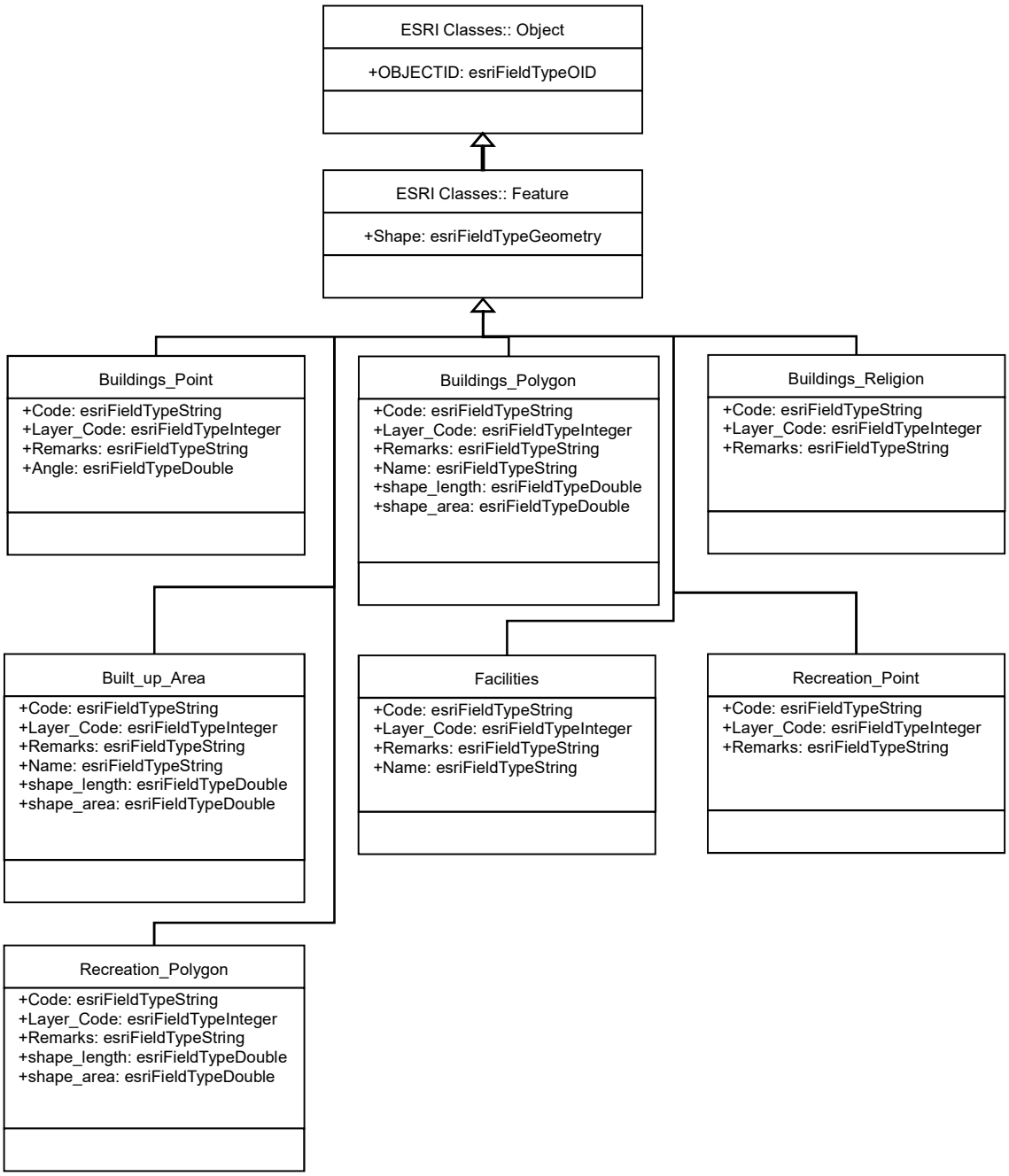


Figure 3 UML of Buildings

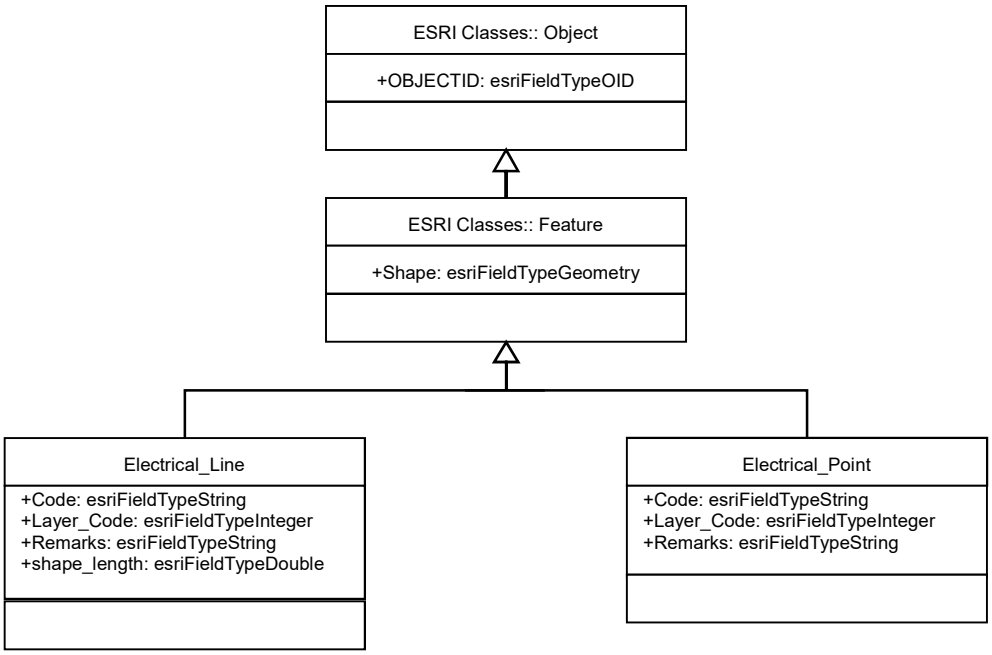


Figure 4 UML of Utilities

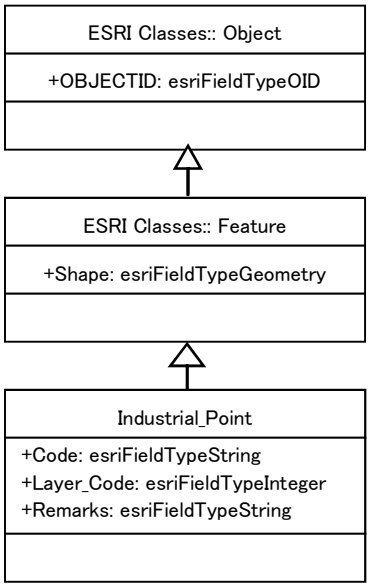


Figure 5 UML of Industries

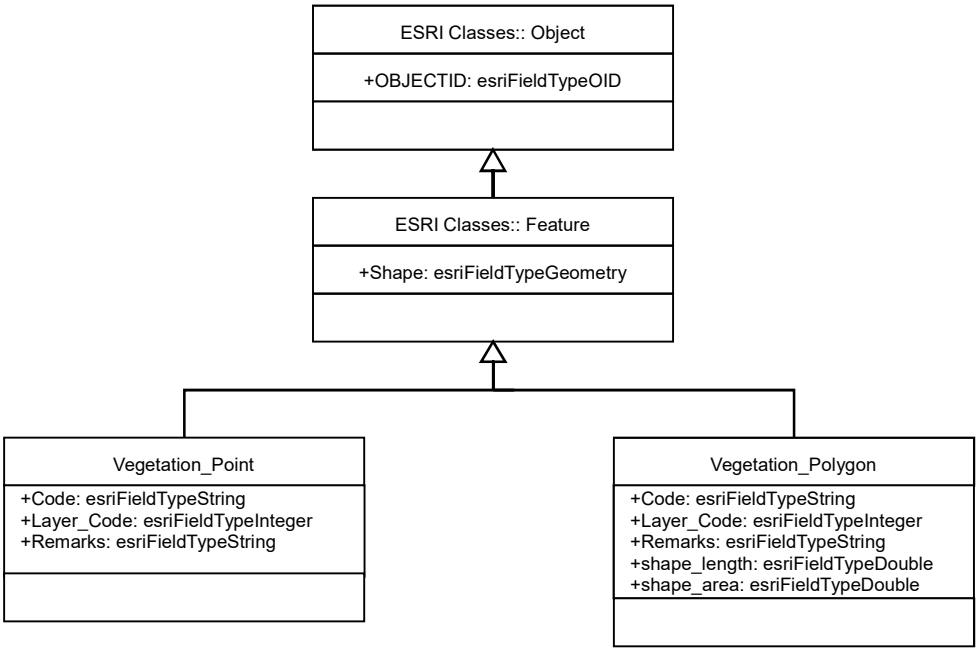


Figure 6 UML of Vegetation

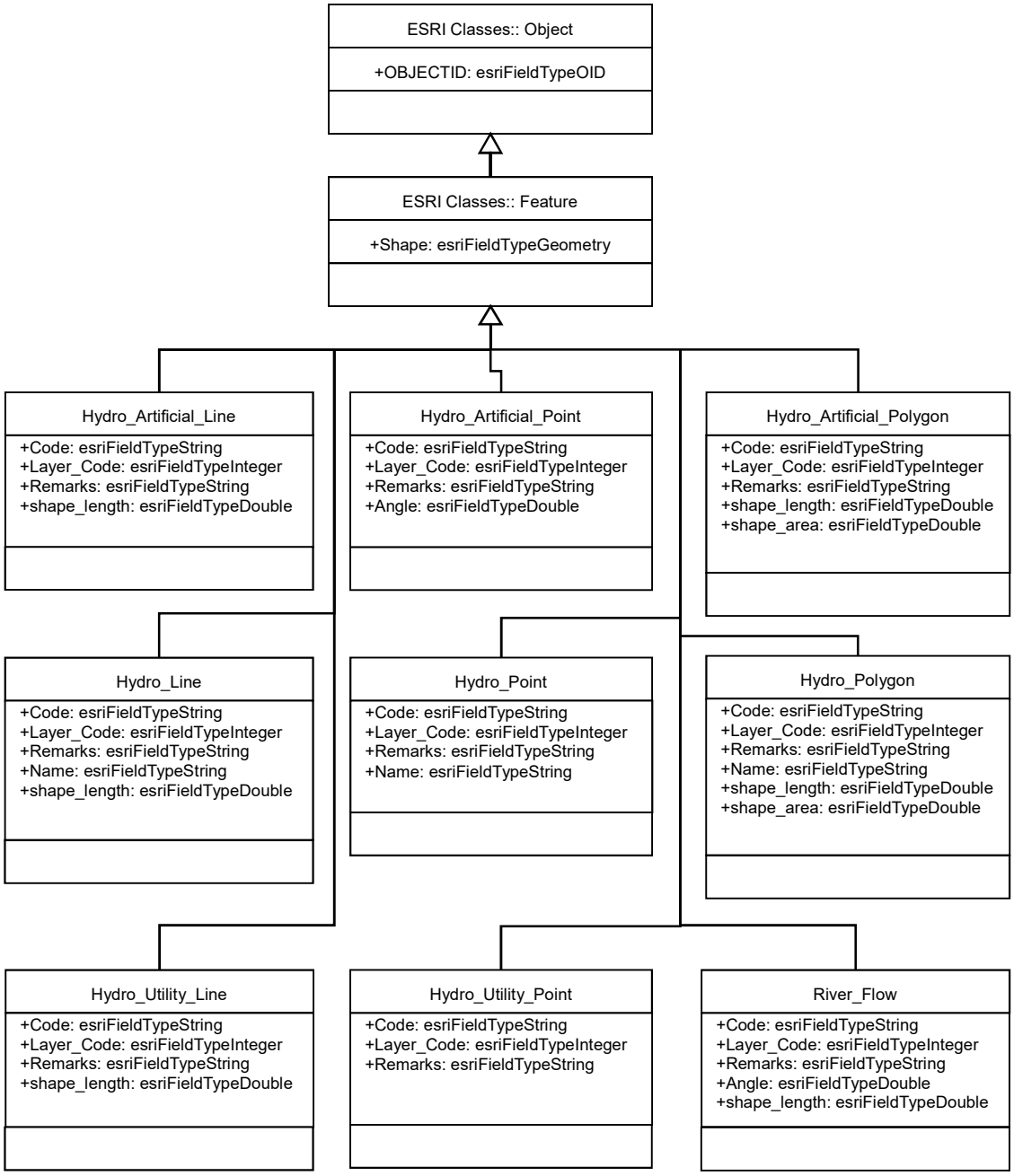


Figure 7 UML of Hydrography

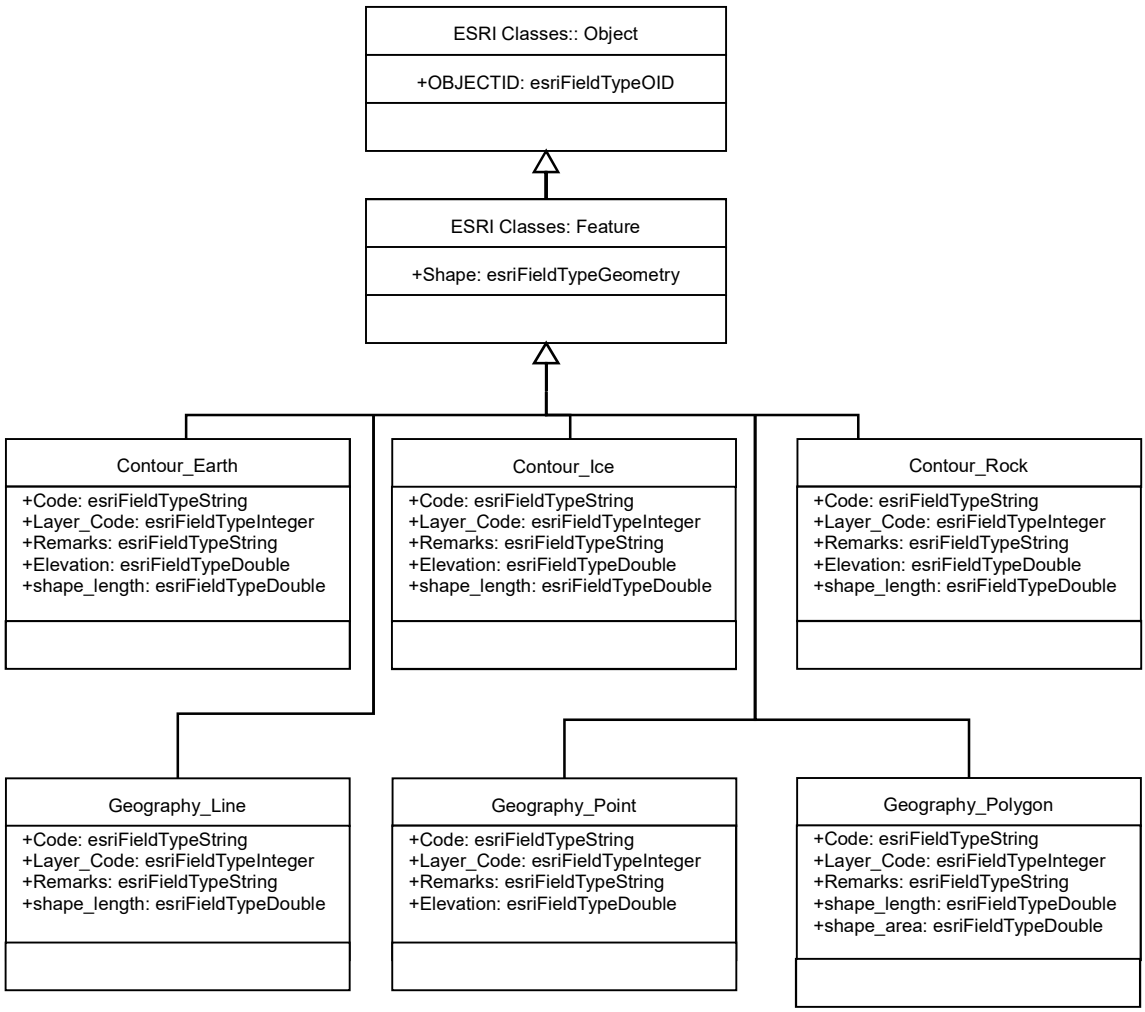


Figure 8 UML of Terrain

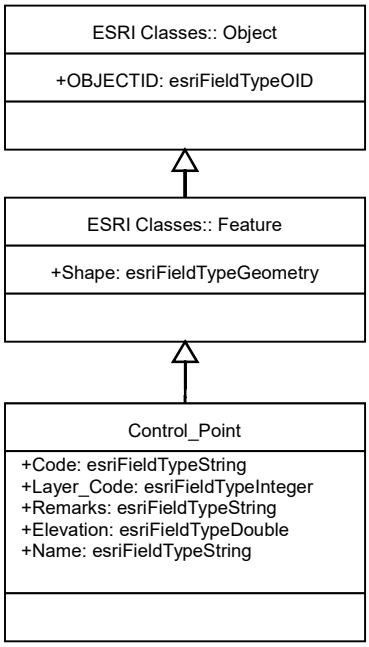
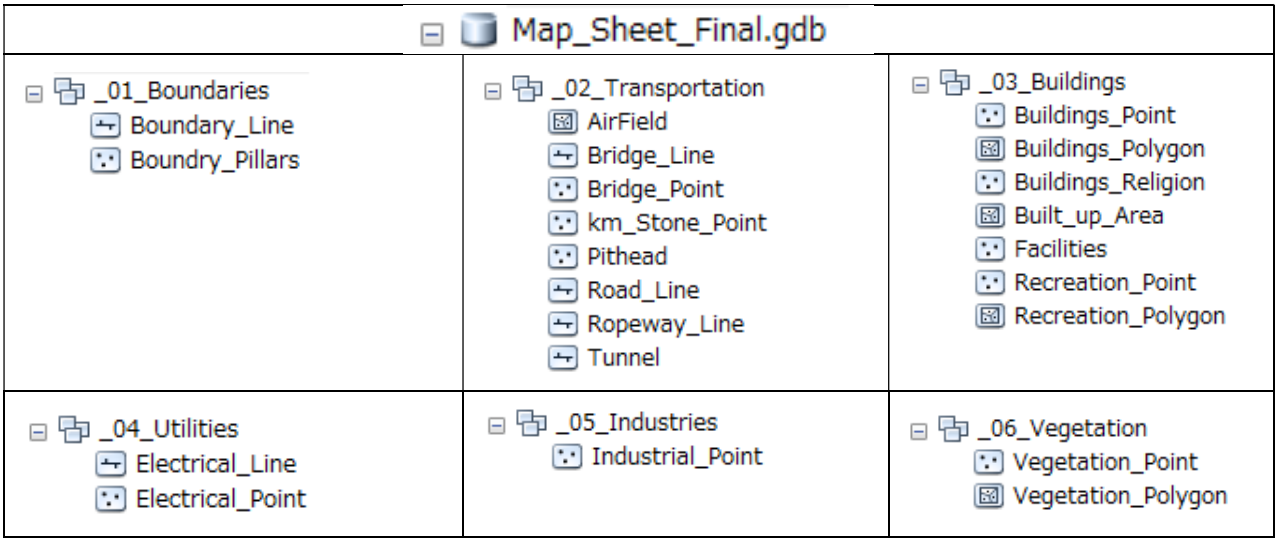


Figure 9 UML of Control Point



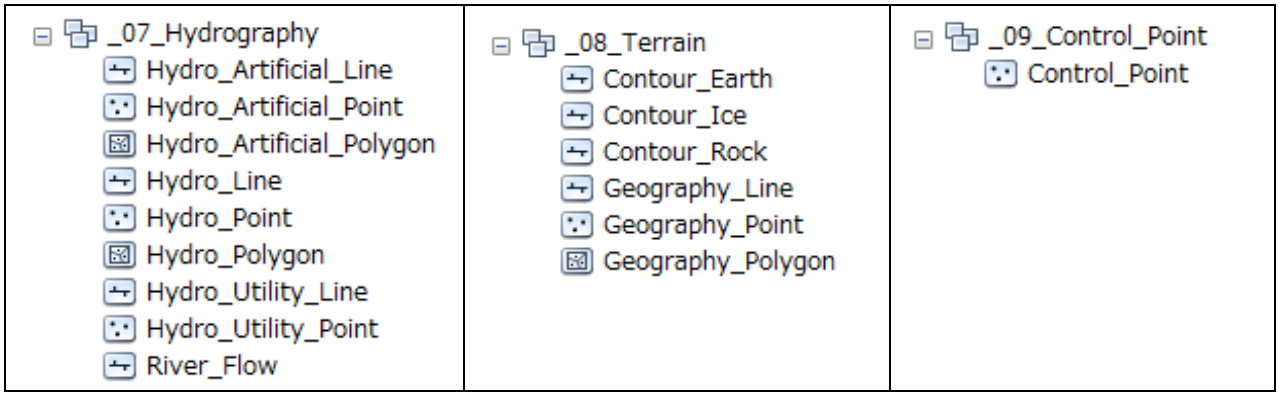


Figure 10 Data structure on ArcGIS Geodatabase

4.2. Application Schema Document

In this chapter, detailed information of all classes, which are defined as the application schema for the data are described as a feature catalog.

1) Topographic Map Package

- Definition

  This Package contains fundamental features that compose the topographic map.

- Target Feature

  Geographic features such as Road, Building, River, etc.

2) Boundary Sub Package

Boudaary_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

  +Code: esriFieldTypeString

  Code number which is defined in the map, symbols regulation

  +Layer_Code: esriFieldTypeInteger

  Code number which is defined in the map symbols regulation as text format

  +Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+shape_length: esriFieldTypeDouble

Line length

Boundary_Pillars

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map, symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

3) Transport Sub Package

AirField

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

+shape_length: esriFieldTypeDouble

Line length

+shape_area: esriFieldTypeDouble

Area

Bridge_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

Bridge_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +Angle: esriFieldTypeDouble

        Angle

Km_Stone_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

Pithead

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Angle: esriFieldTypeDouble

Angle

Road_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

+Number: esriFieldTypeString

Road number

+shape_length: esriFieldTypeDouble

Line length

Ropeway_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

Tunnel

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

4) Building Sub Package

Buildings_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Angle: esriFieldTypeDouble

Angle

Buildings_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

+shape_length: esriFieldTypeDouble

Line length

+shape_area: esriFieldTypeDouble

Area

Buildings_Religion

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

Built_up_Area

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

+shape_length: esriFieldTypeDouble

Line length

+shape_area: esriFieldTypeDouble

Area

Facilities

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

Recreation_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

Recreation_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

    +shape_area: esriFieldTypeDouble

        Area

5) Utility Sub Package

Electrical_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+shape_length: esriFieldTypeDouble

Line length

Electrical_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

6) Industry Sub Package

Industrial_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

7) Vegetation Sub Package

Vegetation_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

Vegetation_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

    +shape_area: esriFieldTypeDouble

        Area

8) Hydrography Sub Package

Hydro_Artificial_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None

- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

Hydro_Artificial_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +Angle: esriFieldTypeDouble

        Angle

Hydro_Artificial_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

+shape_length: esriFieldTypeDouble

Line length

+shape_area: esriFieldTypeDouble

Area

Hydro_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name : esriFieldTypeString

Name

+shape_length: esriFieldTypeDouble

Line length

Hydro_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Name: esriFieldTypeString

Name

Hydro_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +Name: esriFieldTypeString

        Name

    +shape_length: esriFieldTypeDouble

        Line length

    +shape_area: esriFieldTypeDouble

        Area

Hydro_Utility_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

    +Code: esriFieldTypeString

        Code number which is defined in the map symbols regulation

    +Layer_Code: esriFieldTypeInteger

        Code number which is defined in the map symbols regulation as text format

    +Remarks: esriFieldTypeString

        Input special comments as text format, if necessary

    +shape_length: esriFieldTypeDouble

        Line length

Hydro_Utility_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

River_Flow

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Angle: esriFieldTypeDouble

Angle

+shape_length: esriFieldTypeDouble

Line length

9) Terrain Sub Package

Contour_Earth

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Elevation: esriFieldTypeDouble

Elevation value

+shape_length: esriFieldTypeDouble

Line length

Contour_Ice

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Elevation: esriFieldTypeDouble

Elevation value

+shape_length: esriFieldTypeDouble

Line length

Contour_Rock

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Elevation: esriFieldTypeDouble

Elevation value

+shape_length: esriFieldTypeDouble

Line length

Geography_Line

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Line
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+shape_length: esriFieldTypeDouble

Line length

Geography_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Elevation: esriFieldTypeDouble

Elevation value

Geography_Polygon

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Polygon
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+shape_length: esriFieldTypeDouble

Line length

+shape_area: esriFieldTypeDouble

Area

10) Control Point Sub Package

Control_Point

- Definition: Refer to Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps
- Upper class: None
- Geometry type: Point
- Attribute:

+Code: esriFieldTypeString

Code number which is defined in the map symbols regulation

+Layer_Code: esriFieldTypeInteger

Code number which is defined in the map symbols regulation as text format

+Remarks: esriFieldTypeString

Input special comments as text format, if necessary

+Elevation: esriFieldTypeDouble

Elevation value

+Name: esriFieldTypeString

Name

5. Reference Systems

5.1. Spatial Reference Systems

Provide information about spatial reference systems applied to the data product.

Item	Description
Spatial Reference Systems	(a specified coordinate reference system)
EPSG	????
Projection	Transverse_Mercator
False_Easting	??????.?
False_Northing	0.0
Central_Meridian	90.0
Scale_Factor	1.0
Latitude_Of_Origin	0.0
Linear Unit: Meter	(1.0)
Vertical Coordinate Reference System	Existing bench mark

5.2. Temporal Reference Systems

Provide information about temporal reference systems applied to the data product.

Item	Description
Temporal Reference Systems	The Gregorian calendar / XXXXX Standard Time
Reference System Identifier	GC / (specified standard time)

6. Data Quality

Data quality element **Data quality sub-element**	**Description**
Completeness	Presence or absence of features, their attributes and relationships
Commission	Excess data present in a dataset [Example] In case that school data has 105 items while 100 schools exist in a school list (universe of discourse), it is described as “5% excess”.
Omission	Data absent from a dataset [Example] In case that park data has 97 items while 100 parks exist in a park list (universe of discourse), it is described as “3% absent”.

Logical consistency	Degree of adherence to logical rules of data structure, attribution and relationships
Conceptual consistency	Adherence to rules of the conceptual schema [Example] Geo-spatial data reported as XML document must be “appropriate XML document” according to the concept rule (application schema) expressed by XML schema. It is treated as a conceptual consistency error when there are items which are against to such rules as ”Tags which are not defined in XML schema must not exist in XML documents”, “Feature type of a referent must not be incompatible with XML schema”, etc.
Domain consistency	Adherence of values to the value domains [Example] In case that domain for values for a certain feature attribute is defined as integer from one (1) to ten (10), it is treated as a domain consistency error when an item (attribute instance) exists outside the domain.
Format consistency	Degree to which data is stored in accordance with the physical structure of the data set [Example] Geo-spatial data reported as XML document must be “well-formed XML document” according to the XML grammar. It is treated as a format consistency error when there are items which are against to such rules as ”Start-tag and end-tag make a pair”, “One root tag exists and the tag is not nested with other tags”, etc.
Topological consistency	Correctness of the explicitly encoded topological characteristics of a dataset [Example] It is treated as a topological consistency error when there are items which are against to such rules described in application schema as ”all nodes on road-network data are endpoints of edges”, “Contour lines never cross each other”, “A start-point and end-point of those lines making administrative boundaries match” ,etc.
Positional accuracy	Accuracy of the position of features

Absolute or external accuracy	Closeness of reported coordinate values to values accepted as or being true [Example] In case that the standard deviation of the errors between coordinate values of composition points of road data and values accepted is 0.52m, it is described as “absolute accuracy standard deviation is 0.52m”.
Relative or internal accuracy	Closeness of the relative positions of features in a dataset to their respective relative positions accepted as or being true [Example] In case that the standard deviation of the errors between relative distances between reference points measured by field survey and relative distances calculated from coordinate values accepted is 0.12m, it is described as “relative accuracy standard deviation is 0.12m”.
Gridded data position accuracy	Closeness of gridded data position values to values accepted as or being true [Example] In case that the standard deviation of the errors between height values of lattice points generated by TIN interpolation and height values accepted by check survey is 1.23m, it is described as “gridded data position accuracy standard deviation is 1.23m”.
Temporal accuracy	Accuracy of the temporal attributes and temporal relationships of features
Accuracy of a time measurement	Correctness of the temporal references of an item (reporting of error in time measurement) [Example] In case that the standard deviation of the errors between construction dates reported in a building register and construction dates registered as time attributes of the building data is 5 days, it is described as “time measurement accuracy standard deviation is 5 days”.
Temporal consistency	Correctness of ordered events or sequences, if reported [Example] It is treated as a temporal consistency error when there are items (temporal attribute instances) whose reconstruction date is older than its demolition date.

Temporal validity	Validity of data with respect to time [Example] In case that there is a 7 minutes difference between the clock of the observatory showing the timestamp for observation results and the reference clock of the database side, it is described as “temporal validity error is 7 minutes”.
Thematic accuracy	Accuracy of quantitative attributes and the correctness of non-quantitative attributes and of the classifications of features and their relationships
Classification correctness	Comparison of the classes assigned to features or their attributes to a universe of discourse (e.g. ground truth or reference data set) [Example] It is treated as a classification correctness error when an item which must be specified as “river” is classified as “road”.
Non-quantitative attribute correctness	Correctness of non-quantitative attributes [Example] In case that 2% of all items’ (thematic attribute instances) “road name” are different from the names reported in the road register, it is described as “fraction defective of non-quantitative thematic attribute correctness is 2%”.
Quantitative attribute accuracy	Accuracy of quantitative attributes [Example] In case that the standard deviation of the errors between values of road length reported in a road register and values of “length (thematic attribute))” registered to road data is 12m, it is described as “quantitative thematic attribute accuracy standard deviation is 12m”.

In case that Random / Visual Inspection and Random Inspection are carried out, the method of random inspection and judgment of acceptance are described as follows.

1. Inspection lot

   The inspection lot is whole area for the data creation.

2. Quantity for Inspection

   Two (2) % of whole area

3. Extract method for inspection unit

   In case of scale at 1/25,000, inspection units are made by dividing the whole data creation area by a unit of map quadrangle for national topographic map for 1/25,000 scale and then dividing

them further by 5,000m (east and west direction) x 5,000m (north and south direction) grids. One (1) % out of the two (2) % (inspection quantity) is extracted by a supervisor and the other one (1) % is extracted by random sampling.

The extract method for inspection unit: Assign consecutive numbers from top-left of the data creation area. The supervisor extracts 1% of inspection units in order of risk level while the other 1% is extracted using random sampling numbers.
The next unit number shall be taken in case 1) the same inspection units as supervisor's or 2) the inspection units which are located outside of city boundaries or have blank area (e.g. sea) are extracted by random sampling. If it is difficult to extract inspection units not having blank area due to because the data creation area is small, select inspection units having less blank area.

The minimum number of inspection units is four (4). Therefore, four (4) inspection units are inspected even when data creation area is smaller than 5000km2.
Basically, for the same survey results, the same inspection units are used for different quality evaluation items.

4. Definition of items
   It is set down individually.

5. Ratio for random sampling
   All in the inspection unit is targeted
   The inspection unit is basically divided to 10 x 10 sub-mesh and all is inspected in each sub-mesh. In addition, the unit is divided to 2 x 2 mesh depending on quality evaluation procedure.

6. Inspection method
   It is set down individually.

7. Judgment of acceptance
   Error ratio is calculated by the following formula

$$\text{Error Ratio (\%)} = \frac{the\ number\ of\ sub\ meshes\ that\ there\ are\ errors\ more\ than\ 1}{the\ number\ of\ all\ sub\ mesh\ in\ each\ inspection\ unit} \times 100$$

The number of all sub-mesh in each inspection unit is equality of 100. Even white area is included in inspection unit, the error ratio shall be calculated as 100.

If the error ratio exceeds acceptable level for data quality in more than one inspection unit, the data quality is unsatisfied.

If unsatisfied, whole data should be rechecked.

After rechecking, inspection unit which is equal to 3 % of area is extracted. If it becomes nonconformance, inspection unit increases to 4 % or re-work is carried out.

Completeness / Commission / Omission

A-1

Quality Demand	The number of instances is equal to the numbers of the reference data
Sub-Element	Commission and Omission
Data Quality Scope	Instances of the following class: Boundariy_line, Boundary Pillars & Control Point (Ground Control Points and Bench Marks)
Data Quality Measure	Difference between the number of instances of dataset and the number of instances of reference data
Data Quality Evaluation Procedure	Automatic inspection is done on all instances. 1. Count the number of data included in the reference data class by class. 2. Count the number of instances of the dataset class by class. 3. Calculate the difference between the number of reference data and the number of instances class by class using the results of above 1.and 2. The sum of absolute values of the differences is the number of errors.

Acceptable Level for Data Quality	The number of error : 0 (zero)

A-2

Quality Demand	There is no Commission and Omission by comparing reference data (Satellite images, document of field work, existing maps, etc.)
Sub-Element	Commission and Omission
Data Quality Scope	Instances of the following classes: AirField, Bridge_Line, Bridge_Point, Km_Stone_Point, Pithead, Road_Line, Ropeway_Line, Tunnel, Buildings_Point, Buildings_Polygon, Buildings_Religion, Built_up_Area, Facilities, Recreation_Point, Recreation_Polygon, Electrical_Line, Electrical_Point, Industrial_Point, Vegetation_Point, Vegetation_Polygon, Hydro_Artificial_Line, Hydro_Artificial_Point, Hydro_Artificial_Polygon, Hydro_Line, Hydro_Point, Hydro_Polygon, Hydro_Utility_Line, Hydro_Utility_Point, River_Flow
Data Quality Measure	It is determined as an error when something which does not exist in the reference data exists in the dataset or when something which exists in the reference data does not exist in the dataset. A sub-mesh which has one (1) or more error(s) is treated as an error-sub-mesh. [Exception] Shapes added during editing for connection and edge-matching are not counted as commission. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$
Data Quality Evaluation Procedure	Visual inspection is done on randomly extracted instances. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Output all instances of the target class in the scope of the inspection unit. 4. For all sub-meshes of each inspection unit, visually compare the reference data (e.g. aerial photos, field note, original maps,

	etc.,) and the results of 3 above. Count the number of sub-meshes which have a feature instance(s) which does not correspond with either the reference data or the results of 3 above as error-sub-mesh. 5. Calculate error ratio of each inspection unit based on the result of 4 above.
Acceptable Level for Data Quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

A-3

Quality Demand	There is no Commission and Omission by comparing with regulation
Sub-Element	Commission and Omission
Data Quality Scope	Instances of the following classes: Contour_Earth, Contour_Ice, Contour_Rock
Data Quality Measure	In case of the followings, it is judged as an error. ● If there are five (5) or more principal contour lines between index contour lines, count the number of exceeded principal contour lines as excess data. ● If there are two (2) or more intermediate contour lines between principal contour lines, count the number of exceeded intermediate contour lines as excess data. ● There is no index contour line between +/- 200m deference of elevation height ● If the number of principal contour lines there are only 3 principal contour lines between index contour lines is three (3) or less, count the index contour lines as omission of index contour line. (For example: If the number of index contour lines is three, the number of error is 1,if the number of index lines is 2, the number of errors is 2.) A sub-mesh which has one (1) or more error(s) is treated as error-sub-mesh. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$
Data Quality	Visual inspection is done on randomly extracted instances.

Evaluation Procedure	1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Output all instances of the target class in the scope of the inspection unit. 4. For all sub-meshes of each inspection unit, visually compare the reference data (e.g. aerial photos, field note, original maps, etc.,) and the results of 3 above. Count the number of sub-meshes which have a feature instance(s) which does not correspond with either the reference data or the results of 3 above as error-sub-mesh. 5. Calculate error ratio of each inspection unit based on the result of 4 above.
Acceptable Level for Data Quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

A-4

Quality Demand	There is no Commission and Omission by comparing reference data (data for input, list of map symbols and annotations, etc. which are qualified by supervisor as true data.)
Sub-Element	Commission and Omission
Data Quality Scope	All of instance including annotations
Data Quality Measure	In case of the followings, it is judged as an error. ● There are excess map symbols and annotations which do not correspond to reference data (data for input, list of map symbols and annotations, etc. which are qualified by supervisor as true data.) in dataset. ● There are map symbols and annotations which do not pertain to feature instances in dataset. ● There is no map symbols and annotations which correspond to reference data (data for input, list of map symbols and annotations, etc. which are qualified by supervisor as true data.) in dataset. A sub-mesh which has one (1) or more error(s) is treated as

	error-sub-mesh. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$
Data Quality Evaluation Procedure	Visual inspection is done on randomly extracted instances. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Output all instances of the target class in the scope of the inspection unit. 4. For all sub-mesh in each inspection unit, if there is map symbol and annotation which do not pertain to feature instance, reference data (data for input, list of map symbols and annotations, etc. which are qualified by supervisor as true data.) and above 3 are compared by visual. If there is feature instance which does not correspond to either reference data or above 3, that sub-mesh is counted as error sub-mesh. 5. Calculate error ratio of each inspection unit based on the result of 4 above.
Acceptable Level for Data Quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

B-1

Quality Demand	There is no smallness line caused by issues during data creation
Sub-Element	Commission
Data Quality Scope	Instances of classes to be acquired as line
Data Quality Measure	A minute line which is shorter than the set criteria is treated as an error. Draft criteria shall be prepared by a data creator because potential of incidence of minute lines depends on a method of data creation. Data quality evaluation shall be executed after the draft criteria are approved by a supervisor.
Data Quality Evaluation	Automatic inspection is done on all instances. Using an inspection program, count the number instances of which

Procedure	spatial attribute match the minute line criteria as the number of errors in each feature of the target class.
Acceptable Level for Data Quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

B-2

Quality Demand	There is no sliver polygon caused by issues during data creation
Sub-Element	Commission
Data quality scope	Instances of classes to be acquired as polygon
Data quality measure	A sliver polygon which is smaller than the set criteria is treated as an error. Draft criteria shall be prepared by a data creator because potential of incidence of sliver polygon depends on the method of data creation. Data quality evaluation shall be executed after the draft criteria are approved by a supervisor.
Data quality evaluation procedure	Automatic inspection is done on all instances. Using an inspection program, count the number instances of which spatial attribute match the silver polygon criteria as the number of errors in each feature of the target class.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

C-1

Quality Demand	Elevation points measured by stereo plotter are acquired more than density of a criterion.
Sub-Element	Omission
Data quality scope	Instances of the following class: Control_Point
Data quality measure	● Divide the whole data creation area by 2500m×2500m (10cm×10cm on printed map）. A sub-mesh having five (5) or less height points measured by a stereo plotter is treated as an error sub-mesh. ● Sum up the total number of height points measured by a stereo plotter, reference points and annotations of counter line in each 2500m×2500m (10cm×10cm on printed map）

	sum-mesh. A sub-mesh having nine (9) or less points is treated as an error sub-mesh. [exception] In case that blank area (e.g. periphery, sea, lake) is included, the numbers of points described above shall be multiplied by the ratio of non-blank area. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{the\ total\ number\ of\ sub\ meshes} \times 100$
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Divide the data creation area by a unit of map quadrangle for national topographic map for 1/25,000 scale and further divide by sum-meshes of East-West 2500m x South-North 2500m then count the number of those sub-meshes. 2. Count the number of instances whose DM classification code is 7312 as well as the total number of height points, reference points and annotations of counter line of every sub-mesh. 3. Count the error sub-meshes. 4. Calculate error ratio based on the result of the 3 above.
Acceptable level for Data quality	Acceptance: Error ratio is ten (10) % or less. Rejection: Error ratio exceeds ten (10) %.

Logical Consistency / Format Consistency / Conceptual Consistency / Domain Consistency / Topological Consistency

D-1

Quality Demand	Well-formed XML document
Sub-Element	Format Consistency
Data quality scope	All dataset
Data quality measure	The number of places where Well-Formed XML is not correctly used within the dataset.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program (e.g. XML parser), count the number of places where Well-Formed XML is not correctly used within the dataset.
Acceptable level for Data quality	Acceptance: The number of places whose feature type dose not match the feature type defined by application schema is zero (0).

	Rejection: The number of places whose feature type dose not match the feature type defined by application schema is one (1) or more. The dataset which does not achieve this quality requirement is not considered as a finished product.

E-1

Quality Demand	Valid XML document
Sub-Element	Conceptual Consistency
Data quality scope	All dataset
Data quality measure	The number of places where Valid XML is not correctly used within the dataset.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program (e.g. XML parser), count the number of places whose feature type dose not match the feature type defined by application schema.
Acceptable level for Data quality	Acceptance: The number of places where Well-Formed XML is not used is zero (0). Rejection: The number of places where Well-Formed XML is one (1) or more. The dataset which does not achieve this quality requirement is not considered as a finished product.

F-1

Quality Demand	Within the domain defined in the application schema
Sub-Element	Domain Consistency
Data quality scope	All dataset
Data quality measure	The number of places where Valid XML is not correctly used within the dataset.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program (e.g. XML parser), count the number of places where attribute value of feature instance is not included in the domain defined in the application schema.
Acceptable level for Data quality	Acceptance: The number of places where attribute value of feature instance is not included in the domain is zero (0). Rejection: The number of places where attribute value of feature

	instance is not included in the domain is one (1) or more. The dataset which does not achieve this quality requirement is not considered as a finished product.

G-1

Quality Demand	(a single instance) Line or polygon feature instances do not have continuous vertexes in spatial attribute having the same coordinates and line feature instances consist of two or more, polygon feature instances consist of three or more composition points.
Sub-Element	Topological Consistency
Data quality scope	Instances of classes to be acquired as line or polygon
Data quality measure	It is treated as an error either (1) when an instance has continuous vertexes having the same coordinates or the distance between continuous vertexes is shorter than proximity threshold (1.0m) or (2) when a line-feature instance has less than two composition points or a polygon feature instance has less than three composition points.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program, count the number of errors of each feature instance of the target class.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

G-2

Quality Demand	(a single instance) Line or polygon feature instances do not have torsion nor self-contacts other than start/end points in spatial attribute.
Sub-Element	Topological Consistency
Data quality scope	Instances of the following classes: AirField, Bridge_Line, Bridge_Point, Km_Stone_Point, Pithead, Road_Line, Ropeway_Line, Tunnel, Buildings_Point, Buildings_Polygon, Buildings_Religion, Built_up_Area, Facilities, Recreation_Point, Recreation_Polygon, Electrical_Line, Electrical_Point, Industrial_Point, Vegetation_Point, Vegetation_Polygon, Hydro_Artificial_Line, Hydro_Artificial_Point,

	Hydro_Artificial_Polygon, Hydro_Line, Hydro_Point, Hydro_Polygon, Hydro_Utility_Line, Hydro_Utility_Point, River_Flow
Data quality measure	It is treated as an error either when a single instance has (1) torsion or (2) self-contacts (shape pattern UL3, UA2) other than its start/end points. Note that it is not treated as torsion if start/end points have the same coordinates.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program, count the number of instances having torsion of each feature instance of the target class.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

G-3

Quality Demand	(a single instance) A direction of coordinate strings of polygon feature instance is appropriate.
Sub-Element	Topological Consistency
Data quality scope	Instances of classes to be acquired as polygon
Data quality measure	The instance of which a direction of coordinate strings is inappropriate is treated as an error, where anticlockwise rotation is appropriate for peripheries and clockwise rotation is appropriate for inner circumference.–
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Using an inspection program, count the number of instances having inappropriate direction of coordinate strings of each feature instance of the target class.–
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

G-4

Quality Demand	(a single instance) A direction of a line feature instance is appropriate in case a direction of coordinate strings is provided.
Sub-Element	Topological Consistency
Data quality scope	Line feature instances of the following class: Geography_Line,
Data quality	The instance of which a direction of coordinate strings is

measure	inappropriate is treated as an error. Directions of coordinate strings shall be in accordance with “Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps”. A sub-mesh which has one (1) or more error(s) is treated as error-sub-mesh. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$
Data quality evaluation procedure	Visual inspection is done on randomly extracted instances. 1. Extract inspection unit(s) in accordance with the random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Output classification codes defining directions of coordinate strings and instances corresponding to shape classification with the information of directions of coordinate strings from the instances within the inspection units. 4. For all the sub-meshes, check directions of coordinate strings of the outputs by visually comparing with the reference data. Count the number of sub-meshes having instances which have inappropriate directions as error sub-meshes. 5. Calculate error ratio of each inspection unit based on the result of 4 above.
Acceptable level for Data quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

H-1

Quality Demand	(the same class) Line feature instances do not cross or overlap with other instances within the same class.
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances within the same class of the following class: Boundary_Line, Road_Line, Ropeway_Line Hydro_Line
Data quality measure	・ Boundary_Line Within the same class, instance pairs crossing by LL3 to LL10 patterns or overlapping are treated as errors.

	・ Road_Line, Ropeway_Line Within the same class, instance pairs crossing by LL3 to LL10 patterns or overlapping are treated as errors. [exception] Multi level crossing and vertical parallel are treated as exceptions. ・ Hydro_Line Within the same class, instance pairs crossing by LL6 to LL10 patterns or overlapping are treated as errors. [exception] Overpass is treated as an exception. It is counted as one (1) when two (2) instances cross at plural places. Proximity threshold shall be 1.0m and overlap threshold shall be 1.0m.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. For all instance pairs of the same class, count the number of instances which cross or overlap with one of LL6 to LL10 cross patterns.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

H-2

Quality Demand	(the same class) Line feature instances fulfill the given connection conditions at connecting points with other instances within the same class.
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances within the same class of the following class: Boundary_Line, Road_Line, Hydro_Line
Data quality measure	It is treated as an error when the following connecting conditions are not fulfilled at points where instances within the same class cross or connect. A sub-mesh which has one (1) or more error(s) is treated as error-sub-mesh. Boundary_Line ・ Endpoints of all instances except the ones which make a circle by themselves connect to endpoints of other instances

	by LL1 or LL2 patterns. [exception] It is not treated as an error even when unconnected endpoints exist when 1) the data creation area covers only part of administrative areas, 2) the administrative area includes estuary and 3) the administrative boundary is undetermined. · Three or more instances connect at connection points by LL1 pattern. [exception] It is not treated as an error even when two instances connect by LL1 pattern when it is clear that a boundary of neighbor administrative area exists outside of the administrative boundary. · Two instances connect at connection points by LL2 pattern. Road_Line · All instances except the ones making a circle by themselves connect to endpoints of other instances by LL1 or LL2 patterns. [exception] It is not treated as an error even when unconnected endpoints exist when they are on the outer edges of the data creation area or dead ends. Hydro_Line · All instances except the ones making a circle by themselves connect to endpoints of other instances by LL1, LL2, LL3, LL4 or LL5 patterns. [exception] It is not treated as an error even when unconnected endpoints exist when they are on the outer edges of the data creation area or a river line (single). · Thematic attribute (except feature ID) of connected instance pairs differ. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$ Proximity threshold for connection judgement shall be 1.0m
Data quality	Sampling inspection is done.

evaluation procedure	1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. For all the sub-meshes, count the number of sub-meshes having one (1) or more connecting points which do not fulfill the connecting conditions. 4. Calculate error ratio of each inspection unit based on the result of 3 above.
Acceptable level for Data quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

H-3

Quality Demand	(the same class) Polygon feature instances do not overlap with other instances within the same class.
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances within the same class of the following class: Built_up_Area, Vegetation_Polygon, Hydro_Polygon
Data quality measure	Instance pairs must be connected by AA1 crossing pattern or unattached by AA6 pattern. Otherwise, it is treated as an error. [exception] ・ For Built_up_Area, Vegetation_Polygon, Hydro_Polygon, it is not treated as an error when visibility flags are different. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ instance\ pairs}{the\ number\ of\ all\ instaces\ of\ the\ tar\ et\ calss} \times 100$ Proximity threshold shall be 1.0m
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Count the number of all instances of the target feature class. 2. For all the instance pairs in the same class, count the number of instance pairs which do not cross with AA1 or AA6 crossing pattern. 3. Calculate error ratio of each class based on the results of 1

	and 2 above.
Acceptable level for Data quality	Acceptance: Error ratio of all classes is ten (10) % or less. Rejection: Error ratio of one (1) or more classes exceeds ten (10) %.

H-4

Quality Demand	(the same class) Neighboring polygon feature instances within the same class must not have gaps between them.
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances within the same class of the following class: Built_up_Area, Vegetation_Polygon, Hydro_Polygon
Data quality measure	It is treated as an error when a pair of polygon feature instances considered to be contiguous based on a topography point of view has gaps. A sub-mesh having one (1) or more error(s) is treated as error-sub-mesh. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ sub\ meshes}{100} \times 100$ Proximity threshold for gap judgement shall be 1.0m
Data quality evaluation procedure	Visual inspection is done on randomly extracted instances. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Output all instances of the target class in the scope of the inspection unit. 4. For all the sub-meshes, count the number of sub-meshes which have one (1) or more error(s). 5. Calculate error ratio of each inspection unit based on the result of 4 above.
Acceptable level for Data quality	Acceptance: Error ratio of all inspection units is ten (10) % or less. Rejection: Error ratio of one or more inspection units exceeds ten (10) %.

I-1

Quality Demand	(the same class) Polygon feature instances attach or not adjoin with instances within other classes. (i.e. not overlapping)
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances between the following class: Buildings_Polygon ⇔ Hydro_Polygon
Data quality measure	Instance pairs between classes must be adjoin by AA1 pattern or unattached by AA6 pattern. Otherwise, it is treated as an error. [exception] It is not treated as an error when visibility flags are different between the instances being compared. $\text{Error Ratio } (\%) = \frac{the\ number\ of\ error\ instance\ pairs}{the\ number\ of\ all\ instances\ of\ the\ tar\ et\ classes} \times 100$ Proximity threshold shall be 1.0m
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Count the number of all instances of the target feature class. 2. For all the instance pairs in the same class, count the number of instance pairs which do not cross with AA1 or AA6 crossing pattern. 3. Calculate error ratio of each class based on the results of 1 and 2 above.
Acceptable level for Data quality	Acceptance: Error ratio of every class is ten (10) % or less. Rejection: Error ratio of one or more classes exceeds ten (10) %.

I-2

Quality Demand	(between classes) Point instances exist at both ends of a line instance.
Sub-Element	Topological Consistency
Data quality scope	Relationship between instances between the following class: Electrical_Line ⇔ Electrical_Point
Data quality measure	Point feature instances connect both ends of all line feature instances by PL1 pattern. Count as one (1) when a point feature instance does not exist at least one end. All point feature instances have line feature instances and they are connected by PL1 pattern.

	$$\text{Error Ratio (\%)} = \frac{the\ number\ of\ error\ instances}{the\ number\ of\ all\ instaces\ of\ the\ tar\ et\ polon\ features} \times 100$$
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Count the number of all instances of the target feature class. 2. Count the number of errors. 3. Calculate error ratio of each class based on the results of 1 and 2 above.
Acceptable level for Data quality	Acceptance: Error ratio is ten (10) % or less. Rejection: Error ratio exceeds ten (10) %

Positional Accuracy / Absolute or External Positional Accuracy / Relative or Internal Positional Accuracy / Gridded Data Positional Accuracy

J-1

Quality Demand	To have the coordinates equal to the coordinate values accepted.
Sub-Element	Absolute or External Positional Accuracy
Data quality scope	Control_Point
Data quality measure	Automatic inspection is done on all instances. 1. The instance which has plane coordinates unequal to the coordinate values accepted is treated as an error.
Data quality evaluation procedure	Automatic inspection is done on all instances. 1. Count the number of all instances of the target feature class. 2. Count the number of errors. 3. Calculate error ratio of each class based on the results of 1 and 2 above.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

J-2

Quality Demand	The standard deviation of the horizontal position errors calculated by check survey is less than acceptable quality level.

Sub-Element	Absolute or External Positional Accuracy
Data quality scope	Instances of the following classes: AirField, Bridge_Line, Bridge_Point, Km_Stone_Point, Pithead, Road_Line, Ropeway_Line, Tunnel, Buildings_Point, Buildings_Polygon, Buildings_Religion, Built_up_Area, Facilities, Recreation_Point, Recreation_Polygon, Electrical_Line, Electrical_Point, Industrial_Point, Vegetation_Point, Vegetation_Polygon, Hydro_Artificial_Line, Hydro_Artificial_Point, Hydro_Artificial_Polygon, Hydro_Line, Hydro_Point, Hydro_Polygon, Hydro_Utility_Line, Hydro_Utility_Point,
Data quality measure	Calculate the standard deviation of the errors between the coordinates of positions within the data set (Geospatial Data (Scale 1/25,000)) and the coordinates accepted by check survey (i.e. more accurate reference data) where population mean of the errors is zero (0). However, invisible data is not included in the check. [The standard deviation of the horizontal position errors] $= \sqrt{\frac{\sum_{i-1}^{n}((i \quad i)^2 + (i \quad i)^2)}{n-1}}$ *xi* : X coordinates of the positions of the data to be checked within the data set [meter] *yi* : Y coordinates of the positions of the data to be checked within the data set [meter] *Xi* : X coordinates of the positions of more accurate reference data [meter] *Yi* : Y coordinates of the positions of more accurate reference data [meter] *n* : the number of samples
Data quality evaluation procedure	Sampling inspection is done. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into 2500m sub-mesh of 2 x 2. 3. Display or output the data (feature instance) included in the inspection unit(s). 4. Extract 21 or more edges (two or more points/edge) from

	clear features in each 2500m sub-mesh. 5. Measure the position coordinates of the extracted feature on the data set. 6. Acquire the results of check survey of the points corresponding to points of the extracted features. 7. Calculate the standard deviation of the errors based on the results of 5 and 6 above.
Acceptable level for Data quality	Acceptance: The standard deviation of the horizontal position errors of all 2500m sub meshes is less than 17.5m Rejection: The standard deviation of the horizontal position errors exceeds 17.5m

J-3

Quality Demand	The standard deviation of the horizontal position errors calculated by coordinates on existing maps is less than acceptable quality level.
Sub-Element	Absolute or External Positional Accuracy
Data quality scope	Instances of the following classes: AirField, Bridge_Line, Bridge_Point, Km_Stone_Point, Pithead, Road_Line, Ropeway_Line, Tunnel, Buildings_Point, Buildings_Polygon, Buildings_Religion, Built_up_Area, Facilities, Recreation_Point, Recreation_Polygon, Electrical_Line, Electrical_Point, Industrial_Point, Vegetation_Point, Vegetation_Polygon, Hydro_Artificial_Line, Hydro_Artificial_Point, Hydro_Artificial_Polygon, Hydro_Line, Hydro_Point, Hydro_Polygon, Hydro_Utility_Line, Hydro_Utility_Point,
Data quality measure	Calculate the standard deviation of the errors between the coordinates of positions within the data set (Geospatial Data (Scale 1/25,000)) and the coordinates on existing maps (i.e. more accurate reference data) where population mean of the errors is zero (0). [The standard deviation of the horizontal position errors] $= \sqrt{\frac{\sum_{i-1}^{n}((i \quad - \quad i)^2 + (\ i - i\ )^2)}{n-1}}$ *xi* ：X coordinates of the positions of the data to be checked within

	the data set [meter] *yi* : Y coordinates of the positions of the data to be checked within the data set [meter] *Xi* : X coordinates of the positions of more accurate reference data [meter] *Yi* : Y coordinates of the positions of more accurate reference data [meter] *n* : the number of samples
Data quality evaluation procedure	Measure the remaining errors of the four corners of existing maps. Measure the standard deviation of errors of spatial attribute of features by following the procedure below when the remaining errors is less than 0.2mm. Sampling inspection is done. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into 2500m sub-mesh of 2 x 2. 3. Display or output the data (feature instance) included in the inspection unit(s). 4. Extract 21 or more edges (two or more points/edge) from clear features in each 2500m sub-mesh. 5. Measure the position coordinates of the extracted feature on the data set. 6. Measure the coordinates of the points corresponding to the points of the extracted features on the existing maps. 7. Calculate the standard deviation of the errors of each 2500m sub mesh based on the results of 5 and 6 above.
Acceptable level for Data quality	Acceptance: The standard deviation of the horizontal position errors of all 2500m sub meshes is less than 0.3mm on the map scale Rejection: The standard deviation of the horizontal position errors exceeds 0.3mm on the map scale.

J-4

Quality Demand	The standard deviation of the errors of height values of vertical control points is less than acceptable quality level.

Sub-Element	Absolute or External Positional Accuracy
Data quality scope	Instances of the following classes: Control_Point (Only Spot Height)
Data quality measure	Calculate the standard deviation of the errors between the height values within the data set (Geospatial Data (Scale 1/25,000)) and the results of leveling (i.e. more accurate reference data) where population mean of the errors is zero (0). [The standard deviation of the errors of height values] $= \sqrt{\frac{\sum_{i-1}^{n}(hi - \quad i)^2}{n-1}}$ *hi* : height values of the data to be checked within the data set [meter] *Hi* : Height values of more accurate reference data [meter] *n* : the number of samples
Data quality evaluation procedure	Sampling inspection is done. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into 2500m sub-mesh of 2 x 2. 3. Display or output the data (feature instance) included in the inspection unit(s). 4. Extract all vertical control points measured by a stereo plotter in each 2500m sub-mesh. 5. For the extracted points, acquire the values of height (the values of the thematic attribute) of instances on the data set. 6. Acquire the height values of the results of leveling of the points corresponding to the extracted points. 7. Calculate the standard deviation of the errors of each 2500m sub mesh based on the results of 5 and 6 above.
Acceptable level for Data quality	Acceptance: The standard deviation of the height values of vertical control points measured by a stereo plotter of all 2500m sub meshes is less than 6.66mm Rejection: The standard deviation of the errors of height values exceeds 6.66mm.

J-5

Quality Demand	The standard deviation of the errors of height values of contour lines is less than acceptable quality level.
Sub-Element	Absolute or External Positional Accuracy
Data quality scope	Instances of the following classes: Contour_Earth, Contour_Ice, Contour_Rock
Data quality measure	Calculate the standard deviation of the errors between the height values within the data set (Geospatial Data (Scale 1/25,000)) and the results of leveling (i.e. more accurate reference data) where population mean of the errors is zero (0). [The standard deviation of the errors of height values] $= \sqrt{\frac{\sum_{i-1}^{n}(hi - \quad i)^2}{n-1}}$ *hi* : height values of the data to be checked within the data set [meter] *Hi* : Height values of more accurate reference data [meter] *n* : the number of samples
Data quality evaluation procedure	Sampling inspection is done. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into 2500m sub-mesh of 2 x 2. 3. Display or output the data (feature instance) included in the inspection unit(s). 4. Extract ten or more points whose position is clear based on the relationship with other features in each 2500m sub-mesh. 5. For the extracted points, acquire the values of height (the values of the thematic attribute) of instances on the data set. 6. Acquire the height values of the results of leveling of the points corresponding to the extracted points. 7. Calculate the standard deviation of the errors of each 2500m sub mesh based on the results of 5 and 6 above.
Acceptable level for Data quality	Acceptance: The standard deviation of height values of contour lines of all 2500m sub meshes is less than 10m

	Rejection: The standard deviation of height values of contour lines exceeds 10m.

Temporal accuracy / Accuracy of a time measurement / Temporal Consistency / Temporal validity

Temporal elements do not exist in this data set.

Thematic accuracy / Classification Correctness / Non-quantitative Attribute Correctness / Quantitative Attribute Accuracy

O-1

Quality Demand	Classification code, feature type and visibility flag are set correctly.
Sub-Element	Classification Correctness
Data quality scope	The instances which are given incorrect classification code, feature type or visibility flag are treated as error instances.
Data quality measure	Visual inspection is done on all instances. 1. Output instances included in the inspection unit(s) with classification code, feature type and visibility flag attached 2. Check the items of the 1 above by comparing with the reference data (e.g. source documents, coordinate results etc.). 3. The instances which are given incorrect classification code, feature type or visibility flag are treated as error instances based on the result of the 2 above.
Data quality evaluation procedure	Automatic inspection is done on all instances. Count the number of error instances.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

P-1

Quality Demand	Name and Citycode are set correctly.
Sub-Element	Non-quantitative Attribute Correctness
Data quality scope	Instances of the following classes: Boundary_Line,

Data quality measure	The instances whose name and citycode do not correspond with the reference data (e.g. field survey documents, existing maps etc.) are treated as error instances.
Data quality evaluation procedure	Visual inspection is done on all instances. 1. Output instances included in the inspection unit(s) with e.g. field survey documents, existing maps etc. 2. Check the items of the 1 above by comparing with the reference data (e.g. field survey documents, existing maps etc.). 3. The instances which are given incorrect name and citycode are treated as error instances based on the result of the 2 above.
Acceptable level for Data quality	Acceptance: The number of errors is zero (0). Rejection: The number of errors is one (1) or more.

P-2

Quality Demand	Name is set correctly.
Sub-Element	Non-quantitative Attribute Correctness
Data quality scope	Instances of the following classes: AirField, Road_Line, Buildings_Polygon, Built_up_Area, Facilities, Hydro_Line, Hydro_Point, Hydro_Polygon, Control_Point
Data quality measure	The instances whose name do not correspond with the reference data (e.g. field survey documents, existing maps etc.) are treated as error instances. $\text{Error Ratio (\%)} = \frac{the\ number\ of\ error\ instances}{the\ number\ of\ all\ instances\ of\ the\ tar\ et\ classes} \times 100$
Data quality evaluation procedure	Visual inspection is done on randomly extracted instances. 1. Extract inspection unit(s) in accordance with a random inspection method. 2. Divide each mesh of inspection unit(s) into sub-mesh of 10 x 10. 3. Display or output the instances included in the inspection unit(s) with attribute character strings attached.

	4. Check all sub-meshes in each inspection unit by visually comparing with the reference data (e.g. field survey documents, existing maps etc.) to see if attribute values of all instances are appropriate 5. Count the number of sub-meshes which have one or more error instances as error sub-meshes based on the results of the 4 above. 6. Calculate error ratio of each inspection unit based on the result of 5 above.
Acceptable level for Data quality	Acceptance: Error ratio is ten (10) % or less. Rejection: Error ratio exceeds ten (10) %.

7. Data Product Delivery

7.1. Format Type

Provide a name of format type used for the data product. XML is recommended.

7.2. Encoding Specification

Provide a specific method to encode the items shown in the application schema class diagram.

Example: GML

7.3. Character Set

Example: UTF-8

7.4. Language

Example: English (Value of Attribute)

7.5. Delivery Unit

Example: Map Sheet

7.6. Delivery Media

Example: DVD-R

8. Metadata

8.1. Type of Metadata

Example: JMP2.0

8.2. Description Items

Specify items need to be described.

8.3. Unit

Describe for what extent (unit) metadata is created. Generally, metadata is created for geo-spatial data product one by one. When geo-spatial data product is created as a series, metadata which describes the series might be needed. Metadata can be made per unit when geo-spatial data product is created for a specific area or divided into mesh units.

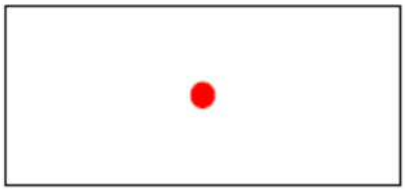
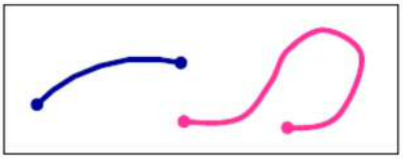
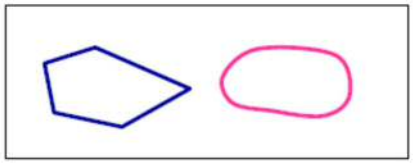
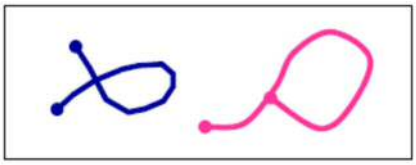
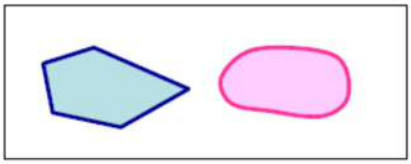
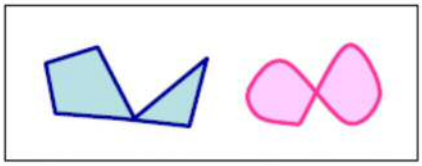
9. Others

Provide any other important information regarding geo-spatial data creation or use of the created geo-spatial data.

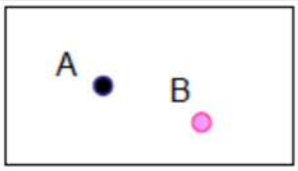
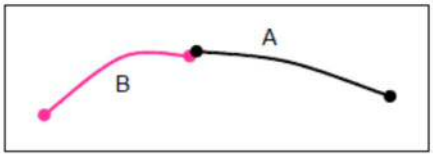
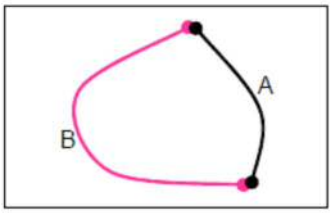
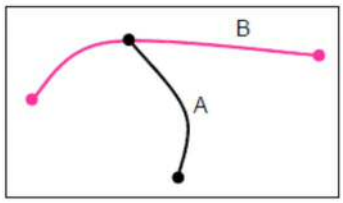
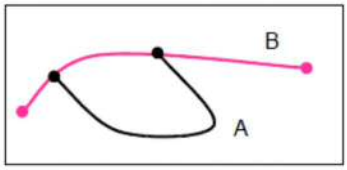
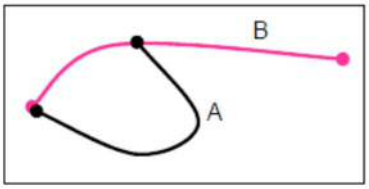
Appendix-A

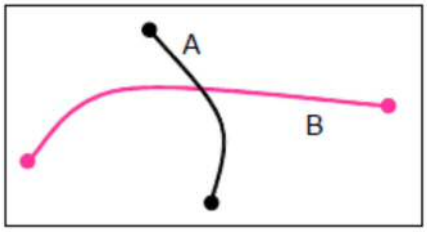
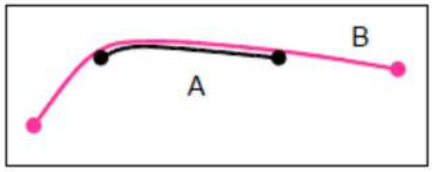
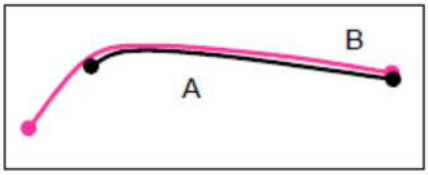
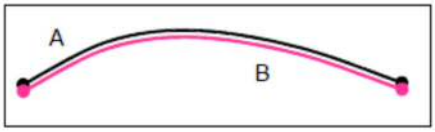
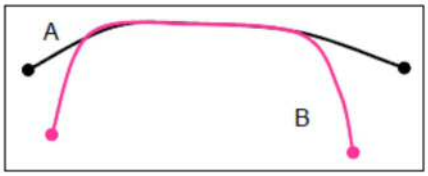
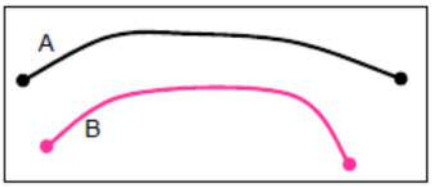
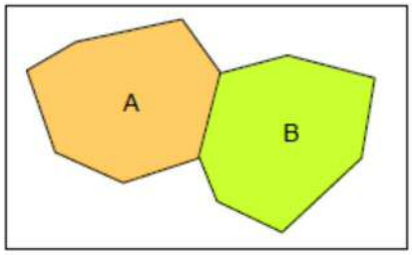
Classification for spatial shape of feature instances and its relation

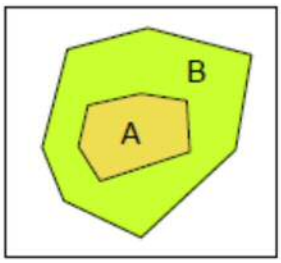
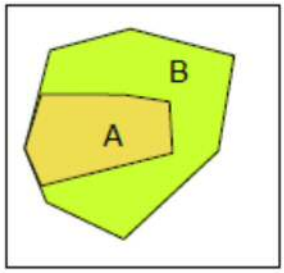
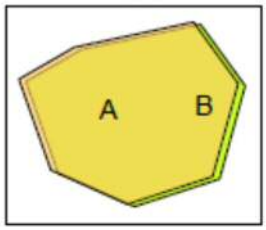
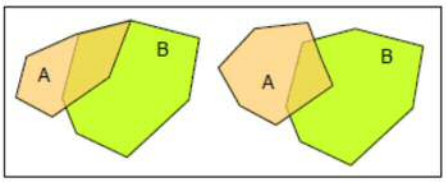
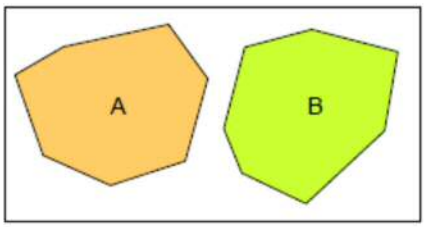
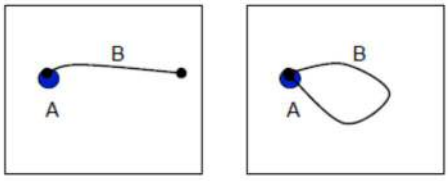
◆ **Shape pattern of feature instances**

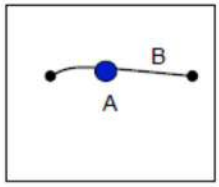
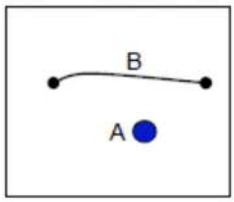
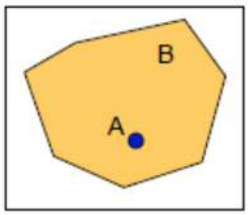
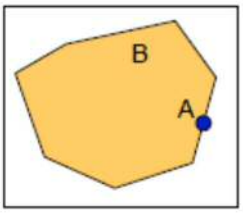
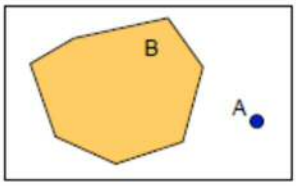
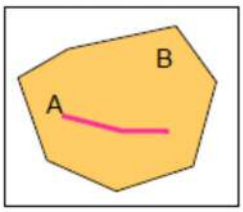
Shape pattern	Description	Examples
UP1	Location of features is indicated as point, and there is no other than that point	
UL1	Simple line feature which is no self-intersection and self-contact	
UL2	Looped line feature which is no self-intersection and self-contact	
UL3	Self-intersection or self-contact	
UA1	Simple polygon feature which is no self-intersection and self-contact	
UA2	Self-intersection or self-contact	

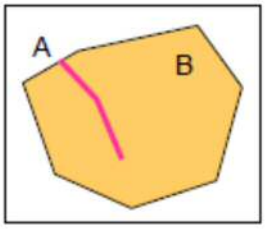
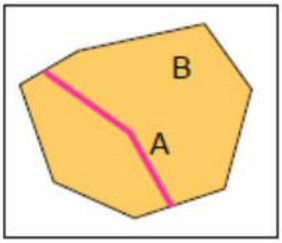
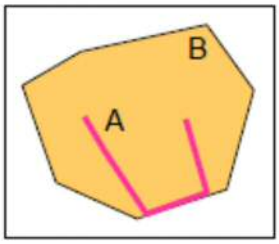
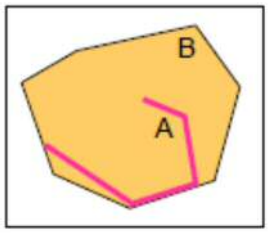
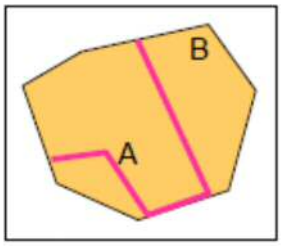
◆ Cross pattern between feature instances

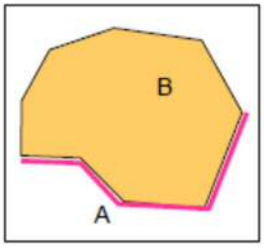
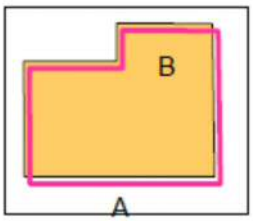
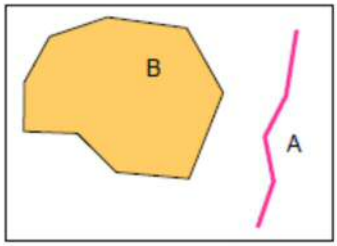
Cross pattern	Description	Examples
PP1	Coordinate value of point feature A and point feature B are different.	
LL1	Line feature A and line feature B connect each other at their end points (one end each) and they never cross.	
LL2	Line feature A and line feature B connect each other at their end points (both ends) and they never cross.	
LL3	One end of line feature A connects to line feature B in the middle and they never cross.	
LL4	Both ends of line feature A connects line feature B in the middle and they never cross.	
LL5	One end of line feature A connects to one end of line feature B and the other end of line feature A connects to line feature B in the middle and they never cross.	

Cross pattern	Description	Examples
LL6	Line feature A and line feature B cross each other.	
LL7	Line feature A is included in line feature B (not sharing both end points of each).	
LL8	Line feature A is included in line feature B (sharing one end point of each).	
LL9	Line feature A and line feature B match.	
LL10	Line feature A and line feature B overlap.	
LL11	Line feature A and line feature B are separately-placed.	
AA1	Polygon feature A and polygon feature B connect.	

Cross pattern	Description	Examples
AA2	Polygon feature B contains polygon feature A	
AA3	Polygon feature B contains polygon feature A (overlapping part of edge line)	
AA4	Polygon feature A and polygon feature B are completely overlap.	
AA5	Polygon feature A and polygon feature B are partly overlap.	
AA6	Polygon feature A and polygon feature B are unattached.	
PL1	Point feature A exist on an end point of line feature B.	

Cross pattern	Description	Examples
PL2	Point feature A exists on the middle of line feature B.	
PL3	Point feature A and line feature B are separately-placed.	
PA1	Polygon feature B contains point feature A	
PA2	Point feature A exists on the edge of polygon feature B	
PA3	Point feature A and polygon feature B are separately-placed.	
LA1	Polygon feature B contains line feature A completely.	

Cross pattern	Description	Examples
LA2	Line feature A does not exist out of polygon feature B (an end point of line feature is on the edge of polygon feature)	
LA3	Line feature A does not exist out of polygon feature B (both end point of line feature are on the edge of polygon feature)	
LA4	Line feature A does not exist out of polygon feature B (part of line feature overlaps with edge of polygon feature, and both end points of line feature are inside of polygon feature)	
LA5	Line feature A does not exist out of polygon feature B (part of the line feature overlaps with the edge of the polygon feature, and an end point of the line feature is on the edge of the polygon feature)	
LA6	Line feature A does not exist out of polygon feature B (part of the line feature overlaps with the edge of the polygon feature, and both end points of the line feature are on the edge of the polygon feature)	

Cross pattern	Description	Examples
LA7	Part of line feature A overlaps with edge of polygon feature B	
LA8	Line feature A overlaps with the edge of polygon feature B completely.	
LA9	Line feature A and polygon feature B are separately-placed.	

Appendix-B

Map symbols regulation for 1: 25,000 Scale Digital Topographic Maps