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RESULTS OF DEVELOPMENT AND APPLICATION GEOGRAPHIC INFORMATION STANDARDS IN VIETNAM

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Contents

Background

1990s of the 20th century:

- **GIS started developing:** 90 years of the 20th century
- **Application:** resource management, agriculture, forestry, land survey, transportation, etc…
- **Method of data creation**: digitization paper maps
- **Software :** Intergraph, Autodesk, MapInfo, etc…
- **Database:** small and not comprehensive, cannot common use

Background

Since 2000:

- **Issued** the national reference system and coordinate system VN-2000
- **Issued** technical regulations for digital topographic maps, cadastral maps and land use maps
- Digital regulations not by ISO-TC211
- **Application for** establishing maps and database:
  - ❖Digital topographic maps 1:2000 -> 1:1000000
  - ❖Digital cadastral maps 1:200 -> 1:10000

Background

Standardisation plan:

- **Stage I (2006 – 2009):** Building national basic geographic information standards and standards for basic geographic data and issued as technical regulations.
- **Stage II (2010 – 2011):** Improving the technical regulations and promulgated as a technical standards.
- **Stage III (2012 - ...):** Publishing the national standards.

Background

Results of standardization in stage I:

✓2007&2008 : MONRE has issued the decision to apply the geographic information basic standard.

➢ 2009: will complete the technical regulations for basic geographic data 1:2000, 1:5000; 1:10000; 1:50000 &1:1000000;

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

2.1 Overview

ISO TC211 Standards to consider:

- ✓ ISO19103 Conceptual Schema Language
- ✓ ISO19107 Spatial schema
- ✓ ISO19108 Temporal schema
- ✓ ISO19109 Rules for Application Schema
- ✓ ISO19110 Methodology for Feature Cataloguing
- ✓ ISO19113 Quality principles
- ✓ ISO19114 Quality evaluation procedures
- ✓ ISO19115 Metadata
- ✓ ISO19117 Portrayal
- ✓ ISO19111 Spatial Referencing by Coordinates
- ✓ ISO19101 Encoding
- ✓ ISO19136 Geography Mark-up Language

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

2.1 Overview *(cont.)*

GIBS include the following 9 standards:

1. Standards for geographic data structure
2. Standards for spatial concept module
3. Standards for time concept module
4. Standards for classifications of geographic object
5. Standards for spatial referencing by coordinate
6. Standards for assessment of geographic data quality
7. Standards for metadata
8. Standards for presenting geographic data
9. Standards for encoding, data sharing's.

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

2.2 Standard for structure model of geographic data

UML components:

- UML package
- UML class
- UML relationship
- UML stereotype

Syntax:

[Range] attribute name [cardinality] [: data type] [= the value generated]

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

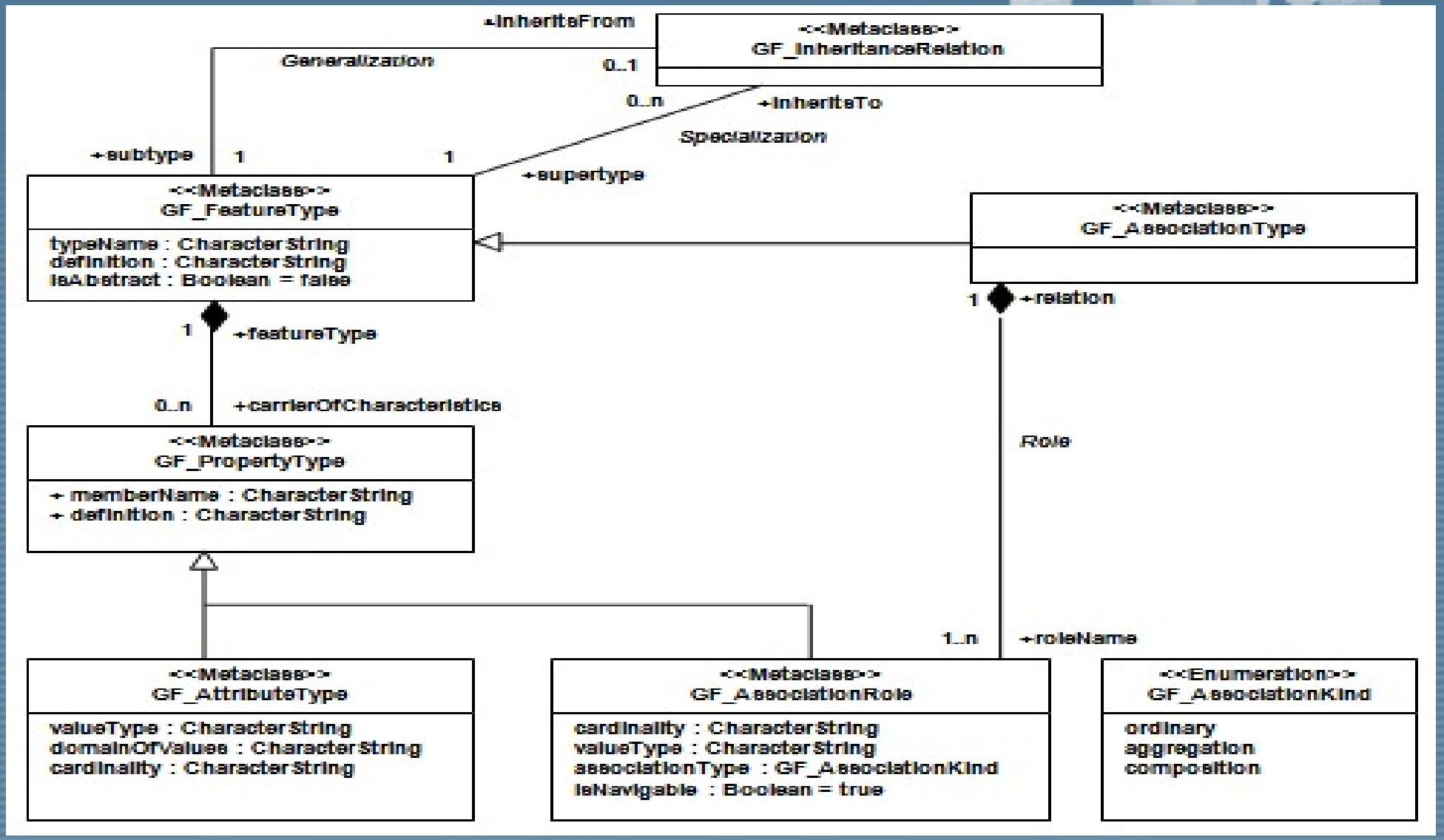


Figure 2.1: **The general structure scheme of geographic data**

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

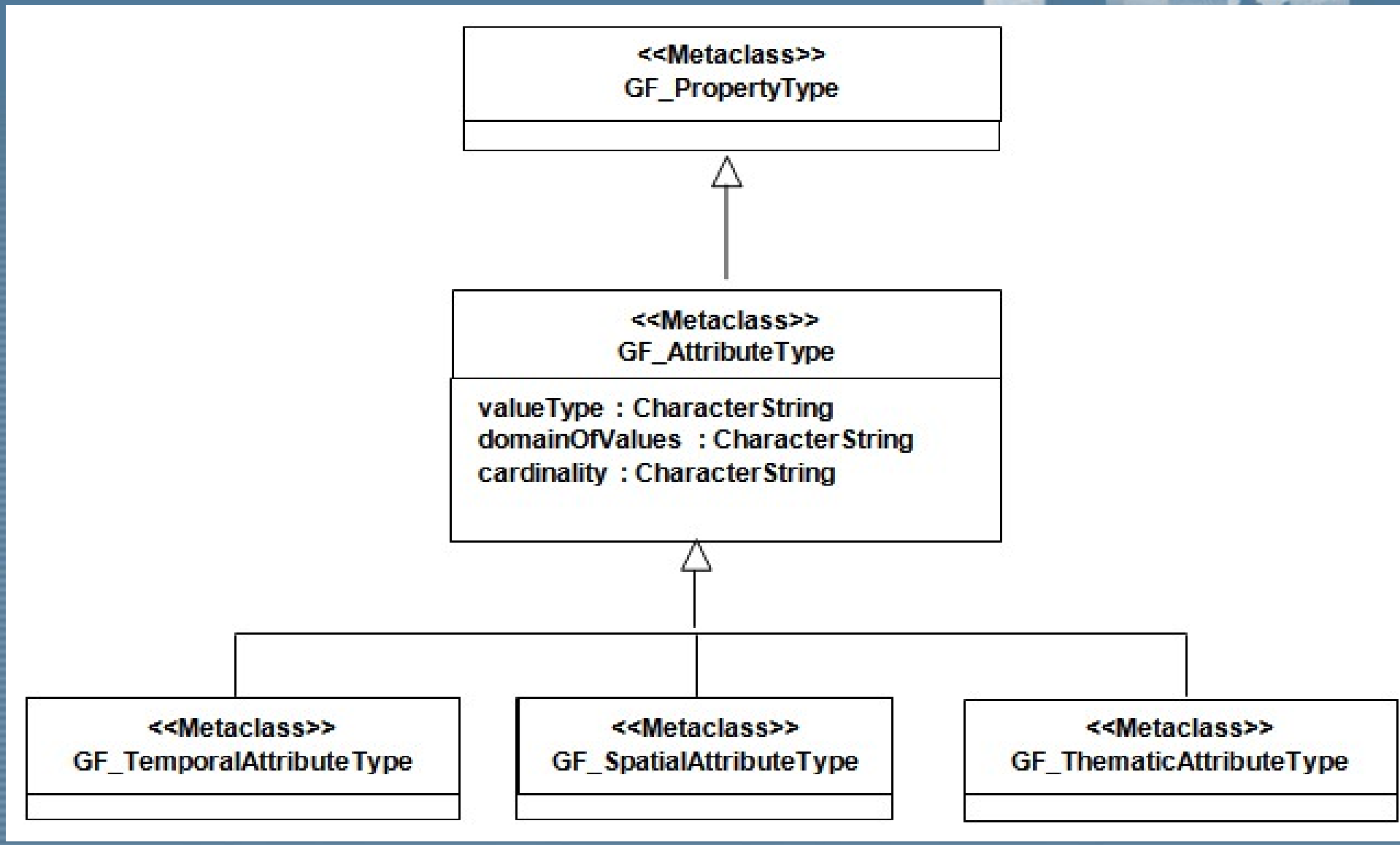


Figure 2.2: **Attribute UML class scheme**

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

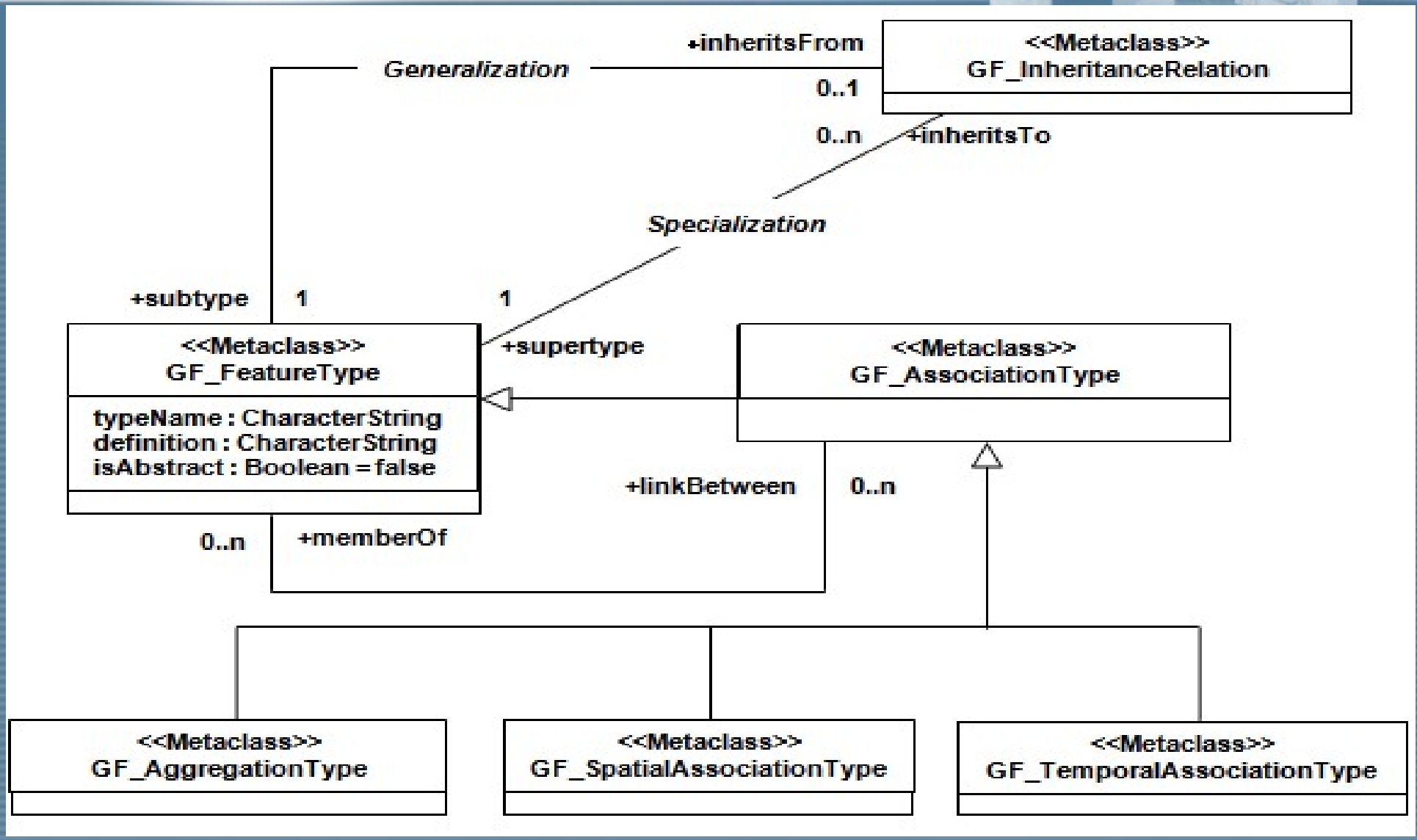


***Figure 2.3*: Relationship UML class scheme**

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

2.3 Standard for classification of geographic objects

Purposes:

- To build the feature catalogue: name, definition, feature type, attribute, relationship, detailed information .
- To build database to provide information about the feature catalogue.

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

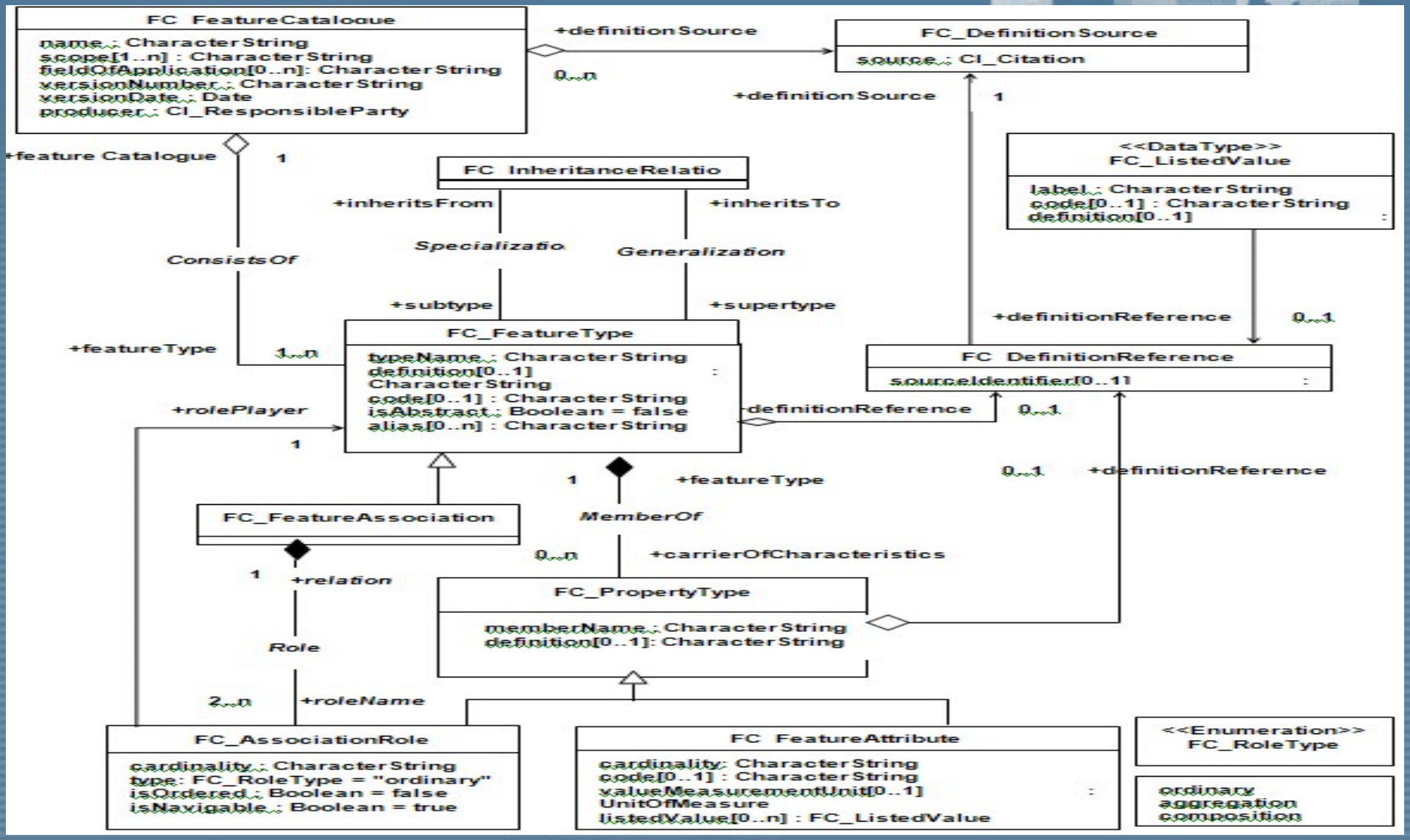


Figure 2.4: **Concept model of feature catalogue**

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

Feature Catalog : 177 objects, 102 attributes in 10 following themes:

1. National borders, administration borders (25)
2. Infrastructure (30)
3. Residential (3)
4. Geographical names(6)
5. Topography (20)
6. Coordinate Reference Systems (9)
7. Transport Networks (35)
8. land cover (13)
9. Boundary (3)
10. Hydrography (33)

2. THE BASIC GEOGRAPHIC INFORMATION STANDARD

2.4 Implementing

- ✓ Compulsory application when building the national basic geographic data and other specific geographic data
- ✓ encouraged to apply for specific geographic information system
- ✓ basis for building of Technical Rules for basic geographic data and specific geographic data such as cadastral data

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.1 Contents and data packages

The technical regulations specified :

- structure model
- feature catalogue
- referencing by coordinates
- quality
- metadata
- portrayal
- encoding
- sharing basic geographic data

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.1 Contents and data packages *(cont.)*

7 data packages:

1. Coordinate control points
2. National and administration borders
3. Topography
4. Hydrography
5. Transport Networks
6. Residential and Infrastructure
7. land cover

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models

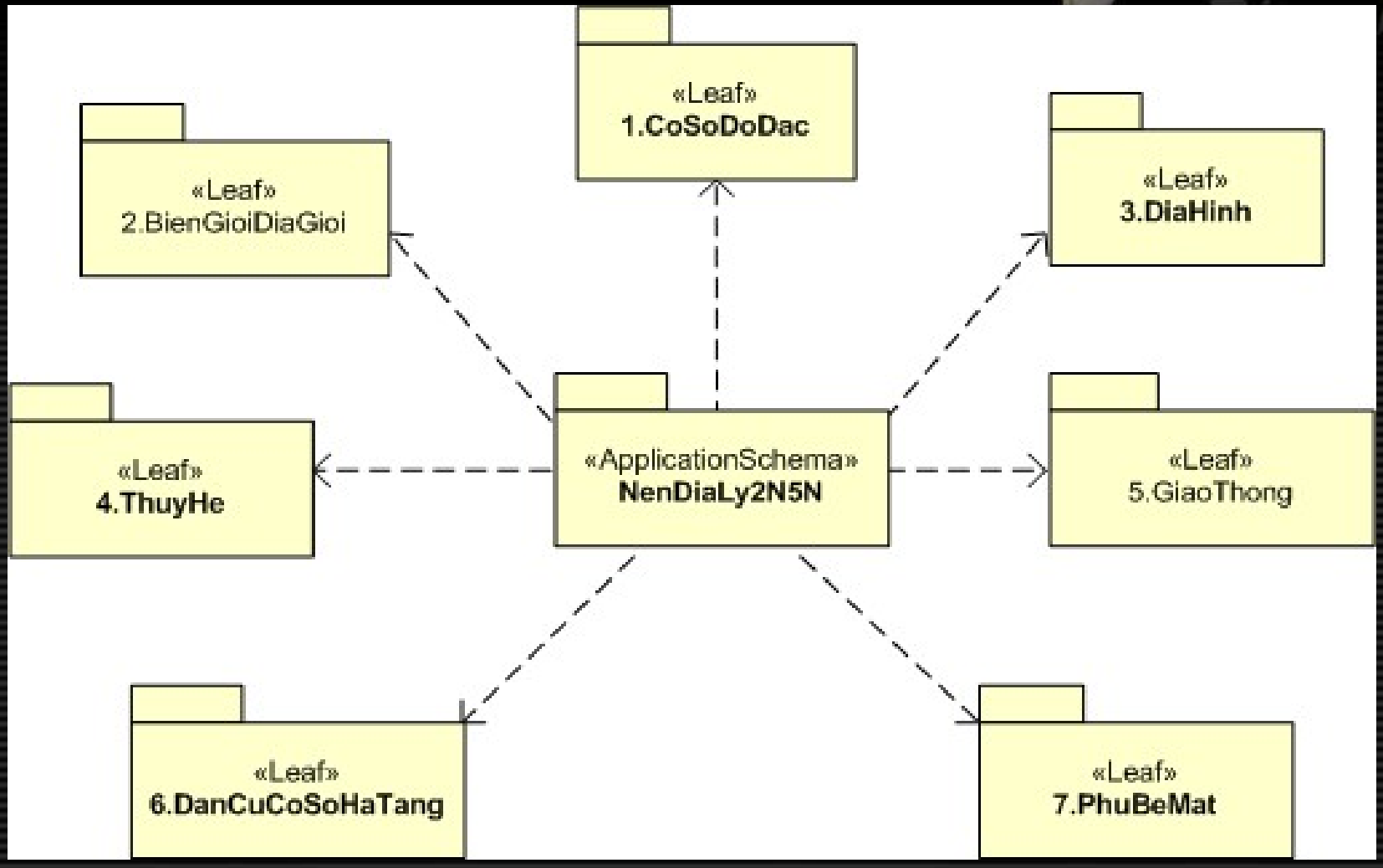


Figure 3.1: General structure model

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

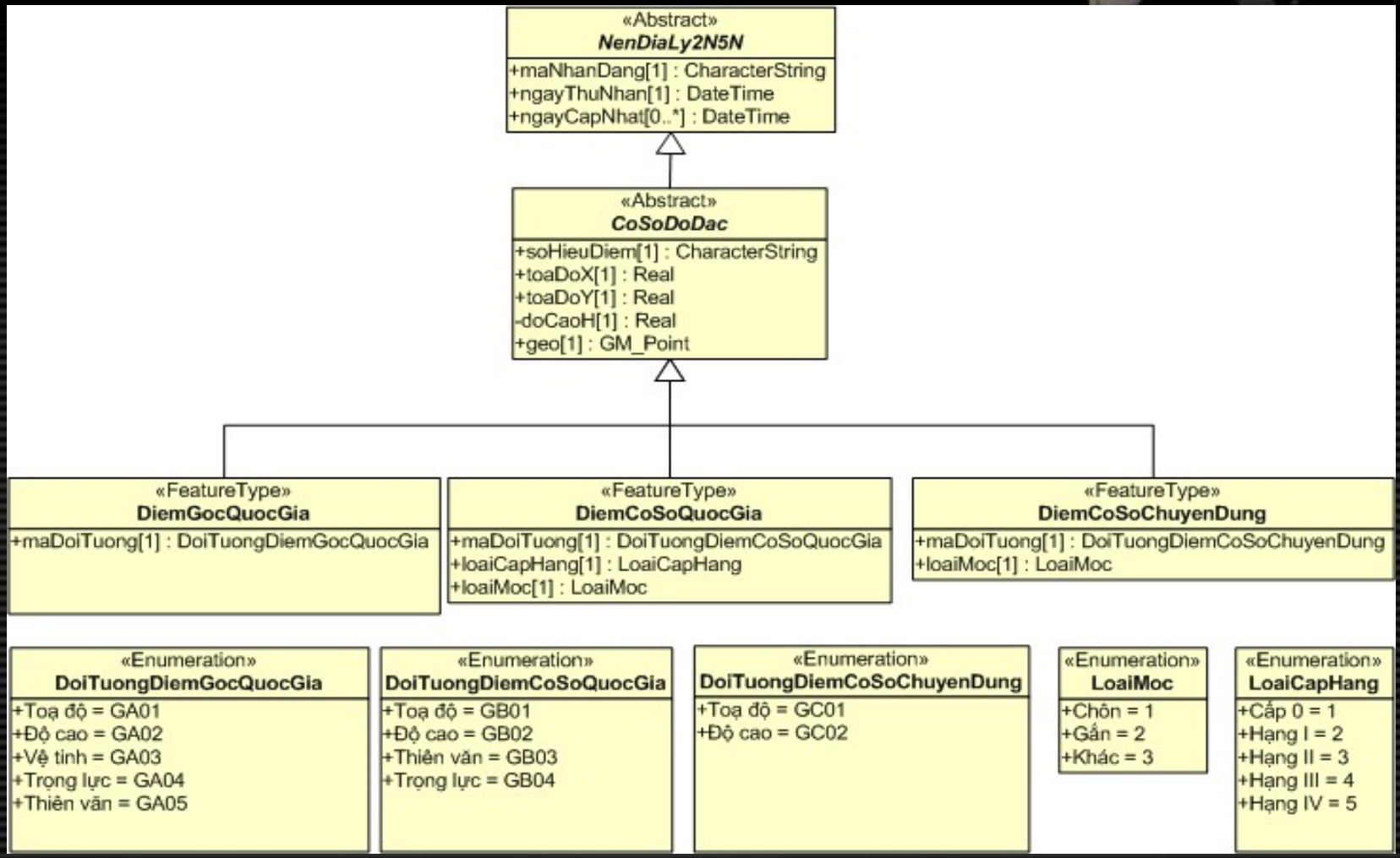


Figure 3.2: Structure model for Coordinate control points

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

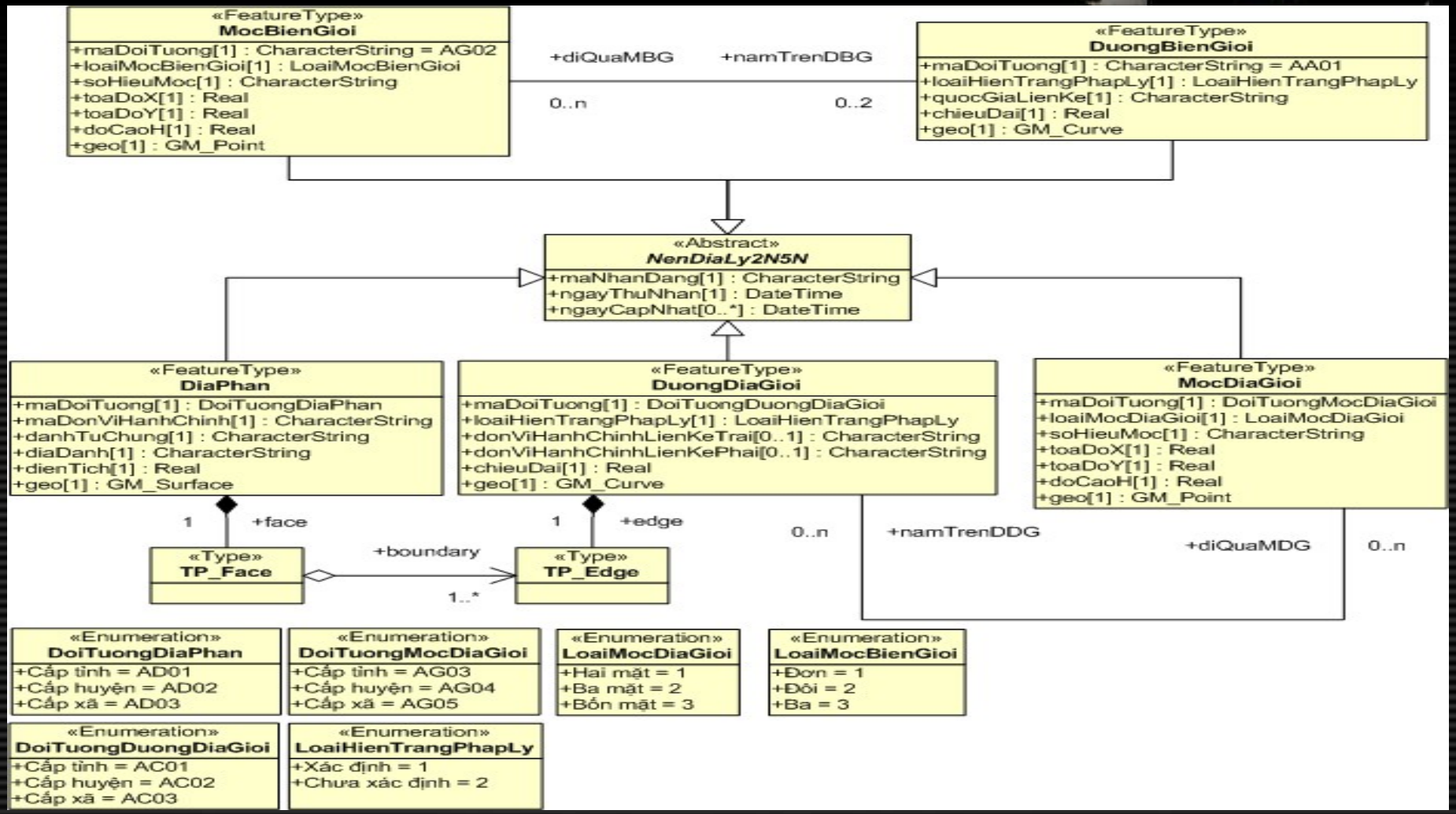


Figure 3.3: Structure model for National and administration borders

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

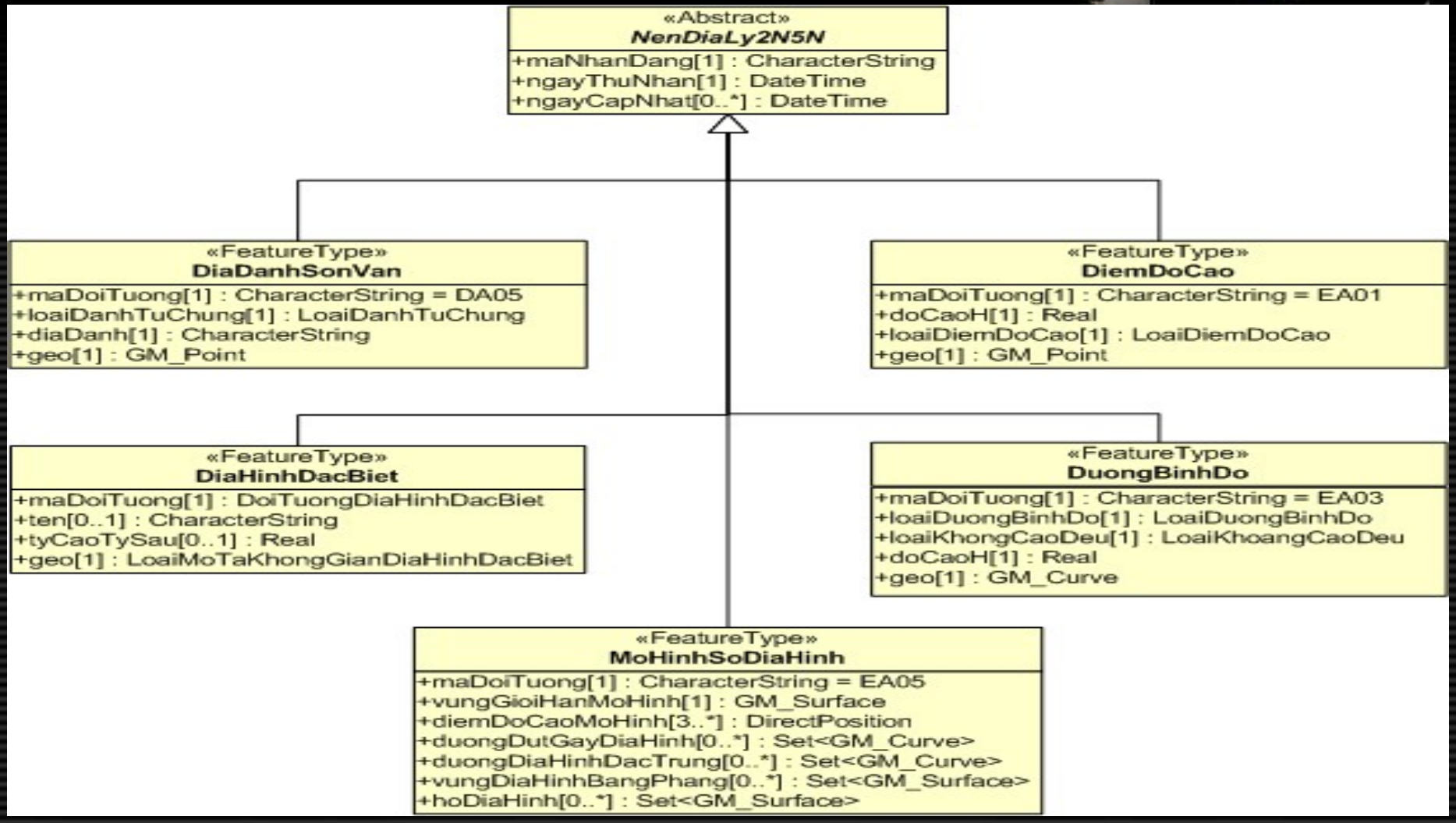


Figure 3.4: Structure model for Topography

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

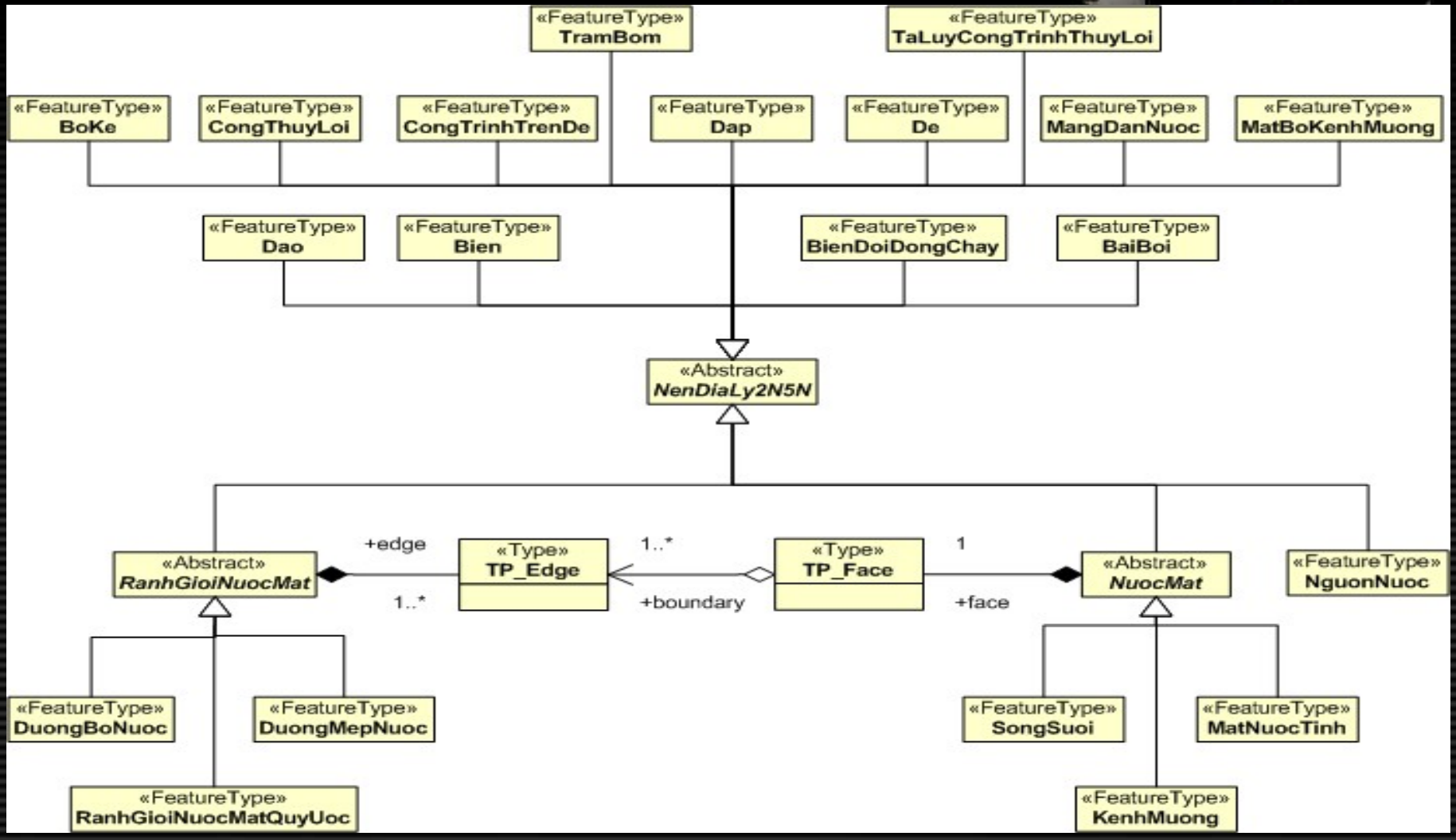


Figure 3.5: Structure model for Hydrography

3.2 Structure models *(cont.)*

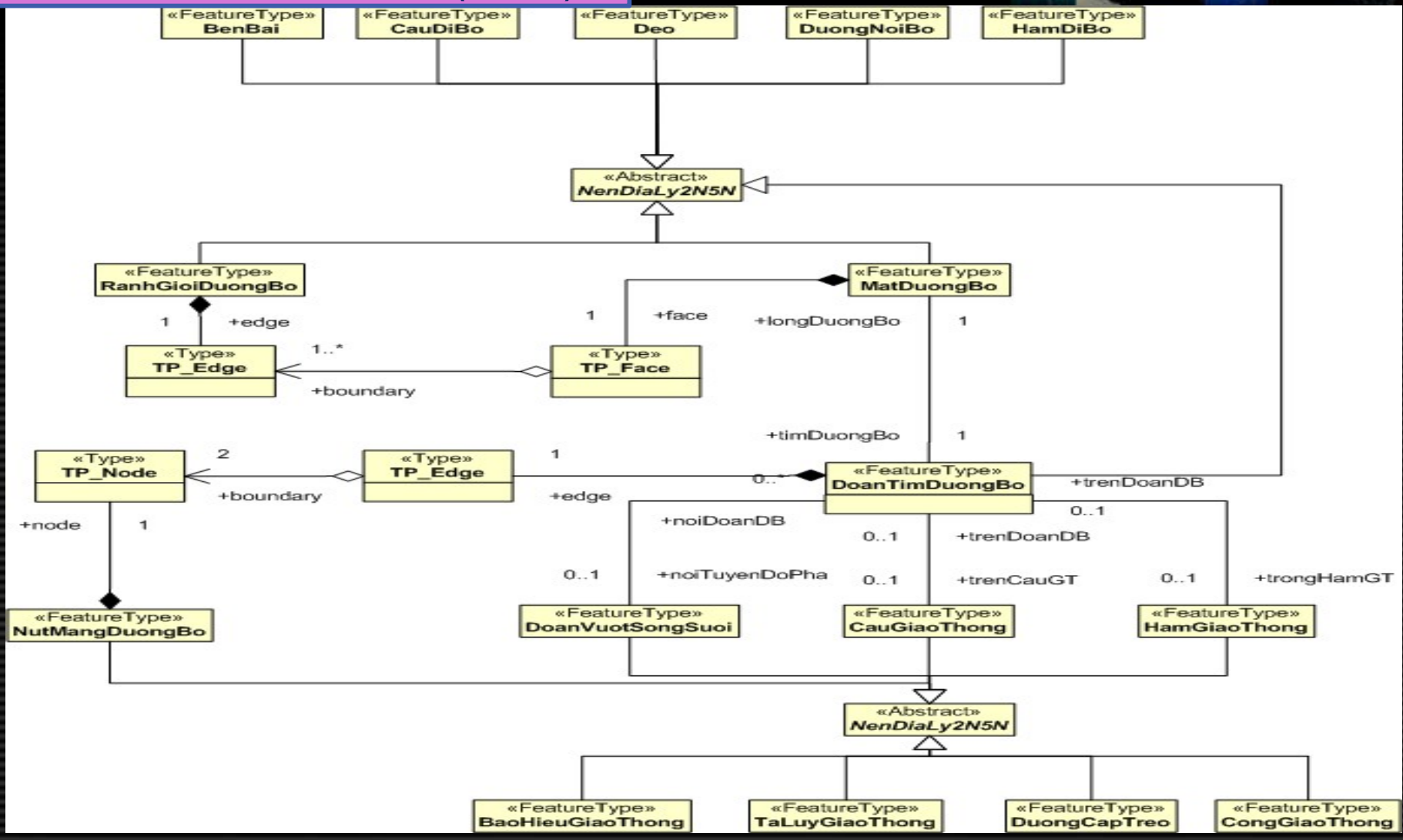


Figure 3.6: Structure model for Transport Networks

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

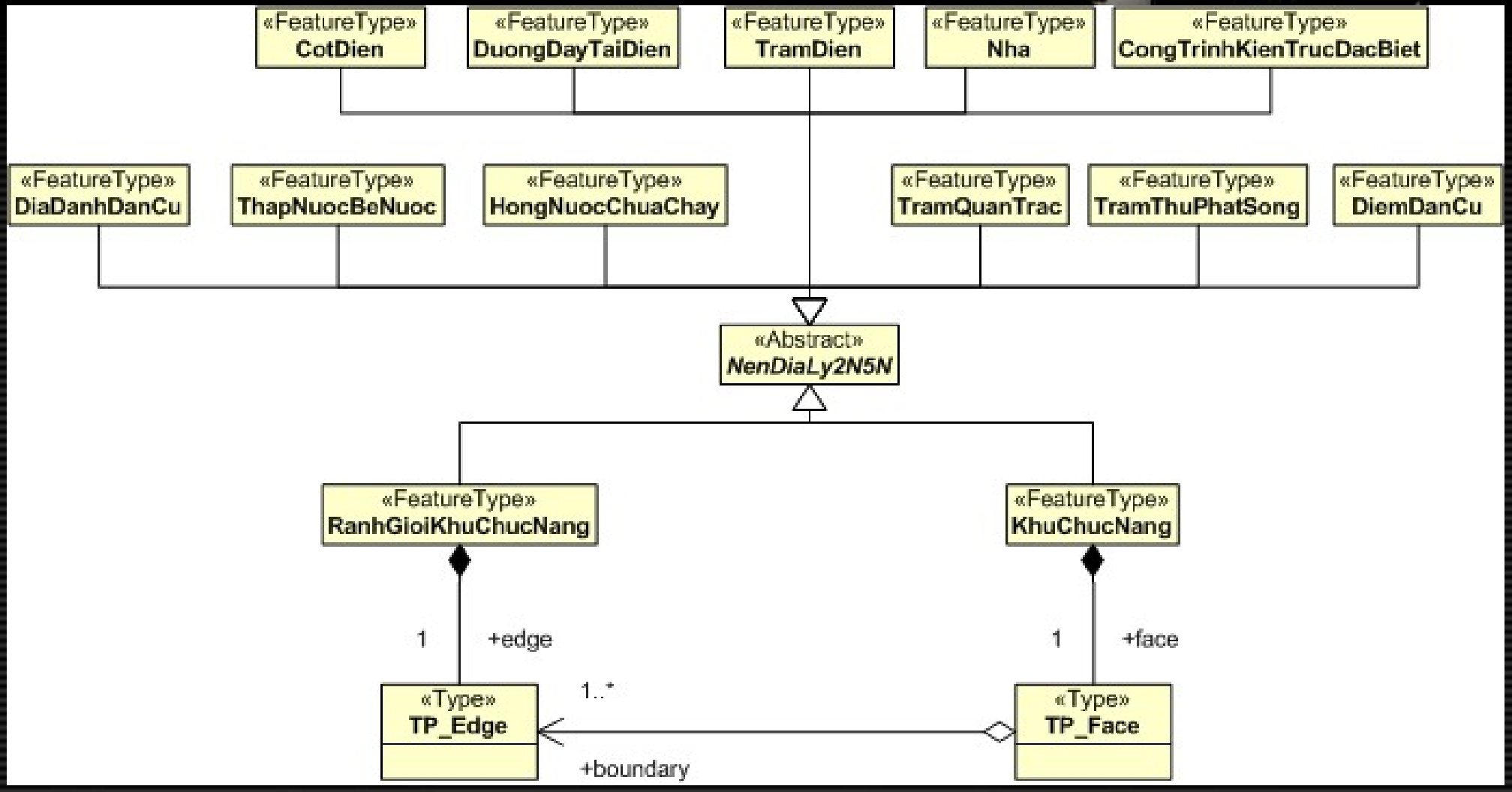


Figure 3.7: Structure model for Residential and Infrastructure

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

3.2 Structure models *(cont.)*

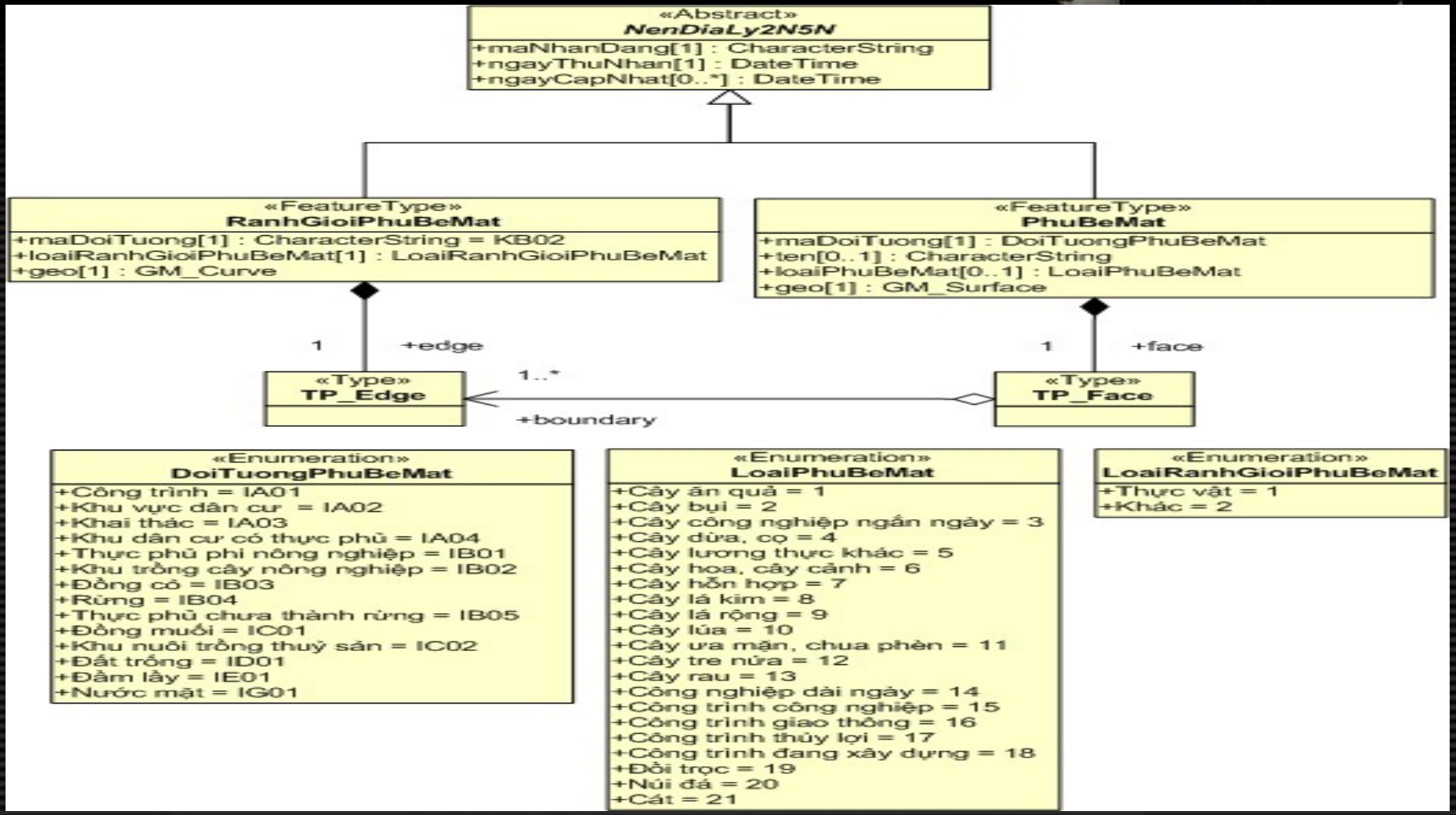


Figure 3.8: Structure model for land cover

3. TECHNICAL RULES FOR BASIC GEOGRAPHIC DATA

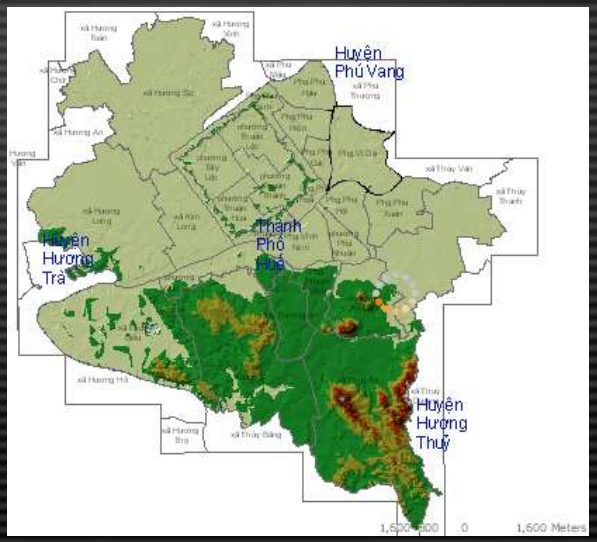
3.2 Application

For establishing base topographic data covering:

- *Whole country*

- *Urban areas*

- *Provinces*



4. CONCLUSION

- **Accordance with ISO and inheritance of the current technical regulations.**
- **Reached the objectives: Development of conceptual framework and specification methodology and development of data specifications for each data theme.**
- **Easily updated, shared and effective database.**

THANK YOU FOR ATTENTION !

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