

DELIVERABLE

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This deliverable contains original unpublished work except where clearly indicated otherwise. Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

D2.8 E.L.F. Cadastre (Regional)

References

Ref.	Title/Version/Publication Date/Author
[1]	E.L.F. Description of Work (DoW)
[2]	EN ISO 19131:2007, Geographic Information – Data product specification
[3]	D2.8.I.4 INSPIRE Data Specification on Administrative Units –Technical Guidelines http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AU_v3.1.pdf
[4]	D2.8.I.5 INSPIRE Data Specification on Adresses – Technical Guidelines http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AD_v3.1.pdf
[5]	D2.8.I.6 INSPIRE Data Specification on Cadastral Parcels – Technical Guidelines http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_CP_v3.1.pdf
[6]	D2.8.III.2 INSPIRE Data Specification on Buildings –Technical Guidelines http://inspire.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_BU_v3.0.pdf
[7]	INSPIRE Consolidated data model (r4618) http://inspire.ec.europa.eu/data-model/approved/r4618/ea+xmi/EAXML.zip
[8]	D2.10 E.L.F. Data Specifications Master

Executive summary

This product specification describes the product “ELF Cadastre”.

ELF Cadastre provides a simplified and harmonised view of footprints of cadastral parcels geometry combined with other basic information as administrative units, addresses and buildings for pan-European use. It will permit also to identify the features and obtain the national reference of the objects that gives users the opportunity to get more information through the national services.

This deliverable provides: A narrative description of the ELF Cadastre, an example of the data content, UML diagrams, the feature catalogue and a basic guidelines for implementation.

An important chapter is the portrayal that defines the ELF cadastre style taking in account the INSPIRE default portrayal for themes CP, BU, AD and AU, the combination of all of them and the range of scales of ELF cadastre.

This specification contains also information about data capture, data quality and delivery. Some sections (metadata, data maintenance, data quality) will be expanded later based on the progress of the ELF project.

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I Scope

This document defines a harmonised product specification for ELF Cadastre.

ELF Cadastre, as a reference data, will permit ELF to provide a view service combining several very useful large scale information as Cadastral Parcels (CP), Buildings (BU), Addresses (AD) and Administrative Units (AU).

The possibility of combining these topics in ELF cadastre at European level is important since addresses are the main way of search and location of the geographical objects by the European citizens. The cadastral parcel and the representation of buildings are very useful tools for the application of many policies in which property distribution or other cadastral information is very necessary.

The scope of this document is therefore to define the specifications that will permit through ELF cascading service, to access the WMS of every data provider of these four themes, combine them and show a continuous map for all Europe.

The national ELF services shall support the GetFeatureInfo functionality. This will allow identifying the features and obtain the national reference that provides a way to access more complete national information, taking into account the differences of the legal regulations of such a data in the different Member States.

In addition to “ELF Cadastre”, data of CP, BU,AD and AU will be available also via ELF download services.

2 Overview

2.1 Informal description

ELF Cadastre provides a simplified and harmonised view of information such as footprints of cadastral parcels geometry, addresses, buildings and the boundaries between neighbouring administrative units for pan-European use: in land administration domain such as agriculture, spatial planning, environmental, infrastructure and utilities management, public land management, risk and security services, socioeconomic data and cartography in general.

ELF Cadastre aims to provide cadastral reference data. Only for reference the scale range can vary from 1:500 to 1:10.000 depending of the NMCA data provider.

ELF Cadastre will provide INSPIRE Cadastral Parcels features (core) from ELF data as a common minimum among all the existing cadastral systems to be used only as locators of geo-information harmonizing with InspireId, areavalue, Cadastral boundaries, label, referencePoint, temporal attributes and national cadastral reference. Some countries will provide also some of the 3 additional feature types to fit with national specificities (conditional feature types) such a Cadastral Zoning, Basic Property Unit and Boundaries.

ELF Cadastre will also provide the INSPIRE features for Addresses, Administrative Units and Buildings of those agencies that provide them in ELF.

National cadastral registers generally contain much more data and users and other 3rd parties will be able through ELF Cadastre to identify the objects and obtain the national reference. With this national reference they will have the opportunity to obtain other valuable information through the national services.

As example of it the ELF Cadastre will meet primary the requirements of ELF use cases as:

- WP7 as insurance company, Emergency Mapping use case
- Insurance risk assessment application
- Companies that utilize the ELF base map together with various reference data themes and hazard data layers

- European Land Information Service (EULIS)

2.2 Product specification

Document title: ELF Cadastre –Product Specification
Reference date: 30/11/2014
Responsible party: ELF WP2
Language: English

2.3 Terms and definitions

Terms and definitions necessary for understanding this document are defined in the INSPIRE Glossary, available from <http://inspire-registry.jrc.ec.europa.eu/registers/GLOSSARY>
And the ELF Glossary, available from <http://www.elfproject.eu/documentation/glossary>

2.4 Normative reference

INSPIRE

- [IR MD] COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata
- [IR MDa] Corrigendum to INSPIRE Metadata Regulation published in the Official Journal of the European Union, L 328, and page 83
- [IR DS] COMMISSION REGULATION (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services
- [IR DSa] COMMISSION REGULATION **No 102/2011 of 4 February 2011** amending regulation 1089/2010 as regards interoperability of spatial data sets and services (amendment to the regulation on the interoperability of spatial data sets and services regarding code lists)
- [IR DSb] COMMISSION REGULATION (EU) No 1253/2013 of 21 October 2013 amending regulation 1089/2010 as regards interoperability of spatial data sets and services

ISO

- [ISO 19107] EN ISO 19107:2005, Geographic Information – Spatial Schema
- [ISO 19108] EN ISO 19108:2005, Geographic Information – Temporal Schema
- [ISO 19108-c] ISO 19108:2002/Cor 1:2006, Geographic Information – Temporal Schema, Technical Corrigendum 1
- [ISO 19111] EN ISO 19111:2007 Geographic information - Spatial referencing by coordinates (ISO 19111:2007)
- [ISO 19113] EN ISO 19113:2005, Geographic Information – Quality principles
- [ISO 19115] EN ISO 19115:2005, Geographic information – Metadata (ISO 19115:2003)
- [ISO 19118] EN ISO 19118:2006, Geographic information – Encoding (ISO 19118:2005)
- [ISO 19131] EN ISO 19131:2007 – Geographic Information – Data product specification
- [ISO 19135] EN ISO 19135:2007 Geographic information – Procedures for item registration (ISO 19135:2005)
- [ISO 19138] ISO/TS 19138:2006, Geographic Information – Data quality measures

2.5 Abbreviations

AD	Addresses
AU	Administrative Units
BU	Buildings
CP	Cadastral Parcels
DoW	Description of Work
EGM	EuroGlobalMap
ELF	European Location Framework
ERM	EuroRegionalMap
EU	European Union

EULIS	European Land Information Service
GML	Geography Mark-up Language
INSPIRE	The EU Directive to establish an Infrastructure for Spatial Information in Europe
IR	Implementing Rules
IR DS	Implementing Rules Data Specification
IR MD	Implementing Rules Metadata
ISO	International Organization for Standardization
LoD	Level of Detail
NMCA	National Mapping and Cadastral Agency
UML	Unified Modelling Language
WP ELF	ELF Work Package

3 Specification scopes

This section defines only a general scope, which applies to each part of this product specification.

4 Data product identification

Title:	Product specification for ELF <i>Cadastre</i>
Abstract:	Contains data from the four INSPIRE themes that make up the Cadastre product specification. Contains mainly the cadastral parcels as closed surfaces with their cadastral reference, contains the addresses of that CP with their locator and the buildings that exist in the area. If appropriate, should also include other spatial objects of CP (auxiliary cadastral zonings, cadastral boundaries and basic property units) and attributes from the themes that considered as helpful for an easy data management
Topic category	planningCadastre
Purpose:	The purpose of this document is to specify a harmonised product specification for ELF <i>Cadastre</i> as defined in ELF DoW.
	It addresses domains such as agriculture, spatial planning, environment, infrastructure and utilities management, public land management, risk management, socio-economic analysis, cartography.
	In the ELF context, cadastral parcels will be mainly used as locators for geoinformation in general, including environmental data.
Geographic description	This specification covers spatial data sets which relate to an area where a Member State of the European Union or EuroGeographics member has and/or exercises jurisdictional rights
Spatial Resolution:	ELF Master LoD0 and LoD1
Geographic Extent:	Pan-European level
URL	http://www.elfproject.eu/documentation/specification

5 Data content and structure

5.1 Basic notions

5.1.1 Narrative description

The concept of ELF Cadastre describes a reference framework at European level. This framework consists of the official Cadastral Parcel, Addresses and Buildings, also Administrative Units when needed; compliant to the INSPIRE data specifications requirements from existing NMCAs databases.

ELF cadastre specifications will permit at European Level to view the cadastral parcel layer combined with addresses layer, buildings layer and administrative units layer.

Also with ELF it will be possible to download any of these layers provided by the national agencies; INSPIRE compliant through the ELF services

ELF cascading service will permit also to zoom in from EGM to ERM, from ERM to BaseMap and from ELF BaseMap to Cadastre. In this way ELF application will permit to obtain any European ELF cadastral map in a harmonised and easy way

The cadastral parcel is the basic feature of ELF Cadastre which should be present. As data come from different INSPIRE themes and could be provided by different NMCA's; in some occasions, any of them may be missing.

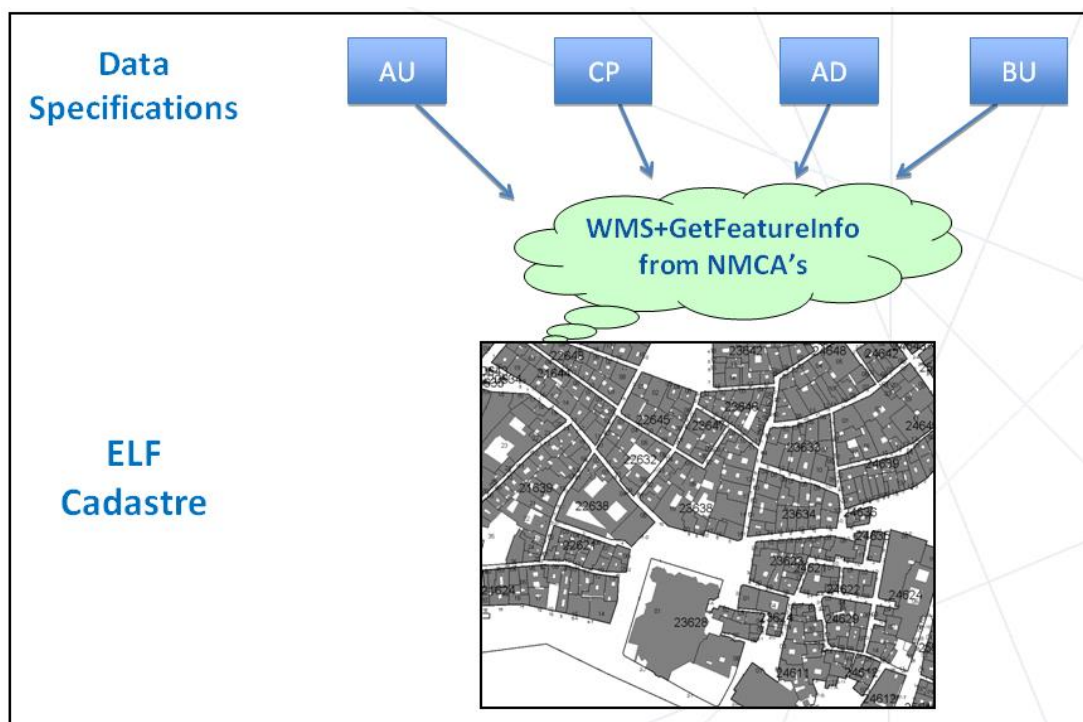


Figure 1 – ELF Cadastre Framework

The main ELF Cadastre features are:

- **Cadastral Parcel:**
 - This basic component represents the area of a cadastral parcel.
 - This feature type has the same concept as defined in the ELF CP data specification.
 - This feature has the same attributes and restrictions as defined in the ELF CP data specification.
- **Address:**
 - This component represents the position of the access point from the thoroughfare, or the entrance door or gate of the address.

- This feature type has the same concept as defined in the ELF AD data specification.
 - This feature has the same attributes and restrictions as defined in the ELF AD data specification.
- **Building:**
 - This component combines the building with the building parts to represent the whole building.
 - This feature type has the same concept as defined in the INSPIRE BU data specification.
 - This feature has the same attributes and restrictions as defined in the INSPIRE BU data specification.
- **AdministrativeUnit:**
 - This component represents the areas of the administrative units
 - This feature type has the same concept as defined in the ELF AU data specification.
 - This feature has the same attributes and restrictions as defined in the ELF AU data specification.

Optional features:

Cadastral Zoning:

- This component represents intermediary areas in order to divide the national territory into cadastral parcels. Cadastral parcels can be municipality, section, parish, district, block etc.
 - This feature type has the same concept as defined in the ELF CP data specification.
 - This feature has the same attributes and restrictions as defined in the ELF CP data specification.
- **Cadastral Boundaries:**
- **Basic Property Units**

6 Reference Systems

In general, the INSPIRE requirements for reference systems (Datum, Coordinate reference systems, Display, Identifiers for coordinate reference systems and Temporal reference systems) are valid for ELF Cadastre.

ELF view services are provided with the following two CRS in order to allow combination of different ELF themes as well as other external data:

- Web Mercator (WGS / Pseudo Mercator ; EPSG : 3857)
- Lambert Azimuthal Equal area (ETRS89 / LAEA Europe ; EPSG : 3035)

7 Data Quality

The objective of ELF Cadastre is to provide pan-European vector data of high quality according the rules of INSPIRE and ELF data specifications for the themes that are part of ELF Cadastre.

The WMS provided by NMCAs will contain the authoritative information that shows legal or official boundaries that cannot be subjected to a process of cross-border edge-matching; therefore it may show cadastral gaps and overlaps.

8 Metadata

Metadata are the fundamental elements needed to discover; access and use geographic data products. ELF Cadastre will follow the general metadata guidelines of the ELF project.

9 Delivery

9.1 Delivery medium

Cascading WMS based on ELF/INSPIRE compliant national theme-based WMS CP, AU, BU, AD.

The national ELF services shall support SLD and the GetFeatureInfo functionality that will allow identifying the features.

In addition to “ELF Cadastre”, data of CP, BU, AD and AU will be available also via ELF download services.

9.2 Encodings

Standard encoding of each of the themes of ELF Cadastre is GML (version 3.2.1). The specification of this format is described in the INSPIRE Guidelines for the encoding of spatial data [DS-D2.7]. The character set is UTF-8.

10 Data Capture

The data sources for ELF Cadastre are the official Cadastral Parcel, the Addresses, the Administrative Units and the Buildings compliant to the INSPIRE/ELF data specifications requirements from existing NMCAs databases and provided by NMCAs.

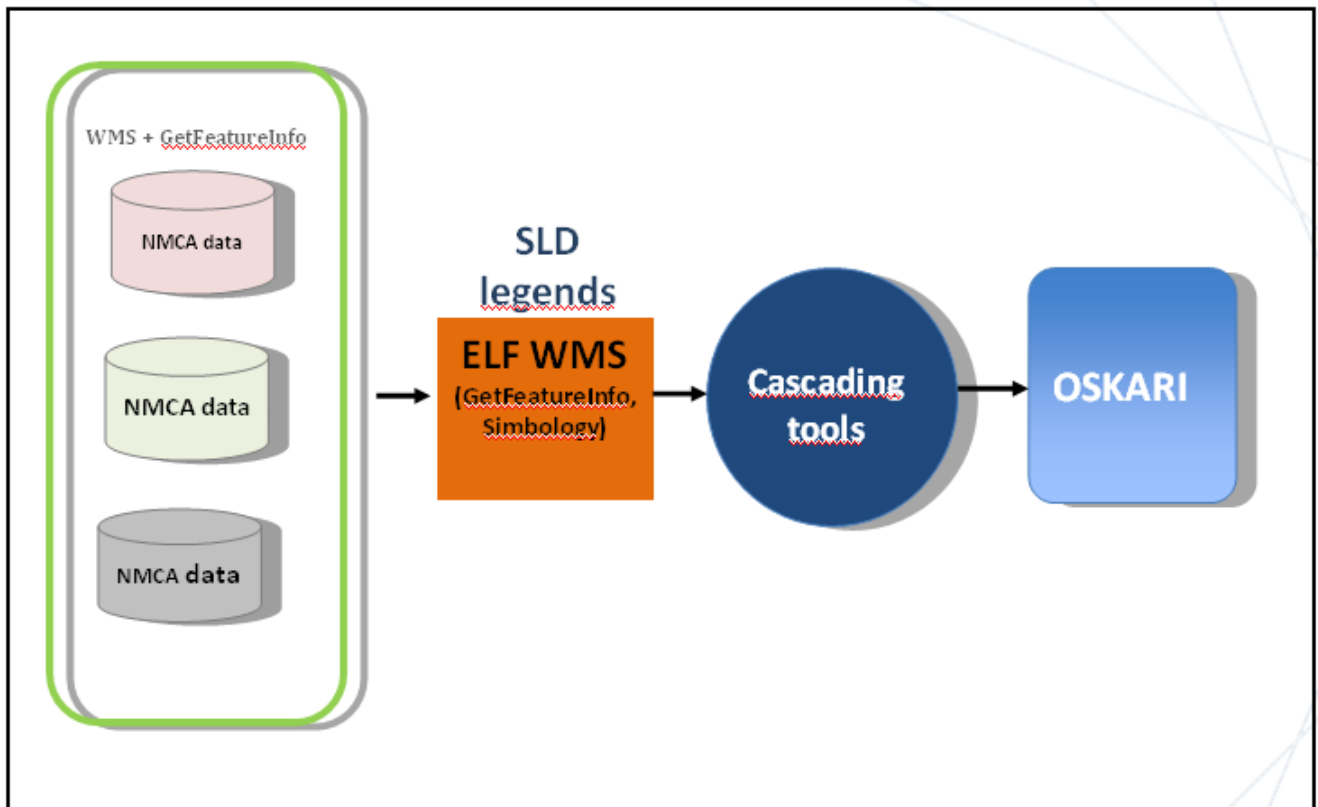


Figure 2 – ELF Cadastre production process

II Portrayal

The ELF Cadastre combines the four themes, in function of scale will display same or all of them. Different styles are defined here for each range of scales.

The representation of the ELF Cadastre will be based on INSPIRE data specifications of each of the layers that constitute the product. (AU, CP, AD, BU).

When there are buildings or buildings parts below ground, the building is represented by over ground part. Addresses will be represented when do not overlap with the labels of the other elements (plots, buildings ...)

The scales of visualization of ELF cadastre range from scale 1:1 to 1:10.000. Such a broad range of scales make its representation difficult: both, when text labels are represented at smaller scales with a fixed size of text, or when there is a high density of elements, by the degree of detail that produces overlapping of texts, which prevent its readability. In these cases it is possible to limit its representation for scale, or to reduce the size of the text this implies that new specific proper representation styles have to be defined for the use of this ELF Cadastre product.

ELF Cadastre uses at least three different levels of scale range, in function of them the style name to show shall be:

Scale range	Style name
1/5.000 to 1/10.000	CP CP.CadastralParcel.BoundariesOnly AU AU.AdministrativeBoundary.Default
1/2.000 to 1/5.000	CP CP.CadastralParcel.BoundariesOnly CP CP.CadastralZoning.Default BU BU.Building.Default AU AU.AdministrativeBoundary.Default
1/1 to 1/2.000	CP CP.CadastralParcel.LabelOnReferencePoint CP CP.CadastralZoning.Default BU BU.Building.Grey BU BU.BuildingPart.Grey AD AD.Address.Number AU AU.AdministrativeBoundary.Default

II.1 Proposed Styles for ELF Cadastre

The representation of the ELF Cadastre is according INSPIRE portrayal with the following modifications to improve clarity and readability.

-The style CP.CadastralParcel.LabelOnReferencePoint the size of the text of the ELF label will be different than the one proposed in INSPIRE because the default proposed in INSPIRE is a too large and sometimes the drawing is not readable.

-ELF AD.Address will only displayed the addressNumber from the LocatorDesignatorTypeValue.

-Also Building and building part boundary in ELF will be represented in grey, instead of default style of INSPIRE, to difference it from Cadastral Parcel in black.

II.2 Style for the layer BU.Building.Grey

Style Name	BU.Building.Grey
Style Title	Building grey outline/point style
Style Abstract	The building reference geometry is represented by following style:

	- Style for surface geometries: grey with dark grey outline •Fill colour: SOLID GREY RGB 128,128,128 •Outline colour: RGB 90, 90, 90 •Outline width: 1 px
Minimum & maximum scales	from 1:1 to 1:2.000
Symbology	<pre> <sld:NamedLayer> <se:Name>BU.Building</se:Name> <sld:UserStyle> <se:Name>Bu.Building.Grey</se:Name> <sld:IsDefault>0</sld:IsDefault> <se:FeatureTypeStyle version="1.1.0"> <se:Description> <se:Title> Building grey outline style </se:Title> <se:Abstract> The building reference geometry is represented by following style: Style for surface geometries: grey with dark grey outline.Fill colour: SOLID GREY RGB 128,128,128. Outline colour: RGB 90, 90, 90. Outline width: 1 px </se:Abstract> </se:Description> <se:FeatureTypeName>Building</se:FeatureTypeName> <se:Rule> <se:MinScaleDenominator>1</se:MinScaleDenominator> <se:MaxScaleDenominator>2000</se:MaxScaleDenominator> <se:PolygonSymbolizer> <se:Geometry> <ogc:PropertyName>geometry</ogc:PropertyName> </se:Geometry> <se:Fill> <se:SvgParameter name="fill">#808080</se:SvgParameter> </se:Fill> <se:Stroke> <se:SvgParameter name="stroke">#5A5A5A </se:SvgParameter> <se:SvgParameter name="stroke-width">1</se:SvgParameter> </se:Stroke> </se:PolygonSymbolizer> </se:Rule> </se:FeatureTypeStyle> </sld:UserStyle> </sld:NamedLayer> </pre>

11.3 Style for the layer BU.BuildingPart.Grey

Style Name	BU.BuildingPart.Grey
Style Title	BuildingPart grey style
Style Abstract	The building part reference geometry is represented by following style: - Style for surface geometries: hollow with grey outline •Fill colour: TRANSPARENT •Outline colour: RGB 90, 90, 90 •Outline width: : 1 px
Minimum & maximum scales	from 1:1 to 1:2.000
Symbology	<pre> <sld:NamedLayer> <se:Name>BU.BuildingPart</se:Name> <sld:UserStyle> <se:Name>BU.BuildingPart.Grey</se:Name> <sld:IsDefault>0</sld:IsDefault> <se:FeatureTypeStyle version="1.1.0"> <se:Description> <se:Title> BuildingPart grey outline style </se:Title> <se:Abstract> The building reference geometry is represented by following style: Style for surface geometries: grey with dark grey outline.fill colour;TRANSPARENT. Outline colour: RGB 90, 90, 90. Outline width: 1 px </se:Abstract> </se:Description> <se:FeatureTypeName>Building</se:FeatureTypeName> <se:Rule> <se:MinScaleDenominator>1</se:MinScaleDenominator> <se:MaxScaleDenominator>2000</se:MaxScaleDenominator> <se:PolygonSymbolizer> <se:Geometry> <ogc:PropertyName>geometry</ogc:PropertyName> </se:Geometry> <se:Stroke> <se:SvgParameter name="stroke">#5A5A5A </se:SvgParameter> <se:SvgParameter name="stroke-width">1</se:SvgParameter> </se:Stroke> </se:PolygonSymbolizer> </se:Rule> </se:FeatureTypeStyle> </sld:UserStyle> </sld:NamedLayer> </pre>

Example of ELF Cadastre

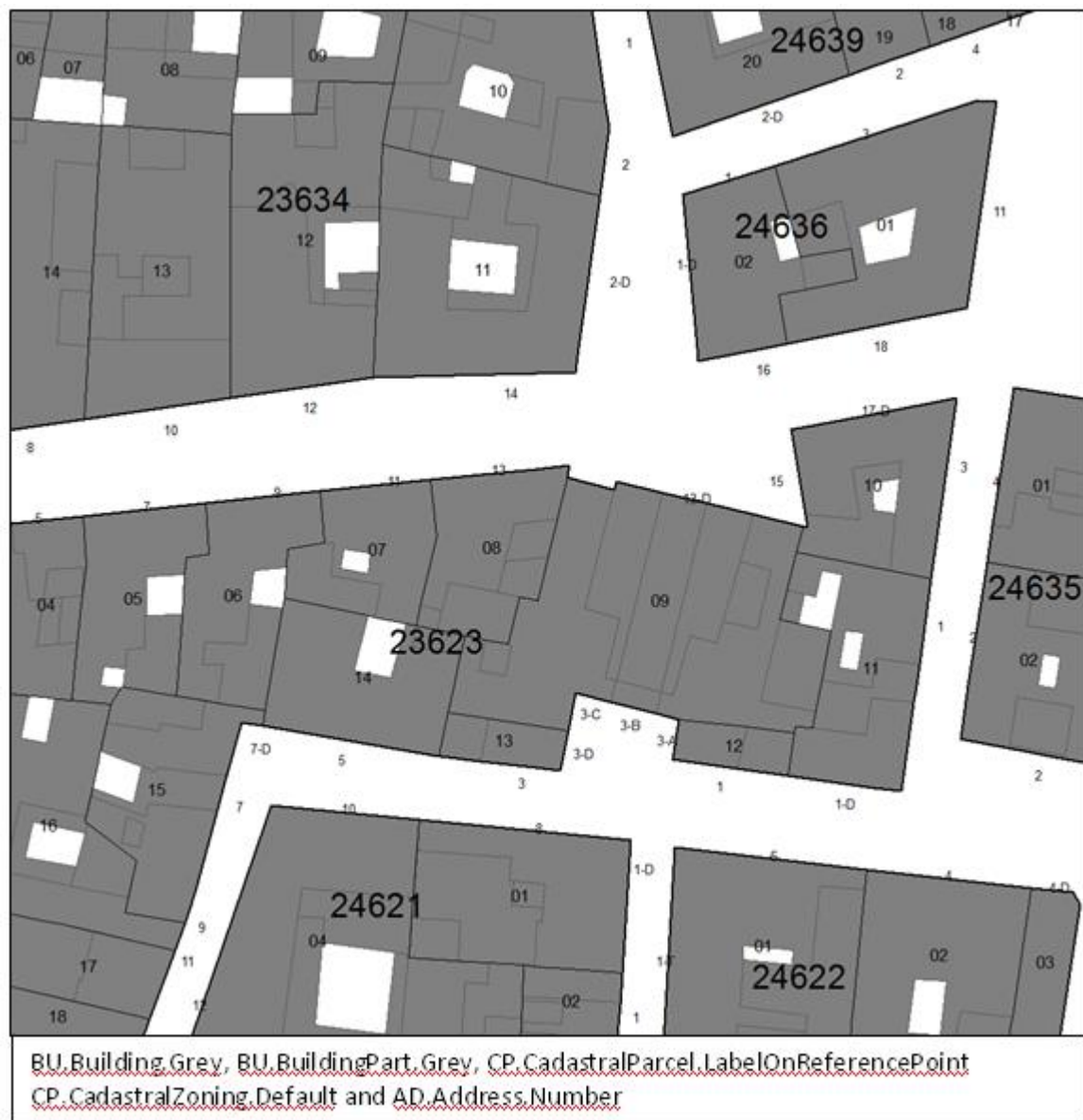


Figure X – ELF Cadastre.

I2 Bibliography

- [DS-D2.3] [INSPIRE DS-D2.3, Definition of Annex Themes and Scope, v3.0](#)
- [DS-D2.5] [INSPIRE DS-D2.5, Generic Conceptual Model v3.4](#)
- [DS-D2.6] [INSPIRE DS-D2.6, Methodology for the development of data specifications, v3.0](#)
- [DS-D2.7] [INSPIRE DS-D2.7, Guidelines for the encoding of spatial data v3.3,](#)

Annex A – Abstract Test Suite

Being ELF Cadastre a data specification that support the integration of several INSPIRE themes (AD, AU, BU and CP); shall be compliant with each Abstract Test Suite of each theme.