

Reference number of working document: **ISO/TC 211 N 000**

Date: 2011-12-08

Reference number of document: **ISO/WD 19160-1**

Committee identification: **ISO/TC 211/WG 7**

Secretariat: **Norway**

Addressing — Part 1: Conceptual model

Adressage —Partie 1: Modèle conceptuel

Warning

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document type: **International standard**
Document stage: **(00) Preliminary**
Document language: **E**

Copyright notice

This ISO document is a working draft or committee draft and is copyright-protected by ISO. While the reproduction of working drafts or committee drafts in any form for use by participants in the ISO standards development process is permitted without prior permission from ISO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ISO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ISO's member body in the country of the requester:

*[Indicate :
the full address
telephone number
fax number
telex number
and electronic mail address*

as appropriate, of the Copyright Manager of the ISO member body responsible for the secretariat of the TC or SC within the framework of which the draft has been prepared]

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Conformance	1
3 Normative references	1
4 Terms and definitions	1
5 Symbols and abbreviations	2
6 Addressing conceptual model	3
6.1 Background	3
6.2 Classes and their attributes	3
6.2.1 AddressSpecification	4
6.2.2 Address	4
6.2.3 AddressableObject	5
6.2.4 AddressComponent	5
6.2.5 ReferenceSpatialObject	6
7 Address maintenance	6
8 Addressing ontology	6
Annex A (normative) Abstract test suites	7
A.1 General	7
A.2 Conformance of a model of an address reference system	7
A.2.1 Test case for mandatory classes	7
A.2.2 Test case for optional classes	7
A.2.3 Test case for associations	7
A.2.4 Test case for mandatory attributes	7
A.2.5 Test case for optional attributes	8
A.2.6 Test case for derived address components	8
A.2.7 Test case for address component composition (into an address)	8
A.3 Conformance of an addressing ontology	8
A.3.1 Test case for	8
Annex B (informative) Examples	9
B.1 Addresses in cultural heritage information	9
B.2 INSPIRE	9
B.3 Japan	9
B.4 South Africa	9
B.5 United Kingdom	10
B.6 Original table	10
Annex C (informative) Country profiles and instance data	12
C.1 Addresses in cultural heritage information	12
C.2 INSPIRE	12
C.3 Japan	12
C.4 South Africa	12
C.4.1 Conceptual model	12
C.4.2 Instance data	15
5.5 United Kingdom	15
5.6 UPU S42	15

Annex D (informative) Examples of using the ISO 19160-1 addressing ontology to cross-map between address specifications	16
D.1 UPU S42 and INSPIRE	16
D.2 UPU S42 and SANS 1883:2009	16
D.3 vCard and INSPIRE	16
D.4 Others	16
Bibliography.....	17

Working Draft

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 19160-1 was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*.

ISO 19160 consists of the following parts, under the general title *Addressing*:

- *Part 1: Terminology and conceptual model*
- *Part 2: Good practices for address assignment schemes*
- *Part 3: Quality management for address data*
- *Part 4: International postal address components and templates*

Introduction

A paragraph.

Text from the US address standard (see email from Jeanne Foust)

For the purpose of converting address data from one format to another.

For finding additional attributes in an address dataset of a different format.

Working Draft

Addressing — Part 1: Conceptual model

1 Scope

This International Standard defines a conceptual model of an address reference system, together with the terms and definitions that describe the concepts in the model. Life cycle, metadata and address aliases are included in the conceptual model. The model is presented in UML and in OWL.

The model provides a common representation of addressing, independent of actual addressing implementations. It enables the conversion of address data between specifications.

The model does not replace conceptual models proposed in other addressing specifications, but provides a means to cross-map between different conceptual models for addressing.

The model provides a basis for an addressing specification by individual countries or communities.

2 Conformance

This International Standard defines two classes of conformance:

— any model of an *address reference system* for which conformance with this document is claimed shall pass all the requirements described in the abstract test suite given in Clause A.1.

— any *ontology* of an address reference system for which conformance with this document is claimed shall pass all the requirements described in the abstract test suite given in Clause A.2.

NOTE If the ontology in the current section 8 is moved to an informative annex, the paragraph above will be deleted.

3 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 19115-1:____¹, Geographic information – Metadata – Part 1: Fundamentals

ISO 19152:____¹, Geographic information – Land administration model (LADM)

4 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

¹ To be published

4.1

address

structured information that uniquely references an **object** for purposes of identification and location

4.2

addressable object

object that may be referenced by an **address**

NOTE Andrew Jones and Serena will discuss this definition offline in order to improve it (should not be circular)

4.3

addressee

party who is the ultimate recipient of a delivery item

[adapted from UPU S42:2006]

4.4

address alias

one of a set of **addresses** referencing the same **addressable object**

4.5

address component

constituent part of the **address**

4.6

address reference system

system that defines how address components are combined to form an **address**

4.7

child address

one of a set of **addresses** with the same **parent address**

NOTE Andrew Jones and Serena will discuss this definition offline in order to improve it (should not be circular)

4.8

parent address

address whose **addressable object** has sub-objects that are uniquely referenced by child addresses

NOTE Andrew Jones and Serena will discuss this definition offline in order to improve it (should not be circular)

4.8

spatial object

object used for representing a spatial characteristic of a feature

[ISO 19107:2003]

5 Symbols and abbreviations

OWL Web Ontology Language

UML Unified Modeling Language

6 Addressing conceptual model

6.1 Background

Some informative text...

6.2 Classes and their attributes

An address specification may specify one or more addresses, i.e. how address components are combined to form an address.

NOTE A legal act, a technical specification or an addressing standard may specify addresses.

EXAMPLE SANS 1883:2009, *Geographic information – Addresses*, specifies South African addresses.

EXAMPLE INSPIRE....

EXAMPLE UPU S42...

EXAMPLE Japanese act...

An address shall uniquely identify an addressable object. An addressable object is identified by zero or more addresses. Multiple addresses identifying the same addressable object are address aliases.

An address may be the parent of one or more child addresses. If an addressable object has sub-objects, each identified by an address, the address identifying the addressable object is the parent address of the addresses identifying the sub-objects.

An address shall comprise of one or more address components.

EXAMPLE An address identifying the main entrance to a building is the parentAddress of the addresses identifying the individual apartments inside the building.

An address component shall have a unique identifier. An address component may have alternative address components.

EXAMPLE Examples of classes that could be derived from the addresses component class are thoroughfare name, place name, addressee and postcode.

An address component may reference a reference spatial object. A reference spatial object may be referenced by zero or more address components.

EXAMPLE An address identifying the main entrance to a building is the parentAddress of the addresses identifying the individual apartments inside the building.

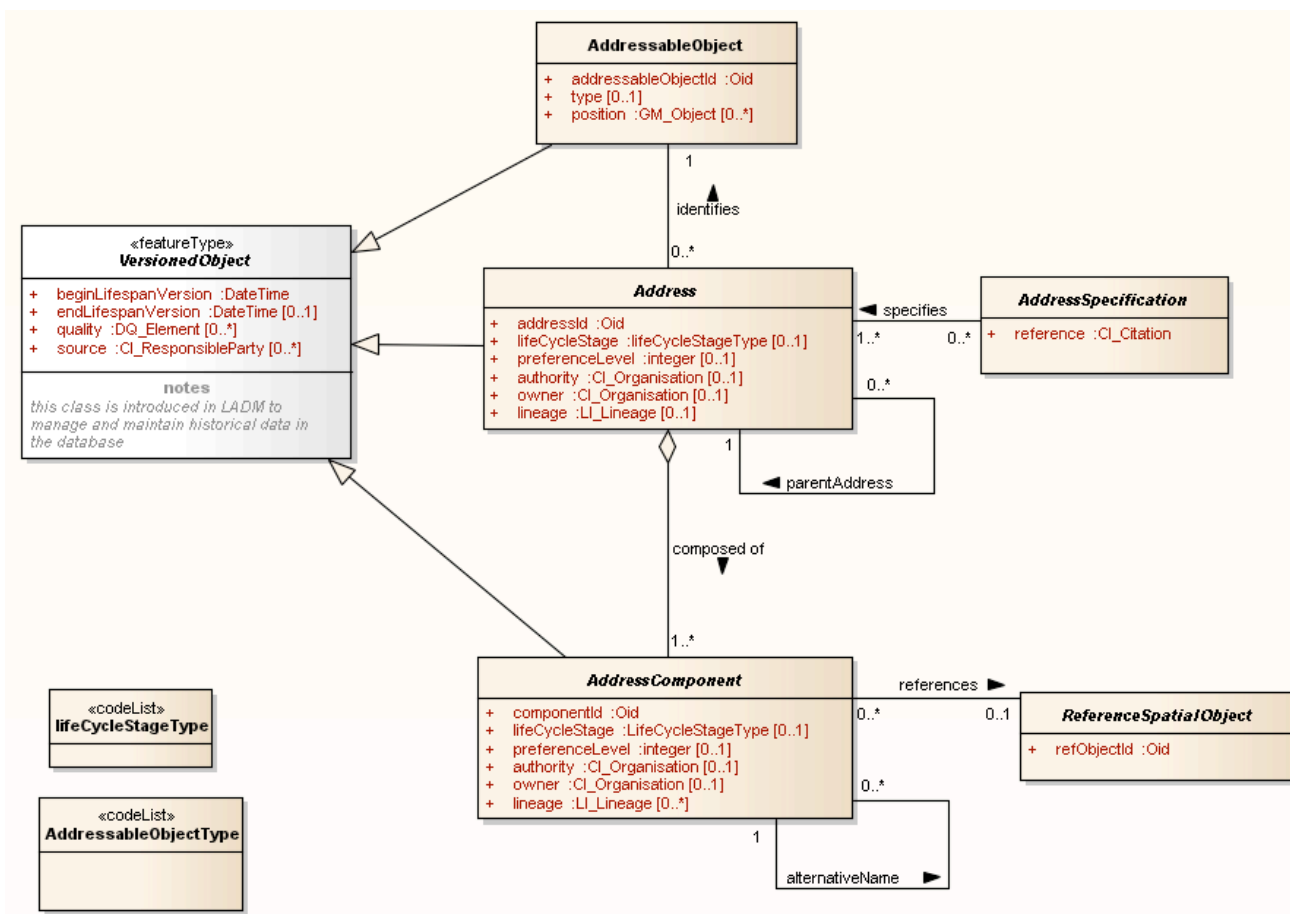


Figure 1 – Addressing

6.2.1 AddressSpecification

Table 1 – AddressSpecification attributes

Name	Definition	Obligation/Condition	Max Occur	Data Type	Domain
reference	Citation for the specification	M	1	CI_Citation	See ISO/DIS 19115-1: ????

6.2.2 Address

Address is an abstract class and is a subclass of VersionedObject [ISO/DIS 19152:????].

Table 3 – Address attributes

Name	Definition	Obligation/Condition	Max Occur	Data Type	Domain
addressId	Unique identifier of an address in a database	M	1	Oid	See ISO/DIS 19152:????
lifeCycleStage	The stage in the life cycle of an address	O	1	Class	lifeCycleStageType

preferenceLevel	Indicates the level of preference of the address to use from a set of aliases	O	1	integer	Integer > 0
authority	Authority that assigns the address	O	1	CI_Organisation	See ISO 19115-1:????
owner	Organization that maintains the address record in the database	O	1	CI_Organisation	See ISO 19115-1:????
lineage	Lineage information about the address	O	N	LI_Lineage	See ISO 19115-1:????

NOTE Different names of address components (e.g. in different languages) to identify the same addressable object are NOT the same address.

NOTE A spelling correction to the name of an address component does NOT create a new address.

EXAMPLE In Switzerland, Biel (German) and Bienne (French) have the same preference level.

EXAMPLE Example where one name has preference over the other.

6.2.3 AddressableObject

AddressableObject is a subclass of VersionedObject [ISO/DIS 19152:????].

Table 4 – AddressableObject attributes

Name	Definition	Condition/ Obligation	Max Occur	Data Type	Domain
addressableObjectId	Unique identifier of the addressable object in a database.	M	1	Oid	ISO/DIS 19152:????
type	The type of object that is addressed.	C : Only if there are no subclasses of AddressableObject	1	Class	AddressableObjectType
position	Geometric primitive representing the addressable object.	O	N	GM_Object	See ISO 19107:2003

6.2.4 AddressComponent

AddressComponent is an abstract class and is a subclass of VersionedObject [ISO/DIS 19152:????].

Table 5 – AddressComponent attributes

Name	Definition	Condition/ Obligation	Max Occur	Data Type	Domain
componentId	Uniquely identifies the address component in the database	M	1	Oid	See ISO/DIS 19152:????
lifeCycleStage	The stage in the life cycle of an address	O	1	Class	lifeCycleStageType
preferenceLevel	Indicates the level of preference of the address to use from a set of aliases	O	1	integer	Integer > 0
authority	Authority that assigns the	O	1	CI_Organisation	See ISO 19115-

	address				1:????
owner	Organization that maintains the address record in the database	O	1	CI_Organisation	See ISO 19115-1:????
lineage	Lineage information about the address	O	N	LI_Lineage	See ISO 19115-1:????

6.2.5 ReferenceSpatialObject

ReferenceSpatialObject is an abstract class and derives from one of the subclasses of GM_Object [ISO 19107:2003], e.g. GM_Polygon or GM_Point.

EXAMPLE The polygon representing an administrative area

EXAMPLE The polygon representing the footprint of a building or the point representing the building

EXAMPLE The polygon representing a land parcel

Table 6 – ReferenceSpatialObject attributes

Name	Definition	Condition/Obligation	Max Occur	Data Type	Domain
refObjectld	Unique identifier of the spatial object in the database	M	1	Oid	ISO/DIS 19152:????

7 Address maintenance

How to treat updates in the real world and in databases, etc.

8 Addressing ontology

Proposed content: OWL/RDFS representation of the model in clause 6.

This section will not necessarily be normative. It could also be included in an informative annex.

See also the presentation by Noh Tewolde in Centurion (www.isotc211.org/protdoc/pt19160), as well as Annex D and E.

Annex A (normative)

Abstract test suites

A.1 General

The abstract test suites for the **two** conformance classes defined by this International Standard are presented in A.2 and A.3 below.

A.2 Conformance of a model of an address reference system

A.2.1 Test case for mandatory classes

- a) Test purpose: Check that the model contains all the mandatory classes
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic (see 19105 for list of types)

A.2.2 Test case for optional classes

- a) Test purpose: Check that where *optional classes* are included that they follow the required structure
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.2.3 Test case for associations

- a) Test purpose: Check that the model includes the required *associations* between classes
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.2.4 Test case for mandatory attributes

- a) Test purpose: Check that the model includes the *mandatory attributes* for each class present
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.2.5 Test case for optional attributes

- a) Test purpose: Check that the model includes any *optional attributes* in the required form
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.2.6 Test case for derived address components

- a) Test purpose: Check that the model contains *well-defined address components* that derive from AddressComponent
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.2.7 Test case for address component composition (into an address)

- a) Test purpose: Check that the model *specifies how address components are combined* to form an address
- b) Test method: Inspect the conceptual model
- c) Reference: (sub clause number)
- d) Test type: Basic

A.3 Conformance of an addressing ontology

If the ontology in the current section 7 is moved to an informative annex, A.3 will be deleted.

A.3.1 Test case for ...

- a) Test purpose: (test purpose)
- b) Test method: (test method)
- c) Reference: (reference)
- d) Test type: (test type)

Annex B (informative)

Examples

Replace Annex B (tables) with Annex C (object diagrams)? See agenda of 11 January 2012 teleconference.

B.1 Addresses in cultural heritage information

Table B1. Example of the address reference system described in ISO 21127, *Information and documentation -- A reference ontology for the interchange of cultural heritage information*

Address component	Attributes	Attribute values	Sample value

B.2 INSPIRE

Table B1. Example of the address reference system described in the INSPIRE data specification on addresses

Address component	Attributes	Attribute values	Sample value

B.3 Japan

Table B2. Example of Japanese block-based address reference system

Address component	Attributes	Attribute values	Sample value

Table B3. Example of Japanese land parcel-based address reference system

Address component	Attributes	Attribute values	Sample value

B.4 South Africa

Table B4. Example of the South African SAPO street address type

Address component	Attributes	Attribute values
Address number	authority	Municipality
	uniqueIdentifier	1005
Street name	authority	Municipality
	uniqueIdentifier	Pretorius Street
Post office name	authority	SA Post Office
	uniqueIdentifier	Hatfield
Postcode	authority	SA Post Office

	uniqueIdentifier	0083
--	------------------	------

Table B5. Example of the South African street address type

Address component	Attributes	Attribute values
Address number	authority	Municipality
	uniqueIdentifier	1005
Street name	authority	Municipality
	uniqueIdentifier	Pretorius Street
Registered place name	authority	Chief Survey General's Office
	uniqueIdentifier	Hatfield
Municipality name	authority	Municipal Demarcation Board
	uniqueIdentifier	City of Tshwane

B.5 United Kingdom

Table B6. Example of the address reference system described in BS 7666

Address component	Attributes	Attribute values	Sample value

B.6 Original table

This table has to be converted. A proposed format is shown in B.3. The format still has to be agreed.

ARS Specification	Address reference system	Address component type	(name) Derived address component type	Authority
SANS 1883	SAPO street address type	Address number Street name Post office name Postcode	1005 Pretorius Street Hatfield 0038	Municipality Municipality SA Post Office SA Post Office
SANS 1883	Street address type	Address number Street name Registered place name Municipality name	1005 Pretorius Street Hatfield City of Tshwane	
INSPIRE	
UPU S42	
Act of Japan	block-based address type (urban area) (jukyo hyoji ni kansuru horitsu (Act on reference of residential address, 1962)	Jukyo bango (the closest kiso(basic) bango(number) to an entrance or major gate of the building) Kiso bango(basis numbers which is subdivided into regular distance (10 – 15m) in clockwise direction	2	Municipality Municipality

	<p>Chihojichiho (local autonomy act).</p> <p>Chihojichiho (local autonomy act).</p>	<p>from the corner of gaiku(bloke area)</p> <p>Gaiku fugou (bloke area code)</p> <p>Mati(tyou) mataw Aza (town and village name)</p> <p>Municipality name</p>	<p>9-bannti</p> <p>Suzaku-tyou</p> <p>Nara</p>	<p>Municipality</p> <p>Municipality</p>
	<p>Land Parcel based address type (rural area)</p> <p>Fudousan touki hou(Real Property Registration Act)</p> <p>Chihojichiho (local autonomy act).</p> <p>Chihojichiho (local autonomy act).</p>	<p>Banchi (land parcel number of building located)</p> <p>Mati(tyou) matawa Aza (town or village name) is an area typically surrounded by roads, rivers, etc. based on the old community unit</p> <p>Municipality name</p>	<p>1500-banchi</p> <p>Misasagi-tyou</p> <p>Nara</p>	<p>Registry Office</p> <p>Municipality</p> <p>Municipality</p>

Annex C (informative)

Country profiles and instance data

Replace Annex B (tables) with Annex C (object diagrams)? See agenda of 11 January 2012 teleconference.

C.1 Addresses in cultural heritage information

C.2 INSPIRE

C.3 Japan

C.4 South Africa

The model is somewhat simplified but good enough for the 11 January discussion.

C.4.1 Conceptual model

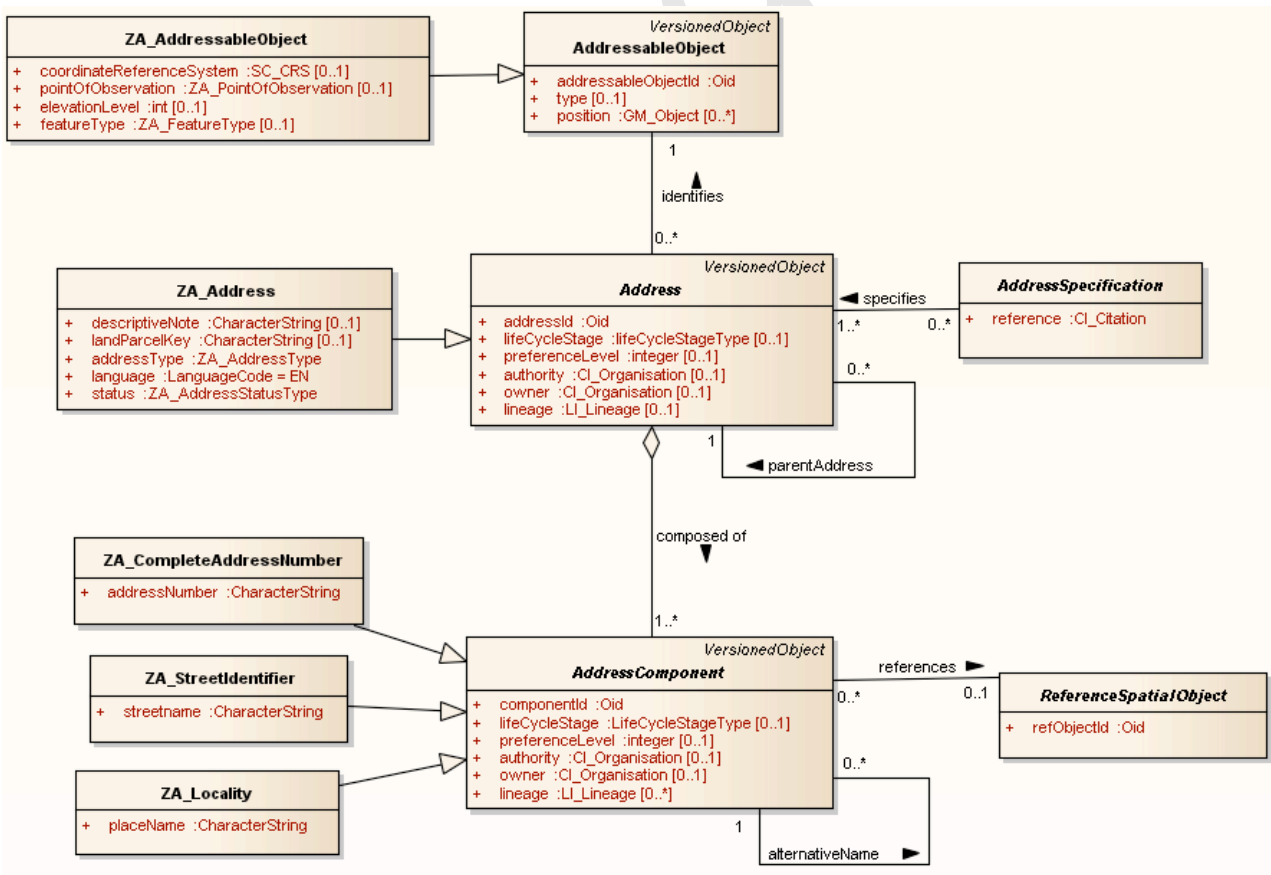


Figure C.1 South African street address

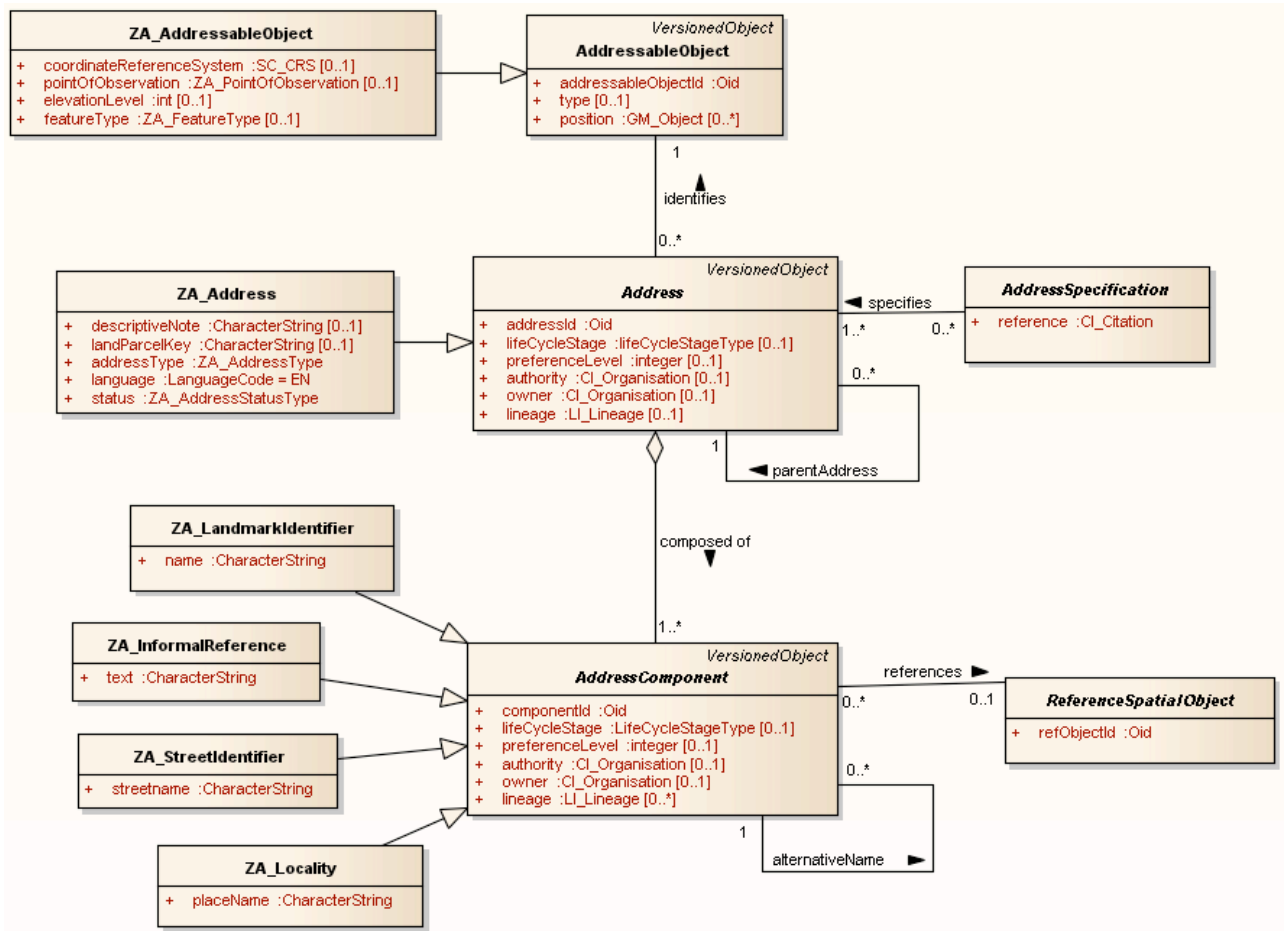


Figure C.2 South African informal address

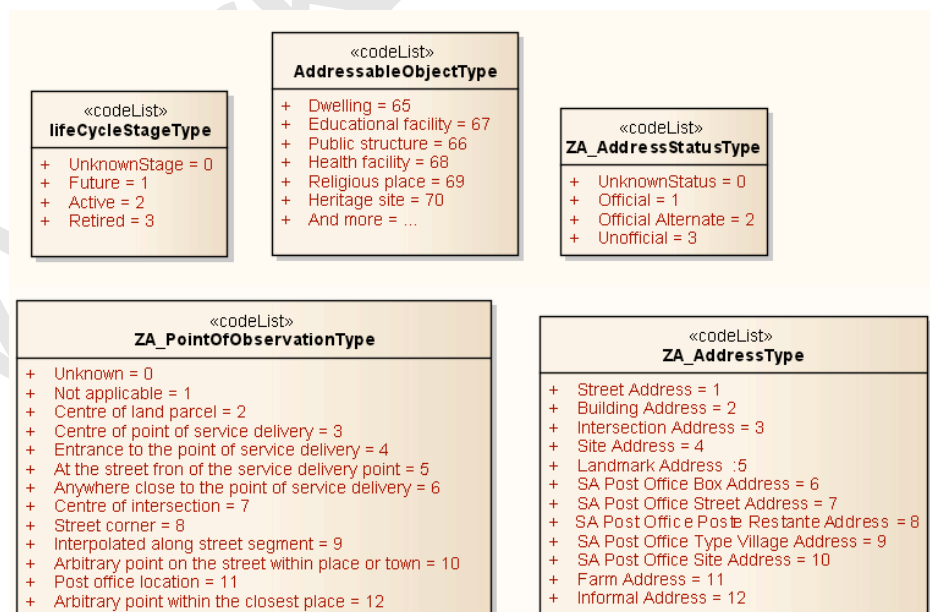


Figure C.3 South African codelists

Table C.1 Matching attributes

SANS 1883:2009 attribute		ISO 19160-1 attribute	
Class	Attribute	Class	Attribute
Address	geoLocation.coordinateReferenceSystem	ZA_AddressableObject	coordinateReferenceSystem
Address	geoLocation.location	AddressableObject	position
Address	geoLocation.pointOfObservation	ZA_AddressableObject	pointOfObservation
Address	descriptiveNote	ZA_Address	descriptiveNote
Address	elevationLevel	ZA_AddressableObject	elevationLevel
Address	custodian.organisationName	Address	authority.name
Address	custodian.contactInfo	Address	authority.contactInfo
Address	custodian.roleCode	Address	authority.roleCode
Address	addressID	Address	addressId
Address	originator.organisationName	Address	owner.name
Address	originator.contactInfo	Address	owner.contactInfo
Address	originator.roleCode	Address	owner.roleCode
Address	resourceProvider	???	???
Address	landParcelKey	ZA_Address	landParcelKey
Address	addressType	Not required	Not required
Address	featureType	ZA_AddressableObject	type
Address	language	ZA_Address	language
Address	lifeCycleStage	Address	lifeCycleStage
Address	status	ZA_Address	status

Add tables for all the classes to show restrictions and extensions to the ISO 19160-1 model

Table C.2 ZA_Address attributes

Name	Definition	Obligation/Condition	Max Occur	Data Type	Domain
descriptiveNote	Free text that describes how to identify the service delivery point accurately when one is there.	O	1	CharacterString	Free text
landParcelKey	The unique identifier for the land parcel (farm, erf or small holding) or sectional title unit to which the address refers (spatially).	O	1	CharacterString	Free text (SG code or identifier)
addressType	The type of the address as specified in section 6 of this standard.	M	1	Class	ZA_AddressType <<codeList>>
language	The two-letter code that indicates which one of the official languages should be used for the street name type, street name modifier and the street name directional.	M	1	Class	LanguageCode <<codeList>>
status	Whether the address was assigned by the official address issuing body (official and official alternate), or an unofficial variant (unofficial).	M	1	CI_Organisation	ZA_AddressStatusType <<codeList>>

C.4.2 Instance data

Many more need to be added...

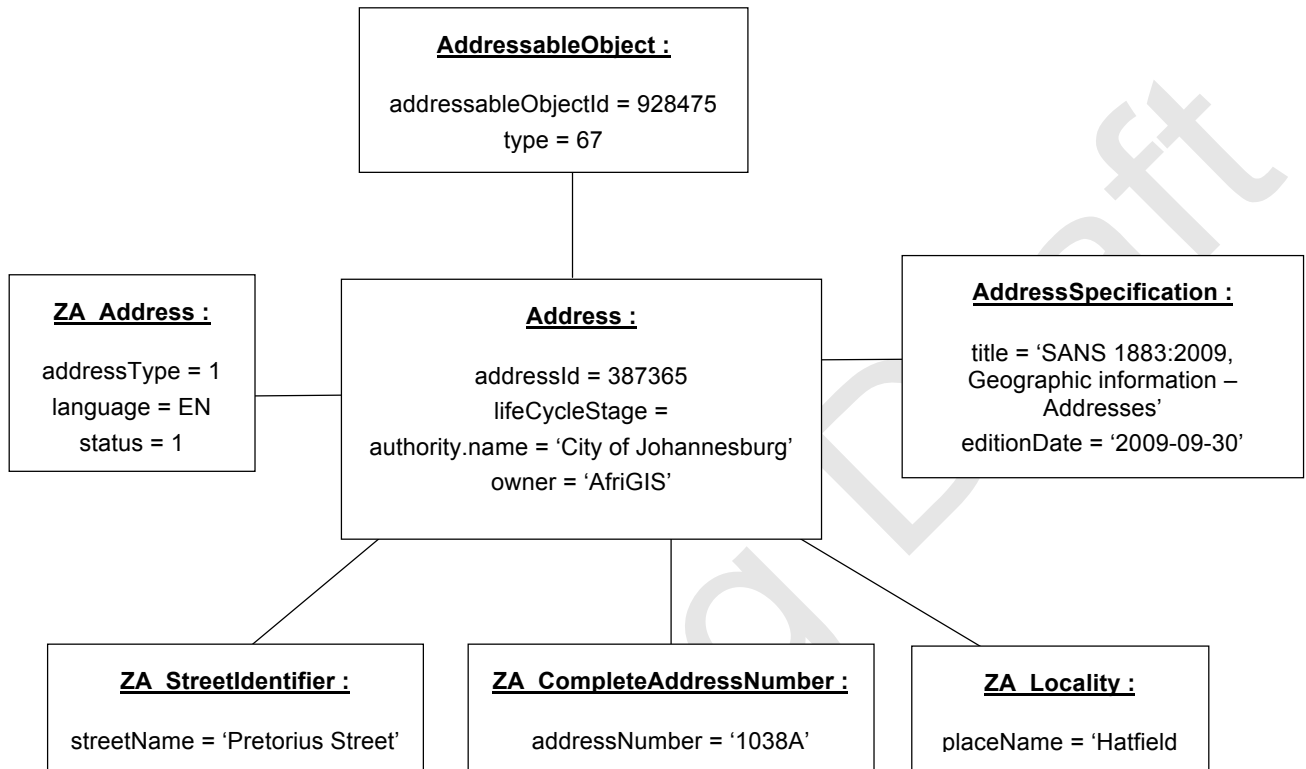


Figure C.4 South African street address

5.5 United Kingdom

5.6 UPU S42

Annex D (informative)

Examples of using the ISO 19160-1 addressing ontology to cross-map between address specifications

D.1 UPU S42 and INSPIRE

To be done

D.2 UPU S42 and SANS 1883:2009

To be done

D.3 vCard and INSPIRE

To be done

D.4 Others

To be done

Bibliography

- [1] D2.8.1.5 *INSPIRE Data Specification on Addresses – Guidelines*, INSPIRE Thematic Working Group on Addresses, 2010.
- [2] ISO 19107:2003, *Geographic information – Spatial schema*
- [3] ISO 19160:2011, *Addressing*. Review summary of the ISO 19160 stage zero project. ISO/TC 211, Geographic information/Geomatics, document n3188.
- [4] UPU S42:2006, International postal address components and templates, Universal Postal Union, Berne, Switzerland.