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Addressing —

Part 4: International postal address components and template language

Adressage —

Partie 4: Composants et langages des modèles d'adresses postales internationales

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 211, *Geographic information/Geomatics*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 331, *Postal services,* in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement), and in collaboration with the Universal Postal Union (UPU).

This second edition cancels and replaces the first edition (ISO 19160-4:2017), which has been technically revised.

The main changes are as follows:

— "telephone number" has been added as an address element.

A list of all parts in the ISO 19160 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The postal service provides letter, package and parcel delivery on a global and universal basis, without the need for mailers and recipients to enter into explicit service contracts. Postal addresses, which combine private recipient information with publicly known delivery point data, provide the mechanism through which mailers specify the intended recipient and the means by which the postal operator can fulfil its delivery commitment.

Traditionally, postal operators have been highly flexible with regard to the manner in which postal items can be addressed; any form and content of address was acceptable as long as it permitted sufficiently unambiguous determination of the delivery point. Even today, many postal operators pride themselves on their ability, using staff intelligence and local knowledge, to deliver postal items carrying incomplete or unusual address representations.

However, increasing volumes and labour cost rates long ago reached the point at which automation became not only economic, but essential. As a result, it has become more and more vital to ensure that the vast majority of postal items are addressed in a way which can be processed automatically, without risk of misinterpretation.

When mail is sent with addresses that are incorrect or incomplete, there is the possibility of undeliverable as addressed mail (UAA mail) which results in the mail being sent back to a return address, being sent on to a forwarding address or discarded as waste. All this unnecessary work has negative economic consequences.

Today, the vast majority of postal items carry printed addresses which are extracted from computer databases. Such databases need to be maintained in the face of population mobility, creation and retirement of delivery points and changes in their specification, such as renaming of streets, renumbering of properties, etc. Moreover, there is a growing need for validation of addresses in e-commerce and the tendency for organizations to exchange or trade address data and for organizations in one country to hold address data of organizations and individuals in other countries, which might use different approaches to the rendering of postal addresses.

Addresses can be rendered according to rules that differ from country to country or from one mailing event (a batch of mail, e.g. letters or monthly statements, sent by a mailer at one time) to another. This document does not impose any obligation on countries or mailers on how addresses shall be rendered but provides a language to express rendering rules recommended by postal operators for mailing purposes.

Templates specified according to this document may be used to exchange information about address rendering rules on international cross-border mail and domestic mail. These templates are available from the Universal Postal Union (UPU) for all countries which have approved them. This facilitates automated processing of mail and international e-commerce deliveries. Rendition engines based on this document are expected to produce the same results for the same addresses. This is conditional upon using approved templates with the same parameters. Even if this were not the case, consistency remains an appropriate goal.

The intended readers of this document include designers and developers of computer systems that process global postal address data including postal address rendering, those who formulate and implement international addressing policies and anyone seeking to reduce UAA mail.

This document is based on UPU S42, Version 8,[3] and has been developed with UPU. It was adopted by CEN as a replacement for EN 14142-1.

This document extends the list of address components by adding the new address element:

— telephone number.

NOTE 1 The preparatory work for this project is described in Reference [2].

NOTE 2 This document implements a recommendation made in Reference [2] and focuses solely on addresses for postal purposes. Addresses for other purposes are described in other parts of the ISO 19160 series.

Addressing —

Part 4: International postal address components and template language

1 Scope

This document defines key terms for postal addressing, postal address components and constraints on their use.

Specifically, this document specifies postal address components organized into three hierarchical levels:

— elements, such as organization name or postcode, which have well-defined conceptual meaning and are not themselves made up of subordinate components, though they can be sub-divided for technical purposes;

— constructs, such as organization identification, which group elements into units form a logical portion of a postal address;

— segments, such as addressee specification, which group related postal address constructs and/or postal address elements into units with a specific defined function.

This document also specifies a mechanism for the creation of sub-elements, which correspond to either sub-divisions of element content, such as door type or door indicator or to multiple occurrences and locations of elements in an address, such as levels of administrative regions.

This document does not specify the length of any component nor the value range of any component.

Moreover, this document specifies the codes to identify elements and sub-elements.

Further, this document specifies postal address rendering rules. This includes:

— identification and ordering of output lines in a rendered address;

— conditions for the selection of candidate lines;

— the order and concatenation of postal address components;

— required and optional components;

— parameters to contextualize an address for rendering;

— the formatting of the components, subject to constraints on the space available for that task.

Postal address rendering rules are represented in this document as a postal address template.

Finally, this document specifies language suitable for computer processing to formally express postal address templates.

This document does not cover the topic of data protection. Users of the document are nevertheless reminded that the storage and exchange of personal data are subject to legislation in many countries.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 639-1, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*

ISO 15924, *Information and documentation — Codes for the representation of names of scripts*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
address
structured information that allows the unambiguous determination of an object for purposes of identification and location

[SOURCE: ISO 19160-1:2015, 4.1, modified — Examples and Notes to entry removed.]

3.2
addressable object
object that may be assigned an address

[SOURCE: ISO 19160-1:2015, 4.2]

3.3
addressee
party who is the ultimate recipient of a delivery item or service

Note 1 to entry: The addressee may be explicitly specified as part of the postal address or may be implicit. For example, in certain countries, omission of addressee information is taken as implying that delivery is to be to an individual or legal entity having legal access to the delivery point.

Note 2 to entry: Mr. or Mrs. Smith specifies that the addressee is either of two individuals, while Mr. Jones and Mrs. Smith denote that the addressee is a group of two individuals. See also role descriptor.

Note 3 to entry: The use made by the postal operator of addressee and mailee data can be dependent on the postal service applicable to the postal item. For some services, such as registered mail, the postal operator's responsibility can include ensuring that the addressee or a duly authorized representative acknowledges receipt of the postal item. In other cases, addressee data can be purely informative or used by the postal operator only for consistency checking and/or for the activation of forwarding services. In other cases, it can be used for sorting or sequencing purposes prior to delivery, for example, in the case of business mail being pre-sequenced by department or individual company official.

Note 4 to entry: In some countries, the addressee may be an abstraction such as "postal customer".

3.4
delivery
<postal> process in which a postal item leaves the responsibility of the postal operator through being handed over to, or left for collection by, the addressee, the mailee, an authorized representative, or deposited in a private letter box accessible to one or other of these

Note 1 to entry: Delivery does not always imply receipt by the addressee or mailee.

3.5
delivery address
<postal> postal address which the postal operator is requested to use to deliver the postal item

Note 1 to entry: In the normal case, the delivery address is the same as the postal address specified by the mailer.

Note 2 to entry: In certain circumstances (e.g. unaddressed mail), the delivery address is not necessarily represented on the postal item. In this case, the delivery address is determined by the postal operator in accordance with an agreement between the operator and the mailer.

Note 3 to entry: The postal item is not always actually delivered to the requested delivery address. For example, in the case of forwarding, delivery takes place at the forwarding address.

3.6
delivery point
<postal> physical location recognized by a postal operator as a valid location at which delivery may occur

3.7
mail recipient
individual who actually receives a postal item at delivery or who first accesses the postal item if it is left for collection

Note 1 to entry: The mail recipient is normally the addressee, the mailee or an authorized representative of one of these two. However, this is not always be the case, for example, if the postal item is left for collection in a location to which third parties have access; if the addressee/mailee have moved house without leaving forwarding instructions or if the addressee or mailee specification was ambiguous and was, as a result, misinterpreted by the postal operator.

3.8
mailee
party designated in a postal address as having responsibility for ensuring that postal items reach their addressee

Note 1 to entry: Unlike the addressee, the mailee is always specified explicitly in a postal address, i.e. if a postal address does not contain a mailee, then there is no mailee.

Note 2 to entry: Notwithstanding Note 1 to entry, the mailee may be designated explicitly by use of a role descriptor or designated implicitly with no role descriptor.

Note 3 to entry: As is the case for an addressee, a mailee specified in a postal address can be ambiguous.

3.9
mailer
party who carries out one or more of the processes involved in creating, producing, finishing, inducting and paying the postage due for a postal item

3.10
party
<postal> one or more natural and/or legal persons and/or organizations without legal personality that act(s) as a single entity for the purpose of participation in a transaction associated with a postal item

3.11
postal address
address, possibly inclusive of the explicit identity of an addressee, where the addressable object is an actual or potential delivery point for a postal item

3.12
postal address component
component
<postal address> constituent part of a postal address

EXAMPLE Locality, postcode, thoroughfare, premises identifier.

Note 1 to entry: The components of postal addresses are specified in 6.2, 6.3 and 6.4.

Note 2 to entry: A postal address component may be, but is not limited to, an element, a construct or a segment.

Note 3 to entry: For convenience, the preferred term "postal address component" has been shortened to the admitted term "component" throughout this document.

3.13
postal address construct
construct
<postal address> postal address component combining postal address elements which together form a logical portion of a postal address

Note 1 to entry: The constructs are specified in 6.2.

Note 2 to entry: For convenience, the preferred term "postal address construct" has been shortened to the admitted term "construct" throughout this document.

3.14
postal address domain
domain
<postal address> an area in which a set of specific postal address types and postal address renderings is prescribed by postal operators

EXAMPLE The most typical example of a postal address domain is a country where a designated postal operator provides postal delivery services.

Note 1 to entry: For convenience, the preferred term "postal address domain" has been shortened to the admitted term "domain" throughout this document.

3.15
postal address element
element
<postal address> postal address component that has a well-defined conceptual meaning with significance for customer or postal processing purposes and is not itself made up of subordinate components

Note 1 to entry: The elements are specified in 6.4.

Note 2 to entry: For convenience, the preferred term "postal address element" has been shortened to the admitted term "element" throughout this document.

3.16
postal address element code
U-code
<postal address> condensed representation for a postal address element or sub-element

Note 1 to entry: The postal address element code conforms to conventions specified in 7.2 and is relatively language-independent when compared with the element and sub-element names.

3.17
postal address sub-element
sub-element
<postal address> identifier of either a sub-division of a postal address element value or one of multiple occurrences of an element in a postal address

Note 1 to entry: Postal address sub-elements are used to facilitate postal address rendering, database storage and related technical needs and should not be considered as specific cases of postal address components.

Note 2 to entry: Postal address sub-elements are further described in 6.5.

Note 3 to entry: For convenience, the preferred term "postal address sub-element" has been shortened to the admitted term "sub-element" throughout this document.

3.18
postal address rendering
address rendition
<postal> process in which the rendered address is created

3.19
postal address segment
segment
<postal address> postal address component comprising a named group of related postal address constructs and/or postal address elements with a specific defined function

Note 1 to entry: Postal address segments are specified in 6.2.

Note 2 to entry: For convenience, the preferred term "postal address segment" has been shortened to the admitted term "segment" throughout this document.

3.20
postal address template
template
<postal> specification of postal address renderings within a postal address domain

Note 1 to entry: A postal address template may need to include rendition instructions.

Note 2 to entry: A template also specifies constraints for syntactical correctness of postal addresses by indicating which elements are mandatory and which are optional.

Note 3 to entry: Software that interprets the rendering rules provided in the template is needed to produce rendered addresses.

Note 4 to entry: Postal address templates are further described in Clause 8.

Note 5 to entry: For convenience, the preferred term "postal address template" has been shortened to the admitted term "template" throughout this document.

3.21
postal address type
set of postal addresses composed of the same set of mandatory and optional components

Note 1 to entry: Postal address types can differ from country to country and from region to region within a country.

3.22
postal item
indivisible mailable entity in respect of which a mail service contractor accepts an obligation to provide postal services

[SOURCE: UPU Standards Glossary, 3.90, modified — Notes to entry have been removed.][5]

3.23
postal operator
organization licensed to provide postal services to the general public

Note 1 to entry: Postal administration is a special case of postal operator.

[SOURCE: UPU Standards Glossary, 3.141][5]

3.24
rendered postal address
rendered address
<postal address> postal address represented as an image in the form of a rectangular shape comprising text lines in which postal address components are separated and ordered

EXAMPLE Address on mail label, order form address, address displayed on screen.

Note 1 to entry: For convenience, the preferred term "rendered postal address" has been shortened to the admitted term "rendered address" throughout this document.

3.25
rendering parameter
<postal address> information item that defines the context for postal address rendering

EXAMPLE When the despatching country and delivering country of the postal item differ, it is cross-border mailing. In this case, the full name of the delivering country is required on the last line of the rendered address. Otherwise, it is domestic mailing and the name of the country is not required on the rendered address.

Note 1 to entry: This includes guiding of rendering of postal addresses on an external medium, such as labels, data files or screens.

Note 2 to entry: Rendering parameters are specified in 8.2.

Note 3 to entry: Rendering parameters do not appear in the rendered postal address, but guide or specify the rendition process.

3.26
rendition instruction
<postal address> operation which either formats, abbreviates, re-arranges or separates elements within address lines when rendering a postal address

Note 1 to entry: Postal address rendition instructions are further described in 8.3.

4 Abbreviated terms

CEN	European Committee for Standardization
ITU	International Telecommunications Union
PATDL	postal address template description language
UPU	Universal Postal Union
XML	extensible markup language

5 Conformance

5.1 Composition

The abstract test suite for the purposes of conformance testing is in Annex A. Any postal address for a specific domain, e.g. country or region, for which conformance to this class is claimed shall pass the requirements described in the abstract test suite in A.2.

5.2 U-code

A U-code (postal address element code; see Clause 7) assigned to an element or sub-element for which conformance with this class is claimed shall pass the requirements described in the abstract test suite in A.3.

5.3 Rendering of postal address

A rendering of postal address for which conformance to this class is claimed shall pass the requirements described in the abstract test suite in A.5.

5.4 PATDL template

Any postal address template description language (PATDL) template for which conformance to this class is claimed shall pass the requirements described in the abstract test suite in A.4.

6 Postal address components

6.1 General

This clause specifies how the postal address is composed from segments, constructs and elements. This is also presented in Annex B as a profile of ISO 19160-1. Definitions of more general terms and concepts are given in Clause 3.

These components can be used to:

a) exchange address data from various countries and between various countries;

b) map between databases containing addresses from multiple countries;

c) specify address rendition rules for multiple countries.

A postal address specification comprises one to four segments:

— an addressee specification (optional);

— a mailee specification (optional);

— mail recipient despatching information (optional);

— a delivery point specification (mandatory).

Each of these is described in 6.2. Segments are built up from postal address constructs and postal address elements, which are described in 6.3 and 6.4 respectively. In addition to constructs and elements, the sub-elements are specified in 6.5.

Figures 1 and 2 show how elements are combined to form constructs and segments of addresses.

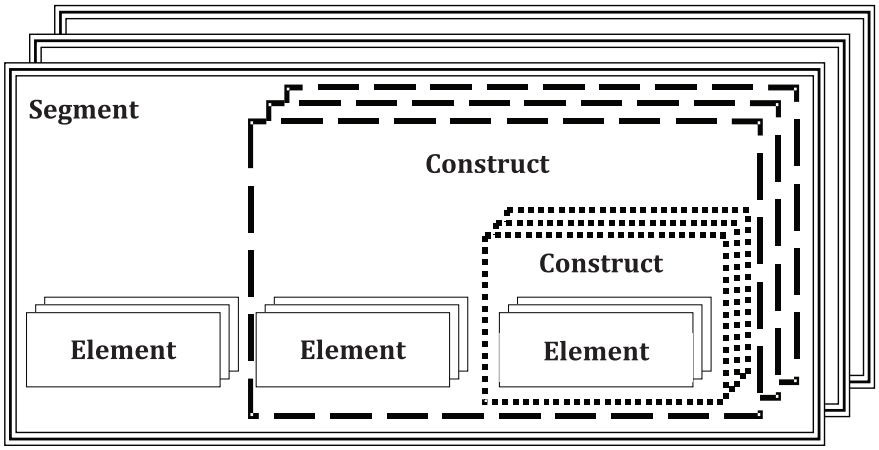

Figure 1 — Relationship between segments, constructs and elements — General box view

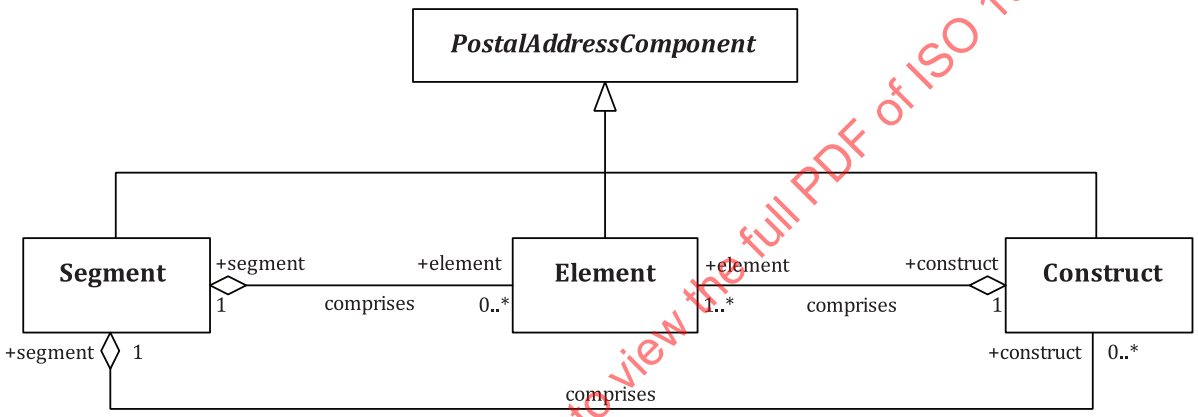

Figure 2 — Relationship between segments, constructs and elements — UML view

Figure 3 shows how elements specified in 6.4 are combined to form constructs and segments specified in 6.3 and 6.2.

NOTE Figure 3 does not include sub-elements. Annex B provides the conceptual hierarchy of components and sub-elements in a form of the ISO 19160-1 profile. The full conceptual hierarchy, including the sub-elements, is provided as the UPU dynamic code list 210 published at the UPU website.[8]

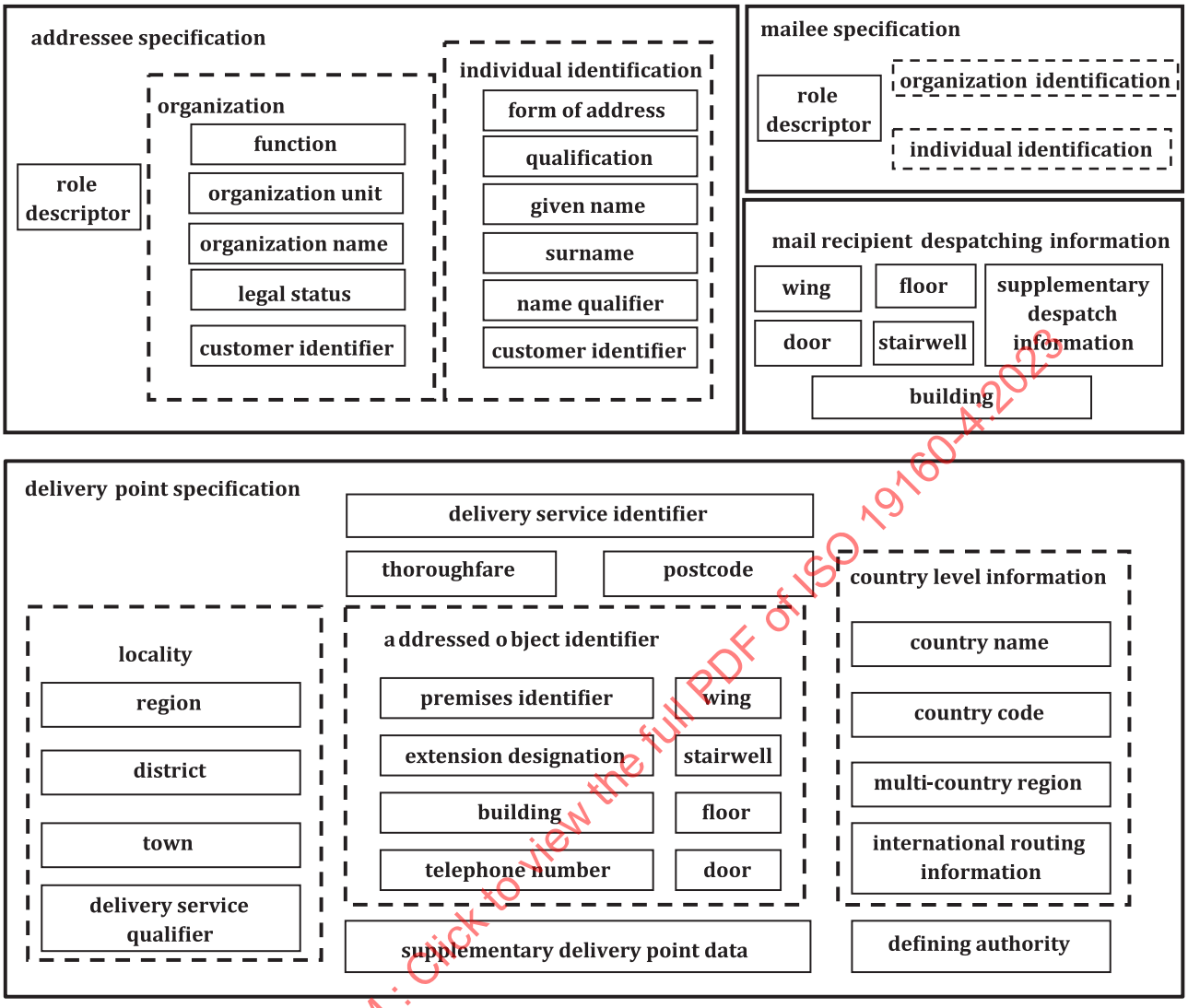

Figure 3 — Postal address components — Segments, constructs and elements

6.2 Postal address segments

Postal address segments are postal address components comprising a named group of related postal address constructs and/or postal address elements with a specific defined function. Postal address segments are specified in Table 1 and depicted in Figure B.10.

Table 1 — Postal address segments

Segment	Code	Description
addressee specification	10	Segment which specifies the addressee. NOTE 1 Addressee specification is composed of either individual identification or organization identification, possibly combined with role descriptor. NOTE 2 Specification of the addressee can be optional or mandatory, depending on the particular postal service for which a postal address is to be used. For example, for normal letter mail, a delivery point specification is sufficient in many countries and in this case, the addressee is considered as being any party which has legal access to the delivery point. In contrast, registered mail normally carries an explicit specification of the addressee.

Table 1 *(continued)*

Segment	Code	Description
mailee specification	20	Segment which specifies the mailee. NOTE 1 Mailee specification is composed of individual identification or organization identification, possibly combined with role descriptor. NOTE 2 Specification of a mailee is required only in situations in which the postal operator is requested to deliver the postal item into the care of an individual or organization other than the addressee.
mail recipient despatching information	30	Segment providing information intended for the routing and despatch of mail by the mail recipient, when this is not the addressee. NOTE 1 Mail recipient despatching information is intended for use by the mailee, if one is specified or by the mail recipient. It is not used by the postal operator. NOTE 2 For postal items addressed to an organization and which are delivered by the postal operator to a mailroom or post office box, mail recipient despatching information can include information such as wing, stairwell, floor and door which, in the case of more specific services (such as registered mail) form part of the delivery point specification. Supplementary despatch information can also be required. NOTE 3 In the case of addresses associated with an educational institution, military facility, prison, hospital or other entity for which the postal operator delivers items to a central point and further distribution is carried out by the institution or its agents, mail recipient despatching information can also include designation of a building or a complex of buildings.
delivery point specification	40	Segment which designates the delivery point for a postal item. NOTE 1 Delivery point specification is composed of country level information, defining authority, locality, postcode, thoroughfare, addressed object identifier, service point identifier and supplementary delivery point data. NOTE 2 The association between a delivery point specification and the delivery point can be service or time dependent. For example, while a normal letter postal item addressed to an apartment can be delivered to a letterbox in the entry hall of the apartment building, a registered postal item carrying an identical postal address has to be delivered to the addressee (or his representative), possibly at the door of the apartment itself. Similarly, the link between a business reply or freepost service number and a delivery point can change if the customer concerned moves locations. NOTE 3 Several delivery point specifications can be associated with a single delivery point. NOTE 4 In some countries, certain forms of delivery point specification are limited to particular postal products. For example, a box number is not always permitted for the addressing of recorded delivery postal items or parcels.

6.3 Postal address constructs

Postal address construct is a postal address component that combines postal address elements to form a logical portion of a postal address. Postal address constructs are specified in Table 2.

Table 2 — Postal address constructs

Construct	Description
addressed object identifier	Construct identifying a delivery point or a group of delivery points. EXAMPLE Addressed object identifier “14” on “Spruenglistrasse” in “3006 Bern” identifies a multifamily building with a group of delivery points that are distinguished by the names of residents on the mailboxes. NOTE 1 Addressed object identifier is a component of delivery point specification. It could be premises identifier, extension designation, building, wing, stairwell, floor, door, telephone number or a combination thereof.

Table 2 *(continued)*

Construct	Description
	NOTE 2 If multiple delivery points are identified by the addressed object identifier, the postal operator chooses the appropriate one.
country level information	Construct encompassing the postal address elements applying to countries or groupings of countries. NOTE 1 Country level information is a component of delivery point specification. It could be country name, country code, multi-country region, international routing information or a combination thereof. NOTE 2 As a rule, these elements are only included in address presentation for cross-border mail, but in that situation, they are necessary to avoid the risk of ambiguity.
individual identification	Construct identifying either a single individual or a group of individuals, from which the postal operator may select one. NOTE Individual identification is a component of addressee specification and mailee specification in which each element can occur zero, one or more times. It could be a form of address, given name, surname, name qualifier, qualification, customer identifier or a combination thereof.
locality	Construct identifying the geographical area in or adjacent to which a delivery point is located. NOTE 1 Locality is a component of delivery point specification. It could be a region, town, district, delivery service qualifier or a combination thereof. Region, town and district provide for multiple levels of geographically localizing information. Use need only be made of the number of levels which are actually required to unambiguously identify the geographic area in which the delivery point is situated. Thus, taking into account the specifications of the postal operator, region should be used if there are multiple towns having the same name within the country.
organization identification	Construct identifying either a single individual or a group of individuals within an organization, from which the postal operator may select one. NOTE 1 Organization identification is a component of addressee specification and mailee specification. It could be a function, organization unit, organization name, legal status, customer identifier or a combination thereof. NOTE 2 In a postal address which includes both an individual identification and an organization identification, one identifies the addressee of the postal item and the other identifies a mailee. Function and organization unit are optional, the (group of) individual(s) then identified being the authorized representative(s) of the organization. Legal status may also be optional, if organization name is sufficient to unambiguously identify the intended organization.

6.4 Postal address elements

Postal address elements with their codes are specified in Table 3.

Table 3 — Postal address elements

Element	Code	Description
building	26	Element identifying the number or name and type of the edifice or construction in or adjacent to which a delivery point is located. EXAMPLE Batiment A, Block 7, Houseboat, London Tower. NOTE 1 This element appears in the delivery point specification and mail recipient despatching information segment. It comprises the sub-elements preceding building type, succeeding building type and building indicator. NOTE 2 Buildings are understood widely as identifying various constructions and groups of buildings. NOTE 3 This element comprises two levels of building in order to account for situations in which an individual building is designated along with a building complex. The building element at each level comprises the sub-elements preceding building type, succeeding building type and building indicator.
country code	41	Element designating the ISO 3166-1 code for the country, territory or area of geopolitical interest, in which a delivery point is located or via which the delivery point is accessed. EXAMPLE FR, NL, NZ. NOTE 1 This element appears in the delivery point specification segment. NOTE 2 The ISO 3166-1 two-character alphabetic representation is specified. NOTE 3 In certain circumstances, the country code can appear in an address presentation for cross-border mail.
country name	14	Element designating the country, dependency or area of geopolitical interest, in which a delivery point is located or via which the delivery point is accessed. NOTE 1 This element appears in the delivery point specification segment. NOTE 2 In specifying the country name, the language used can be significant. NOTE 3 Mobile delivery points, such as mobile homes and ships, are not necessarily (permanently) located in or accessed via a particular country. Nevertheless, they are associated with a country and locality for delivery point specification purposes. Depending on the situation, these can correspond either to the place of registration or to the place in which the delivery point is currently located or is expected to move.
customer identifier	07	Element identifying a customer of a delivery service provider (postal operator). NOTE This element appears in the addressee specification segment.
defining authority	12	Element designating the postal operator or other authority responsible for the definition and maintenance of the delivery point specification concerned. NOTE 1 This element appears in the delivery point specification segment. NOTE 2 Depending on the country, delivery point specifications can be assigned and maintained by a central government agency, by regional or municipal authorities or by a postal operator. NOTE 3 In a competitive postal service environment, a delivery point can be owned or served exclusively by a particular postal operator. In such a case, the defining authority for the delivery point specification will normally be the identity of the postal operator which owns or serves the delivery point concerned. Even where this is not the case, different operators can have different ways of specifying a particular delivery point. For example, in the UK, Hays has its own system of "DX codes" which differ from the postcodes in use by the post office.

Table 3 *(continued)*

Element	Code	Description
delivery service identifier	19	Element which designates a delivery point or a group of delivery points from which the postal operator may choose one, by reference to a specified identifier, rather than by reference to its physical location. EXAMPLE Post office box numbers, BP (Boîte Postale), PRIVATE BAG, poste restante and business reply services. NOTE A postal delivery service identifier appears in the delivery point specification segment. It comprises sub-elements for two positions (alternate) with two parts: delivery service type and delivery service indicator for each position. A delivery service type is a sub-element indicating the type of delivery service. A delivery service indicator is a sub-element designating a specific delivery point, within the category identified by delivery service type, within or accessed for postal delivery services via, the locality.
delivery service qualifier	35	Element designating the name of the distribution office used for delivery services. EXAMPLE BORDEAUX CEDEX, NANTES CEDEX 1, FUTUROSCOPE CEDEX. NOTE This element appears in the delivery point specification segment.
district	17	Element indicating the name of the area within or adjacent to the town in which a delivery point is located, or via which it is accessed. EXAMPLE Hamlet, Sector, Arrondissement, Conjunto, Colonia Juarez, Kebele 4, Moo 11 NOTE 1 This element appears in the delivery point specification segment. It comprises sub-elements for levels of district, each with positions, with a type and indicator for each level and position. NOTE 2 A district can be a commonly known name for an area or it can be an area assigned for postal or administrative purposes. A district or sector can be one of a number of areas with a similar naming structure that can include a type and indicator structure. NOTE 3 “District” is used by some countries for high level administrative divisions that are mapped to element regions while element district is reserved for sub-divisions of town.
door	32	Element indicating the apartment, room or office in, at or adjacent to which a delivery point, situated within a building, is located. NOTE This element appears in the delivery point specification segment and in the mail recipient despatching information segment. In each segment, it comprises the sub-elements door type and door indicator.
extension designation	28	Element designating the specific delivery point where this is not uniquely identified, within the country and locality, by other components of the addressed object identifier. NOTE This element appears in the delivery point specification segment.
floor	31	Element indicating the floor or level on which a delivery point is located in a multi-storey building. NOTE This element appears in the delivery point specification segment and in the mail recipient despatching information segment. In each segment, it comprises the sub-elements floor type and floor indicator.

Table 3 *(continued)*

Element	Code	Description
form of address	05	Element indicating through a word, group of words, acronyms or abbreviations, an individual or group's civil status or condition. EXAMPLE 1 Mr., Mrs., Mr. and Mrs., Miss, Family, Herr, Señora. EXAMPLE 2 Examples of civil status or condition: postal customer, occupant, current resident. NOTE 1 This element appears in the addressee specification segment and in the mailee specification segment. NOTE 2 Form of address can include gender-specific references and honorific distinctions, though preceding qualification is best suited for earned or designated attributes applying to an individual. NOTE 3 A form of address can be sufficient to identify an abstract addressee.
function	03	Element designating role or responsibility within an organization. EXAMPLE 1 The function Postmaster can be followed by a town and postcode, omitting reference to the Post. EXAMPLE 2 Managing Director, Chief Executive, Marketing Manager, Programmer, Janitor, Secretary at CEN/TC 331. NOTE 1 This element appears in the addressee specification segment and in the mailee specification segment. NOTE 2 Function, which relates to a role within an organization, is distinguished from qualification, which is an intrinsic attribute of a specific individual. NOTE 3 If there is a function, it implies that there is also an organization even though an organization is not necessarily present in the address. NOTE 4 An individual addressee can be denoted only by a function, for example, because the name of the individual is perhaps not known.
given name	06	Element specifying the name used to distinguish between persons having the same surname(s) and who may have access to a particular delivery point. NOTE 1 This element appears in the addressee specification segment and in the mailee specification segment. In each segment, it comprises sub-elements for parts. These can be used in address rendering to shorten or eliminate parts of the given name while retaining other parts in full. In each segment, it also comprises sub-elements for preceding and succeeding given name, when name parts are not consistently ordered within a domain. NOTE 2 Given names can be abbreviated, e.g. Ch for Charles, or represented only by an initial letter. NOTE 3 A given name is associated with an individual, as opposed to a family or a matrilineal or patrilineal identifier.
international routing information	44	Element indicating how a country, territory or area of geopolitical interest can potentially be reached. EXAMPLE VIA CAPE TOWN NOTE This element appears in the delivery point specification segment.
legal status	01	Element indicating the formal registration of an organization. EXAMPLE GmbH, Inc., Ltd., AB, A/S, OY. NOTE This element appears in the addressee specification segment and in the mailee specification segment. In the addressee segment, it comprises the sub-elements preceding legal status and succeeding legal status. In the mailee segment, it has two positions and for each position, it provides for the sub-elements preceding legal status and succeeding legal status.

Table 3 *(continued)*

Element	Code	Description
multi-country region	43	Element indicating a region in which the country, territory, or area of geopolitical interest is located and by which it is potentially more effectively recognized. EXAMPLE British West Indies (BWI). NOTE This element appears in the delivery point specification segment.
name qualifier	09	Element used in some countries to distinguish between persons with the same surname(s) who have similar given names or initials. EXAMPLE III, Senior, the Third. NOTE This element appears in the addressee specification segment and in the mailee specification segment.
organization name	00	Element giving the official name, the registered business name or other official designation of an organization. NOTE This element appears in the addressee specification segment and in the mailee specification segment. In the mailee segment, it comprises sub-elements for preceding organization name and succeeding organization name.
organization unit	02	Element identifying a subdivision of an organization. EXAMPLE Marketing Department, Accounts Receivable. NOTE This element appears in the addressee specification segment and in the mailee specification segment. In each segment, it comprises sub-elements for two organizational levels. In the mailee segment, it further provides for the sub-elements preceding organization unit and succeeding organization unit at each level.
postcode	13	Element designating the code used for the sorting of mail. NOTE 1 This element appears in the delivery point specification segment. NOTE 2 Some countries structure postcodes in two or more parts, with one part identifying the delivery region or postal processing facility at which delivery sorting takes place, the second defining the delivery office or route, within the area covered by that facility, and the third, if used, indicating the specific delivery point. For example, most French postcodes commence with the 2-digit number of the Département; British ones are separated into two parts, with the first being a two-, three- or four-character code which indicates the postal district, and the second identifying a delivery address or set of addresses within this district. NOTE 3 Postcodes are sometimes referred to as postal codes, ZIPs or ZIP Codes. NOTE 4 Postcodes are not used in all countries. In many cases, they are complementary information, providing only an encoded representation of locality, (part of the) delivery route which includes the delivery point concerned and, possibly, the individual delivery point on that delivery route. NOTE 5 A postcode can relate to a single delivery point or to a group of delivery points which are related in postal processing terms, usually by virtue of their being served by a single delivery office or being on a single delivery route. It can, however, relate to other grouping parameters, such as special services. NOTE 6 Though normally having long-term national significance, postcodes can be operator specific (see also, Hays DX codes in the United Kingdom) and can have only temporary existence, as when a special postcode is assigned to handle mail resulting from a charity appeal or when an existing assignment of codes is reformed due to changes in the scope or magnitude of delivery point distribution. NOTE 7 Though created primarily for the purpose of sorting mail, postcodes are often used, outside the postal processing context, for other purposes. In particular, many organizations use them in marketing databases to link potential customer characteristics to geographic areas.

Table 3 *(continued)*

Element	Code	Description
premises identifier	24	Element designating the area or the object on an area, adjacent to thoroughfare, in which the delivery point or delivery point access is located. NOTE 1 This element appears in the delivery point specification segment. It has two positions, each comprised of sub-elements for type, indicator and indicator suffix. NOTE 2 This can be in the form of a house or site number or name and will normally correspond to an area specified in the cadastral or municipal register of building plots.
qualification	10	Element indicating an individual's professional or academic qualification or rank in a professional group or society. EXAMPLE PhD, Fellow of the Royal Society, FRS, Barrister at Law. NOTE 1 This element appears in the addressee specification segment and in the mailee specification segment. In each segment, it comprises the sub-elements preceding qualification, intermediate qualification and succeeding qualification. NOTE 2 Qualification, which is an attribute of an individual, is distinguished from function, which designates a role within an organization. An individual's qualification(s) remain valid, irrespective of changes in the organization for which they work or in their function or job title in an organization.
region	15	Element specifying the geographic or administrative area of the country in which the town is situated. NOTE 1 This element appears in the delivery point specification segment. It comprises sub-elements for levels of region, each with positions, with a type and indicator for each level and position. NOTE 2 Regions are generally related to administrative rather than to postal geography. Examples include French Departments, German Länder, British Counties and American States.
role descriptor	04	Element indicating the role of mailee or addressee for the identified individual or organization. NOTE This element appears in the addressee specification segment and in the mailee specification segment. EXAMPLE Attn (attention), tav (ter attentie van), c/o (care of), p/a (per adres)
stairwell	30	Element indicating access to floor or door within a building. EXAMPLE Escalier. NOTE This element appears in the delivery point specification segment and in the mail recipient despatching information segment. In each segment, it comprises the sub-elements stairwell type and stairwell indicator.
supplementary delivery point data	34	Element providing additional data or instructions intended to facilitate access to, or designation of, a delivery point. EXAMPLE "Opposite number 23", "50 metres to the left of the main door", "Cruce Con Calle Obregon". NOTE This element appears in the delivery point specification segment. It comprises sub-elements for two occurrences specified as positions.
supplementary despatch information	33	Element providing additional data or instructions intended to assist the mail recipient in the processing of a postal item. EXAMPLE An internal organizational mail distribution code or mail stop. NOTE This element appears in the mail recipient despatching information segment.

Table 3 *(continued)*

Element	Code	Description
surname	08	Element which identifies the family or parentage of an individual. NOTE 1 This element appears in the addressee specification segment and in the mail-ee specification segment. In each segment, it comprises sub-elements for surname prefix, surname part 1 and surname part 2. These can be used to index names that are not sorted on the part of the surname that is rendered first or optionally can be rendered first. NOTE 2 This element is often identified by other, less precise terms such as last name or family name.
telephone number	11	Element providing a sequence of digits assigned to a fixed-line or a mobile telephone subscriber NOTE 1 This element appears in the delivery point specification segment. It compris-es sub-elements for the following parts: part 1 International Dialing Code (IDC) (1 to 3 digits) and part 2 Global Subscriber Number (GSN) (max. 12 digits). NOTE 2 Telephone numbers can also be presented with the international access prefix that varies from country to country. The requirement to prefix the telephone number with the international access code is indicated by the plus (+) sign preceding the telephone number. EXAMPLE Telephone number +413135051111 begins with "+" sign to indicate that the international access code is required, international dialling code (41 for Switzer-land) and subscriber number 3135031111. NOTE 3 Information taken from ITU-T E.164, The international public telecommuni-cation numbering plan.[7]

Table 3 *(continued)*

Element	Code	Description
thoroughfare	21	Element which identifies the road or part of a road or other access route along which a delivery point can be accessed, either directly or via a secondary or tertiary road or access route. EXAMPLE 1 San Marcos, Pine Ridge, Main, 6th, Charles de Gaulle. NOTE 1 This element appears in the delivery point specification segment. It comprises sub-elements for three occurrences, specified as primary, secondary and tertiary. Within each occurrence, there are sub-elements for name, name prefix, type and qualifier, with the latter two having preceding or succeeding positions of parts. EXAMPLE 2 Directionals such as North or SW and qualifiers such as Little or Upper are examples of a thoroughfare qualifier. NOTE 2 For addressing purposes, a thoroughfare need not be on land. For example, a canal or river can serve as a thoroughfare in the address of a houseboat or of a construction on the bank. NOTE 3 A thoroughfare name can uniquely identify the thoroughfare or can need to be supplemented with type and qualifier information or other elements in order to be unique in the required context. NOTE 4 A thoroughfare name prefix can be used to separate connecting words without sorting significance from the main part of the name of the thoroughfare. EXAMPLE 3 “de la” in Avenue de la Republique, “of the” in Avenue of the Americas are examples of thoroughfare name prefix. NOTE 5 A thoroughfare type indicates the category or type of thoroughfare. Thoroughfare type can be used to distinguish between instances in the locality which have the same thoroughfare name. Thoroughfare type is separated from thoroughfare name and thoroughfare qualifier because it can have different abbreviation rules and/or a sorting significance which differs from its relative position in printed representations. EXAMPLE 4 Avenue, Beach, Canal, Lane, Place, Road, Square, Street are examples of thoroughfare type. NOTE 6 Thoroughfare type can precede or follow thoroughfare name in printed representations; its position can depend on national, regional and/or linguistic considerations or can be specific to the thoroughfare concerned. For example, in Belgium, French language thoroughfare types, such as boulevard and drêve du, generally precede the thoroughfare name, while their Flemish equivalents, laan and dreef, follow the thoroughfare name. NOTE 7 A thoroughfare qualifier distinguishes between different parts or instances of a thoroughfare, within a locality, which have the same thoroughfare name and thoroughfare type. NOTE 8 A thoroughfare qualifier can be separated from a thoroughfare name if it has different abbreviation rules and/or has a position in printed representations which is not adjacent to the thoroughfare name or thoroughfare type. Its position in printed representations, at the beginning, between the thoroughfare name and thoroughfare type, or at the end, can be determined by national, regional and/or linguistic considerations or can be specific to the thoroughfare concerned. NOTE 9 A secondary thoroughfare identifies the road or part of a road or other thoroughfare in which a delivery point can be reached and which is accessed via primary thoroughfare. NOTE 10 A tertiary thoroughfare identifies the road or part of a road or other thoroughfare in which a delivery point can be reached and which is accessed via a primary thoroughfare and secondary thoroughfare.
town	16	Element indicating the name of the populated place in which a delivery point is located, or the populated place near to or via which the delivery point is accessed. NOTE This element appears in the delivery point specification segment.

Table 3 *(continued)*

Element	Code	Description
wing	29	Element identifying, for a delivery point, the building section in which it is housed and/or the main entry door through which it is accessed. NOTE This element appears in the delivery point specification segment and in the mail recipient despatching information segment. In each segment, it comprises the sub-elements wing type and wing indicator.

6.5 Postal address sub-elements

In line with the definition, elements are the basic conceptual units from which addresses are built. An element can, however, be used several times within the address. When an element is used several times in the address, multiple instances are dealt with.

If such instances are hierarchically ordered, they are called levels (in this document). For example, primary thoroughfare and secondary thoroughfare are two levels of the element thoroughfare.

If such instances cannot be hierarchically ordered, they are called positions (in this document). For example, premises identifier position 1 and premises identifier position 2 are two positions of element premises identifier.

Furthermore, different parts of a single element can need to be distinguished for various purposes including the rendition process, for example, in order to insert proper punctuation. Identifiers of such parts are called parts (in this document). For example, thoroughfare type and thoroughfare name are two parts of element thoroughfare.

Finally, the same kind of part of element may occur in an address multiple times. Such instances of parts are called positions of parts. For example, preceding thoroughfare qualifier and succeeding thoroughfare qualifier are two positions of the thoroughfare qualifier that in turn is a part of element thoroughfare.

Levels, positions, parts and positions of parts are four different kinds of sub-elements that are represented by four different digits of sub-element code specified in 7.2.

A sub-element may be created from an element by adding (sub-element operator) words listed in Table 4. Not all combinations of operator and element create a valid sub-element. The list of valid sub-elements is published in the code list 210 on the UPU website.[8]

NOTE 1 Further information on how postal addresses can be mapped to elements and sub-elements is provided in Annex C.

NOTE 2 Sub-elements in the code list provide enough subdivisions to handle known situations, while providing for some degree of extensibility in implementation.

Table 4 lists those operators, descriptions of their use and examples.

Table 4 — Sub-element constructor

Constructor name	Description
alternate	Creates a position sub-element that represents a reference object of an element by means of an alternative reference system, when multiple reference systems apply.
indicator	Creates a part sub-element that represents a logical part of an element, which may be combined with a type to constitute an identifier, and instances of which represent numerical, alphabetic or symbolic data that differentiate one instance of an element from another, within a certain scope of reference. EXAMPLE In Apartment A, Apartment is a type and A is an indicator. Apartment A should be a unique identifier within a limited scope of reference.

Table 4 *(continued)*

Constructor name	Description
intermediate	Creates a position sub-element that represents an instance of an element that is rendered after the preceding sub-element and before the succeeding sub-element. EXAMPLE In Prof. Alex graaf van Nispen BA MKM, graaf is an intermediate qualification.
level	Creates a level sub-element that represents an instance of element in an unspecified hierarchical ordering to the other levels of the element. EXAMPLE Anhui (province of China) is region level 1 and Hefei Shi (prefectural level city within Anhui province) is region level 2.
name	Creates a level sub-element that represents a logical part of an element and may be further differentiated by the content of related sub-elements. EXAMPLE Thoroughfare is further differentiated by the content of thoroughfare name and thoroughfare type. NOTE The term name is also used in the name of address elements, such as organization name and given name. Thoroughfare name is a sub-element and not an element in its own right because it is subordinate to primary, secondary and tertiary thoroughfare, which are sub-elements.
part	Creates a part sub-element that represents a subdivision of the element, such as a word or delimited string. EXAMPLE For physical parts, given name part 1, surname part 2. NOTE 1 Physical and logical parts are both differentiated using the second digit of the sub-element code, but the names of logical parts use other terms specified in this table, such as type, indicator and qualifier. NOTE 2 The given name Jean Claude can be stored as two physical parts or it can be stored in the element. If the name is hyphenated, such as Jean-Claude, it can be stored as two physical parts only if the presence of the hyphen is managed by some convention governing retention or restoration during rendition and in view of those complexities, it is likely to be stored as a single physical part.
position	Creates a position sub-element that represents an instance of the element that can be combined with other instances either within a single address or in a set of addresses to be processed within a particular template. EXAMPLE Supplementary delivery point data position 1.
preceding	Creates a position sub-element that represents an instance of an element that is rendered before intermediate and succeeding sub-elements. EXAMPLE In Prof. Alex graaf van Nispen BA MKM, Prof. is a preceding qualification.
prefix	Creates a part sub-element that represents a part of an element placed before the main part the element name. NOTE The term prefix is also used in the name of address elements, and in that case, represents a position before another element. For example, a surname prefix comes before the surname. Thoroughfare name prefix is a sub-element and not an element in its own right because it is subordinate to primary, secondary and tertiary thoroughfare, which are sub-elements.
primary	Creates a level sub-element that represents an instance of an element with status or level above secondary and above tertiary sub-elements. EXAMPLE Primary thoroughfare. NOTE Primary, secondary and tertiary can be used for both instances and parts.
qualifier	Creates a part sub-element that represents a logical part of an element and further differentiates the content of related sub-elements. EXAMPLE Thoroughfare qualifier further differentiates the content of thoroughfare name and thoroughfare type.

Table 4 *(continued)*

Constructor name	Description
	NOTE The term qualifier is also used in the name of address elements and in that case, differentiates the content of related elements. For example, a name qualifier further differentiates the content of given name and surname. Thoroughfare qualifier is a sub-element and not an element in its own right because it is subordinate to primary, secondary and tertiary thoroughfare, which are sub-elements.
secondary	Creates a level sub-element that represents an instance of an element with status or level below primary and above tertiary. EXAMPLE Secondary thoroughfare, secondary postcode. NOTE Primary, secondary and tertiary can be used for both instances and parts.
succeeding	Creates a position sub-element that represents an instance of an element that is rendered after preceding and after intermediate sub-elements. EXAMPLE In Prof. Alex graaf van Nispen BA MKM, BA MKM is a succeeding qualification.
suffix	Creates a part sub-element that represents part of an element placed after the main part the element name. EXAMPLE Premises identifier position 1 indicator suffix.
tertiary	Creates a level sub-element that represents an instance of an element with a status or level below primary and below secondary. EXAMPLE Tertiary thoroughfare.
type	Creates a part sub-element that represents a logical part of an element, which may be combined with an indicator to constitute an identifier and instances of which describe a category. EXAMPLE In RESIDENCE MASUREL, RESIDENCE is a type.

6.6 Requirement for composition

A postal address shall comprise of any combination of elements specified in 6.4 and sub-elements that can be created from elements as specified in 6.5 and for which a U-code exists in the UPU code list number 210.[8] Some elements may be grouped into constructs and segments specified in 6.3 and 6.2.

7 Element and sub-element codes

7.1 General

U-codes are assigned to elements, sub-elements and rendering parameters. The list of elements, sub-elements and rendering parameters to which U-codes are assigned is published as the code list 210 on the UPU website;[8] see 7.2. The list of sub-elements used can be extended and each new sub-element shall have a new unique U-code that meets the requirements described in 7.2. The main aim of the U-code is to provide a compact representation which enables an element to be easily identified in various applications including templates.

NOTE The codes facilitate error detection by providing a secondary representation to corroborate the name of the element or sub-element. In addition, they provide a means for supporting a limited degree of extensibility of element and sub-element occurrences. The codes are well-suited for computer processing and are relatively independent of any natural language considerations.

7.2 Requirement for a U-code

The requirements for a U-code are described in Table 5. It shall start with the letter "U", followed by two two-digit numeric identifiers for the segment and element respectively, separated by a full stop (period); further followed by a digit each to indicate the level and position of the element, a full stop, and a digit each to indicate the part and position of the element, i.e. Uxx.xx.xx.xx

Table 5 — Structure and domain of a U-code

Sequence	Number of characters	Reference
1	1	Letter "U"
2	2	Segment identifier (assigned in 6.2, Table 1) to which the element (sub-element) belongs
3	1	Full stop (period)
4	2	Element identifier (assigned in 6.4, Table 3) of which the element (sub-element) is a sub-element
5	1	Full stop (period)
6	1	Digit for the level of the element
7	1	Digit for the position of the element
8	1	Full stop (period)
9	1	Digit for the part of the element
10	1	Digit for the position of the part

The value of each single digit in the U-code is zero if the sub-element is latent in that dimension and from one to nine if it is present.

The complete list of codes is maintained in the UPU code list number 210.[8]

NOTE U-codes for rendering parameters, specified in 8.3, match the pattern of the U-code. Instead of the segment identifier, a fixed value, 50, is used to distinguish from segments taking values 10, 20, 30 and 40. Instead of an element identifier, two-digit numbers in the range between 50 and 56 are used.

EXAMPLE 1 U40.17.31.21, where 40 is the delivery point specification, 17 is the district, 3 identifies third level (hierarchical instance), 1 first position (non-hierarchical instance of level 3), 2 identifies second part (district indicator) and 1 the first position of second part.

EXAMPLE 2 U40.17.00.00 is latent both in terms of levels and in terms of parts and therefore, also in terms of positions. It represents the basic element for district without further differentiation of sub-elements.

EXAMPLE 3 Element 00 for organization name occurs both in segment 10 for addressee information and segment 20 for mailee information. This is represented as U10.00.00.00 and U20.00.00.00 respectively.

EXAMPLE 4 The sub-element "door type" is identified by U40.32.11.11 when it involves information found in the delivery point specification (information used by the postal operator for deliveries). However, the same sub-element, but in the mail recipient despatching information (information intended for the routing and despatch by the mail recipient, when this is not the addressee), is identified as U30.32.11.11.

8 Postal address rendering

8.1 General

Rendering of postal address is a process that takes as an input a set of postal address components and produces rendered address comprising an ordered set of rendered lines as shown on Figure 4.

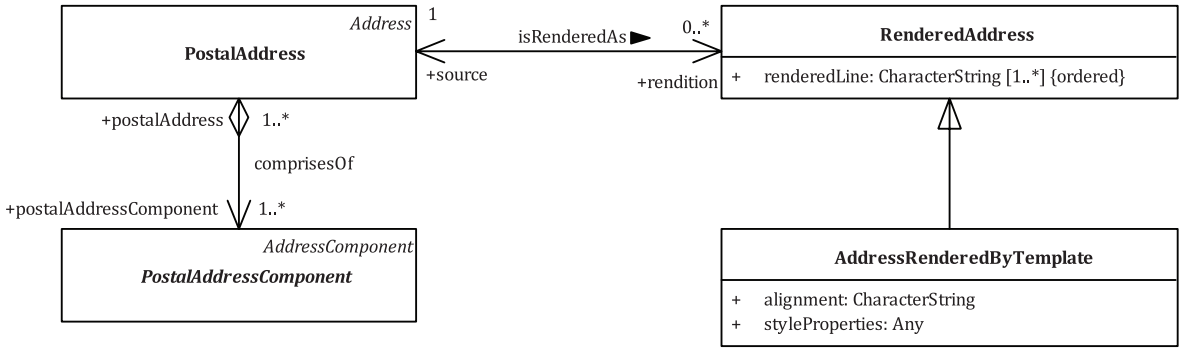

Figure 4 — Rendering of postal address

Rendering of postal addresses can be specified by a postal address template, as shown in Figure 5. The template refers to rendering parameters, specified in 8.2, that contextualize postal address for rendering. Further, the template can require that rendition instructions are executed to format components in rendered lines.

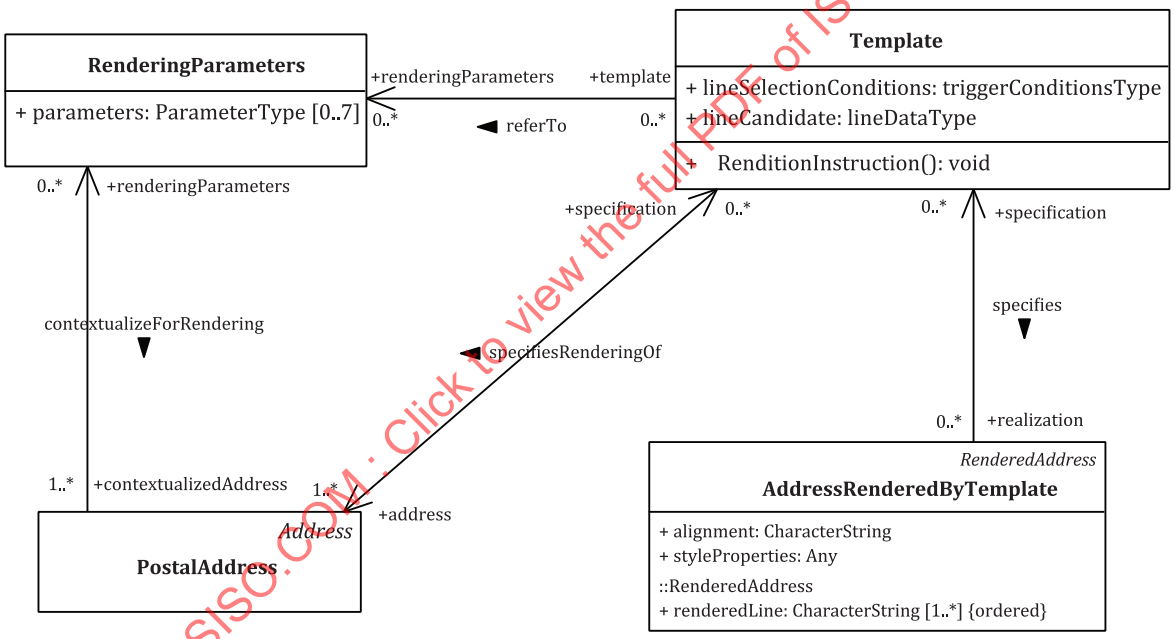

Figure 5 — Rendering of address specified by template

The template specifies:

a) line candidates with an ordered set of postal address components;

b) line selection conditions based on which line candidates are selected and ordered in the rendered address.

NOTE 1 A line candidate describes a possible organization of postal address components in a rendered address. As such, line candidate is a logical object containing a set of references and rules, whereas line in a rendered address (rendered line) is a visual object that can be viewed in the context of preceding and succeeding lines.

Line selection conditions are expressed by means of branching logic based on Boolean functions that take postal address components and rendering parameters as an input.

The template may also specify:

— rules to combine multiple line candidates into a single line of rendered address;

— rules to split a single line candidate into multiple lines of rendered address.

Combining and splitting of line candidates is done to meet constraints on the number of lines in the rendered address while respecting any constraint on the number of characters per line. This is accomplished through a table which lists the lines and line components that can be combined with other lines and line components in an order of priority, either unconditionally or until a target is met. Arguments used for combining lines include specifying groups of components to be combined, priorities, limits and implicit order of the components, as well as any needed delimiters, and the location of the combined components.

NOTE 2 Generally, outputs of combining and splitting are final renderings of postal address, rather than being recycled as inputs to a subsequent additional rendering.

NOTE 3 Annex D explains how specific address formats can be reflected in PATDL templates.

Further rendering transformations can be included in a template by means of rendition instructions described in 8.3.

8.2 Rendering parameters

Rendering depends in part upon the context and the value of certain external data items that are not themselves part of the rendition.

EXAMPLE 1 Canadian addresses can be written in two official languages, French and English. In a French address, thoroughfare type is rendered before thoroughfare name (Rue Saint-Paul), whereas in an English address, thoroughfare type is rendered after the thoroughfare name (Main Street). Correct rendering depends on the language.

EXAMPLE 2 Chinese addresses can be written in Latin script or in Chinese script (Hanzi). All elements of an address in Hanzi will be rendered in one line without any separator while an address in Latin will be rendered in multiple lines with elements separated with whitespace and sometimes a comma.

EXAMPLE 3 The country name is required on the last line of the rendered address on the cross-border postal item but is not required on the domestic postal item.

Rendering parameters are specified in Table 6. The values of rendering parameters shall be in the domain specified in the "Domain" column of Table 6.

Table 6 — Rendering parameters

Parameter	U-code	Description	Domain
script	U50.50.00.00	The writing system in which the address is written.	ISO 15924
language	U50.51.00.00	Language in which the address is provided. NOTE If there are multiple languages in a name and address, the dominant language can be identified. Typically, this corresponds to the language used in the delivery point specification.	ISO 639-1
rendering type	U50.52.00.00	Identifier of one of several permitted renderings of the same postal address.	Character string
despatching country	U50.53.00.00	Country from which the mail is sent to the delivering country. NOTE If there are multiple countries involved, the country from which the mail is sent to the delivering country is considered the despatching country.	ISO 3166-1
delivering country	U50.54.00.00	Country responsible for the delivery of a postal item to a delivery point.	ISO 3166-1

Table 6 *(continued)*

Parameter	U-code	Description	Domain
address type	U50.55.00.00	Identifier of postal address type.	Character string
input granularity	U50.56.00.00	Identifier of one of several permitted decompositions of the same postal address.	Character string

U-codes assigned to rendering parameters match the pattern of U-code and are listed in the code list in Reference [8].

8.3 Rendition instructions

8.3.1 General

Rendition instructions to condition the rendition process are needed for most templates but are not strictly required because some templates are simple enough not to need them. Where used, they accomplish the final presentation of the address or intermediate steps toward that end. Multiple sources of address components and rendition instructions can be used in one template as long as they are uniquely differentiated.

Rendition instructions specify how address components shall be rendered or in some cases, optionally may be rendered, when printed on a postal item or displayed on a screen or another medium in human-readable form. They reflect rules for properly formatting addresses, including punctuation, spacing, formatting, abbreviating and when needed, shortening and reorganizing components to meet national requirements and to ensure deliverability under space constraints.

These instructions can be specified in natural language or as named procedures. Such named procedures can operate directly on address components or upon sets of address components. Alternatively, they can constitute a decision procedure determining aspects of formatting such as inclusion of constants or choice among branches within a template.

EXAMPLE The postcode in the United States of America can be saved in the format 999999999 in a database. However, in an address, the postcode is printed in the format 99999–9999. The rendition instructions therefore state that it is printed with a dash between the 5th and 6th digits. If this rendition instruction is registered as a named procedure, then this procedure can also state that the dash is not present when the last four digits of the postcode are not provided, that the last four digits are not to be 0000, nor the first five 00000, that the last four digits are never printed without the first five, that leading zeros are always printed and that no spacing is allowed preceding or following the dash.

8.3.2 Concatenation

Address components are normally concatenated to form lines of rendered address consecutively from right to left or left to right and delimited with white space or not delimited depending on the nature of the script in which the address is written. The delimiter for addresses written in Latin by default will consist of a single space and for addresses written in Hanzi, will be an empty string. So the default delimiter is itself a parameter that is used by the template. Regardless of how the default delimiter is specified, it can be overridden through the use of rendition instructions. For example, if two parts of a postcode need to be separated not by a single space, but rather by a dash or hyphen without spaces, this can be accomplished through concatenation, inserting the punctuation while selectively overriding the default delimiter. As another example, if two address components are stored separately but shall be rendered without intervening punctuation, this can be accomplished by using an empty string between them, once again overriding the normal default delimiter. In this way, multiple spaces, no spaces and various forms of punctuation can be introduced selectively or generally into the rendering of postal address without being included in the input data set of names and addresses.

8.3.3 Abbreviation

To abbreviate addresses properly, the ability to abbreviate address components is necessary but not sufficient. The abbreviation should be coherent at the component level, which involves known patterns

(for example, when “Rutherford B. Hayes” is preferred to “Rutherford B. H.” as the abbreviation of a name) or consistent depth of abbreviation (for example, when “Intl Bus Mach” is preferred to “International B Machines” as the abbreviation of a company name). This approach to abbreviation is based on pattern analysis using rules.

In each country, national abbreviation tables can be specified (the abbreviation for Avenue is Ave in English but Av in French and for Boulevard it is Blvd in English but Boul in French). In some cases, rules for abbreviations of elements such as street names exist so that algorithms can be involved in abbreviation. This approach to abbreviation is based on table look-up.

8.3.4 Punctuation

Punctuation between elements shall be specified by means of rendition instructions. The purpose is to separate the punctuation that may be required in rendition such as having a numeric floor followed immediately by a numeric door and requiring punctuation for clarity, from punctuation that is part of element content, such as the thoroughfare name “St. James”. Punctuation that connects elements may be conditional and is best handled with rendition instructions.

8.4 Requirements for rendering of postal address

Rules of postal address rendering shall be provided as a template specified in 8.1. The template may refer to rendering parameters specified in 8.2 to contextualize postal address for rendering. The template may specify that rendition instructions are executed to perform advanced rendering tasks as those described in 8.3.

8.5 Requirement for domain of postal address template

A postal address template shall be specified for a specific domain, such as the delivery area of a specific postal operator. The postal address template shall describe rendering of addresses as required within this domain covering all relevant address types.

9 Postal address template description language (PATDL)

9.1 General

The postal address template description language (PATDL) specified in this document facilitates automation of the postal addresses rendering by providing a standardized and computer-readable way to encode templates from various domains. An example of such automation is shown in Figure 6.

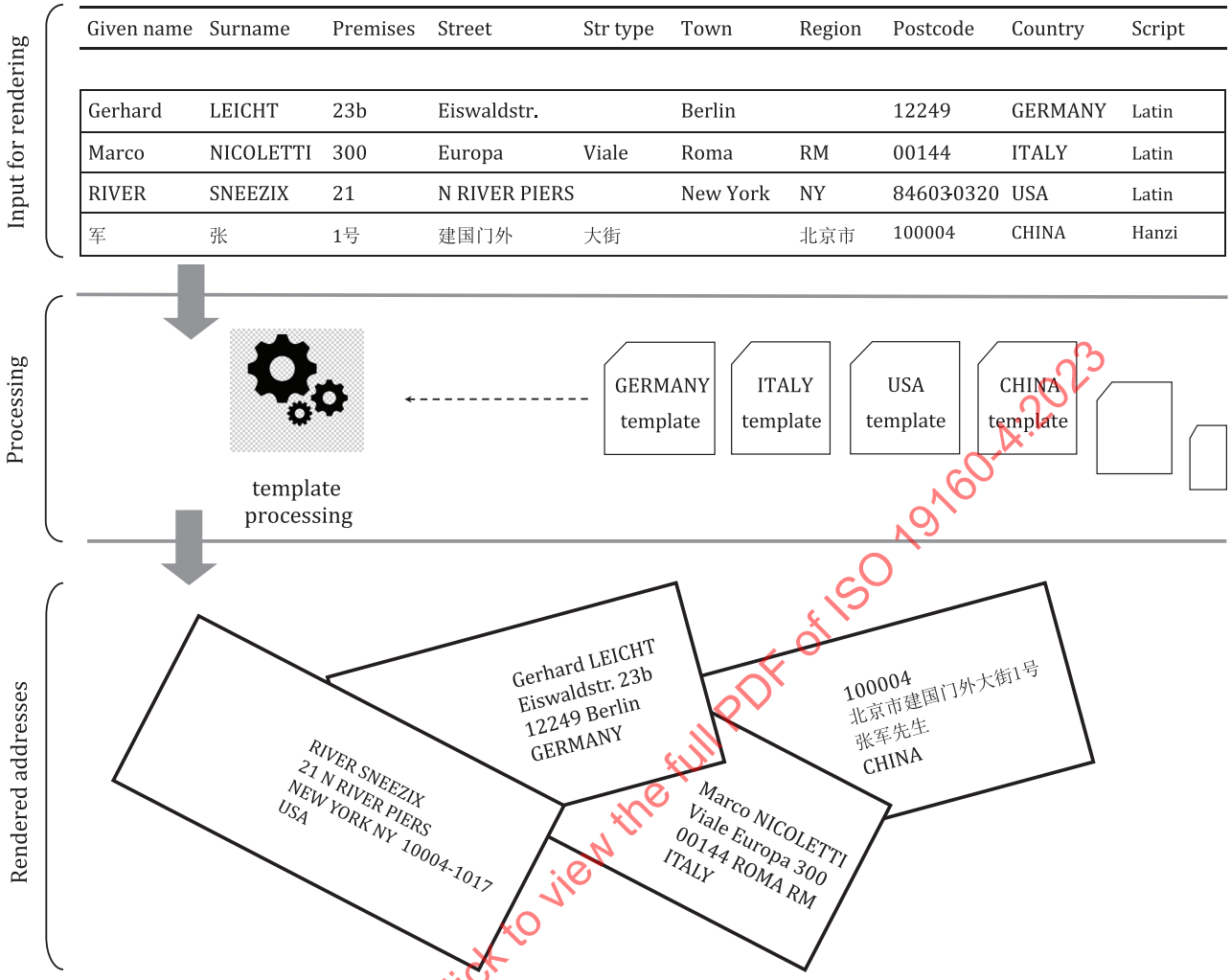

Figure 6 — Automation of postal address rendering with templates

9.2 PATDL as an XML Schema

9.2.1 General

PATDL is specified as an XML Schema that can be found at: https://standards.iso.org/iso/19160/-4/patdl/2.7.3/PATDL.v.2.7.3.xsd. The name and contact information of the maintenance agency for this document can be found at www.iso.org/maintenance_agencies.

NOTE 1 A PATDL interpreter or other forms of processor is needed to read the XML instance reflecting the template for a particular domain, and produce rendered addresses.

A template encoded by means of PATDL is a PATDL template. An XML file conforming to PATDL includes one or more PATDL templates specified in the *contentDefinition* node as shown in Figure 7. The address rendering rules for many UPU member countries can be accessed through the UPU web site.[9] Moreover, a simple example of a PATDL template is provided in Annex F.

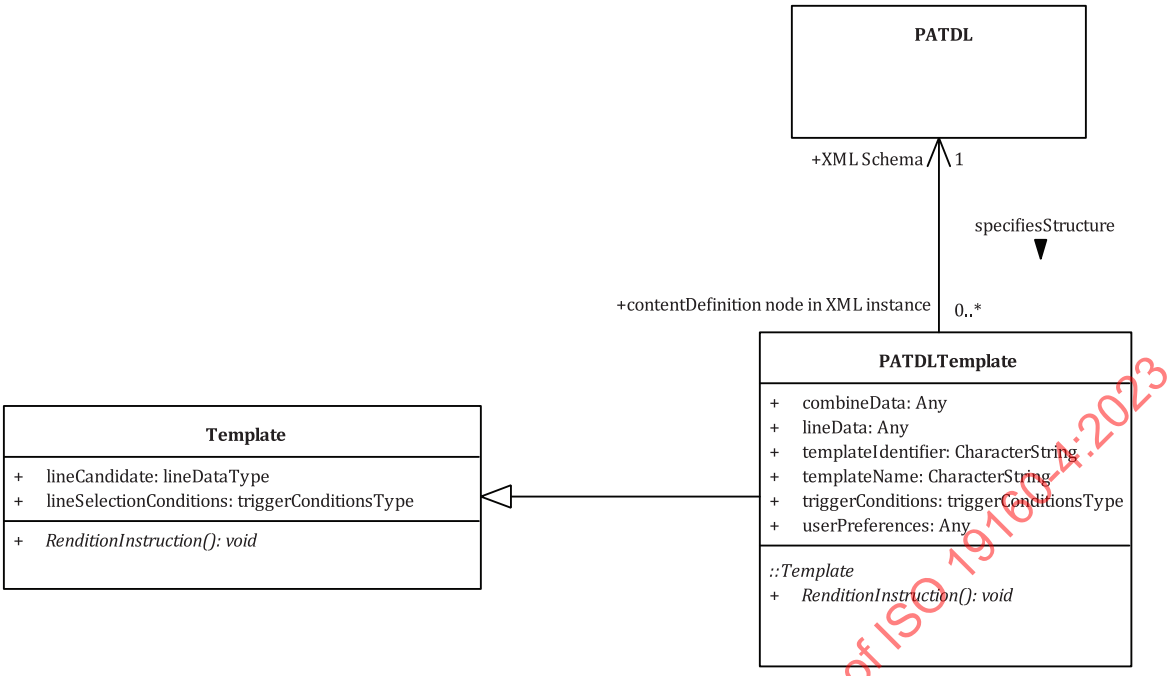

Figure 7 — PATDL template

NOTE 2 When the XML instance contains multiple templates, the header of XML file will also contain information on which template is to be chosen for a specific address. More details on selection of templates from PATDL instances can be found in Annex E and in the PATDL User Guide.[5]

9.2.2 Requirement for encoding of rendering rules

Rendering of postal address shall be encoded as an instance of PATDL XML Schema version 2.7.3.

9.2.3 Requirement for data populating PATDL elements

An instance of PATDL XML Schema that encodes rendering of postal address shall be populated with data specified in 9.3.

NOTE Specification of elements and types of PATDL XML Schema that are not described in 9.3 is provided in the PATDL User Guide but their use is not required for conformance with this document.

9.3 PATDL elements

9.3.1 General

A template is specified in the contentDefinition that contains both elements with simple and complex types specified in Table 7.

Table 7 — Types of contentDefinition

Name	Description	Multiplicity
templateName	Specifies a name that identifies the template uniquely within the document. EXAMPLE Morocco – French. NOTE It can be empty if the template is identified through its template identifier, with its five parameters.	1

Table 7 *(continued)*

Name	Description	Multiplicity
templateIdentifier	Specifies a set of information to identify template and provide basic metadata.	
defaultDelimiter	Specifies a character string used as a default delimiter of component values in rendered address. NOTE The usual value for the defaultDelimiter is one space.	1
defaultSeparator	Specifies a character used within a template to separate arguments supplied to a function specified in renditionCommand, renditionOperator or triggerCondition. NOTE In triggerConditions functions, the value of defaultSeparator has the effect of a logical "and". EXAMPLE Suppose that the value of defaultSeparator is "," (a comma). Considering that the U-codes for thoroughfare and door are U40.21.00.00 and U40.32.00.00 respectively, the trigger condition: < isPopulated > U40.21.00.00, U40.32.00.00 < /isPopulated > (U-codes for thoroughfare and door are separated with a semi-colon) requires checking "if thoroughfare is populated and door is populated".	1
defaultSequencer	Specifies a character used to separate elements within a single argument. NOTE 1 In triggerConditions functions the value of defaultSequencer has the effect of a logical "or". EXAMPLE Suppose that the value of defaultSequencer is ";" (a semi-colon). Considering that the U-codes for thoroughfare and door are U40.21.00.00 and U40.32.00.00 respectively, the trigger condition:< isPopulated > U40.21.00.00;U40.32.00.00 < /isPopulated > (U-codes for thoroughfare and door are separated with a semi-colon) requires checking "if thoroughfare is populated or door is populated". NOTE 2 Parentheses or other means to denote complex logical expressions are not used. If defaultSeparator and defaultSequencer are both used, defaultSequencer takes precedence. In other words, if defaultSeparator is a semi-colon ";" and defaultSequencer is a comma "," then "A;B,C" means "(A,B);C".	1
defaultCollector	Specifies a range within a single argument. NOTE the defaultCollector can be used to as an alternative to providing a long list of values separated by the defaultSequencer. EXAMPLE If defaultCollector is "-", then the string "34–133" indicates a range of numbers from 34 to 133.	1
userPreferences	Carries information instructing to modify the rendering of postal addresses regarding selection of line candidates, line components or address components. It has a complex type that is further specified in 9.3.3.	
triggerConditions	Describes conditions based on which line candidates are selected to be included in the rendered address. It has a complex type that is further specified in 9.3.4.	
lineData	Specifies how line candidates are constructed from the address components. It has a complex type that is further specified in 9.3.5.	
combineData	Specifies how to rearrange line components in lines to meet the criteria about the maximum number of lines or maximum number of characters in the line. It has a complex type that is further specified in 9.3.6.	

9.3.2 templateIdentifier

The templateIdentifier element, specified in Table 8, provides a set of information to identify a template.

Table 8 — Elements of templateIdentifier

Name	Description	Number of characters
templateType	Identifies the specific purpose for which the template is expected to serve.	3
countryCode	(According to ISO 3166-1) of the addresses which the template describes.	2
userId	Identifies the owner or designer of the template.	1..4
templateSeqNum	Identifies one of the templates within a country.	3 digits
templateVersion	Identifies the version of the template.	4

9.3.3 userPreferences

Only elements of userPreferences that are specified in Table 9 are required for conformance with this document.

Table 9 — Elements of userPreferences

Name	Description	Multiplicity
maxLines	Specifies the maximum number of lines in the rendered address.	0..1
maxCharacters	Specifies the maximum number of characters in lines of the rendered address.	0..1

9.3.4 triggerConditions

The triggerConditions element may contain multiple lineSelect elements with complex type. The lineSelect element encodes conditional logic for selection of line candidates. The conditional logic of line selection is presented in pseudocode in Figure 8.

```
If condition1
      then include (line1, line2, . . .)
else if condition2
      then include (line3, line4, . . .)
      . . .
      . . .
      . . .
      else include (line5, line6, . . .);
```

Figure 8 — Conditional logic of line selection

Each of the conditions in the first set is evaluated. If all of them evaluate to “true”, the set of lines that follows is selected. If any of the conditions in the first set evaluates to “false”, the set of lines and/or components following is skipped over and the next set of conditions within the lineSelect block is evaluated. If all of these are “true”, the following set of lines is selected, but if any are “false”, processing continues at the next set of conditions and so on until either a set of conditions is satisfied or the block terminates. Whenever one of the conditions within a lineSelect block has been satisfied, none of the following are evaluated. If a lineSelect starts with a set of lines/components and no preceding conditions, that set is selected unconditionally. If the optional defaultCase condition is found, this shall be the last condition in the lineSelect and shall be the only one in its set. The set of lines/components which follows is selected if all conditions before defaultCase are “false”. In the absence of defaultCase, if none of the sets of conditions evaluates overall to be “true”, then the lineSelect block shall exit without any line selected.

The conditions are specified as a logical conjunction of Boolean functions called trigger conditions. Trigger conditions are represented by elements of the PATDL lineSelect element described in Table 10. Elements representing trigger conditions have simple XML types. Arguments of trigger conditions can be passed through identifiers of postal address components, identifiers of rendering parameters, names of external functions or through a character string. The "Arguments" column of Table 10 describes the multiplicity of arguments and their expected type.

Table 10 — Elements of lineSelect for trigger conditions

Name	Description of Boolean function encoded	
	Behaviour	Arguments
isPopulated	Returns "true" when all arguments are populated (have value that is not null), otherwise returns "false".	Multiplicity: 1..* (one or more) All arguments are passed through the postal address component identifier.
isNotPopulated	Returns "true" when all arguments are not populated (have value that is null), otherwise returns "false".	Multiplicity: 1..* (one or more) All arguments are passed through the postal address component identifier.
hasValue	Returns "true" when the value of the first argument equals the value of the second argument, otherwise returns "false".	Multiplicity: 2 First argument passed through the component identifier or rendering parameter, second argument passed through the postal address component identifier or a specific character string.
hasNotValue	Returns "true" when the value of the first argument equals the value of second argument, otherwise returns "false".	Multiplicity: 2 First argument passed through the postal address component identifier, second argument passed through the address component identifier or a specific character string.
containsValue	Returns "true" when the string in the value of the first argument contains the value of the second argument as a substring, otherwise returns "false".	Multiplicity: 2 First argument passed through the postal address component identifier, second argument passed through the address component identifier or a specific character string.
hasPreference	Returns "true" when the value of userPreference specified in the first argument matches the value specified in the second argument, otherwise returns "false".	Multiplicity: 2 First argument passed through a name user preference specified in userPreferences, second argument passed through a character string.
	EXAMPLE Suppose that the userPreference maxCharacters (see 9.3.3) is set to 40, then < hasPreference > maxCharacters; 40 < /hasPreference > will return "true" and < hasPreference > maxCharacters; 38 < /hasPreference > will return "false".	
hasResult	Returns "true" when the value of the second argument matches the value returned by the external function identified by the first argument, otherwise returns "false".	Multiplicity: 2 First argument passed through the name of an external function, second is a character string.
	EXAMPLE In the case where the function getScript returns the ISO 15924 code of script in which address components are written, if address components are written in Latin, then the trigger condition < hasResult > getScript; 'Latn' < /hasResult > will return "true".	
matchesRegex	Returns "true" in two cases: when the string in the first argument matches the regular expression in the second argument and third argument is equal to "Y"; and when the string in the second argument does not match the regular expression in the second argument and the third argument is equal to "N", otherwise returns "false".	Multiplicity: 2 First argument passed through the postal address component, second argument passed a character string representing the regular expression, third is an indicator of whether the regular expression is expected to be matched or not matched.

Table 10 *(continued)*

Name	Description of Boolean function encoded	
	Behaviour	Arguments
	EXAMPLE Considering that the U-code for the primary thoroughfare name is U40.21.11.41, the following trigger condition will check whether the thoroughfare represents a rural route or highway contract route < matchesRegex > U40.21.11.41;(^RR \d)|(^HC \d) < /matchesRegex >. It will return true when the primary thoroughfare name matches the regular expression "(^RR \d)|(^HC \d)", i.e. it begins with either RR or HC followed by a single space and a digit.	
defaultCase	Returns always "true".	Multiplicity: 0
	NOTE It is used after one or more other trigger conditions to ensure that one of a set of trigger conditions is satisfied.	

In an XML instance, the selection of line is specified as an ordered set of lineSelect elements, each containing a set of conditions followed by an ordered set of line candidates specified by a lineData element specified in 9.3.5.

9.3.5 lineData

9.3.5.1 Top level structure of lineData

Line candidates are specified by means of the lineData element described in Table 11.

Table 11 — Top elements of lineData

Name	Description	Multiplicity
lineName	Specifies the name of a line candidate. It has a complex type that is further specified in 9.3.5.2.	1
lineComponent	Specifies the logical part of a line. It has a complex type that is further specified in 9.3.5.3.	0..*

A PATDL template has one or more lineData elements.

9.3.5.2 lineName element

The lineName element has simple content and attributes specified in Table 12.

Table 12 — Attributes of lineData

Name	Description	Mandatory/ conditional/ optional
lineNumber	Specifies the relative position of the line in the initial rendering. The value of lineName, together with lineNumber, shall be used as a unique identifier of the line within the template.	M
excludeFromMaxLines	Indicates whether the line should be excluded from the count of lines. Can take the value "Y" for excluding from the count and "N" for including. If not populated, the line will be included in the count. NOTE It will only be of significance if maxLines has been specified in userPreferences.	O
Directionality	Specifies a directionality of text in the line. Can take values: "LTR" for left-to-right and "RTL" for right-to-left.	O

9.3.5.3 lineComponent element

9.3.5.3.1 General structure

The general structure of lineComponent is specified in Table 13.

Table 13 — Elements of lineComponent

Name	Description	Multiplicity
componentId	Identifies a component.	1
priority	Indicates the relative importance of the lineComponent for inclusion in the rendered address.	1
alignment	Specifies an alignment of the line in the rendered address.	0..1
requiredIfSelected	Indicates that the component is required to be included in the rendered address. NOTE It is mutually exclusive with groupRequiredIfSelected.	0..1
groupRequiredIfSelected	Indicates that the component is required to be included in the rendered address together with other components being indicated with this element. NOTE It is mutually exclusive with requiredIfSelected.	0..1
renditionCommand	Specifies a rendition instruction that can be invoked in order to resolve constraints upon available space. It has a complex type that is further specified in 9.3.5.3.1. NOTE renditionCommand can appear at the component level or at the element level.	0..*
renditionOperator	Refers to a rendition instruction that can be invoked to render space between components specified in elementData. It has a complex type that is further specified in 9.3.5.3.2. EXAMPLE renditionOperator can specify punctuations between elementData.	0..*
elementData	Specifies an address component and its rendering. It has a complex type that is further specified in 9.3.5.3.3.	0..*

9.3.5.3.2 renditionCommand

The renditionCommand element has two elements, specified in Table 14.

Table 14 — Types of renditionCommand

Name	Description	Multiplicity
cmdId	Specifies the name of the rendition instruction. EXAMPLE “ABBREV”, a name of rendition instruction used to abbreviate the values of address components.	1
cmdPriority	Indicates the position number in the order of execution.	1

9.3.5.3.3 renditionOperator

The renditionOperator element refers to a rendition instruction by using the elements specified in Table 15.

Table 15 — Types of renditionOperator

Name	Description	Multiplicity
operatorId	Specifies a name of the rendition instruction. EXAMPLE "CONCAT", a name of rendition instruction used to delimit two subsequent address components in the rendered address with a string different from that specified in defaultDelimiter.	1
fldText	Specifies a character string used as an argument of the rendition instruction.	0..1

9.3.5.3.4 elementData

The elementData element specifies a postal address component or sub-element to be included in the rendered address using XML elements specified in Table 16.

Table 16 — Types of elementData

Name	Description	Multiplicity
elementId	Specifies an identifier of a postal address component that is also used by the input data. If a template uses components specified in this document, then it should use U-codes in elementId.	1
elementDef	Specifies an alternative identifier of the postal address component such as component name.	0..1
elementDesc	Specifies an alternative identifier of the postal address component such as component name in local language.	0..1
requiredIfSelected	Indicates that the component specified is required to be included in the rendered address. NOTE It is mutually exclusive with groupRequiredIfSelected.	0..1
groupRequiredIfSelected	Indicates that the component specified is required to be included in the rendered address together with other components being indicated with this element. NOTE It is mutually exclusive with requiredIfSelected.	0..1
migrationPrecedence	Specifies a number that prioritizes the position of the specified component in the rendered address in case it can appear in multiple positions.	0..1
canPunctuateAfter	Enables the blocking of punctuation inserted by rendition instructions after the component specified.	1
renditionCommand	Specifies a rendition instruction to execute advanced rendering of the component specified (see 8.3). It has a complex type that is further specified in 9.3.5.3.2. NOTE renditionCommand can appear at the component level or at the element level.	0..*

9.3.6 combineData

9.3.6.1 General

combineData contains one or more combineGroupData elements. combineGroupData contains all the data for a single combine group. Each group is independent and they are processed in the order supplied until all groups have been evaluated or a target value of *maxLines* has been met.

9.3.6.2 Elements of combineGroupData

combineGroupData is a complex type that includes elements specified in Table 17.

Table 17 — Types of combineGroupData

Name	Description	Multiplicity
combineGroup	Specifies an identifier of the group data.	1
combineLocationId	Specifies an identifier of a lineComponent which will hold the entire group when assembled.	1
combineLimit	Specifies the maximum number of components that can be combined at combineLocationId.	0..1
combinePriorityData	Specification of what and how line components should be moved to the location specified in combineLocationId. It has a complex type that is further specified in 9.3.6.3.	0..*

9.3.6.3 combinePriorityData

combinePriorityData is a complex type that includes elements specified in Table 18.

Table 18 — Types of combinePriorityData

Name	Description	Multiplicity
combinePriority	Specifies a number which determines the relative order within the combine group in which the results of combining will be placed in the designated location.	1
combineComponentId	Specifies an identifier of a lineComponent, the contents of which will be put in to the location designated in combineLocationId.	1..*
combineOperatorId	Specifies a name of rendition instruction operating on elements of the re-combined line. NOTE Rendition instructions referred by combineOperatorId are of the same type as those referred by renditionOperator in the lineData.	1..*
combineFldText	Specifies an argument of rendition instruction identified by combine-OperatorId.	1..*

Annex A
(normative)

Abstract test suites

A.1 General

The abstract test suites for the conformance classes specified by this document are presented in A.2 to A.5.

A.2 Comformance class: Composition

Tables A.1 and A.2 contain the details of the tests for the composition conformance class.

Table A.1 — Composition, test 1: Mandatory delivery point specification

Test purpose	Check if the postal address contains the delivery point specification segment.
Test method	Check if the postal address contains postal address components or sub-elements from the delivery point specification segment.
Reference	6.1
Test type	Basic

Table A.2 — Composition, test 2: Terms

Test purpose	Check decomposition.
Test method	Check if the postal address is decomposed to postal address components and sub-elements specified in this document.
Reference	6.6
Test type	Basic

A.3 Conformance class: U-code

Tables A.3 and A.4 contain the details of the tests for the U-code conformance class.

Table A.3 — U-code, test 1: Structure

Test purpose	Check the structure of the U-code.
Test method	Check if the structure of the U-code matches the structure specified in 7.2.
Reference	7.2
Test type	Basic

Table A.4 — U-code, test 2: Element and segment identifiers

Test purpose	Check the values of the segment identifiers and element identifiers in the U-code.
Test method	Check if the values of the segment identifiers and element identifiers in the U-code are valid.
Reference	7.2, 6.2, 6.5
Test type	Basic

A.4 Conformance class: Rendering of postal address

Tables A.5 and A.6 contain the details of the tests for the rendering of a postal address.

Table A.5 — Rendering of postal address, test 1: Postal address rendering

Test purpose	Check if the rules of postal address rendering are provided as a template referring to rendering parameters and rendition instructions.
Test method	Check if rendering rules specify line candidates and line selection conditions.
Reference	8.4
Test type	Basic

Table A.6 — Rendering of postal address, test 2: Domain of template

Test purpose	Check if the template represents address rendering required in the specific domain.
Test method	Check if the rendering of addresses representative for a domain and specified by the template is correct. Test data set shall comprise addresses of all address types and all valid rendition variations used in the domain. It shall further provide each address in two formats: a) decomposed to components specified by domain address standards; b) rendered as required by domain address standards. The test is positive when template renderings of addresses in the first format match the rendered address provided in the second format.
Reference	8.5
Test type	Capability

A.5 Conformance class: PATDL template

Tables A.7 and A.8 contain the details of the tests for the PATDL template.

Table A.7 — PATDL template, test 1: PATDL Schema

Test purpose	Check that the template conforms to the PATDL XML Schema version 2.7.3 specified in this document.
Test method	Use schema validation software to validate the postal address template.
Reference	9.2.2
Test type	Basic

Table A.8 — PATDL template, test 2: Data populating PATDL template

Test purpose	Check if data items populated in the PATDL template match descriptions specified in 9.3.
Test method	Inspect data items populated in the PATDL template.
Reference	9.2.3
Test type	Basic

Annex B
(informative)

Postal address profile of ISO 19160-1

B.1 Profile developer

Name: UPU Addressing Group

Contact details: UPU Standards Secretariat, UPU website.[6]

B.2 Specification

The postal address profile represents postal addresses decomposed to postal address components specified in this document.

B.3 Conformance

The postal address profile conforms to the Core conformance class (ISO 19160-1).

B.4 Profile model

Figure B.1 depicts postal address as a profile of ISO 19160-1 address.

NOTE Italic font is used for names of classes in the body text of this Clause.

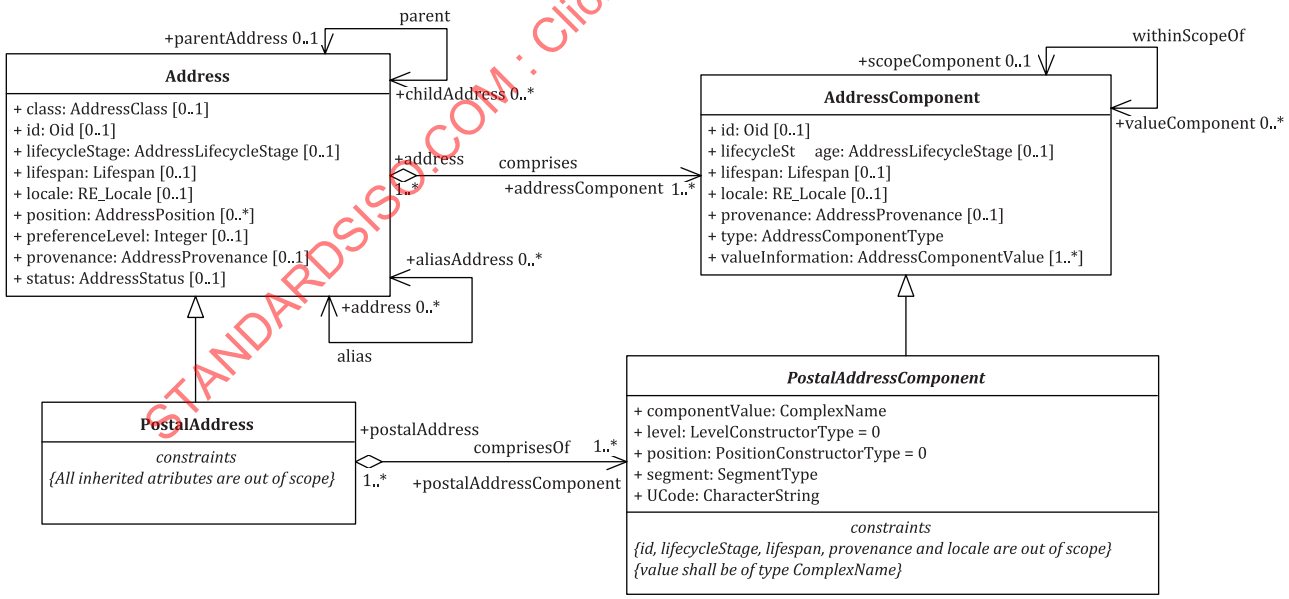

Figure B.1 — Postal address as a specialization of ISO 19160-1 address

Address and *AddressComponent* are the only classes from the ISO 19160-1 conceptual model that are used in the profile model and the association between these two classes is the only association from the ISO 19160-1 conceptual model that is used in the profile model. All other classes and associations from the ISO 19160-1 conceptual model are out of scope in this profile.

PostalAddress and *PostalAddressComponent* are profile-specific classes inherited from *Address* and *AddressComponent*.

PostalAddressComponent has profile-specific attributes specified in Table B.1.

Table B.1 — Attributes of PostalAddressComponent

Attribute	Description	Type
segment	Identifies a segment within which an instance of component belongs.	SegmentType
level	Specifies an identifier that allows distinguishing between hierarchical instances of an element.	LevelConstructorType
position	Specifies an identifier that allows distinguishing between non-hierarchical instances of an element.	PostitionType
UCode	Specifies a U-code assigned to an element.	Character String

Figures B.2, B.3 and B.4 represent postal address components in the addressee and mailee segments.

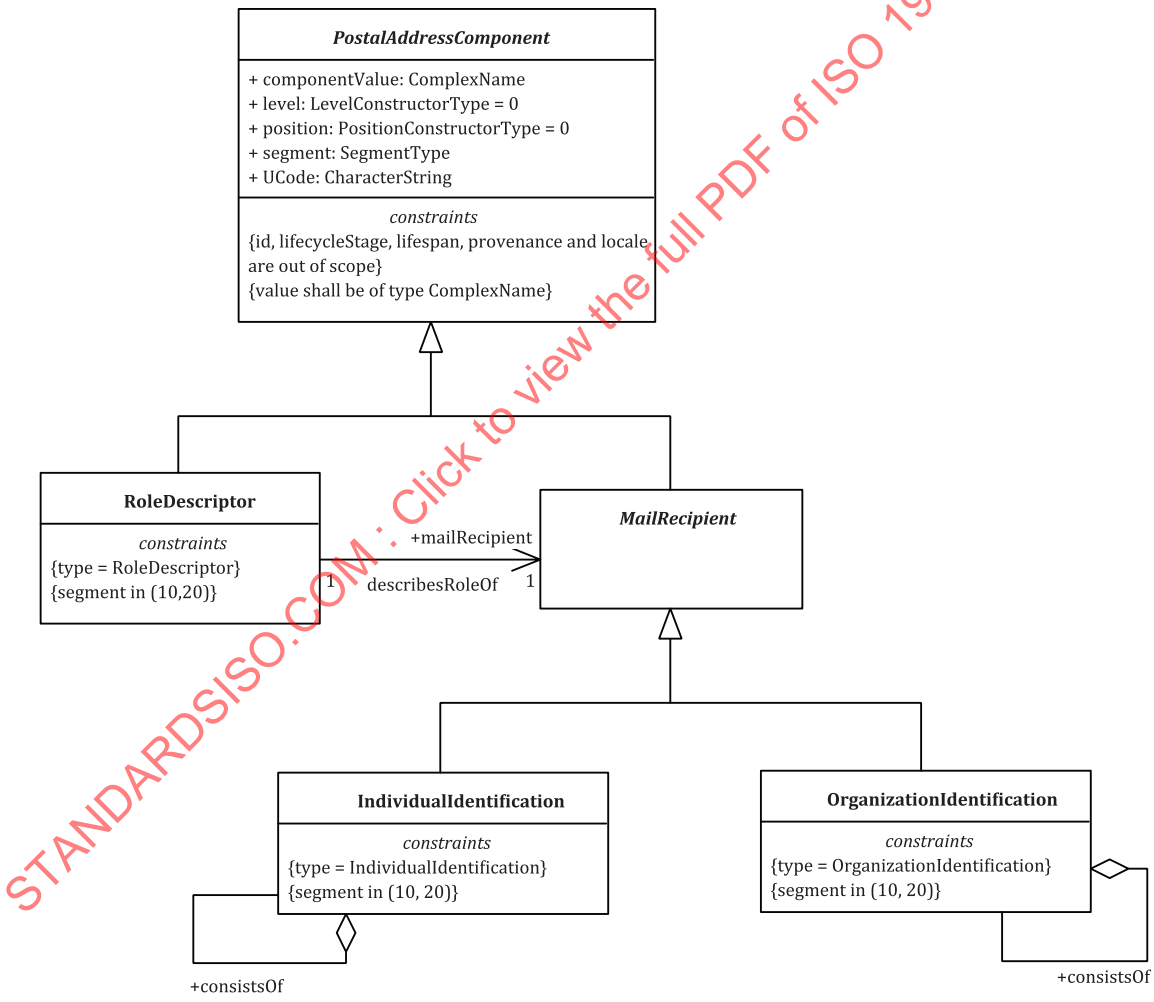

Figure B.2 — Postal address components for addressee and mailee

MailRecipient is an abstract class that generalizes *IndividiualIdentification* and *OrganizationIdentification* to illustrate the function of their relationship with *RoleDescriptor*.

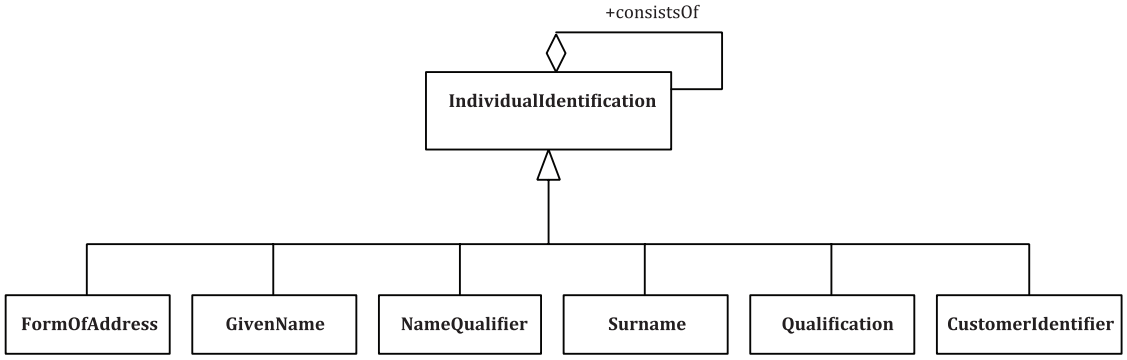

Figure B.3 — Individual identification construct

*IndividualIdentificatio*n could be a *FormOfAddress*, *GivenName*, *Surname*, *NameQualifier*, *Qualification*, *CustomerIdentifier* or a combination thereof.

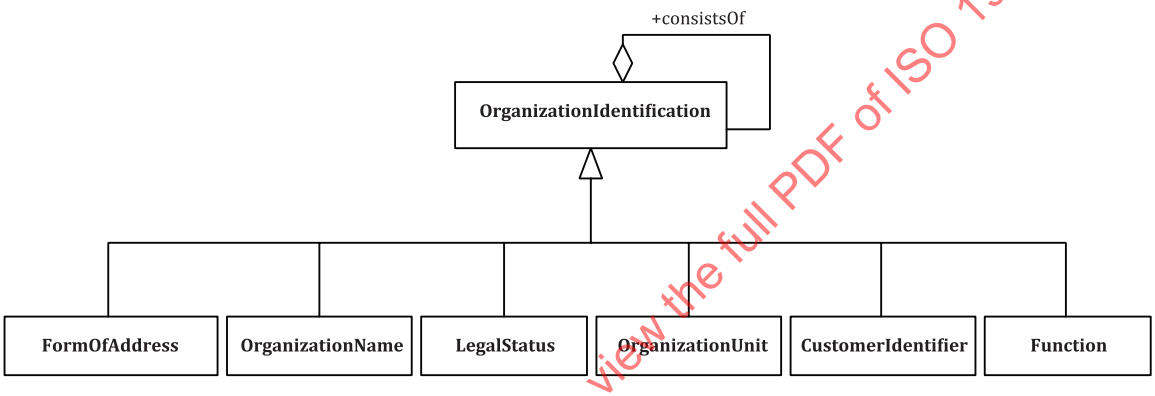

Figure B.4 — Organization identification construct

OrganizationIdentification could be a *Function*, *OrganizationUnit*, *OrganizationName*, *LegalStatus*, *CustomerIdentifier* or a combination thereof.

Figures B.5, B.6, B.7 and B.8 depict postal address components in the delivery point specification.

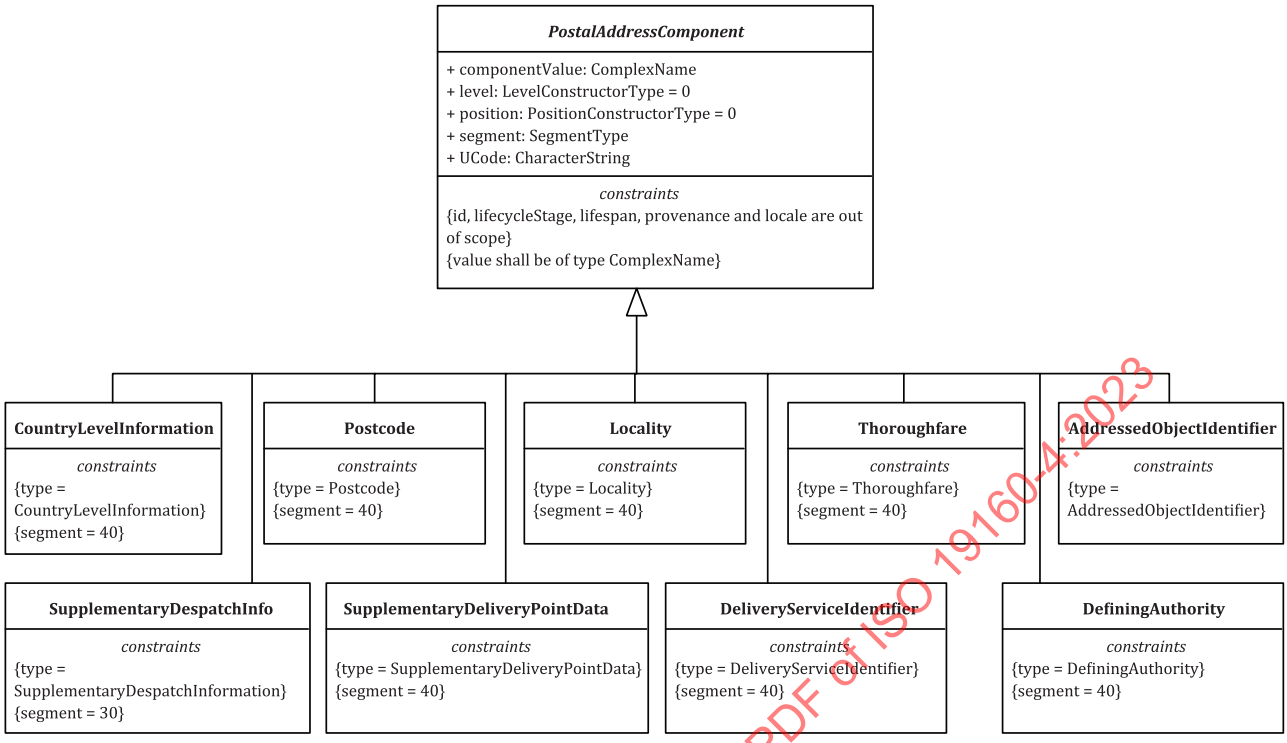

Figure B.5 — Delivery point components

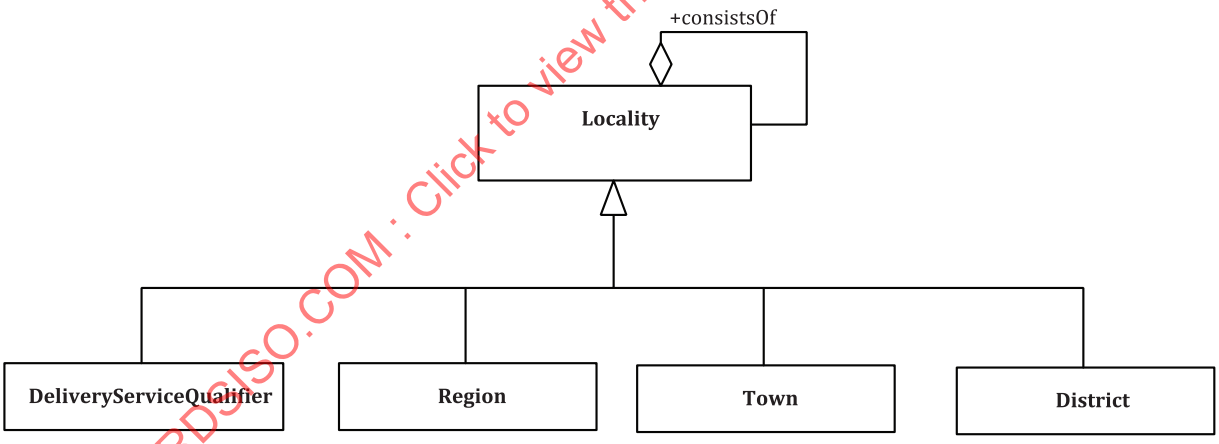

Figure B.6 — Locality construct

Locality could be a *Region, Town, District, DeliveryServiceQualifier* or a combination thereof.

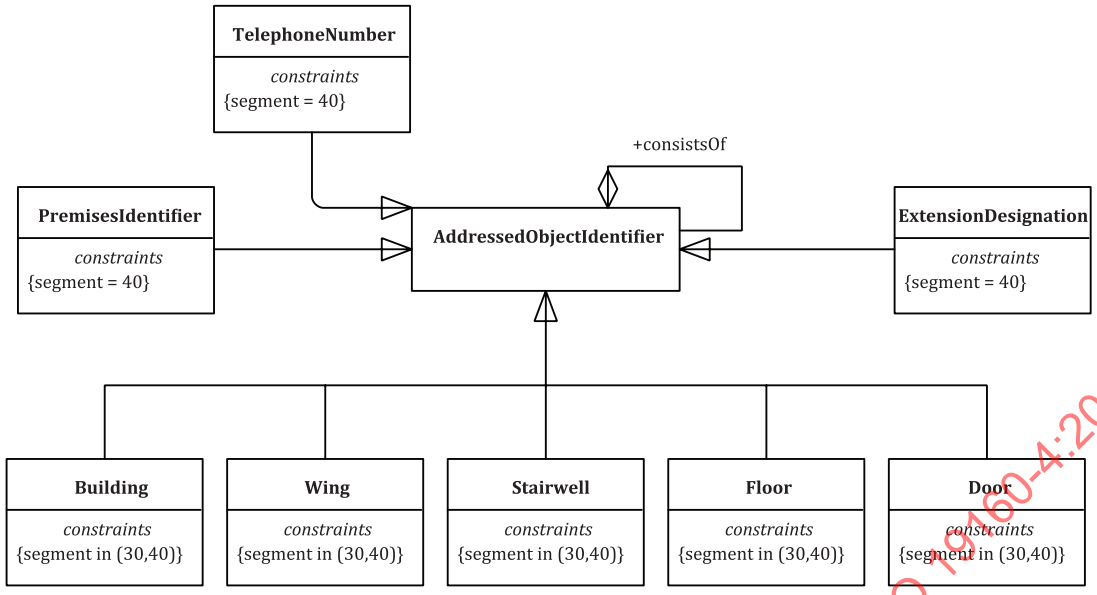

Figure B.7 — Addressed object identifier construct

AddressedObjectIdentifier could be *PremisesIdentifier*, *ExtensionDesignation*, *Building, Wing, Stairwell, Floor, Door, TelephoneNumber* or a combination thereof. *PremisesIdentifier* and *ExtensionDesignation* appear in the Delivery Point Specification segment. *Building, Wing, Stairwell, Floor, Door* appear both in Delivery Point Specification and Mail Recipient Despatch Information segments.

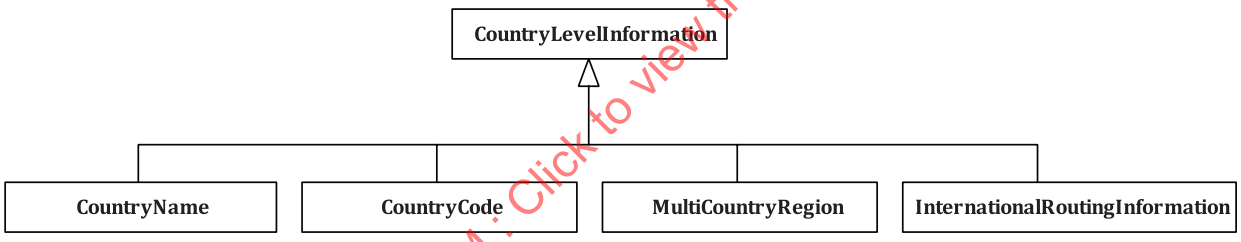

Figure B.8 — Country level information construct

Countrylevelinformation could be *CountryName*, *CountryCode*, *MulticountryRegion*, *InternationalRoutingInformation* or a combination thereof.

Figure B.9 depicts profile specific types that support sub-elements.

Through LevelType and PositionType, hierarchical (levels) and sibling (positions) instances of elements can be identified. levelNumber and positionNumber allow identification through numerals. levelName and positionName provide a sub-element constructor than can be used in combination with the element name to create a sub-element name.

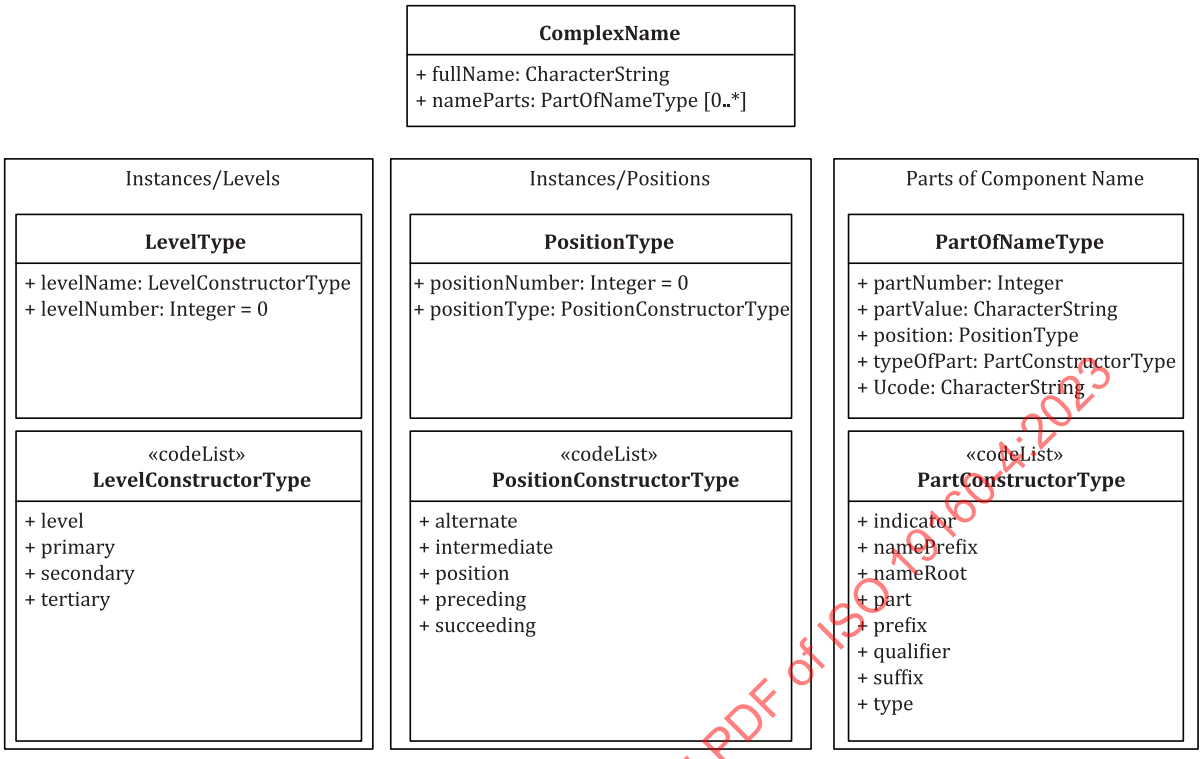

Figure B.9 — Classes supporting sub-elements

Any element has the valueInformation of type ComplexName. ComplexName allows the element value to be represented in a fullName attribute (single character string) and as a set of parts of name in the nameParts attribute. Tables B.2 and B.3 describe the attributes of ComplexName and PartOfNameType.

Table B.2 — Attributes of ComplexName

Attribute	Description	Type
fullName	Value of component as a single character string.	Character String
nameParts	Value of component as a set of parts of name.	PartOfNameType

Table B.3 — Attributes of PartOfNameType

Attribute	Description	Type
partValue	Value of component part.	Character String
typeOfPart	Type of component part.	PartConstructorType
partNumber	Integer used to identify the part.	Integer
position	Allows distinguishing between non-hierarchical instances of an element.	PostitionType
UCode	U-code assigned to a sub-element representing partValue and reflecting its partNumber and positionNumber.	Character String

Values in the code lists LevelConstructorType, PositionConstructorType and PartConstructorType refer to sub-element constructors specified in 6.5.

Figure B.10 depicts a code list for the address component type.

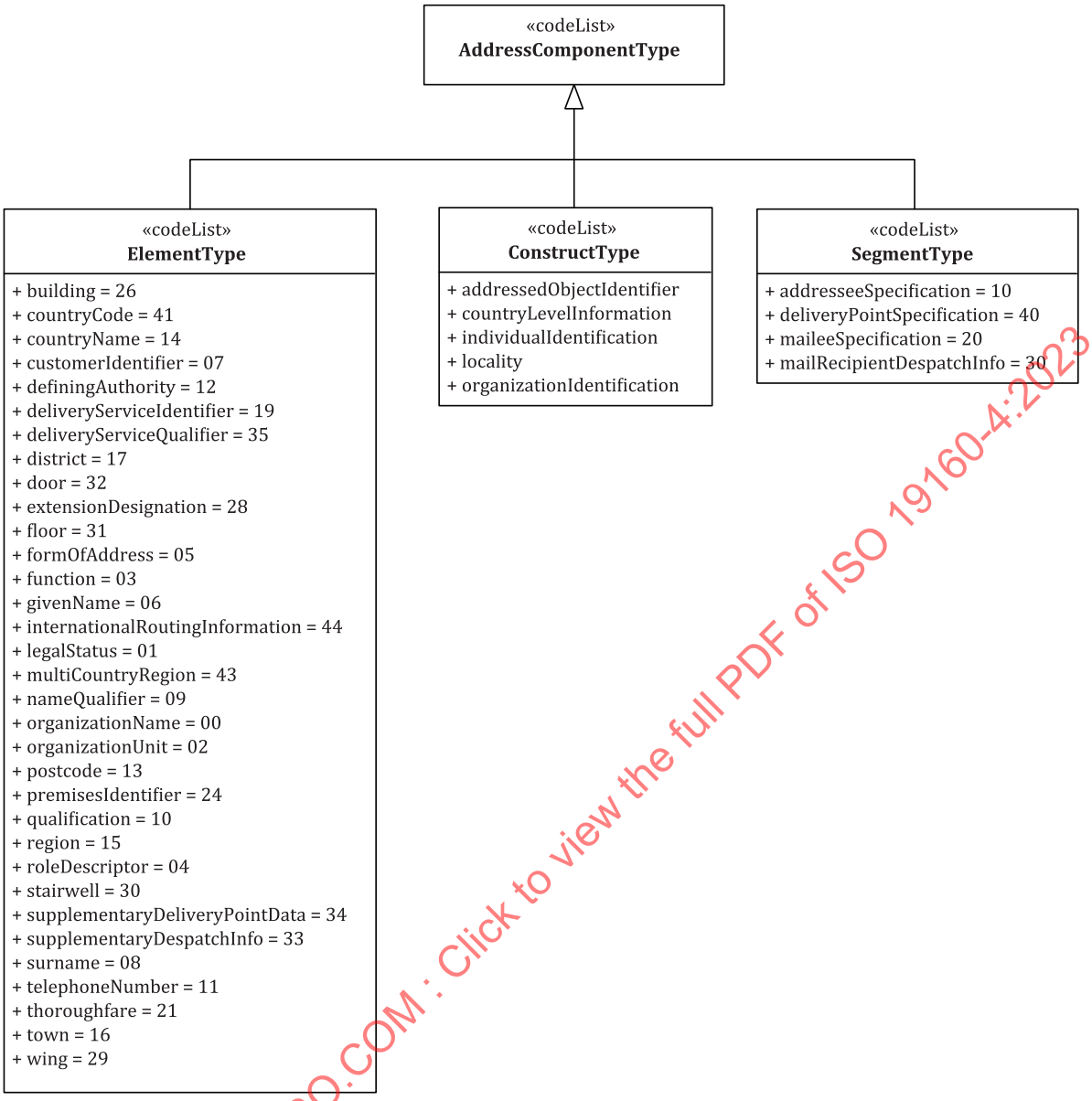

Figure B.10 — Profile code lists

Values in the code lists *ElementType*, *ConstructType* and *SegmentType* refer to elements, constructs and segments specified in 6.4, 6.3 and 6.2, respectively.

Annex C
(informative)

Mapping conventions

C.1 General

Element mapping conventions are procedures to use elements, sub-elements and their associated codes in ways agreed upon to handle various generic or specific situations that arise by development of postal address templates for different countries. They can be used to:

— determine how to deploy the elements and sub-elements, particularly in situations where more than one alternative mapping is feasible;

— help to determine how various address types, particularly those which are distinctive or unusual, can be mapped while using the standardized elements and sub-elements;

— help to determine the complexity of a branching structure within a template, and in turn, to determine how complex the entire structure of the template needs to be in order to represent a set of addresses and when it can be simplified.

C.2 Basic rules regarding the addressee

By convention, each address as presented on a postal item should have at most one logical addressee.

If the postal item is addressed to a person, the person is the addressee and if to a company, the company is the addressee. If it is addressed to two or more persons, they are jointly the addressee. There are then two physical addressees but only one logical addressee. If the postal item is addressed to a person at a company, the person is the addressee and the company is the mailee, implicitly if not explicitly. Through the concept of an implicit mailee, the precision of the identification of the addressee is protected.

In some countries, such as the United States, it is not customary to think of a mailee being present in an address unless there is an explicit mailee role descriptor. There is an explicit mailee if the postal item is addressed to one party "in care of" a second party. In that case, the second party is the mailee. It may be that in some countries with limited complexity in their address formats, even the explicit mailee is not recognized. Mail without an addressee is possible in many countries.

C.3 Rule on the presence of mailee and addressee

By convention, there can be no mailee without an addressee.

The mailee has the responsibility for assuring that the postal item reaches the addressee and in that sense, the mailee requires an addressee.

Using this convention and the basic rule regarding the addressee, it is possible to specify which combinations of addressee and mailee are supported in this document. See Annex D.

C.4 Rules on positions of the mailee

By convention, mailee information may either precede or follow the addressee, but not both at the same time.

The preceding analysis implies that certain combinations of name and address elements are to be regarded as invalid or at least unsupported within this document. The convention has been discussed that the addressee can be an individual or an organization but not both at the same time. Furthermore, there should not be a mailee without an addressee. It is also expected that a mailee organization can either precede or follow an individual addressee, but not both at the same time. This simplifies template design for the addressee and mailee.

In the process of designing templates, the focus has been on specifying the valid alternatives, not on evaluating all possible combinations and then eliminating any that are not considered valid. However, the fact that some combinations are invalid or unsupported should be taken into account by implementers of this document. They will need to decide on a case by case basis how best to handle the unsupported cases, either by discarding inputs that are considered superfluous or by allowing them to pass through the templates or by processing them through customized template extensions. In any event, a PATDL implementation should be capable of issuing warnings in such cases.

C.5 Indirect identification of the addressee and mailee

By convention, an addressee or mailee may be identified by name, by title without a name, by organizational component, by organization name or by a form of address.

The title is located within the element hierarchy as part of the organization information. However, as an alternate way of designating an individual whose name one may not know, it is a form of individual addressee. Therefore, in the templates and in the common initial section, the title is associated in the same choice group with name elements rather than with organization elements. Though there has been some dialogue about whether there can be a title without an organization, there is no doubt that the title may be known and the associated organizational information not known.

An addressee can be identified indirectly by a form of address such as “postal customer” or where appropriate, not identified at all in the case of unaddressed mail.

C.6 Granularity constraints

Granularity constraints can be formulated on the template level and on the address level.

Under the template level granularity constraint, if a particular element is deployed within a template, sub-elements of that element are ineligible for use in that template, while if any of its sub-elements are deployed, an element is ineligible for use in that template.

Under the address level constraint, the address submitted for rendering should not comprise both an element and its sub-elements. For example, submission of both <thoroughfare>Main Street</thoroughfare> and (<thoroughfareName>Main</thoroughfareName>, <thoroughfareType>Street</thoroughfareType>) is not eligible.

Under the template level granularity constraint, it is not correct to use (40.17.00.00 district) in one part of a template and then decide to add (40.17.11.00 district level 1 position 1) in another part. (40.17.11.00) can have a specific meaning, rather than just being a way to differentiate placeholders for information items. The first level can represent a preceding position or a primary level of district as opposed to some other position or level. The first part as in (40.17.11.11) can represent a type as opposed to an indicator. It is necessary to take note of this in the context of implementation by matching levels of granularity when linking database cells to the template.

Situations can arise in the implementation of this document in which varying levels of granularity can be found within an address data set. If, for some reason, this situation is not resolved by further parsing an element or by combining its sub-elements, it may be handled by a template modified to follow an address level granularity constraint. For example, the template could branch between using an element and using its sub-types based on testing the content of the element. In this situation, each address has its own granularity constraint, but at different levels of granularity for different addresses.

In the implementation of this document, there can be data available upon request that can be accessed at both the element and sub-element levels. In such cases, it is possible that neither form of granularity constraints will be necessary.

A postal service can have a limited amount of granularity in its database storage and identification of elements in tables and columns. This can be because of a design that is not element based. It can be present even when the design is element based, if the storing of constructs and complex combinations of elements saves on storage space or combines sparse elements with more frequently occurring elements. In this event, the implementer of this document can specify more granularity in deploying elements and sub-elements in a template than the underlying postal data recognizes. This capability should be employed with discretion, however, since complex parsing can sometimes be required in order to fill the elements in the application database from the postal database. Notwithstanding this cautionary statement, this additional effort is generally appropriate when the increased granularity provides for using elements and sub-elements recognized in this document.

In the US, "Main" and "Street" are stored in separate fields, but "Calle" and "Ortega" are stored in the same field, which generally stores the thoroughfare name. This is because "Street" is considered as a succeeding thoroughfare qualifier, while there is no field for a preceding thoroughfare qualifier. In general, it is appropriate for an application to store the information the same way as it is stored in the postal database, although in this case, that storage method is not completely consistent with components specified in this document. It would be consistent to store both "Main Street" and "Calle Ortega" in the 40.21.11.41 thoroughfare name; though that would mean that two fields in the USPS database would have to be combined to cover the case of "Main Street". It would therefore be consistent and appropriate to use three sub-elements for this case and store "Calle" in the 40.21.11.21 preceding thoroughfare type and "Street" in the 40.21.11.22 succeeding thoroughfare type, while "Main" or "Ortega" is found in the 40.21.11.41 thoroughfare name. That is how the USPS template is written.

Some thoroughfare constructs have connecting words between the thoroughfare type and the root of the thoroughfare name. An example is "Rue de la Paix". In different countries, these are stored in postal databases in at least three ways. In one case, “Rue” is stored as a preceding thoroughfare type and “de la Paix” as the thoroughfare name. In a second case, “Rue de la” is the preceding thoroughfare type, and “Paix” is the thoroughfare name. In a third case, “Rue” is the preceding thoroughfare type, “Paix” is the thoroughfare name and “de la” is stored in a separate sub-element, the thoroughfare name prefix. Mapping conventions do not prescribe a common approach to these situations and yet, it is appropriate for an application to store the data in the way it is stored in postal databases, which would in this situation lead to different approaches for the different situations.

C.7 Descriptive addresses

Descriptive addresses specify a delivery point in terms of how it is reached from a salient point of origin. Descriptive addresses are mapped as supplementary delivery point data.

Descriptive addresses are found in various countries and are common in Latin America. In descriptive addresses, an addressee is located by giving directions outward from a landmark point. One example of this is in Costa Rica: “200 norte/25 este del Banco Nacional”. Another case is in Nicaragua: “Del Hotel Granada 1c. arriba 75 vrs. al sur”. In English, this would translate to “one street up and 75 yards to the south”. These details help to fulfil the purpose of the descriptive address, which is anachronistic in comparison with the intention in this document. That intention is to document locally constructed natural addresses that are reached by postal services, stored in postal databases and locally and globally unique to facilitate productive use. The need to stipulate how to navigate physical space to locate the addressee is peripheral in this context. This information is in that sense supplementary. It is identified in the element list as a generic category of supplementary delivery point data. Despite the generic description, that element has the same functionality as any other and its use helps to determine how the templates are structured. The information stored in it is still recognized as valuable in another context and it can still be the best address available in some circumstances. For these reasons, descriptive addresses are supported using the capabilities of this document.

As the descriptive address type is considered as anachronistic based on the criteria in use for this document, there is not a requirement to parse out the concept of descriptive and to specify the sub-

elements for this concept. Otherwise, that would be a considerable task. It can be expected that as addressing systems improve in precision, this sort of traditional form should gradually become less frequent. In the meantime, there are several ways that this address type can be handled. One is to put the entire string in 40.34.00.00 supplementary delivery point data and another is to map the landmark as a building and put the rest of the information in 40.34.00.00. What is decisive here is that the landmark is definitely not the delivery point. Therefore, at most, it is considered supplementary data. As a result, the convention is to consider the entire string as supplementary delivery point data.

There is a potential need for address data that is based on a full coordinate system with an origin point rather than a physical landmark as the base. Systems such as latitude and longitude are widely used and are natural supplements to postal addresses. Various efforts have been made to make such coordinate-based codes part of postal addresses. No universal recommendation has as yet been developed in this area, but some such codes have been adopted as postcodes.

C.8 Cross-street addresses

Cross-street addresses identify a delivery point by the intersection of two thoroughfares in a manner that can, but does not always, uniquely specify the delivery point.

By convention, cross-street addresses are mapped as primary and secondary thoroughfares. This avoids the burden of mapping the secondary thoroughfare to supplementary delivery point data when it is not necessary for defining the delivery point, and mapping it to secondary thoroughfare when it is needed to specify the delivery point.

Consider the hypothetical addresses “Third and Main” or “Calle 4 y Avenida 7”, which refer to the intersection of two or more streets. This type of address can be considered inexact because it typically does not reference a delivery point in a unique manner. There could be several delivery points at the intersection of "Calle 4" and "Avenida 7" and they do not necessarily all have the same postcode.

A more complex case including this feature can be found in older Central American addresses, where there is a hybrid of a street address and a cross-street address. In one case, the address line was “Calle 1 Ave 3 y 4 Casa 23”. This contains a delivery point that can be uniquely specified, namely “Calle 1 Casa 23”. However, there is additional information conveyed by “Ave 3 y 4”.

Newly standardized addresses in Costa Rica can take the form of “Av 5 Ca 56 #48”, which lacks the conjunction “y”. In this case, “#48” can be a calculated number in metres referring to the distance from the intersection of the indicated Avenida and Calle, by reference to a defined zero point.

For purposes of consistency, all the above cases can be mapped to primary and secondary thoroughfare, with the primary thoroughfare being the one on which the premises number is located, or if that is not present, the first one mentioned. The conjunction “y” convention may be included with the secondary thoroughfare if present.

Cross-street information can be useful not only as a heuristic for finding addresses that are not precisely defined, but also as a way to locate a physical place that does have a postal delivery point uniquely specified. An example is an address in Manhattan such as “1001 Avenue of the Americas”, which, in conjunction with secondary identifiers such as suite numbers, will normally uniquely identify a postal delivery point. But, in order to leave time to arrive by taxicab for a meeting, it is useful to know the cross-street, such as 67th Street, in addition to the identifiers defining uniqueness. If starting from 63th Street, this is not likely to be a problem and walking can be an option. If this information is not in the postal database, but is wanted to be retained, it can be put in supplementary delivery point data, as would be the case with information such as “deliver to side entrance” and other informal text.

Certain addresses can resemble cross-street addresses but with further contextual knowledge can be analysed as having a single axis with two reinforcing semantic references. For example, "Highway 12" can be the same road as "Old Lawton Highway", with both provided in a supplied address. Cases such as this are technically not cross-street addresses, but can be mapped similarly if no information is available to clarify the situation. If it is known that both refer to the same street, then the obsolete street can be mapped to supplementary delivery point data.

C.9 Dual addresses

Dual addresses are addresses which contain more than one delivery point. Each country can specify whether dual addresses are to be considered as standardized addresses, and if so, those addresses can be mapped using orderings of the elements and sub-elements provided.

This situation can typically result from a business having a physical location and also securing a post office box.

Many countries specify that standardized addresses contain only one delivery point. In that event, additional addresses for one party can be mapped using segment replication, thus making it clear that a different delivery point is designated. Alternatively, template design patterns (see Annex D) can be applied in such a way as to prefer one or another delivery point while ignoring the less preferred alternative. For countries such as Switzerland which support dual addressing, both delivery points are mapped into the primary name and address segments (10, 20, 30 and 40).

EXAMPLE Schweitzer AG, Gerechtigkeitsgasse 4, Postfach 75, 3000 Bern 8.

C.10 Sectoral addresses

Sectoral addresses are used in urban areas subdivided into units of the same type and distinguished by indicators.

EXAMPLE "Setor Sudoeste, SQSW 105" can be found in Brasilia, the capital of Brazil that is divided into sectors (setor) that are further subdivided into quadras (SQSW).

The sector indicator can be a commonly known name for an area or it can be assigned for postal or administrative purposes. Sectors are mapped as districts, using sub-elements as can be specified for type and indicator. In some cases, like in the case of Brasilia, there are multiple levels of sector type and indicator that are mapped to multiple levels of districts.

Sectoral addresses can be found in pure or hybrid form. In pure form, the sectoral information replaces any thoroughfare information, though the premises identifier can still be used. In hybrid form, sectoral addresses are found together with thoroughfare information.

C.11 Logical vs. sequential assignment

In a group of elements or sub-elements that have a similar function, logical assignment is based on the definitions of the elements and sub-elements, while sequential assignment is based on the order in which the items are encountered.

Both logical and sequential assignment of instances of an element to its sub-elements can be done, but at the template level, consistency is required.

EXAMPLE Administrative divisions of China are organized into categories corresponding to their levels. The first level is called provincial, the second level is prefectural and the third level is county. Beijing has a provincial status, but its districts have a status of county as prefectural level divisions of Beijing do not exist. Xicheng District will be mapped to region level 2 based on sequential assignment and to region level 3 based on logical assignment.

C.12 Assignment of level numbers

When an element has multiple instances in the form of levels, by convention, the largest and most inclusive instance is mapped as level one and successively smaller levels are mapped as levels two and higher, depending on the highest level represented in the code structure.

This convention implies that when addresses have smaller districts appearing in the rendition before larger districts, then the numbering of such districts in order of occurrence will proceed in sequence from the highest number to the lowest number.

EXAMPLE For the element (district.40.17.00.00), the largest and most inclusive districts will be mapped as level one (40.17.11.00) and successively smaller districts are mapped as levels two (40.17.21.00) through four (40.17.41.00), regardless of the order of appearance in the rendered addresses.

C.13 Extension vs. multiple secondary identifiers

By convention, the element (40.28.00.00 extension designation) provides an alternate way to map one or more undifferentiated types of secondary identifiers such as wing, stairwell, floor and door.

This convention should be applied at the template level and in database design. Different postal services have different practices with respect to the identification of distinct types of secondary identifier. There are cases where the element (40.28.00.00 premises identifier) includes the extension designation, cases in which it holds one or more types of secondary identifier and cases in which it is not used at all.

C.14 Postcode vs. sorting code

Not all codes issued by postal services are required to be mapped to postcodes.

Consider the example of Liberia with “1000 MONROVIA 10”. If the 1000 is a postcode and the 10 is a sorting code, then these are distinct codes. On the other hand, they are both postal codes in the sense that they are used for postal sorting and distribution. If they are both postal codes, and especially if assigned by the same authority, they could be mapped as parts of a postcode and the template could handle the positional variations with respect to the city name. Instead, this document supports reserving the postcode element for the information that is long term and of national scope. The sorting code is mapped to the 40.35.00.00 delivery service qualifier. This fits with the definition for that element. Several other countries have similar situations.

A somewhat different situation occurs in Benin and Burkina Faso. In Benin, “03 BP 1000” can be found where “BP 1000” is a post office box. But “03” is not a postcode in the full sense, since Benin, at this time, lacks a national postcode system. Instead, “03” represents the delivery post office and functions as a sorting code. Here the element (40.35.00.00) can also be used for the sorting code information.

C.15 Cardinality

Cardinality refers to multiple occurrences of elements and sub-elements in an address or an address template. Multiple occurrences of elements in an address are handled through the use of sub-elements.

Once the need for multiple sub-elements for a given element is recognized, they will either be limited to a small finite number of instances or specified with unbounded cardinality. It is not hard to define an unlimited number of levels of an element such as district within a formal notation, but the number of levels actually needed to represent postal addresses is limited by what is sufficient for unique postal addresses, as well as the constraints of postal databases and the limited space available for address presentation. Specification of limited cardinality has value in a standard since it provides guidance to designers of address databases. Taking these considerations into account, sub-elements are specified in such a way as to provide enough levels, parts and positions of the levels and parts to handle known situations, while providing for some degree of extensibility in implementation.

C.16 Criteria for sub-elements

Sub-elements are specified in terms of instances and parts. Instances are either in a hierarchical relation called levels or in a sibling relation called positions. Instances can have multiple positions in name and address renditions. There can be multiple parts of an element and parts can also have multiple positions in rendition.

The element and sub-element codes are represented in two blocks of two numbers separated by a full stop. For base elements, these two blocks of numbers contain zeros. The first block represents instances when more than one is called for, while the second block represents parts when more than one is specified. The base element 40.17 for district is represented as 40.17.00.00 and with the "U" prefix for UPU added, as U40.17.00.00. If there are multiple levels, they can be represented as U40.17.11.00 followed by U40.17.21.00. If the first level had two parts, they would be represented as U40.17.11.11 and U40.17.11.21, respectively. If the first level had two positions, they would be U40.17.11.00 and U40.17.12.00 in that order. If the first level had two parts each with two positions, this would give U40.17.11.11, U40.17.11.12, U40.17.11.21 and U40.17.11.22. The rules for code structure are discussed below.

In all cases, this document explicitly specifies the sub-elements that are considered to be actually needed, rather than allowing unlimited occurrences and thus neglecting to specify an upper bound to the occurrences. It was understood that natural addresses will not necessarily always follow any meaningful restriction of the number of occurrences that can potentially be proposed. Focusing on an effort in this document to document natural addresses that are unique, can be contained in postal databases, can be presented on a mail piece and exchanged efficiently with other parties, there is a need for some upper bound in small finite integers to be specified to limit occurrences. For counter-examples such as individuals with very long and complex names with possibly many parts, hopefully, this bound will provide an appropriate length and number of parts to guarantee uniqueness in addressing. Further, despite some cultural redundancy in the rendition, the upper bound should be sufficient to meet the criteria specified in this document. Clearly, however, this document needs to be extensible to some degree in order to take into account non-postal business functions. Such a capability is described below under the explanation of segments.

Criteria for specifying sub-elements include the following:

a) parts of an element in a numeric sequence (postcodes, given names, surnames);

b) parts in the specific sense of type and indicator (wing, stairwell, floor, door);

c) primary, secondary, tertiary (thoroughfares);

d) name and qualifier;

e) prefix or suffix;

f) instances in the sense of positional variations (preceding and succeeding, organization details in relation to names);

g) instances in the sense of levels (district and region).

Some forms of instances are treated in this document not as sub-elements, but rather as separate elements. These are as follows:

— instances in the sense of representations (country names in different forms);

— instances in the sense of occurrences (two named addressees).

C.17 Segment replication

Segment replication is a vehicle for extensibility of constructs, elements and sub-elements in this document.

The second digit of the segment code is reserved for replicating the segment, that is, for providing a copy of all the elements and sub-elements within the segment. Where the form of address, for example, is 10.05.00.00, a replicated segment provides for a copy with the code 11.05.00.00. This capability provides for multiple addressees with one postal address or one addressee with multiple postal addresses. In this way, it facilitates the design of address databases. However, many postal operators specify that only one delivery point should be presented in a rendition for mailing purposes. Some postal operators do allow a post office box delivery point coupled with a thoroughfare address on the same postal item.