

Rapport

IMKL 3 Data Model

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1 References

1.1 Other documents

Document	Description
imkl_3_0.xsd	The XSD of IMKL 3.0. The XSD is available for download at the following URL: http://vocab.belgif.be/ns/imkl/3.0/imkl_3_0.xsd
IMKL 3 vs IMKL 2.3 – What, Why and How.pdf	This document describes in detail what the differences between IMKL 2.3 and IMKL 3.0 are.
IMKL2.3 to IMKL3 migration guide.pdf	This document describes step-by-step how a valid IMKL 2.3 document can be converted into a valid IMKL 3 document.
IMKL3_Codelists.xlsx	This document contains an overview of the codelists, where they are used and what their values are.
IMKL3_ExtraRules_v1.xlsx	This document contains an overview of the properties per object type and the corresponding validation rules. This information is also included in chapter 4 of the current document.
https://belgif.github.io/thematic/models/cable-pipe/index_en.html	ICEG Cables and Pipes application profile (English).
https://belgif.github.io/thematic/models/cable-pipe/index_fr.html	ICEG Cables and Pipes application profile (French).
https://belgif.github.io/thematic/models/cable-pipe/index_nl.html	ICEG Cables and Pipes application profile (Dutch).
https://github.com/belgif/ICEGthema-imkl	ICEG repository for the IMKL thema.

1.2 Glossary

Term	Description
DNG	<i>Deuxième Nivellement Général</i> French-speaking equivalent of TAW.



ERD	Entity Relationship Diagram A type of diagram often used to visualize a conceptual data model.
GML	Geography Markup Language An XML-based encoding standard used to represent geographical features and their properties.
ICEG	Inter-Communautair Overleg e-Government
INSPIRE	INfrastructure for Spatial InfoRmation in the European Community
INSPIRE US	INSPIRE Utility Services
IMKL	<i>Informatiemodel Kabels en Leidingen</i> Information Model for Cables and Conduits.
OSLO	Open Standaarden voor Linkende Organisaties
UtilityLinkSet	An abstract utility network class. <i>Cable</i> , <i>Pipe</i> and <i>Duct</i> objects are a type of <i>UtilityLinkSet</i> .
UtilityNode	Point-shaped spatial object that plays an important role in a Utility Network. <i>Appurtenance</i> and <i>Connection</i> objects are a type of <i>UtilityNode</i> .
UtilityNodeContainer	Point shaped Utility Network Element, potential carrier of Utility Nodes. <i>Cabinet</i> , <i>Manhole</i> , <i>Pole</i> and <i>Tower</i> are a type of <i>UtilityNodeContainer</i> .
UtilityNodeElement	Abstract base type representing an utility network element in an utility network. All <i>UtilityLinkSet</i> , <i>UtilityNode</i> and <i>UtilityNodeContainer</i> objects are a type of <i>UtilityNodeElement</i> .
TAW	<i>Tweede Algemene Waterpassing</i> Dutch-speaking equivalent of DNG.
URI	Uniform Resource Identifier
URL	Uniform Resource Locator
URN	Uniform Resource Name
XML	Extensible Markup Language
XSD	W3C XML Schema Definition Language

2

Introduction

For the planning and execution of excavation works, plan applicants (contractors, engineering firms, etc.) require information about the location and nature of underground cables and pipelines. This information is held by various utility network operators (utility companies, public authorities, etc.).

For the integration of cable and pipeline information from different parties, it is essential to have a common framework of terms, allowing information from various types of cables, pipelines, and sectors (gas, electricity, drinking water, wastewater, telecommunications, etc.) to be provided in a uniform manner in response to a plan request. This common framework is established by the Information Model for Cables and Conduits (IMKL).

IMKL focuses on the information that is needed to minimize excavation damage by exchanging information about network infrastructure in a clear manner. The emphasis is not on information exchange for network analysis, operational maintenance planning, or similar activities.

The scope of this document is to define and describe the IMKL 3 data model.

The remainder of the document contains the following chapters:

- **IMKL concept:** An introduction to the Cables and Pipes application profile and the IMKL 3 implementation model.
- **IMKL data dictionary:** An overview of all objects and their properties and relationships.
- **Codelists:** A description of all codelists and their contents used in the context of IMKL 3.
- **Getting started:** Information on how to start with creating IMKL 3 compliant XML files.
- **Best practices:** Best practices for providing specific information in IMKL 3.



3 IMKL 3 concept

3.1 Introduction

IMKL 3 is an update of the existing IMKL 2.3 standard. The design and implementation of IMKL 3 occurred in two phases. In the first phase, a semantic data model was developed, which resulted in the *Cables and Pipes* application profile. This profile defines the terms that are relevant in the context of IMKL.

Next, based on this application profile, an implementation model was created. This implementation model precisely defines how data must be encoded to comply with the IMKL 3 standard.

In Belgium, IMKL 3 is the first regional (OSLO = Open Standaarden voor Linkende Organisaties) data model that has been ratified at interfederal level (ICEG = Inter-Communautair Overleg E-government). This means that the various regional authorities as well as the federal government and the private sector were involved in the development and approval of this model. Both the semantic datamodel as the application profile were developed in an interregional co-creation set-up. While the IMKL 2.3 model was only used in Flanders, the IMKL 3 model will be implemented and rolled out across the country. This means that both public and private actors will speak the same language when it comes to exchanging information about underground cables and pipes.

Section 3.2 contains a short introduction of the *Cables and Pipes* application profile. More information can be found on the following website: https://belgif.github.io/thematic/models/cable-pipe/index_en.html. The remainder of this document (as from 3.3) focuses on the implementation of this application profile in XML, i.e. the IMKL 3 standard.

3.2 The Cables and Pipes application profile

The Cables and Pipes application profile shows how terms from the associated vocabulary should be used to describe cables, pipes and ducts. These can be located both above and below ground. As far as the underground cables and pipes or ducts are concerned, the description is such that all elements are present that contribute to limiting excavation damage.

The model builds on *INSPIRE Utility Services* and models on which that model is based, mainly *INSPIRE Networks*.

Utilities such as cables and pipes or ducts are conceived as a network (a *UtilityNetwork*) in which they form linear elements, connected by point objects such as splitters, connectors, connections mounted in or on cabinets, towers, poles, etc.

Cables and pipes or ducts are collections of links in the network, *UtilityLinkSets* composed of *UtilityLinkSequences* or *Links*. The main types of link sets are *Cables*, *Pipes* and *Ducts*. *Pipes* and *Ducts* are conduits: they carry substances such as water, waste water, gas or contain *Cables* or other *Pipes* or *Ducts*.

The *Cables* class is divided into *Electrical Cables* and *Telecommunications Cables*. In *Pipes*, a distinction is made between *Oil/Gas/ChemicalsPipes*, *SewerPipes*, *WaterPipes* and *ThermalPipes*.

The point objects that realize the connections in the network (For example couplings, connections, pumps, meters) are the nodes of the network, the so-called *Utility Nodes*. They can stand alone but are typically mounted on larger sized point objects such as Poles or Towers or sit in Cabinets on the street. We call these *Utility Node Containers*.

Some *Utility Elements* together form a facility or installation that can be separately described as an *Activity Complex*.

The model includes various supporting classes and data types, including to supplement the network information with topographical information (class *Topographic Element*) or zones where certain regulations apply when carrying out works (class *Protected Area*) or to annotate the objects (class *Annotation*).

The geometry of cables and pipes and nodes in the network can be described in 2D or 2.5D.

If 2.5D is not possible or is insufficient, additional information about the *VerticalPosition* can be provided, both relative (to a *Reference Surface*) and absolute (*Direct Position* in a vertical coordinate system such as TAW/DNG). This information is important to avoid excavation damage.

The documentation of the application profile can be found on the following website:

https://belgif.github.io/thematic/models/cable-pipe/index_en.html

3.3 IMKL 3 implementation model

The IMKL 3 implementation model is an implementation of the *Cables and Pipes* application profile described in the previous section. The European exchange standard for cable and pipeline information (INSPIRE Utility Services, hereafter abbreviated as 'INSPIRE US') was used as the foundation for the IMKL 3 implementation model. This standard has been extended with several IMKL-specific elements that are relevant for the use cases of IMKL.

The INSPIRE technical guidelines define XML as the default encoding for all INSPIRE spatial data themes. Since the IMKL 3 implementation model is based on this, XML is also used as the exchange format for IMKL 3. The IMKL 3 implementation model consists of an XSD and a set of guidelines that define how data must be encoded.

For cable and pipeline operators subject to INSPIRE requirements, this integrated modelling approach offers operational benefits, as there is no need to develop an additional transformation service to comply with both the KLIP/KLIM decree and the INSPIRE directive. By filtering out the IMKL-specific elements, it is possible to exchange a subset of cable and pipeline information in an INSPIRE-compliant manner using the same information service.

The following chapters in this document contain a detailed description of the objects and requirements as included in the IMKL 3 implementation model and instructions to get started with converting data into valid IMKL 3 XML documents.

3.4 Differences between IMKL 2.3 and IMKL 3

For more information on the differences between IMKL 2.3 and IMKL 3.0, please refer to the following documents:

- IMKL2.3 to IMKL3 migration guide.pdf.
- IMKL 3 vs IMKL 2.3 – What, Why and How.pdf



4 IMKL 3 data dictionary

4.1 Introduction

The Data Dictionary in this chapter describes each data object, the properties of these objects and their associations with other objects or codelists. The values from the codelists are detailed in chapter 5.

For each concept, a table provides the definition, a description, and its origin. Next, the properties of each object are listed. Additionally, an *Entity Relationship Diagram* (ERD) is provided for each object, illustrating how the object relates to other objects.

Some attributes consist of multiple elements. These attributes are referred to as Data Types, which are described in section 4.4.

Section 4.5 lists all properties present in the data model. For each property the following information is listed:

- Namespace: The namespace of the property
- Definition: The definition of the property
- Description: A description of the property
- Type: The data type of the property
- Occurrence: listing the objects in which the property is used
- NilReason: whether a nilReason is allowed (Yes) or not (No). More information on nilReasons is given in section 6.6.

Since most data objects are spatial objects or *features*, the data dictionary can also be considered a *feature catalogue*. All of the data objects listed in this chapter are instantiable. Abstract data objects are not described individually in this data dictionary.

4.2 Feature Objects

4.2.1 ActivityComplex

4.2.1.1 Overview

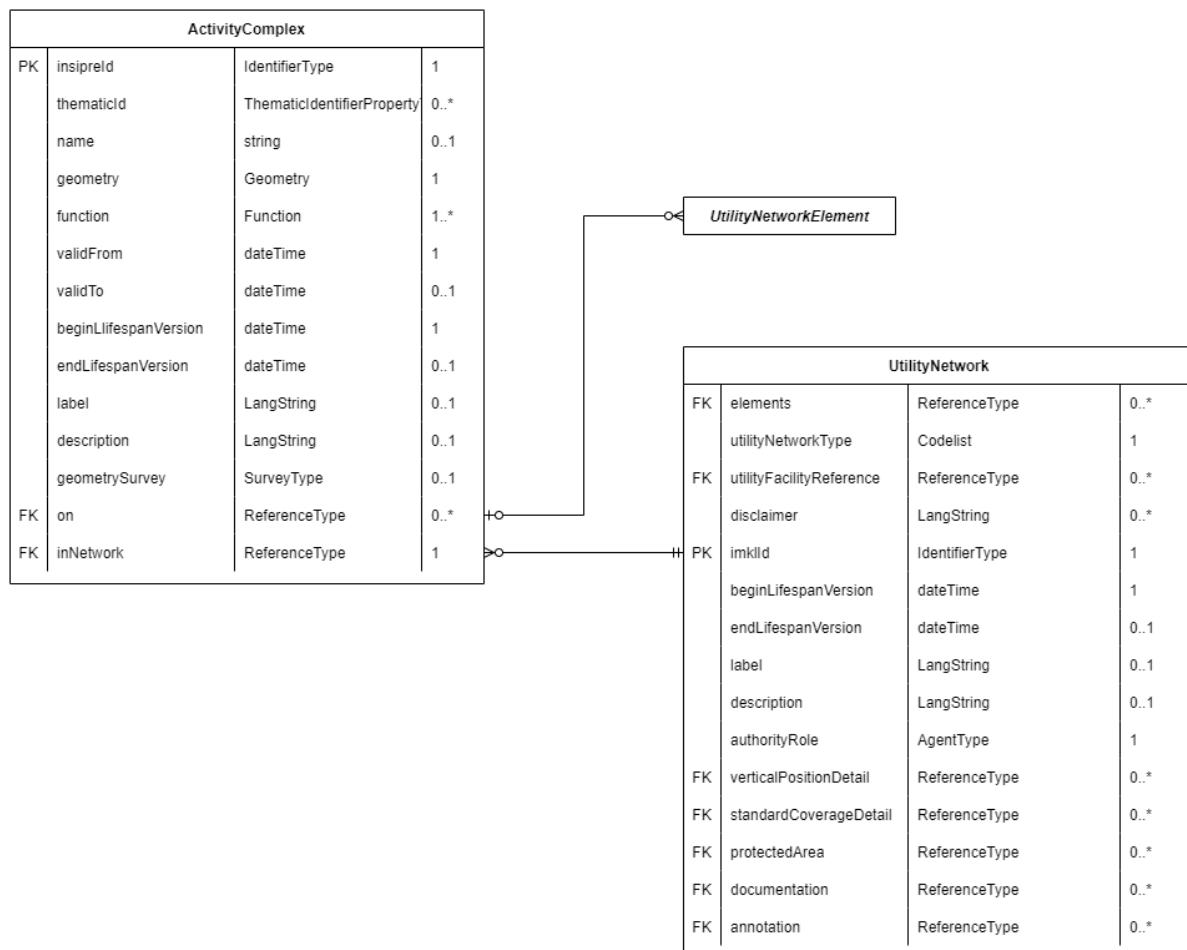
Name	ActivityComplex
Definition	Technical and economic unit managed by the same operator where certain activities regarding production and services take place.
Description	In practice, a site, plot, facility, installation, building where the activity takes place. In the context of cables and pipes, it refers to for example a power plant, a pumping station, a sewage treatment plant, etc. An <i>ActivityComplex</i> includes the infrastructure, equipment and material required for it and may include several sites as long as they are part of the same complex. The activity is identified by NACEBEL codes.

	An <i>ActivityComplex</i> object is always associated with a <i>UtilityNetwork</i> object via the <i>inNetwork</i> association. An <i>ActivityComplex</i> can also be associated with multiple <i>UtilityNetworkElement</i> objects via the <i>on</i> association. When an <i>ActivityComplex</i> is associated with the <i>UtilityNetwork</i> as a whole and is not associated with specific <i>UtilityNetworkElement</i> objects, the <i>on</i> associations can be omitted.
Inherits from	INSPIRE act-core 4.0 - ActivityComplex

4.2.1.2 Properties and associations

Property name	Namespace	Cardinality	Type
inspireId	act-core	1	Identifier.PropertyType
thematicId	act-core	0..*	ThematicIdentifier.PropertyType
name	act-core	0..1	string
geometry	act-core	1	Geometry
function	act-core	1..*	Function
validFrom	act-core	1	dateTime
validTo	act-core	0..1	dateTime
beginLifespanVersion	act-core	1	dateTime
endLifespanVersion	act-core	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
geometrySurvey	imkl	0..1	SurveyType
on	imkl	0..*	ReferenceType
inNetwork	imkl	1	ReferenceType

4.2.1.3 Entity Relationship Diagram



4.2.2 Annotation

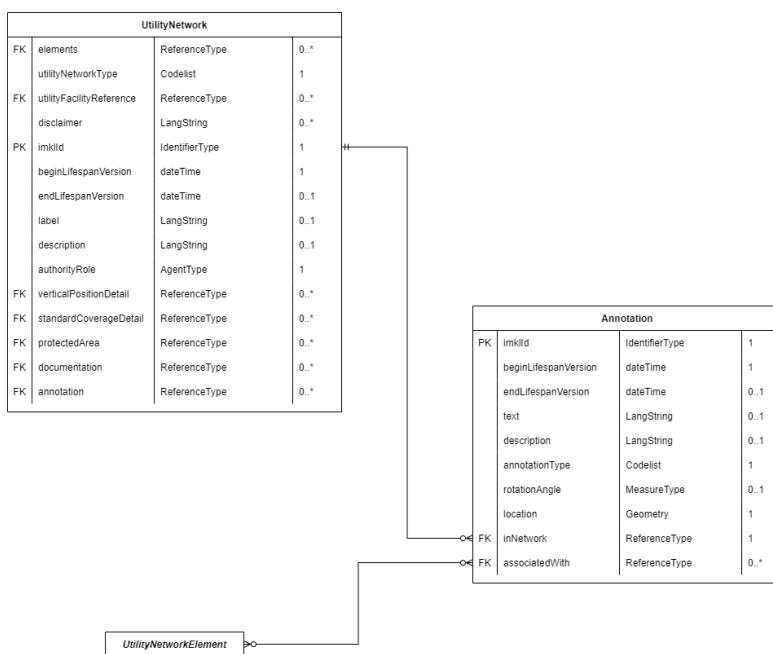
4.2.2.1 Overview

Name	Annotation
Definition	An object that displays additional information in the form of annotations and dimensions.
Description	<p><i>Annotations</i> can be used to provide additional information in the form of annotations and dimensions. The <i>annotationType</i> property can be used to specify the type of the <i>Annotation</i>.</p> <p>The position of the <i>Annotation</i> must be specified via the location property. The location must be a point or line geometry.</p>
Inherits from	N/A

4.2.2.2 Properties and associations

Property name	Namespace	Cardinality	Type
imkId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
text	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
annotationType	imkl	1	ReferenceType
rotationAngle	imkl	0..1	MeasureType
location	imkl	1	Geometry
inNetwork	imkl	1	ReferenceType
associatedWith	imkl	0..*	ReferenceType

4.2.2.3 Entity Relationship Diagram





4.2.3 Appurtenance

4.2.3.1 Overview

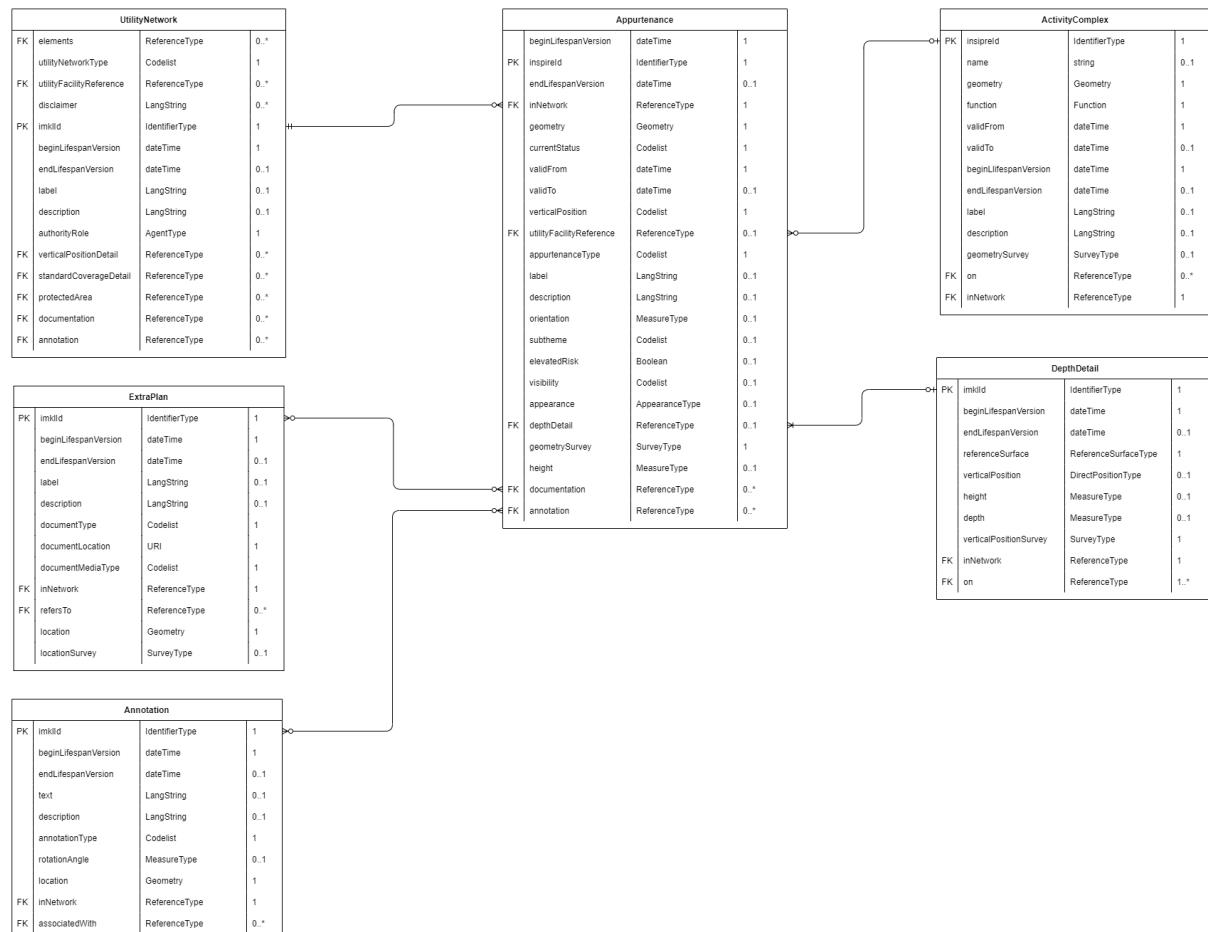
Name	Appurtenance
Definition	Physical point-shaped part of the <i>UtilityNetwork</i> .
Description	An <i>Appurtenance</i> can stand alone as a <i>UtilityNode</i> , but is often mounted on a carrier (a <i>UtilityNodeContainer</i>). The <i>appurtenanceType</i> property describes the type of the <i>Appurtenance</i> and corresponds to the INSPIRE classification of the <i>Appurtenance</i> . For the use cases of IMKL, IMKL specific options are added to this classification. The <i>specificAppurtenanceType</i> property is not used for the use cases of IMKL.
Inherits from	INSPIRE us-net-common 4.0 - Appurtenance

4.2.3.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
geometry	net	1	Geometry
spokeEnd	net	0..*	ReferenceType
spokeStart	net	0..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
appurtenanceType	us-net-common	1	ReferenceType
specificAppurtenanceType	us-net-common	0..1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType

orientation	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
height	imkl	0..1	MeasureType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

4.2.3.3 Entity Relationship Diagram





4.2.4 Cabinet

4.2.4.1 Overview

Name	Cabinet
Definition	Simple <i>UtilityNodeContainer</i> that takes the shape of a cabinet.
Description	A <i>Cabinet</i> typically contains smaller mountable <i>Appurtenances</i> . The <i>nodes</i> association can be used to track the association between the <i>Cabinet</i> and these <i>Appurtenances</i> .
Inherits from	INSPIRE us-net-common 4.0 - Cabinet

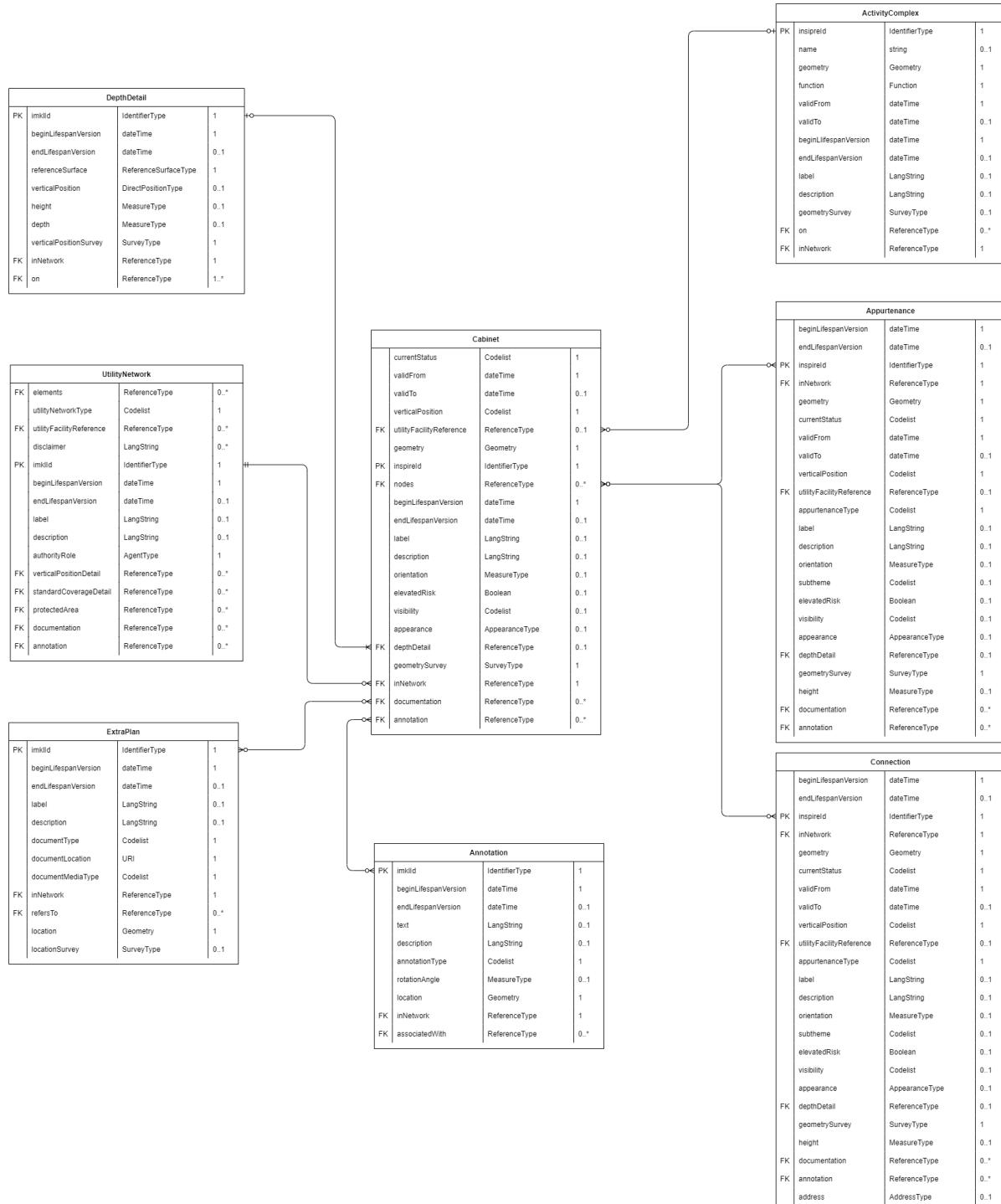
4.2.4.2 Properties and associations

Property name	Namespace	Cardinality	Type
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
geometry	us-net-common	1	Geometry
inspireId	us-net-common	1	Identifier.PropertyType
nodes	us-net-common	0..*	ReferenceType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
orientation	imkl	0..1	MeasureType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType

documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType



4.2.4.3 Entity Relationship Diagram



4.2.5 Connection

4.2.5.1 Overview

Name	Connection
Definition	Specific type of <i>Appurtenance</i> describing the connection of a <i>Cable</i> or <i>Pipe</i> to a building or other physical object.
Description	A <i>Connection</i> is a specific type of <i>Appurtenance</i> that is used to describe the connection of a <i>Cable</i> or <i>Pipe</i> to a building or other physical object. A <i>Connection</i> object must have one of the following <i>appurtenanceTypes</i> : <ul style="list-style-type: none"> • WaterAppurtenanceTypeIMKLValue – deliveryPoint • ThermalAppurtenanceTypeIMKLValue – deliveryPoint • ElectricityAppurtenanceTypeValue – deliveryPoint • OilGasChemicalsAppurtenanceTypeValue – deliveryPoint • TelecommunicationsAppurtenanceTypeIMKLValue – termination • SewerAppurtenanceTypeIMKLValue – deliveryPoint The <i>address</i> property can be used to include information on the address of the connection.
Inherits from	IMKL 3.0 - Appurtenance

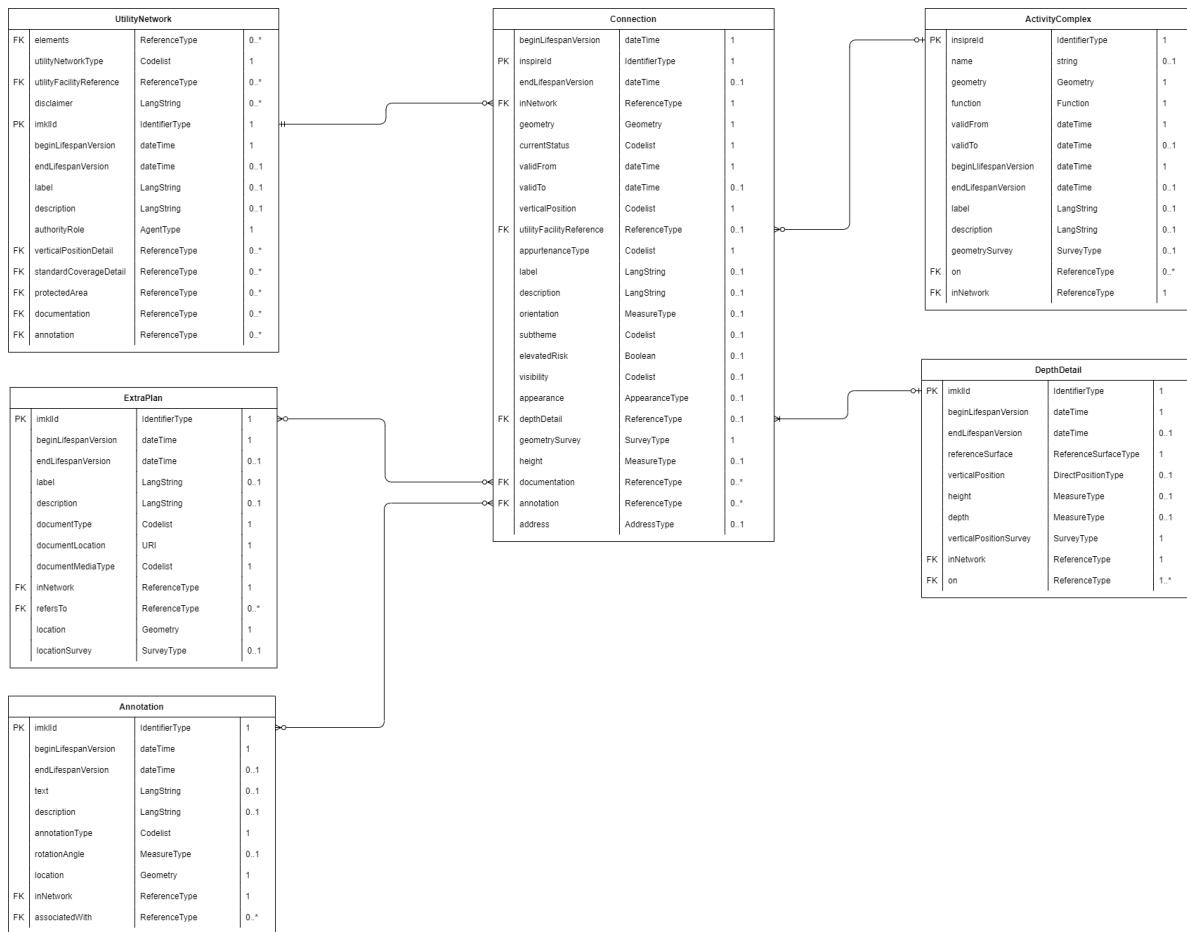
4.2.5.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
geometry	net	1	Geometry
spokeEnd	net	0..*	ReferenceType
spokeStart	net	0..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime



verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
appurtenanceType	us-net-common	1	ReferenceType
specificAppurtenanceType	us-net-common	0..1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
orientation	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
height	imkl	0..1	MeasureType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
address	imkl	0..1	AddressType

4.2.5.3 Entity Relationship Diagram



4.2.6 CoverageDetail

4.2.6.1 Overview

Name	CoverageDetail
Definition	<p>Object used to represent:</p> <ul style="list-style-type: none"> the distance from the surface level to the top of a <i>UtilityLinkSet</i> object. The distance in absolute value – expressed in TAW/DNG level – from the TAW/DNG zero point to the top of a <i>UtilityLinkSet</i> object.
Description	<p><i>CoverageDetail</i> can be used to provide information on the depth or vertical position of <i>UtilityLinkSet</i> objects. For these objects the depth or vertical position information should be measured to the top of the object.</p> <p><i>UtilityLinkSet</i> objects are:</p> <ul style="list-style-type: none"> ElectricityCable



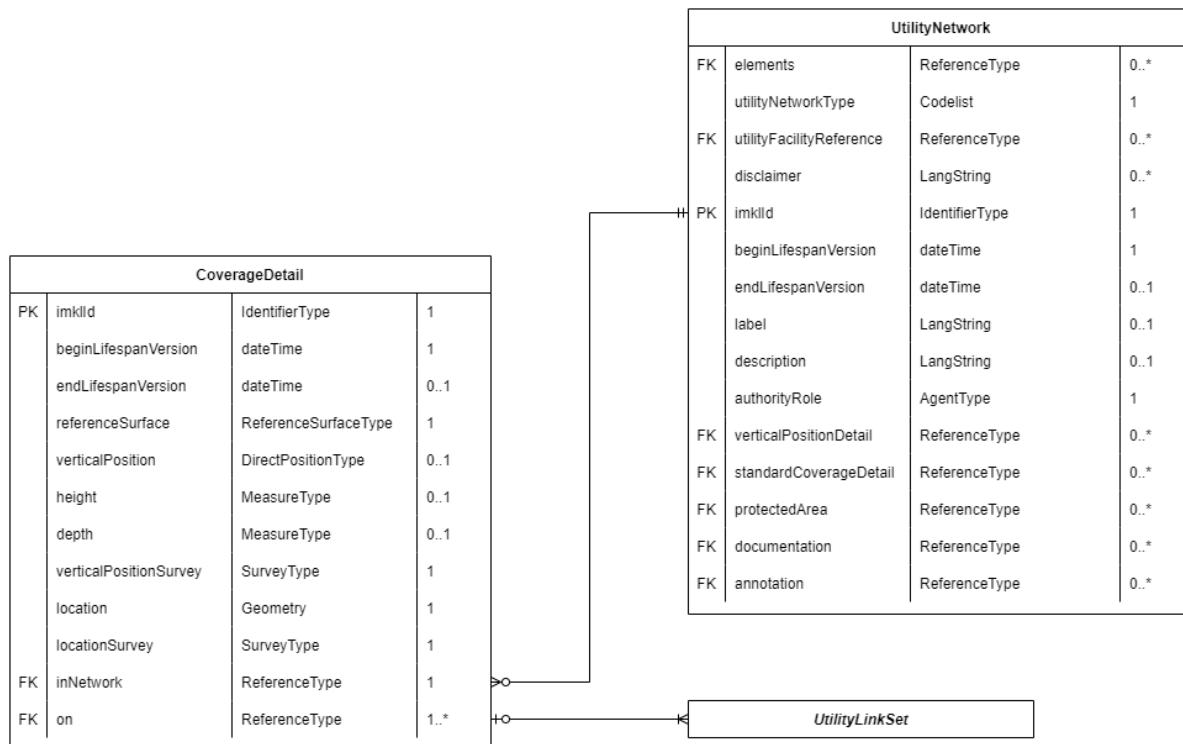
	<ul style="list-style-type: none">• TelecommunicationsCable• Pipe• OilGasChemicalsPipe• SewerPipe• WaterPipe• ThermalPipe• Duct <p><i>CoverageDetail</i> can be used to represent both a relative height (i.e. a distance above the surface) or depth (i.e. a distance below the surface) as well as an absolute TAW/DNG level.</p> <p>Every <i>CoverageDetail</i> object should have one (and at most one) of the following properties:</p> <ul style="list-style-type: none">• depth: Represents the depth below the surface.• height: The <i>height</i> property is similar to the <i>depth</i>, but it represents a height above the surface.• verticalPosition: The <i>verticalPosition</i> property should be used to provide a TAW/DNG level. Note that the <i>srsName</i> and <i>srsDimension</i> attributes are required for this element. <p>A single <i>CoverageDetail</i> can be associated with multiple <i>UtilityLinkSet</i> objects. If multiple objects have the same depth, height or vertical position, the <i>CoverageDetail</i> can be reused and needs to be provided only once.</p> <p>The location of a <i>CoverageDetail</i> must be provided via the <i>location</i> property. This location can be a Point or Line geometry.</p>
Inherits from	N/A

4.2.6.2 Properties and associations

Property name	Namespace	Cardinality	Type
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
referenceSurface	imkl	1	ReferenceSurfaceType
verticalPosition	imkl	0..1	DirectPositionType
height	imkl	0..1	MeasureType
depth	imkl	0..1	MeasureType
verticalPositionSurvey	imkl	1	SurveyType

location	imkl	1	Geometry
locationSurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType
on	imkl	1..*	ReferenceType

4.2.6.3 Entity Relationship Diagram



4.2.7 DepthDetail

4.2.7.1 Overview

Name	DepthDetail
Definition	<p>Object used to represent:</p> <ul style="list-style-type: none"> the distance from the surface level to the bottom of a <i>UtilityNode</i> or <i>UtilityNodeContainer</i> object. The distance in absolute value – expressed in TAW/DNG level – from the TAW/DNG zero point to the bottom of a <i>UtilityNode</i> or <i>UtilityNodeContainer</i> object.
Description	<i>DepthDetail</i> can be used to provide information on the depth of <i>UtilityNode</i> or <i>UtilityNodeContainer</i> objects. For these objects (having a point geometry) the



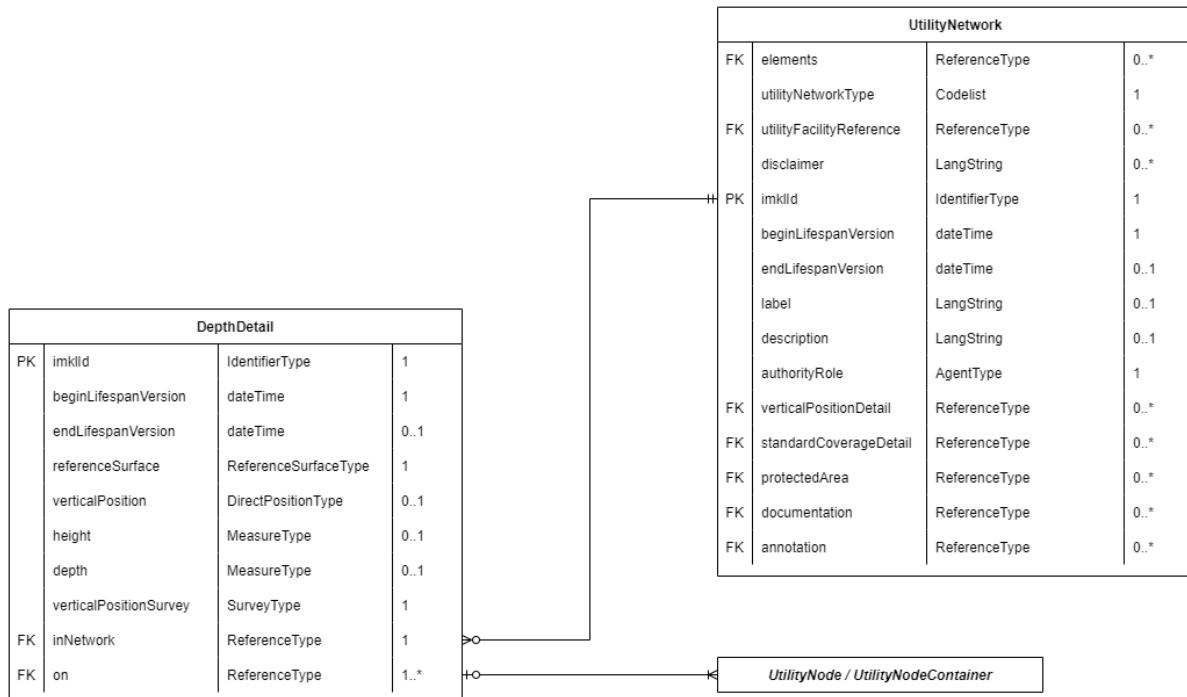
	<p>depth or vertical position information should be measured to the lowest point of the object.</p> <p><i>UtilityNode</i> objects are:</p> <ul style="list-style-type: none">• Appurtenance• Connection <p><i>UtilityNodeContainer</i> objects are:</p> <ul style="list-style-type: none">• Tower• Pole• Cabinet• Manhole <p><i>DepthDetail</i> can be used to represent both a relative height (i.e. a distance above the surface) or depth (i.e. a distance below the surface) as well as an absolute TAW/DNG level.</p> <p>Every <i>DepthDetail</i> object should have one (and at most one) of the following properties:</p> <ul style="list-style-type: none">• depth: Represents the depth below the surface.• height: The <i>height</i> property is similar to the <i>depth</i>, but it represents a height above the surface.• verticalPosition: The <i>verticalPosition</i> property should be used to provide a TAW/DNG level. Note that the <i>srsName</i> and <i>srsDimension</i> attributes are required for this element. <p>A single <i>DepthDetail</i> can be associated with multiple <i>UtilityNode</i> or <i>UtilityNodeContainer</i> objects. If multiple objects have the same depth, height or vertical position, the <i>DepthDetail</i> can be reused and needs to be provided only once.</p>
Inherits from	N/A

4.2.7.2 Properties and associations

Property name	Namespace	Cardinality	Type
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
referenceSurface	imkl	1	ReferenceSurfaceType
verticalPosition	imkl	0..1	DirectPositionType

height	imkl	0..1	MeasureType
depth	imkl	0..1	MeasureType
verticalPositionSurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType
on	imkl	1..*	ReferenceType

4.2.7.3 Entity Relationship Diagram



4.2.8 Document

4.2.8.1 Overview

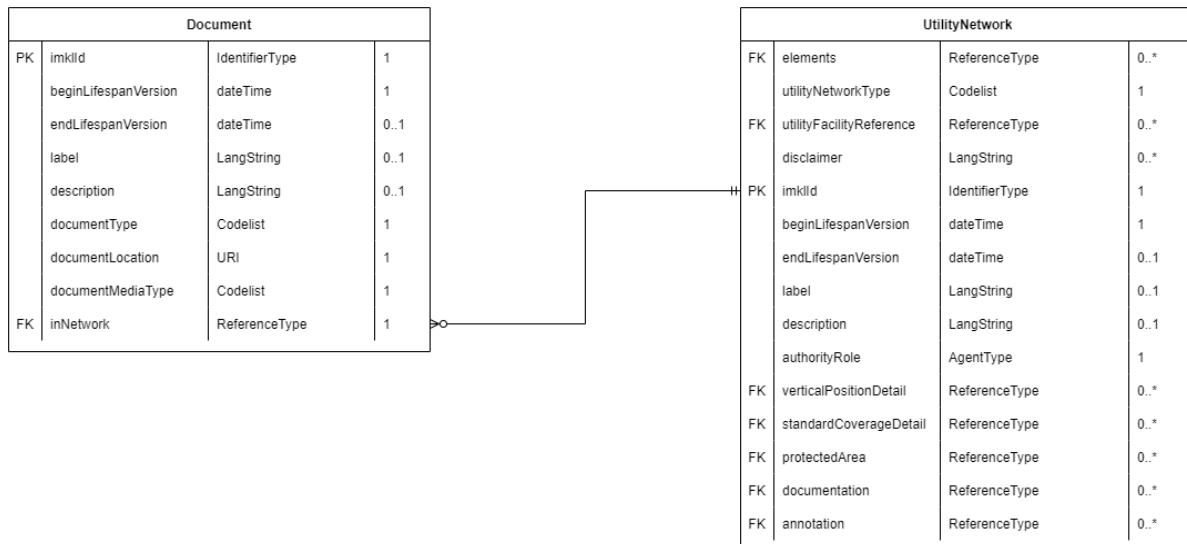
Name	Document
Definition	Object that provides extra information on a <i>UtilityNetwork</i> via an attached file.
Description	A <i>Document</i> should always be associated to a <i>UtilityNetwork</i> . This is done via the <i>inNetwork</i> association of the <i>Document</i> .
Inherits from	N/A

4.2.8.2 Properties and associations

Property name	Namespace	Cardinality	Type

imkId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
documentType	imkl	1	ReferenceType
documentLocation	imkl	1	anyURI
documentMediaType	imkl	1	ReferenceType
inNetwork	imkl	1	ReferenceType

4.2.8.3 Entity Relationship Diagram



4.2.9 Duct

4.2.9.1 Overview

Name	Duct
Definition	A <i>UtilityLinkSet</i> used to protect and route cables and pipes through an enclosing structure.
Description	The <i>ductWidth</i> property is used to describe the width of the <i>Duct</i> . Through the associations <i>cables</i> , <i>pipes</i> and <i>ducts</i> , references can be made to the respective <i>Cable</i> , <i>Pipe</i> and <i>Duct</i> objects contained within this <i>Duct</i> object.

Inherits from | INSPIRE US 4.0 - Duct

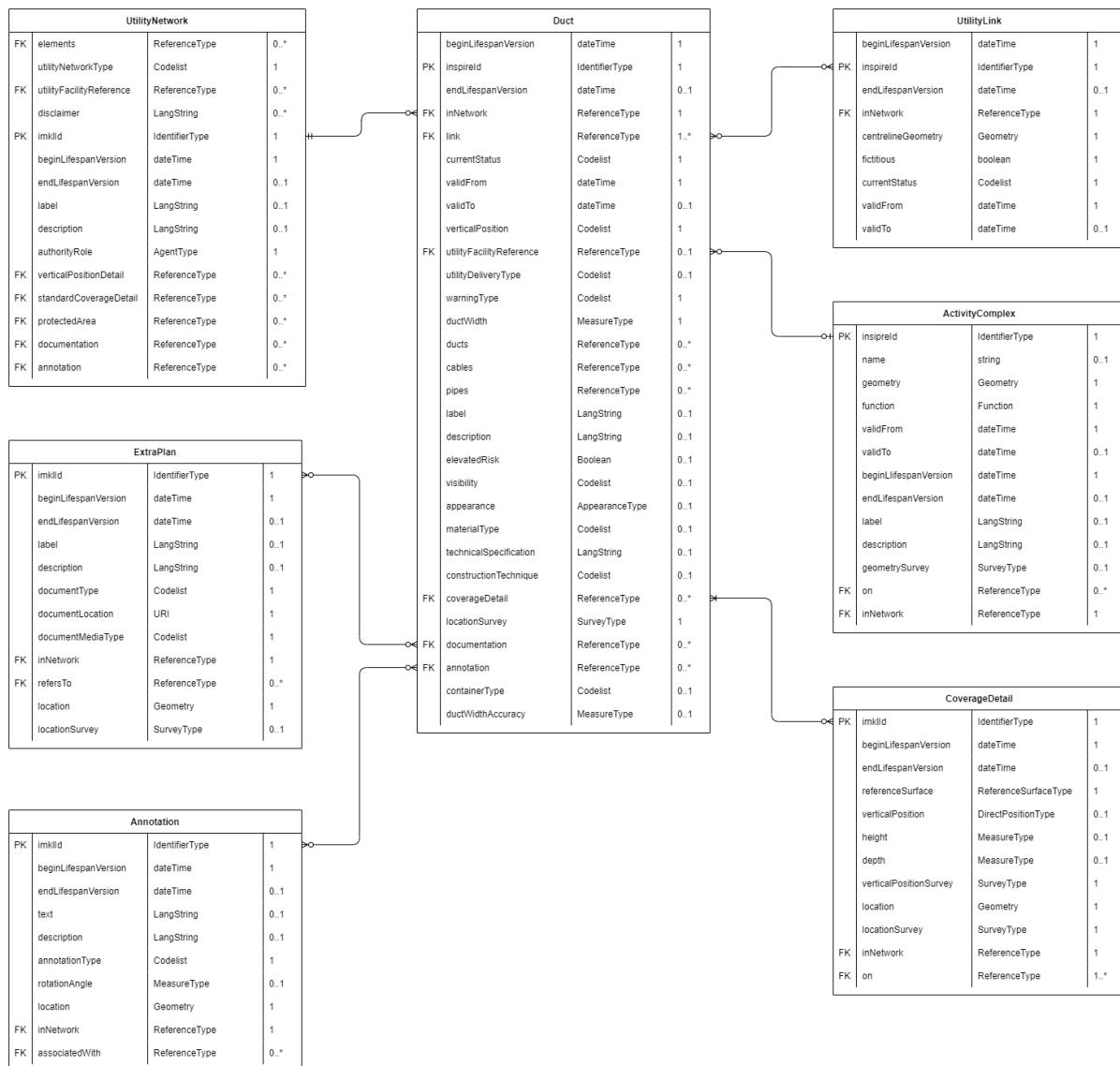
4.2.9.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
ductWidth	us-net-common	1	MeasureType
ducts	us-net-common	0..*	ReferenceType
cables	us-net-common	0..*	ReferenceType
pipes	us-net-common	0..*	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType



visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
containerType	imkl	0..1	ReferenceType
ductWidthAccuracy	imkl	0..1	MeasureType

4.2.9.3 Entity Relationship Diagram



4.2.10 ElectricityCable

4.2.10.1 Overview

Name	ElectricityCable
Definition	A cable used to transport electricity from one location to another.
Description	<p><i>ElectricityCable</i> is a subtype of <i>UtilityLinkSet</i>.</p> <p>The nominal voltage represents the voltage without load. The operating voltage represents the voltage during load.</p>



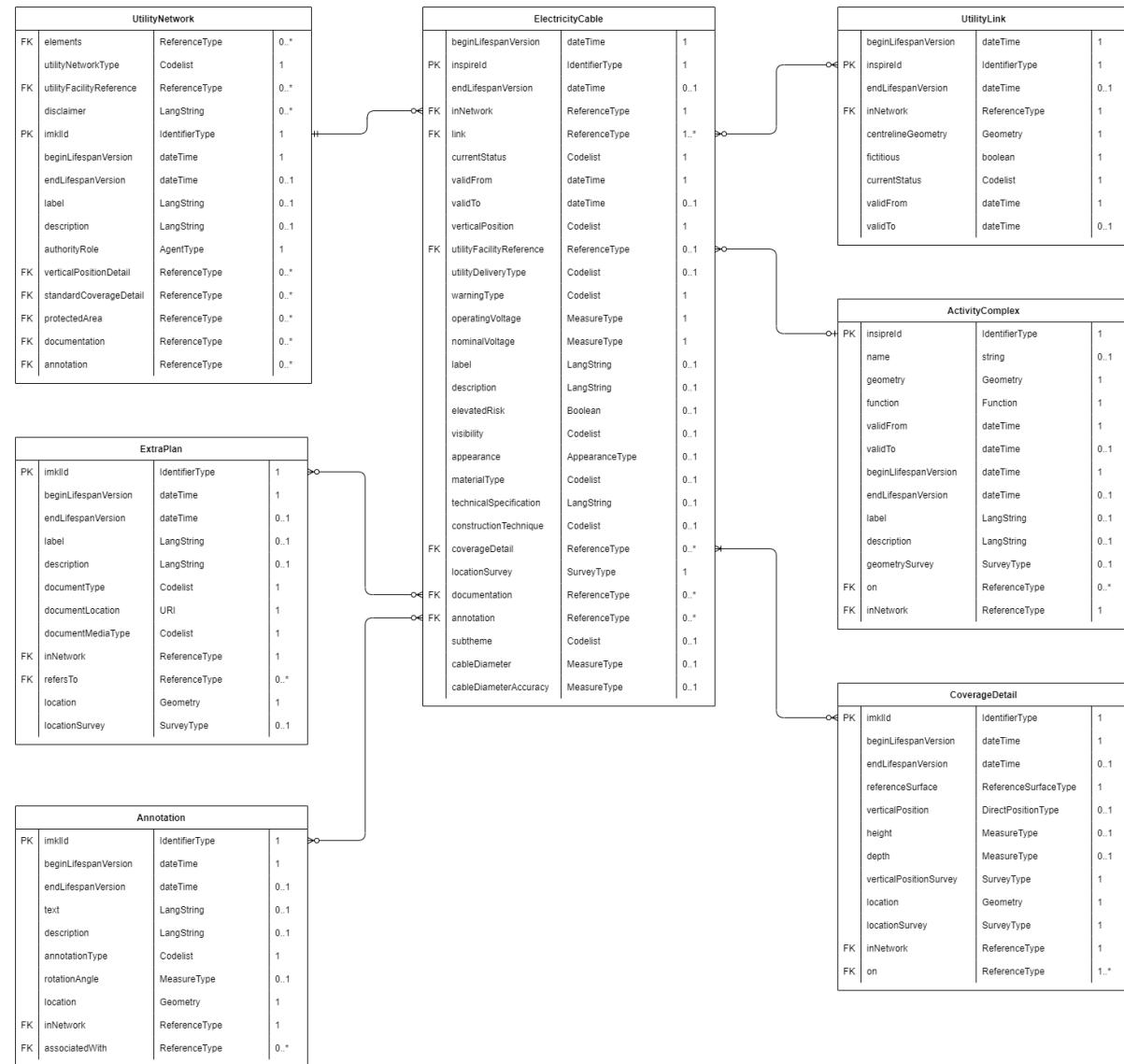
Inherits from | INSPIRE US 4.0 - ElectricityCable

4.2.10.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
operatingVoltage	us-net-el	1	MeasureType
nominalVoltage	us-net-el	1	MeasureType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType

annotation	imkl	0..*	ReferenceType
subtheme	imkl	0..1	ReferenceType
cableDiameter	imkl	0..1	MeasureType
cableDiameterAccuracy	imkl	0..1	MeasureType

4.2.10.3 Entity Relationship Diagram





4.2.11 ExtraPlan

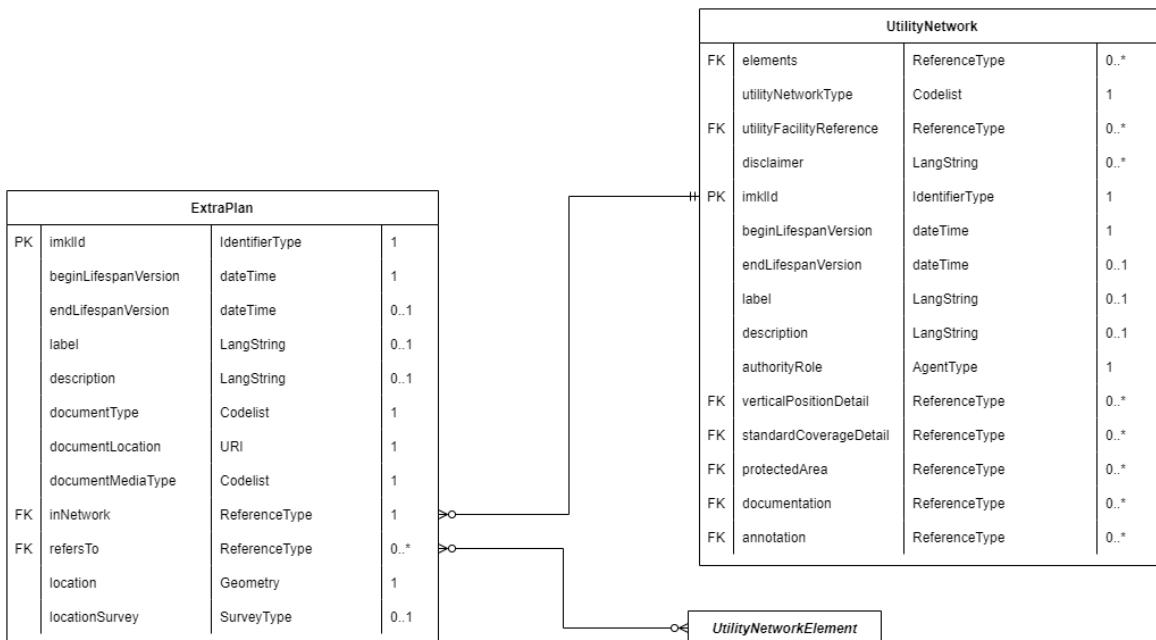
4.2.11.1 Overview

Name	ExtraPlan
Definition	Object that provides extra information on one or more <i>UtilityNetworkElements</i> via an attached file.
Description	An <i>ExtraPlan</i> should always be associated to a <i>UtilityNetwork</i> . This is done via the <i>inNetwork</i> association of the <i>ExtraPlan</i> . Via the <i>refersTo</i> association it can be linked to one or more <i>UtilityNetworkElements</i> . An <i>ExtraPlan</i> has the same properties as a <i>Document</i> and in addition it also has a mandatory <i>location</i> and an optional <i>locationSurvey</i> property.
Inherits from	IMKL 3.0 - Document

4.2.11.2 Properties and associations

Property name	Namespace	Cardinality	Type
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
documentType	imkl	1	ReferenceType
documentLocation	imkl	1	anyURI
documentMediaType	imkl	1	ReferenceType
inNetwork	imkl	1	ReferenceType
refersTo	imkl	0..*	ReferenceType
location	imkl	1	Geometry
locationSurvey	imkl	0..1	SurveyType

4.2.11.3 Entity Relationship Diagram



4.2.12 Manhole

4.2.12.1 Overview

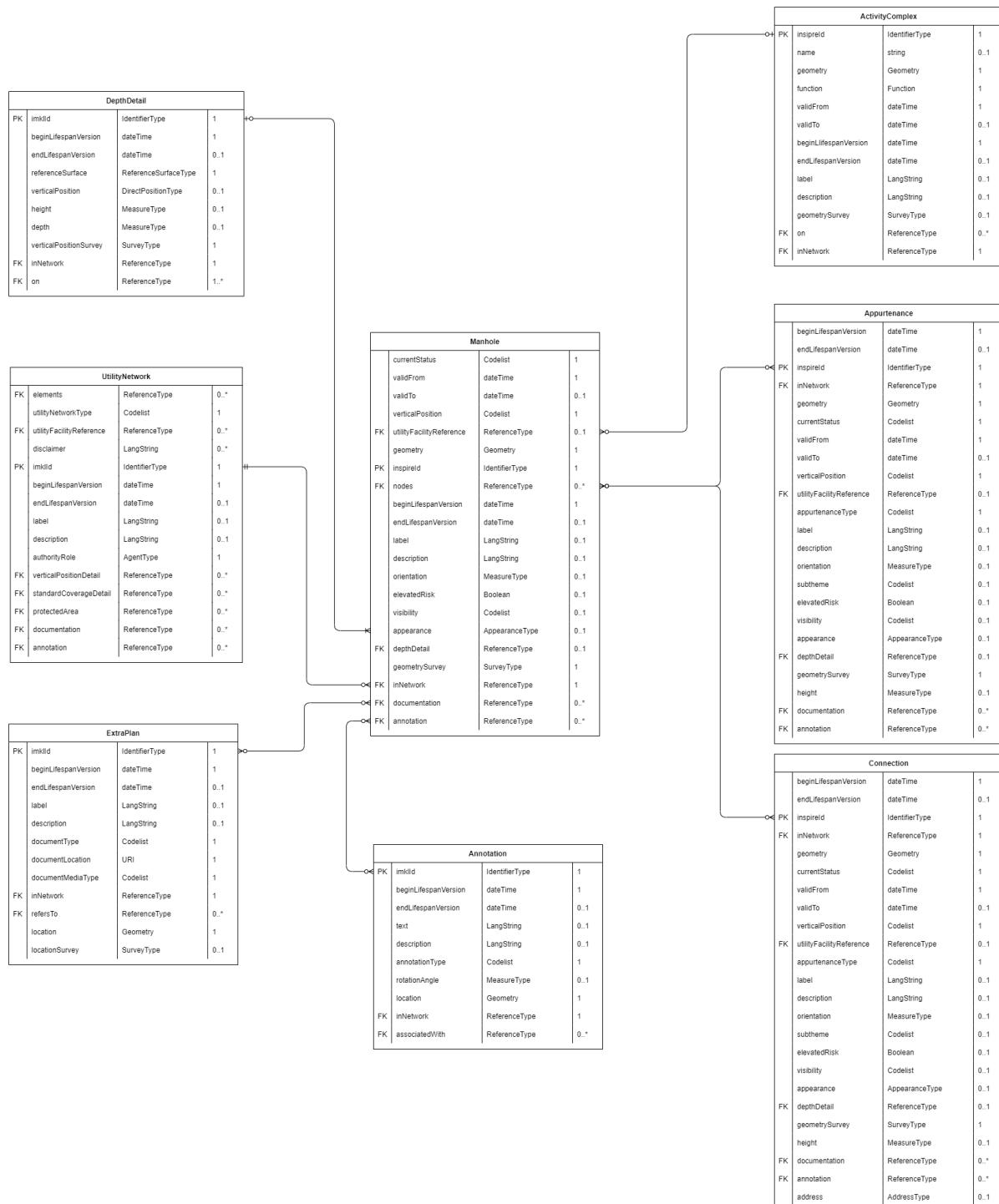
Name	Manhole
Definition	Simple <i>UtilityNodeContainer</i> that takes the form of a covered opening in the road surface providing access to the subsurface.
Description	A <i>Manhole</i> typically contains smaller mountable <i>Appurtenances</i> . The <i>nodes</i> association can be used to track the association between the <i>Manhole</i> and these <i>Appurtenances</i> .
Inherits from	INSPIRE us-net-common 4.0 - Manhole

4.2.12.2 Properties and associations

Property name	Namespace	Cardinality	Type
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType

governmentalServiceReference	us-net-common	0..1	ReferenceType
geometry	us-net-common	1	Geometry
inspireId	us-net-common	1	Identifier.PropertyType
nodes	us-net-common	0..*	ReferenceType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
orientation	imkl	0..1	MeasureType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

4.2.12.3 Entity Relationship Diagram





4.2.13 OilGasChemicalsPipe

4.2.13.1 Overview

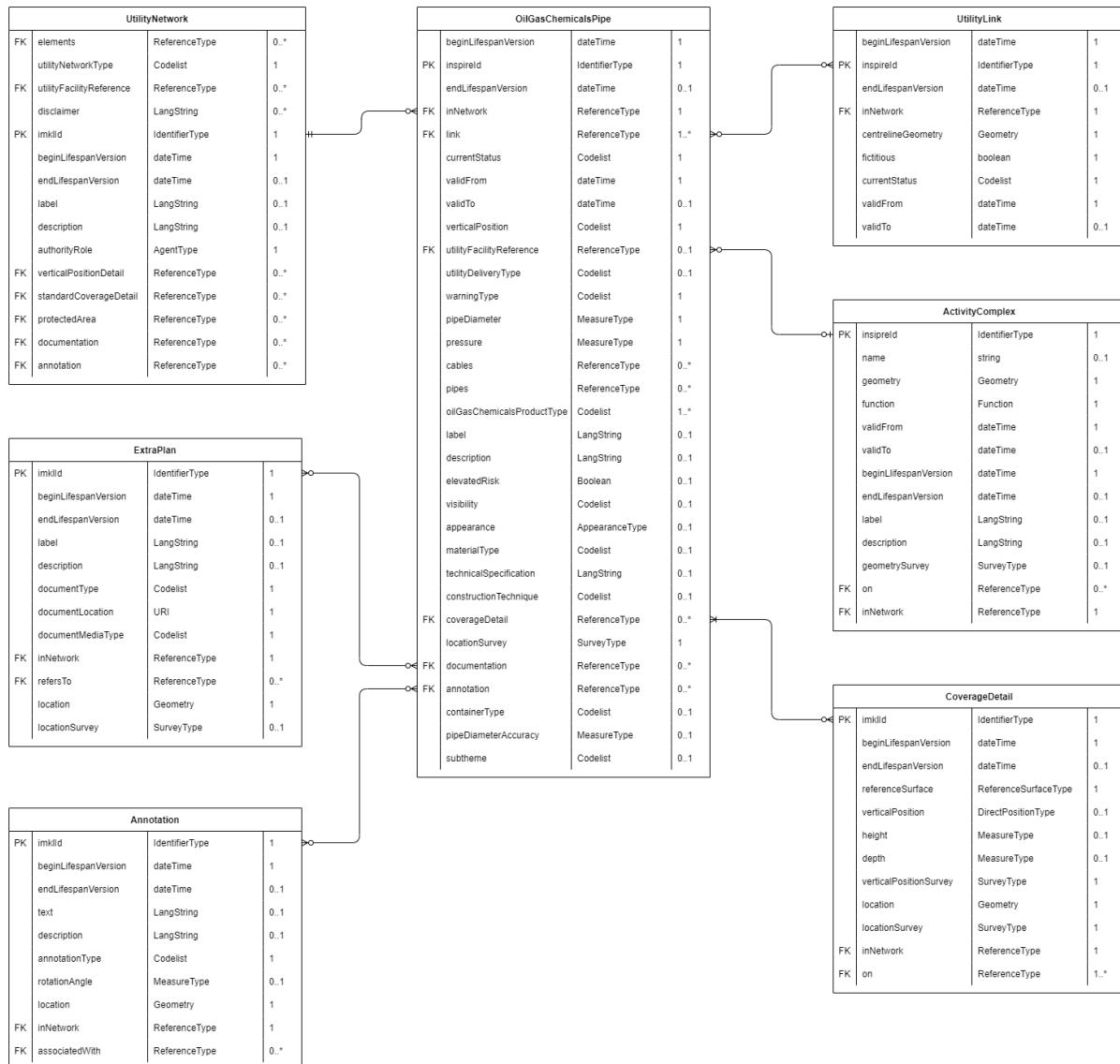
Name	OilGasChemicalsPipe
Definition	A pipe used to transport oil, gas or chemicals from one location to another.
Description	<p><i>OilGasChemicalsPipe</i> is a subtype of <i>Pipe</i>.</p> <p>The <i>oilGasChemicalsProductType</i> property describes the type of oil, gas or chemical product that is transported through the <i>OilGasChemicalsPipe</i>.</p> <p>In IMKL, the <i>cables</i> and <i>pipes</i> associations should not be used for <i>OilGasChemicalsPipe</i> objects.</p>
Inherits from	INSPIRE US 4.0 – OilGasChemicalsPipe IMKL 3.0 - Pipe

4.2.13.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType

warningType	us-net-common	1	ReferenceType
pipeDiameter	us-net-common	1	MeasureType
pressure	us-net-common	0..1	MeasureType
cables	us-net-common	0..*	ReferenceType
pipes	us-net-common	0..*	ReferenceType
oilGasChemicalsProductType	us-net-ogc	1..*	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
containerType	imkl	0..1	ReferenceType
pipeDiameterAccuracy	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType

4.2.13.3 Entity Relationship Diagram



4.2.14 Pipe

4.2.14.1 Overview

Name	Pipe
Definition	A <i>UtilityLinkSet</i> intended for the transportation of solids, liquids, chemicals or gases from one location to another or as a casing for Cables or other Pipes.
Description	Pipe is a subtype of <i>UtilityLinkSet</i> .

	Through the associations <i>cables</i> and <i>pipes</i> , references can be made to the respective <i>ElectricityCable</i> , <i>TelecommunicationsCable</i> and <i>Pipe</i> objects contained within this <i>Pipe</i> object. These associations should only be used for <i>Pipe</i> objects and not for its subtypes.
Inherits from	INSPIRE US 4.0 - Pipe

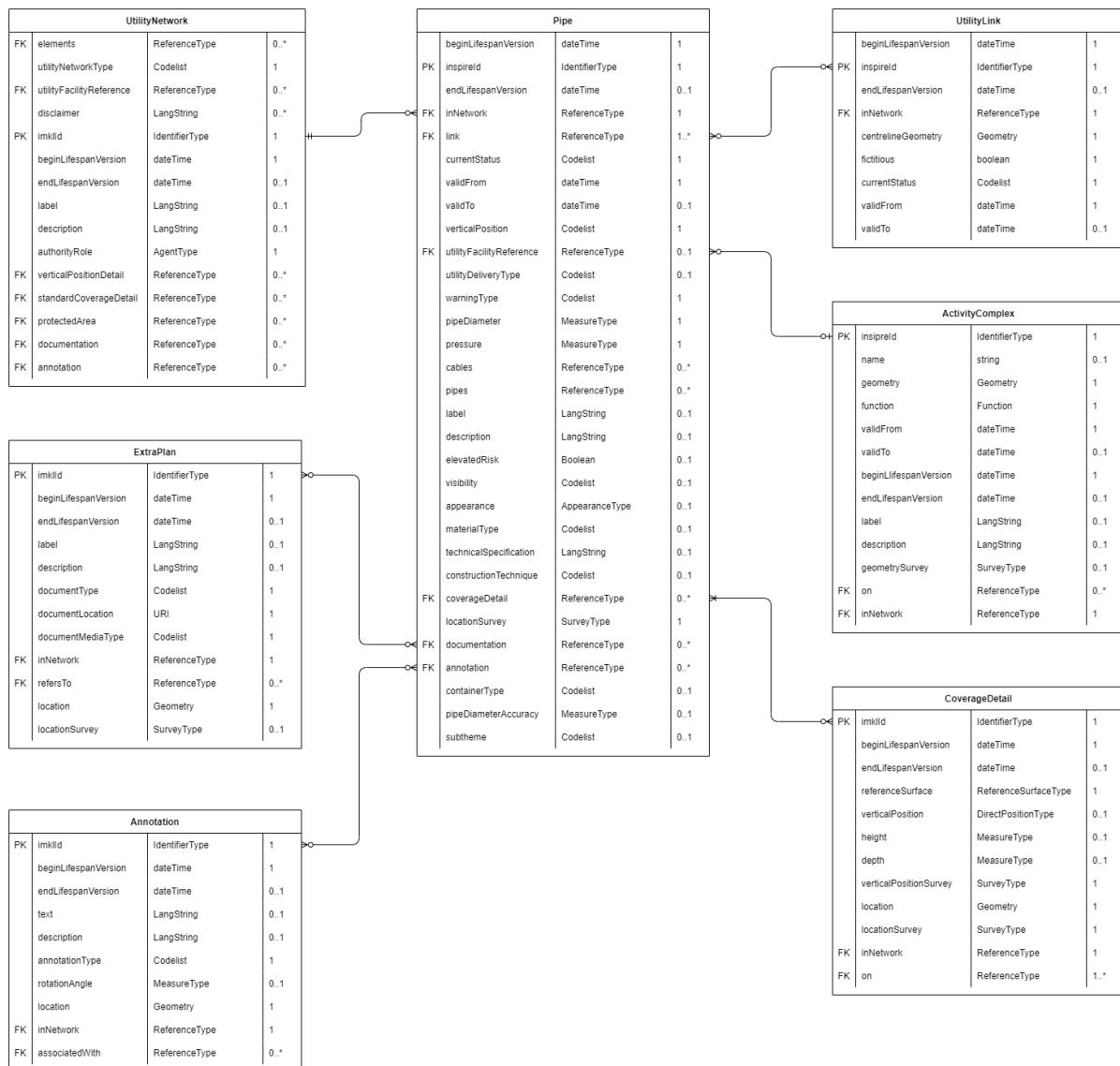
4.2.14.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
pipeDiameter	us-net-common	1	MeasureType
pressure	us-net-common	0..1	MeasureType
cables	us-net-common	0..*	ReferenceType



pipes	us-net-common	0..*	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
containerType	imkl	0..1	ReferenceType
pipeDiameterAccuracy	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType

4.2.14.3 Entity Relationship Diagram



4.2.15 Pole

4.2.15.1 Overview

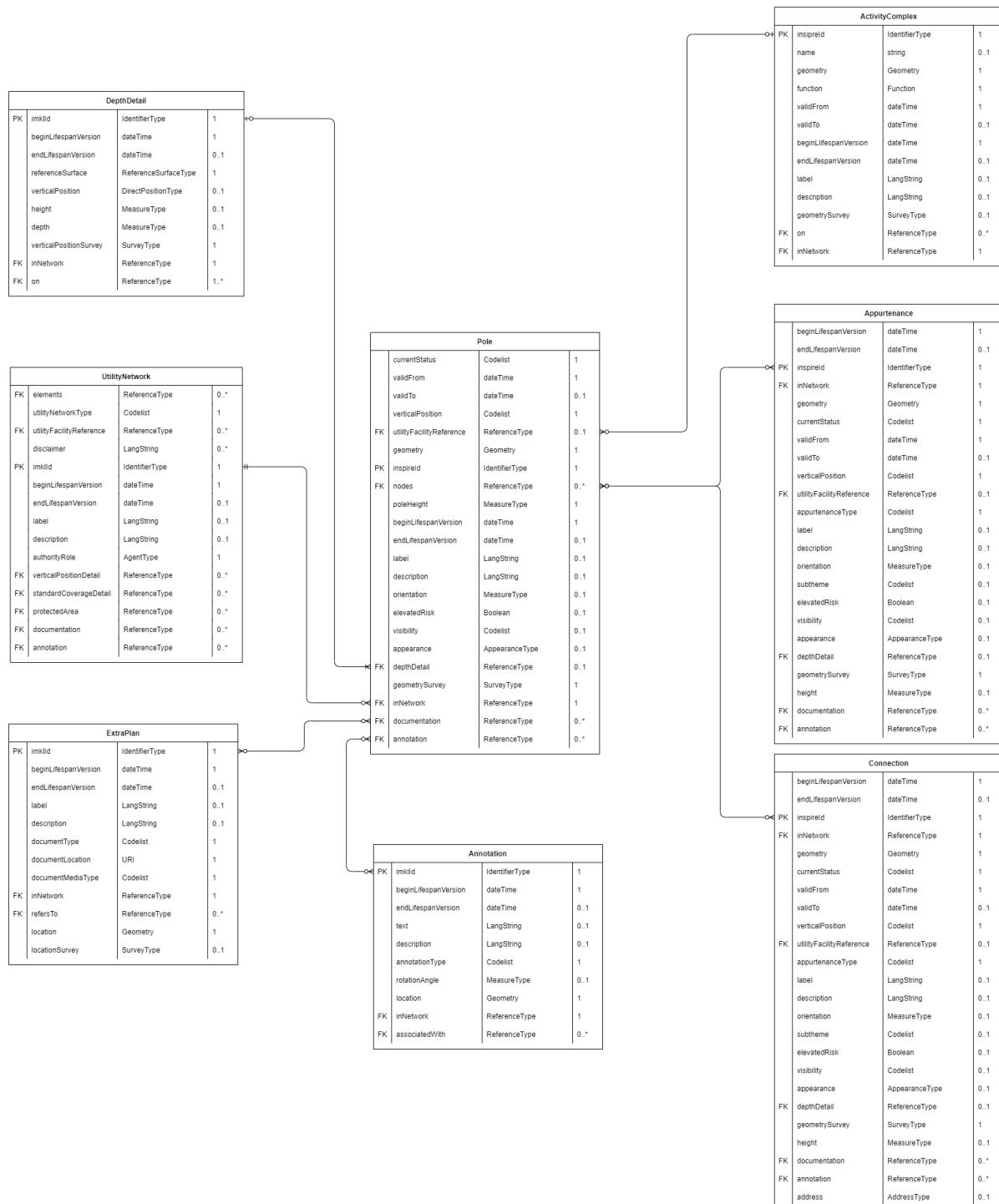
Name	Pole
Definition	Simple <i>UtilityNodeContainer</i> that takes the shape of a pole.
Description	A <i>Pole</i> typically contains smaller mountable <i>Appurtenances</i> . The <i>nodes</i> association can be used to track the association between the <i>Pole</i> and these <i>Appurtenances</i> .

	The <i>poleHeight</i> property describes the height of the <i>Pole</i> .
Inherits from	INSPIRE us-net-common 4.0 - Pole

4.2.15.2 Properties and associations

Property name	Namespace	Cardinality	Type
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
geometry	us-net-common	1	Geometry
inspireId	us-net-common	1	Identifier.PropertyType
nodes	us-net-common	0..*	ReferenceType
poleHeight	us-net-common	1	LengthType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
orientation	imkl	0..1	MeasureType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

4.2.15.3 Entity Relationship Diagram





4.2.16 ProtectedArea

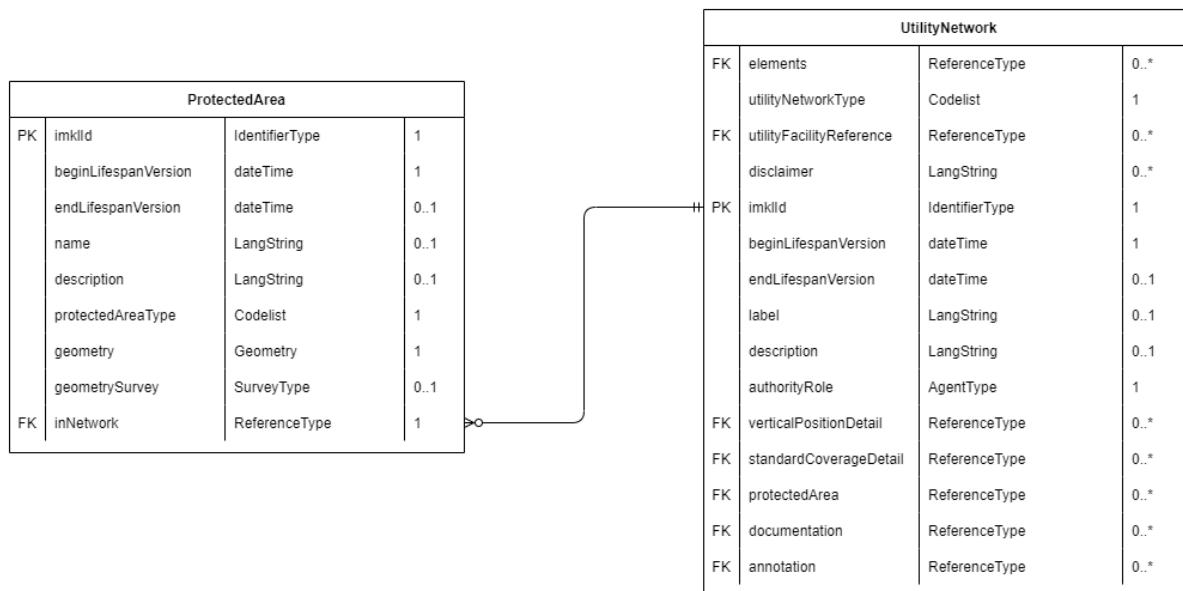
4.2.16.1 Overview

Name	ProtectedArea
Definition	Object to represent a protected area within which certain regulations apply when carrying out works.
Description	A <i>ProtectedArea</i> object can be provided to represent larger protected areas in which certain regulations apply. The geometry of the area must be specified via the <i>geometry</i> property. This geometry must be a valid polygon. Multipolygons are not allowed. The precautions that apply to this area must be included in the precautions linked with the <i>UtilityNetwork</i> itself.
Inherits from	N/A

4.2.16.2 Properties and associations

Property name	Namespace	Cardinality	Type
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
name	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
protectedAreaType	imkl	1	ReferenceType
geometry	imkl	1	Geometry
geometrySurvey	imkl	0..1	SurveyType
inNetwork	imkl	1	ReferenceType

4.2.16.3 Entity Relationship Diagram



4.2.17 SewerPipe

4.2.17.1 Overview

Name	SewerPipe
Definition	A sewer pipe used to convey wastewater (sewer) from one location to another.
Description	<p><i>SewerPipe</i> is a subtype of <i>Pipe</i>.</p> <p>The <i>sewerWaterType</i> property describes the type of sewage water that is transported through the <i>SewerPipe</i>.</p> <p>In IMKL, the <i>cables</i> and <i>pipes</i> associations should not be used for <i>SewerPipe</i> objects.</p>
Inherits from	<p>INSPIRE US 4.0 – SewerPipe</p> <p>IMKL 3.0 - Pipe</p>

4.2.17.2 Properties and associations

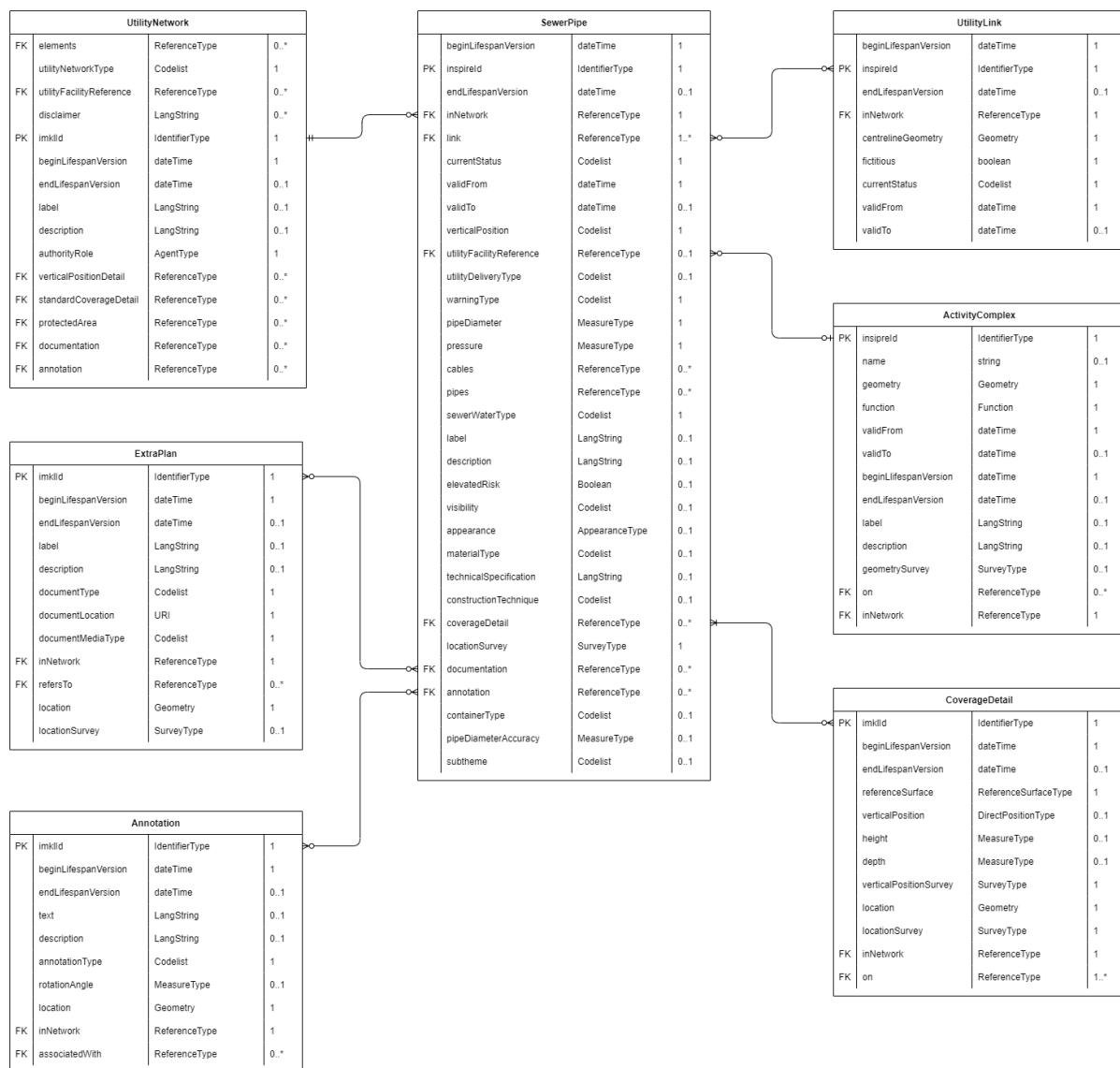
Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType



link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
pipeDiameter	us-net-common	1	MeasureType
pressure	us-net-common	0..1	MeasureType
cables	us-net-common	0..*	ReferenceType
pipes	us-net-common	0..*	ReferenceType
sewerWaterType	us-net-sw	1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType

locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
containerType	imkl	0..1	ReferenceType
pipeDiameterAccuracy	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType

4.2.17.3 Entity Relationship Diagram





4.2.18 StandardCoverageDetail

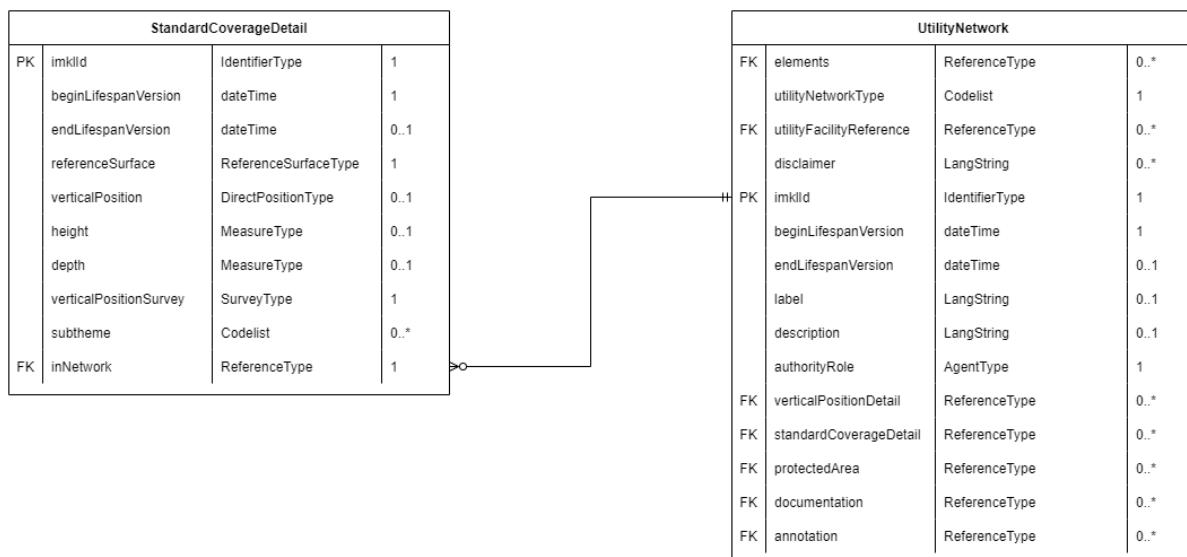
4.2.18.1 Overview

Name	StandardCoverageDetail
Definition	Object used to represent the standard coverage of <i>UtilityNetworkElement</i> objects within a <i>UtilityNetwork</i> .
Description	The <i>StandardCoverageDetail</i> object can be used to provide one or more standard coverages for the <i>UtilityNetwork</i> . See section 6.11 for more detailed information.
Inherits from	N/A

4.2.18.2 Properties and associations

Property name	Namespace	Cardinality	Type
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
referenceSurface	imkl	1	ReferenceSurfaceType
verticalPosition	imkl	0..1	DirectPositionType
height	imkl	0..1	MeasureType
depth	imkl	0..1	MeasureType
verticalPositionSurvey	imkl	1	SurveyType
subtheme	imkl	0..*	ReferenceType
inNetwork	imkl	1	ReferenceType

4.2.18.3 Entity Relationship Diagram



4.2.19 TelecommunicationsCable

4.2.19.1 Overview

Name	TelecommunicationsCable
Definition	A cable used to convey data signals (PSTN (Public switched telephone network), radio or computer) from one location to another.
Description	<i>TelecommunicationsCable</i> is a subtype of <i>UtilityLinkSet</i> . The <i>telecommunicationsCableMaterialType</i> property describes the type of material from which a telecommunications cable is made.
Inherits from	INSPIRE US 4.0 - TelecommunicationsCable

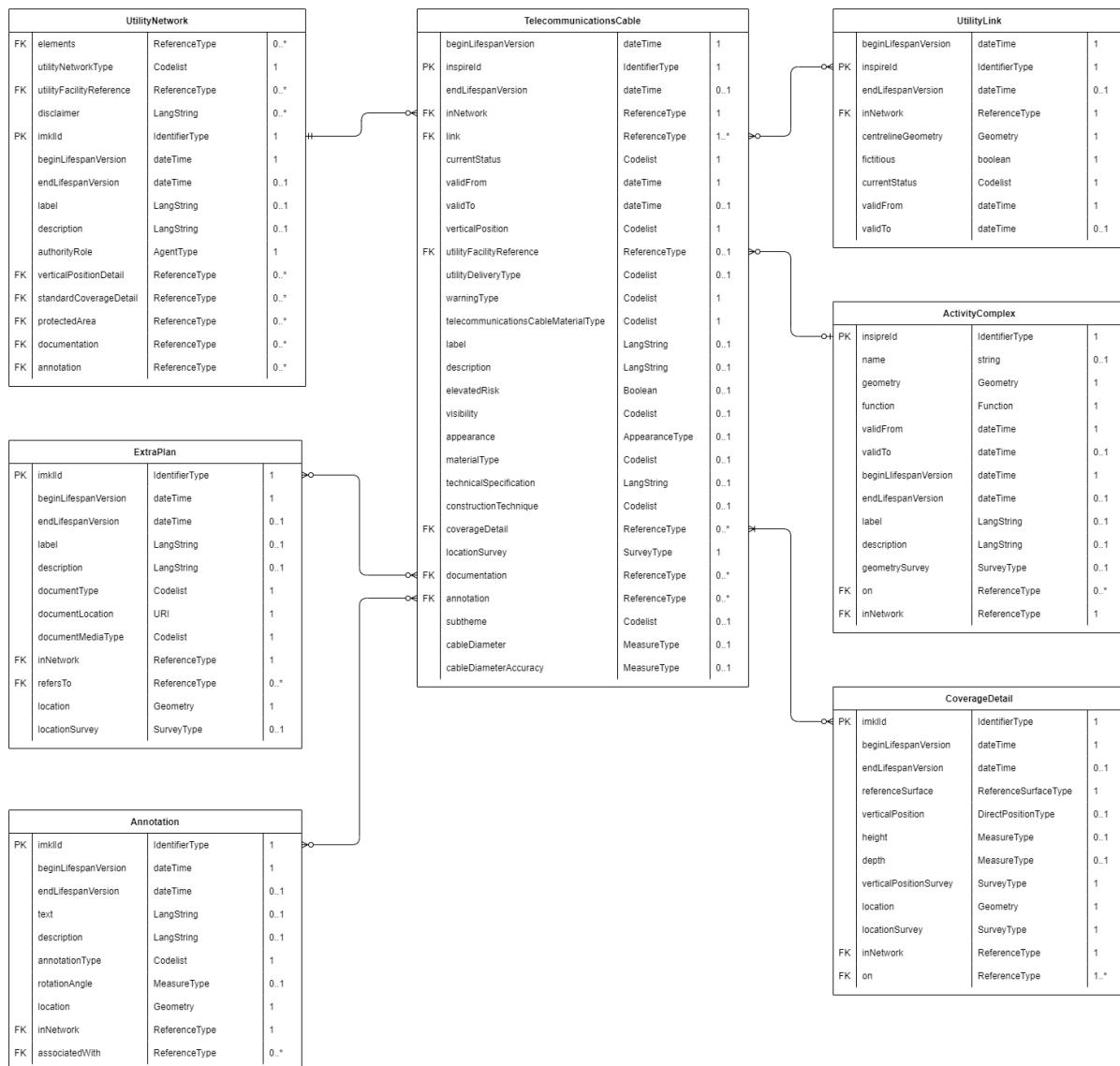
4.2.19.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType



validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
telecommunicationsCableMaterialType	us-net-tc	1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
subtheme	imkl	0..1	ReferenceType
cableDiameter	imkl	0..1	MeasureType
cableDiameterAccuracy	imkl	0..1	MeasureType

4.2.19.3 Entity Relationship Diagram



4.2.20 ThermalPipe

4.2.20.1 Overview

Name	ThermalPipe
Definition	A pipe used to disseminate heating or cooling from one location to another.
Description	<p><i>ThermalPipe</i> is a subtype of <i>Pipe</i>.</p> <p>The <i>thermalProductType</i> property describes the type of thermal product that is transported through the <i>ThermalPipe</i>.</p>



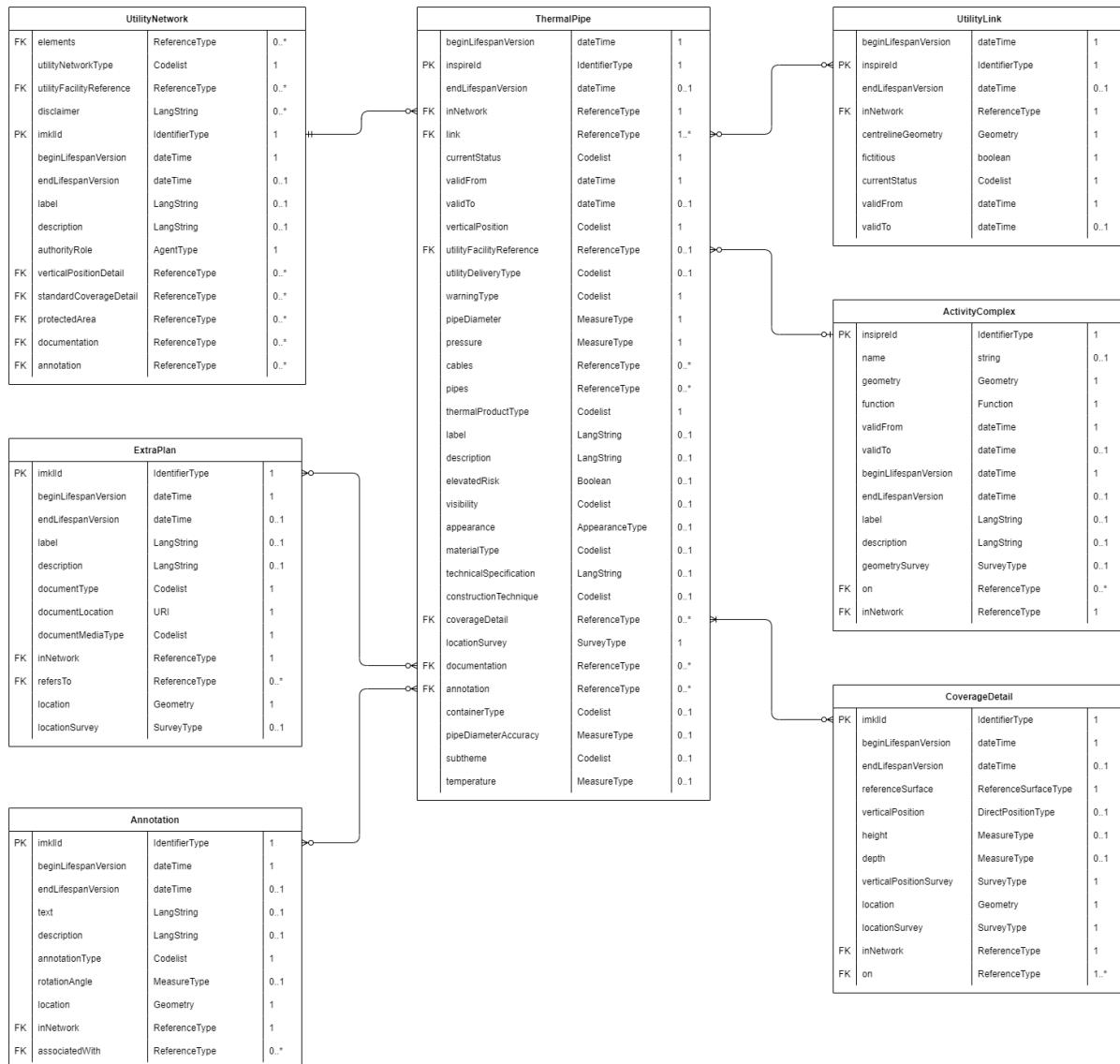
	In IMKL, the <i>cables</i> and <i>pipes</i> associations should not be used for <i>ThermalPipe</i> objects.
Inherits from	INSPIRE US 4.0 – ThermalPipe IMKL 3.0 - Pipe

4.2.20.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
pipeDiameter	us-net-common	1	MeasureType
pressure	us-net-common	0..1	MeasureType
cables	us-net-common	0..*	ReferenceType

pipes	us-net-common	0..*	ReferenceType
thermalProductType	us-net-th	1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType
containerType	imkl	0..1	ReferenceType
pipeDiameterAccuracy	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType
temperature	imkl	0..1	MeasureType

4.2.20.3 Entity Relationship Diagram



4.2.21 TopographicalElement

4.2.21.1 Overview

Name	TopographicalElement
Definition	Object that can provide additional topographical information.
Description	Topographical elements provide extra context of the area that can help with orientation on site: e.g. trees, fences or other landmarks.

	<i>TopographicalElements</i> are by definition not related to a <i>UtilityNetwork</i> . Hence, there is no association between <i>TopographicalElement</i> objects and <i>UtilityNetwork</i> or <i>UtilityNetworkElement</i> objects.
Inherits from	N/A

4.2.21.2 Properties and associations

Property name	Namespace	Cardinality	Type
imkId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
location	imkl	1	Geometry
locationSurvey	imkl	0..1	SurveyType

4.2.21.3 Entity Relationship Diagram

TopographicalElement			
PK			
	imkId	IdentifierType	1
	beginLifespanVersion	dateTime	1
	endLifespanVersion	dateTime	0..1
	label	LangString	0..1
	description	LangString	0..1
	location	Geometry	1
	locationSurvey	SurveyType	0..1

4.2.22 Tower

4.2.22.1 Overview

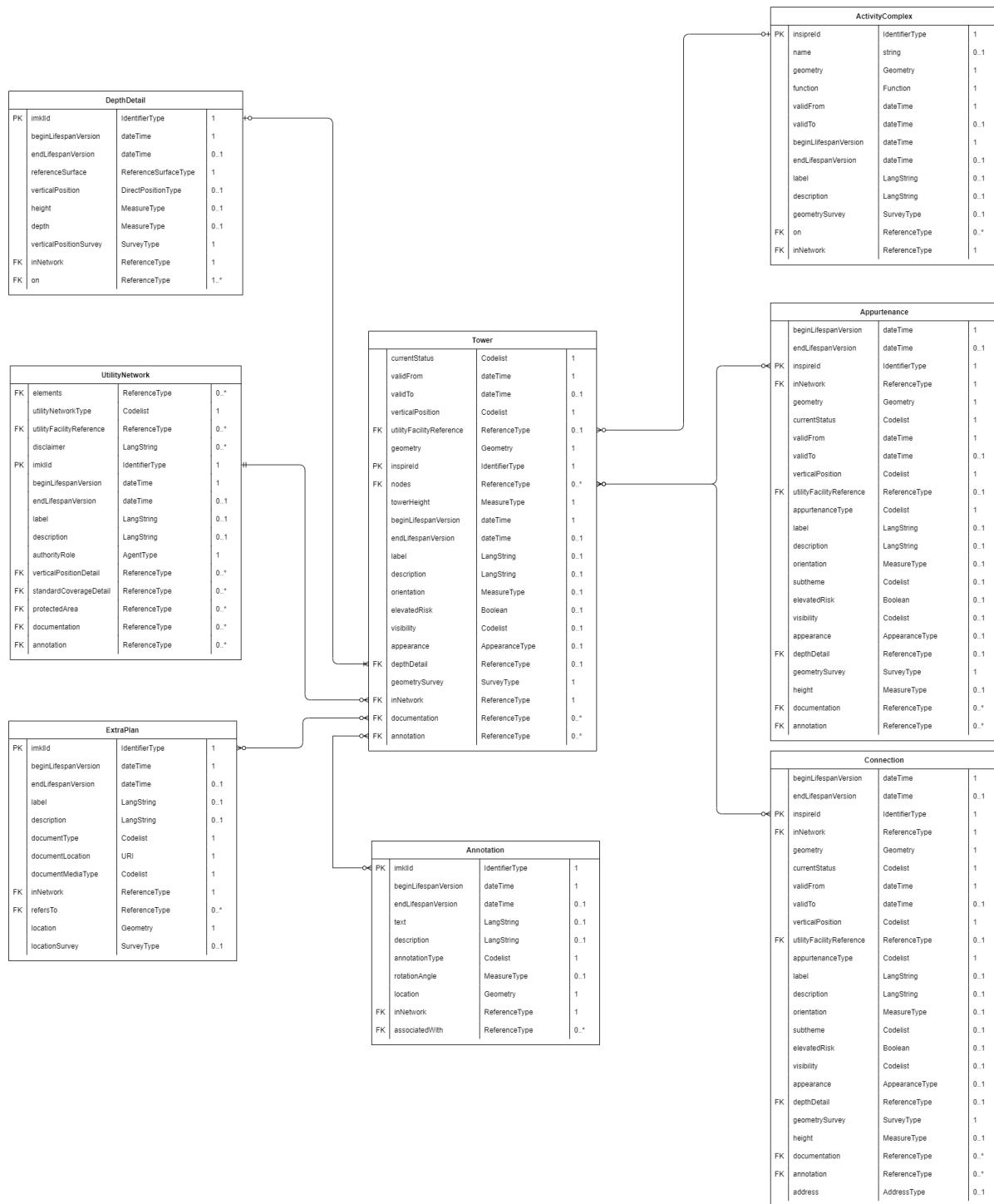
Name	Tower
Definition	Simple <i>UtilityNodeContainer</i> that takes the shape of a tower.

Description	A <i>Tower</i> typically contains smaller mountable <i>Appurtenances</i> . The <i>nodes</i> association can be used to track the association between the <i>Tower</i> and these <i>Appurtenances</i> . The <i>towerHeight</i> property describes the height of the <i>Tower</i> .
Inherits from	INSPIRE us-net-common 4.0 - Tower

4.2.22.2 Properties and associations

Property name	Namespace	Cardinality	Type
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
geometry	us-net-common	1	Geometry
inspireId	us-net-common	1	Identifier.PropertyType
nodes	us-net-common	0..*	ReferenceType
towerHeight	us-net-common	1	LengthType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
orientation	imkl	0..1	MeasureType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
depthDetail	imkl	0..1	ReferenceType
geometrySurvey	imkl	1	SurveyType
inNetwork	imkl	1	ReferenceType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

4.2.22.3 Entity Relationship Diagram





4.2.23 UtilityLink

4.2.23.1 Overview

Name	UtilityLink
Definition	A linear spatial object that describes the geometry and connectivity of a utility network between two points in the network.
Description	Every <i>UtilityLinkSet</i> object (<i>Cables</i> , <i>Pipes</i> and <i>Ducts</i>) must be associated with at least one <i>UtilityLink</i> object via its <i>link</i> property. The <i>centrelineGeometry</i> property of the <i>UtilityLink</i> object represents (a section of) the geometry of the <i>UtilityLinkSet</i> object.
Inherits from	N/A

4.2.23.2 Properties and associations

Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
centrelineGeometry	net	1	Geometry
fictitious	net	1	boolean
endNode	net	0..1	ReferenceType
startNode	net	0..1	ReferenceType
currentStatus	us-net-common	1	ReferenceType
validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType

4.2.23.3 Entity Relationship Diagram

Please refer to the diagrams of the *Cable*, *Pipe* and *Duct* objects.

4.2.24 UtilityLinkSequence

4.2.24.1 Overview

Name	UtilityLinkSequence
Definition	A linear spatial object, composed of an ordered collection of utility links, which represents a continuous path in the utility network without any branches. The element has a defined beginning and end and every position on the utility link sequence is identifiable with one single parameter.
Description	Since the flow direction is not important in the context of IMKL, <i>UtilityLinkSequence</i> objects are not used.
Inherits from	N/A

4.2.25 WaterPipe

4.2.25.1 Overview

Name	WaterPipe
Definition	A water pipe used to convey water from one location to another.
Description	<i>WaterPipe</i> is a subtype of <i>Pipe</i> . The <i>waterType</i> property describes the type of water that is transported through the <i>WaterPipe</i> . In IMKL, the <i>cables</i> and <i>pipes</i> associations should not be used for <i>WaterPipe</i> objects.
Inherits from	INSPIRE US 4.0 – WaterPipe IMKL 3.0 - Pipe

4.2.25.2 Properties and associations

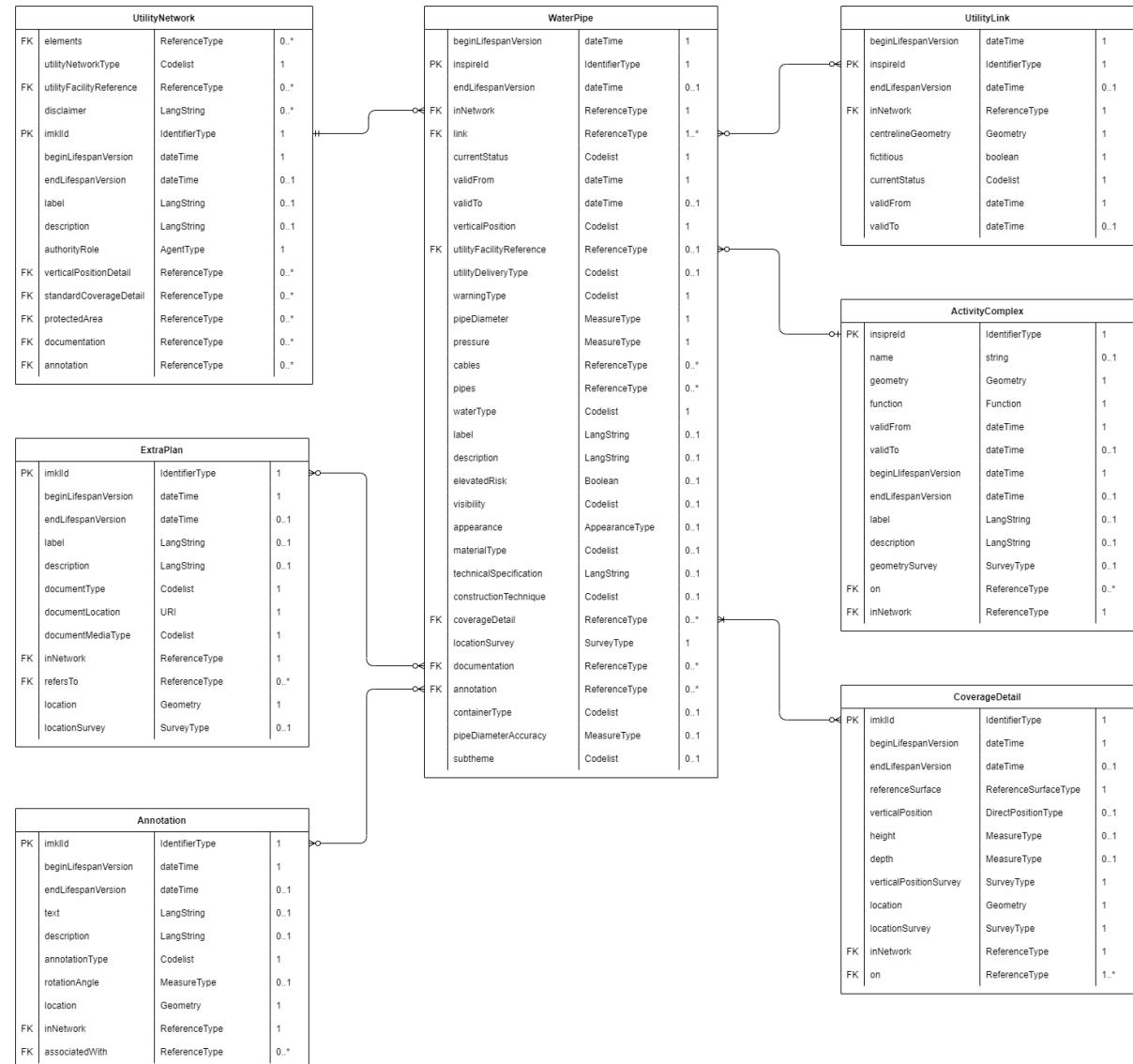
Property name	Namespace	Cardinality	Type
beginLifespanVersion	net	1	dateTime
inspireId	net	1	Identifier.PropertyType
endLifespanVersion	net	0..1	dateTime
inNetwork	net	1	ReferenceType
link	net	1..*	ReferenceType
currentStatus	us-net-common	1	ReferenceType



validFrom	us-net-common	1	dateTime
validTo	us-net-common	0..1	dateTime
verticalPosition	us-net-common	1	ReferenceType
utilityFacilityReference	us-net-common	0..1	ReferenceType
governmentalServiceReference	us-net-common	0..1	ReferenceType
utilityDeliveryType	us-net-common	0..1	ReferenceType
warningType	us-net-common	1	ReferenceType
pipeDiameter	us-net-common	1	MeasureType
pressure	us-net-common	0..1	MeasureType
cables	us-net-common	0..*	ReferenceType
pipes	us-net-common	0..*	ReferenceType
waterType	us-net-wa	1	ReferenceType
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
visibility	imkl	0..1	ReferenceType
appearance	imkl	0..1	AppearanceType
materialType	imkl	0..1	ReferenceType
technicalSpecification	imkl	0..1	PT_FreeText_PropertyType
constructionTechnique	imkl	0..1	ReferenceType
coverageDetail	imkl	0..*	ReferenceType
locationSurvey	imkl	1	SurveyType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

containerType	imkl	0..1	ReferenceType
pipeDiameterAccuracy	imkl	0..1	MeasureType
subtheme	imkl	0..1	ReferenceType

4.2.25.3 Entity Relationship Diagram





4.3 Other objects

4.3.1 UtilityNetwork

4.3.1.1 Overview

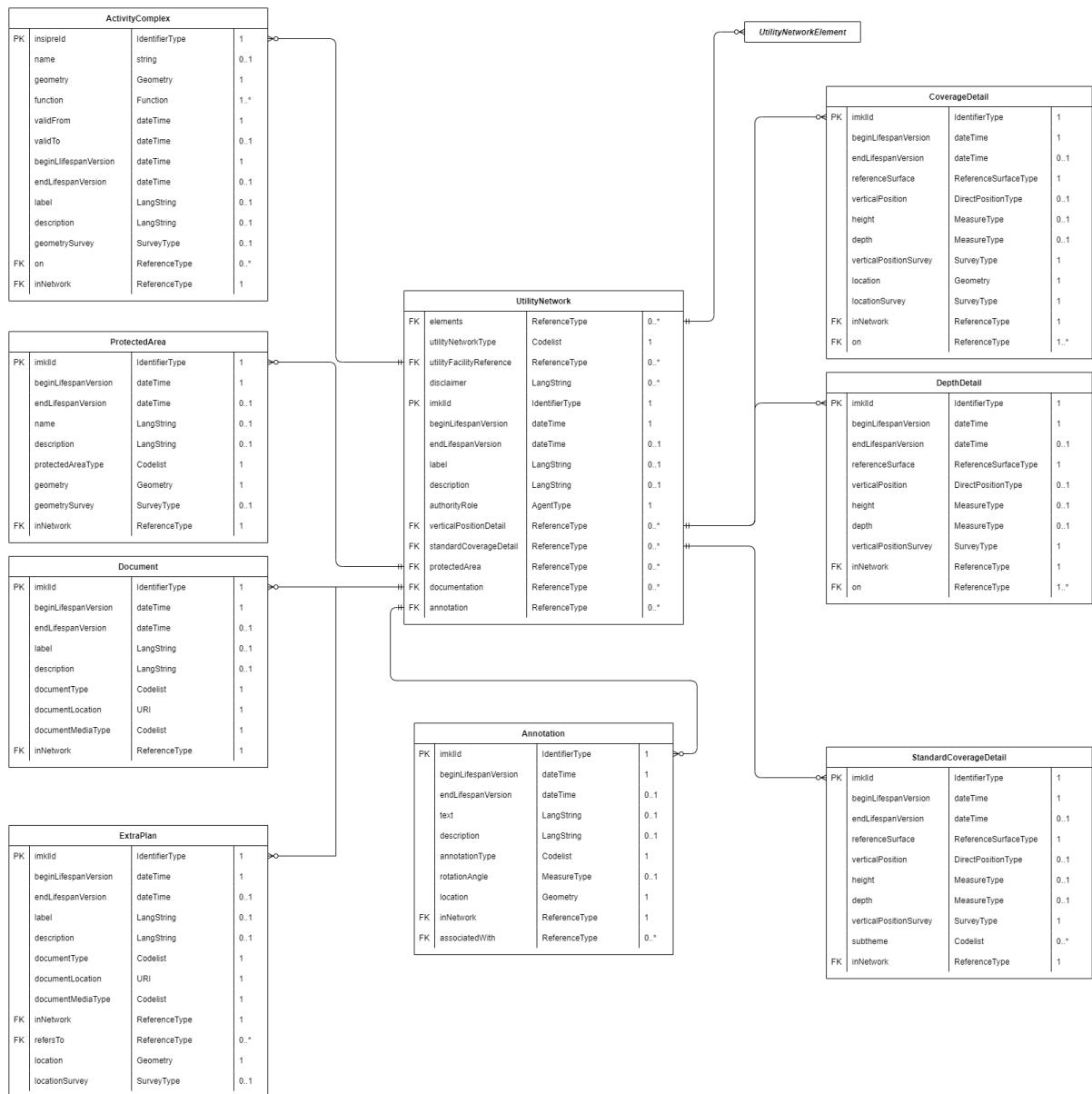
Name	UtilityNetwork
Definition	A collection of network elements of one type of utility service.
Description	<p>This object is not strictly considered a feature nor a geographic object. It is used to collect or group network elements within a single utility theme. The utility theme is indicated by the <i>utilityNetworkType</i> property.</p> <p>Through the <i>networks</i> association, references can be made to other <i>UtilityNetworks</i>, such as subnetworks. Via <i>elements</i>, all network elements belonging to the <i>UtilityNetwork</i> must be referenced.</p> <p>A <i>UtilityNetwork</i> object must contain at least 1 element, ActivityComplex; ProtectedArea, Document, or Annotation.</p>
Inherits from	INSPIRE US 4.0 - UtilityNetwork

4.3.1.2 Properties and associations

Property name	Namespace	Cardinality	Type
geographicalName	net	0..*	GeographicalName
elements	net	0..*	ReferenceType
utilityNetworkType	us-net-common	1	ReferenceType
authorityRole	us-net-common	1..*	ReferenceType
utilityFacilityReference	us-net-common	0..*	ReferenceType
disclaimer	us-net-common	0..*	PT_FreeText_PropertyType
networks	us-net-common	0..*	ReferenceType
imklId	imkl	1	Identifier.PropertyType
beginLifespanVersion	imkl	1	dateTime
endLifespanVersion	imkl	0..1	dateTime
label	imkl	0..1	PT_FreeText_PropertyType
description	imkl	0..1	PT_FreeText_PropertyType
authorityRole	imkl	1	AgentType
verticalPositionDetail	imkl	0..*	ReferenceType

standardCoverageDetail	imkl	0..*	ReferenceType
protectedArea	imkl	0..*	ReferenceType
documentation	imkl	0..*	ReferenceType
annotation	imkl	0..*	ReferenceType

4.3.1.3 Entity Relationship Diagram





4.4 Data Types

4.4.1 AddressType

4.4.1.1 Overview

Name	AddressType
Definition	Provides address information.
Origin	IMKL 3.0

4.4.1.2 Properties and associations

Property name	Namespace	Cardinality	Type
municipalityName	imkl	1	PT_FreeText_PropertyType
streetName	imkl	1	PT_FreeText_PropertyType
houseNumber	imkl	0..1	string
postalCode	imkl	1	string

4.4.2 AgentType

4.4.2.1 Overview

Name	AgentType
Definition	Provides information on a stakeholder.
Origin	IMKL 3.0

4.4.2.2 Properties and associations

Property name	Namespace	Cardinality	Type
name	imkl	1	string
phone	imkl	1	string
email	imkl	1	string

4.4.3 AppearanceType

4.4.3.1 Overview

Name	AppearanceType
Definition	Provides information on the way an item looks.
Origin	IMKL 3.0

4.4.3.2 Properties and associations

Property name	Namespace	Cardinality	Type
colour	imkl	1	PT_FreeText_PropertyType

4.4.4 Function

4.4.4.1 Overview

Name	Function
Definition	Activities performed by the activity complex. Function is described by the activity and potentially complemented with information about inputs and outputs as result of it.
Origin	INSPIRE act-core 4.0

4.4.4.2 Properties and associations

Property name	Namespace	Cardinality	Type
activity	act-core	1..*	ReferenceType
input	act-core	0..*	ReferenceType
output	act-core	0..*	ReferenceType
description	act-core	0..1	PT_FreeText_PropertyType

4.4.5 Identifier.PropertyType

4.4.5.1 Overview

Name	Identifier.PropertyType
Definition	External unique object identifier published by the responsible body, which may be used by external applications to reference the spatial object.
Origin	INSPIRE base 3.3



4.4.5.2 Properties and associations

Property name	Namespace	Cardinality	Type
localId	base	1	string
namespace	base	1	string
versionId	base	0..1	string

4.4.6 ReferenceSurfaceType

4.4.6.1 Overview

Name	ReferenceSurfaceType
Definition	Provides information on the reference surface used to determine a depth, height or vertical position.
Origin	IMKL 3.0

4.4.6.2 Properties and associations

Property name	Namespace	Cardinality	Type
referenceSurfaceType	imkl	1	ReferenceType
verticalPosition	imkl	0..1	DirectPositionType
location	imkl	0..1	GeometryPropertyType
locationSurvey	imkl	0..1	SurveyType

4.4.7 SurveyType

4.4.7.1 Overview

Name	SurveyType
Definition	Describes the method and accuracy with which a geometry was determined.
Origin	IMKL 3.0

4.4.7.2 Properties and associations

Property name	Namespace	Cardinality	Type
method	imkl	1	ReferenceType
recordedBy	imkl	0..1	AgentType
date	imkl	0..1	dateTime

accuracy	imkl	1	MeasureType
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4.5 Data Properties

4.5.1 accuracy

Name	accuracy
Namespace	imkl
Definition	The positional accuracy of the <i>Survey</i> expressed in a unit of measure (<i>uom</i>).
Type	gml:MeasureType
Description	<p>This property gives information on the accuracy of a survey and thus of the accuracy of the location, depth, height or vertical position of the property the survey is associated with.</p> <p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none"> • urn:ogc:def:uom:OGC::mm • urn:ogc:def:uom:OGC::cm • urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	SurveyType
NilReason	Yes

4.5.2 activity

Name	activity
Namespace	INSPIRE act-core
Definition	Classification of the economic activity of a function.
Type	gml:ReferenceType
Description	<p>In the context of an <i>ActivityComplex</i> that contains a <i>Function</i> object, the <i>activity</i> refers to the economic activity of the <i>ActivityComplex</i>.</p> <p>The classification of activities is based on the NACEBEL 2008 codes. The NACEBEL codes are available for download via the following URL: https://economie.fgov.be/sites/default/files/Files/Entreprises/KBO/Nacebel-2008-FR-NL-DE.xls</p>



	<p>The <i>activity</i> property should reference any of the NACEBEL codes via the <i>xlink:href</i> attribute using the following URI, where [code] is replaced with the actual NACEBEL code:</p> <p>https://vocab.belgif.be/auth/IMKL-ActivityValue/[code]</p> <p>For example:</p> <p>https://vocab.belgif.be/auth/IMKL-ActivityValue/42</p> <p>https://vocab.belgif.be/auth/IMKL-ActivityValue/42212</p>
Occurrence	Function
NilReason	No

4.5.3 address

Name	address
Namespace	imkl
Definition	The address information of a <i>Connection</i> object.
Type	imkl:AddressType
Description	The <i>address</i> property is used to provide address information of a <i>Connection</i> object. The <i>address</i> is of type <i>AddressType</i> and provides information on the municipality name, street name, house number and postal code of the connection.
Occurrence	Connection
NilReason	No

4.5.4 annotation

Name	annotation
Namespace	imkl
Definition	Reference to an <i>Annotation</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	The <i>annotation</i> property is used to keep track of the <i>Annotation</i> objects that are associated with the source object. This property is the inverse of the <i>associatedWith</i> property of <i>Annotation</i> objects.
Occurrence	UtilityNetwork, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole

NilReason	No
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4.5.5 annotationType

Name	annotationType
Namespace	imkl
Definition	Classification of <i>Annotations</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>AnnotationTypeValue</i> codelist.
Occurrence	Annotation
NilReason	No

4.5.6 appearance

Name	appearance
Namespace	imkl
Definition	Provides information on the way an item looks.
Type	imkl:ApperanceType
Description	This property can be used to provide information on the appearance of a <i>UtilityNetworkElement</i> .
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.7 appurtenanceType

Name	appurtenanceType
Namespace	INSPIRE us-net-common
Definition	Classification of appurtenances.
Type	gml:ReferenceType
Description	This property should reference a value in one of the following codelists: <ul style="list-style-type: none"> • ElectricityAppurtenanceTypeValue • ElectricityAppurtenanceTypeIMKLValue • OilGasChemicalsAppurtenanceTypeValue



	<ul style="list-style-type: none">• OilGasChemicalsAppurtenanceTypeIMKLValue• SewerAppurtenanceTypeValue• SewerAppurtenanceTypeIMKLValue• TelecommunicationsAppurtenanceTypeIMKLValue• ThermalAppurtenanceTypeIMKLValue• WaterAppurtenanceTypeValue• WaterAppurtenanceTypeIMKLValue <p>There are different codelists depending on the type of utility network. The codelist that is used should correspond to the type of the <i>UtilityNetwork</i> the <i>Appurtenance</i> or <i>Connection</i> belongs to.</p>
Occurrence	Appurtenance, Connection
NilReason	No

4.5.8 associatedWith

Name	associatedWith
Namespace	imkl
Definition	Reference to a <i>UtilityNetworkElement</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	The <i>associatedWith</i> property is used to keep track of the <i>UtilityNetworkElements</i> objects that are associated with the source (<i>Annotation</i>) object. This property is the inverse of the <i>annotation</i> property of the associated objects.
Occurrence	Annotation
NilReason	No

4.5.9 authorityRole (imkl)

Name	authorityRole
Namespace	imkl
Definition	The person or organisation acting as the point of contact for the <i>UtilityNetwork</i> .
Type	AgentType

Description	The <i>imkl:authorityRole</i> element is of type <i>AgentType</i> . The element should contain the contact information for the person or organisation acting as the point of contact for the utility network. It must include the following elements: <ul style="list-style-type: none"> • name: The name of the person or organisation • phone: The telephone number. The phone number should include the country code (e.g. +32 for Belgium) • email: The email address
Occurrence	UtilityNetwork
NilReason	No

4.5.10 authorityRole (us-net-common)

Name	authorityRole
Namespace	INSPIRE us-net-common
Definition	Parties authorized to manage a utility network, such as maintainers, operators or owners.
Type	base2:RelatedParty
Description	The element <i>us-net-common:authorityRole</i> must be present and must contain an empty <i>RelatedParty</i> element. This <i>authorityRole</i> element is ignored in IMKL 3, but it needs to be present to comply with the INSPIRE XSD.
Occurrence	UtilityNetwork
NilReason	No

4.5.11 beginLifespanVersion

Name	beginLifespanVersion
Namespace	imkl, INSPIRE net
Definition	The start date on which a data object was created, marking the beginning of the data object's lifecycle.
Type	dateTime
Description	This attribute originates from INSPIRE but is also used in the IMKL-specific objects to ensure consistency across all objects.
Occurrence	All objects
NilReason	No



4.5.12 cableDiameter

Name	cableDiameter
Namespace	imkl
Definition	The diameter of a cable expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>For the use case of IMKL, the <i>cableDiameter</i> should represent the outer diameter.</p> <p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	ElectricityCable, TelecommunicationsCable
NilReason	No

4.5.13 cableDiameterAccuracy

Name	cableDiameterAccuracy
Namespace	imkl
Definition	The accuracy of the <i>cableDiameter</i> expressed in a unit of measure (<i>uom</i>).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none"> • urn:ogc:def:uom:OGC::mm • urn:ogc:def:uom:OGC::cm • urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>For example: A <i>cableDiameter</i> of 70cm and a <i>cableDiameterAccuracy</i> of 10cm indicates that the diameter is somewhere between 60 and 80cm.</p>
Occurrence	ElectricityCable, TelecommunicationsCable
NilReason	No

4.5.14 cables

Name	cables
Namespace	INSPIRE us-net-common
Definition	Reference to a <i>Cable</i> object that is contained within the source <i>Pipe</i> or <i>Duct</i> object.
Type	gml:ReferenceType
Description	<p>The <i>cables</i> property is used to keep track of the <i>Cable</i> objects that are contained within the source <i>Pipe</i> or <i>Duct</i> object.</p> <p>This property can only be used for <i>Pipe</i> and <i>Duct</i> objects. It is not allowed for <i>OilGasChemicalsPipe</i>, <i>SewerPipe</i>, <i>WaterPipe</i> and <i>ThermalPipe</i> objects.</p> <p>The data model does not include a reverse association.</p>
Occurrence	Pipe, Duct
NilReason	No

4.5.15 centrelineGeometry

Name	centrelineGeometry
Namespace	INSPIRE net



Definition	The geometry representing the centreline of a <i>UtilityLink</i> object.
Type	gml:CurvePropertyType
Occurrence	UtilityLink
NilReason	No

4.5.16 colour

Name	colour
Namespace	imkl
Definition	The colour of the coating of a <i>UtilityLinkElement</i> .
Type	gmd:PT_FreeText_PropertyType
Description	If there is a coating around the <i>UtilityLinkElement</i> , then the <i>colour</i> property represents the colour of this coating. If there is no coating, <i>colour</i> can be used to represent the colour of the <i>UtilityLinkElement</i> itself. <i>Colour</i> supports visual inspection but is only relevant for coatings that are colourfast (i.e., where no discolouration occurs due to exposure to soil). If this is not the case, it is best not to use the <i>colour</i> property. Since there are so many colours and colour combinations, the <i>colour</i> property is not referencing a codelist. Instead, the value is a language specific free text.
Occurrence	AppearanceType
NilReason	No

4.5.17 constructionTechnique

Name	constructionTechnique
Namespace	imkl
Definition	The technique used for the installation of a <i>Cable</i> , <i>Pipe</i> or <i>Duct</i> .
Type	gml:ReferenceType
Description	This property allows providing additional information regarding the construction technique used during the construction or installation of a cable, pipe or duct. It is recommended to include this property if information about the construction technique is available. If no information is available this can be clarified by adding the element with a <i>nilReason</i> . This property should reference a value in the <i>ConstructionTechniqueValue</i> codelist.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct

NilReason	Yes
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4.5.18 containerType

Name	containerType
Namespace	imkl
Definition	Classification of the type of container.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>ContainerTypeValue</i> codelist.
Occurrence	Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.19 coverageDetail

Name	coverageDetail
Namespace	imkl
Definition	Reference to a <i>CoverageDetail</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	The <i>coverageDetail</i> property is used to reference the <i>CoverageDetail</i> object that is associated with the source object. This property is the inverse of the <i>on</i> property of the associated objects.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.20 currentStatus

Name	currentStatus
Namespace	INSPIRE us-net-common
Definition	The current status of the <i>UtilityNetworkElement</i> object.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>ConditionOfFacilityValue</i> codelist.



Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	No

4.5.21 date

Name	date
Namespace	imkl
Definition	The date the survey took place.
Type	dateTime
Occurrence	SurveyType
NilReason	No

4.5.22 depth

Name	depth
Namespace	imkl
Definition	The distance to an object below a reference surface measured from that same reference surface expressed in a unit of measure (<i>uom</i>).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>The interpretation of the depth depends on the type of object. See section 6.10 for more information.</p>
Occurrence	CoverageDetail, DepthDetail, StandardCoverageDetail
NilReason	No

4.5.23 depthDetail

Name	depthDetail

Namespace	imkl
Definition	Reference to a <i>DepthDetail</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	The <i>depthDetail</i> property is used to reference the <i>DepthDetail</i> object that is associated with the source object. This property is the inverse of the <i>on</i> property of the associated objects.
Occurrence	Cabinet, Manhole, Pole, Tower, Appurtenance, Connection
NilReason	No

4.5.24 description

Name	description
Namespace	imkl
Definition	Detailed description of an object.
Type	gmd:PT_FreeText_PropertyType
Description	This property can be included to provide additional information on an object.
Occurrence	ActivityComplex, UtilityNetwork, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, Document, ExtraPlan, Annotation, ProtectedArea, TopographicalElement, ActivityComplex
NilReason	No

4.5.25 disclaimer

Name	disclaimer
Namespace	INSPIRE us-net-common
Definition	Legal text describing confidentiality clauses applying to the utility network information.
Type	gmd:PT_FreeText_PropertyType
Description	The <i>disclaimer</i> is an example of language-specific free text.
Occurrence	UtilityNetwork
NilReason	No



4.5.26 documentation

Name	documentation
Namespace	imkl
Definition	Reference to a <i>Documentation</i> or <i>ExtraPlan</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	<p>The <i>documentation</i> property is used to keep track of the <i>Document</i> and <i>ExtraPlan</i> objects that are associated with the source object.</p> <p>For a <i>UtilityNetwork</i> object, this property is the inverse of the <i>inNetwork</i> property of the associated objects. For other objects, this property is the inverse of the <i>refersTo</i> property of the associated objects.</p> <p>All <i>Documents</i> or <i>ExtraPlans</i> that are relevant to the <i>UtilityNetwork</i> (i.e. applicable to the entire <i>UtilityNetwork</i> or to any of the elements within the network) should be linked to from the <i>UtilityNetwork</i> object. This must be done via the <i>documentation</i> association. A <i>UtilityNetwork</i> can have as many <i>documentation</i> associations as needed.</p> <p>When a <i>Document</i> is linked to the <i>UtilityNetwork</i>, but not to a specific element within the network, this means the <i>Document</i> is applicable to the <i>UtilityNetwork</i> itself.</p>
Occurrence	UtilityNetwork, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.27 documentLocation

Name	documentLocation
Namespace	imkl
Definition	File name of the corresponding document.
Type	anyURI
Description	Corresponds to the name of the file included within the IMKL package. If the file is located within a subfolder of the IMKL package, then the relative path must be given.
Occurrence	Document, ExtraPlan
NilReason	No

4.5.28 documentMediaType

Name	documentMediaType
Namespace	imkl
Definition	File type of the corresponding document.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>DocumentMediaTypeValue</i> codelist.
Occurrence	Document, ExtraPlan
NilReason	No

4.5.29 documentType

Name	documentType
Namespace	imkl
Definition	Classification of the type of <i>Documents</i> and <i>ExtraPlans</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>DocumentTypeValue</i> codelist.
Occurrence	Document, ExtraPlan
NilReason	No

4.5.30 ducts

Name	ducts
Namespace	INSPIRE us-net-common
Definition	Reference to a <i>Duct</i> object that is contained within the source <i>Duct</i> object.
Type	gml:ReferenceType
Description	The <i>ducts</i> property is used to keep track of the <i>Duct</i> objects that are contained within the source <i>Duct</i> object. The data model does not include a reverse association.
Occurrence	Duct
NilReason	No



4.5.31 ductWidth

Name	ductWidth
Namespace	INSPIRE us-net-common
Definition	The width of a duct expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>For the use case of IMKL, the <i>ductWidth</i> should represent the outer width.</p> <p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	Duct
NilReason	Yes

4.5.32 ductWidthAccuracy

Name	ductWidthAccuracy
Namespace	imkl
Definition	The accuracy of the <i>ductWidth</i> expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>For example: A <i>ductWidth</i> of 70cm and a <i>ductWidthAccuracy</i> of 10cm indicates that the width is somewhere between 60 and 80cm.</p>
Occurrence	Duct
NilReason	No

4.5.33 elements

Name	elements
Namespace	INSPIRE net
Definition	Reference to a <i>UtilityNetworkElement</i> object that is contained within the source <i>UtilityNetwork</i> object.
Type	gml:ReferenceType
Description	This property is the inverse of the <i>inNetwork</i> property of the associated objects.
Occurrence	UtilityNetwork
NilReason	No

4.5.34 email

Name	email
Namespace	imkl
Definition	The email address of the <i>Agent</i> .
Type	string
Description	The email address of the <i>Agent</i> . The value should be a valid email address.
Occurrence	AgentType
NilReason	No

4.5.35 endLifespanVersion

Name	endLifespanVersion
Namespace	imkl, INSPIRE net
Definition	The end date on which a data object was created, marking the end of the data object's lifecycle.
Type	dateTime
Description	This attribute originates from INSPIRE but is also used in the IMKL-specific objects.
Occurrence	All objects
NilReason	No

4.5.36 endNode

Name	endNode
Namespace	INSPIRE net
Definition	The optional end node for this link.
Type	gml:ReferenceType
Description	The <i>endNode</i> property is not used in the context of IMKL. This property will be ignored if provided.
Occurrence	UtilityLink
NilReason	No

4.5.37 fictitious

Name	fictitious
Namespace	INSPIRE net
Definition	Indicator that the centreline geometry of the link is a straight line with no intermediate control points unless the straight line represents the geography in the resolution of the data set appropriately.
Type	boolean
Description	For a UtilityLink the value must be <i>false</i> .
Occurrence	UtilityLink
NilReason	No

4.5.38 function

Name	function
Namespace	INSPIRE act-core
Definition	Activities performed by the <i>ActivityComplex</i> . <i>Function</i> is described by the activity and potentially complemented with information about inputs and outputs as result of it.
Type	Function
Description	This property is used to describe the function of the <i>ActivityComplex</i> .
Occurrence	ActivityComplex
NilReason	No

4.5.39 geographicalName

Name	geographicalName
Namespace	INSPIRE net
Definition	Geographical name for the <i>UtilityNetwork</i> .
Type	gn:GeographicalName
Description	This property is not used in the context of IMKL.
Occurrence	UtilityNetwork
NilReason	No

4.5.40 geometry

Name	geometry
Namespace	INSPIRE us, INSPIRE act-core
Definition	Represents the geometric properties of the object.
Type	Geometry
Description	The type of geometry that can be represented depends on the object type.
Occurrence	ActivityComplex, ProtectedArea, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.41 geometrySurvey

Name	geometrySurvey
Namespace	imkl
Definition	Additional information on how the geometry was determined.
Type	SurveyType
Description	The <i>geometrySurvey</i> property is associated with the <i>geometry</i> property of its object.
Occurrence	ActivityComplex, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, ProtectedArea
NilReason	No



4.5.42 governmentalServiceReference

Name	governmentalServiceReference
Namespace	INSPIRE us-net-common
Definition	Reference to a governmental service object that is related to the UtilityNetworkElement object.
Type	gml:ReferenceType
Description	This property is not used in the context of IMKL.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	No

4.5.43 height (Appurtenance, Connection)

Name	height
Namespace	imkl
Definition	The height of the Appurtenance or Connection expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>The <i>height</i> refers to the height of the object itself and does not indicate the vertical position of the object.</p>
Occurrence	Appurtenance, Connection
NilReason	No

4.5.44 height (CoverageDetail, DepthDetail, StandardCoverageDetail)

Name	height
Namespace	imkl

Definition	The distance to an object above a reference surface measured from that same reference surface expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none"> • urn:ogc:def:uom:OGC::mm • urn:ogc:def:uom:OGC::cm • urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	CoverageDetail, DepthDetail, StandardCoverageDetail
NilReason	No

4.5.45 houseNumber

Name	houseNumber
Namespace	imkl
Definition	The house number on the street where the building or other physical object is located.
Type	string
Occurrence	AddressType
NilReason	No

4.5.46 imkId

Name	imkId
Namespace	imkl
Definition	Unique identifier of an IMKL object.
Type	base:IdentifierPropertyType
Description	The <i>imkId</i> property is similar to the <i>inspireId</i> present in INSPIRE objects. This property is included as unique identifier for objects that do not originate from INSPIRE.
Occurrence	CoverageDetail, DepthDetail, UtilityNetwork, StandardCoverageDetail, Document, ExtraPlan, Annotation, ProtectedArea, TopographicalElement
NilReason	No



4.5.47 inNetwork

Name	inNetwork
Namespace	INSPIRE net, imkl
Definition	Reference to the <i>UtilityNetwork</i> object that contains the source object.
Type	gml:ReferenceType
Description	The reverse property of the <i>inNetwork</i> property varies and depends on the object type.
Occurrence	ActivityComplex, CoverageDetail, DepthDetail, StandardCoverageDetail, Cabinet, Manhole, Tower, Pole, Document, ExtraPlan, Annotation, ProtectedArea, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, UtilityLink
NilReason	No

4.5.48 input

Name	input
Namespace	INSPIRE act-core
Definition	Measurable information about parameters related with the inputs related with the activity carried out by the <i>ActivityComplex</i> .
Type	act-core:InputOutputAmountPropertyType
Description	This property is not used in the context of IMKL.
Occurrence	Function
NilReason	No

4.5.49 inspireId

Name	inspireId
Namespace	INSPIRE net
Definition	External object identifier of the spatial object.
Type	base:IdentifierPropertyType
Description	Unique identifier for objects originating from INSPIRE.
Occurrence	ActivityComplex, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, UtilityLink, Cabinet, Manhole, Tower, Pole

NilReason	No
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4.5.50 label

Name	label
Namespace	imkl
Definition	Short description of the object.
Type	gmd:PT_FreeText_PropertyType
Description	The label can be used to provide a description for an element (e.g. the code on an air beacon Appurtenance).
Occurrence	ActivityComplex, UtilityNetwork, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, Document, ExtraPlan, TopographicalElement
NilReason	No

4.5.51 link

Name	link
Namespace	INSPIRE net
Definition	Reference to the <i>UtilityLink</i> object that represents the geometry of the source object.
Type	gml:ReferenceType
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.52 location

Name	location
Namespace	imkl
Definition	Represents the geometric properties of the object.
Type	Geometry
Description	The type of geometry that can be represented depends on the object type.
Occurrence	DepthDetail, CoverageDetail, StandardCoverageDetail, ExtraPlan, Annotation, TopographicalElement, ReferenceSurfaceType



NilReason	No
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4.5.53 locationSurvey

Name	locationSurvey
Namespace	imkl
Definition	Additional information on how the geometry was determined.
Type	SurveyType
Description	The <i>locationSurvey</i> property is associated with the <i>location</i> property of its object or - in case of <i>Cables</i> , <i>Pipes</i> or <i>Ducts</i> - with the geometry of its <i>link</i> object.
Occurrence	CoverageDetail, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, ExtraPlan, TopographicalElement, ReferenceSurfaceType
NilReason	No

4.5.54 materialType

Name	materialType
Namespace	imkl
Definition	Classification of the material of an object.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>MaterialTypeValue</i> codelist.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.55 method

Name	method
Namespace	imkl
Definition	Classification of the survey methods.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>SurveyMethodValue</i> codelist.
Occurrence	SurveyType

NilReason	Yes
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4.5.56 municipalityName

Name	municipalityName
Namespace	imkl
Definition	The name of the municipality where the building or other physical object is located.
Type	gmd:PT_FreeText_PropertyType
Occurrence	AddressType
NilReason	No

4.5.57 name (ActivityComplex)

Name	name (ActivityComplex)
Namespace	INSPIRE act-core
Definition	The name of the <i>ActivityComplex</i> object.
Type	string
Occurrence	ActivityComplex
NilReason	No

4.5.58 name (AgentType)

Name	name (AgentType)
Namespace	imkl
Definition	The name of the <i>Agent</i> .
Type	string
Description	The name of the <i>Agent</i> .
Occurrence	AgentType
NilReason	No

4.5.59 name (ProtectedArea)

Name	name (ProtectedArea)
Namespace	imkl

Definition	The name of the <i>ProtectedArea</i> object.
Type	string
Occurrence	ProtectedArea
NilReason	No

4.5.60 networks

Name	networks
Namespace	INSPIRE us-net-common
Definition	A single sub-network that can be considered as part of a higher-order utility network.
Type	gml:ReferenceType
Occurrence	UtilityNetwork
NilReason	No

4.5.61 nodes

Name	nodes
Namespace	INSPIRE us-net-common
Definition	Contained utility nodes.
Type	gml:ReferenceType
Description	The <i>nodes</i> property is used to keep track of the <i>Appurtenance</i> and <i>Connection</i> objects that are associated with the source object.
Occurrence	Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.62 nominalVoltage

Name	nominalVoltage
Namespace	INSPIRE us-net-el
Definition	The nominal system voltage at the point of supply.
Type	gml:MeasureType
Description	This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::V. The unit of measure must be provided via the <i>uom</i> attribute.

Occurrence	ElectricityCable
NilReason	Yes

4.5.63 oilGasChemicalsProductType

Name	oilGasChemicalsProductType
Namespace	INSPIRE us-net-ogc
Definition	Classification of the product transported by an <i>OilGasChemicalsPipe</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>OilGasChemicalsProductTypeIMKLValue</i> codelist.
Occurrence	OilGasChemicalsPipe
NilReason	No

4.5.64 on

Name	on
Namespace	imkl
Definition	Reference to another object that is associated with the source object.
Type	gml:ReferenceType
Description	The types of objects that can be referenced varies and depends on the type of the source object. For <i>ActivityComplex</i> objects, this property is the inverse of the <i>utilityFacilityReference</i> property of the associated objects. For <i>DepthDetail</i> objects, this property is the inverse of the <i>depthDetail</i> property of the associated objects. For <i>CoverageDetail</i> objects, this property is the inverse of the <i>coverageDetail</i> property of the associated objects.
Occurrence	ActivityComplex, CoverageDetail, DepthDetail
NilReason	No

4.5.65 operatingVoltage

Name	operatingVoltage
Namespace	INSPIRE us-net-el
Definition	The utilization or operating voltage by the equipment using the electricity.



Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::V.</p> <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	ElectricityCable
NilReason	Yes

4.5.66 orientation

Name	orientation
Namespace	imkl
Definition	The orientation of the (symbol of the) object expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::deg.</p> <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>The orientation represents the angle (in degrees) by which the symbol should be rotated. The rotation occurs counterclockwise. An orientation of 0 degrees means no rotation.</p>
Occurrence	Appurtenance, Connection, Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.67 output

Name	output
Namespace	INSPIRE act-core
Definition	Measurable information about parameters related with the outputs related with the activity carried out by the <i>ActivityComplex</i> .
Type	act-core:InputOutputAmountPropertyType
Description	This property is not used in the context of IMKL.
Occurrence	Function
NilReason	No

4.5.68 phone

Name	phone
Namespace	imkl
Definition	The phone number of the <i>Agent</i> .
Type	string
Description	The phone number of the <i>Agent</i> . The value should be a valid phone number. The phone number must include the country code (e.g. +32 for Belgium).
Occurrence	AgentType
NilReason	No

4.5.69 pipeDiameter

Name	pipeDiameter
Namespace	INSPIRE us-net-common
Definition	The diameter of a pipe expressed in a unit of measure (<i>uom</i>).
Type	gml:MeasureType
Description	<p>For the use case of IMKL, the <i>pipeDiameter</i> should represent the outer diameter.</p> <p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none"> • urn:ogc:def:uom:OGC::mm • urn:ogc:def:uom:OGC::cm • urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe
NilReason	Yes

4.5.70 pipeDiameterAccuracy

Name	pipeDiameterAccuracy
Namespace	imkl
Definition	The accuracy of the <i>pipeDiameter</i> expressed in a unit of measure (<i>uom</i>).
Type	gml:MeasureType



Description	This property is of type gml:MeasureType and can have any of the following units of measure: <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm• urn:ogc:def:uom:OGC::cm• urn:ogc:def:uom:OGC::m The unit of measure must be provided via the <i>uom</i> attribute. For example: A <i>pipeDiameter</i> of 70cm and a <i>pipeDiameterAccuracy</i> of 10cm indicates that the diameter is somewhere between 60 and 80cm.
Occurrence	Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe
NilReason	No

4.5.71 pipes

Name	pipes
Namespace	INSPIRE us-net-common
Definition	Reference to a <i>Pipe</i> object that is contained within the source <i>Pipe</i> or <i>Duct</i> object.
Type	gml:ReferenceType
Description	The <i>pipes</i> property is used to keep track of the <i>Pipe</i> objects that are contained within the source <i>Pipe</i> or <i>Duct</i> object. This property can only be used for <i>Pipe</i> and <i>Duct</i> objects. It is not allowed for <i>OilGasChemicalsPipe</i> , <i>SewerPipe</i> , <i>WaterPipe</i> and <i>ThermalPipe</i> objects. The data model does not include a reverse association.
Occurrence	Pipe, Duct
NilReason	No

4.5.72 poleHeight

Name	poleHeight
Namespace	INSPIRE us-net-common
Definition	The height of the pole.
Type	gml:LengthType
Description	This property is of type gml:MeasureType and can have any of the following units of measure: <ul style="list-style-type: none">• urn:ogc:def:uom:OGC::mm

	<ul style="list-style-type: none"> urn:ogc:def:uom:OGC::cm urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	Pole
NilReason	No

4.5.73 postalCode

Name	postalCode
Namespace	imkl
Definition	The postal code of the location where the building or other physical object is located.
Type	string
Occurrence	AddressType
NilReason	No

4.5.74 pressure

Name	pressure
Namespace	INSPIRE us-net-common
Definition	The maximum allowable operating pressure at which a product is conveyed through a pipe.
Type	gml:MeasureType
Description	<p>This property cannot be present in IMKL for Pipe objects. Is only allowed for subtypes of Pipe (i.e. OilGasChemicalsPipe, SewerPipe, WaterPipe and ThermalPipe).</p> <p>This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::bar.</p> <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe
NilReason	Yes

4.5.75 protectedArea

Name	protectedArea
Namespace	imkl



Definition	Reference to a <i>ProtectedArea</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	The <i>protectedArea</i> property is used to keep track of the <i>ProtectedArea</i> objects that are associated with the source object. This property is the inverse of the <i>inNetwork</i> property of the <i>ProtectedArea</i> objects.
Occurrence	UtilityNetwork
NilReason	No

4.5.76 protectedAreaType

Name	protectedAreaType
Namespace	imkl
Definition	Classification of the type of <i>ProtectedAreas</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>ProtectedAreaTypeValue</i> codelist.
Occurrence	ProtectedArea
NilReason	No

4.5.77 recordedBy

Name	recordedBy
Namespace	imkl
Definition	The <i>Agent</i> who conducted the survey.
Type	AgentType
Occurrence	SurveyType
NilReason	No

4.5.78 referenceSurface

Name	referenceSurface
Namespace	imkl
Definition	The reference surface used to determine the vertical position of an object.

Type	ReferenceSurfaceType
Description	The type of the reference surface should always be <i>surfaceLevel</i> .
Occurrence	CoverageDetail, DepthDetail, StandardCoverageDetail
NilReason	No

4.5.79 referenceSurfaceType

Name	referenceSurfaceType
Namespace	imkl
Definition	Classification of the type of a <i>ReferenceSurface</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>ReferenceSurfaceTypeValue</i> codelist.
Occurrence	ReferenceSurfaceType
NilReason	No

4.5.80 refersTo

Name	refersTo
Namespace	imkl
Definition	Reference to the object that is associated with the source <i>ExtraPlan</i> object.
Type	gml:ReferenceType
Description	The <i>refersTo</i> property is used to keep track of the <i>UtilityNetworkElement</i> objects the <i>ExtraPlan</i> is associated with. This property is the inverse of the <i>documentation</i> property of <i>UtilityNetworkElement</i> objects.
Occurrence	ExtraPlan
NilReason	No

4.5.81 rotationAngle

Name	rotationAngle
Namespace	imkl
Definition	The rotation angle for the text label of the object expressed in a unit of measure (uom).

Type	gml:MeasureType
Description	<p>This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::deg.</p> <p>The unit of measure must be provided via the <i>uom</i> attribute.</p> <p>The rotationAngle represents the angle (in degrees) by which the text label should be rotated. The rotation occurs counterclockwise. A rotationAngle of 0 degrees means no rotation.</p>
Occurrence	Annotation
NilReason	No

4.5.82 sewerWaterType

Name	sewerWaterType
Namespace	INSPIRE us-net-sw
Definition	Classification of the product transported by a <i>SewerPipe</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>SewerWaterTypeValue codelist</i> .
Occurrence	SewerPipe
NilReason	No

4.5.83 specificAppurtenanceType

Name	specificAppurtenanceType
Namespace	INSPIRE us-net-common
Definition	Type of appurtenance according to a domain-specific classification.
Type	gml:ReferenceType
Description	This property cannot be present in IMKL.
Occurrence	Appurtenance, Connection
NilReason	No

4.5.84 spokeEnd

Name	spokeEnd
Namespace	INSPIRE net
Definition	The links that enter the node.

Type	gml:ReferenceType
Description	<p>The <i>spokeEnd</i> property is used to keep track of the <i>UtilityLink</i> objects the <i>Appurtenance</i> or <i>Connection</i> is associated with.</p> <p>This property is the inverse of the <i>endNode</i> property of <i>UtilityLink</i> objects.</p> <p>This property is not used in the context of IMKL and will be ignored if provided.</p>
Occurrence	Appurtenance, Connection
NilReason	No

4.5.85 spokeStart

Name	spokeStart
Namespace	INSPIRE net
Definition	The links that leave the node.
Type	gml:ReferenceType
Description	<p>The <i>spokeStart</i> property is used to keep track of the <i>UtilityLink</i> objects the <i>Appurtenance</i> or <i>Connection</i> is associated with.</p> <p>This property is the inverse of the <i>startNode</i> property of <i>UtilityLink</i> objects.</p> <p>This property is not used in the context of IMKL and will be ignored if provided.</p>
Occurrence	Appurtenance, Connection
NilReason	No

4.5.86 standardCoverageDetail

Name	standardCoverageDetail
Namespace	imkl
Definition	Reference to a <i>StandardCoverageDetail</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	<p>The <i>standardCoverageDetail</i> property is used to reference the <i>StandardCoverageDetail</i> objects that are associated with the source object.</p> <p>This property is the inverse of the <i>inNetwork</i> property of <i>StandardCoverageDetail</i> objects.</p> <p>A <i>UtilityNetwork</i> can have:</p> <ul style="list-style-type: none"> • at most 1 standard coverage per subtheme.



	<ul style="list-style-type: none">at most 1 standard coverage without subtheme. If this is present, this will be used as the coverage for an <i>UtilityNetworkElement</i> unless it is overruled by either a <i>coverageDetail</i> on the element itself or by a <i>standardCoverageDetail</i> with the same subtheme.
Occurrence	UtilityNetwork
NilReason	No

4.5.87 startNode

Name	startNode
Namespace	INSPIRE net
Definition	The optional start node for this link.
Type	gml:ReferenceType
Description	The <i>startNode</i> property is not used in the context of IMKL. This property will be ignored if provided.
Occurrence	UtilityLink
NilReason	No

4.5.88 streetName

Name	streetName
Namespace	imkl
Definition	The name of the street where the building or other physical object is located.
Type	gmd:PT_FreeText_PropertyType
Occurrence	AddressType
NilReason	No

4.5.89 subtheme

Name	subtheme
Namespace	imkl
Definition	Classification of the subtheme of an object.
Type	gml:ReferenceType
Description	This property should reference a value in one of the following codelists: <ul style="list-style-type: none">ElectricitySubthemeValue

	<ul style="list-style-type: none"> • OilGasChemicalsSubthemeValue • SewerSubthemeValue • TelecommunicationsSubthemeValue • ThermalSubthemeValue • WaterSubthemeValue <p>There are different codelists depending on the type of utility network. The codelist that is used should correspond to the type of the <i>UtilityNetwork</i> the object belongs to.</p> <p>This property is allowed for <i>OilGasChemicalsPipe</i>, <i>SewerPipe</i>, <i>WaterPipe</i> and <i>ThermalPipe</i> objects, but is not allowed for <i>Pipe</i> objects.</p>
Occurrence	StandardCoverageDetail, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Appurtenance, Connection
NilReason	No

4.5.90 technicalSpecification

Name	technicalSpecification
Namespace	imkl
Definition	Technical specifications of a <i>Cable</i> , <i>Pipe</i> or <i>Duct</i> .
Type	gmd:PT_FreeText_PropertyType
Description	Further specification of the <i>Cable</i> , <i>Pipe</i> or <i>Duct</i> . E.g.: “4-core cable.”
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.91 telecommunicationsCableMaterialType

Name	telecommunicationsCableMaterialType
Namespace	INSPIRE us-net-tc
Definition	Classification of the product transported by a <i>TelecommunicationsCable</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>TelecommunicationsCableMaterialTypeIMKLValue</i> codelist.
Occurrence	TelecommunicationsCable



NilReason	No
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4.5.92 temperature

Name	temperature
Namespace	imkl
Definition	Temperature of the water in a <i>thermalPipe</i> expressed in a unit of measure (uom).
Type	gml:MeasureType
Description	This property is of type gml:MeasureType and should have the following unit of measure: urn:ogc:def:uom:OGC::degC. The unit of measure must be provided via the <i>uom</i> attribute.
Occurrence	ThermalPipe
NilReason	No

4.5.93 text

Name	text
Namespace	imkl
Definition	Short description of the object.
Type	gmd:PT_FreeText_PropertyType
Description	The <i>text</i> property can be used to provide the text label that must be displayed for the <i>Annotation</i> . The <i>text</i> property must be present for <i>Annotations</i> with annotationType <i>dimensioningLabel</i> or <i>annotationLabel</i> .
Occurrence	Annotation
NilReason	No

4.5.94 thematicId

Name	thematicId
Namespace	INSPIRE act-core
Definition	Thematic Activity Complex identifier.
Type	base2:ThematicIdentifierPropertyType
Occurrence	ActivityComplex

NilReason	No
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4.5.95 thermalProductType

Name	thermalProductType
Namespace	INSPIRE us-net-th
Definition	Classification of the product transported by a <i>ThermalPipe</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>ThermalProductTypeIMKLValue</i> codelist.
Occurrence	ThermalPipe
NilReason	No

4.5.96 towerHeight

Name	towerHeight
Namespace	INSPIRE us-net-common
Definition	The height of the <i>Tower</i> .
Type	gml:LengthType
Description	<p>This property is of type gml:MeasureType and can have any of the following units of measure:</p> <ul style="list-style-type: none"> • urn:ogc:def:uom:OGC::mm • urn:ogc:def:uom:OGC::cm • urn:ogc:def:uom:OGC::m <p>The unit of measure must be provided via the <i>uom</i> attribute.</p>
Occurrence	Tower
NilReason	No

4.5.97 utilityDeliveryType

Name	utilityDeliveryType
Namespace	INSPIRE us-net-common
Definition	Kind of utility delivery network e.g. transport, distribution, collection ...
Type	gml:ReferenceType



Description	This property should reference a value in the <i>UtilityDeliveryTypeValue</i> or <i>UtilityDeliveryTypeIMKLValue</i> codelist.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	No

4.5.98 utilityFacilityReference

Name	utilityFacilityReference
Namespace	INSPIRE us-net-common
Definition	Reference to a facility <i>ActivityComplex</i> that is linked (related) to the source object.
Type	gml:ReferenceType
Description	<p>The <i>utilityFacilityReference</i> property is used to keep track of the <i>ActivityComplex</i> objects that are associated with the source object.</p> <p>For a <i>UtilityNetwork</i> object, this property is the inverse of the <i>inNetwork</i> property of the associated objects. For other objects, this property is the inverse of the <i>on</i> property of the associated objects.</p> <p>If an <i>ActivityComplex</i> is present it needs to be linked to from the <i>UtilityNetwork</i>. If the <i>ActivityComplex</i> is applicable to a <i>UtilityNetworkElement</i> it needs to be linked from these elements as well.</p>
Occurrence	UtilityNetwork, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	No

4.5.99 utilityNetworkType

Name	utilityNetworkType
Namespace	INSPIRE us-net-common
Definition	Classification of the type of a <i>UtilityNetwork</i> .
Type	gml:ReferenceType
Description	This property should reference a value in the <i>UtilityNetworkTypeValue</i> or <i>UtilityNetworkTypeIMKLValue</i> codelist.
Occurrence	UtilityNetwork
NilReason	No

4.5.100 validFrom

Name	validFrom
Namespace	INSPIRE us-net-common, INSPIRE act-core
Definition	The time when the object started to exist in the real world.
Type	dateTime
Occurrence	ActivityComplex, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	Yes

4.5.101 validTo

Name	validTo
Namespace	INSPIRE us-net-common, INSPIRE act-core
Definition	The time from which the object no longer exists in the real world.
Type	dateTime
Occurrence	ActivityComplex, ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	No

4.5.102 verticalPosition (imkl)

Name	verticalPosition (imkl)
Namespace	imkl
Definition	The TAW/DNG level of an element or surface.
Type	gml:DirectPositionType
Description	The verticalPosition represents the TAW/DNG level of an element or surface. The <i>srsName</i> attribute must be present and must be set to https://spatialreference.org/ref/epsg/5710/ (Ostend height). The <i>srsDimension</i> attribute must also be present and must be set to 1.
Occurrence	CoverageDetail, DepthDetail, ReferenceSurfaceType
NilReason	No



4.5.103 verticalPosition (us-net-common)

Name	verticalPosition (us-net-common)
Namespace	INSPIRE us-net-common
Definition	The vertical position of the utility object relative to ground.
Type	gml:ReferenceType
Description	This property should have a value in the <i>VerticalPositionValue</i> codelist.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole, UtilityLink
NilReason	Yes

4.5.104 verticalPositionDetail

Name	verticalPositionDetail
Namespace	imkl
Definition	Reference to a <i>CoverageDetail</i> or <i>DepthDetail</i> object that is associated with the source object.
Type	gml:ReferenceType
Description	<p>The <i>verticalPositionDetail</i> property is used to keep track of the <i>CoverageDetail</i> and <i>DepthDetail</i> objects that are associated with any element within the <i>UtilityNetwork</i>. All <i>CoverageDetail</i> and <i>DepthDetail</i> objects that are related to any element within the <i>UtilityNetwork</i> must be referenced from the <i>UtilityNetwork</i> object itself.</p> <p>The object or objects representing the standard coverage for the network should not be listed here. These should be referenced using the <i>standardCoverageDetail</i> association.</p> <p>This property is the inverse of the <i>inNetwork</i> property of the associated objects.</p>
Occurrence	UtilityNetwork
NilReason	No

4.5.105 verticalPositionSurvey

Name	verticalPositionSurvey
Namespace	imkl
Definition	Additional information on how the vertical position was determined.

Type	SurveyType
Description	The <i>verticalPositionSurvey</i> property is associated with the <i>verticalPosition</i> , <i>depth</i> or <i>height</i> property of the object.
Occurrence	ReferenceSurfaceType, DepthDetail, CoverageDetail, StandardCoverageDetail
NilReason	No

4.5.106 visibility

Name	visibility
Namespace	imkl
Definition	Classification of the visibility of an object.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>VisibilityTypeValue</i> codelist.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct, Appurtenance, Connection, Cabinet, Manhole, Tower, Pole
NilReason	No

4.5.107 warningType

Name	warningType
Namespace	INSPIRE us-net-common
Definition	Kind of overground visible warning mechanism used to indicate an underground utility network element.
Type	gml:ReferenceType
Description	This property should reference a value in the <i>WarningTypeValue</i> or <i>WarningTypeIMKLValue</i> codelists.
Occurrence	ElectricityCable, TelecommunicationsCable, Pipe, OilGasChemicalsPipe, SewerPipe, WaterPipe, ThermalPipe, Duct
NilReason	Yes

4.5.108 waterType

Name	waterType
Namespace	INSPIRE us-net-wa
Definition	Classification of the type of water transported by a <i>WaterPipe</i> .



Type	gml:ReferenceType
Description	This property should reference a value in the <i>WaterTypeValue</i> codelist.
Occurrence	WaterPipe
NilReason	No

5 Codelists

5.1 Introduction

This chapter describes all codelists used in the context of IMKL 3. A distinction is made between:

- IMKL 3 codelists: These codelists have been specifically developed for IMKL.
 - The values in these codelist can be adjusted based on proposals from the technical working group responsible for IMKL.
- INSPIRE codelists: These codelists are specific tot he INSPIRE domain.
 - The values in these codelist can only be modified by the INSPIRE maintenance committee.
 - This document includes only the values used in the context of IMKL. The complete INSPIRE codelist can be found on the INSPIRE website. The link to the INSPIRE website for each codelist is listed in section 5.4.

5.2 Codelist URIs

The codelists – and their values – described here each have a URI. The URI for the values of a codelist is structured as follows: [codelist URI]/[codelist value].

Some examples:

- IMKL 3 codelist *ConstructionTechniqueValue*:
 - The URI of the codelist is: <https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue>
 - The URI of the *openTrench* value is: <https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/openTrench>
- INSPIRE codelist *UtilityNetworkTypeValue*:
 - The URI of the codelist is: <http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue>
 - The URI of the *electricity* value is: <http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/electricity>

Chapter 8 contains an overview of the URIs for all codelist values.

5.3 IMKL codelists

5.3.1 ActivityValue

Name	ActivityValue



Definition	Classification of economic activity.
Description	The classification of activities is based on the NACEBEL 2008 codes. The NACEBEL codes are available for download via the following URL: https://economie.fgov.be/sites/default/files/Files/Entreprises/KBO/Nacebel-2008-FR-NL-DE.xls See section 4.5.2 for more information.
URI	https://vocab.belgif.be/auth/IMKL-ActivityValue
Usage	activity

5.3.2 AnnotationTypeValue

Name	AnnotationTypeValue	
Definition	Classification of annotation types.	
Description	Codelist containing values for the <i>annotationType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue	
Usage	annotationType	
Contents	Value	annotationLabel
	Description	To be used to visualise a label in an annotation.
	Value	annotationLine
	Description	To be used to visualise a line in an annotation.
	Value	arrow
	Description	To be used to visualise an arrow in an annotation.
	Value	dimensioningGuideline
	Description	To be used to visualise an auxiliary dimensioning line.
	Value	dimensioningLabel
	Description	To be used to visualise a dimensioning label.
	Value	dimensioningLine
	Description	To be used to visualise a dimensioning line.

5.3.3 ConstructionTechniqueValue

Name	ConstructionTechniqueValue	
Definition	Classification of construction techniques.	
Description	Codelist containing values for the <i>constructionTechnique</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue	
Usage	constructionTechnique	
Contents	Value culvert Value Culvert. Value directionalDrilling Value Directional drilling. Value openTrench Value Open trench. Value other Value Other.	culvert directionalDrilling openTrench other

5.3.4 ContainerTypeValue

Name	ContainerTypeValue	
Definition	Classification of container types.	
Description	Codelist containing values for the <i>containerType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-ContainerTypeValue	
Usage	containerType	
Contents	Value cableAndPipeGutter Value Accessible gutter embedded in engineering structures to protect cables and pipes. Value jacketPipe Value Underground pipe serving as a sheath to protect cables and pipes.	cableAndPipeGutter jacketPipe

5.3.5 DocumentMediaTypeValue

Name	DocumentMediaTypeValue



Definition	Classification of document media types.	
Description	Codelist containing values for the <i>documentMediaType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-DocumentMediaTypeValue	
Usage	documentMediaType	
Contents	Value	JPEG
	Description	JPEG document.
	Value	PDF
	Description	PDF document.
	Value	PNG
	Description	PNG document.
	Value	TIFF
	Description	TIFF document.

5.3.6 DocumentTypeValue

Name	DocumentTypeValue	
Definition	Classification of document types.	
Description	Codelist containing values for the <i>documentType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue	
Usage	documentType	
Contents	Value	crossSection
	Description	Document containing a cross section.
	Value	detailedPlan
	Description	Document containing a detailed plan. The purpose of a detailed plan is to provide additional information that cannot be specified elsewhere in IMKL.
	Value	directionalDrilling
	Description	Document containing information on a directional drilling.
	Value	longitudinalSection

	Description	Document containing a longitudinal section.
	Value	other
	Description	Other type of document
	Value	precaution
	Description	Document containing precautions.

5.3.7 ElectricityAppurtenanceIMKLValue

Name	ElectricityAppurtenanceIMKLValue													
Definition	Classification of electricity appurtenances.													
Description	Codelist containing values for the <i>appurtenanceType</i> property.													
URI	https://vocab.belgif.be/auth/IMKL-ElectricityAppurtenanceTypeIMKLValue													
Usage	appurtenanceType													
Contents	<table border="1"> <tr> <td>Value</td> <td>grounding</td> </tr> <tr> <td>Description</td> <td>Grounding.</td> </tr> <tr> <td>Value</td> <td>marker</td> </tr> <tr> <td>Description</td> <td>Marker or ground beacon.</td> </tr> <tr> <td>Value</td> <td>sleeve</td> </tr> <tr> <td>Description</td> <td>Sleeve.</td> </tr> </table>	Value	grounding	Description	Grounding.	Value	marker	Description	Marker or ground beacon.	Value	sleeve	Description	Sleeve.	
Value	grounding													
Description	Grounding.													
Value	marker													
Description	Marker or ground beacon.													
Value	sleeve													
Description	Sleeve.													

5.3.8 ElectricitySubthemeValue

Name	ElectricitySubthemeValue					
Definition	Classification of electricity subthemes.					
Description	Codelist containing values for the <i>subtheme</i> property.					
URI	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue					
Usage	subtheme					
Contents	<table border="1"> <tr> <td>Value</td> <td>electricityCathodicProtection</td> </tr> <tr> <td>Description</td> <td>Cables for the protection of metals against electrochemical corrosion. Connections between measurement poles and measurement points are not covered by this subtheme.</td> </tr> </table>	Value	electricityCathodicProtection	Description	Cables for the protection of metals against electrochemical corrosion. Connections between measurement poles and measurement points are not covered by this subtheme.	
Value	electricityCathodicProtection					
Description	Cables for the protection of metals against electrochemical corrosion. Connections between measurement poles and measurement points are not covered by this subtheme.					



	Value	electricityDistributionHighVoltage
	Description	1-36kV
	Value	electricityDistributionLowVoltage
	Description	< 1kV
	Value	electricityPublicLighting
	Description	E.g. road lighting, illuminated signs
	Value	electricityTrafficEnforcementSystems
	Description	E.g. red light and speed cameras, changeable signage such as 'zone 30', lane signs, calamity routes, smog signs,...
	Value	electricityTrafficLights
	Description	E.g. cables used to control traffic lights
	Value	electricityTransport
	Description	> 70kV
	Value	electricityTransportLocal
	Description	=< 70kV

5.3.9 MaterialTypeValue

Name	MaterialTypeValue	
Definition	Classification of material types.	
Description	Codelist containing values for the <i>materialType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue	
Usage	materialType	
Contents	Value	brickwork
	Description	Brickwork.
	Value	concrete
	Description	Concrete.
	Value	crossLinkPolyethylene
	Description	Cross-linked polyethylene.
	Value	ductileCastIron

	Description	Ductile cast iron.
	Value	ductileCastIronBlutop
	Description	Ductile cast iron Blutop.
	Value	fiberCement
	Description	Fiber cement.
	Value	galvanisedSteel
	Description	Galvanised steel.
	Value	glassFiberReinforcedPolyester
	Description	Fiber-reinforced polyester.
	Value	grayCastIron
	Description	Gray cast iron.
	Value	jute
	Description	Jute.
	Value	lead
	Description	Lead.
	Value	other
	Description	Other.
	Value	polyethylene
	Description	Polyethylene.
	Value	polyethyleneHighDensity
	Description	High density polyethylene.
	Value	polyethyleneSafetyLine
	Description	Polyethylene SafeteLine
	Value	polypropylene
	Description	Polypropylene.
	Value	polypropyleneSLA
	Description	Polypropylene SLA.
	Value	prestressedConcrete
	Description	Prestressed concrete.

	Value	pvc
	Description	PVC.
	Value	sideroCement
	Description	Sidero cement.
	Value	stainlessSteel
	Description	Stainless steel.
	Value	steel
	Description	Steel.
	Value	stoneware
	Description	Stoneware.
	Value	sulfurConcrete
	Description	Sulfur concrete.
	Value	unknown
	Description	Unknown.

5.3.10 OilGasChemicalsAppurtenanceTypeIMKLValue

Name	OilGasChemicalsAppurtenanceTypeIMKLValue																	
Definition	Classification of oil, gas, chemicals appurtenances.																	
Description	Codelist containing values for the appurtenanceType property.																	
URI	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue																	
Usage	appurtenanceType																	
Contents	<table border="1"> <tr> <td>Value</td> <td>adapter</td> </tr> <tr> <td>Description</td> <td>Adapter.</td> </tr> <tr> <td>Value</td> <td>airBeacon</td> </tr> <tr> <td>Description</td> <td>Air beacon.</td> </tr> <tr> <td>Value</td> <td>blowHole</td> </tr> <tr> <td>Description</td> <td>Blowhole.</td> </tr> <tr> <td>Value</td> <td>cathodicProtectionInstallation</td> </tr> <tr> <td>Description</td> <td>Cathodic protection installation.</td> </tr> </table>	Value	adapter	Description	Adapter.	Value	airBeacon	Description	Air beacon.	Value	blowHole	Description	Blowhole.	Value	cathodicProtectionInstallation	Description	Cathodic protection installation.	
Value	adapter																	
Description	Adapter.																	
Value	airBeacon																	
Description	Air beacon.																	
Value	blowHole																	
Description	Blowhole.																	
Value	cathodicProtectionInstallation																	
Description	Cathodic protection installation.																	

	Value	cathodicProtectionMeasurementPoint
	Description	Cathodic protection measurement point.
	Value	endCap
	Description	End cap.
	Value	flange
	Description	Flange.
	Value	measurementPoint
	Description	Measurement point.
	Value	siphon
	Description	Siphon.
	Value	sleeve
	Description	Sleeve.
	Value	sluice
	Description	Sluice.
	Value	stoppleFitting
	Description	Stopple fitting.
	Value	valve
	Description	Valve.

5.3.11 OilGasChemicalsProductTypeIMKLValue

Name	OilGasChemicalsProductTypeIMKLValue	
Definition	Classification of oil, gas, chemicals product types.	
Description	Codelist containing values for the oilGasChemicalsProductType property.	
URI	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue	
Usage	oilGasChemicalsProductType	
Contents	Value	acetone
	Description	Acetone (CH ₃ COCH ₃).
	Value	air
	Description	Air.

	Value	argon
	Description	Argon (AR).
	Value	bioGas
	Description	Bio gas.
	Value	butadiene1_2
	Description	Butadiene 1,2 (C4H6).
	Value	butadiene1_3
	Description	Butadiene 1,3 (C4H6).
	Value	butane
	Description	Butane (C4H10).
	Value	carbonDioxide
	Description	Carbon dioxide (CO2).
	Value	carbonMonoxide
	Description	Carbon monoxide (CO).
	Value	chlorine
	Description	Chlorine (C12).
	Value	concrete
	Description	Concrete.
	Value	crude
	Description	Crude.
	Value	dichloroethane
	Description	Dichloroethane (C2H4Cl2).
	Value	diesel
	Description	Diesel.
	Value	empty
	Description	Empty.
	Value	ethylene
	Description	Ethylene (C2H4).
	Value	gasFabricationOfCocs

	Description	Gas fabrication of Cocs.
	Value	gasHFx
	Description	Gas HFx.
	Value	gasoil
	Description	Gasoil.
	Value	hydrogen
	Description	Hydrogen (H2).
	Value	isobutane
	Description	Isobutane (C4H10).
	Value	JET-A1
	Description	Jet-A1.
	Value	kerosene
	Description	Kerosine.
	Value	liquidAmmonia
	Description	Liquid ammonia (NH3).
	Value	liquidHydrocarbon
	Description	Liquid hydrocarbon (CnHm).
	Value	multiProduct
	Description	Object capable of transporting various products.
	Value	MVC
	Description	Monovinyl chloride (C2H3Cl).
	Value	naturalGas
	Description	Natural gas (Methane - CH4).
	Value	nitrogen
	Description	Nitrogen (N2).
	Value	oxygen
	Description	Oxygen (O2).
	Value	phenol



	Description	Phenol (C6H5OH).
	Value	propane
	Description	Propane (C3H8).
	Value	propylene
	Description	Propylene.
	Value	saltWater
	Description	Salt water.
	Value	sand
	Description	Sand.
	Value	saumur
	Description	Saumur, brine.
	Value	tetrachloroide
	Description	Tetrachloroide (Cl4).
	Value	unknown
	Description	Unknown.
	Value	water
	Description	Water.

5.3.12 OilGasChemicalsSubthemeValue

Name	OilGasChemicalsSubthemeValue	
Definition	Classification of oil, gas, chemicals subthemes.	
Description	Codelist containing values for the <i>subtheme</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsSubthemeValue	
Usage	subtheme	
Contents	Value	naturalGasDistributionLowPressure
	Description	Pipe whose highest permissible operating pressure does not exceed 0.1 kgf/cm ² (98.07 mbar).
	Value	naturalGasDistributionMediumPressure
	Description	Pipe whose highest allowable operating pressure exceeds 0.1 kgf/cm ² (98.07

		mbar), without exceeding 15 kgf/cm ² (14.71 bar).
	Value	naturalGasTransport
	Description	Natural gas transmission network - installations subject to law 12/04/65.
	Value	oilGasChemicalsTransport
	Description	Transmission network for transporting products other than natural gas - installations subject to law 12/04/65.

5.3.13 ProtectedAreaTypeValue

Name	ProtectedAreaTypeValue	
Definition	Classification of protected area types.	
Description	Codelist containing values for the <i>protectedAreaType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue	
Usage	protectedAreaType	
Contents	Value	drinkingWaterExtractionArea
		Description Area in which a water company extracts groundwater for the production of drinking water.
	Value	geothermalInstallation
	Description	Area in which a large geothermal plant occurs.
	Value	infiltrationArea
	Description	Area intended for the infiltration of water into the soil.
	Value	otherProtectedArea
	Description	Area protected for another reason.
	Value	undergroundGasStorage
	Description	Area used for underground gas storage.

5.3.14 ReferenceSurfaceTypeValue

Name	ReferenceSurfaceTypeValue
------	---------------------------



Definition	Classification of surface types.	
Description	Codelist containing values for the <i>type</i> property of reference surfaces.	
URI	https://vocab.belgif.be/auth/IMKL-ReferenceSurfaceTypeValue	
Usage	referenceSurfaceType	
Contents	Value	surfaceLevel
	Description	The surface level.

5.3.15 SewerAppurtenanceTypeIMKLValue

Name	SewerAppurtenanceTypeIMKLValue	
Definition	Classification of sewer appurtenances.	
Description	Codelist containing values for the <i>appurtenanceType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue	
Usage	appurtenanceType	
Contents	Value	cathodicProtectionInstallation
	Description	Installation of cathodic protection.
	Value	cathodicProtectionMeasurementPoint
	Description	Cathodic protection measurement point.
	Value	deliveryPoint
	Description	Delivery point.
	Value	effluent
	Description	Effluent from a treatment plant.
	Value	infiltrationStructure
	Description	Structure for the infiltration of water.
	Value	inlet
	Description	Inlet.
	Value	measurementPoint
	Description	Measurement point.
	Value	other
	Description	Other.

	Value	overflow
	Description	Overflow.
	Value	treatmentSystem
	Description	Treatment system or plant.

5.3.16 SewerSubthemeValue

Name	SewerSubthemeValue	
Definition	Classification of sewer subthemes.	
Description	Codelist containing values for the <i>subtheme</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue	
Usage	subtheme	
Contents	Value	sewageWasteWaterGravitationalPipe
	Description	Gravitational piping of wastewater and mixed water.
	Value	sewageWasteWaterPressurePipe
	Description	Wastewater and mixed water pressure pipes.
	Value	waterDrainageArchedWaterways
	Description	Piped-in sections of catalogued watercourses.
	Value	waterDrainagePipedCanal
	Description	Piped-in canals that are not constructed according to code, often localised arches, may also have pollution connected to them.
	Value	waterDrainageSurfaceWaterGravitationalPipe
	Description	Gravitational piping of rainwater (constructed according to code).
	Value	waterDrainageSurfaceWaterPressurePipe
	Description	Rainwater pressure pipes (constructed according to code).

5.3.17 SurveyMethodValue

Name	SurveyMethodValue	
Definition	Classification of survey methods.	



Description	Codelist containing values for the <i>method</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue	
Usage	method	
Contents	Value	digitizedPlan
	Description	Digitized plan.
	Value	gnss
	Description	Global Navigation Satelite System.
	Value	lidar
	Description	Light Detection And Ranging.
	Value	measuringTape
	Description	Measuring tape.
	Value	measuringWheel
	Description	Measuring wheel.
	Value	photogrammetry
	Description	Photogrammetry.
	Value	sketch
	Description	Sketch.
	Value	terrestrial
	Description	Terrestrial.
	Value	totalStation
	Description	Total station.
	Value	triangulation
	Description	Triangulation.

5.3.18 TelecommunicationsAppurtenanceTypeIMKLValue

Name	TelecommunicationsAppurtenanceTypeIMKLValue
Definition	Classification of telecommunication appurtenances.
Description	Codelist containing values for the <i>appurtenanceType</i> property.
URI	https://vocab.belgif.be/auth/IMKL-TelecommunicationsAppurtenanceTypeIMKLValue

Usage	appurtenanceType	
Contents	Value	amplifier
	Description	Device for upgrading the signal for distribution and trunk line over long distances.
	Value	spliceClosure
	Description	Splice closure.
	Value	splitter
	Description	Device to split the signal in two or three directions.
	Value	termination
	Description	Home connection, split point on cable.

5.3.19 TelecommunicationsCableMaterialTypeIMKLValue

Name	TelecommunicationsCableMaterialTypeIMKLValue	
Definition	Classification of telecommunication cable materials.	
Description	Codelist containing values for the <i>telecommunicationsCableMaterialType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-TelecommunicationsCableMaterialTypeIMKLValue	
Usage	telecommunicationsCableMaterialType	
Contents	Value	coaxial
	Description	Coaxial cable.
	Value	opticalFiber
	Description	Optical fibre cable.
	Value	other
	Description	Other.
	Value	twistedPair
	Description	Twisted pair.

5.3.20 TelecommunicationsSubthemeValue

Name	TelecommunicationsSubthemeValue



Definition	Classification of telecommunication subthemes.	
Description	Codelist containing values for the <i>subtheme</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-TelecommunicationsSubthemeValue	
Usage	subtheme	
Contents	Value	electronicCommunication
	Description	E.g. cables used to convey data.
	Value	telecommunicationDistribution
	Description	Cabling for local distribution of radio, TV, data and telephone signals up to the user's connection point(s).
	Value	telecommunicationMainline
	Description	Cabling carrying radio, TV, data and telephone signals over long distances to the distribution network.

5.3.21 ThermalAppurtenanceTypeIMKLValue

Name	ThermalAppurtenanceTypeIMKLValue	
Definition	Classification of thermal appurtenances.	
Description	Codelist containing values for the <i>appurtenanceType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue	
Usage	appurtenanceType	
Contents	Value	adapter
	Description	Adapter.
	Value	adapterSingleDualPipe
	Description	Adapter single dual pipe.
	Value	endCap
	Description	End cap.
	Value	cathodicProtectionInstallation
	Description	Cathodic protection installation.
	Value	cathodicProtectionMeasurementPoint
	Description	Cathodic protection measurement point.

	Value	condensateWell
	Description	Condensate well.
	Value	deliveryPoint
	Description	Delivery point.
	Value	dilatationJoint
	Description	Dilatation joint.
	Value	flange
	Description	Flange.
	Value	leakdetectionInstallation
	Description	Leak detection installation.
	Value	leakdetectionMeasurementPoint
	Description	Leak detection measurement point.
	Value	measurementPoint
	Description	Measurement point.
	Value	siphon
	Description	Siphon.
	Value	sleeve
	Description	Sleeve.
	Value	sluice
	Description	Sluice.
	Value	valve
	Description	Valve.

5.3.22 ThermalProductTypeIMKLValue

Name	ThermalProductTypeIMKLValue
Definition	Classification of thermal products.
Description	Codelist containing values for the <i>thermalProductType</i> property.
URI	https://vocab.belgif.be/auth/IMKL-ThermalProductTypeIMKLValue
Usage	thermalProductType



Contents	Value	condensate
	Description	Condensate from a thermal pipe.
	Value	coolingWater
	Description	Cooling water.
	Value	heatingSteam
	Description	Heating steam.
	Value	heatingWater
	Description	Heating water.

5.3.23 ThermalSubthemeValue

Name	ThermalSubthemeValue	
Definition	Classification of thermal subthemes.	
Description	Codelist containing values for the <i>subtheme</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-ThermalSubthemeValue	
Usage	subtheme	
Contents	Value	heatDistribution
	Description	Heat distribution.
	Value	heatTransport
	Description	Heat transport.
	Value	steamCondensate
	Description	Steam condensate.
	Value	steamTransport
	Description	Steam transport.

5.3.24 UtilityDeliveryTypeIMKLValue

Name	UtilityDeliveryTypeIMKLValue	
Definition	Classification of utility delivery types.	
Description	Codelist containing values for the <i>utilityDeliveryType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-UtilityDeliveryTypeIMKLValue	
Usage	utilityDeliveryType	

Contents	Value	connection
	Description	Connection linking the distribution network to the end customer.

5.3.25 UtilityNetworkTypeIMKLValue

Name	UtilityNetworkTypeIMKLValue	
Definition	Classification of utility network types.	
Description	Codelist containing values for the <i>utilityNetworkType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-UtilityNetworkTypeIMKLValue	
Usage	utilityNetworkType	
Contents	Value	crossTheme
	Description	Mixed Networks. For use in case of, for example, a UtilityNetwork with empty <i>Duct</i> and <i>Pipe</i> objects or for <i>Duct</i> and <i>Pipe</i> objects containing cables or pipes of different themes.

5.3.26 VisibilityTypeValue

Name	VisibilityTypeValue	
Definition	Classification of visibility types.	
Description	Codelist containing values for the <i>visibility</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-VisibilityTypeValue	
Usage	visibility	
Contents	Value	notVisibleAboveGround
	Description	Not visible above ground.
	Value	visibleAboveGround
	Description	Visible above ground.

5.3.27 WarningTypeIMKLValue

Name	WarningTypeIMKLValue	
Definition	Classification of warning types.	
Description	Codelist containing values for the <i>warningType</i> property.	

URI	https://vocab.belgif.be/auth/IMKL-WarningTypeIMKLValue	
Usage	warningType	
Contents	Value	geotextile
	Description	Geotextile.
	Value	protectivePlate
	Description	A series of underground protective plates to cover cables or pipelines. (e.g. plastic sheet plates).

5.3.28 WaterAppurtenanceTypeIMKLValue

Name	WaterAppurtenanceTypeIMKLValue	
Definition	Classification of water appurtenances.	
Description	Codelist containing values for the <i>appurtenanceType</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue	
Usage	appurtenanceType	
Contents	Value	cathodicProtectionInstallation
	Description	Cathodic protection installation.
	Value	cathodicProtectionMeasurementPoint
	Description	Cathodic protection measurement point.
	Value	connectionValve
	Description	Connection valve.
	Value	deliveryPoint
	Description	Delivery point.
	Value	drinkingWaterExtractionPoint
	Description	Extraction point for drinking water.
	Value	measurementPoint
	Description	Measurement point.

5.3.29 WaterSubthemeValue

Name	WaterSubthemeValue	
Definition	Classification of water subthemes.	

Description	Codelist containing values for the <i>subtheme</i> property.	
URI	https://vocab.belgif.be/auth/IMKL-WaterSubthemeValue	
Usage	subtheme	
Contents	Value	drinkingWaterDistribution
	Description	Regardless of its diameter, the main purpose of a distribution pipeline is to provide local distribution of drinking water by distributing the supplied water directly to a large number of individual household and non-household final customers.
	Value	drinkingWaterSupply
	Description	<p>A supply pipeline, irrespective of its diameter, has one of the following purposes :</p> <ul style="list-style-type: none"> • The supply of demarcated distribution areas, whether they are of a domestic, industrial or agricultural nature or a mixture thereof; • The security connections between and within distribution areas, with the aim of ensuring the supplied capacities of these distribution areas; • The transport of drinking water between water production centres and between the water extractions and these water distribution centres; • The transport of drinking water to large customers (port areas, a large company, an airport,...)

5.4 INSPIRE codelists

5.4.1 ConditionOfFacilityValue

Name	ConditionOfFacilityValue



Definition	The status of a facility with regards to its completion and use.	
Description	Codelist containing values for the <i>currentStatus</i> property.	
URI	http://inspire.ec.europa.eu/codelist/ConditionOfFacilityValue	
Usage	currentStatus	
Contents	Value	disused
	Description	The facility is no longer used, but is not being or has not been decommissioned.
	Value	functional
	Description	The facility is functional.
	Value	projected
	Description	The facility is being designed. Construction has not yet started.
	Value	underConstruction
	Description	The facility is under construction and not yet functional. This applies only to the initial construction of the facility and not to maintenance work.

5.4.2 ElectricityAppurtenanceTypeValue

Name	ElectricityAppurtenanceTypeValue	
Definition	Classification of electricity appurtenances.	
Description	Codelist containing values for the <i>appurtenanceType</i> property.	
URI	http://inspire.ec.europa.eu/codelist/ElectricityAppurtenanceTypeValue	
Usage	appurtenanceType	
Contents	Value	deliveryPoint
	Description	Point the electric power is being delivered to.
	Value	streetLight
	Description	A street light (or lamppost, street lamp, light standard, or lamp standard) is a raised source of light on the edge of a road, which is turned on or lit at a certain time every night.

5.4.3 nilReason

Name	nilReason																				
Definition	Reason why no value is provided for a property.																				
Description	<p>Codelist containing values for the <i>nilReason</i> attribute.</p> <p>The <i>nilReason</i> is an exception compared to other codelists. Its value is not provided via a URI but as a direct value of the <i>nilReason</i> attribute.</p>																				
URI	Not applicable																				
Usage	All properties where a nilReason is allowed (section 4.5).																				
Contents	<table border="1"> <thead> <tr> <th>Value</th> <th>inapplicable</th> </tr> </thead> <tbody> <tr> <td>Description</td> <td>There is no value.</td> </tr> <tr> <th>Value</th> <th>missing</th> </tr> <tr> <td>Description</td> <td>The correct value is not readily available, however a correct value probably exists.</td> </tr> <tr> <th>Value</th> <th>template</th> </tr> <tr> <td>Description</td> <td>The value will be available later.</td> </tr> <tr> <th>Value</th> <th>unknown</th> </tr> <tr> <td>Description</td> <td>The correct value is not known.</td> </tr> <tr> <th>Value</th> <th>withheld</th> </tr> <tr> <td>Description</td> <td>The value is not divulged.</td> </tr> </tbody> </table>	Value	inapplicable	Description	There is no value.	Value	missing	Description	The correct value is not readily available, however a correct value probably exists.	Value	template	Description	The value will be available later.	Value	unknown	Description	The correct value is not known.	Value	withheld	Description	The value is not divulged.
Value	inapplicable																				
Description	There is no value.																				
Value	missing																				
Description	The correct value is not readily available, however a correct value probably exists.																				
Value	template																				
Description	The value will be available later.																				
Value	unknown																				
Description	The correct value is not known.																				
Value	withheld																				
Description	The value is not divulged.																				

5.4.4 OilGasChemicalsAppurtenanceTypeValue

Name	OilGasChemicalsAppurtenanceTypeValue						
Definition	Classification of oil, gas, chemicals appurtenances.						
Description	Codelist containing values for the <i>appurtenanceType</i> property.						
URI	http://inspire.ec.europa.eu/codelist/OilGasChemicalsAppurtenanceTypeValue						
Usage	appurtenanceType						
Contents	<table border="1"> <thead> <tr> <th>Value</th> <th>deliveryPoint</th> </tr> </thead> <tbody> <tr> <td>Description</td> <td>Delivery point.</td> </tr> <tr> <th>Value</th> <th>marker</th> </tr> </tbody> </table>	Value	deliveryPoint	Description	Delivery point.	Value	marker
Value	deliveryPoint						
Description	Delivery point.						
Value	marker						

	Description	Marker.
	Value	oilGasChemicalsNode
	Description	Node in an oil, gas and chemicals network.

5.4.5 SewerAppurtenanceTypeValue

Name	SewerAppurtenanceTypeValue	
Definition	Classification of sewer appurtenances.	
Description	Codelist containing values for the <i>appurtenanceType</i> property.	
URI	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue	
Usage	appurtenanceType	
Contents	Value	catchBasin
		Catch basin.
	Value	dischargeStructure
	Description	Discharge structure.
	Value	pump
	Description	Pump.
	Value	sewerNode
	Description	Node in a sewer network.
	Value	tideGate
	Description	Tide gate.

5.4.6 SewerWaterTypeValue

Name	SewerWaterTypeValue	
Definition	Classification of sewer water types.	
Description	Codelist containing values for the <i>sewerWaterType</i> property.	
URI	http://inspire.ec.europa.eu/codelist/SewerWaterTypeValue	
Usage	sewerWaterType	
Contents	Value	combined
	Description	Combined sewer water.

	Value	reclaimed
	Description	Reclaimed sewer water.
	Value	sanitary
	Description	Sanitary sewer water.
	Value	storm
	Description	Storm sewer water.

5.4.7 UtilityDeliveryTypeValue

Name	UtilityDeliveryTypeValue																	
Definition	Classification of utility delivery types.																	
Description	Codelist containing values for the <i>utilityDeliveryType</i> property.																	
URI	http://inspire.ec.europa.eu/codelist/UtilityDeliveryTypeValue																	
Usage	utilityDeliveryType																	
Contents	<table border="1"> <tr> <td>Value</td> <td>collection</td> </tr> <tr> <td>Description</td> <td>Description of a type of utility network delivering its utility product via collection (e.g. for sewer utility networks, collecting sewer water from customers)</td> </tr> <tr> <td>Value</td> <td>distribution</td> </tr> <tr> <td>Description</td> <td>Description of a type of utility network delivering its utility product via mainly local distribution (e.g. local distribution of electricity), connecting directly to consumers</td> </tr> <tr> <td>Value</td> <td>private</td> </tr> <tr> <td>Description</td> <td>Description of a type of utility network delivering its utility product via a small private network (e.g. owned by a private company).</td> </tr> <tr> <td>Value</td> <td>transport</td> </tr> <tr> <td>Description</td> <td>Description of a type of utility network delivering its utility product via a large transport network (e.g. to convey oil-gas-chemicals products over larger distances).</td> </tr> </table>	Value	collection	Description	Description of a type of utility network delivering its utility product via collection (e.g. for sewer utility networks, collecting sewer water from customers)	Value	distribution	Description	Description of a type of utility network delivering its utility product via mainly local distribution (e.g. local distribution of electricity), connecting directly to consumers	Value	private	Description	Description of a type of utility network delivering its utility product via a small private network (e.g. owned by a private company).	Value	transport	Description	Description of a type of utility network delivering its utility product via a large transport network (e.g. to convey oil-gas-chemicals products over larger distances).	
Value	collection																	
Description	Description of a type of utility network delivering its utility product via collection (e.g. for sewer utility networks, collecting sewer water from customers)																	
Value	distribution																	
Description	Description of a type of utility network delivering its utility product via mainly local distribution (e.g. local distribution of electricity), connecting directly to consumers																	
Value	private																	
Description	Description of a type of utility network delivering its utility product via a small private network (e.g. owned by a private company).																	
Value	transport																	
Description	Description of a type of utility network delivering its utility product via a large transport network (e.g. to convey oil-gas-chemicals products over larger distances).																	

5.4.8 UtilityNetworkTypeValue

Name	UtilityNetworkTypeValue															
Definition	Classification of utility network types.															
Description	Codelist containing values for the <i>utilityNetworkType</i> property.															
URI	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue															
Usage	utilityNetworkType															
Contents	<table border="1"> <thead> <tr> <th>Value</th> <th></th> </tr> </thead> <tbody> <tr> <td>electricity</td> <td>Electricity networks.</td> </tr> <tr> <td>oilGasChemical</td> <td>Oil, gas or chemical networks.</td> </tr> <tr> <td>sewer</td> <td>Sewer networks.</td> </tr> <tr> <td>telecommunications</td> <td>Telecommunications networks.</td> </tr> <tr> <td>thermal</td> <td>Thermal networks.</td> </tr> <tr> <td>water</td> <td>Water networks.</td> </tr> </tbody> </table>	Value		electricity	Electricity networks.	oilGasChemical	Oil, gas or chemical networks.	sewer	Sewer networks.	telecommunications	Telecommunications networks.	thermal	Thermal networks.	water	Water networks.	
Value																
electricity	Electricity networks.															
oilGasChemical	Oil, gas or chemical networks.															
sewer	Sewer networks.															
telecommunications	Telecommunications networks.															
thermal	Thermal networks.															
water	Water networks.															

5.4.9 VerticalPositionValue

Name	VerticalPositionValue							
Definition	The relative vertical position of a spatial object.							
Description	Codelist containing values for the <i>verticalPosition</i> property.							
URI	http://inspire.ec.europa.eu/codelist/VerticalPositionValue							
Usage	verticalPosition							
Contents	<table border="1"> <thead> <tr> <th>Value</th> <th></th> </tr> </thead> <tbody> <tr> <td>onGroundSurface</td> <td>The spatial object is on ground level.</td> </tr> <tr> <td>suspendedOrElevated</td> <td>The spatial object is suspended or elevated.</td> </tr> </tbody> </table>	Value		onGroundSurface	The spatial object is on ground level.	suspendedOrElevated	The spatial object is suspended or elevated.	
Value								
onGroundSurface	The spatial object is on ground level.							
suspendedOrElevated	The spatial object is suspended or elevated.							

	Value	underground
	Description	The spatial object is underground.

5.4.10 WarningTypeValue

Name	WarningTypeValue													
Definition	Classification of warning types.													
Description	Codelist containing values for the <i>warningType</i> property.													
URI	http://inspire.ec.europa.eu/codelist/WarningTypeValue													
Usage	warningType													
Contents	<table border="1"> <tr> <td>Value</td> <td>concretePaving</td> </tr> <tr> <td>Description</td> <td>A set or paving of pavers or tiles in concrete material covering cables or pipes.</td> </tr> </table> <table border="1"> <tr> <td>Value</td> <td>net</td> </tr> <tr> <td>Description</td> <td>Warning net for protection of cables and pipes.</td> </tr> </table> <table border="1"> <tr> <td>Value</td> <td>tape</td> </tr> <tr> <td>Description</td> <td>Caution tape (also known as warning tape) is a resilient plastic tape of a signal colour or highly contrasting colour combination (such as yellow-black or red-white).</td> </tr> </table>	Value	concretePaving	Description	A set or paving of pavers or tiles in concrete material covering cables or pipes.	Value	net	Description	Warning net for protection of cables and pipes.	Value	tape	Description	Caution tape (also known as warning tape) is a resilient plastic tape of a signal colour or highly contrasting colour combination (such as yellow-black or red-white).	
Value	concretePaving													
Description	A set or paving of pavers or tiles in concrete material covering cables or pipes.													
Value	net													
Description	Warning net for protection of cables and pipes.													
Value	tape													
Description	Caution tape (also known as warning tape) is a resilient plastic tape of a signal colour or highly contrasting colour combination (such as yellow-black or red-white).													

5.4.11 WaterAppurtenanceTypeValue

Name	WaterAppurtenanceTypeValue									
Definition	Classification of water appurtenances.									
Description	Codelist containing values for the <i>appurtenanceType</i> property.									
URI	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue									
Usage	appurtenanceType									
Contents	<table border="1"> <tr> <td>Value</td> <td>airRelieveValve</td> </tr> <tr> <td>Description</td> <td>Air relieve valve.</td> </tr> </table> <table border="1"> <tr> <td>Value</td> <td>checkValve</td> </tr> <tr> <td>Description</td> <td>Check valve.</td> </tr> </table>	Value	airRelieveValve	Description	Air relieve valve.	Value	checkValve	Description	Check valve.	
Value	airRelieveValve									
Description	Air relieve valve.									
Value	checkValve									
Description	Check valve.									

	Value	fireHydrant
	Description	Fire hydrant.
	Value	fountain
	Description	Fountain.
	Value	hydrant
	Description	Hydrant.
	Value	meter
	Description	Meter.
	Value	pressureController
	Description	Pressure controller.
	Value	pump
	Description	Pump.
	Value	systemValve
	Description	System valve.
	Value	thrustProtection
	Description	Thrust protection.
	Value	waterExhaustPoint
	Description	Water exhaust point.

5.4.12 WaterTypeValue

Name	WaterTypeValue	
Definition	Classification of water types.	
Description	Codelist containing values for the <code>waterType</code> property.	
URI	http://inspire.ec.europa.eu/codelist/WaterTypeValue	
Usage	<code>waterType</code>	
Contents	Value	potable
	Description	Potable water.
	Value	raw
	Description	Raw water.

	Value	salt
	Description	Salt water.
	Value	treated
	Description	Treated water.



6 Getting started

6.1 Introduction

This chapter contains several tips and tricks to assist in creating XML files according to the IMKL 3 standard. For more detailed examples, we refer to the sample files available online (<https://github.com/belgif/ICEGthema-imkl>).

6.2 IMKL namespace and dependencies

6.2.1 IMKL 3 namespace

The namespace for the IMKL 3 schema is:

<https://vocab.belgif.be/ns/imkl/3.0>

The XSD is available for download at the following URL:

https://vocab.belgif.be/ns/imkl/3.0/imkl_3_0.xsd

6.2.2 Schema imports

To be able to use the IMKL 3 XSD and other required XSDs, they must be defined in the XML that is generated to represent the UtilityNetwork. This can be done as demonstrated in the example below. Notice the declaration of the *imkl* namespace using the URIs as specified above. Schemas that are not used can be removed from the import.

Example of namespace declaration:

```
<gml:FeatureCollection
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:act-core="http://inspire.ec.europa.eu/schemas/act-core/4.0"
  xmlns:us-net-common="http://inspire.ec.europa.eu/schemas/us-net-common/4.0"
  xmlns:us-net-el="http://inspire.ec.europa.eu/schemas/us-net-el/4.0"
  xmlns:us-net-tc="http://inspire.ec.europa.eu/schemas/us-net-tc/4.0"
  xmlns:us-net-ogc="http://inspire.ec.europa.eu/schemas/us-net-ogc/4.0"
  xmlns:us-net-sw="http://inspire.ec.europa.eu/schemas/us-net-sw/4.0"
  xmlns:us-net-wa="http://inspire.ec.europa.eu/schemas/us-net-wa/4.0"
  xmlns:us-net-th="http://inspire.ec.europa.eu/schemas/us-net-th/4.0"
  xmlns:net="http://inspire.ec.europa.eu/schemas/net/4.0"
  xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3"
  xmlns:base2="http://inspire.ec.europa.eu/schemas/base2/2.0"
  xmlns:imkl="https://vocab.belgif.be/ns/imkl/3.0"
```

```

xsi:schemaLocation="https://vocab.belgif.be/ns/imkl/3.0
https://vocab.belgif.be/ns/imkl/3.0/imkl_3_0.xsd"
xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:gmd="http://www.isotc211.org/2005/gmd">

```

6.3 CDATA tags

In IMKL 3.0 documents, the use of CDATA tags is not allowed.

6.4 Language

In IMKL 3, the English language is used for all items specified in the data model (e.g. objects, properties, codelist values). However, various elements allow for the specification of free text, such as the disclaimer, labels, descriptions or the colour of cables or pipes. For these properties it is required to indicate the language of the free text in these elements. The supported languages are German (#de), English (#en), French (#fr), or Dutch (#nl). For these language-specific free text fields it is also possible to provide text in multiple languages (see the example below).

Example of appearance and colour:

```

<imkl:appearance>
  <imkl:colour>
    <gmd:PT_FreeText>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#en">
          White
        </gmd:LocalisedCharacterString>
      </gmd:textGroup>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#nl">
          Wit
        </gmd:LocalisedCharacterString>
      </gmd:textGroup>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#fr">
          Blanc
        </gmd:LocalisedCharacterString>
      </gmd:textGroup>
    </gmd:PT_FreeText>
  </imkl:colour>
</imkl:appearance>

```



Example of description:

```
<imkl:description>
  <gmd:PT_FreeText>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#en">This is an
example</gmd:LocalisedCharacterString>
    </gmd:textGroup>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#nl">Dit is een
voorbeeld</gmd:LocalisedCharacterString>
    </gmd:textGroup>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#fr">Voici un
exemple</gmd:LocalisedCharacterString>
    </gmd:textGroup>
  </gmd:PT_FreeText>
</imkl:description>
```

This representation follows the existing method for displaying text in multiple languages, as defined in the INSPIRE XSDs.

Example of disclaimer:

```
<us-net-common:disclaimer>
  <gmd:PT_FreeText>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#en">Example</gmd:LocalisedCharacterString>
    </gmd:textGroup>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#nl">Voorbeeld</gmd:LocalisedCharacterString>
    </gmd:textGroup>
    <gmd:textGroup>
      <gmd:LocalisedCharacterString locale="#fr">Exemple</gmd:LocalisedCharacterString>
    </gmd:textGroup>
  </gmd:PT_FreeText>
</us-net-common:disclaimer>
```

6.5 Order of elements

The XSD schema of IMKL 3 defines which elements can appear per object and specifies the order of these elements. In general, elements that are inherited from the INSPIRE model come first. Next are the elements that are shared by multiple objects. Elements that are specific for a single object come last. This ordering allows for the reuse of common elements through groups (e.g. imkl:UtilityNodeContainerGroup) which simplifies the XSD.

For the correct order of elements, please refer to the XSD schema itself or to the IMKL 3 data dictionary in chapter 4. These resources provide detailed information on the sequence of elements required for each object.

6.6 nilReason

For certain properties, it is not mandatory to provide a value. If a property is optional, it can be omitted. However, for mandatory properties, this is not allowed, and it is required to specify why no valid value was provided. The following things are required for this:

1. The `xsi:nil` attribute must be provided with a *true* value.
2. The `nilReason` attribute must be provided with a value from the `nilReason` codelist (section 5.4.3).

Which properties allow for a `nilReason` to be provided is detailed in section 4.5.

Example of a `method` element with a `nilReason`:

```
<imkl:method nilReason="unknown" xsi:nil="true" />
```

6.7 Using codelists in IMKL and referencing other objects

6.7.1 Using codelists in IMKL

In IMKL, referencing the value of a codelist is done through the `xlink:href` attribute of the element. The value of this attribute corresponds to the URI of the codelist value.

Some examples:

`appurtenanceType` of an `Appurtenance` object:

```
<us-net-common:appurtenanceType  
xlink:href="http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/sewerNode"  
/>
```

`utilityNetworkType` of a `UtilityNetwork` object:



```
<us-net-common:utilityNetworkType  
xlink:href="http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/sewer" />
```

subtheme of a SewerPipe object:

```
<imkl:subtheme  
xlink:href="https://vocab.belgif.be/auth/IMKL-  
SewerSubthemeValue/sewageWasteWaterPressurePipe" />
```

An exception to this rule is the *us-net-common:verticalPosition* property. In this case, *xlink:href* is not used. Instead, the value is provided directly as the value of the XML element.

verticalPosition of a UtilityNetworkElement:

```
<us-net-common:verticalPosition>onGroundSurface</us-net-common:verticalPosition>
```

6.7.2 Referencing other objects

In various sections of IMKL, it is necessary to include references to other IMKL objects, such as when listing all elements of a *UtilityNetwork* (via the *elements* property). This is achieved in the same manner as referencing codelist values, by utilizing the *xlink:href* attribute.

The URI for the referenced object is structured as follows:

[IMKL 3 namespace]/[object type]/[object namespace]:[object localId]

For example, referencing an *Appurtenance* object with a namespace of *telecom-be* and a localId of *001*, from a *UtilityNetwork*, is done like this:

```
<net:elements xlink:href="https://vocab.belgif.be/ns/imkl/3.0/Appurtenance/telecom-  
be:001" />
```

6.8 Geometry

6.8.1 Overview

When representing geometries in IMKL 3, the following rules apply:

- The coordinate reference system to be used is Lambert2008.
- Z-coordinates are allowed (2.5D), although their inclusion alongside XY-coordinates is optional.
- The *srsDimension* attribute is mandatory.

These changes are further explained in sections 6.8.2 and 6.8.3.

6.8.2 Coordinate reference system

In IMKL 3, Lambert2008 (EPSG:3812) is used as the coordinate reference system for all geometries.

To specify the correct coordinate reference system, use the *srsName* attribute.

```
srsName="http://spatialreference.org/ref/epsg/3812/"
```

6.8.3 2.5D and *srsDimension*

IMKL 3 supports the inclusion of 2.5D coordinates. This means Z-coordinates can be provided when available. The value of the Z-coordinates should correspond with the TAW/DNG level (EPSG:5710). However, to provide depth information, it is recommended to include the *StandardCoverageDetail*, *DepthDetail* and *CoverageDetail* objects.

Note that only one Z-coordinate is required for every XY-coordinate pair. Therefore, in the context of IMKL 3 this is referred to as 2.5D rather than a true 3D representation of objects. The interpretation of the Z-coordinate should follow the same guidelines as those of the verticalPosition (section 6.10).

To differentiate between geometries specified in 2D and those in 2.5D, the *srsDimension* attribute must be added. For 2D coordinates, set *srsDimension* to 2. For 2.5D coordinates, set *srsDimension* to 3. Although the usage of 2.5D coordinates is optional, the *srsDimension* attribute itself is mandatory.

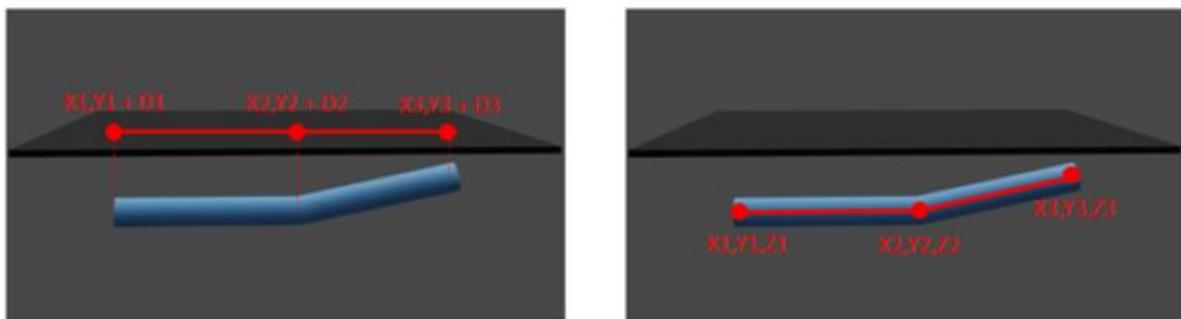


Figure 1 - 2D + depth (left) vs 2.5D (right)

Example of 2D coordinates:

```
<net:centrelineGeometry>
  <gml:LineString srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
    <gml:posList>603516 692178 603576 692157</gml:posList>
  </gml:LineString>
</net:centrelineGeometry>
```

Example of 2.5D coordinates:

```
<net:centrelineGeometry>
  <gml:LineString srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="3">
    <gml:posList>603516 692178 20 603576 692157 20</gml:posList>
  </gml:LineString>
</net:centrelineGeometry>
```



Note that `srsDimension` with value 1 is also possible. This is the case when specifying a TAW/DNG level (Tweede Algemene Waterpassing / Deuxième Nivellement General). Here, EPSG:5710 is used. See section 6.10.2 for more information.

Example of a TAW/DNG level:

```
<imkl:verticalPosition srsName="http://spatialreference.org/ref/epsg/5710/"  
srsDimension="1">22.02</imkl:verticalPosition>
```

6.9 Survey

In IMKL 3, elements of type *Survey* are used for objects where location, depth or vertical position information can be specified. This *Survey* element allows for the following data to be provided:

- **method:** Specifies the method used to determine the location, depth or vertical position. This element is mandatory but it can be empty and have a *nilReason*.
- **recordedBy:** Indicates the person or organization who conducted the survey. This element is optional.
- **date:** Specifies the date when the survey was conducted. This element is optional.
- **accuracy:** Provides the accuracy with which the location, depth or vertical position was determined. This element is mandatory but it can be empty and have a *nilReason*.

The *Survey* type is utilized in various places across IMKL 3. The name of the element varies depending on the object it applies to, ensuring clarity in interpretation. For example:

- *ActivityComplex* includes a *geometry* and a *geometrySurvey*. The *geometrySurvey* applies to the *geometry*.
- *ExtraPlan* has a *location* and a *locationSurvey*. The *locationSurvey* applies to the *location*.
- *DepthDetail* includes a *verticalPosition*, *depth* or *height* and a *verticalPositionSurvey*. The *verticalPositionSurvey* applies to either the *verticalPosition*, *depth* or *height*.

A *Survey* element is available for objects with a geometry, excluding *Annotations*. It is mandatory for all cables, pipes, ducts, appurtenances, towers, poles, cabinets and manholes. For other objects it is optional.

6.10 DepthDetail and CoverageDetail

6.10.1 DepthDetail vs CoverageDetail

In IMKL 3, a *DepthDetail* object should be used for elements with a point geometry. It can be used to represent both a relative depth as well as a TAW/DNG level. For elements with a point geometry the depth or vertical position information should be interpreted as the lowest point of the element.

Elements with a point geometry are:

- Appurtenance
- Connection
- Tower
- Pole
- Cabinet
- Manhole

A *CoverageDetail* object should be used for elements with a line geometry. For these elements the depth or vertical position information should be interpreted as the highest part of the element.

Elements with a line geometry (via the referenced *UtilityLinks*) are:



- ElectricityCable
- TelecommunicationsCable
- Pipe
- OilGasChemicalsPipe
- SewerPipe
- WaterPipe
- ThermalPipe
- Duct

Since *DepthDetail* is applicable only for elements with a point geometry, it is not possible to provide a *location* or *locationSurvey* together with the *DepthDetail*. On the other hand, it is required to provide a *location* and *locationSurvey* in the *CoverageDetail* object. Without a location it would not be clear to which location along the trajectory of the line the *CoverageDetail* information applies.

6.10.2 depth, height and verticalPosition

Every *DepthDetail* or *CoverageDetail* object should have exactly one of the following element:

- **depth:** The *depth* element represents the depth below the reference surface. A *uom* attribute must be included for this element.
- **height:** The *height* element is similar to the *depth*, but it represents a height above the reference surface. A *uom* attribute must be included for this element.
- **verticalPosition:** The *verticalPosition* element should be used to provide a TAW/DNG level. Note that the *srsName* and *srsDimension* attributes are required for this element.

Example of depth:

```
<imkl:depth uom="urn:ogc:def:uom:OGC::cm">100</imkl:depth>
```

Example of height:

```
<imkl:height uom="urn:ogc:def:uom:OGC::cm">100</imkl:height>
```

Example of verticalPosition:

```
<imkl:verticalPosition  
    srsName="http://spatialreference.org/ref/epsg/5710/"  
    srsDimension="1">21.65  
</imkl:verticalPosition>
```

6.10.3 verticalPositionSurvey

Every *DepthDetail* and *CoverageDetail* object should have a *verticalPositionSurvey* element. This element is of type *Survey* and provides additional information on the *depth*, *height* or *verticalPosition*.



Example of verticalPositionSurvey:

```
<imkl:verticalPositionSurvey>
  <imkl:method nilReason="missing" xsi:nil="true" />
  <imkl:date>2001-12-17T09:30:47Z</imkl:date>
  <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">30</imkl:accuracy>
</imkl:verticalPositionSurvey>
```

6.10.4 referenceSurface

Every *DepthDetail* and *CoverageDetail* object has an element called *referenceSurface*. This element is mandatory and needs to have at least a *referenceSurfaceType* child element. This *referenceSurfaceType* element indicates the type of the reference surface. It should always be of type *surfaceLevel*.

Next to the *referenceSurfaceType* child element, the *referenceSurface* can have the following optional child elements:

- **verticalPosition:** The *verticalPosition* element can be used to indicate the TAW/DNG level of the reference surface at the given location. If no location is given for the reference surface, it is assumed that the location is the same as the location of the *UtilityNetworkElement* or *CoverageDetail* object itself.
- **verticalPositionSurvey:** The *verticalPositionSurvey* element is of type *Survey* and can be used to provide additional information on how the *verticalPosition* was determined. It can be used to provide for example the date the vertical position of the reference surface was determined.
- **location:** The *location* element can be used if the location where the TAW/DNG level of the reference surface was determined is not the same as that of the *UtilityNetworkElement* or *CoverageDetail* object it is linked to.
- **locationSurvey:** The *locationSurvey* element is of type *Survey* and can be used to provide additional information on how the location of the reference surface was determined.

Example of referenceSurface:

```
<imkl:referenceSurface>
  <imkl:referenceSurfaceType xlink:href="https://vocab.belgif.be/auth/IMKL-
ReferenceSurfaceTypeValue/surfaceLevel" />
  <imkl:verticalPosition srsName="http://spatialreference.org/ref/epsg/5710/">
    <srsDimension>1</srsDimension>22.02</imkl:verticalPosition>
  <imkl:verticalPositionSurvey>
    <imkl:method nilReason="unknown" xsi:nil="true" />
    <imkl:date>2001-12-17T09:30:47Z</imkl:date>
    <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm" nilReason="unknown">
      xsi:nil="true" </imkl:accuracy>
```



```
</imkl:verticalPositionSurvey>
</imkl:referenceSurface>
```

6.10.5 Associations

A single *DepthDetail* or *CoverageDetail* object can be linked to multiple *UtilityNetworkElement* objects. If multiple *UtilityNetworkElement* objects have the same depth, height or vertical position information, the *DepthDetail* or *CoverageDetail* can be reused and needs to be provided only once. This means a *DepthDetail* or *CoverageDetail* object can have as many *on* elements as needed.

6.11 StandardCoverageDetail

The *StandardCoverageDetail* object can be used to provide one or more standard coverages for the *UtilityNetwork*. *StandardCoverageDetail* is similar to the *CoverageDetail* object, but with the following differences:

- Because a standard coverage is not limited to specific *UtilityNetworkElement* objects there is no need to provide a specific location. Hence, there is no option to add the *location* or *locationSurvey* elements.
- Because a standard coverage is not linked to specific *UtilityNetworkElement* objects there is no *on* association.
- There is an extra element called *subtheme*. If there are different standard coverages depending on the subtheme of *Cable*, *Pipe* or *Duct* objects, it is possible to provide multiple standard coverages for a single *UtilityNetwork*. Via the *subtheme* element you can specify for which subtheme(s) the standard coverage should be used.
There should be at most one standard coverage per subtheme. There can also be at most one standard coverage without a subtheme per *UtilityNetwork*. The *StandardCoverageDetail* without subtheme will be used as the standard coverage for all *Cable*, *Pipe* or *Duct* objects that do not have a standard coverage for their subtheme or that do not have an element specific coverage detail.

Example of StandardCoverageDetail:

```
<imkl:StandardCoverageDetail gml:id="ID_be8fc9cc-775f-4469-a8ce-bf1c892e5e14">
  <imkl:imklId>
    <base:Identifier>
      <base:localId>DD001</base:localId>
      <base:namespace>sewercom-be</base:namespace>
    </base:Identifier>
```

```

</imkl:imklId>
<imkl:beginLifespanVersion>2001-12-17T09:30:47Z</imkl:beginLifespanVersion>
<imkl:referenceSurface>
  <imkl:referenceSurfaceType xlink:href="https://vocab.belgif.be/auth/IMKL-
ReferenceSurfaceTypeValue/surfaceLevel" />
</imkl:referenceSurface>
<imkl:depth uom="urn:ogc:def:uom:OGC::cm">100</imkl:depth>
<imkl:verticalPositionSurvey>
  <imkl:method nilReason="missing" xsi:nil="true" />
  <imkl:date>2001-12-17T09:30:47Z</imkl:date>
  <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">30</imkl:accuracy>
</imkl:verticalPositionSurvey>
<imkl:inNetwork
  xlink:href=" https://vocab.belgif.be/ns/imkl/3.0/UtilityNetwork/sewercom-be:001" />
</imkl:StandardCoverageDetail>

```

6.12 Connection

Connections are a specific type of *Appurtenance*. They represent the connection of *Cable* or *Pipe* objects to a building or other physical object. Compared to *Appurtenance* objects, *Connection* objects include one additional, but optional, element called *address*. The *address* element includes the following child elements:

- **municipalityName:** The *municipalityName* element is mandatory. The *municipality* is a language-specific string.
- **streetName:** The *streetName* element is mandatory. The *streetName* is a language-specific string.
- **houseNumber:** The *houseNumber* element is optional. The *houseNumber* is a simple string.
- **postalCode:** The *postalCode* element is optional. The *postalCode* is a simple string.

A *Connection* object must have one of the following *appurtenanceTypes*:

- WaterAppurtenanceTypeIMKLValue – deliveryPoint
- ThermalAppurtenanceTypeIMKLValue – deliveryPoint
- ElectricityAppurtenanceTypeValue – deliveryPoint
- OilGasChemicalsAppurtenanceTypeValue – deliveryPoint
- TelecommunicationsAppurtenanceTypeIMKLValue – termination
- SewerAppurtenanceTypeIMKLValue – deliveryPoint



Example of an address:

```
<imkl:address>
  <imkl:municipalityName>
    <gmd:PT_FreeText>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#fr">Gand</gmd:LocalisedCharacterString>
      </gmd:textGroup>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#nl">Gent</gmd:LocalisedCharacterString>
      </gmd:textGroup>
    </gmd:PT_FreeText>
  </imkl:municipalityName>
  <imkl:streetName>
    <gmd:PT_FreeText>
      <gmd:textGroup>
        <gmd:LocalisedCharacterString locale="#nl">Koningin
Fabiolaan</gmd:LocalisedCharacterString>
      </gmd:textGroup>
    </gmd:PT_FreeText>
  </imkl:streetName>
  <imkl:houseNumber>5</imkl:houseNumber>
  <imkl:postalCode>9000</imkl:postalCode>
</imkl:address>
```

7 Best practices

7.1 Introduction

This section outlines several best practices for providing specific information in IMKL 3. These recommendations aim to enhance clarity and consistency in data representation.

7.2 Contact information

Contact information should be provided via the *imkl:authorityRole* element of a *UtilityNetwork*. Contact information should only be provided via the designated fields (name, phone, email). The phone number should include the country code. The email address should be an actively monitored email address. Do not use a *noreply* address.

The purpose of this contact information is to give users the ability to reach out to someone who can answer technical questions about elements of the utility network.

7.3 Disclaimer

A disclaimer can be provided via the *us-net-common:disclaimer* element of a *UtilityNetwork*. Keep the disclaimer concise. Detailed disclaimers should be provided through an attached *Document* with the type *precaution* (section 7.7).

7.4 Utility Network Elements

Cables, Pipes and Ducts should be drawn as accurately as possible. The geometries should be provided via *UtilityLink* objects. All properties should be provided in IMKL via the designated objects and properties. This ensures that users can easily access this information. Do not assume that a user will always review attached *ExtraPlan* objects.

Appurtenances should be designated with the most appropriate *appurtenanceType*. Provide a clear description when the *other* type is used.

7.5 ActivityComplex

Use an *ActivityComplex* object for:

- Sites with a complex network of cables, pipes and ducts.
- Large underground structures that do not have their own IMKL object (e.g. un underground water container).

Clearly indicate the function of the *ActivityComplex* via the *function* element. Via the *function* element the activity and a description can be provided (section 4.4.4).



7.6 Depth and vertical position

Depth or vertical position information that deviates from the standard coverage should be provided via designated *DepthDetail* or *CoverageDetail* objects. This ensures that users can easily access this information. Do not assume that a user will always review attached *ExtraPlan* objects.

7.7 Precautions

A *UtilityNetwork* object can reference *Document* objects. These *Document* objects can include the safety precautions that need to be taken into account for elements within the *UtilityNetwork*. A *Document* object representing a precaution must have its *documentType* set to *precaution*. The *precaution* value is one of the options of the *DocumentTypeValue* codelist and should be used for this purpose. It should not be used for *ExtraPlans*.

Example of a “precaution” Document:

```
<gml:featureMember>
  <imkl:UtilityNetwork gml:id="ID_230dbcf3-4fb9-4118-9f57-b2f370f04107">
    ...
    <imkl:imklId>
      <base:Identifier>
        <base:localId>001</base:localId>
        <base:namespace>aquacom-be</base:namespace>
      </base:Identifier>
    </imkl:imklId>
    ...
    <imkl:documentation xlink:href="https://vocab.belgif.be/ns/imkl/3.0
/Document/aquacom-be:D001" />
  </imkl:UtilityNetwork>
</gml:featureMember>

<gml:featureMember>
  <imkl:Document gml:id="ID_5b5e7f28-c98d-4bfd-bf0f-33e5c3ccb9c8">
    <imkl:imklId>
      <base:Identifier>
        <base:localId>D001</base:localId>
        <base:namespace>aquacom-be</base:namespace>
      </base:Identifier>
    </imkl:imklId>
    <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
    <imkl:documentType xlink:href="https://vocab.belgif.be/auth/IMKL-
DocumentTypeValue/precaution" />
```

```

<imkl:documentLocation>Voorzorgsmaatregelen.pdf</imkl:documentLocation>
<imkl:documentMediaType xlink:href="https://vocab.belgif.be/auth/IMKL-
DocumentMediaTypeValue/PDF" />
<imkl:inNetwork xlink:href="https://vocab.belgif.be/ns/imkl/3.0
/UtilityNetwork/aquacom-be:001" />
</imkl:Document>
</gml:featureMember>
```

7.8 ExtraPlan

Through *ExtraPlan* objects, it is possible to add additional information via attached documents. The purpose of an *ExtraPlan* is to provide information that cannot be included in any other way within IMKL. Cables, pipes, and other objects should primarily be included as objects in the IMKL XML document, with all mandatory properties. In other words, it is not intended for these objects to be provided solely via an *ExtraPlan*.

Documents containing safety instructions are not *ExtraPlans*. These documents should be provided as *Document* with the correct *documentType* (section 7.7).

7.9 Directional drillings

In IMKL 2.3, there was no direct method to indicate that a cable, pipe or duct was installed using directional drilling (*gestuurde boring*). The only method available was to add an *ExtraPlan* with the *extraPlanType* set to *gestuurdeBoring*.

In IMKL 3, the *constructionTechnique* element should be used to specify that a cable, pipe or duct is installed via a directional drilling by setting its value to *directionalDrilling*.

It is strongly recommended to include the *constructionTechnique* element with the correct value when the construction technique is known. This allows elements with a specific construction technique to be visualized distinctly so they can be easily identified when looking at the map.

The *DocumentTypeValue* codelist in IMKL 3 also includes the option *directionalDrilling*. This allows for the addition of *ExtraPlans* providing additional documentation for a directional drilling. For these *ExtraPlans* the *documentType* should be set to *directionalDrilling*. If the *ExtraPlan* contains information in addition to directional drilling information, use the type *directionalDrilling*. However, in this case, it is recommended to split the *ExtraPlan*.

An *ExtraPlan* with its *documentType* set to *directionalDrilling* must be linked to a cable, pipe or duct whose *constructionTechnique* is set to *directionalDrilling*. Having an *ExtraPlan* with a *documentType* of *directionalDrilling* linked to an object with a different *constructionTechnique* is not valid.

Example of a directional drilling:

```

<gml:featureMember>
<imkl:Duct gml:id="ID_83dd154b-a708-4d93-bbe0-173f46e896da">
<net:beginLifespanVersion>2001-12-17T09:30:47.0Z</net:beginLifespanVersion>
<net:inspireId>
```



```
<base:Identifier>
  <base:localId>D001</base:localId>
  <base:namespace>telecom-be</base:namespace>
</base:Identifier>
</net:inspireId>
...
<imkl:constructionTechnique
  xlink:href="https://vocab.belgif.be/auth/IMKL-
ConstructionTechniqueValue/directionalDrilling" />
...
</imkl:Duct>
</gml:featureMember>
```

If a *Cable* or *Pipe* is installed via a combination of *open trench* and *directional drilling* construction techniques, the following approach is recommended:

- Provide a single *Cable* or *Pipe* object representing the entire trajectory of the *Cable* or *Pipe*, and set its *constructionTechnique* to *openTrench*.
- For each section of the *Cable* or *Pipe* where directional drilling is used, provide a *Duct* object and set the *constructionTechnique* of this object to *directionalDrilling*. Link the *Cables* or *Pipes* passing through the directional drilling to these *Duct* objects via the *cables* or *pipes* element of the *Duct*.

An alternative method is to specify the *directional drilling* construction technique directly on the *Cable* or *Pipe* itself. However, if the construction technique is not the same for the entire *Cable* or *Pipe* (e.g., a combination of open trench and directional drilling), this requires splitting the *Cable* or *Pipe* into segments, so that each segment has the correct construction technique assigned.

Example of a Cable with a combination of *openTrench* and *directionalDrilling* techniques:

```
<imkl:TelecommunicationsCable>
  <net:inspireId>
    <base:Identifier>
      <base:localId>001</base:localId>
      <base:namespace>telecom-be</base:namespace>
    </base:Identifier>
  </net:inspireId>
  <net:link xlink:href=" https://vocab.belgif.be/ns/imkl/3.0/UtilityLink/electricitycom-
be:002" />
  <imkl:constructionTechnique xlink:href="https://vocab.belgif.be/auth/IMKL-
ConstructionTechniqueValue/openTrench" />
</imkl:TelecommunicationsCable>

<imkl:Duct>
```

```
<net:inspireId>
  <base:Identifier>
    <base:localId>D001</base:localId>
    <base:namespace>electricitycom-be</base:namespace>
  </base:Identifier>
</net:inspireId>
<net:link xlink:href="https://vocab.belgif.be/ns/imkl/3.0/UtilityLink/telecom-be:004">
</>
<us-net-common:cables xlink:href="https://vocab.belgif.be/ns/imkl/3.0/TelecommunicationsCable/telecom-be:001" />
<imkl:constructionTechnique
  xlink:href="https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/directionalDrilling" />
</imkl:Duct>
```

7.10 Measurement points and drinking water extraction points

In some utility networks, measurement locations play an important role in measuring or monitoring specific values, such as groundwater levels. These measurement points are typically vertical drillings.

In IMKL 3, the recommended way to represent these utility network elements is by including them as *Appurtenance* objects. The following information can be provided for each measurement point:

- **Location:** The location should be provided as a 2D or 2.5D point.
- **Depth:** The depth of the *Appurtenance* can be provided by adding a *depthDetail* element. As explained in section 6.10, this depth should be interpreted as the lowest point of the *Appurtenance* (the total depth of the vertical drilling in this case).
- **Height:** An optional *height* element can be included to provide information on the total height of the *Appurtenance*, for example if some part extends above the surface.

Note: The *height* element refers to the height of the object itself and does not indicate the vertical position of the object. Therefore, the height mentioned here is different from the height described in section 6.10.2.

- **Type:** The *appurtenanceType* element should be set to *measurementPoint*. This value is available in the following codelists: *OilGasChemicalsAppurtenanceTypeIMKLValue*, *SewerAppurtenanceTypeIMKLValue*, *WaterAppurtenanceTypeIMKLValue* and *ThermalAppurtenanceTypeIMKLValue*.

Extraction points for drinking water share similarities with measurement points, as both can be included as *Appurtenance* objects within IMKL 3. However, for these objects the *appurtenanceType* should be set to *drinkingWaterExtractionPoint*, which is available in the *WaterAppurtenanceTypeIMKLValue* codelist.



7.11 Connection lines

Connection lines are the lines that link the distribution network to the end customer. Since these lines are typically located on the customer's property, it can be useful to differentiate them from the network operator's distribution network. To facilitate this, a specific *utilityDeliveryType* is provided: *connection*. Note that the *connection* option is not part of the *UtilityDeliveryTypeValue* codelist from INSPIRE, but belongs to an IMKL-specific codelist: *UtilityDeliveryTypeIMKLValue*.

At the end of the connection line, a *Connection* object can be included to provide the address details of the connection.

7.12 Vaulted waterways

The recommended way to include underground, vaulted waterways in IMKL is as *SewerPipe* objects with the value *waterDrainageArchedWaterways* for the *subtheme* property. The property *sewerWaterType* should be given the value *storm*. The width of the vaulted waterways can be included via the *pipeDiameter* property.

8 Codelist URIs

Theme	URI
AnnotationTypeValue	
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/annotationLabel
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/annotationLine
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/arrow
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/dimensioningGuideline
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/dimensioningLabel
common	https://vocab.belgif.be/auth/IMKL-AnnotationTypeValue/dimensioningLine
ConditionOfFacilityValue	
common	http://inspire.ec.europa.eu/codelist/ConditionOfFacilityValue/disused
common	http://inspire.ec.europa.eu/codelist/ConditionOfFacilityValue/functional
common	http://inspire.ec.europa.eu/codelist/ConditionOfFacilityValue/projected
common	http://inspire.ec.europa.eu/codelist/ConditionOfFacilityValue/underConstruction
ConstructionTechniqueValue	
common	https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/culvert
common	https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/directionalDrilling
common	https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/openTrench
common	https://vocab.belgif.be/auth/IMKL-ConstructionTechniqueValue/other
ContainerTypeValue	
common	https://vocab.belgif.be/auth/IMKL-ContainerTypeValue/cableAndPipeGutter
common	https://vocab.belgif.be/auth/IMKL-ContainerTypeValue/jacketPipe
DocumentMediaTypeValue	
common	https://vocab.belgif.be/auth/IMKL-DocumentMediaTypeValue/JPEG
common	https://vocab.belgif.be/auth/IMKL-DocumentMediaTypeValue/PDF
common	https://vocab.belgif.be/auth/IMKL-DocumentMediaTypeValue/PNG
common	https://vocab.belgif.be/auth/IMKL-DocumentMediaTypeValue/TIFF

DocumentTypeValue	
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/crossSection
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/detailedPlan
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/directionalDrilling
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/longitudinalSection
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/other
common	https://vocab.belgif.be/auth/IMKL-DocumentTypeValue/precaution
ElectricityAppurtenanceTypeIMKLValue	
electricity	https://vocab.belgif.be/auth/IMKL-ElectricityAppurtenanceTypeIMKLValue/grounding
electricity	https://vocab.belgif.be/auth/IMKL-ElectricityAppurtenanceTypeIMKLValue/marker
electricity	https://vocab.belgif.be/auth/IMKL-ElectricityAppurtenanceTypeIMKLValue/sleeve
ElectricityAppurtenanceTypeValue	
electricity	http://inspire.ec.europa.eu/codelist/ElectricityAppurtenanceTypeValue/deliveryPoint
electricity	http://inspire.ec.europa.eu/codelist/ElectricityAppurtenanceTypeValue/streetLight
ElectricitySubthemeValue	
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityCathodicProtection
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityDistributionHighVoltage
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityDistributionLowVoltage
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityPublicLighting
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityTrafficEnforcementSystems
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityTrafficLights
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityTransport
electricity	https://vocab.belgif.be/auth/IMKL-ElectricitySubthemeValue/electricityTransportLocal
MaterialTypeValue	
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/brickwork
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/concrete
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/crossLinkPolyethylene
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/ductileCastIron
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/ductileCastIronBlutop
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/fiberCement
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/galvanisedSteel

common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/glassFiberReinforcedPolyester
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/grayCastIron
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/jute
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/lead
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/other
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/polyethylene
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/polyethyleneHighDensity
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/polyethyleneSafetyLine
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/polypropylene
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/polypropyleneSLA
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/prestressedConcrete
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/pvc
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/sideroCement
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/stainlessSteel
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/steel
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/stoneware
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/sulfurConcrete
common	https://vocab.belgif.be/auth/IMKL-MaterialTypeValue/unknown
OilGasChemicalsAppurtenanceTypeIMKLValue	
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/adapter
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/airBeacon
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/blowHole
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/cathodicProtectionInstallation
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/cathodicProtectionMeasurementPoint
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/endCap
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/flange
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/measurementPoint
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/siphon
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/sleeve

oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/sludge
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/stoppoleFitting
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsAppurtenanceTypeIMKLValue/valve
OilGasChemicalsAppurtenanceTypeValue	
oilGasChemicals	http://inspire.ec.europa.eu/codelist/OilGasChemicalsAppurtenanceTypeValue/deliveryPoint
oilGasChemicals	http://inspire.ec.europa.eu/codelist/OilGasChemicalsAppurtenanceTypeValue/marker
oilGasChemicals	http://inspire.ec.europa.eu/codelist/OilGasChemicalsAppurtenanceTypeValue/oilGasChemicalsNode
OilGasChemicalsProductTypeIMKLValue	
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/acetone
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/air
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/argon
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/bioGas
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/butadiene1_2
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/butadiene1_3
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/butane
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/carbonDioxide
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/carbonMonoxide
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/chlorine
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/concrete
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue-crude
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/dichloroethane
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/diesel
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/empty
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/ethylene
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/gasFabricationOfCocs
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/gasHFX
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/gasoil
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/hydrogen
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/isobutane
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/JET-A1
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/kerosene

oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/liquidAmmonia
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/liquidHydrocarbon
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/multiProduct
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/MVC
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/naturalGas
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/nitrogen
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/oxygen
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/phenol
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/propane
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/propylene
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/saltWater
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/sand
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/saumur
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/tetrachloroide
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/unknown
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsProductTypeIMKLValue/water
OilGasChemicalsSubthemeValue	
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsSubthemeValue/naturalGasDistributionLowPressure
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsSubthemeValue/naturalGasDistributionMediumPressure
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsSubthemeValue/naturalGasTransport
oilGasChemicals	https://vocab.belgif.be/auth/IMKL-OilGasChemicalsSubthemeValue/oilGasChemicalsTransport
ProtectedAreaTypeValue	
common	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue/drinkingWaterExtractionArea
common	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue/geothermalInstallation
common	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue/infiltrationArea
common	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue/otherProtectedArea
common	https://vocab.belgif.be/auth/IMKL-ProtectedAreaTypeValue/undergroundGasStorage
ReferenceSurfaceTypeValue	
common	https://vocab.belgif.be/auth/IMKL-ReferenceSurfaceTypeValue/surfaceLevel
SewerAppurtenanceTypeIMKLValue	

sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/cathodicProtectionInstallation
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/cathodicProtectionMeasurementPoint
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/deliveryPoint
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/effluent
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/infiltrationStructure
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/inlet
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/measurementPoint
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/other
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/overflow
sewer	https://vocab.belgif.be/auth/IMKL-SewerAppurtenanceTypeIMKLValue/treatmentSystem
SewerAppurtenanceTypeValue	
sewer	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/catchBasin
sewer	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/dischargeStructure
sewer	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/pump
sewer	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/sewerNode
sewer	http://inspire.ec.europa.eu/codelist/SewerAppurtenanceTypeValue/tideGate
SewerSubthemeValue	
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/sewageWasteWaterGravitationalPipe
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/sewageWasteWaterPressurePipe
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/waterDrainageArchedWaterways
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/waterDrainagePipedCanal
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/waterDrainageSurfaceWaterGravitationalPipe
sewer	https://vocab.belgif.be/auth/IMKL-SewerSubthemeValue/waterDrainageSurfaceWaterPressurePipe
SewerWaterTypeValue	
sewer	http://inspire.ec.europa.eu/codelist/SewerWaterTypeValue/combined
sewer	http://inspire.ec.europa.eu/codelist/SewerWaterTypeValue/reclaimed
sewer	http://inspire.ec.europa.eu/codelist/SewerWaterTypeValue/sanitary
sewer	http://inspire.ec.europa.eu/codelist/SewerWaterTypeValue/storm
SurveyMethodValue	
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/digitizedPlan

common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/gnss
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/lidar
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/measuringTape
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/measuringWheel
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/photogrammetry
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/sketch
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/terrestrial
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/totalStation
common	https://vocab.belgif.be/auth/IMKL-SurveyMethodValue/triangulation
TelecommunicationsAppurtenanceTypeIMKLValue	
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsAppurtenanceTypeIMKLValue/amplifier
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsAppurtenanceTypeIMKLValue/spliceClosure
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsAppurtenanceTypeIMKLValue/splitter
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsAppurtenanceTypeIMKLValue/termination
TelecommunicationsCableMaterialTypeIMKLValue	
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsCableMaterialTypeIMKLValue/coaxial
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsCableMaterialTypeIMKLValue/opticalFiber
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsCableMaterialTypeIMKLValue/other
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsCableMaterialTypeIMKLValue/twistedPair
TelecommunicationsSubthemeValue	
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsSubthemeValue/electronicCommunication
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsSubthemeValue/telecommunicationDistribution
telecommunications	https://vocab.belgif.be/auth/IMKL-TelecommunicationsSubthemeValue/telecommunicationMainline
ThermalAppurtenanceTypeIMKLValue	
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/adapter
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/adapterSingleDualPipe
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/endCap
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/cathodicProtectionInstallation
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/cathodicProtectionMeasurementPoint
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/condensateWell

thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/deliveryPoint
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/dilatationJoint
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/flange
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/leakdetectionInstallation
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/leakdetectionMeasurementPoint
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/measurementPoint
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/siphon
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/sleeve
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/sludge
thermal	https://vocab.belgif.be/auth/IMKL-ThermalAppurtenanceTypeIMKLValue/valve
ThermalProductTypeIMKLValue	
thermal	https://vocab.belgif.be/auth/IMKL-ThermalProductTypeIMKLValue/condensate
thermal	https://vocab.belgif.be/auth/IMKL-ThermalProductTypeIMKLValue/coolingWater
thermal	https://vocab.belgif.be/auth/IMKL-ThermalProductTypeIMKLValue/heatingSteam
thermal	https://vocab.belgif.be/auth/IMKL-ThermalProductTypeIMKLValue/heatingWater
ThermalSubthemeValue	
thermal	https://vocab.belgif.be/auth/IMKL-ThermalSubthemeValue/heatDistribution
thermal	https://vocab.belgif.be/auth/IMKL-ThermalSubthemeValue/heatTransport
thermal	https://vocab.belgif.be/auth/IMKL-ThermalSubthemeValue/steamCondensate
thermal	https://vocab.belgif.be/auth/IMKL-ThermalSubthemeValue/steamTransport
UtilityDeliveryTypeIMKLValue	
common	https://vocab.belgif.be/auth/IMKL-UtilityDeliveryTypeIMKLValue/connection
UtilityDeliveryTypeValue	
common	http://inspire.ec.europa.eu/codelist/UtilityDeliveryTypeValue/collection
common	http://inspire.ec.europa.eu/codelist/UtilityDeliveryTypeValue/distribution
common	http://inspire.ec.europa.eu/codelist/UtilityDeliveryTypeValue/private
common	http://inspire.ec.europa.eu/codelist/UtilityDeliveryTypeValue/transport
UtilityNetworkTypeIMKLValue	
common	https://vocab.belgif.be/auth/IMKL-UtilityNetworkTypeIMKLValue/crossTheme
UtilityNetworkTypeValue	
common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/electricity

common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/oilGasChemical
common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/sewer
common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/telecommunications
common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/thermal
common	http://inspire.ec.europa.eu/codelist/UtilityNetworkTypeValue/water
VerticalPositionValue	
common	http://inspire.ec.europa.eu/codelist/VerticalPositionValue/onGroundSurface
common	http://inspire.ec.europa.eu/codelist/VerticalPositionValue/suspendedOrElevated
common	http://inspire.ec.europa.eu/codelist/VerticalPositionValue/underground
VisibilityTypeValue	
common	https://vocab.belgif.be/auth/IMKL-VisibilityTypeValue/notVisibleAboveGround
common	https://vocab.belgif.be/auth/IMKL-VisibilityTypeValue/visibleAboveGround
WarningTypeIMKLValue	
common	https://vocab.belgif.be/auth/IMKL-WarningTypeIMKLValue/geotextile
common	https://vocab.belgif.be/auth/IMKL-WarningTypeIMKLValue/protectivePlate
WarningTypeValue	
common	http://inspire.ec.europa.eu/codelist/WarningTypeValue/concretePaving
common	http://inspire.ec.europa.eu/codelist/WarningTypeValue/net
common	http://inspire.ec.europa.eu/codelist/WarningTypeValue/tape
WaterAppurtenanceTypeIMKLValue	
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/cathodicProtectionInstallation
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/cathodicProtectionMeasurementPoint
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/connectionValve
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/deliveryPoint
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/drinkingWaterExtractionPoint
water	https://vocab.belgif.be/auth/IMKL-WaterAppurtenanceTypeIMKLValue/measurementPoint
WaterAppurtenanceTypeValue	
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/airRelieveValve
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/checkValve
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/fireHydrant

water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/fountain
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/hydrant
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/meter
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/pressureController
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/pump
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/systemValve
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/thrustProtection
water	http://inspire.ec.europa.eu/codelist/WaterAppurtenanceTypeValue/waterExhaustPoint
WaterSubthemeValue	
water	https://vocab.belgif.be/auth/IMKL-WaterSubthemeValue/drinkingWaterDistribution
water	https://vocab.belgif.be/auth/IMKL-WaterSubthemeValue/drinkingWaterSupply
WaterTypeValue	
water	http://inspire.ec.europa.eu/codelist/WaterTypeValue/potable
water	http://inspire.ec.europa.eu/codelist/WaterTypeValue/raw
water	http://inspire.ec.europa.eu/codelist/WaterTypeValue/salt
water	http://inspire.ec.europa.eu/codelist/WaterTypeValue/treated