athumi
Vlaams Datanutsbedrijf

IMKL Update 3.0
Workshop 4

13/06/2024

Practical arrangements

Sound of audience is **muted** by default

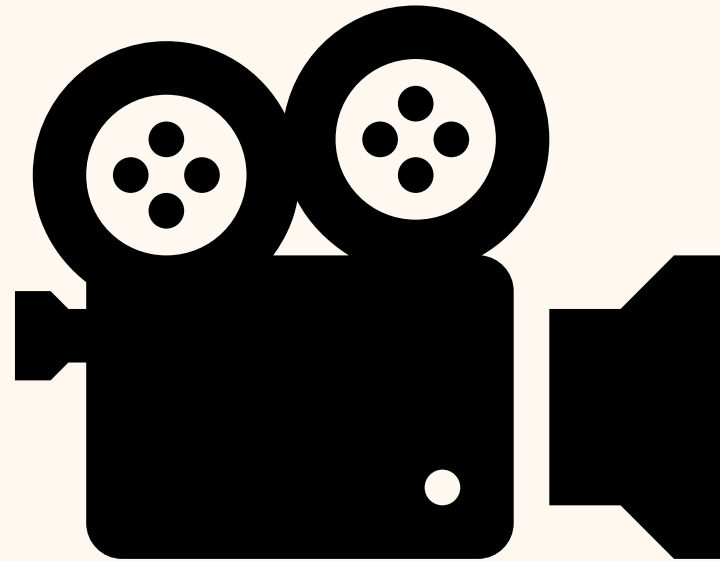Use the **hand** icon if you want to say something. Collaboration is greatly appreciated!

Questions, comments and suggestions can be shared via the chat function. Interaction is encouraged!

Leading language will be **English,** questions can be asked in mother tongue (NL/FR)

Recording?

Agenda

- Decisions and feedback from workshop 3

- Depth & Coverage

- Cardinality of verticalPositionDetail

- Plan (ExtraPlan)

- Document (Voorzorgsmaatregel)

- Connection (Aansluiting)

- Annotation (Annotatie)

- Protected Area (Beschermd Gebied)

- Topographical Element (Extra Topografie)

- Agent

- Construction technique

- Risk

- Next steps

Workshop 3: Decisions and feedback

Decisions workshop 3

- **Survey** will not be nested within us-net-common:geometry. Instead, it will be a sibling of the geometry element.

Option 1: Nested in geometry

```xml
<gml:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
        <base:Identifier>
            <base:localId>M-01</base:localId>
            <base:namespace>Demo</base:namespace>
        </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>
        <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
            <gml:pos>103674.885 192127.454</gml:pos>
        </gml:Point>
        <imkl:survey>
            <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation"/>
            <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01"/>
            <imkl:date>2024-01-01T12:00:00</imkl:date>
            <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
        </imkl:survey>
    </us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</gml:featureMember>
```

Option 2: Sibling of geometry

```xml
<gml:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
        <base:Identifier>
            <base:localId>M-01</base:localId>
            <base:namespace>Demo</base:namespace>
        </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>
        <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
            <gml:pos>103674.885 192127.454</gml:pos>
        </gml:Point>
    </us-net-common:geometry>
    <imkl:locationSurvey>
        <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation"/>
        <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01"/>
        <imkl:date>2024-01-01T12:00:00</imkl:date>
        <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
    </imkl:locationSurvey>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</gml:featureMember>
```

Decisions

- When using a TAW/DNG level in **VerticalPositionDetail**: The **verticalPosition** and **location** (and the corresponding surveys) of the reference surface will be optional.

  If no location is provided we will assume the location is the same as the location of the element it is linked to.

```xml
<imkl:featureMember>
    <imkl:verticalPositionDetail>
        <imkl:imklId>
            <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
                ...
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
        <imkl:referenceSurface>
            <imkl:verticalPosition>
                <imkl:pos srsName="http://spatialreference.org/ref/epsg/5710/" srsDimension="1">
                    22</imkl:pos>
                <imkl:survey>
                    <imkl:method nilReason="missing" xsi:nil="true" />
                    <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01" />
                    <imkl:date>2024-01-01T12:00:00</imkl:date>
                    <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
                </imkl:survey>
            </imkl:verticalPosition>
            <imkl:type xlink:href="http://TODO/ReferenceSurfaceTypeValue/SurfaceLevel" />
            <imkl:location>
                <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                    <gml:pos>103674.885 192127.454</gml:pos>
                </gml:Point>
                <imkl:survey>
                    <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation" />
                    <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01" />
                    <imkl:date>2024-01-01T12:00:00</imkl:date>
                    <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
                </imkl:survey>
            </imkl:location>
        </imkl:referenceSurface>
        <imkl:verticalPosition>
            ...
        </imkl:verticalPosition>
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-01"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:verticalPositionDetail>
</imkl:featureMember>
```
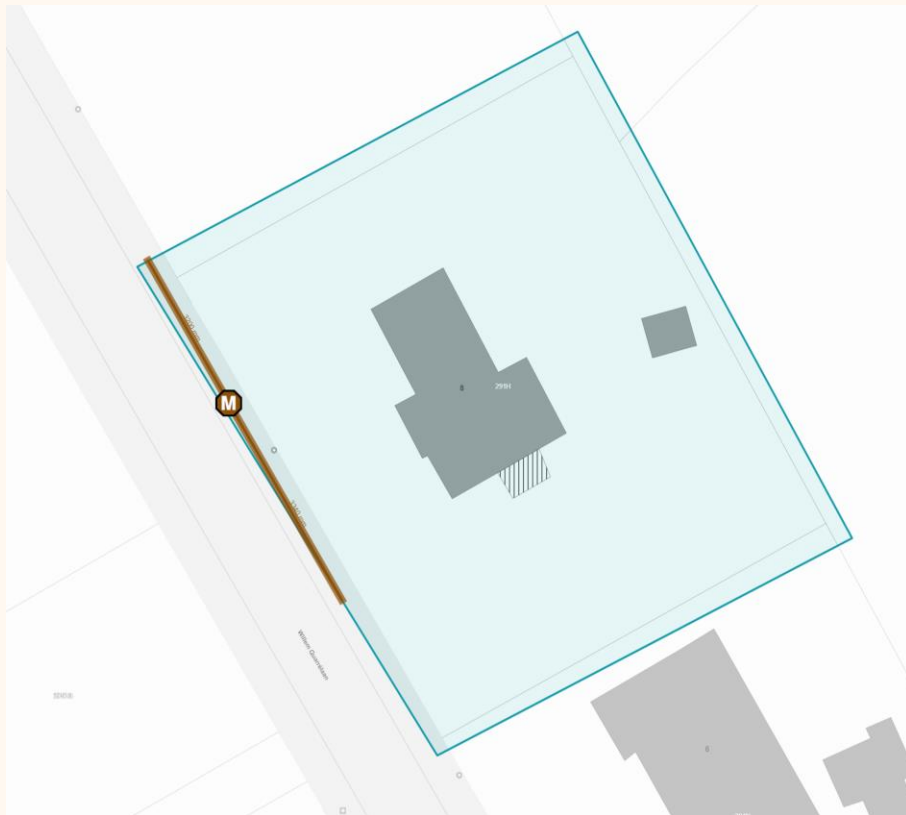
Decisions workshop 3

- Only relative depth information will be allowed as **standard vertical position** of a UtilityNetwork (no TAW/DNG level).

```xml
<imkl:featureMember>
    <imkl:verticalPositionDetail>
        <imkl:imklId>
            <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
                <base:localId>VPD-1</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
        <imkl:referenceSurface>
            <imkl:type xlink:href="http://TODO/ReferenceSurfaceTypeValue/SurfaceLevel" />
        </imkl:referenceSurface>
        <imkl:depth uom="urn:ogc:def:uom:OGC::m">1</imkl:depth>
    <imkl:utilityNetwork
      xlink:href="http://TODO/UtilityNetwork/Demo:UN-01"
      xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:verticalPositionDetail>
</imkl:featureMember>
```

Decisions workshop 3

- **UtilityLinkSequences** (i.e. links with a direction) will **<u>not</u>** be included in IMKL 3.

UtilityLink

UtilityLinkSequence

Decisions workshop 3

- Support for **MultiCurves** in **UtilityLinks** will **not** be included.


```
<imkl:featureMember>
    <us-net-common:UtilityLink>
        <net:beginLifespanVersion>2024-01-01T12:00:00.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>L-01</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <net:centrelineGeometry>
            <gml:MultiCurve srsDimension="2">
                <gml:curveMember>
                    <gml:LineString>
                        <gml:posList>0 0 4 0</gml:posList>
                    </gml:LineString>
                </gml:curveMember>
                <gml:curveMember>
                    <gml:LineString>
                        <gml:posList>6 0 10 0</gml:posList>
                    </gml:LineString>
                </gml:curveMember>
            </gml:MultiCurve>
        </net:centrelineGeometry>
    </us-net-common:UtilityLink>
</imkl:featureMember>
```
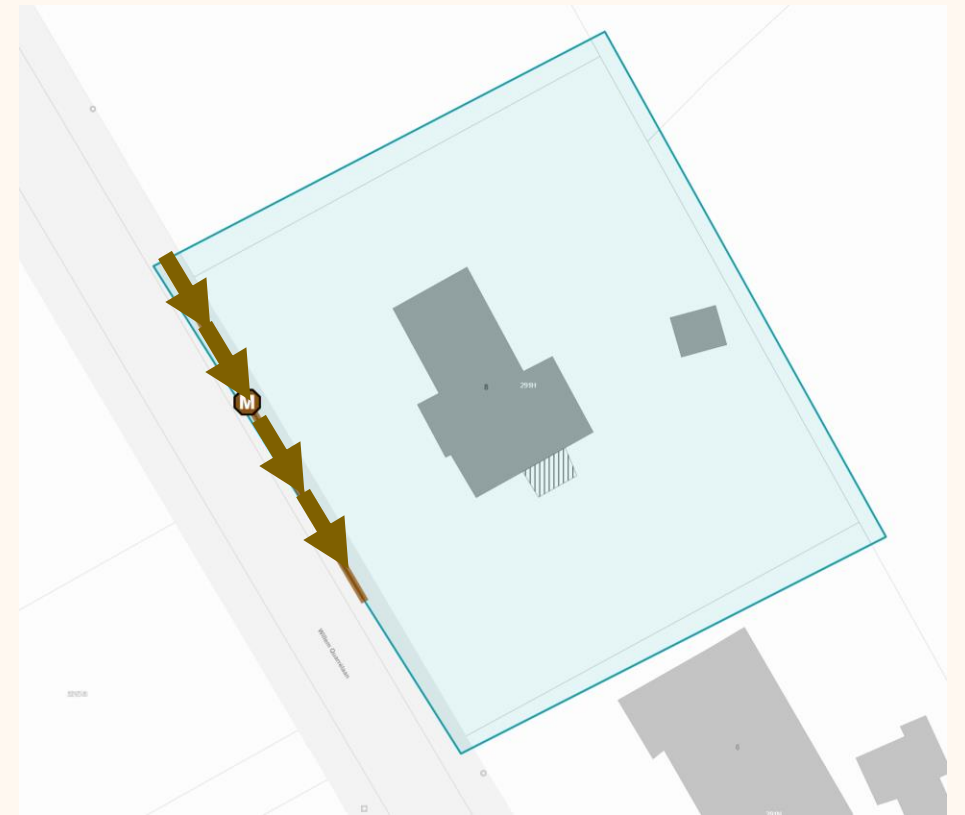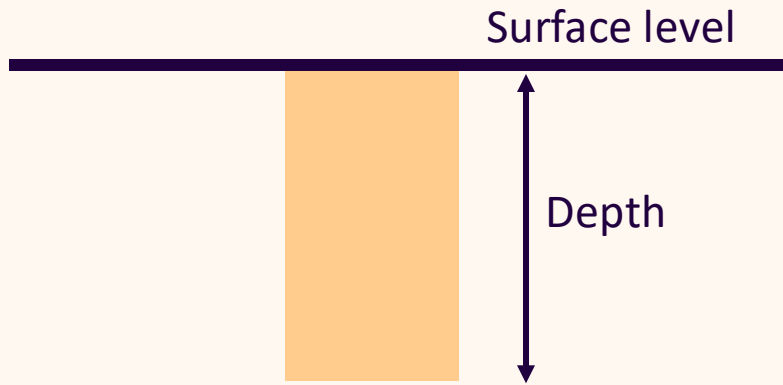
Depth / Coverage

Manhole - verticalPositionDetail

Surface level

Depth

```xml
<imkl:featureMember>
    <imkl:manhole>
        <us-net-common:inspireId>
            <base:Identifier>
                <base:localId>M-01</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </us-net-common:inspireId>
        <us-net-common:geometry>
            <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:pos>103674.885 192127.454</gml:pos>
            </gml:Point>
            <imkl:survey>
                <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation"/>
                <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01"/>
                <imkl:date>2024-01-01T12:00:00</imkl:date>
                <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
            </imkl:survey>
        </us-net-common:geometry>
        <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
        <imkl:verticalPositionDetail
                    xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
                    xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:manhole>
</imkl:featureMember>
```
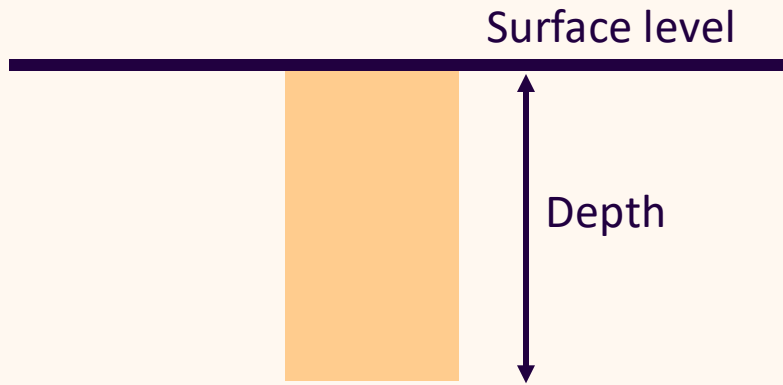
Manhole - verticalPositionDetail

Surface level

Depth

Depth: For elements with a *point* geometry the depth is the **lowest** point of the element (below the surface level).

```xml
<imkl:featureMember>
    <imkl:verticalPositionDetail>
        <imkl:imklId>
            <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
                <base:localId>VPD-1</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
        <imkl:depth uom="urn:ogc:def:uom:OGC::m">1</imkl:depth>
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-01"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:verticalPositionDetail>
</imkl:featureMember>
```
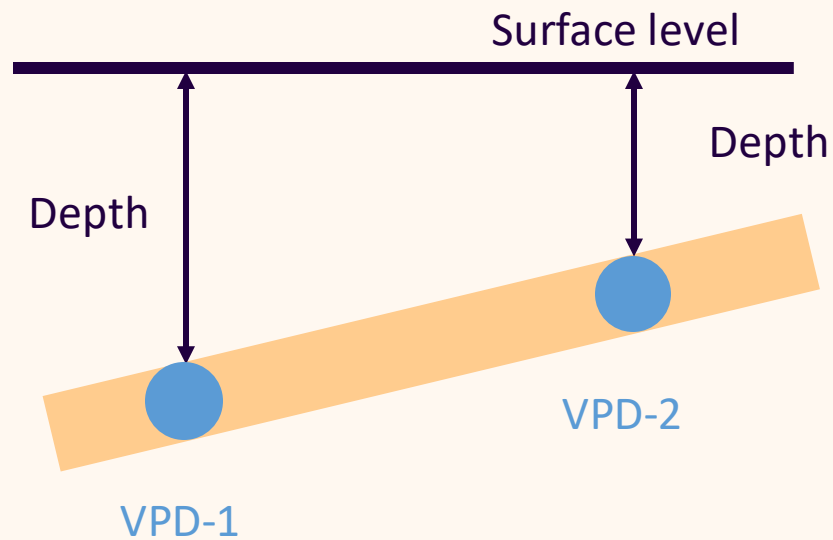
SewerPipe - verticalPositionDetail

Surface level

Depth

Depth

VPD-2

VPD-1

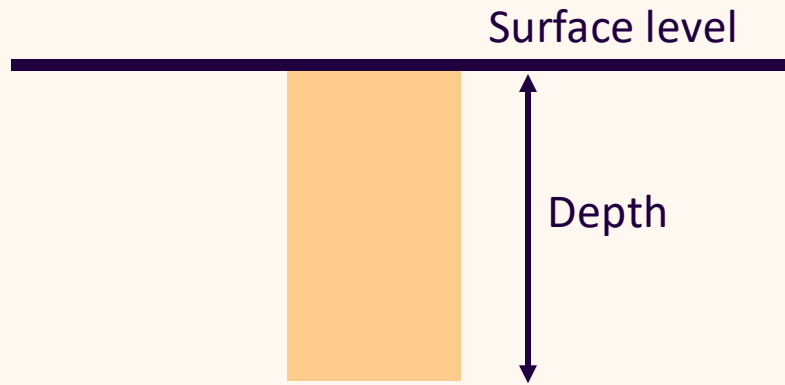**Depth:** For elements with a *line* geometry the depth is the **highest** point of the element (below the surface level).

```xml
<imkl:featureMember>
    <imkl:sewerPipe>
        <us-net-common:inspireId>
            <base:Identifier>
                <base:localId>SP-01</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </us-net-common:inspireId>
        <net:link xlink:href="http://TODO/UtilityLink/Demo:L-01" />
        <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
        <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-2"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <!-- + subtheme, sewerWaterType, ... -->
    </imkl:sewerPipe>
</imkl:featureMember>
```
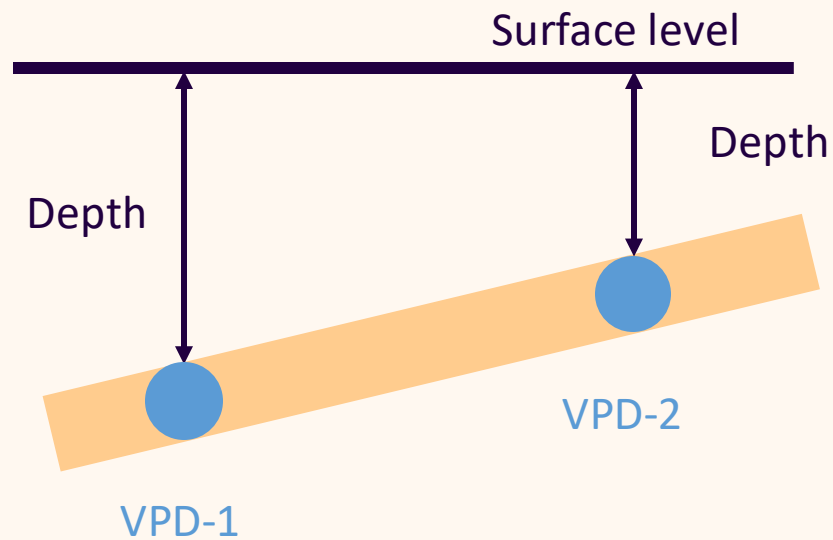
Manhole - verticalPositionDetail

Surface level

Depth

Proposal:
Replace **verticalPositionDetail** with **depthDetail** for UtilityNodes and UtilityNodeContainers

```xml
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
      <base:Identifier>
        <base:localId>M-01</base:localId>
        <base:namespace>Demo</base:namespace>
      </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>
      <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
        <gml:pos>103674.885 192127.454</gml:pos>
      </gml:Point>
      <imkl:survey>
        <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation"/>
        <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01"/>
        <imkl:date>2024-01-01T12:00:00</imkl:date>
        <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
      </imkl:survey>
    </us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:depthDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

SewerPipe - verticalPositionDetail

Surface level

Depth

Depth

VPD-2

VPD-1

Proposal:
Replace **verticalPositionDetail** with
coverageDetail for UtilityLinkSets

```xml
<imkl:featureMember>
    <imkl:sewerPipe>
        <us-net-common:inspireId>
            <base:Identifier>
                <base:localId>SP-01</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </us-net-common:inspireId>
        <net:link xlink:href="http://TODO/UtilityLink/Demo:L-01" />
        <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
        <imkl:coverageDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <imkl:coverageDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-2"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <!-- + subtheme, sewerWaterType, ... -->
    </imkl:sewerPipe>
</imkl:featureMember>
```

UtilityNetwork – standard VerticalPositionDetail


```
<gml:featureMember>
    <imkl:UtilityNetwork>
        ...
        <imkl:standardVerticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <imkl:standardCoverageDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        ...
    </imkl:UtilityNetwork>
</gml:featureMember>
```

Proposal:
Replace **standardVerticalPositionDetail**
with **standardCoverageDetail**

VerticalPositionDetail Cardinality

VerticalPositionDetail - Cardinality

```xml
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
      <base:Identifier>
        <base:localId>M-01</base:localId>
        <base:namespace>Demo</base:namespace>
      </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>
      <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
        <gml:pos>103674.885 192127.454</gml:pos>
      </gml:Point>
      <imkl:survey>
        <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation"/>
        <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01"/>
        <imkl:date>2024-01-01T12:00:00</imkl:date>
        <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
      </imkl:survey>
    </us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
        xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
        xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

```xml
<imkl:featureMember>
  <imkl:verticalPositionDetail>
    <imkl:imklId>
      <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
        <base:localId>VPD-1</base:localId>
        <base:namespace>Demo</base:namespace>
      </base:Identifier>
    </imkl:imklId>
    <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
    <imkl:depth uom="urn:ogc:def:uom:OGC::m">1</imkl:depth>
    <imkl:hasUtilityNetworkElement
        xlink:href="http://TODO/manhole/Demo:M-01"
        xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:verticalPositionDetail>
</imkl:featureMember>
```

In IMKL 2.3 each verticalPositionDetail (RelatieveDiepte/TAWDiepte) was linked with **1 element.**

VerticalPositionDetail - Cardinality

```xml
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
        <base:Identifier>
            <base:localId>M-01</base:localId>
            <base:namespace>Demo</base:namespace>
        </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>...</us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

Proposal:
Allow verticalPositionDetails to be linked to **multiple elements** so they can be reused.

```xml
<imkl:featureMember>
    <imkl:verticalPositionDetail>
        <imkl:imklId>
            <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
                <base:localId>VPD-1</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
        <imkl:depth uom="urn:ogc:def:uom:OGC::m">1</imkl:depth>
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-01"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-02"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:verticalPositionDetail>
</imkl:featureMember>
```

```xml
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
        <base:Identifier>
            <base:localId>M-02</base:localId>
            <base:namespace>Demo</base:namespace>
        </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>...</us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

VerticalPositionDetail - Cardinality

```
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
      <base:Identifier>
        <base:localId>M-01</base:localId>
        <base:namespace>Demo</base:namespace>
      </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>...</us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

Proposal:
Allow verticalPositionDetails to be linked to **multiple elements** so they can be reused.

```
<imkl:featureMember>
    <imkl:verticalPositionDetail>
        <imkl:imklId>
            <base:Identifier xmlns:base="http://inspire.ec.europa.eu/schemas/base/3.3">
                <base:localId>VPD-1</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2000-10-05T00:00:00</imkl:beginLifespanVersion>
        <imkl:depth uom="urn:ogc:def:uom:OGC::m">1</imkl:depth>
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-01"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
        <imkl:hasUtilityNetworkElement
            xlink:href="http://TODO/manhole/Demo:M-02"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
    </imkl:verticalPositionDetail>
</imkl:featureMember>
```

```
<imkl:featureMember>
  <imkl:manhole>
    <us-net-common:inspireId>
      <base:Identifier>
        <base:localId>M-02</base:localId>
        <base:namespace>Demo</base:namespace>
      </base:Identifier>
    </us-net-common:inspireId>
    <us-net-common:geometry>...</us-net-common:geometry>
    <us-net-common:verticalPosition>underground</us-net-common:verticalPosition>
    <imkl:verticalPositionDetail
            xlink:href="http:/TODO/verticalPositionDetail/Demo:VPD-1"
            xmlns:xlink="http://www.w3.org/1999/xlink" />
  </imkl:manhole>
</imkl:featureMember>
```

VerticalPositionDetail - Cardinality

Proposal:
Allow verticalPositionDetails to be linked to **multiple elements** so they can be reused.

Points of attention:

- Both the forward and backward relationships need to be correct.

- In some cases the verticalPositionDetail requires a location (e.g. for UtilityLinkSets). These can only be reused if the same location applies.

Advantages:

- Possibility to reuse verticalPositionDetail elements.

- No breaking change: You can still add 1 verticalPositionDetail per element

Disadvantages:

- ?

ExtraPlan / Plan

ExtraPlan / Plan

IMKL 2.3

An **ExtraPlan** in IMKL 2.3 is an object linked to **UtilityNetworkElements** or a **UtilityNetwork**
It can be used to provide more information via an attached file.

```xml
<gml:featureMember>
    <imkl:ExtraPlan>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>ExtraPlan_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>1900-01-01T00:00:00</imkl:beginLifespanVersion>
        <imkl:label>ExtraPlan 001</imkl:label>
        <imkl:omschrijving />
        <!-- inNetwork: Exact 1 -->
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <!-- opKabelEnLeidingen: 0 of meer -->
        <imkl:opKabelEnLeidingen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/WaterPipe/Demo:WaterPipe_001" />
        <imkl:extraPlanType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/ExtraPlanTypeValue/detailplan" />
        <imkl:bestandLocatie>001.pdf</imkl:bestandLocatie>
        <imkl:bestandMediaType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/BestandMediaTypeValue/PDF" />
        <imkl:ligging>
            <gml:Point gml:id="ID_9ad4bd1e-4164-4f49-831b-5dcb3e559c2e-0"
                srsName="http://spatialreference.org/ref/epsg/31370/" srsDimension="2">
                <gml:pos>176879.34284843697 173961.2857563747</gml:pos>
            </gml:Point>
        </imkl:ligging>
    </imkl:ExtraPlan>
</gml:featureMember>
```

```xml
<gml:featureMember>
    <imkl:WaterPipe>
        <net:beginLifespanVersion>2020-01-23T00:00:00</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>WaterPipe_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/ExtraPlan/Demo:ExtraPlan_001" />
    </imkl:WaterPipe>
</gml:featureMember>
```

ExtraPlan / Plan

IMKL 2.3

A UtilityNetwork can be linked to an ExtraPlan that is applicable to the UtilityNetwork itself.

```xml
<gml:featureMember>
    <imkl:UtilityNetwork>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Network_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:eigenExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/ExtraPlan/Demo:ExtraPlan_002" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/ExtraPlan/Demo:ExtraPlan_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/ExtraPlan/Demo:ExtraPlan_002" />
    </imkl:UtilityNetwork>
</gml:featureMember>
```

```xml
<gml:featureMember>
    <imkl:ExtraPlan>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>ExtraPlan_002</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>1900-01-01T00:00:00</imkl:beginLifespanVersion>
        <imkl:label>ExtraPlan 002</imkl:label>
        <imkl:omschrijving />
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <imkl:heeftUtilityNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <imkl:extraPlanType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/ExtraPlanTypeValue/detailplan" />
        <imkl:bestandLocatie>001.pdf</imkl:bestandLocatie>
        <imkl:bestandMediaType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/BestandMediaTypeValue/PDF" />
        <imkl:ligging>
            ...
        </imkl:ligging>
    </imkl:ExtraPlan>
</gml:featureMember>
```

ExtraPlan / Plan

IMKL 3

In IMKL 3 **ExtraPlan** will be replaced by **Plan**. The property **heeftExtraInformatie** will be replaced by **documentation**.

```
<gml:featureMember>
    <imkl:WaterPipe>
        <net:beginLifespanVersion>2020-01-23T00:00:00</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>WaterPipe_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <imkl:inNetwork
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:documentation
            xlink:href="http:/TODO/Demo:Plan_001" />
    </imkl:WaterPipe>
</gml:featureMember>
```

```
<gml:featureMember>
    <imkl:Plan>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Plan_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>1900-01-01T00:00:00</i
        <imkl:label lang="EN">Plan 001</imkl:label>
        <imkl:label lang="NL">Plan 001</imkl:label>
        <imkl:label lang="FR">Plan 001</imkl:label>
        <imkl:description lang="EN">Example</imkl:description>
        <imkl:description lang="NL">Voorbeeld</imkl:description>
        <imkl:description lang="FR">Exemple</imkl:description>
        <imkl:refersTo
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:refersTo
            xlink:href="http://TODO/Demo:WaterPipe_001" />
        <imkl:documentType
            xlink:href="http://TODO/DocumentTypeValue/detailplan" />
        <imkl:documentLocation>plan001.pdf</imkl:documentLocation>
        <imkl:documentMediaType
            xlink:href="http:/TODO/DocumentMediaTypeValue/PDF" />
        <imkl:location>
            <gml:Point gml:id="ID_9ad4bd1e-4164-4f49-831b-5dcb3e559c2e-0"
                srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:pos>176879.34284843697 173961.2857563747</gml:pos>
            </gml:Point>
        </imkl:location>
        <imkl:locationSurvey>
            <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation" />
            <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01" />
            <imkl:date>2024-01-01T12:00:00</imkl:date>
            <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
        </imkl:locationSurvey>
    </imkl:Plan>
</gml:featureMember>
```

LangString for label and description

locationSurvey will be optional in Plan

ExtraPlan / Plan

IMKL 2.3 vs IMKL 3

IMKL 2.3

```xml
<gml:featureMember>
    <imkl:WaterPipe>
        <net:beginLifespanVersion>2020-01-23T00:00:00</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>WaterPipe_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/ExtraPlan/Demo:ExtraPlan_001" />
    </imkl:WaterPipe>
</gml:featureMember>
```

IMKL 3

```xml
<gml:featureMember>
    <imkl:WaterPipe>
        <net:beginLifespanVersion>2020-01-23T00:00:00</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>WaterPipe_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <imkl:inNetwork
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:documentation
            xlink:href="http://TODO/Demo:Plan_001" />
    </imkl:WaterPipe>
</gml:featureMember>
```

ExtraPlan / Plan

IMKL 2.3 vs IMKL 3

IMKL 2.3

```xml
<gml:featureMember>
    <imkl:ExtraPlan>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>ExtraPlan_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>1900-01-01T00:00:00</imkl:beginLifespanVersion>
        <imkl:label>ExtraPlan 001</imkl:label>
        <imkl:omschrijving />
        <!-- inNetwork: Exact 1 -->
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/UtilityNetwork/Demo:Network_001" />
        <!-- opKabelEnLeidingen: 0 of meer -->
        <imkl:opKabelEnLeidingen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.3/WaterPipe/Demo:WaterPipe_001" />
        <imkl:extraPlanType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/ExtraPlanTypeValue/detailplan" />
        <imkl:bestandLocatie>001.pdf</imkl:bestandLocatie>
        <imkl:bestandMediaType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/BestandMediaTypeValue/PDF" />
        <imkl:ligging>
            <gml:Point gml:id="ID_9ad4bd1e-4164-4f49-831b-5dcb3e559c2e-0"
                srsName="http://spatialreference.org/ref/epsg/31370/" srsDimension="2">
                <gml:pos>176879.34284843697 173961.2857563747</gml:pos>
            </gml:Point>
        </imkl:ligging>
    </imkl:ExtraPlan>
</gml:featureMember>
```

IMKL 3

```xml
<gml:featureMember>
    <imkl:Plan>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Plan_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>1900-01-01T00:00:00</imkl:beginLifespanVersion>
        <imkl:label lang="EN">Plan 001</imkl:label>
        <imkl:label lang="NL">Plan 001</imkl:label>
        <imkl:label lang="FR">Plan 001</imkl:label>
        <imkl:description lang="EN">Example</imkl:description>
        <imkl:description lang="NL">Voorbeeld</imkl:description>
        <imkl:description lang="FR">Exemple</imkl:description>
        <imkl:refersTo
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:refersTo
            xlink:href="http://TODO/Demo:WaterPipe_001" />
        <imkl:documentType
            xlink:href="http://TODO/DocumentTypeValue/detailplan" />
        <imkl:documentLocation>plan001.pdf</imkl:documentLocation>
        <imkl:documentMediaType
            xlink:href="http:/TODO/DocumentMediaTypeValue/PDF" />
        <imkl:location>
            <gml:Point gml:id="ID_9ad4bd1e-4164-4f49-831b-5dcb3e559c2e-0"
                srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:pos>176879.34284843697 173961.2857563747</gml:pos>
            </gml:Point>
        </imkl:location>
        <imkl:locationSurvey>
            <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation" />
            <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:A-01" />
            <imkl:date>2024-01-01T12:00:00</imkl:date>
            <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
        </imkl:locationSurvey>
    </imkl:Plan>
</gml:featureMember>
```

ExtraPlan / Plan

Supported Types

ExtraPlanType (IMKL 2.3)	DocumentType (IMKL 3)
detailplan	detailedPlan
lengteprofiel	longitudinalSection
dwarsprofiel	crossSection
andere	other
gestuurdeBoring	directionalDrilling
	precaution

Will be discussed later

BestandMediaTypeValue (IMKL 2.3)	DocumentMediaTypeValue (IMKL 3)
PNG	PNG
PDF	PDF
JPG	JPG
TIFF	TIFF

Voorzorgsmaatregel / Document

Voorzorgsmaatregel / Document

IMKL 2.3

In IMKL 2.3 it was possible to add **voorzorgsmaatregel**en (precautions) to a **UtilityNetwork**.

This allowed to describe the precautions that must be taken into account when working on site.

```xml
<gml:featureMember>
    <imkl:UtilityNetwork>
        ...
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Network_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        ...
        <imkl:voorzorgsmaatregel>
            <imkl:Voorzorgsmaatregel>
                <imkl:bestandLocatie>Voorzorgsmaatregel_001.pdf</imkl:bestandLocatie>
                <imkl:bestandMediaType
                    xlink:href="http://mir.agiv.be/cl/IMKL/v2/BestandMediaTypeValue/PDF" />
            </imkl:Voorzorgsmaatregel>
        </imkl:voorzorgsmaatregel>
        ...
    </imkl:UtilityNetwork>
</gml:featureMember>
```

Voorzorgsmaatregel / Document

IMKL 3

In IMKL 3 **voorzorgsmaatregel**en (precautions) will be replaced by **Document**s.

A **Document** is similar to a **Plan** but it does not have a location.

Document instead of Plan

```xml
<gml:featureMember>
    <imkl:UtilityNetwork>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Network_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:documentation
            xlink:href="http:/TODO/Demo:Document_001" />
    </imkl:UtilityNetwork>
</gml:featureMember>
```

```xml
<gml:featureMember>
    <imkl:Document>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Document_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:refersTo
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:documentType
            xlink:href="http://TODO/DocumentTypeValue/precaution" />
        <imkl:documentLocation>Precaution_001.pdf</imkl:documentLocation>
        <imkl:documentMediaType
            xlink:href="http:/TODO/DocumentMediaTypeValue/PDF" />
    </imkl:Document>
</gml:featureMember>
```
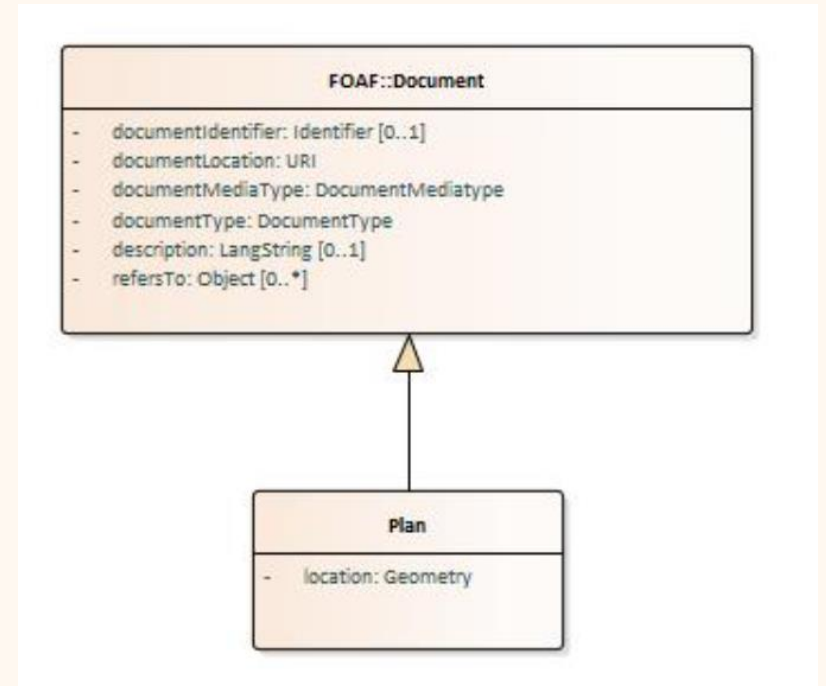
New document type

Document vs Plan

- Document:
    - Replaces **voorzorgsmaatregel** of IMKL 2.3
    - Linked to **UtilityNetwork**
    - Does not have a location

- Plan:
    - Replaces **ExtraPlan** of IMKL 2.3
    - Linked to **UtilityNetworkElement** or **UtilityNetwork**
    - **location** is mandatory
    - **locationSurvey** is optional

Aansluiting / Connection

Aansluiting / Connection

IMKL 2.3

In IMKL 2.3 an **Aansluiting** is an object that can be used to provide address information.

It can be linked to **Appurtenances** of specific types:

- WaterAppurtenanceTypeIMKLValue – aansluitpunt
- ThermalAppurtenanceTypeIMKLValue – aansluiting
- ElectricityAppurtenanceTypeExtendedValue – deliveryPoint
- OilGasChemicalsAppurtenanceTypeExtendedValue – deliveryPoint
- TelecommunicationsAppurtenanceTypeExtendedValue – termination
- SewerAppurtenanceTypeIMKLValue – aansluiting

Aansluiting / Connection

IMKL 2.3

```
<gml:featureMember>
    <imkl:Appurtenance>
        <net:beginLifespanVersion>2001-12-17T09:30:47.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>Appurtenance_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <us-net-common:appurtenanceType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/WaterAppurtenanceTypeIMKLValue/aansluitpunt" />
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Aansluiting/Demo:Aansluiting_001" />
    </imkl:Appurtenance>
</gml:featureMember>
```

```
<gml:featureMember>
    <imkl:Aansluiting>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Aansluiting_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:opLeidingElementen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Appurtenance/Demo:Appurtenance_001" />
        <imkl:adres>
            <imkl:Adres>
                <imkl:gemeente>Gent</imkl:gemeente>
                <imkl:straatnaam>Koningin Maria Hendrikaplein</imkl:straatnaam>
                <imkl:huisnummer>70</imkl:huisnummer>
                <imkl:postcode>9000</imkl:postcode>
            </imkl:Adres>
        </imkl:adres>
    </imkl:Aansluiting>
</gml:featureMember>
```
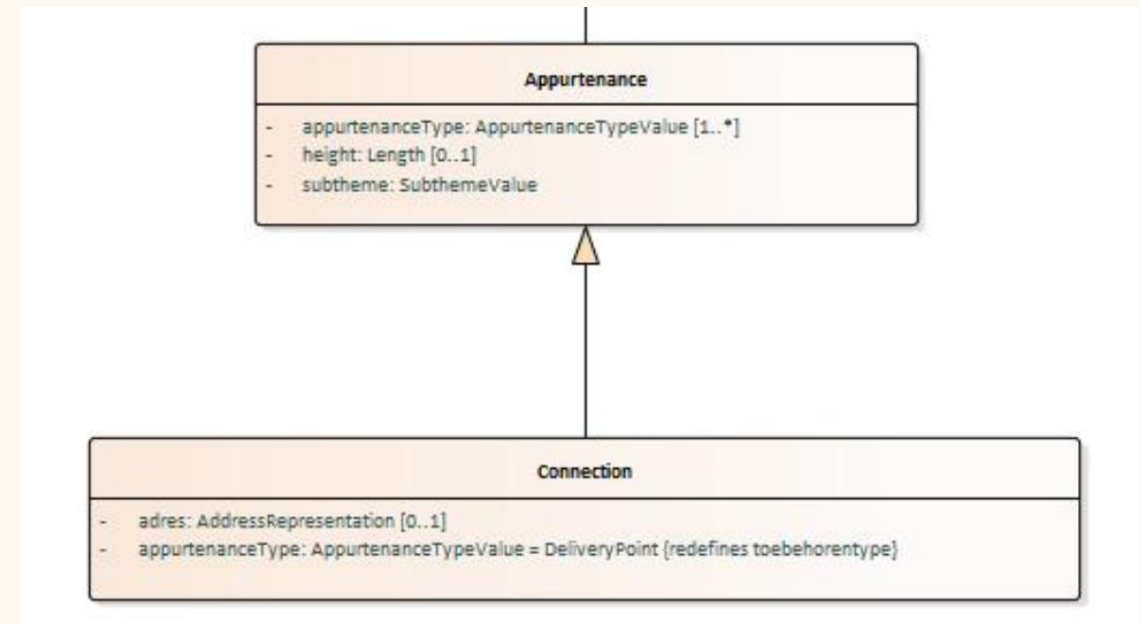
Municipality, street and postal code are mandatory.
House number is optional.

Aansluiting / Connection

In IMKL 3 the combination of Appurtenance and Aansluiting will be replaced by a **Connection**.

Connection is a subtype of Appurtenance with an extra **address** property.

A Connection should have one of the accepted appurtenanceTypes:

- WaterAppurtenanceTypeIMKLValue – deliveryPoint (aansluitpunt)
- ThermalAppurtenanceTypeIMKLValue – deliveryPoint (aansluiting)
- ElectricityAppurtenanceTypeExtendedValue – deliveryPoint
- OilGasChemicalsAppurtenanceTypeExtendedValue – deliveryPoint
- TelecommunicationsAppurtenanceTypeExtendedValue – termination
- SewerAppurtenanceTypeIMKLValue – deliveryPoint (aansluiting)

Appurtenance

- appurtenanceType: AppurtenanceTypeValue [1..*]
- height: Length [0..1]
- subtheme: SubthemeValue

Connection

- adres: AddressRepresentation [0..1]
- appurtenanceType: AppurtenanceTypeValue = DeliveryPoint {redefines toebehorentype}

Aansluiting / Connection

IMKL 3

IMKL 2.3

```xml
<gml:featureMember>
    <imkl:Appurtenance>
        <net:beginLifespanVersion>2001-12-17T09:30:47.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>Appurtenance_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <us-net-common:appurtenanceType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/WaterAppurtenanceTypeIMKLValue/aansluitpunt" />
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Aansluiting/Demo:Aansluiting_001" />
    </imkl:Appurtenance>
</gml:featureMember>
```

```xml
<gml:featureMember>
    <imkl:Aansluiting>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Aansluiting_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:opLeidingElementen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Appurtenance/Demo:Appurtenance_001" />
        <imkl:adres>
            <imkl:Adres>
                <imkl:gemeente>Gent</imkl:gemeente>
                <imkl:straatnaam>Koningin Maria Hendrikaplein</imkl:straatnaam>
                <imkl:huisnummer>70</imkl:huisnummer>
                <imkl:postcode>9000</imkl:postcode>
            </imkl:Adres>
        </imkl:adres>
    </imkl:Aansluiting>
</gml:featureMember>
```

IMKL 3

```xml
<gml:featureMember>
    <imkl:Connection>
        <net:beginLifespanVersion>2001-12-17T09:30:47.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>Appurtenance_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <us-net-common:appurtenanceType
            xlink:href="http://TODO/WaterAppurtenanceTypeIMKLValue/deliveryPoint" />
        <imkl:address>
            <imkl:municipalityName lang="NL">Gent</imkl:municipalityName>
            <imkl:municipalityName lang="FR">Gand</imkl:municipalityName>
            <imkl:houseNumber>70</imkl:houseNumber>
            <imkl:postalCode>9000</imkl:postalCode>
            <imkl:streetName lang="NL">Koningin Maria Hendrikaplein</imkl:streetName>
        </imkl:address>
    </imkl:Connection>
</gml:featureMember>
```

LangString

Annotatie / Annotation

Annotation

An **Annotation** in IMKL 2.3 is an object linked to UtilityNetworkElements or a UtilityNetwork.

Annotations can be used to provide additional information (labels and measurements) that will be displayed on the map.

Annotation

IMKL 2.3

```
<gml:featureMember>
    <imkl:Appurtenance>
        <net:beginLifespanVersion>2001-12-17T09:30:47.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>AAppurtenance_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Annotatie/Demo:Annotation_001" />
        <imkl:heeftExtraInformatie
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Annotatie/Demo:Annotation_002" />
    </imkl:Appurtenance>
</gml:featureMember>
```

```
<gml:featureMember>
    <imkl:Annotatie>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Annotation_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:opLeidingElementen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Appurtenance/Demo:Appurtenance_001" />
        <imkl:annotatieType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/AnnotatieTypeValue/maatvoeringsLijn" />
        <imkl:rotatiehoek uom="urn:ogc:def:uom:OGC::deg">10</imkl:rotatiehoek>
        <imkl:ligging>
            <gml:LineString gml:id="ID_1520c760-002f-42de-8fbb-196260939b19"
                srsName="http://spatialreference.org/ref/epsg/31370/">
                <gml:posList>252708.605 159597.922 252717.998 159604.801</gml:posList>
            </gml:LineString>
        </imkl:ligging>
    </imkl:Annotatie>
</gml:featureMember>
```

LineString

```
<gml:featureMember>
    <imkl:Annotatie>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Annotation_002</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:label>25 m</imkl:label>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
        <imkl:opLeidingElementen
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/Appurtenance/Demo:Appurtenance_001" />
        <imkl:annotatieType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/AnnotatieTypeValue/maatvoeringsLabel" />
        <imkl:rotatiehoek uom="urn:ogc:def:uom:OGC::deg">12</imkl:rotatiehoek>
        <imkl:ligging>
            <gml:Point gml:id="ID_99f6a4f3-4219-491e-8c33-8373d562a3b6"
                srsName="http://spatialreference.org/ref/epsg/31370/">
                <gml:pos>252712.65 159600.73</gml:pos>
            </gml:Point>
        </imkl:ligging>
    </imkl:Annotatie>
</gml:featureMember>
```

Label

Annotation

IMKL 3

Changes to annotations in IMKL 3:

- Types and properties are translated into English

- Codelist values are translated into English

- Coordinates are in Lambert 2008 (Note: Survey is not applicable for annotations)

- LangStrings are used where applicable

```xml
<gml:featureMember>
    <imkl:Annotation>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Annotation_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:inNetwork
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:associatedWith
            xlink:href="http://TODO/Demo:Appurtenance_001" />
        <imkl:annotationType
            xlink:href="http://TODO/AnnotationTypeValue/dimensioningLine" />
        <imkl:rotationAngle uom="urn:ogc:def:uom:OGC::deg">10</imkl:rotationAngle>
        <imkl:location>
            <gml:LineString srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:posList>252708.605 159597.922 252717.998 159604.801</gml:posList>
            </gml:LineString>
        </imkl:location>
    </imkl:Annotation>
</gml:featureMember>
```

```xml
<gml:featureMember>
    <imkl:Annotation>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Annotation_002</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <!-- text = LangString -->
        <imkl:text lang="EN">25 m</imkl:text>
        <imkl:inNetwork
            xlink:href="http://TODO/Demo:Network_001" />
        <imkl:associatedWith
            xlink:href="http://TODO/Demo:Appurtenance_001" />
        <imkl:annotationType
            xlink:href="http://TODO/AnnotationTypeValue/dimensioningLabel" />
        <imkl:rotationAngle uom="urn:ogc:def:uom:OGC::deg">12</imkl:rotationAngle>
        <imkl:location>
            <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:pos>252712.65 159600.73</gml:pos>
            </gml:Point>
        </imkl:location>
    </imkl:Annotation>
</gml:featureMember>
```

Annotation

Annotation Types

AnnotatieTypeValue (IMKL 2.3)	AnnotationTypeValue (IMKL 3)
maatvoeringsHulplijn	dimensioningGuideline
maatvoeringsLijn	dimensioningLine
maatvoeringsLabel	dimensioningLabel
pijl	arrow
annotatieLijn	annotationLine
annotatieLabel	annotationLabel

Beschermd Gebied / Protected Area

Beschermd Gebied / Protected Area

IMKL 2.3

In IMKL 2.3 **BeschermdGebied** (protected area) is an object that can be used to provide information on large protected areas.

A **BeschermdGebied** has a location (polygon) and a type. **BeschermdGebied** is linked to a UtilityNetwork.

```xml
<gml:featureMember>
    <imkl:BeschermdGebied>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Area_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:label>Example</imkl:label>
        <imkl:omschrijving>Example</imkl:omschrijving>
        <imkl:beschermdGebiedType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/BeschermdGebiedTypeValue/geothermischeInstallatie" />
        <imkl:ligging>
            <gml:Polygon
                srsName="http://www.opengis.net/def/crs/EPSG/0/31370/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:ligging>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:BeschermdGebied>
</gml:featureMember>
```

Beschermd Gebied / Protected Area

IMKL 3

Changes to protected areas in IMKL 3:

- Types and properties are translated into English

- Codelist values are translated into English

- Coordinates are in Lambert 2008

- Survey property added (Optional)

- LangStrings are used where applicable

BeschermdGebiedTypeValue (IMKL 2.3)	ProtectedAreaTypeValue (IMKL 3)
ondergrondseGasopslag	undergroundGasStorage
Drinkwaterwingebied	drinkingWaterExtractionArea
geothermischeInstallatie	geothermalInstallation
anderBeschermdGebied	otherProtectedArea

Beschermd Gebied / Protected Area

IMKL 3

IMKL 2.3

```xml
<gml:featureMember>
    <imkl:BeschermdGebied>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Area_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:label>Example</imkl:label>
        <imkl:omschrijving>Example</imkl:omschrijving>
        <imkl:beschermdGebiedType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/BeschermdGebiedTypeValue/geothermischeInstallatie" />
        <imkl:ligging>
            <gml:Polygon
                srsName="http://www.opengis.net/def/crs/EPSG/0/31370/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:ligging>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:BeschermdGebied>
</gml:featureMember>
```

IMKL 3

```xml
<gml:featureMember>
    <imkl:ProtectedArea>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Area_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:name lang="EN">Example</imkl:name>
        <imkl:description lang="EN">Example</imkl:description>
        <imkl:type xlink:href="http://TODO/ProtectedAreaType/geothermalInstallation" />
        <imkl:geometry>
            <gml:Polygon
                srsName="http://www.opengis.net/def/crs/EPSG/0/3812/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:geometry>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:ProtectedArea>
</gml:featureMember>
```

Extra Topografie / Topographical Element

Extra Topografie / Topographical Element

IMKL 2.3

Extra Topografie (topographical element) can be used to provide additional geographical context that is not related to the utility network itself (e.g. trees, fences).

These elements are displayed in the KLIP viewer as black points, lines or polygons.

```xml
<gml:featureMember>
    <imkl:ExtraTopografie>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>ET_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:extraTopografieType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/ExtraTopografieTypeValue/eigen" />
        <imkl:ligging>
            <gml:Polygon gml:id="ID_1891a479-cf92-468e-b71a-ea5862add5b0"
                srsName="http://www.opengis.net/def/crs/EPSG/0/31370/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:ligging>
        <imkl:inNetwork xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:ExtraTopografie>
</gml:featureMember>
```

Extra Topografie / Topographical Element

IMKL 3

Changes to topographical elements in IMKL 3:

- Types and properties are translated into English

- Codelist values are translated into English

- Coordinates are in Lambert 2008

- Survey property added (Optional)

- LangStrings are used where applicable

- **Relationship with UtilityNetwork is removed**

- **Proposal: Can we remove the type property?** Type *design* is not used.

ExtraTopografieTypeValue (IMKL 2.3)	TopographicalElementTypeValue (IMKL 3)
eigen	own
ontwerp	design

Extra Topografie / Topographical Element

IMKL 3

IMKL 2.3

```xml
<gml:featureMember>
    <imkl:ExtraTopografie>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>ET_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:extraTopografieType
            xlink:href="http://mir.agiv.be/cl/IMKL/v2/ExtraTopografieTypeValue/eigen" />
        <imkl:ligging>
            <gml:Polygon gml:id="ID_1891a479-cf92-468e-b71a-ea5862add5b0"
                srsName="http://www.opengis.net/def/crs/EPSG/0/31370/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:ligging>
        <imkl:inNetwork xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:ExtraTopografie>
</gml:featureMember>
```

IMKL 3

```xml
<gml:featureMember>
    <imkl:TopographicalElement>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Area_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:beginLifespanVersion>2001-12-17T09:30:47.0Z</imkl:beginLifespanVersion>
        <imkl:label lang="EN">Example</imkl:name>
        <imkl:description lang="EN">Example</imkl:description>
        <imkl:topographicalElementType xlink:href="http://TODO/TopographicalElementTypeValue/eigen" />
        <imkl:location>
            <gml:Polygon
                srsName="http://www.opengis.net/def/crs/EPSG/0/3812/">
                <gml:exterior>
                    <gml:LinearRing>
                        <gml:posList>...</gml:posList>
                    </gml:LinearRing>
                </gml:exterior>
            </gml:Polygon>
        </imkl:location>
        <imkl:inNetwork
            xlink:href="http://mir.agiv.be/data/IMKL/v2.2/UtilityNetwork/Demo:Network_001" />
    </imkl:TopographicalElement>
</gml:featureMember>
```

Agent

Agent

IMKL 3

In IMKL 3 an **Agent** is used to describe an organization or person.

An Agent can be used to provide information about the organisation or person:

- that carried out a **survey** (New in IMKL 3).

- that manages, operates or owns a **utility network** (replaces TechnischContactpersoon).

An **Agent** has the following properties:

- Name (mandatory, nilReason not allowed)

- Phone (mandatory, nilReason not allowed)

- Email (mandatory, nilReason not allowed)

Agent

IMKL 3

```
<gml:featureMember>
    <imkl:UtilityNetwork>
        <imkl:imklId>
            <base:Identifier>
                <base:localId>Network_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </imkl:imklId>
        <imkl:technischContactpersoon>
            <imkl:TechnischContactpersoon>
                <imkl:naam>distributiezone Dijle Hageland</imkl:naam>
                <imkl:telefoon>02 238 96 99</imkl:telefoon>
                <imkl:email>info@dewatergroep.be</imkl:email>
            </imkl:TechnischContactpersoon>
        </imkl:technischContactpersoon>
        <imkl:authorityRole xlink:href="http://TODO/Agent/Demo:Agent_001" />
    </imkl:UtilityNetwork>
</gml:featureMember>
```

authorityRole replaces
TechnischContactpersoon

```
<gml:featureMember>
    <imkl:manhole>
        <us-net-common:inspireId>
            <base:Identifier>
                <base:localId>Manhole_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </us-net-common:inspireId>
        <us-net-common:geometry>
            <gml:Point srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:pos>103674.885 192127.454</gml:pos>
            </gml:Point>
        </us-net-common:geometry>
        <imkl:locationSurvey>
            <imkl:method xlink:href="http://TODO/SurveyMethodValue/TotalStation" />
            <imkl:recordedBy xlink:href="http://TODO/Agent/Demo:Agent_001" />
            <imkl:date>2024-01-01T12:00:00</imkl:date>
            <imkl:accuracy uom="urn:ogc:def:uom:OGC::cm">100</imkl:accuracy>
        </imkl:locationSurvey>
    </imkl:manhole>
</gml:featureMember>
```

```
<gml:featureMember>
    <imkl:Agent>
        <us-net-common:inspireId>
            <base:Identifier>
                <base:localId>Agent_001</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </us-net-common:inspireId>
        <imkl:name>John Doe</imkl:name>
        <imkl:phone>02 123 45 67</imkl:phone>
        <imkl:email>john.doe@athumi.eu</imkl:email>
        <imkl:associatedWith
            xlink:href="http://TODO/Manhole/Demo:Manhole_001" />
        <imkl:associatedWith
            xlink:href="http://TODO/Manhole/Demo:Network_001" />
    </imkl:Agent>
</gml:featureMember>
```

Construction technique

Construction technique

In IMKL 2.3 information about *gestuurde boringen* (directional drillings) can be provided by adding an **ExtraPlan** with type **gestuurdeBoring** to a cable, pipe or duct.

This approach has some **disadvantages**:

- The ExtraPlan is linked to the entire UtilityLinkSet even if only a section of the total length is a *gestuurde boring*

- It is not possible to clearly indicate gestuurde boringen on the map

- It is limited to directional drilling as construction type. No other types are foreseen

Proposal for IMKL 3:

- An extra property **constructionTechnologyType** is added to UtilityLink.

- This property can be used to indicate the used technology.

- Since it is a property of UtilityLink a UtilityLinkSet can consist of multiple UtilityLinks each with their own technology type.

- constructionTechnologyType will be **mandatory**, but with nillReason.

Construction technique

Example

```xml
<imkl:featureMember>
    <us-net-common:UtilityLink>
        <net:beginLifespanVersion>2024-01-01T12:00:00.0Z</net:beginLifespanVersion>
        <net:inspireId>
            <base:Identifier>
                <base:localId>L-01</base:localId>
                <base:namespace>Demo</base:namespace>
            </base:Identifier>
        </net:inspireId>
        <net:centrelineGeometry>
            <gml:LineString srsName="http://spatialreference.org/ref/epsg/3812/" srsDimension="2">
                <gml:posList>...</gml:posList>
            </gml:LineString>
        </net:centrelineGeometry>
        ...
        <imkl:constructionTechnologyType xlink:href="http://TODO/ConstructionTechnologyTypeValue/directionalDrilling"/>
    </us-net-common:UtilityLink>
</imkl:featureMember>
```

Construction technique

Proposal for ConstructionTechnologyTypeValue codelist:

ConstructionTechnologyTypeValue	
directionalDrilling	*Gestuurde boring*
openFrontDrilling	*Open frontboring*
closedFrontDrilling	*Gesloten frontboring*
pneumaticDrilling	*Pneumatische boring*
submerged	*Zinker*
openTrench	*Open sleuf*

- Do the proposed values make sense?
- Do extra types need to be added?

Risk

Risk

In the semantic datamodel a property called **risk** is foreseen.

Challenge: How do we define risk? An unclear definition can lead to more dangerous situations…

Let's take a step back…

What do we want to achieve?

As a utility network operator, you want to:

- Be notified when exactly construction work will take place

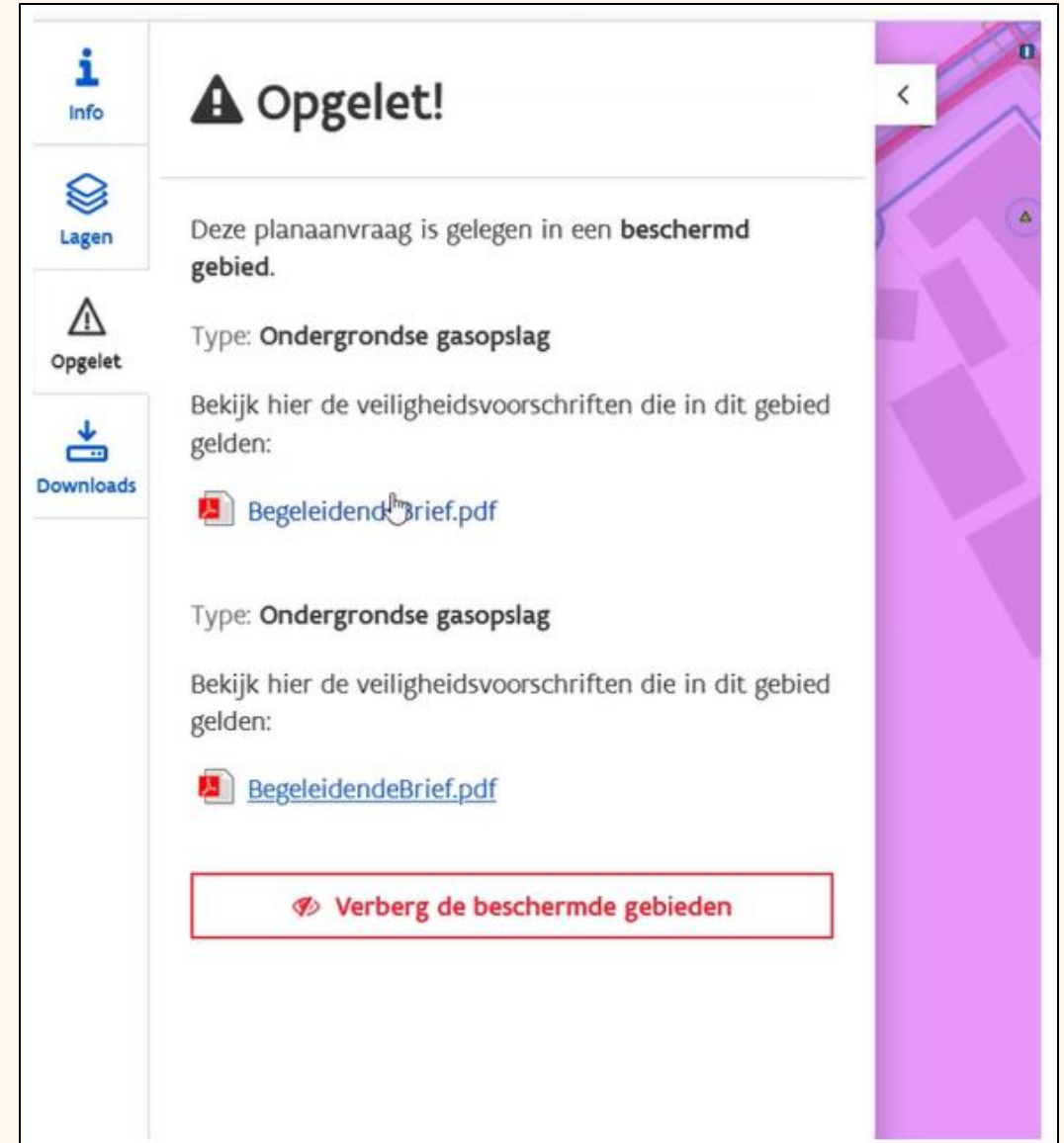- Ensure the required safety measures are taken into account on site

⇒ Instead of specifying the risk, is it better to indicate you – as a network operator – want to be contacted upfront?

Risk

The request to be notified can be defined:

- on the utility network operator / platform level

- on the IMKL response level

- on network element level

Next steps

Next workshops

- **Workshop 5 (25/06/2024):** To be decided

- **June/July:** Implementation of XSD. A draft version of the XSD and documentation will be provided as soon as possible.

- **Workshop 6 (12/09/2024):** Presentation of XSD, migration from IMKL 2.3 to IMKL 3 and start of review

- **Workshop 7 (29/09/2024):** Evaluation of updated XSD

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