

## RICS International Property Measurement Standards (IPMS) Data Standard

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Version: 2.0

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### Release Notes

The RICS International Property Measurement Standards (IPMS) data standard is an XML schema allowing users to capture, denote and share IPMS measurements of buildings and is compatible with 'RICS Property Measurement, 2nd edition', and with IPMS for Office Buildings, IPMS for Residential Buildings and IPMS for Industrial Buildings. At the time of release IPMS Retail is under development with the draft standard released for public consultation. The schema is extensible and flexible.

Version 2.0 of the standard includes the following enhancements to support more explicit and detailed reporting of:

- Limited use areas
- Areas included within IPMS but stated separately
- Areas excluded from IPMS but stated separately
- Additional, alternative units of measure, such as car parking spaces etc.
- Dual reporting with other pre-existing local measurement standards such as RICS Code of Measurement Practice 6 (COMP6), BOMA, HKIS, PCA etc.

In addition, the standard has been updated to support additional measurements for IPMS for Industrial Buildings and for the new component areas in IPMS Industrial Buildings and IPMS for Retail Buildings (when released).

### RICS Data Standards

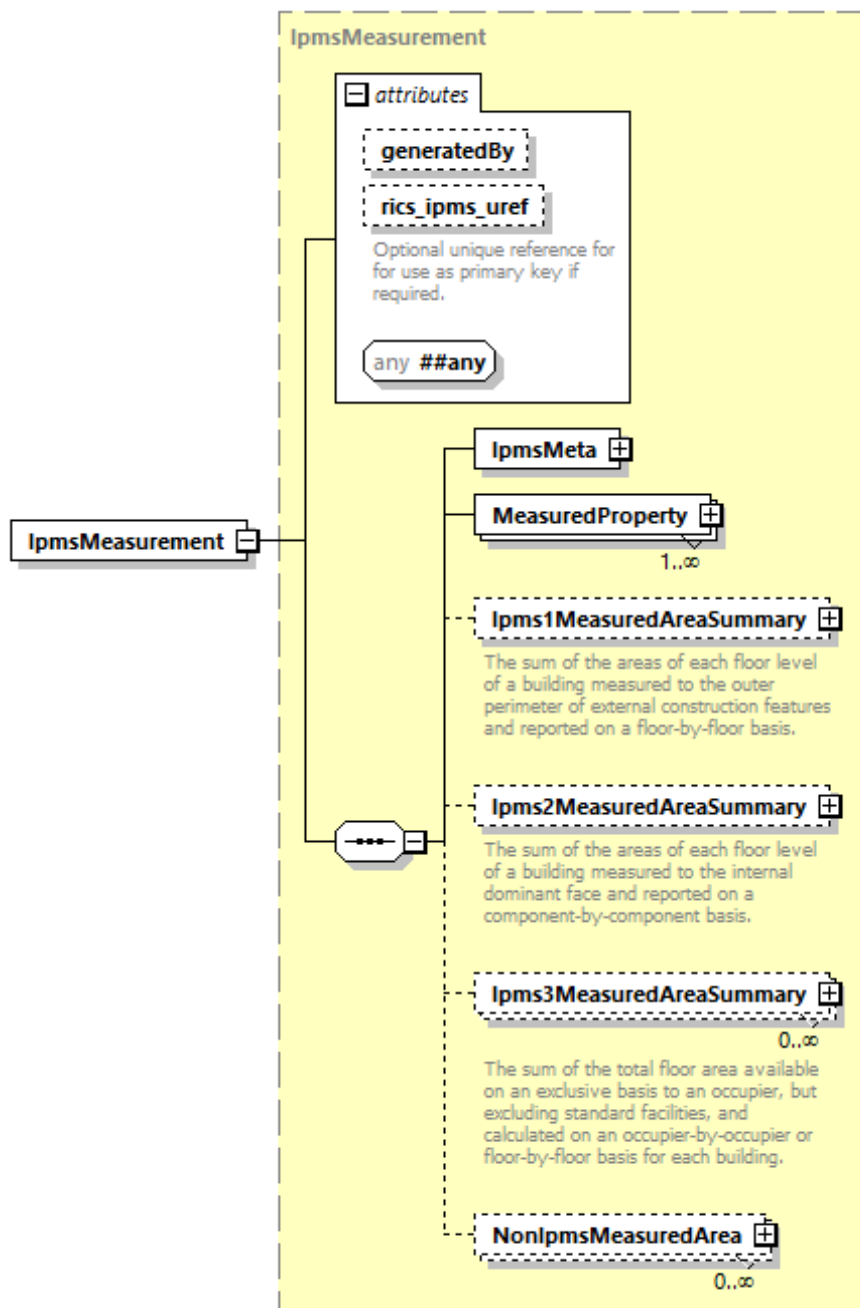
All RICS data standards are implemented via XML .xsd files that reference shared .xsd files containing definitions of common types and common enumerations that are used in one or more of the data standards such as IPMS, International Construction Measurement Standards (ICMS) and International Land Measurements (ILMS). Complete documentation of all the elements and enumerations in the schema is available via an additional document on [rics.org](http://rics.org). RICS can provide support on the implementation of the XML schemas and mapping between IPMS and other measurement standards. For further information and technical details please contact [datastandards@rics.org](mailto:datastandards@rics.org).

### Use of Enumerations

The IPMS data standard provides lists of known values for many attributes and elements where a list or set of data may be chosen from, for example, IPMS component area definitions. In this instance, the enumeration, found in the enumeration schema, is defined by the type: *KnownIpmsComponentAreaEnum*. This enumeration contains the current list of known component areas: 'A-H'. These lists are useful for software developers, but it should be noted that the schema allows for extensions of this data via the use of *IpmsComponentAreaType* which is defined as the superset of a string and the *KnownIpmsComponentAreaType*, therefore technically allowing any string value. This pattern is followed throughout the data standard and serves to provide users of the standard with strong hints as to what values should be expected despite allowing freedom to submit any data.

## Overview

The XML schema comprise a top-level element: *IpmsMeasurement*, which contains an *IpmsMeta* element, containing details about the *Entity* being measured and the process of how it was measured. At its simplest, this *Entity* is an address (which may represent multiple measured properties), a reference identifier, and an optional attribute specifying the entity's *primaryUse* (generally one of either *Office*, *Residential*, *Industrial*, *Retail* or *MixedUse*). Addresses are specified using the OASIS xAL address specification – and can be specified with a high level of flexibility (see <http://www.oasis-open.org/committees/ciq>



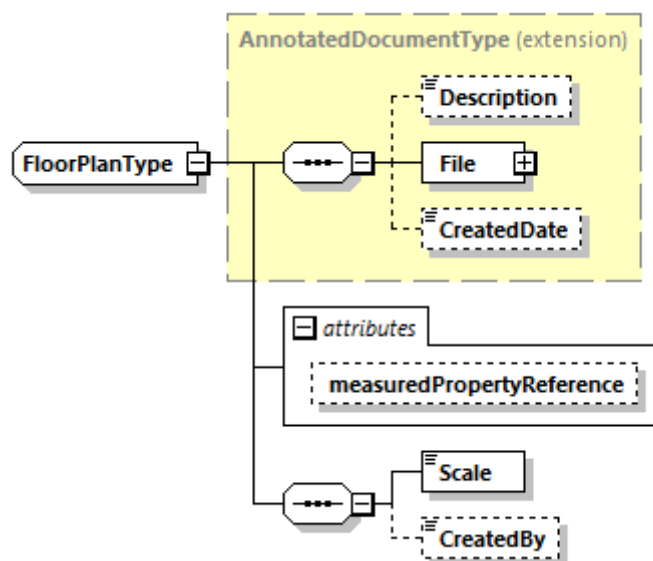
## Overview

Further details contain information about who the measurement was *PreparedFor*, who took the measurement, *MeasuredBy*, the *InstructedMeasurementDate*, *MeasurementDate*, the date the report was written, the methodology of the measurement and the *AreaUnitOfMeasure*. This *AreaUnitOfMeasure* element must contain a unit of measure (taken from the standard 3 letter UN/CEFACT common codes). There may be multiple *AreaUnitOfMeasure* elements if a report has a requirement to specify a measurement in multiple units.

## Floor Plans

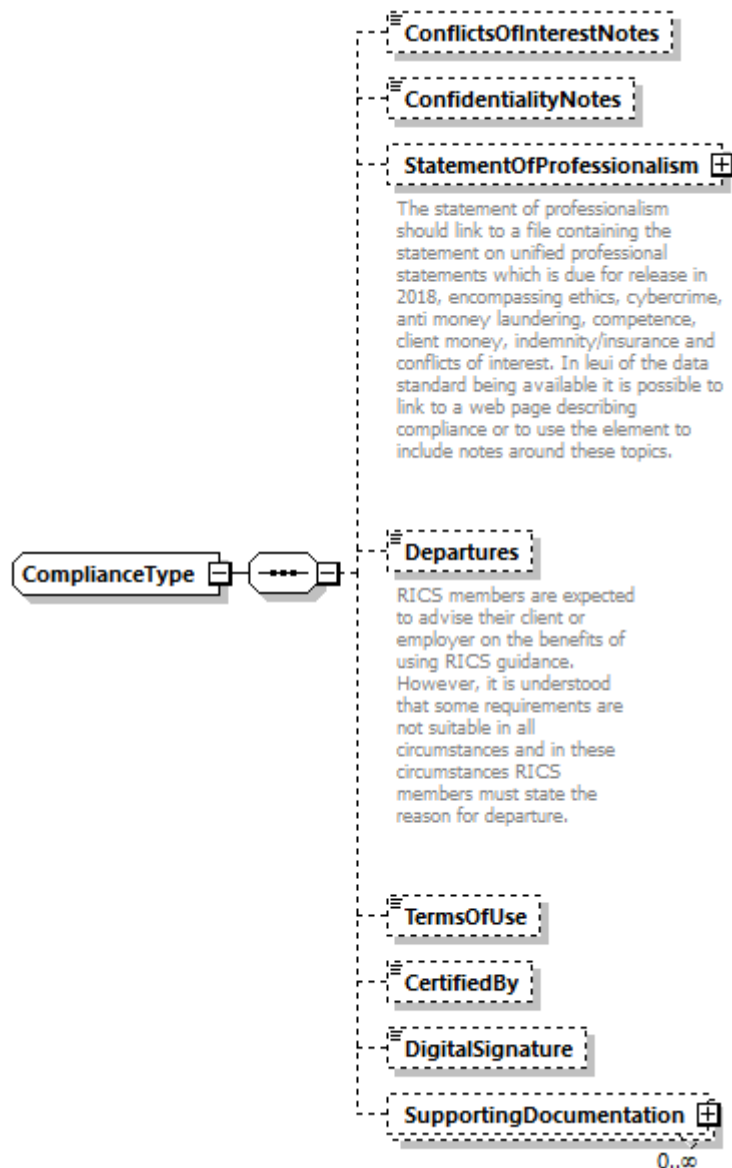
Within the *IpmsMeta* and *MeasuredProperty* elements, there is an element that refers to the floor plans that may be available with additional details of the *Scale* used and *Description* of the plans, along with files contained within the *File* element that contains the floor plans themselves. Files may also be identified by the *CreatedBy* element, which may reference the person or company that generated the file. These floor plans exist at the *IpmsMeta* level, to avoid the need to separate plans that feature many properties should the measurement comprise of multiple measurements.

An *AccuracyInMm* element optionally allows the report to specify how accurately (+/- in mm) the measurement has been taken. Permitted values have been derived from the RICS guidance note *Measured surveys of land, buildings and utilities (3rd edition, November 2014)*, section 2.3 Survey accuracy band table (namely 5, 10, 25 or 50), but does allow for other values, should they be required.



## Compliance

There is a *Compliance* element within the *IpmsMeta* element that may contain details as to who certified the measurement. Additional elements available within the Compliance element are *ConflictsOfInterestNotes*, *ConfidentialityNotes*, *DigitalSignature*, *TermsOfUse*, *CertifiedBy*, and the ability to add multiple files with the *SupportingDocumentation* element.



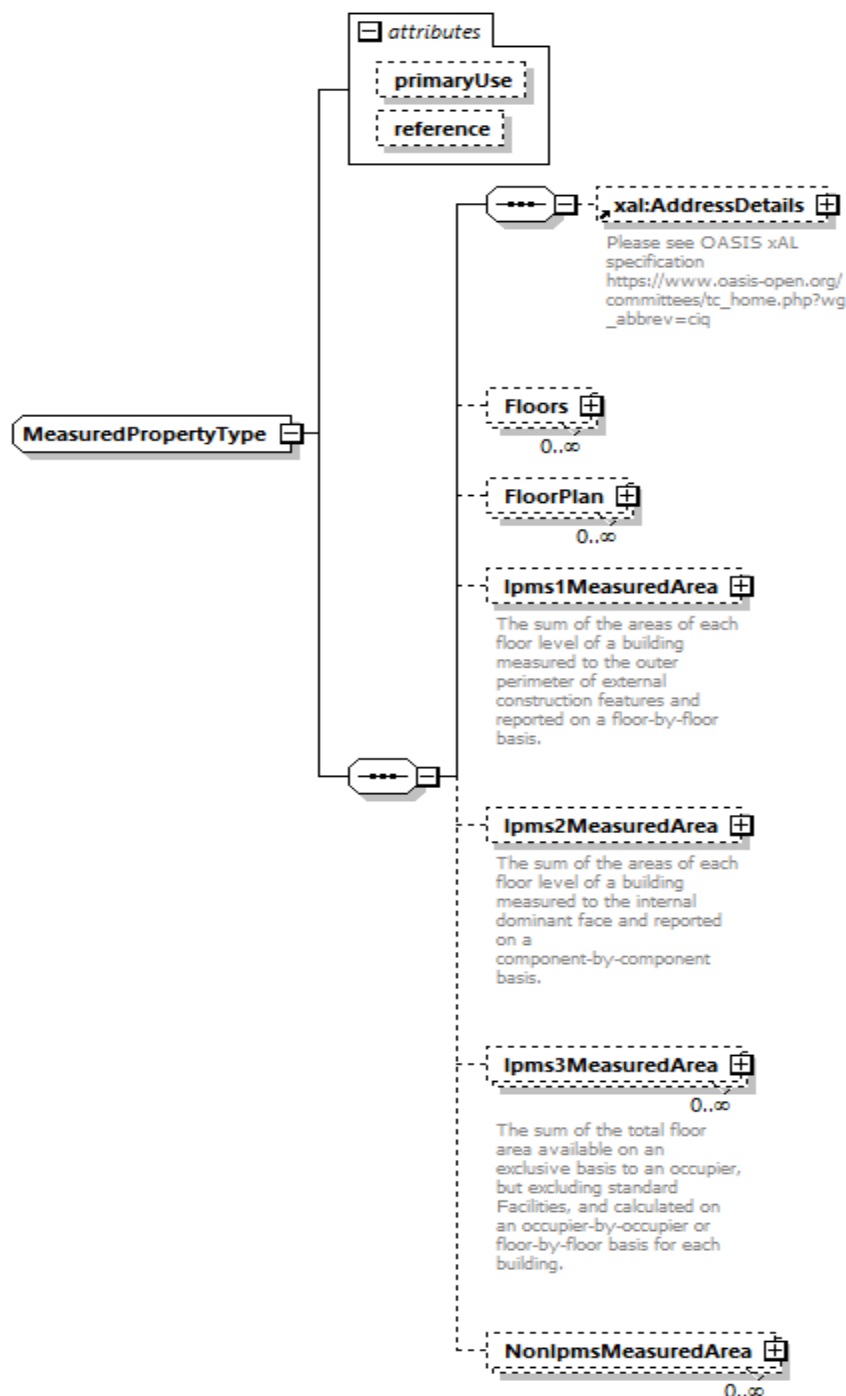
It should be noted that the *DigitalSignature* component of the standard allows for cryptographic signatures to be embedded within the standard to attest to the document's authenticity. Whilst there is no defined standard for how this element should be signed it is considered best practice to provide details on the signing process by the creator of the file, should this element be used.

## Compliance

The *StatementOfProfessionalism* element is used to document the firm or surveyor's stance in respect to the RICS Professional Statements around professionalism issued by the RICS. For example, Conflicts of Interest (see: <http://www.rics.org/uk/knowledge/professional-guidance/professional-statements/conflicts-of-interest-global-1st-edition/>). The associated link attribute supports a URI to direct readers to a statement defining compliance.

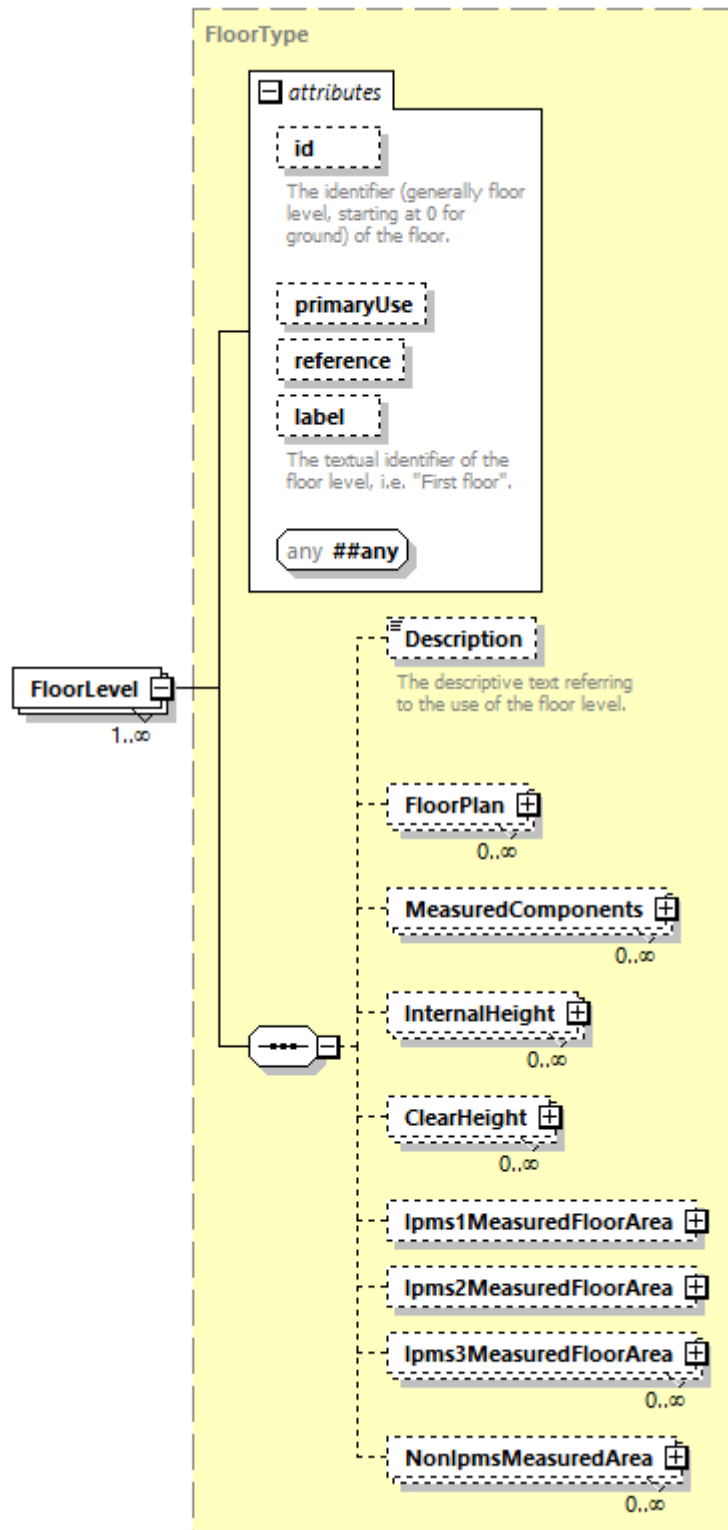
## Measured Property

Each *IpmsMeasurement* element may contain multiple *MeasuredProperties*. This is to support entities such as shopping centres, which may contain more than one property to measure. Each *MeasuredProperty* element has an attribute for *primaryUse*, and a *reference* which is used to link to *FloorPlans* via its corresponding *measuredPropertyReference* attribute). Floor plans are optional at this element level to prevent the necessity of splitting floor plans by building. The *measuredPropertyReference* is available at the floor plan element level to provide the ability to provide a full set of floor plans at the *IpmsMeasurement* level and facilitate look-ups via the supplied reference.



## Floors

*Floors* are optional elements within the specification that support the breakdown of measurements by floor levels within a building. If included in the document, *Floors* must contain at least one *FloorLevel* element.



## Floor Levels

*FloorLevels* are identified by a combination of an identifier, *id*, which is to represent the floor number, i.e. “-1” for a basement, “0” for ground, “1” for the first floor, etc., and a *label* attribute, which can be used to give a local language identifier, e.g. “First floor”. Within the *Floor* element there is a *description* (a description of the general use of the floor).

Floor plans are optional at this element level to prevent the necessity of splitting floor plans by building floors. The *measuredPropertyReference* is available at the floor plan element level to provide the ability to provide a full set of floor plans at the *IpmsMeasurement* and/or *MeasuredProperty* level and facilitate look-ups via the supplied reference.

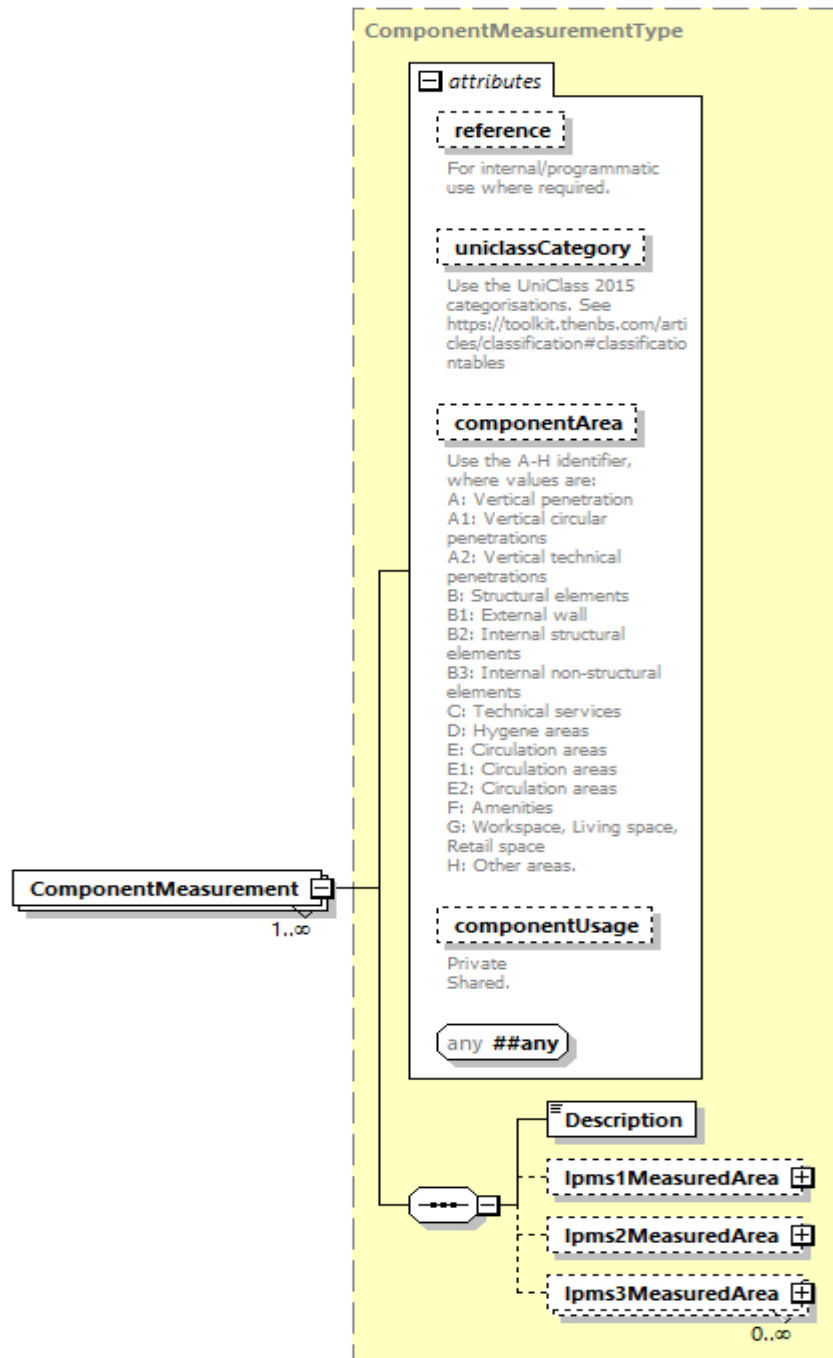
Each floor level may optionally include elements that define the component areas within a given floor.



## Components

Components at floor level are identified by a *description* together with reference that may be used for other purposes. Components have a *componentAreaType* (“A”-“H”) attribute and may optionally be identified by a *uniclassCategory* attribute which is taken from the UniClass 2015 spaces and areas list (see <https://toolkit.thenbs.com/articles/classification#classificationtables>).

The attribute *componentUsage* should be used to define whether the space is private or shared with other occupiers.



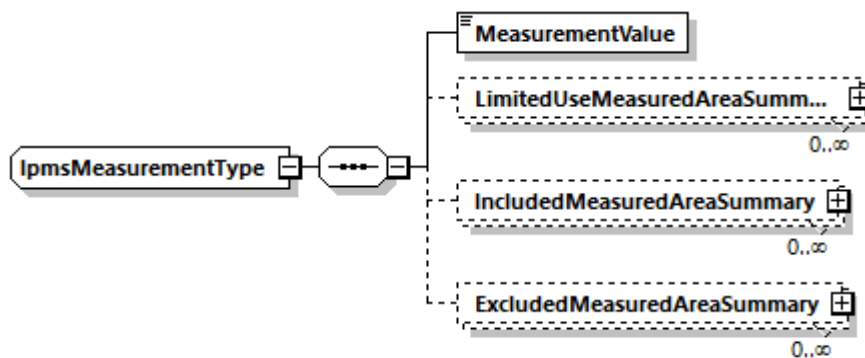
## IPMS & Non IPMS Measurements

Measurements can be reported at different levels of granularity in the data standard:

- At summary level as part of the overall *IPMSMeasurement*
- At property level as part of the *MeasuredProperty*
- At floor level as part of each *FloorLevel* in the *FloorType*
- At component level as part of *MeasuredComponents*

At each level of granularity, the *IpmsMeasurementType* is used to capture IPMS1 and IPMS2 measurements, the *Ipms3MeasurementType* to capture IPMS3 measurements, and the *NonIpmsMeasurementType* to capture measurements made using other pre-existing local standards.

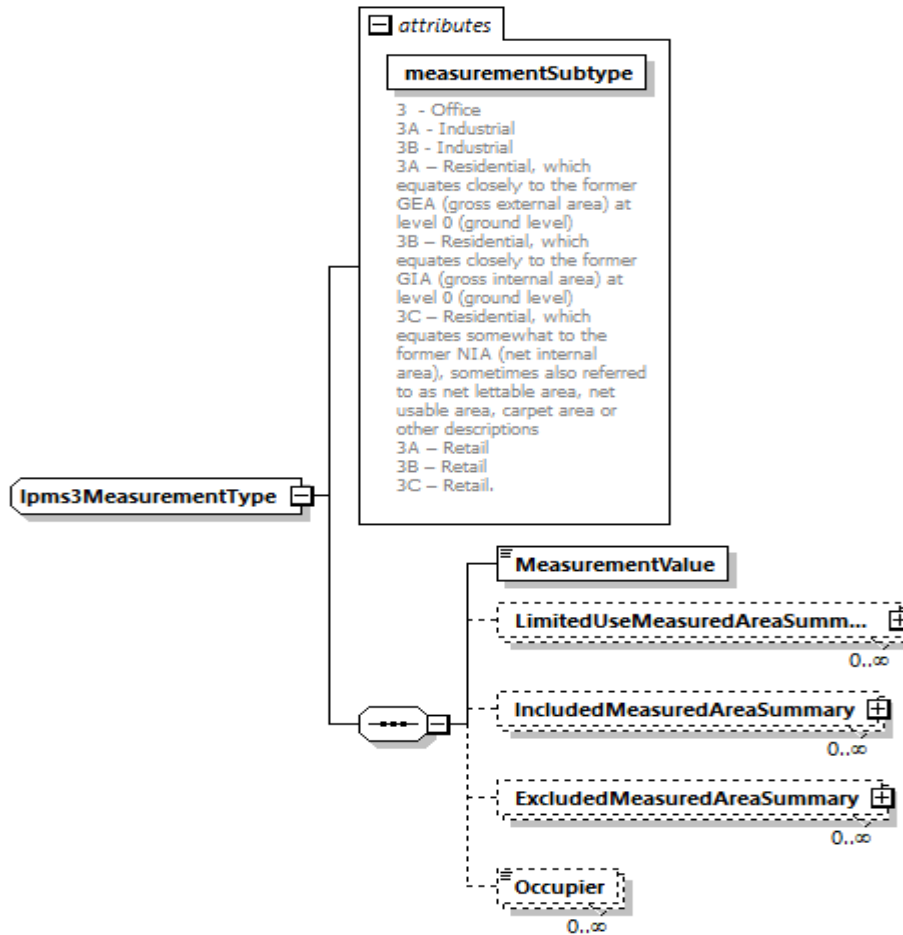
All summarised elements should be totals based on the total measurements beneath in *MeasuredProperty*, *FloorLevel* and *MeasuredComponents* as reported.



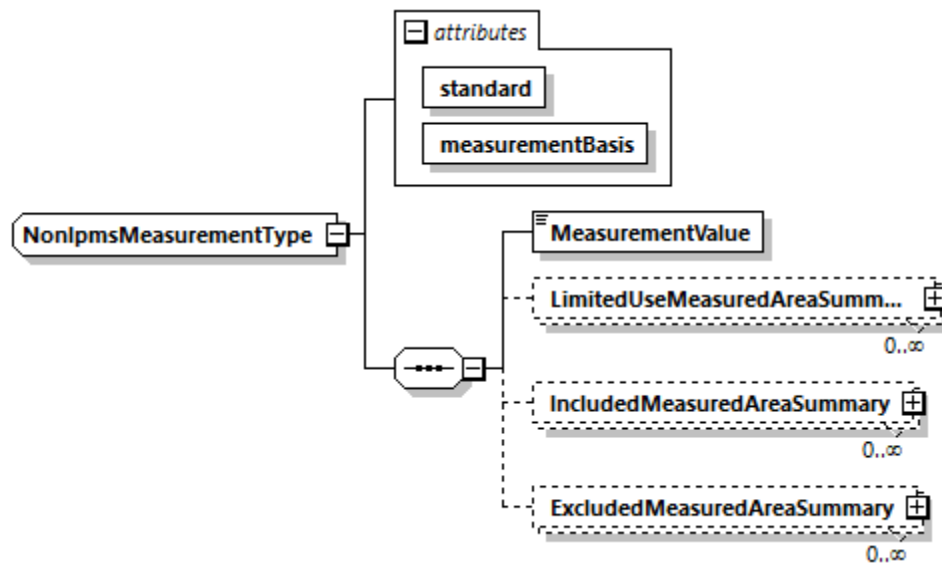
At *FloorLevel*, IPMS Industrial is supported by the elements *InternalHeight* and *ClearHeight* which are expressed as simple decimal values of the primary measurement unit specified in the *LinearUnitOfMeasure* within the *IpmsMeta* element.

### IPMS3 Measurements

The *Ipms3MeasurementType* type includes the *measurementSubtype* attribute to define the IPMS types, currently '3' for Office, '3A', '3B' and '3C' for Residential, and '3A' and '3B' for Industrial. In addition, a list of one or more occupiers can be reported for each measured area.



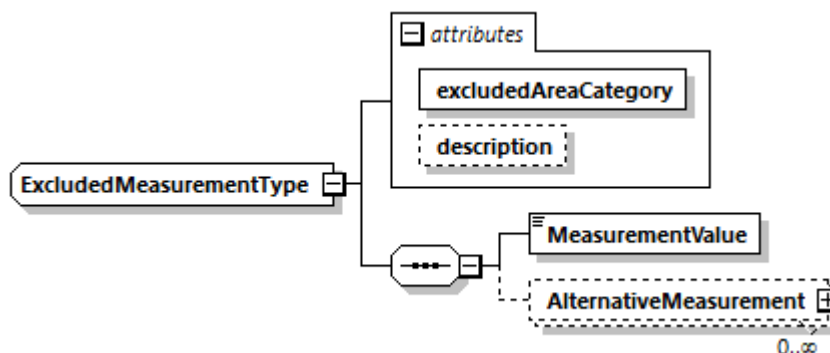
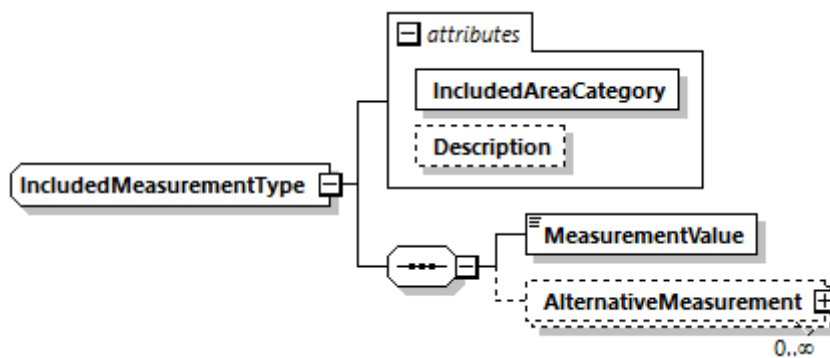
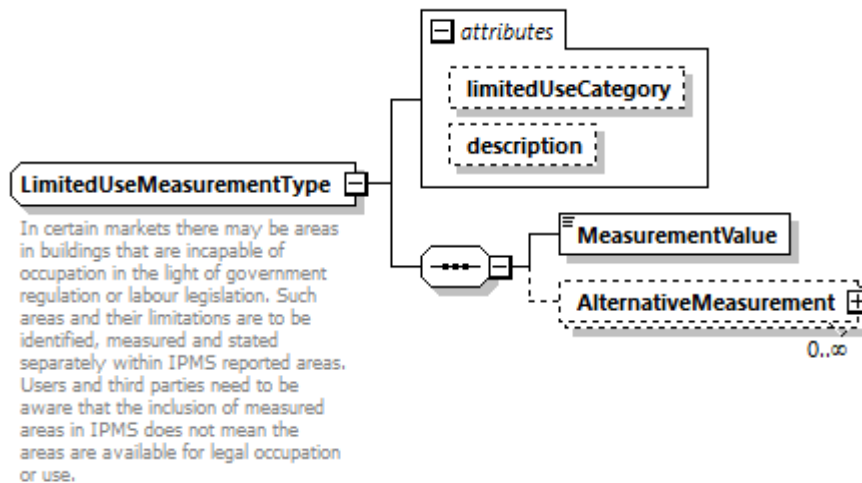
## Non IPMS Measurements



For Non IPMS Measurements the attributes *standard* and *measurementBasis* describe the nature of the dual reporting: e.g. COMP6 and GIA.

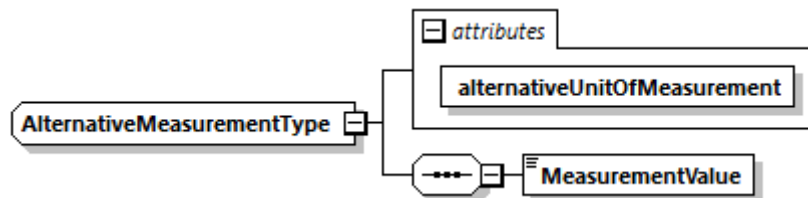
## Areas Reported Separately

In addition to the reported *MeasuredValue* (expressed as simple decimal values of the primary measurement unit specified in *AreaUnitOfMeasure* within the *IpmsMeta* element), data can be included to provide detailed information on limited use areas, areas included within IPMS (or other standards for non IPMS measurements) but reported separately, and areas excluded from IPMS (or other standards for non IPMS measurements) but stated separately.



## Alternative Measurements

For each measurement type the standard supports an optional, additional, alternative unit of measurement, such as number of vehicle spaces in an area used for parking, through the *AlternativeMeasurementType* element:



## File References

Within the data standard there is the ability to refer to files. These files may be text, PDF files or proprietary binary files. Files may be referenced as internal files or external files.

*InternalFiles* contain an element which should be mime-encoded, in addition to attributes detailing its format and description. Other attributes allowing for extensibility here are allowed, too.

External files may be referenced by a URI and include a *description* attribute.

## Self-documenting Schema

The schema contains multiple annotations, currently just in English, taken from the appropriate RICS Professional Statement and the International Standard itself that document the use of various elements that are defined in the schema. For example:

```

<xs:complexType name="LimitedUseMeasurementType">
  <xs:annotation>
    <xs:documentation xml:lang="en">In certain markets there may be areas in
    buildings that are incapable of occupation in the light of government regulation
    or labour legislation. Such areas and their limitations are to be identified,
    measured and stated separately within IPMS reported areas. Users and third parties
    need to be aware that the inclusion of measured areas in IPMS does not mean the
    areas are available for legal occupation or use.
    </xs:documentation>
  </xs:annotation>
  <xs:sequence>
    <xs:element name="MeasurementValue" type="xs:decimal"/>
    <xs:element name="AlternativeMeasurement" type="AlternativeMeasurementType"
    minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="limitedUseCategory" type="LimitedUseCategoryType"/>
  <xs:attribute name="description" type="xs:string"/>
</xs:complexType>
  
```

This documentation may be automatically extracted and presented in software applications and online documentation tools that utilise the schema.

## Address Types

With the use of the OASIS XML address specification (xAL) it is possible to define property addresses very precisely. The following examples, taken from the Oasis website, are valid xAL representations:

```
Level 12, 67 Albert Avenue  
Chatswood  
NSW 2067  
Australia
```

```
<AddressDetails>  
<AddressLines>  
  <AddressLine>Level 12, 67 Albert Avenue</AddressLine>  
  <AddressLine>Chatswood</AddressLine>  
  <AddressLine>NSW 2209</AddressLine>  
  <AddressLine>Australia</AddressLine>  
</AddressLines>  
</AddressDetails>
```

```
Level 12, 67 Albert Avenue, Chatswood, NSW 2067  
PO Box: 773, Chatswood, NSW 2057  
Australia
```

```
<AddressDetails AddressType="Primary and Residential">  
<Country>  
  <CountryName>Australia</CountryName>  
<AdministrativeArea>  
  <AdministrativeAreaName>NSW</AdministrativeAreaName>  
<Locality>  
  <LocalityName>Chatswood</LocalityName>  
  <Thoroughfare Type="Street">  
    <ThoroughfareNumber>67</ThoroughfareNumber>  
    <ThoroughfareName>Archer Street</ThoroughfareName>  
  <Premise Type="Building">  
    <BuildingName>Egis</BuildingName>  
    <SubPremise Type="LEVEL">  
      <SubPremiseNumber>12</SubPremiseNumber>  
    </SubPremise>  
  </Premise>  
</Thoroughfare>  
<PostalCode>  
  <PostalCodeNumber>2067</PostalCodeNumber>  
</PostalCode>  
</Locality>  
</AdministrativeArea>  
</Country>  
</AddressDetails>
```

## Address Types

Chatswood Grove, Block A, Level 2, Suite 1A, 12-14 Malvern Avenue,  
Adjacent to Chatswood Chase, Chatswood, NSW 2067, Australia

```
<AddressDetails>
  <Country>
    <CountryName>Australia</CountryName>
  <AdministrativeArea>
    <AdministrativeAreaName>NSW</AdministrativeAreaName>
  <Locality>
    <LocalityName>Chatswood</LocalityName>
  <Thoroughfare>
    <ThoroughfareNumberRange Type="EVEN">
      <ThoroughfareNumberFrom>
        <ThoroughfareNumber>12</ThoroughfareNumber>
      </ThoroughfareNumberFrom>
      <ThoroughfareNumberTo>
        <ThoroughfareNumber>14</ThoroughfareNumber>
      </ThoroughfareNumberTo>
    </ThoroughfareNumberRange>
    <ThoroughfareName>Malvern</ThoroughfareName>
    <ThoroughfareTrailingType>Avenue</ThoroughfareTrailingType>
  <Premise Type="Building">
    <BuildingName>CHASTWOOD GROVE</BuildingName>
    <SubPremise Type="BLOCK">
      <SubPremiseNumber>A</SubPremiseNumber>
    <SubPremise Type="LEVEL">
      <SubPremiseNumber>2</SubPremiseNumber>
    <SubPremise Type="SUITE">
      <SubPremiseNumber>1</SubPremiseNumber>
      <SubPremiseNumberSuffix>A</SubPremiseNumberSuffix>
    </SubPremise>
  </SubPremise>
  <Premise Type="SHOPPING CENTRE" PremiseDependency="PREMISE"
PremiseDependencyType="ADJACENT TO">
    <PremiseName>Chatswood Grove</PremiseName>
  </Premise>
</Thoroughfare>
<PostalCode>
  <PostalCodeNumber>2067</PostalCodeNumber>
</PostalCode>
</Locality>
</AdministrativeArea>
</Country>
</AddressDetails>
```



## Sample Data File

A simple RICS IPMS measurement may look something like this:

```
<?xml version="1.0" encoding="UTF-8"?>
<ipms:IpmsMeasurement xmlns:ipms="urn:rics:xsdschema:ipms:2.0"
xmlns:rics="urn:rics:xsdschema:commontypes:2.0"
xmlns:xal="urn:oasis:names:tc:ciq:xsdschema:xAL:2.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:rics:xsdschema:ipms:2.0 rics-ipms-2.0.xsd">
  <ipms:IpmsMeta>
    <rics:Entity primaryUse="Office">
      <rics:Description>Aura House</rics:Description>
      <xal:AddressDetails>
        <xal:AddressLines>
          <xal:AddressLine>1 High Street</xal:AddressLine>
        </xal:AddressLines>
      </xal:AddressDetails>
    </rics:Entity>
    <rics:PreparedFor>Aura House Investments</rics:PreparedFor>
    <rics:Compliance>
      <rics:CertifiedBy>Andrew Knight</rics:CertifiedBy>
    </rics:Compliance>
    <rics:ReportDate>2018-08-28</rics:ReportDate>
    <rics:Methodology>Laser</rics:Methodology>
    <rics:Verification>MeasuredOnSite</rics:Verification>
    <rics:AreaUnitOfMeasure scaleFactor="1"
isPrimaryUnitMeasurement="true">MTK</rics:AreaUnitOfMeasure>
    <rics:AccuracyInMm>10</rics:AccuracyInMm>
    <rics:MeasuredBy>Andrew Knight</rics:MeasuredBy>
    <rics:InstructedMeasurementDate>2018-08-
13</rics:InstructedMeasurementDate>
    <rics:MeasurementDate>2018-08-20</rics:MeasurementDate>
  </ipms:IpmsMeta>
  <ipms:MeasuredProperty primaryUse="Office">
    <rics:Floors>
      <rics:FloorLevel id="0" primaryUse="Office">
        <rics:Description>Office space</rics:Description>
        <rics:MeasuredComponents>
          <rics:ComponentMeasurement reference="Open plan
office" uniclassCategory="Co_20_15_58" componentArea="G" componentUsage="Private">
            <rics:Description>Ground floor
office</rics:Description>
            <rics:Ipms2MeasuredArea>
              <rics:MeasurementValue>52</rics:MeasurementValue>
            </rics:Ipms2MeasuredArea>
          </rics:ComponentMeasurement>
        </rics:MeasuredComponents>
        <rics:Ipms1MeasuredFloorArea>
          <rics:MeasurementValue>52</rics:MeasurementValue>
        </rics:Ipms1MeasuredFloorArea>
        <rics:Ipms2MeasuredFloorArea>
          <rics:MeasurementValue>50</rics:MeasurementValue>
        </rics:Ipms2MeasuredFloorArea>
        <rics:Ipms3MeasuredFloorArea measurementSubtype="3">
          <rics:MeasurementValue>50</rics:MeasurementValue>
        </rics:Ipms3MeasuredFloorArea>
      </rics:FloorLevel>
    </rics:Floors>
  </ipms:MeasuredProperty>
</ipms:IpmsMeasurement>
```

```
        </rics:Ipms3MeasuredFloorArea>
      </rics:FloorLevel>
    </rics:Floors>
  <rics:Ipms1MeasuredArea>
    <rics:MeasurementValue>52</rics:MeasurementValue>
  </rics:Ipms1MeasuredArea>
  <rics:Ipms2MeasuredArea>
    <rics:MeasurementValue>50</rics:MeasurementValue>
  </rics:Ipms2MeasuredArea>
  <rics:Ipms3MeasuredArea measurementSubtype="3">
    <rics:MeasurementValue>50</rics:MeasurementValue>
    <rics:Occupier>Aura House Investments</rics:Occupier>
  </rics:Ipms3MeasuredArea>
</ipms:MeasuredProperty>
<ipms:Ipms1MeasuredAreaSummary>
  <rics:MeasurementValue>52</rics:MeasurementValue>
</ipms:Ipms1MeasuredAreaSummary>
<ipms:Ipms2MeasuredAreaSummary>
  <rics:MeasurementValue>50</rics:MeasurementValue>
</ipms:Ipms2MeasuredAreaSummary>
<ipms:Ipms3MeasuredAreaSummary measurementSubtype="3">
  <rics:MeasurementValue>50</rics:MeasurementValue>
</ipms:Ipms3MeasuredAreaSummary>
</ipms:IpmsMeasurement>
```