**Open Geospatial Consortium**

Submission Date: <yyyy-mm-dd>

Approval Date:   <yyyy-mm-dd>

Publication Date:   <yyyy-mm-dd>

External identifier of this OGC® document: <<http://www.opengis.net/doc/standard/infragml/part6/1.0>>

Internal reference number of this OGC® document:    16-106

Version: 1.0.0

Category: OGC® Encoding Standard

Editor: Hans-Christoph Gruler 

Contributors: Paul Scarponcini

OGC InfraGML 1.0: Part 6 – LandInfra Survey - Encoding Standard

Note: This 20161122 version submitted to OGC for approval as an OGC Standard.

**Copyright notice**

Copyright © 2016 Open Geospatial Consortium  
To obtain additional rights of use, visit <http://www.opengeospatial.org/legal/>.

**Warning**

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

Document type:    OGC® Standard

Document subtype:    if applicable

Document stage:    Draft

Document language:  English

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

License Agreement

Permission is hereby granted by the Open Geospatial Consortium, ("Licensor"), free of charge and subject to the terms set forth below, to any person obtaining a copy of this Intellectual Property and any associated documentation, to deal in the Intellectual Property without restriction (except as set forth below), including without limitation the rights to implement, use, copy, modify, merge, publish, distribute, and/or sublicense copies of the Intellectual Property, and to permit persons to whom the Intellectual Property is furnished to do so, provided that all copyright notices on the intellectual property are retained intact and that each person to whom the Intellectual Property is furnished agrees to the terms of this Agreement.

If you modify the Intellectual Property, all copies of the modified Intellectual Property must include, in addition to the above copyright notice, a notice that the Intellectual Property includes modifications that have not been approved or adopted by LICENSOR.

THIS LICENSE IS A COPYRIGHT LICENSE ONLY, AND DOES NOT CONVEY ANY RIGHTS UNDER ANY PATENTS THAT MAY BE IN FORCE ANYWHERE IN THE WORLD.

THE INTELLECTUAL PROPERTY IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE DO NOT WARRANT THAT THE FUNCTIONS CONTAINED IN THE INTELLECTUAL PROPERTY WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION OF THE INTELLECTUAL PROPERTY WILL BE UNINTERRUPTED OR ERROR FREE. ANY USE OF THE INTELLECTUAL PROPERTY SHALL BE MADE ENTIRELY AT THE USER’S OWN RISK. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR ANY CONTRIBUTOR OF INTELLECTUAL PROPERTY RIGHTS TO THE INTELLECTUAL PROPERTY BE LIABLE FOR ANY CLAIM, OR ANY DIRECT, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM ANY ALLEGED INFRINGEMENT OR ANY LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR UNDER ANY OTHER LEGAL THEORY, ARISING OUT OF OR IN CONNECTION WITH THE IMPLEMENTATION, USE, COMMERCIALIZATION OR PERFORMANCE OF THIS INTELLECTUAL PROPERTY.

This license is effective until terminated. You may terminate it at any time by destroying the Intellectual Property together with all copies in any form. The license will also terminate if you fail to comply with any term or condition of this Agreement. Except as provided in the following sentence, no such termination of this license shall require the termination of any third party end-user sublicense to the Intellectual Property which is in force as of the date of notice of such termination. In addition, should the Intellectual Property, or the operation of the Intellectual Property, infringe, or in LICENSOR’s sole opinion be likely to infringe, any patent, copyright, trademark or other right of a third party, you agree that LICENSOR, in its sole discretion, may terminate this license without any compensation or liability to you, your licensees or any other party. You agree upon termination of any kind to destroy or cause to be destroyed the Intellectual Property together with all copies in any form, whether held by you or by any third party.

Except as contained in this notice, the name of LICENSOR or of any other holder of a copyright in all or part of the Intellectual Property shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Intellectual Property without prior written authorization of LICENSOR or such copyright holder. LICENSOR is and shall at all times be the sole entity that may authorize you or any third party to use certification marks, trademarks or other special designations to indicate compliance with any LICENSOR standards or specifications. This Agreement is governed by the laws of the Commonwealth of Massachusetts. The application to this Agreement of the United Nations Convention on Contracts for the International Sale of Goods is hereby expressly excluded. In the event any provision of this Agreement shall be deemed unenforceable, void or invalid, such provision shall be modified so as to make it valid and enforceable, and as so modified the entire Agreement shall remain in full force and effect. No decision, action or inaction by LICENSOR shall be construed to be a waiver of any rights or remedies available to it.

Contents

[1. Scope 8](#_Toc467434162)

[2. Conformance 8](#_Toc467434163)

[3. References 9](#_Toc467434164)

[4. Terms and Definitions 9](#_Toc467434165)

[5. Conventions 10](#_Toc467434166)

[5.1 Abbreviations 10](#_Toc467434167)

[5.2 UML Package and Class Diagrams 10](#_Toc467434168)

[5.3 Requirements 10](#_Toc467434169)

[6. InfraGML Parts 12](#_Toc467434170)

[7. Requirements Classes for this Part 14](#_Toc467434171)

[7.1 Structural Overview of Requirements Classes 14](#_Toc467434172)

[7.1.1 Requirement Classes Defined in This Part 15](#_Toc467434173)

[7.1.2 Dependent Requirement Classes Defined in Other Parts 15](#_Toc467434174)

[7.1.3 Other Standards upon which the Requirement Classes of this Part Depend 15](#_Toc467434175)

[7.2 Requirements Class: Survey 17](#_Toc467434176)

[7.2.1 Implementation decisions regarding OGC 15-111r1 UML 17](#_Toc467434177)

[7.2.2 Specific Requirements for this Requirements Class 17](#_Toc467434178)

[7.3 Requirements Class: Equipment 18](#_Toc467434179)

[7.3.1 Implementation decisions regarding OGC 15-111r1 UML 18](#_Toc467434180)

[7.3.2 Specific Requirements for this Requirements Class 19](#_Toc467434181)

[7.4 Requirements Class: Observations 22](#_Toc467434182)

[7.4.1 Implementation decisions regarding OGC 15-111r1 UML 22](#_Toc467434183)

[7.4.2 Specific Requirements for this Requirements Class 22](#_Toc467434184)

[7.5 Requirements Class: SurveyResults 24](#_Toc467434185)

[7.5.1 Implementation decisions regarding OGC 15-111r1 UML 24](#_Toc467434186)

[7.5.2 Specific Requirements for this Requirements Class 24](#_Toc467434187)

[8. Media Types for any data encoding(s) 26](#_Toc467434188)

[Annex A: Conformance Class Abstract Test Suite (Normative) 27](#_Toc467434189)

[A.1 Conformance class: Survey 27](#_Toc467434190)

[A.2 Conformance class: Equipment 27](#_Toc467434191)

[A.3 Conformance class: Observations 27](#_Toc467434192)

[A.4 Conformance class:SurveyResults 28](#_Toc467434193)

[Annex B: Sample XML (Informative) 29](#_Toc467434194)

[Annex C: Revision history 65](#_Toc467434195)

[Annex D: Bibliography 66](#_Toc467434196)

[Annex E: GML XSD (informative) 67](#_Toc467434197)

[E. 1 Part6Survey1119.xsd 67](#_Toc467434198)

[E. 2 Part6Equipment1119.xsd 68](#_Toc467434199)

[E. 3 Part6Observations1119.xsd 85](#_Toc467434200)

[E. 4 Part6SurveyResults1119.xsd 98](#_Toc467434201)

Figures

[Figure 1. InfraGML Part Dependencies 13](#_Toc467092085)

[Figure 2. LandInfra Requirements Classes grouped into InfraGML Parts 14](#_Toc467092086)

[Figure 3. Requirements Classes for this Part and their Dependencies 16](#_Toc467092087)

Abstract

This OGC InfraGML Encoding Standard presents the implementation-dependent, GML encoding of concepts supporting land and civil engineering infrastructure facilities specified in the OGC Land and Infrastructure Conceptual Model Standard (LandInfra), OGC 15-111r1. Conceptual model subject areas include land features, facilities, projects, alignment, road, railway, survey (including equipment, observations, and survey results), land division, and condominiums.

InfraGML is published as a multi-part standard. This Part 6 addresses the Survey, Equipment, Observations and Survey Results Requirements Classes from LandInfra.

Keywords

The following are keywords to be used by search engines and document catalogues.

OGC document, LandInfra, InfraGML, infrastructure, civil, survey, observation, measurements

Preface

In order to achieve consensus on the concepts supporting land and civil engineering infrastructure facilities, a UML Conceptual Model, LandInfra, was approved as an OGC standard in August, 2016. This model provides a unifying basis for encodings including but not limited to InfraGML, including similar work in buildingSMART International. It can also provide a framework for discussing how other software standards relate to LandInfra.

As an OGC standard, LandInfra follows the OGC modular specification standard, OGC 08-131r3. Because of the breadth of LandInfra, its subject areas are divided into separate Requirements Classes. This InfraGML encoding similarly is divided into Requirements Classes which are then grouped into Parts. A Part may address multiple LandInfra Requirements Classes but each Requirements Class is addressed in a single part. Because Requirements Classes may depend on other Requirements Classes (see LandInfra Figure 1, “Requirements Classes as UML Packages with their dependencies”), the reader of this InfraGML Part may need to conform to Requirements Classes in other Parts as well.

Note that this InfraGML encoding standard is a target of LandInfra and therefor this standard conforms to the Requirements Classes in LandInfra. On the other hand, an application claiming conformance to this InfraGML encoding standard must conform to the Requirements Classes contained in this InfraGML standard.

There are several reasons for separating InfraGML into Parts. Because they are likely to have separate authors, the rate at which each Part is completed may vary. It would not be advisable to wait until all Parts complete before any can be released as separate OGC standards. Multiple Parts will also allow each subject to have its own standards life cycle. One Part can be updated independent of other Parts, subject to dependency constraints. And of course, it should be easier for the application software developer to only deal with Parts relevant to their application.

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

*Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.*

Submitting organizations

The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

Bentley Systems, Inc.

Leica Geosystems

Swedish Transport Administration

Trimble, Inc.

Autodesk

Submitters

All questions regarding this submission should be directed to the editor or the submitters:

|  |  |
| --- | --- |
| **Name** | **Affiliation** |
| Paul Scarponcini, SWG chair | Bentley Systems, Inc. |
| Hans-Christoph Gruler, SWG co-chair | Leica Geosystems |
| Peter Axelsson | Swedish Transport Administration |
| Lars Wikström | Swedish Transport Administration |
| Leif Granholm | Trimble Inc. |
| Johnny Jensen | Trimble Inc. |
| Thomas Liebich | buildingSMART International |
| Orest Halustchak | Autodesk |

# Scope

InfraGML is a GML encoding standard of the LandInfra Conceptual Model standard, OGC 15-111r1. InfraGML is provided as a set of individual though inter-dependent Parts, each of which is a GML standard.

The overall scope of this InfraGML Encoding Standard is infrastructure facilities and the land on which they are constructed. Also included is the surveying necessary for the setting out and as-built recording of these facilities and land interests. Primarily having a civil engineering point of view, InfraGML is relevant across all life cycle phases of a facility. Subject areas include land features, facilities, projects, alignment, road, railway, survey (including equipment, observations, and survey results), land division, and condominiums.

The scope of this Part 6 of InfraGML addresses the following subject area(s): survey, observations, equipment, survey results. The InfraGML Survey, Observations, Equipment and Survey Results Requirements Classes are included. It is optional in that an application can conform to InfraGML without supporting any of these, for example by only supporting the LandDivision Requirements Classes in Part 7. However, to claim support for Survey, an application must also support the InfraGML Core Requirements Class. To claim support for Equipment, an application must also support the InfraGML Core and Survey Requirements Classes. To claim support for Observations, an application must also support the InfraGML Core and Survey Requirements Classes and may choose to support the Equipment and also the Survey Results Requirements Class. To claim support for Survey Results, an application must also support the InfraGML Core and Survey Requirements Classes and may choose to also support the Observations and also the Equipment Requirement Class for sampling features.

# Conformance

The InfraGML encoding standard defines requirements, grouped into Requirements Classes, for applications which read and write information about infrastructure facilities and the land on which they are constructed, including the surveying necessary for the setting out and as-built recording of these facilities and land interests.

The OGC modular specification (OGC 08-131r3) defines “standardization target” as the entity to which requirements of a standard apply. It further notes that the standardization target is the entity which may receive a certificate of conformance for a requirements class. The standardization target type for this standard is therefore:

* software applications which read/write data instances, i.e. XML documents that encode land, infrastructure facility, and survey data for exchange

Conformance with this standard shall be checked using all the relevant tests specified in Annex A (normative) of this document. The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance are specified in the OGC Compliance Testing Policies and Procedures and the OGC Compliance Testing web site[[1]](#footnote-1).

In order to conform to this OGC encoding standard, a standardization target shall choose to implement the core conformance class and any of the other conformance classes with their dependencies. Conformance classes are based on Requirements Classes which are specified in this and possibly other Parts of the InfraGML standard.

All requirements classes and conformance classes described in this document are owned by the standard(s) identified. Note that Conformance Classes for this Part of InfraGML may require conformance with Conformance Classes from other Parts of InfraGML.

# References

The following normative documents contain provisions that, through reference in this text, constitute provisions of this Part of InfraGML. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

OGC 07-036, *OpenGIS® Geography Markup Language (GML) Encoding Standard,* v3.2.1, August 27, 2007

OGC 10-129r1, *OGC® Geography Markup Language (GML) — Extended schemas and encoding rules*, v3.3, February 7, 2012

OGC 15-111r1, *OGC Land and Infrastructure Conceptual Model Standard (LandInfra)*, v1.0, August nn, 2016.

OGC 16-100, *OGC InfraGML 1.0: Part 0 – LandInfra Core – Encoding Standard*, v1.0, 2017

# Terms and Definitions

This document uses the terms defined in Sub-clause 5.3 of [OGC 06-121r8], which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this standard.

The LandInfra standard contains a long list of terms and definitions relevant to the scope of InfraGML. As these will not be repeated here, the reader is directed to Clause 4 of LandInfra. Only terms not already appearing there are listed below.

# Conventions

## Abbreviations

In this document the following abbreviations and acronyms are used or introduced:

GML Geography Markup Language

ISO International Organization for Standardization

OGC Open Geospatial Consortium

UML Unified Modeling Language

XML eXtensible Markup Language

## UML Package and Class Diagrams

The LandInfra standard contains UML diagrams for the concepts supported by InfraGML. As these will not be repeated here, the reader is directed to Clause 7 of LandInfra. UML will only appear in InfraGML in the rare cases where LandInfra is extended by InfraGML.

## Requirements

When referred to in a Requirement or Requirements Class, the boxes contained in the LandInfra UML figures may all be called “Classes” even if they are data types, enumerations, code lists, unions etc. In most cases, these will be encoded as XML elements in InfraGML.

When an InfraGML Requirement states that “A conforming application shall support the [Requirements Class] XML elements listed in Table <n> in accordance with the GML XSD in this standard.”, the XSD was developed to support the UML for the corresponding LandInfra Requirements Class as follows:

1. all classes shown as blue boxes for the corresponding LandInfra Requirements Class UML diagrams
2. all attributes, attribute cardinalities, and attribute data types of these classes (usually shown in subsequent diagrams)
3. all associations, navigation, roles, and role cardinalities connected to the blue classes
4. all classes shown as beige boxes (another Requirements Class) in the diagrams connected to the blue box classes by association or used as attribute data types
5. all classes shown as pink boxes (another Standard) in the figure connected to the blue box classes by association or used as attribute data types

Note that, in rare cases, the OGC 15-111r1 UML may be altered. In such cases, the alterations are declared in the first subclause of each Requirements Class, entitled “Implementation decisions regarding OGC 15-111r1 UML”. Logical Model UML diagrams may be included if the implementation constraints of GML (or XML) dictate that the Conceptual Model cannot be implemented directly as shown in OGC 15-111r1.

In most cases, the InfraGML XML derived from the LandInfra UML follows the rules in OGC 07-036, GML, Annex E, UML-to-GML application schema encoding rules.

The only normative version of the GML XSD (XML schema definition) for all Parts of the InfraGML Encoding Standard is available from the official OGC XML schema repository at <http://schemas.opengis.net>. Any occurrences of all or part of this XSD contained within this document are to be considered to be informative only.

The URI base for the LandInfra Conceptual Model standard is <http://www.opengis.net/spec/landinfra/1.0>. All URIs of Requirements Classes, Requirements, and Conformance Classes contained in that standard are relative to this base.

The URI base for this InfraGML encoding standard is <http://www.opengis.net/spec/infragml/part6/1.0>. All URIs of Requirements Classes, Requirements, and Conformance Classes contained in this standard are relative to this base.

# InfraGML Parts

The InfraGML encoding standard has been divided into Parts. These Parts enable the grouping of LandInfra subject areas (Requirements Classes) into individual OGC encoding standards. All of these InfraGML encoding standards have a similar name: “OGC 16-10n, OGC® InfraGML 1.0: Part n - <part name> Encoding Standard”, where Part numbers and names are as follows:

|  |  |
| --- | --- |
| **N** | **<part name>** |
| 0 | LandInfra Core |
| 1 | LandInfra LandFeatures |
| 2 | LandInfra Facilities and Projects |
| 3 | LandInfra Alignments |
| 4 | LandInfra Roads |
| 5 | LandInfra Railways |
| 6 | LandInfra Survey |
| 7 | LandInfra LandDivision |

Some InfraGML Parts depend upon other parts:



Figure 1. InfraGML Part Dependencies

The boxes above represent InfraGML Parts. Arrows show Part dependencies.

The Part dependencies derive from the dependencies of the InfraGML Requirements Classes contained in these Parts. The reader should rely more on the InfraGML Requirements Class dependencies and only use the Part dependencies as a guide for knowing which InfraGML Part standards to consider.

InfraGML Parts include the following LandInfra 1.0 Requirements Classes (UML Packages):



Figure 2. LandInfra Requirements Classes grouped into InfraGML Parts

The boxes above and their names represent LandInfra Requirements Classes. The numbers are InfraGML Part numbers. Dependency arrows shown above are dependencies between LandInfra Requirements Classes.

# Requirements Classes for this Part

## Structural Overview of Requirements Classes

The Requirements Classes for this Part of the InfraGML encoding standard (shown in blue in Figure 3 below) are defined in this Clause 7. Requirements Classes from other Parts upon which this Part’s Requirements Classes are dependent (shown in beige in Figure 3 below) are listed here but defined in the documentation of their respective Parts. External OGC and ISO standards on which Requirements Classes in this Standard depend (shown in pink in Figure 3 below) are also listed. Below is a brief summary of the function of each of these Requirements Classes.



Figure 3. Requirements Classes for this Part and their Dependencies

### Requirement Classes Defined in This Part

**Survey**

The Survey Requirement Class supports those use cases to hold the observations, processes and their results for the acquisition of points, lines, surfaces and properties of features of interest. The primary focus of this package is to have the possibility of recording and reprocessing the observations of the acquired objects.

The present Survey Requirement Class contains header information for the surveys, as the survey package has been divided in sub- packages because of the number of classes in the Observations, SurveyResults and Equipment packages.

**Equipment**

The Equipment Requirements Class describes the observation processes. The purpose of an Survey Process is to generate a survey result and holds all the information about the sensors used for the measurements.

**Observations**

The Observations Requirements Class contains all measurements in an structured way to for a later reprocessing possibility.

**Survey Results**

The SurveyResults Requirement Class contains the estimate of the value(s) of a geometry or property of the feature of interest. The results could be linked to sample features – this would enable a later reprocessing of all observation to determine how the results have been determined.

### Dependent Requirement Classes Defined in Other Parts

The Requirements Classes defined in this Part are dependent on the following Requirements Classes from other Parts.

**Part 0. LandInfra Core**

LandInfra is the core Requirements Class and is the only mandatory Requirements Class. This class contains information about the Land and Infrastructure dataset that can contain information about facilities, land features, land division, documents, survey marks, surveys, sets, and feature associations. LandInfra also contains the definition of types common across other Requirements Classes, such as the Status CodeList.

### Other Standards upon which the Requirement Classes of this Part Depend

For external OGC and ISO standards on which Requirements Classes in this Standard depend, a brief summary of the function of each of these Standards is described below.

**GML 3.2**

OGC 07-036, OpenGIS® Geography Markup Language (GML) Encoding Standard, v3.2 provides most of the geometry types (e.g., Point, LineString, Polygon) used for spatial representations in this Standard. Defines Coordinate Reference Systems. Supports the General Feature Model upon which this Standard is based.

**GML 3.3**

OGC 10-129r1, OGC® Geography Markup Language (GML) — Extended schemas and encoding rules, v3.3 defines the linear referencing concepts (e.g., linear element, distance along, Linear Referencing Methods) used for linearly referenced locations in this Standard.

## Requirements Class: Survey

|  |  |
| --- | --- |
| **Requirements Class** | |
| **/req/survey** | |
| Target type | Conforming application |
| Name | Survey |
| Dependency | **/req/core** (from InfraGML Part 0) |
| **Requirement** | **/req/survey/elements** |

### Implementation decisions regarding OGC 15-111r1 UML

The following implementation decisions have been made regarding the OGC 15-111r1 LandInfra Requirements Class UML:

1. New association for surveyProcess has been added because of the change to have this class as individual class with the link to SurveySensors instead of deriving SurveySensors from gml:: ProcedurePropertyType – therefore SurveyProcess would not have a home inside Equipment.
2. New association for sampling has been added - Sampling would not have a home inside SurveyResults.

### Specific Requirements for this Requirements Class

|  |  |
| --- | --- |
| **Requirement** | **/req/survey/elements**  A conforming application shall support the Survey XML elements listed in Table 1 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/survey.xsd. |

An application conforming to this standard shall support the Survey XML elements listed below in Table 1 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/Survey.xsd. Survey XML element names are shown with a XML namespace prefix of “lis”. Corresponding LandInfra UML classes are shown with their LandInfra Requirements Class prefix of “Survey”.

|  |  |
| --- | --- |
| **InfraGML XML element** | **LandInfra UML Class** |
| lis:Survey | Survey::Survey |

Table 1. InfraGML Survey XML elements with corresponding LandInfra UML classes

## Requirements Class: Equipment

|  |  |
| --- | --- |
| **Requirements Class** | |
| **/req/equipment** | |
| Target type | Conforming application |
| Name | Equipment |
| Dependency | **/req/survey** |
| **Requirement** | **/req/equipment/elements** |
| **Requirement** | **/req/equipment/observation-correction** |

### Implementation decisions regarding OGC 15-111r1 UML

1. In OGC 15-111r1UML the model equioment model had the dependeny to OGC 07-022r1, OGC® Observations and Measurements — Part 1 — Observation schema and OGC 07-002r3, OGC® Observations and Measurements — Part 2 — Sampling Features. However in GML 3.2 there is already an observation encoding with the schema observation ( urn:x-ogc:specification:gml:schema-xsd:observation:3.2.1) defined. Therefore it was decided to use this basic structures introduced in this gml 3.2.1 schema as the foundation for more comprehensive schemas for scientific, technical and engineering measurement schemas like the LandInfra equipment schema. The ecoding between the OM and the gml schema are similar and only differentiate in regards of association names and cardinalities. Therefore the decision was mad to use the base gml schema and therefore avoid another dependencies to external encodings.
2. OM:Process had been an Feature and most of the classes in the survey part had been derived from then. The change #1 then required to put Antenna to a Feature
3. Correction::type was set to optional- The type is then not needed for dervived classes and makes the resulting xml file clener.
4. Equipment : equivalent to #2
5. SurveyProcess…add element instead of inheritance and derive now from gml:ProcedurePropertyType
6. SurveySensor - equivalent to #2.
7. SurveySensor:type -> optiona because it is then not needed for for dervived classes.
8. In the SurveySensorTpye enumeration a new type “other” was added and the unused “tilt” entry was removed.
9. Figure 4 shows the encoding of camera related information based on the ISO – 1930-ImagarySensors concetional model.



Figure 4. Camera Class encoding for ISO-19130

### Specific Requirements for this Requirements Class

|  |  |
| --- | --- |
| **Requirement** | **/req/equipment/elements**  A conforming application shall support the Survey XML elements listed in Table 2 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/equipment.xsd. An application shall decide which SurveySensor types it will support and then include appropriate elements accordingly. |

An application conforming to this standard shall support the Equipment XML elements listed below in Table 2 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/Equipment.xsd. Equipment XML element names are shown with a XML namespace prefix of “lise”. Corresponding LandInfra UML classes are shown with their LandInfra Requirements Class prefix of “Equipment”.

|  |  |
| --- | --- |
| **InfraGML XML element** | **LandInfra UML Class** |
| lise:AngularCorrection | Equipment::AngularCorrection |
| lise:Antenna | Equipment::Antenna |
| lise:Camera | Equipment::Camera |
| lise:Correction | Equipment::Correction |
| lise:DetectionArray | ISO-19130-SD\_DetectionArray |
| lise:DistanceCorrection | Equipment::DistanceCorrection |
| lise:Distortion | ISO-19130-SD\_Distortion |
| lise:EDM | Equipment::EDM |
| lise:Equipment | Equipment::Equipment |
| lise:GNSS | Equipment::GNSS |
| lise:GenericAngle | Equipment::GenericAngle |
| lise:GenericDistance | Equipment::GenericDistance |
| lise:InteriorOrientation | Equipment::InteriorOrientation |
| lise:LaserScanner | Equipment::LaserScanner |
| lise:Level | Equipment::Level |
| lise:ObservationCorrections | Equipment::ObservationCorrections |
| lise:Offset | Equipment::Offset |
| lise:SensorSystem | ISO-19130-SD\_SensorSystem |
| lise:SurveyProcess | Equipment::SurveyProcess |
| lise:SurveySensor | Equipment::SurveySensor |
| lise:Tps | Equipment::Tps |
| lise:Transformation | Equipment::Transformation |

Table 2. InfraGML Equipmnent XML elements with corresponding LandInfra UML classes

|  |  |
| --- | --- |
| **Requirement** | **/req/equipment/observation-correction**  If an application allows corrections to be applied to the raw observations then that application shall support the ObservationCorrections element. The application shall specify which correction types it supports. |

## Requirements Class: Observations

|  |  |
| --- | --- |
| **Requirements Class** | |
| **/req/observations** | |
| Target type | Conforming application |
| Name | Observations |
| Dependency | **/req/survey** |
| **Requirement** | **/req/observations/elements** |

### Implementation decisions regarding OGC 15-111r1 UML

The implementation follows the OGC 15-111r1Survey Requirements Class UML.

1. In OGC 15-111r1UML the model equioment model had the dependeny to OGC 07-022r1, OGC® Observations and Measurements — Part 1 — Observation schema and OGC 07-002r3, OGC® Observations and Measurements — Part 2 — Sampling Features. However in GML 3.2 there is already an observation encoding with the schema observation ( urn:x-ogc:specification:gml:schema-xsd:observation:3.2.1) defined. Therefore it was decided to use this basic structures introduced in this gml 3.2.1 schema as the foundation for more comprehensive schemas for scientific, technical and engineering measurement schemas like the LandInfra equipment schema. The ecoding between the OM and the gml schema are similar and only differentiate in regards of association names and cardinalities. Therefore the decision was mad to use the base gml schema and therefore avoid another dependencies to external encodings.
2. OM:Observation had been an Feature and most of the classes in the survey part had been derived from then. The change #1 then required to put PanoramaImage amd Setup to a Feature .
3. More and more survey sensors contains a camera -> therefore the Images and Panorama images had been moved to the SurveyObservation Base.

### Specific Requirements for this Requirements Class

|  |  |
| --- | --- |
| **Requirement** | **/req/observations/elements**  A conforming application shall support the Survey XML elements listed in Table 3 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/observations.xsd. An application shall decide which Observation types it will support and then include appropriate elements accordingly. |

An application conforming to this standard shall support the Observations XML elements listed below in Table 3 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/Observations.xsd. Observations XML element names are shown with a XML namespace prefix of “liso”. Corresponding LandInfra UML classes are shown with their LandInfra Requirements Class prefix of “Observations”.

|  |  |
| --- | --- |
| **InfraGML XML element** | **LandInfra UML Class** |
| liso:AngularObservation | Observations::AngularObservation |
| liso:DistanceObservation | Observations::DistanceObservation |
| liso:ExteriorOrientation | Observations::ExteriorOrientation |
| liso:GF\_PropertyType | Observations::GF\_PropertyType |
| liso:GnssObservation | Observations::GnssObservation |
| liso:GnssQuality | Observations::GnssQuality |
| liso:ImageObservation | Observations::ImageObservation |
| liso:InstrumentPoint | Observations::InstrumentPoint |
| liso:LevelObservation | Observations::LevelObservation |
| liso:PanoramaImage | Observations::PanoramaImage |
| liso:PointCloudObservation | Observations::PointCloudObservation |
| liso:RtkInfo | Observations::RtkInfo |
| liso:SatelliteInfo | Observations::SatelliteInfo |
| liso:Setup | Observations::Setup |
| liso:SurveyObservation | Observations::SurveyObservation |
| liso:TpsObservation | Observations::TpsObservation |

Table 3. InfraGML Observations XML elements with corresponding LandInfra UML classes

## Requirements Class: SurveyResults

|  |  |
| --- | --- |
| **Requirements Class** | |
| **/req/survey-results** | |
| Target type | Conforming application |
| Name | SurveyResults |
| Dependency | **/req/observations** |
| **Requirement** | **/req/survey-results/elements** |

### Implementation decisions regarding OGC 15-111r1 UML

The implementation follows the OGC 15-111r1Survey Requirements Class UML.

1. In OGC 15-111r1UML the model equioment model had the dependeny to OGC 07-022r1, OGC® Observations and Measurements — Part 1 — Observation schema and OGC 07-002r3, OGC® Observations and Measurements — Part 2 — Sampling Features. However in GML 3.2 there is already an observation encoding with the schema observation ( urn:x-ogc:specification:gml:schema-xsd:observation:3.2.1) defined. Therefore it was decided to use this basic structures introduced in this gml 3.2.1 schema as the foundation for more comprehensive schemas for scientific, technical and engineering measurement schemas like the LandInfra equipment schema. The ecoding between the OM and the gml schema are similar and only differentiate in regards of association names and cardinalities. Therefore the decision was made to use the base gml schema and therefore avoid another dependencies to external encodings.
2. To support sampling the dependency to observation had been added.

### Specific Requirements for this Requirements Class

|  |  |
| --- | --- |
| **Requirement** | **/req/survey-results/elements**  A conforming application shall support the Survey XML elements listed in Table 4 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/surveyResults.xsd. An application shall decide which SurveyResults types it will support and then include appropriate elements accordingly. |

An application conforming to this standard shall support the SurveyResults XML elements listed below in Table 4 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/ SurveyResults.xsd. SurveyResults XML element names are shown with a XML namespace prefix of “lisr”. Corresponding LandInfra UML classes are shown with their LandInfra Requirements Class prefix of “SurveyResults”.

|  |  |
| --- | --- |
| **InfraGML XML element** | **LandInfra UML Class** |
| lisr:Average | SurveyResults::Average |
| lisr: AveragePoint | SurveyResults:: AveragePoint |
| lisr: DesignPoint | SurveyResults:: DesignPoint |
| lisr: Image | SurveyResults:: Image |
| lisr: PointCloud | SurveyResults:: PointCloud |
| lisr: PointQuality | SurveyResults:: PointQuality |
| lisr: Stakeout | SurveyResults:: Stakeout |
| lisr: String | SurveyResults:: String |
| lisr: SurveyResult | SurveyResults:: SurveyResult |
| lisr: TargetPoint | SurveyResults:: TargetPoint |
| lisr: UserDefined | SurveyResults:: UserDefined |
| lisr: Value | SurveyResults:: Value |

Table 4. InfraGML SurveyResults XML elements with corresponding LandInfra UML classes

# Media Types for any data encoding(s)

Data for all Parts of the InfraGML encoding standard is encoded in GML-conformant

XML documents. The standard MIME-type and sub-type for GML data should be used to

indicate the encoding in internet exchange, as specified in MIME Media Types for GML,

namely ‘application/gml+xml’.

1. Conformance Class Abstract Test Suite (Normative)
   1. Conformance class: Survey

|  |  |  |
| --- | --- | --- |
| [**/conf/survey**](http://www.opengis.net/spec/waterml/2.0/conf/uml-timeseries-observation) | | |
| Requirements | [**/req/survey**](http://www.opengis.net/spec/Infrastructure/1.0/req/LandInfra%20) | |
| Dependency | **/conf/core** (from InfraGML Part 0) | |
| **Test** | **/conf/survey/elements** | |
| Requirement | **/req/survey/elements** |
| Test purpose | Verify that the conforming application supports the Survey XML elements listed in Table 1 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/survey.xsd. |
| Test method | Inspect the GML output to verify the above requirement. |
| Test type | Capability |

* 1. Conformance class: Equipment

|  |  |  |
| --- | --- | --- |
| [**/conf/equipment**](http://www.opengis.net/spec/waterml/2.0/conf/uml-timeseries-observation) | | |
| Requirements | [/req/equipment](http://www.opengis.net/spec/Infrastructure/1.0/req/LandInfra%20) | |
| Dependency | **/conf/survey** | |
| **Test** | **/conf/equipment/elements** | |
| Requirement | **/req/equipment/elements** |
| Test purpose | Verify that the conforming application supports the Equipment XML elements listed in Table 2 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/equipment.xsd. |
| Test method | Inspect the GML output to verify the above requirement. |
| Test type | Capability |
| **Test** | **/conf/equipment/observation-correction** | |
| Requirement | **/req/equipment/elements** |
| Test purpose | Verify that the conforming application specifies which correction types it supports, if any. |
| Test method | Inspect the GML output to verify the above requirement. |
| Test type | Capability |

* 1. Conformance class: Observations

|  |  |  |
| --- | --- | --- |
| [**/conf/observations**](http://www.opengis.net/spec/waterml/2.0/conf/uml-timeseries-observation) | | |
| Requirements | [/req/observations](http://www.opengis.net/spec/Infrastructure/1.0/req/LandInfra%20) | |
| Dependency | **/conf/survey** | |
| **Test** | **/conf/observations/elements** | |
| Requirement | **/req/observations/elements** |
| Test purpose | Verify that the conforming application supports the Observations XML elements listed in Table 3 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/observations.xsd. |
| Test method | Inspect the GML output to verify the above requirement. |
| Test type | Capability |

* 1. Conformance class:SurveyResults

|  |  |  |
| --- | --- | --- |
| [**/conf/surveyResults**](http://www.opengis.net/spec/waterml/2.0/conf/uml-timeseries-observation) | | |
| Requirements | [/req/surveyResults](http://www.opengis.net/spec/Infrastructure/1.0/req/LandInfra%20) | |
| Dependency | **/conf/observations** | |
| **Test** | **/conf/survey-results/elements** | |
| Requirement | **/req/surveyResults/elements** |
| Test purpose | Verify that the conforming application supports the SurveyResults XML elements listed in Table 4 in accordance with the GML XSD specified in http://schemas.opengis.net/infragml/part6/1.0/surveyResults.xsd. |
| Test method | Inspect the GML output to verify the above requirement. |
| Test type | Capability |

1. Sample XML (Informative)

B1 Survey

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/survey/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6Survey1119.xsd" >

<datasetID>

<identifier>DS6</identifier>

<scope>OGC LandInfraSWG</scope>

</datasetID>

<name>Sample Part6 Dataset</name>

<description>LandInfra dataset to test all possible content for Part6 Survey

</description>

<dateTime>2016-10-19T10:00:00</dateTime>

<datasetVersion>1.0</datasetVersion>

<application>manual</application>

<author>Hans-Christoph Gruler, Leica Geosystems AG</author>

<infraVersion>1.0</infraVersion>

<language>English</language>

<defaultCRS xlink:href="crs1"/>

<abstractData>

<lis:Survey gml:id="S1">

<gml:description>sample survey definition required content</gml:description>

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

</lis:Survey>

</abstractData>

<abstractData>

<lis:Survey gml:id="S2">

<gml:description>sample survey definition all possible content</gml:description>

<gml:name>Survey 1 Survey</gml:name>

<propertySet>

<PropertySet gml:id="PS1">

<property>

<Property gml:id="P1">

<valueType xsi:type="gml:StringOrRefType"></valueType>

<value></value>

</Property>

</property>

<property>

<Property gml:id="P2">

<valueType></valueType>

<value></value>

</Property>

</property>

</PropertySet>

</propertySet>

<lis:surveyID>

<lis:identifier>Survey2</lis:identifier>

<lis:scope>OGC LandInfraSWG</lis:scope>

</lis:surveyID>

<lis:landSurveyor>

<Professional gml:id="p1">

<li:fullName>Surveyor1</li:fullName>

<li:type xlink:href="http://example.com/professionalType#landSurveyor" xlink:title="Land Surveyor"/>

<li:company>LandSurveyors Inc.</li:company>

<li:registration>SR12345678</li:registration>

<li:licensingCountry>Switzerland</li:licensingCountry>

</Professional>

</lis:landSurveyor>

<lis:purposeOfSurvey>Determination of new Parcel Boundery</lis:purposeOfSurvey>

<lis:type xlink:href="http://example.com/surveyType#surveyed" xlink:title="Surveyed"/>

</lis:Survey>

</abstractData>

</LandInfraDataset>

B2 Equipment

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:lise="http://www.opengis.net/infragml/equipment/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/equipment/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6Equipment1119.xsd" >

<datasetID>

<identifier>DS6\_1</identifier>

<scope>OGC LandInfraSWG</scope>

</datasetID>

<name>Sample Part6 Dataset</name>

<description>LandInfra dataset to test all possible content for Part6 Survey Equipment

</description>

<dateTime>2016-10-19T10:00:00</dateTime>

<datasetVersion>1.0</datasetVersion>

<application>manual</application>

<author>Hans-Christoph Gruler, Leica Geosystems AG</author>

<infraVersion>1.0</infraVersion>

<language>English</language>

<defaultCRS xlink:href="crs1"/>

<abstractData>

<lis:Survey gml:id="S1">

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

<lis:equipment gml:id="E1" xsi:type="lise:EquipmentType">

<gml:description>sample survey equipment definition required content all possible sensors</gml:description>

<lise:surveySensor>

<lise:Camera gml:id="SC1">

<lise:surveySensorID>

<lise:identifier>Camera1</lise:identifier>

</lise:surveySensorID>

</lise:Camera>

</lise:surveySensor>

<lise:surveySensor>

<lise:EDM gml:id="SE1">

<lise:surveySensorID>

<lise:identifier>EDM1</lise:identifier>

</lise:surveySensorID>

</lise:EDM>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericAngle gml:id="SGA1">

<lise:surveySensorID>

<lise:identifier>GenAng1</lise:identifier>

</lise:surveySensorID>

</lise:GenericAngle>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericDistance gml:id="SGD1">

<lise:surveySensorID>

<lise:identifier>GenDist1</lise:identifier>

</lise:surveySensorID>

</lise:GenericDistance>

</lise:surveySensor>

<lise:surveySensor>

<lise:GNSS gml:id="SG1">

<lise:surveySensorID>

<lise:identifier>GNSS1</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:surveySensor>

<lise:surveySensor>

<lise:LaserScanner gml:id="SS1">

<lise:surveySensorID>

<lise:identifier>Scanner1</lise:identifier>

</lise:surveySensorID>

</lise:LaserScanner>

</lise:surveySensor>

<lise:surveySensor>

<lise:Level gml:id="SL1">

<lise:surveySensorID>

<lise:identifier>Level1</lise:identifier>

</lise:surveySensorID>

</lise:Level>

</lise:surveySensor>

<lise:surveySensor>

<lise:Tps gml:id="ST1">

<lise:surveySensorID>

<lise:identifier>TPS1</lise:identifier>

</lise:surveySensorID>

</lise:Tps>

</lise:surveySensor>

</lis:equipment>

</lis:Survey>

</abstractData>

<abstractData>

<lis:Survey gml:id="S2">

<gml:description>sample survey definition all possible content</gml:description>

<gml:name>Survey 1 Survey</gml:name>

<lis:surveyID>

<lis:identifier>Survey2</lis:identifier>

<lis:scope>OGC LandInfraSWG</lis:scope>

</lis:surveyID>

<lis:landSurveyor>

<Professional gml:id="p1">

<li:fullName>Surveyor1</li:fullName>

<li:type xlink:href="http://example.com/professionalType#landSurveyor" xlink:title="Land Surveyor"/>

<li:company>LandSurveyors Inc.</li:company>

<li:registration>SR12345678</li:registration>

<li:licensingCountry>Switzerland</li:licensingCountry>

</Professional>

</lis:landSurveyor>

<lis:purposeOfSurvey>Determination of new Parcel Boundery</lis:purposeOfSurvey>

<lis:type xlink:href="http://example.com/surveyType#surveyed" xlink:title="Surveyed"/>

<lis:equipment gml:id="E2" xsi:type="lise:EquipmentType">

<gml:description>sample survey equipment definition all possible sensors</gml:description>

<gml:name>Equipment 12 Crew2</gml:name>

<lise:serialID>12345678</lise:serialID>

<lise:dataCollector>Survey Datacollector</lise:dataCollector>

<lise:controlSoftware>Software for Surveyors</lise:controlSoftware>

<lise:softwareVersion>1.97 Build 34</lise:softwareVersion>

<lise:surveySensor>

<lise:SurveySensor gml:id="SSB1">

<lise:surveySensorID>

<lise:identifier>BarCode Scanner</lise:identifier>

</lise:surveySensorID>

<lise:type xlink:href="http://example.com/surveySensorType#other" xlink:title="Other Sensor"/>

<lise:manufacture>ScanFactory</lise:manufacture>

<lise:model>Model X1</lise:model>

<lise:serialID>254</lise:serialID>

<lise:softwareVersion>2.03</lise:softwareVersion>

</lise:SurveySensor>

</lise:surveySensor>

<lise:surveySensor>

<lise:Camera gml:id="SC2">

<lise:surveySensorID>

<lise:identifier>Camera2</lise:identifier>

</lise:surveySensorID>

<lise:autoFocus>true</lise:autoFocus>

<lise:offsetAndOrientation gml:id="OFSET1">

<gml:validTime>

<gml:TimeInstant gml:id="TIM1">

<gml:timePosition>2016-10-19T10:00:00</gml:timePosition>

</gml:TimeInstant>

</gml:validTime>

<gml:position>

<gml:Point gml:id="OFSETP1">

<gml:pos>0.00013 0.254 0.136</gml:pos>

</gml:Point>

</gml:position>

<gml:bearing>

<gml:DirectionString>relative</gml:DirectionString>

</gml:bearing>

</lise:offsetAndOrientation>

<lise:crs>

<gml:ImageCRS gml:id="CCRS1">

<gml:identifier codeSpace="Crs Camera2"></gml:identifier>

<gml:scope></gml:scope>

<gml:usesCartesianCS></gml:usesCartesianCS>

<gml:usesImageDatum><gml:ImageDatum gml:id="ID1">

<gml:identifier codeSpace="SC2ID1"></gml:identifier>

<gml:scope></gml:scope>

<gml:pixelInCell codeSpace="1258">

</gml:pixelInCell>

</gml:ImageDatum>

</gml:usesImageDatum>

</gml:ImageCRS></lise:crs>

<lise:detector>

<lise:DetectorArray gml:id="SC2DA1">

<lise:numberOfDimentions>2</lise:numberOfDimentions>

<lise:arrayDimentionsValue>1246</lise:arrayDimentionsValue>

<lise:arrayDimentionsValue>758</lise:arrayDimentionsValue>

<lise:arrayDimentionsName>array1</lise:arrayDimentionsName>

<lise:arrayDimentionsName>array2</lise:arrayDimentionsName>

<lise:detectorSize>528</lise:detectorSize>

<lise:detectorSize>256</lise:detectorSize>

<lise:offsetVector>0 0.00006</lise:offsetVector>

</lise:DetectorArray>

</lise:detector>

<lise:interiorOrientation>

<lise:InteriorOrientation gml:id="SC2IO1">

<lise:principalPointX uom="Pixel">508</lise:principalPointX>

<lise:principalPointY uom="Pixel">248</lise:principalPointY>

<lise:focalLength uom="m">2.082550E-002</lise:focalLength>

<lise:crossHairPosX uom="Pixel">0</lise:crossHairPosX>

<lise:crossHairPosY uom="Pixel">0</lise:crossHairPosY>

<lise:virtualCameraConstant>0</lise:virtualCameraConstant>

</lise:InteriorOrientation>

</lise:interiorOrientation>

<lise:gNSS>

<lise:GNSS gml:id="SC2GNSS">

<lise:surveySensorID>

<lise:identifier>Integrated GPS</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:gNSS>

<lise:system>

<lise:SensorSystem gml:id="SC2SS1">

<lise:calibratedFocalLength uom="m">2.082550E-002</lise:calibratedFocalLength>

<lise:princPoint>

<gml:Point gml:id="SC2PP1">

<gml:pos>254 190</gml:pos>

</gml:Point>

</lise:princPoint>

<lise:instFieldOfView uom="deg">1.3</lise:instFieldOfView>

<lise:swathFieldOfView uom="deg">0.9</lise:swathFieldOfView>

<lise:opticalDistortion>

<lise:Distortion gml:id="SC2DI1">

<lise:princPoint>

<gml:Point gml:id="SC2PP2">

<gml:pos>254 190</gml:pos>

</gml:Point>

</lise:princPoint>

<lise:distortionK1>0.123</lise:distortionK1>

<lise:distortionK2>0.456</lise:distortionK2>

</lise:Distortion>

</lise:opticalDistortion>

</lise:SensorSystem>

</lise:system>

</lise:Camera>

</lise:surveySensor>

<lise:surveySensor>

<lise:EDM gml:id="SE2">

<lise:surveySensorID>

<lise:identifier>EDM2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.001</lise:accuracy>

<lise:carrierWavelength uom="nm">1.12345</lise:carrierWavelength>

</lise:EDM>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericAngle gml:id="SGA2">

<lise:surveySensorID>

<lise:identifier>GenAng2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="deg">0.000123</lise:accuracy>

</lise:GenericAngle>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericDistance gml:id="SGD2">

<lise:surveySensorID>

<lise:identifier>GenDist2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.0001</lise:accuracy>

</lise:GenericDistance>

</lise:surveySensor>

<lise:surveySensor>

<lise:GNSS gml:id="SG2">

<lise:surveySensorID>

<lise:identifier>GNSS2</lise:identifier>

</lise:surveySensorID>

<lise:posAccuracy uom="m">0.002</lise:posAccuracy>

<lise:hgtAccuracy uom="m">0.005</lise:hgtAccuracy>

<lise:camera>

<lise:Camera gml:id="GNSSC1">

<lise:surveySensorID>

<lise:identifier>GNSS Camera1</lise:identifier>

</lise:surveySensorID>

</lise:Camera>

</lise:camera>

<lise:antenna>

<lise:Antenna gml:id="GNSS2A1">

<lise:antennaID>

<lise:identifier>GNSS2 Antenna</lise:identifier>

</lise:antennaID>

<lise:iGSName>GNSS ANTENNA</lise:iGSName>

<lise:horizzontalOffset uom="m">0.123</lise:horizzontalOffset>

<lise:verticallOffset uom="m">0.234</lise:verticallOffset>

<lise:l1phaseOffset uom="m">0.345</lise:l1phaseOffset>

<lise:l2phaseOffset uom="m">0.456</lise:l2phaseOffset>

</lise:Antenna>

</lise:antenna>

<lise:reference><lise:GNSS gml:id="SG3">

<lise:surveySensorID>

<lise:identifier>reference</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:reference>

</lise:GNSS>

</lise:surveySensor>

<lise:surveySensor>

<lise:LaserScanner gml:id="SS2">

<lise:surveySensorID>

<lise:identifier>Scanner2</lise:identifier>

</lise:surveySensorID>

<lise:horizontalAngle>

<lise:GenericAngle gml:id="LSGA1">

<lise:surveySensorID>

<lise:identifier>Scanner HZ Angle</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="deg">0.003</lise:accuracy>

</lise:GenericAngle>

</lise:horizontalAngle>

</lise:LaserScanner>

</lise:surveySensor>

<lise:surveySensor>

<lise:Level gml:id="SL2">

<lise:surveySensorID>

<lise:identifier>Level2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.0005</lise:accuracy>

<lise:staff1>9876543</lise:staff1>

<lise:staff2>76543</lise:staff2>

</lise:Level>

</lise:surveySensor>

<lise:surveySensor>

<lise:Tps gml:id="ST2">

<lise:surveySensorID>

<lise:identifier>TPS2</lise:identifier>

</lise:surveySensorID>

<lise:compLongitudinal uom="deg">0.000030814891377</lise:compLongitudinal>

<lise:compTransversal uom="deg">-0.000485202964925</lise:compTransversal>

</lise:Tps>

</lise:surveySensor>

</lis:equipment>

<lis:surveyProcess xsi:type="lise:SurveyProcessType">

<lise:surveySensor xlink:href="SGA1">

</lise:surveySensor>

<lise:surveySensor xlink:href="SS2">

</lise:surveySensor>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:correction>

<lise:Correction gml:id="OC1">

<lise:correctionID>

<lise:identifier>Generic Observation correction</lise:identifier>

</lise:correctionID>

<lise:type xlink:href="http://example.com/observationCorrectionType#userDefined" xlink:title="User Defined"/>

</lise:Correction>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGD1">

</lise:surveySensor>

<lise:correction>

<lise:DistanceCorrection gml:id="DC1">

<lise:correctionID>

<lise:identifier>Distance Corr1</lise:identifier>

</lise:correctionID>

<lise:individualScale uom="m">1.0006</lise:individualScale>

</lise:DistanceCorrection>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGD1">

</lise:surveySensor>

<lise:correction>

<lise:Offset gml:id="OCO1">

<lise:correctionID>

<lise:identifier>Offset1</lise:identifier>

</lise:correctionID>

<lise:crossOffset uom="m">1.123</lise:crossOffset>

<lise:lengthOffset uom="m">2.345</lise:lengthOffset>

</lise:Offset>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGA1">

</lise:surveySensor>

<lise:correction>

<lise:AngularCorrection gml:id="OCA1">

<lise:correctionID>

<lise:identifier>Angular Correction1</lise:identifier>

</lise:correctionID>

<lise:rotation uom="deg">0.234</lise:rotation>

</lise:AngularCorrection>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="ST2">

</lise:surveySensor>

<lise:correction>

<lise:Transformation gml:id="OCTR1">

<lise:correctionID>

<lise:identifier></lise:identifier>

</lise:correctionID>

<lise:deltaX uom="m">1.0</lise:deltaX>

<lise:deltaY uom="m">2.0</lise:deltaY>

<lise:deltaZ uom="m">3.0</lise:deltaZ>

<lise:scaleX uom="s">1.0</lise:scaleX>

<lise:scaleY uom="s">0.9996</lise:scaleY>

<lise:scaleZ uom="s">1.123</lise:scaleZ>

<lise:rotX uom="deg">0</lise:rotX>

<lise:rotY uom="deg">0</lise:rotY>

<lise:rotZ uom="deg">45.0</lise:rotZ>

</lise:Transformation>

</lise:correction>

</lis:surveyProcess>

</lis:Survey>

</abstractData>

</LandInfraDataset>

B2.1 Equipment and SurveyProcess

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:lise="http://www.opengis.net/infragml/equipment/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/equipment/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6Equipment1119.xsd" >

<datasetID>

<identifier>DS6\_1</identifier>

<scope>OGC LandInfraSWG</scope>

</datasetID>

<name>Sample Part6 Dataset</name>

<description>LandInfra dataset to test all possible content for Part6 Survey Equipment

</description>

<dateTime>2016-10-19T10:00:00</dateTime>

<datasetVersion>1.0</datasetVersion>

<application>manual</application>

<author>Hans-Christoph Gruler, Leica Geosystems AG</author>

<infraVersion>1.0</infraVersion>

<language>English</language>

<defaultCRS xlink:href="crs1"/>

<abstractData>

<lis:Survey gml:id="S1">

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

<lis:equipment gml:id="E1" xsi:type="lise:EquipmentType">

<gml:description>sample survey equipment definition required content all possible sensors</gml:description>

<lise:surveySensor>

<lise:Camera gml:id="SC1">

<lise:surveySensorID>

<lise:identifier>Camera1</lise:identifier>

</lise:surveySensorID>

</lise:Camera>

</lise:surveySensor>

<lise:surveySensor>

<lise:EDM gml:id="SE1">

<lise:surveySensorID>

<lise:identifier>EDM1</lise:identifier>

</lise:surveySensorID>

</lise:EDM>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericAngle gml:id="SGA1">

<lise:surveySensorID>

<lise:identifier>GenAng1</lise:identifier>

</lise:surveySensorID>

</lise:GenericAngle>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericDistance gml:id="SGD1">

<lise:surveySensorID>

<lise:identifier>GenDist1</lise:identifier>

</lise:surveySensorID>

</lise:GenericDistance>

</lise:surveySensor>

<lise:surveySensor>

<lise:GNSS gml:id="SG1">

<lise:surveySensorID>

<lise:identifier>GNSS1</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:surveySensor>

<lise:surveySensor>

<lise:LaserScanner gml:id="SS1">

<lise:surveySensorID>

<lise:identifier>Scanner1</lise:identifier>

</lise:surveySensorID>

</lise:LaserScanner>

</lise:surveySensor>

<lise:surveySensor>

<lise:Level gml:id="SL1">

<lise:surveySensorID>

<lise:identifier>Level1</lise:identifier>

</lise:surveySensorID>

</lise:Level>

</lise:surveySensor>

<lise:surveySensor>

<lise:Tps gml:id="ST1">

<lise:surveySensorID>

<lise:identifier>TPS1</lise:identifier>

</lise:surveySensorID>

</lise:Tps>

</lise:surveySensor>

</lis:equipment>

</lis:Survey>

</abstractData>

<abstractData>

<lis:Survey gml:id="S2">

<gml:description>sample survey definition all possible content</gml:description>

<gml:name>Survey 1 Survey</gml:name>

<lis:surveyID>

<lis:identifier>Survey2</lis:identifier>

<lis:scope>OGC LandInfraSWG</lis:scope>

</lis:surveyID>

<lis:landSurveyor>

<Professional gml:id="p1">

<li:fullName>Surveyor1</li:fullName>

<li:type xlink:href="http://example.com/professionalType#landSurveyor" xlink:title="Land Surveyor"/>

<li:company>LandSurveyors Inc.</li:company>

<li:registration>SR12345678</li:registration>

<li:licensingCountry>Switzerland</li:licensingCountry>

</Professional>

</lis:landSurveyor>

<lis:purposeOfSurvey>Determination of new Parcel Boundery</lis:purposeOfSurvey>

<lis:type xlink:href="http://example.com/surveyType#surveyed" xlink:title="Surveyed"/>

<lis:equipment gml:id="E2" xsi:type="lise:EquipmentType">

<gml:description>sample survey equipment definition all possible sensors</gml:description>

<gml:name>Equipment 12 Crew2</gml:name>

<lise:serialID>12345678</lise:serialID>

<lise:dataCollector>Survey Datacollector</lise:dataCollector>

<lise:controlSoftware>Software for Surveyors</lise:controlSoftware>

<lise:softwareVersion>1.97 Build 34</lise:softwareVersion>

<lise:surveySensor>

<lise:SurveySensor gml:id="SSB1">

<lise:surveySensorID>

<lise:identifier>BarCode Scanner</lise:identifier>

</lise:surveySensorID>

<lise:type xlink:href="http://example.com/surveySensorType#other" xlink:title="Other Sensor"/>

<lise:manufacture>ScanFactory</lise:manufacture>

<lise:model>Model X1</lise:model>

<lise:serialID>254</lise:serialID>

<lise:softwareVersion>2.03</lise:softwareVersion>

</lise:SurveySensor>

</lise:surveySensor>

<lise:surveySensor>

<lise:Camera gml:id="SC2">

<lise:surveySensorID>

<lise:identifier>Camera2</lise:identifier>

</lise:surveySensorID>

<lise:autoFocus>true</lise:autoFocus>

<lise:offsetAndOrientation gml:id="OFSET1">

<gml:validTime>

<gml:TimeInstant gml:id="TIM1">

<gml:timePosition>2016-10-19T10:00:00</gml:timePosition>

</gml:TimeInstant>

</gml:validTime>

<gml:position>

<gml:Point gml:id="OFSETP1">

<gml:pos>0.00013 0.254 0.136</gml:pos>

</gml:Point>

</gml:position>

<gml:bearing>

<gml:DirectionString>relative</gml:DirectionString>

</gml:bearing>

</lise:offsetAndOrientation>

<lise:crs>

<gml:ImageCRS gml:id="CCRS1">

<gml:identifier codeSpace="Crs Camera2"></gml:identifier>

<gml:scope></gml:scope>

<gml:usesCartesianCS></gml:usesCartesianCS>

<gml:usesImageDatum><gml:ImageDatum gml:id="ID1">

<gml:identifier codeSpace="SC2ID1"></gml:identifier>

<gml:scope></gml:scope>

<gml:pixelInCell codeSpace="1258">

</gml:pixelInCell>

</gml:ImageDatum>

</gml:usesImageDatum>

</gml:ImageCRS></lise:crs>

<lise:detector>

<lise:DetectorArray gml:id="SC2DA1">

<lise:numberOfDimentions>2</lise:numberOfDimentions>

<lise:arrayDimentionsValue>1246</lise:arrayDimentionsValue>

<lise:arrayDimentionsValue>758</lise:arrayDimentionsValue>

<lise:arrayDimentionsName>array1</lise:arrayDimentionsName>

<lise:arrayDimentionsName>array2</lise:arrayDimentionsName>

<lise:detectorSize>528</lise:detectorSize>

<lise:detectorSize>256</lise:detectorSize>

<lise:offsetVector>0 0.00006</lise:offsetVector>

</lise:DetectorArray>

</lise:detector>

<lise:interiorOrientation>

<lise:InteriorOrientation gml:id="SC2IO1">

<lise:principalPointX uom="Pixel">508</lise:principalPointX>

<lise:principalPointY uom="Pixel">248</lise:principalPointY>

<lise:focalLength uom="m">2.082550E-002</lise:focalLength>

<lise:crossHairPosX uom="Pixel">0</lise:crossHairPosX>

<lise:crossHairPosY uom="Pixel">0</lise:crossHairPosY>

<lise:virtualCameraConstant>0</lise:virtualCameraConstant>

</lise:InteriorOrientation>

</lise:interiorOrientation>

<lise:gNSS>

<lise:GNSS gml:id="SC2GNSS">

<lise:surveySensorID>

<lise:identifier>Integrated GPS</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:gNSS>

<lise:system>

<lise:SensorSystem gml:id="SC2SS1">

<lise:calibratedFocalLength uom="m">2.082550E-002</lise:calibratedFocalLength>

<lise:princPoint>

<gml:Point gml:id="SC2PP1">

<gml:pos>254 190</gml:pos>

</gml:Point>

</lise:princPoint>

<lise:instFieldOfView uom="deg">1.3</lise:instFieldOfView>

<lise:swathFieldOfView uom="deg">0.9</lise:swathFieldOfView>

<lise:opticalDistortion>

<lise:Distortion gml:id="SC2DI1">

<lise:princPoint>

<gml:Point gml:id="SC2PP2">

<gml:pos>254 190</gml:pos>

</gml:Point>

</lise:princPoint>

<lise:distortionK1>0.123</lise:distortionK1>

<lise:distortionK2>0.456</lise:distortionK2>

</lise:Distortion>

</lise:opticalDistortion>

</lise:SensorSystem>

</lise:system>

</lise:Camera>

</lise:surveySensor>

<lise:surveySensor>

<lise:EDM gml:id="SE2">

<lise:surveySensorID>

<lise:identifier>EDM2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.001</lise:accuracy>

<lise:carrierWavelength uom="nm">1.12345</lise:carrierWavelength>

</lise:EDM>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericAngle gml:id="SGA2">

<lise:surveySensorID>

<lise:identifier>GenAng2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="deg">0.000123</lise:accuracy>

</lise:GenericAngle>

</lise:surveySensor>

<lise:surveySensor>

<lise:GenericDistance gml:id="SGD2">

<lise:surveySensorID>

<lise:identifier>GenDist2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.0001</lise:accuracy>

</lise:GenericDistance>

</lise:surveySensor>

<lise:surveySensor>

<lise:GNSS gml:id="SG2">

<lise:surveySensorID>

<lise:identifier>GNSS2</lise:identifier>

</lise:surveySensorID>

<lise:posAccuracy uom="m">0.002</lise:posAccuracy>

<lise:hgtAccuracy uom="m">0.005</lise:hgtAccuracy>

<lise:camera>

<lise:Camera gml:id="GNSSC1">

<lise:surveySensorID>

<lise:identifier>GNSS Camera1</lise:identifier>

</lise:surveySensorID>

</lise:Camera>

</lise:camera>

<lise:antenna>

<lise:Antenna gml:id="GNSS2A1">

<lise:antennaID>

<lise:identifier>GNSS2 Antenna</lise:identifier>

</lise:antennaID>

<lise:iGSName>GNSS ANTENNA</lise:iGSName>

<lise:horizzontalOffset uom="m">0.123</lise:horizzontalOffset>

<lise:verticallOffset uom="m">0.234</lise:verticallOffset>

<lise:l1phaseOffset uom="m">0.345</lise:l1phaseOffset>

<lise:l2phaseOffset uom="m">0.456</lise:l2phaseOffset>

</lise:Antenna>

</lise:antenna>

<lise:reference><lise:GNSS gml:id="SG3">

<lise:surveySensorID>

<lise:identifier>reference</lise:identifier>

</lise:surveySensorID>

</lise:GNSS>

</lise:reference>

</lise:GNSS>

</lise:surveySensor>

<lise:surveySensor>

<lise:LaserScanner gml:id="SS2">

<lise:surveySensorID>

<lise:identifier>Scanner2</lise:identifier>

</lise:surveySensorID>

<lise:horizontalAngle>

<lise:GenericAngle gml:id="LSGA1">

<lise:surveySensorID>

<lise:identifier>Scanner HZ Angle</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="deg">0.003</lise:accuracy>

</lise:GenericAngle>

</lise:horizontalAngle>

</lise:LaserScanner>

</lise:surveySensor>

<lise:surveySensor>

<lise:Level gml:id="SL2">

<lise:surveySensorID>

<lise:identifier>Level2</lise:identifier>

</lise:surveySensorID>

<lise:accuracy uom="m">0.0005</lise:accuracy>

<lise:staff1>9876543</lise:staff1>

<lise:staff2>76543</lise:staff2>

</lise:Level>

</lise:surveySensor>

<lise:surveySensor>

<lise:Tps gml:id="ST2">

<lise:surveySensorID>

<lise:identifier>TPS2</lise:identifier>

</lise:surveySensorID>

<lise:compLongitudinal uom="deg">0.000030814891377</lise:compLongitudinal>

<lise:compTransversal uom="deg">-0.000485202964925</lise:compTransversal>

</lise:Tps>

</lise:surveySensor>

</lis:equipment>

<lis:surveyProcess xsi:type="lise:SurveyProcessType">

<Feature gml:id="SP1"/>

<lise:surveySensor xlink:href="SGA1">

</lise:surveySensor>

<lise:surveySensor xlink:href="SS2">

</lise:surveySensor>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:correction>

<lise:Correction gml:id="OC1">

<lise:correctionID>

<lise:identifier>Generic Observation correction</lise:identifier>

</lise:correctionID>

<lise:type xlink:href="http://example.com/observationCorrectionType#userDefined" xlink:title="User Defined"/>

</lise:Correction>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGD1">

</lise:surveySensor>

<lise:correction>

<lise:DistanceCorrection gml:id="DC1">

<lise:correctionID>

<lise:identifier>Distance Corr1</lise:identifier>

</lise:correctionID>

<lise:individualScale uom="m">1.0006</lise:individualScale>

</lise:DistanceCorrection>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGD1">

</lise:surveySensor>

<lise:correction>

<lise:Offset gml:id="OCO1">

<lise:correctionID>

<lise:identifier>Offset1</lise:identifier>

</lise:correctionID>

<lise:crossOffset uom="m">1.123</lise:crossOffset>

<lise:lengthOffset uom="m">2.345</lise:lengthOffset>

</lise:Offset>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="SGA1">

</lise:surveySensor>

<lise:correction>

<lise:AngularCorrection gml:id="OCA1">

<lise:correctionID>

<lise:identifier>Angular Correction1</lise:identifier>

</lise:correctionID>

<lise:rotation uom="deg">0.234</lise:rotation>

</lise:AngularCorrection>

</lise:correction>

</lis:surveyProcess>

<lis:surveyProcess xsi:type="lise:ObservationCorrectionsType">

<lise:surveySensor xlink:href="ST2">

</lise:surveySensor>

<lise:correction>

<lise:Transformation gml:id="OCTR1">

<lise:correctionID>

<lise:identifier></lise:identifier>

</lise:correctionID>

<lise:deltaX uom="m">1.0</lise:deltaX>

<lise:deltaY uom="m">2.0</lise:deltaY>

<lise:deltaZ uom="m">3.0</lise:deltaZ>

<lise:scaleX uom="s">1.0</lise:scaleX>

<lise:scaleY uom="s">0.9996</lise:scaleY>

<lise:scaleZ uom="s">1.123</lise:scaleZ>

<lise:rotX uom="deg">0</lise:rotX>

<lise:rotY uom="deg">0</lise:rotY>

<lise:rotZ uom="deg">45.0</lise:rotZ>

</lise:Transformation>

</lise:correction>

</lis:surveyProcess>

</lis:Survey>

</abstractData>

</LandInfraDataset>

B3 Observations

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:liso="http://www.opengis.net/infragml/observations/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/observations/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6Observations1119.xsd" >

<datasetID>

<identifier/>

</datasetID>

<dateTime>2016-08-24T10:00:00</dateTime>

<datasetVersion/>

<application/>

<author/>

<infraVersion/>

<language/>

<defaultCRS/>

<abstractData>

<lis:Survey gml:id="S1">

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

<lis:setup gml:id="SET1" xsi:type="liso:SetupType">

<gml:description>sample survey observation definition required content all possible observations</gml:description>

<liso:instrumentHeight uom="m">1.50</liso:instrumentHeight>

<liso:validTime>

<gml:TimePeriod gml:id="SET1T1">

<gml:beginPosition>2016-08-24T09:00:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:30:00</gml:endPosition>

</gml:TimePeriod>

</liso:validTime>

<liso:observations>

<liso:surveyObservation>

<liso:SurveyObservation gml:id="SO1">

<gml:validTime>

<gml:TimePeriod gml:id="SO1TP1">

<gml:beginPosition>2016-08-24T09:01:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:01:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:using>

<Feature gml:id="PI1"></Feature>

</gml:using>

<gml:resultOf>

<gml:target>

<gml:Point gml:id="SO1POS1">

<gml:pos>0 50 0</gml:pos>

</gml:Point>

</gml:target>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SO1RT1">

<gml:timePosition>2016-08-24T09:01:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:type xlink:href="http://example.com/observationType#calculated" xlink:title="Calculated"/>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

</liso:SurveyObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:AngularObservation gml:id="AO1">

<gml:validTime>

<gml:TimePeriod gml:id="AO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="AO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="AO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:angle uom="deg">123.45</liso:angle>

</liso:AngularObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:DistanceObservation gml:id="DO1">

<gml:validTime>

<gml:TimePeriod gml:id="DO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="DO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="DO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:distance uom="meter">12.345</liso:distance>

</liso:DistanceObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:TpsObservation gml:id="TO1">

<gml:validTime>

<gml:TimePeriod gml:id="TO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="TO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="TO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:reflectorHeight uom="m">1.65</liso:reflectorHeight>

<liso:directFace>true</liso:directFace>

<liso:meanFace>false</liso:meanFace>

<liso:horizontalAngle uom="deg">254.123</liso:horizontalAngle>

<liso:verticalAngle uom="deg">89.523</liso:verticalAngle>

</liso:TpsObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:LevelObservation gml:id="LO1">

<gml:validTime>

<gml:TimePeriod gml:id="LO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="LO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="LO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:deltaHeight uom="m">1.123</liso:deltaHeight>

</liso:LevelObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:GnssObservation gml:id="GO1">

<gml:validTime>

<gml:TimePeriod gml:id="GO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="GO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="GO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:antennaHeight uom="m">2.000</liso:antennaHeight>

</liso:GnssObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:ImageObservation gml:id="IO1">

<gml:validTime>

<gml:TimePeriod gml:id="IO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>Image01</gml:name>

</gml:rangeParameters>

<gml:fileName>Image1234.jpg</gml:fileName>

<gml:fileStructure>binary</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="IO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

</liso:ImageObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:PointCloudObservation gml:id="PO1">

<gml:validTime>

<gml:TimePeriod gml:id="PO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>PointCloud01</gml:name>

</gml:rangeParameters>

<gml:fileName>PointCloud1234.las</gml:fileName>

<gml:fileStructure>ASCII</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="PO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

</liso:PointCloudObservation>

</liso:surveyObservation>

</liso:observations>

<liso:setupObservations>

<liso:setupObservation>

<liso:SurveyObservation gml:id="SETO1">

<gml:validTime>

<gml:TimePeriod gml:id="SETO1TP1">

<gml:beginPosition>2016-08-24T09:01:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:01:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:target>

<gml:Point gml:id="SETO1POS1">

<gml:pos>0 50 0</gml:pos>

</gml:Point>

</gml:target>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SETO1RT1">

<gml:timePosition>2016-08-24T09:01:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:type xlink:href="http://example.com/observationType#calculated" xlink:title="Calculated"/>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

</liso:SurveyObservation>

</liso:setupObservation>

<liso:setupObservation>

<liso:DistanceObservation gml:id="SDO1">

<gml:validTime>

<gml:TimePeriod gml:id="SDO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="SDO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SDO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:distance uom="meter">12.345</liso:distance>

</liso:DistanceObservation>

</liso:setupObservation>

</liso:setupObservations>

</lis:setup>

<lis:setup gml:id="SET2" xsi:type="liso:SetupType">

<gml:description>sample survey observation definition all possible content of observations</gml:description>

<gml:name>Setup 2</gml:name>

<liso:instrumentHeight uom="m">1.50</liso:instrumentHeight>

<liso:instrumentPoint gml:id="S2IP1">

<gml:location>

<gml:Point gml:id="S2IPNT1">

<gml:pos>100 200 10</gml:pos>

</gml:Point>

</gml:location>

</liso:instrumentPoint>

<liso:validTime>

<gml:TimePeriod gml:id="SET2T1">

<gml:beginPosition>2016-08-24T09:00:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:30:00</gml:endPosition>

</gml:TimePeriod>

</liso:validTime>

<liso:observations>

<liso:surveyObservation>

<liso:SurveyObservation gml:id="SO2">

<gml:validTime>

<gml:TimePeriod gml:id="SO2TP1">

<gml:beginPosition>2016-08-24T09:01:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:01:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:using>

<Feature gml:id="PI2">

<gml:description>This can be a standard description of the process if equipment information is not available</gml:description>

</Feature>

</gml:using>

<gml:resultOf>

<gml:target>

<gml:Point gml:id="SO2POS1">

<gml:pos>0 50 0</gml:pos>

</gml:Point>

</gml:target>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SO2RT1">

<gml:timePosition>2016-08-24T09:01:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:type xlink:href="http://example.com/observationType#calculated" xlink:title="Calculated"/>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

</liso:SurveyObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:AngularObservation gml:id="AO2">

<gml:validTime>

<gml:TimePeriod gml:id="AO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="AO2POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="AO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:angle uom="deg">123.45</liso:angle>

<liso:angularType xlink:href="http://example.com/angularType#azimuth" xlink:title="Azimuth"/>

<liso:angularQuality uom="deg">0.05</liso:angularQuality>

</liso:AngularObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:DistanceObservation gml:id="DO2">

<gml:validTime>

<gml:TimePeriod gml:id="DO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="DO2POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="DO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:distance uom="meter">12.345</liso:distance>

<liso:distanceType xlink:href="http://example.com/distanceType#azimuth" xlink:title="Slope"/>

<liso:distanceQuality uom="m">0.005</liso:distanceQuality>

</liso:DistanceObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:TpsObservation gml:id="TO2">

<gml:validTime>

<gml:TimePeriod gml:id="TO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="TO2POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="TO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:reflectorHeight uom="m">1.65</liso:reflectorHeight>

<liso:directFace>true</liso:directFace>

<liso:meanFace>false</liso:meanFace>

<liso:horizontalAngle uom="deg">254.123</liso:horizontalAngle>

<liso:hzAngleQuality uom="deg">0.0001</liso:hzAngleQuality>

<liso:verticalAngle uom="deg">89.523</liso:verticalAngle>

<liso:vAngleQuality uom="deg">0.0001</liso:vAngleQuality>

<liso:slopeDistance uom="m">10.123</liso:slopeDistance>

<liso:sDistanceQuality uom="m">0.001</liso:sDistanceQuality>

<liso:azimuth uom="deg">250.123</liso:azimuth>

<liso:azQuality uom="deg">0.0001</liso:azQuality>

<liso:horizontalDistance uom="m">9.995</liso:horizontalDistance>

<liso:hDistanceQuality uom="m">0.002</liso:hDistanceQuality>

<liso:inclinationLength uom="deg">-0.000008</liso:inclinationLength>

<liso:inclLengthQuality uom="deg">0.0001</liso:inclLengthQuality>

<liso:inclinationCross uom="deg">0.000005</liso:inclinationCross>

<liso:inclCrossQuality uom="deg">0.00001</liso:inclCrossQuality>

</liso:TpsObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:LevelObservation gml:id="LO2">

<gml:validTime>

<gml:TimePeriod gml:id="LO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="LO2POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="LO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:deltaHeight uom="m">1.123</liso:deltaHeight>

<liso:deltaHeightQuality uom="m">0.0005</liso:deltaHeightQuality>

</liso:LevelObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:GnssObservation gml:id="GO2">

<gml:validTime>

<gml:TimePeriod gml:id="GO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="GO2POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="GO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

<liso:antennaHeight uom="m">2.000</liso:antennaHeight>

<liso:quality>

<liso:GnssQuality gml:id="DOPS1">

<liso:hDOP>1.100000</liso:hDOP>

<liso:gDOP>2.406242</liso:gDOP>

<liso:pDOP>2.024846</liso:pDOP>

<liso:vDOP>1.700000</liso:vDOP>

<liso:tDOP>1.300000</liso:tDOP>

</liso:GnssQuality>

</liso:quality>

<liso:rtkInfo>

<liso:RtkInfo gml:id="RTK1">

<liso:networkSolution>true</liso:networkSolution>

<liso:networkType xlink:href="http://example.com/networkType#vRS" xlink:title="VRS"/>

<liso:dataFormat>RTCM3.3</liso:dataFormat>

<liso:insideRTKNetwork>true</liso:insideRTKNetwork>

<liso:mountpoint>MOUNTPNT1</liso:mountpoint>

<liso:numNetworkReferences>12</liso:numNetworkReferences>

<liso:numRtkPositionsUsed>5</liso:numRtkPositionsUsed>

</liso:RtkInfo>

</liso:rtkInfo>

<liso:satInfo>

<liso:SatelliteInfo gml:id="SATGP1">

<liso:systemType xlink:href="http://example.com/systemType#gps" xlink:title="GPS"/>

<liso:numSatsTracked>10</liso:numSatsTracked>

<liso:numSatsUsed>8</liso:numSatsUsed>

</liso:SatelliteInfo>

</liso:satInfo>

<liso:satInfo>

<liso:SatelliteInfo gml:id="SATGL1">

<liso:systemType xlink:href="http://example.com/systemType#glonass" xlink:title="GLONASS"/>

<liso:numSatsTracked>6</liso:numSatsTracked>

<liso:numSatsUsed>4</liso:numSatsUsed>

</liso:SatelliteInfo>

</liso:satInfo>

<liso:satInfo>

<liso:SatelliteInfo gml:id="SATGA1">

<liso:systemType xlink:href="http://example.com/systemType#galileo" xlink:title="Galileo"/>

<liso:numSatsTracked>3</liso:numSatsTracked>

<liso:numSatsUsed>0</liso:numSatsUsed>

</liso:SatelliteInfo>

</liso:satInfo>

<liso:satInfo>

<liso:SatelliteInfo gml:id="SATBD1">

<liso:systemType xlink:href="http://example.com/systemType#beidou" xlink:title="BeiDou"/>

<liso:numSatsTracked>5</liso:numSatsTracked>

<liso:numSatsUsed>2</liso:numSatsUsed>

</liso:SatelliteInfo>

</liso:satInfo>

</liso:GnssObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:ImageObservation gml:id="IO2">

<gml:validTime>

<gml:TimePeriod gml:id="IO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>Image01</gml:name>

</gml:rangeParameters>

<gml:fileName>Image1234.jpg</gml:fileName>

<gml:fileStructure>binary</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="IO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:illuminationElevationAngle uom="deg">0.5</liso:illuminationElevationAngle>

<liso:cloudCoverPercentage>70.00</liso:cloudCoverPercentage>

<liso:triangulationIndicator>true</liso:triangulationIndicator>

<liso:radiometricCalibrationDataAvailability>false</liso:radiometricCalibrationDataAvailability>

<liso:cameraCalibrationInformationAvailability>false</liso:cameraCalibrationInformationAvailability>

<liso:filmDistortionInformationAvailability>false</liso:filmDistortionInformationAvailability>

<liso:lensDistortionInformationAvailability>false</liso:lensDistortionInformationAvailability>

<liso:exteriorOrientation>

<liso:ExteriorOrientation gml:id="EORI1">

<liso:projectionCenterX uom="m">2.051058</liso:projectionCenterX>

<liso:projectionCenterY uom="m">-0.411609</liso:projectionCenterY>

<liso:projectionCenterZ uom="m">2.643776</liso:projectionCenterZ>

<liso:phi uom="deg">239.659557929903800</liso:phi>

<liso:theta uom="deg">96.498259821404559</liso:theta>

<liso:kappa uom="deg">0.000000000000000</liso:kappa>

</liso:ExteriorOrientation>

</liso:exteriorOrientation>

</liso:ImageObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:PointCloudObservation gml:id="PO2">

<gml:validTime>

<gml:TimePeriod gml:id="PO2TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>PointCloud02</gml:name>

</gml:rangeParameters>

<gml:fileName>PointCloud2345.las</gml:fileName>

<gml:fileStructure>ASCII</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="PO2RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:image xlink:href="IO1"></liso:image>

<liso:image xlink:href="IO2"></liso:image>

<liso:panoImage xlink:href="POI1"></liso:panoImage>

<liso:numberPoints>20000000000</liso:numberPoints>

<liso:maxSNR>3177</liso:maxSNR>

<liso:minSNR>29</liso:minSNR>

<liso:maxIntensity>52771</liso:maxIntensity>

<liso:minIntensity>978</liso:minIntensity>

<liso:maxDistance uom="m">3.693400</liso:maxDistance>

<liso:minDistance uom="m">3.164200</liso:minDistance>

<liso:maxNorthing uom="m">0.350678</liso:maxNorthing>

<liso:minNorthing uom="m">-0.090125</liso:minNorthing>

<liso:maxEasting uom="m">0.416469</liso:maxEasting>

<liso:minEasting uom="m">-0.241113</liso:minEasting>

<liso:maxElevation uom="m">0.001460</liso:maxElevation>

<liso:minElevation uom="m">-0.460276</liso:minElevation>

</liso:PointCloudObservation>

</liso:surveyObservation>

</liso:observations>

<liso:panoImage>

<liso:PanoramaImage gml:id="POI1">

<liso:panoramaImageID>Panorama 1</liso:panoramaImageID>

<liso:image xlink:href="IO1"></liso:image>

<liso:image xlink:href="IO2"></liso:image>

</liso:PanoramaImage>

</liso:panoImage>

</lis:setup>

</lis:Survey>

</abstractData>

</LandInfraDataset>

B4 SurveyResults

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:lisr="http://www.opengis.net/infragml/surveyresults/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/surveyresults/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6SurveyResults1119.xsd" >

<datasetID>

<identifier/>

</datasetID>

<dateTime>2016-08-24T10:00:00</dateTime>

<datasetVersion/>

<application/>

<author/>

<infraVersion>1.0</infraVersion>

<language>English</language>

<defaultCRS xlink:href="crs1"/>

<abstractData>

<lis:Survey gml:id="S1">

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

<lis:purposeOfSurvey>String</lis:purposeOfSurvey>

<lis:type xlink:href="http://example.com/surveyType#surveyed" xlink:title="Surveyed"/>

<lis:surveyResult gml:id="SR1" xsi:type="lisr:SurveyResultType">

<gml:description>sample survey result definition all content of results</gml:description>

<lisr:surveyResultID>UserDefined</lisr:surveyResultID>

<lisr:type xlink:href="http://example.com/surveyResultType#userdefined" xlink:title="User Defined"/>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

</lis:surveyResult>

<lis:surveyResult gml:id="SRT1" xsi:type="lisr:TargetPointType">

<lisr:surveyResultID>TargetP1</lisr:surveyResultID>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

<lisr:geometry gml:id="SRTP1">

<gml:pos>10 0 10</gml:pos>

</lisr:geometry>

<lisr:isComplete>true</lisr:isComplete>

<lisr:quality gml:id="Q1">

<lisr:meanError uom="m">1.123</lisr:meanError>

<lisr:qxx>0.0000076011</lisr:qxx>

<lisr:qxy>0.0000035428</lisr:qxy>

<lisr:qxz>-0.0000003152</lisr:qxz>

<lisr:qyy>0.0000016799</lisr:qyy>

<lisr:qyz>-0.0000001474</lisr:qyz>

<lisr:qzz>0.0000000367</lisr:qzz>

</lisr:quality>

</lis:surveyResult>

<lis:surveyResult gml:id="SRT2" xsi:type="lisr:TargetPointType">

<lisr:surveyResultID>TargetP1</lisr:surveyResultID>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

<lisr:geometry gml:id="SRTP2">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

<lisr:isComplete>true</lisr:isComplete>

</lis:surveyResult>

<lis:surveyResult gml:id="SRS1" xsi:type="lisr:StringType">

<lisr:surveyResultID>Sring1</lisr:surveyResultID>

<lisr:featureOfInterest><!--reference to a feature in the document--></lisr:featureOfInterest>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:targetPoint xlink:href="SRT2"/>

</lis:surveyResult>

<lis:surveyResult gml:id="SRSKT1" xsi:type="lisr:StakeoutType">

<lisr:surveyResultID>StakeResult1</lisr:surveyResultID>

<lisr:diffNorthing uom="m">0.013</lisr:diffNorthing>

<lisr:diffEasting uom="m">-0.02</lisr:diffEasting>

<lisr:diffElevation uom="m">0.032</lisr:diffElevation>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:designPoint gml:id="SRSKT1D1">

<lisr:geometry gml:id="SRSKT1D1P">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

</lisr:designPoint>

</lis:surveyResult>

<lis:surveyResult gml:id="SRA1" xsi:type="lisr:AverageType">

<lisr:surveyResultID>Average1</lisr:surveyResultID>

<lisr:averagePoint gml:id="SRA1P">

<lisr:geometry gml:id="SRA1G">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:targetPoint xlink:href="SRT2"/>

</lisr:averagePoint>

</lis:surveyResult>

<lis:surveyResult gml:id="SRI1" xsi:type="lisr:ImageType">

<lisr:surveyResultID>Image1</lisr:surveyResultID>

<lisr:file>

<gml:rangeParameters>

<gml:name>Image01</gml:name>

</gml:rangeParameters>

<gml:fileName>Image1234.jpg</gml:fileName>

<gml:fileStructure>binary</gml:fileStructure>

</lisr:file>

</lis:surveyResult>

<lis:surveyResult gml:id="SRPC1" xsi:type="lisr:PointCloudType">

<lisr:surveyResultID>PointCloud1</lisr:surveyResultID>

<lisr:file>

<gml:rangeParameters>

<gml:name>PointCloud02</gml:name>

</gml:rangeParameters>

<gml:fileName>PointCloud2345.las</gml:fileName>

<gml:fileStructure>ASCII</gml:fileStructure>

</lisr:file>

</lis:surveyResult>

</lis:Survey>

</abstractData>

</LandInfraDataset>

B4.1 SurveyResults with Sampling

<?xml version="1.0" encoding="UTF-8"?>

<LandInfraDataset xmlns="http://www.opengis.net/infragml/core/1.0"

xmlns:gml="http://www.opengis.net/gml/3.2"

gml:id="ds1"

xmlns:xlink="http://www.w3.org/1999/xlink"

xmlns:li="http://www.opengis.net/infragml/core/1.0"

xmlns:lis="http://www.opengis.net/infragml/survey/1.0"

xmlns:lisr="http://www.opengis.net/infragml/surveyresults/1.0"

xmlns:liso="http://www.opengis.net/infragml/observations/1.0"

xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

xsi:schemaLocation="http://www.opengis.net/infragml/surveyresults/1.0 file:///C:/Data\_GRUH/XML/OGC/Encoding/Parts/XSDs%20XML/Part6SurveyResults1119.xsd" >

<datasetID>

<identifier/>

</datasetID>

<dateTime>2016-08-24T10:00:00</dateTime>

<datasetVersion/>

<application/>

<author/>

<infraVersion>1.0</infraVersion>

<language>English</language>

<defaultCRS xlink:href="crs1"/>

<abstractData>

<lis:Survey gml:id="S1">

<lis:surveyID>

<lis:identifier>Survey1</lis:identifier>

</lis:surveyID>

<lis:purposeOfSurvey>String</lis:purposeOfSurvey>

<lis:type xlink:href="http://example.com/surveyType#surveyed" xlink:title="Surveyed"/>

<lis:setup gml:id="SET1" xsi:type="liso:SetupType">

<gml:description>sample survey observation definition required content all possible observations</gml:description>

<liso:instrumentHeight uom="m">1.50</liso:instrumentHeight>

<liso:validTime>

<gml:TimePeriod gml:id="SET1T1">

<gml:beginPosition>2016-08-24T09:00:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:30:00</gml:endPosition>

</gml:TimePeriod>

</liso:validTime>

<liso:observations>

<liso:surveyObservation>

<liso:SurveyObservation gml:id="SO1">

<gml:validTime>

<gml:TimePeriod gml:id="SO1TP1">

<gml:beginPosition>2016-08-24T09:01:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:01:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:using>

<Feature gml:id="PI1"></Feature>

</gml:using>

<gml:resultOf>

<gml:target>

<gml:Point gml:id="SO1POS1">

<gml:pos>0 50 0</gml:pos>

</gml:Point>

</gml:target>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SO1RT1">

<gml:timePosition>2016-08-24T09:01:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:type xlink:href="http://example.com/observationType#calculated" xlink:title="Calculated"/>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

</liso:SurveyObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:AngularObservation gml:id="AO1">

<gml:validTime>

<gml:TimePeriod gml:id="AO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="AO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="AO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:angle uom="deg">123.45</liso:angle>

</liso:AngularObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:DistanceObservation gml:id="DO1">

<gml:validTime>

<gml:TimePeriod gml:id="DO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="DO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="DO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:distance uom="meter">12.345</liso:distance>

</liso:DistanceObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:TpsObservation gml:id="TO1">

<gml:validTime>

<gml:TimePeriod gml:id="TO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="TO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="TO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:reflectorHeight uom="m">1.65</liso:reflectorHeight>

<liso:directFace>true</liso:directFace>

<liso:meanFace>false</liso:meanFace>

<liso:horizontalAngle uom="deg">254.123</liso:horizontalAngle>

<liso:verticalAngle uom="deg">89.523</liso:verticalAngle>

</liso:TpsObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:LevelObservation gml:id="LO1">

<gml:validTime>

<gml:TimePeriod gml:id="LO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="LO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="LO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:deltaHeight uom="m">1.123</liso:deltaHeight>

</liso:LevelObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:GnssObservation gml:id="GO1">

<gml:validTime>

<gml:TimePeriod gml:id="GO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="GO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="GO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:antennaHeight uom="m">2.000</liso:antennaHeight>

</liso:GnssObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:ImageObservation gml:id="IO1">

<gml:validTime>

<gml:TimePeriod gml:id="IO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>Image01</gml:name>

</gml:rangeParameters>

<gml:fileName>Image1234.jpg</gml:fileName>

<gml:fileStructure>binary</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="IO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

</liso:ImageObservation>

</liso:surveyObservation>

<liso:surveyObservation>

<liso:PointCloudObservation gml:id="PO1">

<gml:validTime>

<gml:TimePeriod gml:id="PO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:File>

<gml:rangeParameters>

<gml:name>PointCloud01</gml:name>

</gml:rangeParameters>

<gml:fileName>PointCloud1234.las</gml:fileName>

<gml:fileStructure>ASCII</gml:fileStructure>

</gml:File>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="PO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

</liso:PointCloudObservation>

</liso:surveyObservation>

</liso:observations>

<liso:setupObservations>

<liso:setupObservation>

<liso:SurveyObservation gml:id="SETO1">

<gml:validTime>

<gml:TimePeriod gml:id="SETO1TP1">

<gml:beginPosition>2016-08-24T09:01:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:01:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:target>

<gml:Point gml:id="SETO1POS1">

<gml:pos>0 50 0</gml:pos>

</gml:Point>

</gml:target>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SETO1RT1">

<gml:timePosition>2016-08-24T09:01:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:type xlink:href="http://example.com/observationType#calculated" xlink:title="Calculated"/>

<liso:bInstrumentPoint>false</liso:bInstrumentPoint>

</liso:SurveyObservation>

</liso:setupObservation>

<liso:setupObservation>

<liso:DistanceObservation gml:id="SDO1">

<gml:validTime>

<gml:TimePeriod gml:id="SDO1TP1">

<gml:beginPosition>2016-08-24T09:05:00</gml:beginPosition>

<gml:endPosition>2016-08-24T09:05:05</gml:endPosition>

</gml:TimePeriod>

</gml:validTime>

<gml:resultOf>

<gml:Point gml:id="SDO1POS1">

<gml:pos>50 0 0</gml:pos>

</gml:Point>

</gml:resultOf>

<liso:resultTime>

<gml:TimeInstant gml:id="SDO1RT1">

<gml:timePosition>2016-08-24T09:05:04</gml:timePosition>

</gml:TimeInstant>

</liso:resultTime>

<liso:bInstrumentPoint>true</liso:bInstrumentPoint>

<liso:distance uom="meter">12.345</liso:distance>

</liso:DistanceObservation>

</liso:setupObservation>

</liso:setupObservations>

</lis:setup>

<lis:surveyResult gml:id="SR1" xsi:type="lisr:SurveyResultType">

<gml:description>sample survey result definition all content of results</gml:description>

<lisr:surveyResultID>UserDefined</lisr:surveyResultID>

<lisr:type xlink:href="http://example.com/surveyResultType#userdefined" xlink:title="User Defined"/>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

</lis:surveyResult>

<lis:surveyResult gml:id="SRT1" xsi:type="lisr:TargetPointType">

<lisr:surveyResultID>TargetP1</lisr:surveyResultID>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

<lisr:geometry gml:id="SRTP1">

<gml:pos>10 0 10</gml:pos>

</lisr:geometry>

<lisr:isComplete>true</lisr:isComplete>

<lisr:quality gml:id="Q1">

<lisr:meanError uom="m">1.123</lisr:meanError>

<lisr:qxx>0.0000076011</lisr:qxx>

<lisr:qxy>0.0000035428</lisr:qxy>

<lisr:qxz>-0.0000003152</lisr:qxz>

<lisr:qyy>0.0000016799</lisr:qyy>

<lisr:qyz>-0.0000001474</lisr:qyz>

<lisr:qzz>0.0000000367</lisr:qzz>

</lisr:quality>

</lis:surveyResult>

<lis:surveyResult gml:id="SRT2" xsi:type="lisr:TargetPointType">

<lisr:surveyResultID>TargetP1</lisr:surveyResultID>

<lisr:featureOfInterest>

<!--reference to a feature in the document-->

</lisr:featureOfInterest>

<lisr:geometry gml:id="SRTP2">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

<lisr:isComplete>true</lisr:isComplete>

</lis:surveyResult>

<lis:surveyResult gml:id="SRS1" xsi:type="lisr:StringType">

<lisr:surveyResultID>Sring1</lisr:surveyResultID>

<lisr:featureOfInterest><!--reference to a feature in the document--></lisr:featureOfInterest>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:targetPoint xlink:href="SRT2"/>

</lis:surveyResult>

<lis:surveyResult gml:id="SRSKT1" xsi:type="lisr:StakeoutType">

<lisr:surveyResultID>StakeResult1</lisr:surveyResultID>

<lisr:diffNorthing uom="m">0.013</lisr:diffNorthing>

<lisr:diffEasting uom="m">-0.02</lisr:diffEasting>

<lisr:diffElevation uom="m">0.032</lisr:diffElevation>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:designPoint gml:id="SRSKT1D1">

<lisr:geometry gml:id="SRSKT1D1P">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

</lisr:designPoint>

</lis:surveyResult>

<lis:surveyResult gml:id="SRA1" xsi:type="lisr:AverageType">

<lisr:surveyResultID>Average1</lisr:surveyResultID>

<lisr:averagePoint gml:id="SRA1P">

<lisr:geometry gml:id="SRA1G">

<gml:pos>10 10 0</gml:pos>

</lisr:geometry>

<lisr:targetPoint xlink:href="SRT1"/>

<lisr:targetPoint xlink:href="SRT2"/>

</lisr:averagePoint>

</lis:surveyResult>

<lis:surveyResult gml:id="SRI1" xsi:type="lisr:ImageType">

<lisr:surveyResultID>Image1</lisr:surveyResultID>

<lisr:file>

<gml:rangeParameters>

<gml:name>Image01</gml:name>

</gml:rangeParameters>

<gml:fileName>Image1234.jpg</gml:fileName>

<gml:fileStructure>binary</gml:fileStructure>

</lisr:file>

</lis:surveyResult>

<lis:surveyResult gml:id="SRPC1" xsi:type="lisr:PointCloudType">

<lisr:surveyResultID>PointCloud1</lisr:surveyResultID>

<lisr:file>

<gml:rangeParameters>

<gml:name>PointCloud02</gml:name>

</gml:rangeParameters>

<gml:fileName>PointCloud2345.las</gml:fileName>

<gml:fileStructure>ASCII</gml:fileStructure>

</lisr:file>

</lis:surveyResult>

<lis:sampling gml:id="SAM1" xsi:type="lisr:SamplingFeatureType">

<lisr:sampledFeature xlink:href="SRSKT1D1"/>

<lisr:relatedObservation xlink:href="SO1"/>

<lisr:relatedObservation xlink:href="AO1"/>

<lisr:relatedObservation xlink:href="IO1"/>

</lis:sampling>

</lis:Survey>

</abstractData>

</LandInfraDataset>

1. Revision history

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date | Release | Author | Paragraph modified | Description |
|  |  |  |  |  |

1. Bibliography

[1] OGC 08-131r3 The Specification Model — A Standard for Modular specifications, Open Geospatial Consortium, (2009)

1. GML XSD (informative)

Note: This Annex will not appear in the adopted standard document.

1. Part6Survey1119.xsd

<?xml version="1.0" encoding="UTF-8"?>

<schema xmlns="http://www.w3.org/2001/XMLSchema" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:li="http://www.opengis.net/infragml/core/1.0" xmlns:lis="http://www.opengis.net/infragml/survey/1.0" xmlns:gml="http://www.opengis.net/gml/3.2" targetNamespace="http://www.opengis.net/infragml/survey/1.0" elementFormDefault="qualified" version="1.0">

<import namespace="http://www.opengis.net/infragml/core/1.0" schemaLocation="Part0Core1116.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<!--XML Schema document created by ShapeChange - http://shapechange.net/

Modified by Hans-Christoph Gruler(Leica Geosystems AG) October 19, 2016-

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 02, 2016-

Changes in 1102 version: 1) Survey: gml:Abstract to li:Abstract; 2) added new

elements for SurveyProcess and Sampling

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 16, 2016-

Remove embedded landSurveyor to landSurveyor with type li:Professional

-->

<!-- -->

<!-- Survey -->

<!-- -->

<element name="Survey" type="lis:SurveyType" substitutionGroup="li:AbstractData">

<annotation>

<documentation>Survey is a collection of observations relevant to a project; The observed property may be any property associated with the type of the feature of interest. Observations are collected within different Setups - this is necessary for processing all different measurements taken from several sensors.</documentation>

</annotation>

</element>

<complexType name="SurveyType">

<complexContent>

<extension base="li:AbstractDataType">

<sequence>

<element name="surveyID">

<complexType>

<sequence>

<element name="identifier" type="string" minOccurs="1"/>

<element name="scope" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

<element name="landSurveyor" type="li:ProfessionalPropertyType" minOccurs="0"/>

<element name="purposeOfSurvey" type="string" minOccurs="0"/>

<element name="type" type="gml:ReferenceType" minOccurs="0"/>

<element name="document" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="li:Document"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="setup" type="li:FeatureType" minOccurs="0" maxOccurs="unbounded"/>

<element name="equipment" type="li:FeatureType" minOccurs="0"/>

<element name="surveyProcess" type="gml:ProcedurePropertyType" minOccurs="0" maxOccurs="unbounded"/>

<element name="surveyResult" type="li:FeatureType" minOccurs="0" maxOccurs="unbounded"/>

<element name="sampling" type="li:FeatureType" minOccurs="0" maxOccurs="unbounded"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SurveyPropertyType">

<sequence minOccurs="0">

<element ref="lis:Survey"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

</schema>

1. Part6Equipment1119.xsd

<?xml version="1.0" encoding="UTF-8"?>

<schema xmlns="http://www.w3.org/2001/XMLSchema" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:li="http://www.opengis.net/infragml/core/1.0" xmlns:lis="http://www.opengis.net/infragml/survey/1.0" xmlns:lise="http://www.opengis.net/infragml/equipment/1.0" xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:om="http://www.opengis.net/om/2.0" targetNamespace="http://www.opengis.net/infragml/equipment/1.0" elementFormDefault="qualified" version="1.0">

<import namespace="http://www.opengis.net/infragml/core/1.0" schemaLocation="Part0Core1116.xsd"/>

<import namespace="http://www.opengis.net/infragml/survey/1.0" schemaLocation="Part6Survey1119.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/observation.xsd"/>

<!--XML Schema document created by ShapeChange - http://shapechange.net/

Modified by Hans-Christoph Gruler(Leica Geosystems AG) October 19, 2016

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 02, 2016-

Changes in 1102 version: 1) remove dependency from OM and use gml:observation

1. Uses gml:observation instead of OM-Observations

2. Antenna -> Feature

3. Model ISO1930 for Camera

4. Correction::type -> optional…not needed for dervived classes

5. Added distortion class

6. Equipment -> feature

7. Remove SurveySensor Sets

8. added pixel definition gml:GridLengthType

9. ObservationCorrection nove has the correct base

10. Added Sensor System ISO19130

11.SurveyProcess…add element instead of inheritance -

12.Derive now from gml:ProcedurePropertyType

13. SurveySensor -> Feature

14. SurveySensor:type -> optional…not needed for dervived classes

15. SurveySensorTpye -> add other and remove tilt

-->

<!-- -->

<!-- AngularCorrection -->

<!-- -->

<element name="AngularCorrection" type="lise:AngularCorrectionType" substitutionGroup="lise:Correction">

<annotation>

<documentation>Angular correction could be for example the inclination between magnetic and geometric North.</documentation>

</annotation>

</element>

<complexType name="AngularCorrectionType">

<complexContent>

<extension base="lise:CorrectionType">

<sequence>

<element name="rotation" type="gml:AngleType"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="AngularCorrectionPropertyType">

<sequence minOccurs="0">

<element ref="lise:AngularCorrection"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Antenna -->

<!-- -->

<element name="Antenna" type="lise:AntennaType" substitutionGroup="li:Feature"/>

<complexType name="AntennaType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="antennaID">

<complexType>

<sequence>

<element name="identifier" type="string" minOccurs="1"/>

<element name="scope" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

<element name="iGSName" type="string" minOccurs="0"/>

<element name="horizzontalOffset" type="gml:LengthType" minOccurs="0"/>

<element name="verticallOffset" type="gml:LengthType" minOccurs="0"/>

<element name="l1phaseOffset" type="gml:LengthType" minOccurs="0"/>

<element name="l2phaseOffset" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="AntennaPropertyType">

<sequence minOccurs="0">

<element ref="lise:Antenna"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Camera -->

<!-- -->

<element name="Camera" type="lise:CameraType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>Camera - Information about the pixel size, chip window. If the focal length for the camera is always constant the interior orientation is always the same. Therefore this information is attached to the equipment and not the image observation</documentation>

</annotation>

</element>

<complexType name="CameraType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="autoFocus" type="boolean" minOccurs="0"/>

<element name="offsetAndOrientation" type="gml:MovingObjectStatusType" minOccurs="0"/>

<element name="crs" type="gml:CRSPropertyType" minOccurs="0"/>

<element name="detector" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:DetectorArray"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="interiorOrientation" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:InteriorOrientation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="gNSS" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GNSS"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="system" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:SensorSystem"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="CameraPropertyType">

<sequence minOccurs="0">

<element ref="lise:Camera"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Correction -->

<!-- -->

<element name="Correction" type="lise:CorrectionType" substitutionGroup="gml:AbstractGML">

<annotation>

<documentation>Correction could be applied to the raw measurements from a sensor. Observations always contain the raw reading from a measurements and individual corrections have to be applied for the Target point under several conditions.</documentation>

</annotation>

</element>

<complexType name="CorrectionType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="correctionID">

<complexType>

<sequence>

<element name="identifier" type="string" minOccurs="1"/>

<element name="scope" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

<element name="type" type="gml:ReferenceType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="CorrectionPropertyType">

<sequence minOccurs="0">

<element ref="lise:Correction"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- DetectorArray -->

<!-- -->

<element name="DetectorArray" type="lise:DetectorArrayType" substitutionGroup="gml:AbstractGML"/>

<complexType name="DetectorArrayType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="numberOfDimentions" type="integer"/>

<element name="arrayDimentionsValue" type="integer" maxOccurs="2"/>

<element name="arrayDimentionsName" type="string" maxOccurs="2"/>

<element name="detectorSize" type="integer" maxOccurs="2"/>

<element name="offsetVector" type="gml:VectorType" maxOccurs="2"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="DetectorArrayPropertyType">

<sequence minOccurs="0">

<element ref="lise:DetectorArray"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- DistanceCorrection -->

<!-- -->

<element name="DistanceCorrection" type="lise:DistanceCorrectionType" substitutionGroup="lise:Correction">

<annotation>

<documentation>Distance correction is used to correct the distance between Instrument and Target points ( example scale, refraction )</documentation>

</annotation>

</element>

<complexType name="DistanceCorrectionType">

<complexContent>

<extension base="lise:CorrectionType">

<sequence>

<element name="projectionDistortion" type="gml:ScaleType" minOccurs="0">

<annotation>

<documentation>correction of the projection distortion</documentation>

</annotation>

</element>

<element name="heightReduction" type="gml:ScaleType" minOccurs="0">

<annotation>

<documentation>reduction to reference ellipsoid</documentation>

</annotation>

</element>

<element name="atmosphericalCorrection" type="gml:ScaleType" minOccurs="0">

<annotation>

<documentation>value for the correction of atmosheric effects</documentation>

</annotation>

</element>

<element name="individualScale" type="gml:ScaleType" minOccurs="0">

<annotation>

<documentation>reduction to reference ellipsoid</documentation>

</annotation>

</element>

<element name="absolutePrismConstant" type="gml:LengthType" minOccurs="0">

<annotation>

<documentation>prism const</documentation>

</annotation>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="DistanceCorrectionPropertyType">

<sequence minOccurs="0">

<element ref="lise:DistanceCorrection"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Distortion -->

<!-- -->

<element name="Distortion" type="lise:DistortionType" substitutionGroup="gml:AbstractGML"/>

<complexType name="DistortionType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="princPoint" type="gml:GeometryPropertyType"/>

<element name="crs" type="gml:CRSPropertyType" minOccurs="0"/>

<element name="distortionK1" type="double">

<annotation>

<documentation>first coefficient of Taylor approximation to correct radial distortion</documentation>

</annotation>

</element>

<element name="distortionK2" type="double">

<annotation>

<documentation>second coefficient of Taylor approximation to correct radial distortion</documentation>

</annotation>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="DistortionPropertyType">

<sequence minOccurs="0">

<element ref="lise:Distortion"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- EDM -->

<!-- -->

<element name="EDM" type="lise:EDMType" substitutionGroup="lise:GenericDistance"/>

<complexType name="EDMType">

<complexContent>

<extension base="lise:GenericDistanceType">

<sequence>

<element name="carrierWavelength" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="EDMPropertyType">

<sequence minOccurs="0">

<element ref="lise:EDM"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Equipment -->

<!-- -->

<element name="Equipment" type="lise:EquipmentType" substitutionGroup="li:Feature">

<annotation>

<documentation>Equipment includes all information about the sensoric that was used each observation</documentation>

</annotation>

</element>

<complexType name="EquipmentType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="serialID" type="string" minOccurs="0"/>

<element name="dataCollector" type="string" minOccurs="0">

<annotation>

<documentation>Name of the Hardware used with controlling software</documentation>

</annotation>

</element>

<element name="controlSoftware" type="string" minOccurs="0">

<annotation>

<documentation>Name of the Software that was use to control the sensor(s)</documentation>

</annotation>

</element>

<element name="softwareVersion" type="string" minOccurs="0"/>

<element name="surveySensor" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:SurveySensor"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="EquipmentPropertyType">

<sequence minOccurs="0">

<element ref="lise:Equipment"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GNSS -->

<!-- -->

<element name="GNSS" type="lise:GNSSType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>GNSS - Sensors of different satellite systems to determine a 3d location of a CRS. External antennas could be also used.</documentation>

</annotation>

</element>

<complexType name="GNSSType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="posAccuracy" type="gml:LengthType" minOccurs="0"/>

<element name="hgtAccuracy" type="gml:LengthType" minOccurs="0"/>

<element name="camera" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Camera"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="antenna" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Antenna"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="reference" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GNSS"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="GNSSPropertyType">

<sequence minOccurs="0">

<element ref="lise:GNSS"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GenericAngle -->

<!-- -->

<element name="GenericAngle" type="lise:GenericAngleType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>Generic Angle delivers angular measurements</documentation>

</annotation>

</element>

<complexType name="GenericAngleType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="accuracy" type="gml:AngleType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="GenericAnglePropertyType">

<sequence minOccurs="0">

<element ref="lise:GenericAngle"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GenericDistance -->

<!-- -->

<element name="GenericDistance" type="lise:GenericDistanceType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>GenericDistance sensor could be a manual (tape) device or any other kinds of sensor that measures distances between to locations.</documentation>

</annotation>

</element>

<complexType name="GenericDistanceType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="accuracy" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="GenericDistancePropertyType">

<sequence minOccurs="0">

<element ref="lise:GenericDistance"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- InteriorOrientation -->

<!-- -->

<element name="InteriorOrientation" type="lise:InteriorOrientationType" substitutionGroup="gml:AbstractGML"/>

<complexType name="InteriorOrientationType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="principalPointX" type="gml:GridLengthType">

<annotation>

<documentation>uom = Pixel spacing</documentation>

</annotation>

</element>

<!--to do get type Pixel in gml type="gml:pixelInCell"-->

<element name="principalPointY" type="gml:GridLengthType">

<annotation>

<documentation>uom = Pixel spacing</documentation>

</annotation>

</element>

<element name="focalLength" type="gml:LengthType"/>

<element name="crossHairPosX" type="gml:GridLengthType">

<annotation>

<documentation>uom = Pixel spacing</documentation>

</annotation>

</element>

<element name="crossHairPosY" type="gml:GridLengthType">

<annotation>

<documentation>uom = Pixel spacing</documentation>

</annotation>

</element>

<element name="virtualCameraConstant" type="double"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="InteriorOrientationPropertyType">

<sequence minOccurs="0">

<element ref="lise:InteriorOrientation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- LaserScanner -->

<!-- -->

<element name="LaserScanner" type="lise:LaserScannerType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>Laser Scanners the controlled steering of laser beams followed by a distance measurement at every pointing direction.</documentation>

</annotation>

</element>

<complexType name="LaserScannerType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="horizontalAngle" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GenericAngle"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="verticalAngle" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GenericAngle"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="eDM" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:EDM"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="camera" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Camera"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="LaserScannerPropertyType">

<sequence minOccurs="0">

<element ref="lise:LaserScanner"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Level -->

<!-- -->

<element name="Level" type="lise:LevelType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>Level sensors are used to determine the height difference between two locations</documentation>

</annotation>

</element>

<complexType name="LevelType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="accuracy" type="gml:LengthType" minOccurs="0"/>

<element name="staff1" type="string" minOccurs="0"/>

<element name="staff2" type="string" minOccurs="0"/>

<element name="camera" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Camera"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="LevelPropertyType">

<sequence minOccurs="0">

<element ref="lise:Level"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- ObservationCorrections -->

<!-- -->

<element name="ObservationCorrections" type="lise:ObservationCorrectionsType" substitutionGroup="lise:SurveyProcess">

<annotation>

<documentation>Tranforamtion is used to get the Targetpoint in the Targer CRS if the Instrument Point is not in the Target CRS.</documentation>

</annotation>

</element>

<complexType name="ObservationCorrectionsType">

<complexContent>

<extension base="lise:SurveyProcessType">

<sequence>

<element name="correction" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Correction"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="ObservationCorrectionsPropertyType">

<sequence minOccurs="0">

<element ref="lise:ObservationCorrections"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Offset -->

<!-- -->

<element name="Offset" type="lise:OffsetType" substitutionGroup="lise:Correction">

<annotation>

<documentation>Offset is a user entered value that is applied to the measurements</documentation>

</annotation>

</element>

<complexType name="OffsetType">

<complexContent>

<extension base="lise:CorrectionType">

<sequence>

<element name="crossOffset" type="gml:LengthType"/>

<element name="lengthOffset" type="gml:LengthType"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="OffsetPropertyType">

<sequence minOccurs="0">

<element ref="lise:Offset"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SensorSystem -->

<!-- -->

<element name="SensorSystem" type="lise:SensorSystemType" substitutionGroup="gml:AbstractGML"/>

<complexType name="SensorSystemType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="calibratedFocalLength" type="gml:LengthType"/>

<element name="princPoint" type="gml:GeometryPropertyType"/>

<element name="crs" type="gml:CRSPropertyType" minOccurs="0"/>

<element name="instFieldOfView" type="gml:AngleType"/>

<element name="swathFieldOfView" type="gml:AngleType"/>

<element name="opticalDistortion" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Distortion"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SensorSystemPropertyType">

<sequence minOccurs="0">

<element ref="lise:SensorSystem"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SurveyProcess -->

<!-- -->

<element name="SurveyProcess" type="lise:SurveyProcessType" substitutionGroup="gml:using"/>

<annotation>

<documentation> The purpose of an observation process is to generate an observation

result. An instance is often an instrument or sensor, but may be a human observer, a

simulator, or a process or algorithm applied to more primitive results used as

inputs. </documentation>

</annotation>

<complexType name="SurveyProcessType">

<complexContent>

<extension base="gml:ProcedurePropertyType">

<sequence>

<element name="surveySensor" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:SurveySensor"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SurveyProcessPropertyType">

<sequence minOccurs="0">

<element ref="lise:SurveyProcess"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SurveySensor -->

<!-- -->

<element name="SurveySensor" type="lise:SurveySensorType" substitutionGroup="li:Feature">

<annotation>

<documentation>Sensor contains information about the hardware that is used to collect measurements</documentation>

</annotation>

</element>

<complexType name="SurveySensorType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="surveySensorID">

<complexType>

<sequence>

<element name="identifier" type="string" minOccurs="1"/>

<element name="scope" type="string" minOccurs="0"/>

</sequence>

</complexType>

</element>

<element name="type" type="gml:ReferenceType" minOccurs="0"/>

<element name="manufacture" type="string" minOccurs="0">

<annotation>

<documentation>name of the manufactor</documentation>

</annotation>

</element>

<element name="model" type="string" minOccurs="0"/>

<element name="serialID" type="string" minOccurs="0">

<annotation>

<documentation>Serial Number of the equipment</documentation>

</annotation>

</element>

<element name="softwareVersion" type="string" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SurveySensorPropertyType">

<sequence minOccurs="0">

<element ref="lise:SurveySensor"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Tps -->

<!-- -->

<element name="Tps" type="lise:TpsType" substitutionGroup="lise:SurveySensor">

<annotation>

<documentation>TPS - total station that measures distances and angles.</documentation>

</annotation>

</element>

<complexType name="TpsType">

<complexContent>

<extension base="lise:SurveySensorType">

<sequence>

<element name="horizontalAngle" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GenericAngle"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="vericalAngle" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:GenericAngle"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="eDM" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:EDM"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="compLongitudinal" type="gml:LengthType" minOccurs="0"/>

<element name="compTransversal" type="gml:LengthType" minOccurs="0"/>

<element name="verticalIndexErrorl" type="gml:LengthType" minOccurs="0"/>

<element name="collimHzErrorl" type="gml:LengthType" minOccurs="0"/>

<element name="tiltAxisError" type="gml:LengthType" minOccurs="0"/>

<element name="aTRHzError" type="gml:LengthType" minOccurs="0"/>

<element name="aTRVError" type="gml:LengthType" minOccurs="0"/>

<element name="camera" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lise:Camera"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="TpsPropertyType">

<sequence minOccurs="0">

<element ref="lise:Tps"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Transformation -->

<!-- -->

<element name="Transformation" type="lise:TransformationType" substitutionGroup="lise:Correction">

<annotation>

<documentation>Transformation is used to get the TargetPoint in the Target CRS if the Instrument Point is not in the Target CRS.</documentation>

</annotation>

</element>

<complexType name="TransformationType">

<complexContent>

<extension base="lise:CorrectionType">

<sequence>

<element name="deltaX" type="gml:LengthType"/>

<element name="deltaY" type="gml:LengthType"/>

<element name="deltaZ" type="gml:LengthType"/>

<element name="scaleX" type="gml:ScaleType"/>

<element name="scaleY" type="gml:ScaleType"/>

<element name="scaleZ" type="gml:ScaleType"/>

<element name="rotX" type="gml:AngleType"/>

<element name="rotY" type="gml:AngleType"/>

<element name="rotZ" type="gml:AngleType"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="TransformationPropertyType">

<sequence minOccurs="0">

<element ref="lise:Transformation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

</schema>

1. Part6Observations1119.xsd

<?xml version="1.0" encoding="UTF-8"?>

<schema xmlns="http://www.w3.org/2001/XMLSchema" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:li="http://www.opengis.net/infragml/core/1.0" xmlns:lis="http://www.opengis.net/infragml/survey/1.0" xmlns:liso="http://www.opengis.net/infragml/observations/1.0" xmlns:gml="http://www.opengis.net/gml/3.2" targetNamespace="http://www.opengis.net/infragml/observations/1.0" elementFormDefault="qualified" version="1.0">

<import namespace="http://www.opengis.net/infragml/core/1.0" schemaLocation="Part0Core1116.xsd"/>

<import namespace="http://www.opengis.net/infragml/survey/1.0" schemaLocation="Part6Survey1119.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/observation.xsd"/>

<!--<import namespace="http://www.opengis.net/om/2.0" schemaLocation="http://schemas.opengis.net/om/2.0/observation.xsd"/>-->

<!--<import namespace="http://www.isotc211.org/2005/gmd" schemaLocation="http://schemas.opengis.net/iso/19139/20070417/gmd/content.xsd"/>-->

<!--XML Schema document created by ShapeChange - http://shapechange.net/

Modified by Hans-Christoph Gruler(Leica Geosystems AG) October 17, 2016

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 02, 2016-

Changes in 1102 version: 1) remove dependency from OM and use gml:observation

1. Uses gml:observation instead of OM-Observations

2. Model MD\_ImageObservation into liso:ImageObservation

3.InstrumentPoint -> Feature

4.PanoramaImage -> Feature

5.Setup -> Feature

6. Nested sequences in setup

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 16, 2016

added Types and Qualities - moved image observation and panorama image to SurveySensor

added instrumentPoint into Setup

-->

<!-- -->

<!-- AngularObservation -->

<!-- -->

<element name="AngularObservation" type="liso:AngularObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>AngularObservation is a horizontal or vertical direction from the InstrumentPoint to the Target Point</documentation>

</annotation>

</element>

<complexType name="AngularObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="angle" type="gml:AngleType"/>

<element name="angularType" type="gml:ReferenceType" minOccurs="0"/>

<element name="angularQuality" type="gml:AngleType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="AngularObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:AngularObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- DistanceObservation -->

<!-- -->

<element name="DistanceObservation" type="liso:DistanceObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>DistanceObservation is a horizontal / vertical or slope distance from the InstrumentPoint to the Target Point</documentation>

</annotation>

</element>

<complexType name="DistanceObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="distance" type="gml:LengthType"/>

<element name="distanceType" type="gml:ReferenceType" minOccurs="0"/>

<element name="distanceQuality" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="DistanceObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:DistanceObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- ExteriorOrientation -->

<!-- -->

<element name="ExteriorOrientation" type="liso:ExteriorOrientationType" substitutionGroup="gml:AbstractGML"/>

<complexType name="ExteriorOrientationType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="projectionCenterX" type="gml:LengthType"/>

<element name="projectionCenterY" type="gml:LengthType"/>

<element name="projectionCenterZ" type="gml:LengthType"/>

<element name="phi" type="gml:AngleType"/>

<element name="theta" type="gml:AngleType"/>

<element name="kappa" type="gml:AngleType"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="ExteriorOrientationPropertyType">

<sequence minOccurs="0">

<element ref="liso:ExteriorOrientation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GF\_PropertyType -->

<!-- -->

<element name="GF\_PropertyType" type="liso:GF\_PropertyTypeType" substitutionGroup="gml:AbstractGML"/>

<complexType name="GF\_PropertyTypeType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence/>

</extension>

</complexContent>

</complexType>

<complexType name="GF\_PropertyTypePropertyType">

<sequence minOccurs="0">

<element ref="liso:GF\_PropertyType"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GnssObservation -->

<!-- -->

<element name="GnssObservation" type="liso:GnssObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>GNSS observation contains all oberservation to a satellite system. When using differental GNSS also the observation from the reference stations are included.</documentation>

</annotation>

</element>

<complexType name="GnssObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="antennaHeight" type="gml:LengthType"/>

<element name="quality" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:GnssQuality"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="rtkInfo" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:RtkInfo"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="satInfo" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:SatelliteInfo"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="GnssObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:GnssObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- GnssQuality -->

<!-- -->

<element name="GnssQuality" type="liso:GnssQualityType" substitutionGroup="gml:AbstractGML"/>

<complexType name="GnssQualityType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="hDOP" type="double" minOccurs="0"/>

<element name="gDOP" type="double" minOccurs="0"/>

<element name="pDOP" type="double" minOccurs="0"/>

<element name="vDOP" type="double" minOccurs="0"/>

<element name="tDOP" type="double" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="GnssQualityPropertyType">

<sequence minOccurs="0">

<element ref="liso:GnssQuality"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- ImageObservation -->

<!-- -->

<element name="ImageObservation" type="liso:ImageObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>Image Observations contains the Interior and Exterior orientation as well as the current camera settings ( example focal length, scale )</documentation>

</annotation>

</element>

<complexType name="ImageObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="illuminationElevationAngle" type="gml:AngleType" minOccurs="0"/>

<element name="illuminationAzimuthAngle" type="gml:AngleType" minOccurs="0"/>

<element name="cloudCoverPercentage" type="double" minOccurs="0"/>

<element name="triangulationIndicator" type="boolean" minOccurs="0"/>

<element name="radiometricCalibrationDataAvailability" type="boolean" minOccurs="0"/>

<element name="cameraCalibrationInformationAvailability" type="boolean" minOccurs="0"/>

<element name="filmDistortionInformationAvailability" type="boolean" minOccurs="0"/>

<element name="lensDistortionInformationAvailability" type="boolean" minOccurs="0"/>

<element name="exteriorOrientation" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:ExteriorOrientation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="ImageObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:ImageObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- InstrumentPoint -->

<!-- -->

<element name="InstrumentPoint" type="liso:InstrumentPointType" substitutionGroup="li:Feature">

<annotation>

<documentation>InstrumentPoint is the geometric location of the Setup. For GNSS Setup this is the position of the Base , For other setup this is the location of the equipment.</documentation>

</annotation>

</element>

<complexType name="InstrumentPointType">

<complexContent>

<extension base="li:FeatureType"/>

</complexContent>

</complexType>

<complexType name="InstrumentPointPropertyType">

<sequence minOccurs="0">

<element ref="liso:InstrumentPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- LevelObservation -->

<!-- -->

<element name="LevelObservation" type="liso:LevelObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>LevelObservation is a elevation difference from the InstrumentPoint to the Target Point</documentation>

</annotation>

</element>

<complexType name="LevelObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="deltaHeight" type="gml:LengthType"/>

<element name="deltaHeightQuality" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="LevelObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:LevelObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- PanoramaImage -->

<!-- -->

<element name="PanoramaImage" type="liso:PanoramaImageType" substitutionGroup="li:Feature">

<annotation>

<documentation>Panorama images is a stitched images from single images</documentation>

</annotation>

</element>

<complexType name="PanoramaImageType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="panoramaImageID"/>

<element name="image" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:ImageObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="PanoramaImagePropertyType">

<sequence minOccurs="0">

<element ref="liso:PanoramaImage"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- PointCloudObservation -->

<!-- -->

<element name="PointCloudObservation" type="liso:PointCloudObservationType" substitutionGroup="liso:SurveyObservation"/>

<complexType name="PointCloudObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="numberPoints" type="integer" minOccurs="0"/>

<element name="maxSNR" type="integer" minOccurs="0"/>

<element name="minSNR" type="integer" minOccurs="0"/>

<element name="maxIntensity" type="integer" minOccurs="0"/>

<element name="minIntensity" type="integer" minOccurs="0"/>

<element name="maxDistance" type="gml:LengthType" minOccurs="0"/>

<element name="minDistance" type="gml:LengthType" minOccurs="0"/>

<element name="maxNorthing" type="gml:LengthType" minOccurs="0"/>

<element name="minNorthing" type="gml:LengthType" minOccurs="0"/>

<element name="maxEasting" type="gml:LengthType" minOccurs="0"/>

<element name="minEasting" type="gml:LengthType" minOccurs="0"/>

<element name="maxElevation" type="gml:LengthType" minOccurs="0"/>

<element name="minElevation" type="gml:LengthType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="PointCloudObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:PointCloudObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- RtkInfo -->

<!-- -->

<element name="RtkInfo" type="liso:RtkInfoType" substitutionGroup="gml:AbstractGML"/>

<complexType name="RtkInfoType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="networkSolution" type="boolean" minOccurs="0">

<annotation>

<documentation>If not known then attribute is not written</documentation>

</annotation>

</element>

<element name="networkType" type="gml:ReferenceType" minOccurs="0"/>

<element name="dataFormat" type="string" minOccurs="0"/>

<element name="insideRTKNetwork" type="boolean" minOccurs="0">

<annotation>

<documentation>If not known then attribute is not written</documentation>

</annotation>

</element>

<element name="mountpoint" type="string" minOccurs="0"/>

<element name="numNetworkReferences" type="integer" minOccurs="0"/>

<element name="numRtkPositionsUsed" type="integer" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="RtkInfoPropertyType">

<sequence minOccurs="0">

<element ref="liso:RtkInfo"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SatelliteInfo -->

<!-- -->

<element name="SatelliteInfo" type="liso:SatelliteInfoType" substitutionGroup="gml:AbstractGML"/>

<complexType name="SatelliteInfoType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="systemType" type="gml:ReferenceType"/>

<element name="numSatsTracked" type="integer" minOccurs="0"/>

<element name="numSatsUsed" type="integer" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SatelliteInfoPropertyType">

<sequence minOccurs="0">

<element ref="liso:SatelliteInfo"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Setup -->

<!-- -->

<element name="Setup" type="liso:SetupType" substitutionGroup="li:Feature">

<annotation>

<documentation>Setup describes the place from where different observations has been measured</documentation>

</annotation>

</element>

<complexType name="SetupType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="instrumentHeight" type="gml:LengthType" minOccurs="0"/>

<element name="instrumentPoint" type="liso:InstrumentPointType" minOccurs="0"/>

<element name="validTime" type="gml:TimePeriodPropertyType" minOccurs="0">

<annotation>

<documentation> If present, the attribute validTime:TM\_Period shall describe the

time period during which the result is intended to be used. </documentation>

</annotation>

</element>

<element name="observations" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0" maxOccurs="unbounded">

<choice>

<element name="surveyObservation">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence maxOccurs="unbounded">

<choice>

<element ref="liso:SurveyObservation"/>

</choice>

</sequence>

</extension>

</complexContent>

</complexType>

</element>

</choice>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="setupObservations" minOccurs="0" maxOccurs="unbounded">

<annotation>

<documentation>Obersvations to determine setup parameters</documentation>

</annotation>

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0" maxOccurs="unbounded">

<choice>

<element name="setupObservation">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence maxOccurs="unbounded">

<choice>

<element ref="liso:SurveyObservation"/>

</choice>

</sequence>

</extension>

</complexContent>

</complexType>

</element>

</choice>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="panoImage" type="liso:PanoramaImagePropertyType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SetupPropertyType">

<sequence minOccurs="0">

<element ref="liso:Setup"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SurveyObservation -->

<!-- -->

<element name="SurveyObservation" type="liso:SurveyObservationType" substitutionGroup="gml:Observation">

<annotation>

<documentation>Observation is reading of a property at a specific time from a measurement sensor.</documentation>

</annotation>

</element>

<complexType name="SurveyObservationType">

<complexContent>

<extension base="gml:ObservationType">

<sequence>

<element name="phenomenonTime" type="liso:TimeObjectPropertyType" minOccurs="0">

<annotation>

<documentation> The attribute phenomenonTime:TM\_Object shall describe the time

that the result (6.2.2.9) applies to the property of the feature-of-interest

(6.2.2.7). This is often the time of interaction by a sampling procedure

(8.1.3) or observation procedure (6.2.2.10) with a real-world feature.

</documentation>

</annotation>

</element>

<element name="resultTime" type="gml:TimeInstantPropertyType" block="#all">

<annotation>

<documentation> The attribute resultTime:TM\_Instant shall describe the time when

the result became available, typically when the procedure (6.2.2.10)

associated with the observation was completed For some observations this is

identical to the samplingTime. However, there are important cases where they

differ. </documentation>

</annotation>

<!-- om:resultTime is used in schematron-based validaty tests, so must not be changed -->

</element>

<element name="type" type="gml:ReferenceType" minOccurs="0"/>

<element name="bInstrumentPoint" type="boolean">

<annotation>

<documentation>Flag describes if observation was made at Instrument or Target position</documentation>

</annotation>

</element>

<element name="image" minOccurs="0" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:ImageObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="panoImage" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:PanoramaImage"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SurveyObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:SurveyObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- TimeObjectPropertyType -->

<!-- -->

<complexType name="TimeObjectPropertyType">

<annotation>

<documentation>This property type is not provided directly by GML</documentation>

</annotation>

<sequence minOccurs="0">

<element ref="gml:AbstractTimeObject"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</complexType>

<!-- -->

<!-- TpsObservation -->

<!-- -->

<element name="TpsObservation" type="liso:TpsObservationType" substitutionGroup="liso:SurveyObservation">

<annotation>

<documentation>TPSObservation is an anguar or distance observation from the InstrumentPoint to the Target Point</documentation>

</annotation>

</element>

<complexType name="TpsObservationType">

<complexContent>

<extension base="liso:SurveyObservationType">

<sequence>

<element name="reflectorHeight" type="gml:LengthType"/>

<element name="directFace" type="boolean"/>

<element name="meanFace" type="boolean"/>

<element name="horizontalAngle" type="gml:AngleType"/>

<element name="hzAngleQuality" type="gml:AngleType" minOccurs="0"/>

<element name="verticalAngle" type="gml:AngleType"/>

<element name="vAngleQuality" type="gml:AngleType" minOccurs="0"/>

<element name="slopeDistance" type="gml:LengthType" minOccurs="0"/>

<element name="sDistanceQuality" type="gml:LengthType" minOccurs="0"/>

<element name="azimuth" type="gml:AngleType" minOccurs="0"/>

<element name="azQuality" type="gml:AngleType" minOccurs="0"/>

<element name="horizontalDistance" type="gml:LengthType" minOccurs="0"/>

<element name="hDistanceQuality" type="gml:LengthType" minOccurs="0"/>

<element name="inclinationLength" type="gml:AngleType" minOccurs="0"/>

<element name="inclLengthQuality" type="gml:AngleType" minOccurs="0"/>

<element name="inclinationCross" type="gml:AngleType" minOccurs="0"/>

<element name="inclCrossQuality" type="gml:AngleType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="TpsObservationPropertyType">

<sequence minOccurs="0">

<element ref="liso:TpsObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

</schema>

1. Part6SurveyResults1119.xsd

<?xml version="1.0" encoding="UTF-8"?>

<schema xmlns="http://www.w3.org/2001/XMLSchema" xmlns:xlink="http://www.w3.org/1999/xlink" xmlns:li="http://www.opengis.net/infragml/core/1.0" xmlns:lis="http://www.opengis.net/infragml/survey/1.0" xmlns:liso="http://www.opengis.net/infragml/observations/1.0" xmlns:lisr="http://www.opengis.net/infragml/surveyresults/1.0" xmlns:gml="http://www.opengis.net/gml/3.2" targetNamespace="http://www.opengis.net/infragml/surveyresults/1.0" elementFormDefault="qualified" version="1.0">

<import namespace="http://www.opengis.net/infragml/core/1.0" schemaLocation="Part0Core1116.xsd"/>

<import namespace="http://www.opengis.net/infragml/survey/1.0" schemaLocation="Part6Survey1119.xsd"/>

<import namespace="http://www.opengis.net/infragml/observations/1.0" schemaLocation="Part6Observations1119.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<import namespace="http://www.opengis.net/gml/3.2" schemaLocation="http://schemas.opengis.net/gml/3.2.1/gml.xsd"/>

<!--<import namespace="http://www.opengis.net/sampling/2.0" schemaLocation="http://schemas.opengis.net/sampling/2.0/samplingFeature.xsd"/>-->

<!--XML Schema document created by ShapeChange - http://shapechange.net/

Modified by Hans-Christoph Gruler(Leica Geosystems AG) October 19, 2016

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 02, 2016-

Changes in 1102 version: 1) remove dependency from OM and use gml:observation

1. Uses gml:observation instead of OM-Observations

2. therefore model sampling herer instead of import standard

Modified by Hans-Christoph Gruler(Leica Geosystems AG) November 16, 2016-

make type optional in the base class

-->

<!-- -->

<!-- Average -->

<!-- -->

<element name="Average" type="lisr:AverageType" substitutionGroup="lisr:SurveyResult">

<annotation>

<documentation>Average is represents multiple measurements on the same target location. Averaging may be required for determine the geometry of the feature of when observation are made at different times for monitoring the object of interest</documentation>

</annotation>

</element>

<complexType name="AverageType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="averagePoint" type="lisr:AveragePointType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="AveragePropertyType">

<sequence minOccurs="0">

<element ref="lisr:Average"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- AveragePoint -->

<!-- -->

<element name="AveragePoint" type="lisr:AveragePointType" substitutionGroup="gml:AbstractGML">

<annotation>

<documentation>AveragePoint represents the geometry of the feature of interest determined with multiple measurements on the same target location.</documentation>

</annotation>

</element>

<complexType name="AveragePointType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="geometry" type="gml:PointType"/>

<element name="quality" type="lisr:PointQualityType" minOccurs="0"/>

<element name="targetPoint" minOccurs="2" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lisr:TargetPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="AveragePointPropertyType">

<sequence minOccurs="0">

<element ref="lisr:AveragePoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- DesignPoint -->

<!-- -->

<element name="DesignPoint" type="lisr:DesignPointType" substitutionGroup="gml:AbstractGML"/>

<complexType name="DesignPointType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="geometry" type="gml:PointType"/>

<element name="quality" type="lisr:PointQualityType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="DesignPointPropertyType">

<sequence minOccurs="0">

<element ref="lisr:DesignPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Image -->

<!-- -->

<element name="Image" type="lisr:ImageType" substitutionGroup="lisr:SurveyResult"/>

<complexType name="ImageType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="file" type="gml:FileType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="ImagePropertyType">

<sequence minOccurs="0">

<element ref="lisr:Image"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- PointCloud -->

<!-- -->

<element name="PointCloud" type="lisr:PointCloudType" substitutionGroup="lisr:SurveyResult"/>

<complexType name="PointCloudType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="file" type="gml:FileType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="PointCloudPropertyType">

<sequence minOccurs="0">

<element ref="lisr:PointCloud"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- PointQuality -->

<!-- -->

<element name="PointQuality" type="lisr:PointQualityType" substitutionGroup="gml:AbstractGML"/>

<complexType name="PointQualityType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="meanError" type="gml:LengthType"/>

<element name="qxx" type="double"/>

<element name="qxy" type="double"/>

<element name="qxz" type="double"/>

<element name="qyy" type="double"/>

<element name="qyz" type="double"/>

<element name="qzz" type="double"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="PointQualityPropertyType">

<sequence minOccurs="0">

<element ref="lisr:PointQuality"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SamplingFeature -->

<!-- -->

<element name="SamplingFeature" type="lisr:SamplingFeatureType" abstract="true" substitutionGroup="li:Feature"/>

<complexType name="SamplingFeatureType">

<annotation>

<documentation>A "SamplingFeature" is a feature used primarily for taking

observations.</documentation>

</annotation>

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="type" type="gml:ReferenceType" minOccurs="0">

<annotation>

<documentation>If present, the sub-element 'type' shall indicate the class of

spatial sampling feature. A register of type identifiers corresponding with

the sampling feature types in ISO 19156 is provided by OGC at

http://www.opengis.net/def/samplingFeatureType/OGC-OM/2.0/ </documentation>

</annotation>

</element>

<element name="sampledFeature" block="#all" nillable="true" maxOccurs="unbounded">

<annotation>

<documentation> A sampling feature is established in order to make observations

concerning some domain feature. The association Intention shall link the

SF\_SamplingFeature to the feature which the sampling feature was designed to

sample. The target of this association has the role sampledFeature with

respect to the sampling feature, and shall not be a sampling feature. It is

usually a real-world feature from an application domain (Figures 5 and 10).

</documentation>

</annotation>

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="li:Feature"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="relatedObservation" minOccurs="0" maxOccurs="unbounded">

<annotation>

<documentation> Sampling features are distinctive compared with other features

from application domains by having navigable associations to observations.

If present, the association Design shall link the SF\_SamplingFeature to an

OM\_Observation that was made utilizing the sampling feature, and the

description of the sampling feature provides an intrinsic element of the

observation protocol, along with the observation procedure (6.2.2.10) and

the decomposition of the domain geometry in the case of a coverage-valued

result (7.3.1). The OM\_Observation has the role relatedObservation with

respect to the sampling feature. Multiple observations may be made on a

single sampling feature. </documentation>

</annotation>

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="liso:SurveyObservation"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="relatedSamplingFeature" type="lisr:SamplingFeatureComplexPropertyType" minOccurs="0" maxOccurs="unbounded">

<annotation>

<documentation> Sampling features are frequently related to each other, as parts

of complexes, through sub-sampling, and in other ways. If present, the

association class SamplingFeatureComplex (Figure 9) shall link a

SamplingFeature to another SamplingFeature. </documentation>

</annotation>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SamplingFeaturePropertyType">

<sequence minOccurs="0">

<element ref="lisr:SamplingFeature"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</complexType>

<!-- -->

<!-- SamplingFeatureComplex -->

<!-- -->

<element name="SamplingFeatureComplex" type="lisr:SamplingFeatureComplexType"/>

<complexType name="SamplingFeatureComplexType">

<annotation>

<documentation>A "SamplingFeatureRelation" is used to describe relationships between

sampling features, including part-whole, siblings, etc.</documentation>

</annotation>

<sequence>

<element name="role" type="gml:ReferenceType"/>

<element name="relatedSamplingFeature" type="lisr:SamplingFeaturePropertyType"/>

</sequence>

</complexType>

<complexType name="SamplingFeatureComplexPropertyType">

<sequence>

<element ref="lisr:SamplingFeatureComplex"/>

</sequence>

</complexType>

<!-- -->

<!-- Stakeout -->

<!-- -->

<element name="Stakeout" type="lisr:StakeoutType" substitutionGroup="lisr:SurveyResult">

<annotation>

<documentation>Stakeout results contains the differences between the design and the collected observations</documentation>

</annotation>

</element>

<complexType name="StakeoutType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="diffNorthing" type="gml:LengthType"/>

<element name="diffEasting" type="gml:LengthType"/>

<element name="diffElevation" type="gml:LengthType"/>

<element name="targetPoint">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lisr:TargetPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

<element name="designPoint" type="lisr:DesignPointType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="StakeoutPropertyType">

<sequence minOccurs="0">

<element ref="lisr:Stakeout"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- String -->

<!-- -->

<element name="String" type="lisr:StringType" substitutionGroup="lisr:SurveyResult">

<annotation>

<documentation>Boundery String related to ISO 19152</documentation>

</annotation>

</element>

<complexType name="StringType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="targetPoint" minOccurs="2" maxOccurs="unbounded">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lisr:TargetPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="StringPropertyType">

<sequence minOccurs="0">

<element ref="lisr:String"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- SurveyResult -->

<!-- -->

<element name="SurveyResult" type="lisr:SurveyResultType" substitutionGroup="gml:AbstractFeature">

<annotation>

<documentation>SurveyResult is an estimate of the value of a geometry or property of the feature of interest.</documentation>

</annotation>

</element>

<complexType name="SurveyResultType">

<complexContent>

<extension base="li:FeatureType">

<sequence>

<element name="surveyResultID"/>

<element name="type" type="gml:ReferenceType" minOccurs="0"/>

<element name="featureOfInterest" minOccurs="0">

<complexType>

<complexContent>

<extension base="gml:AbstractMemberType">

<sequence minOccurs="0">

<element ref="lisr:SamplingFeature"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

</extension>

</complexContent>

</complexType>

</element>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="SurveyResultPropertyType">

<sequence minOccurs="0">

<element ref="lisr:SurveyResult"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- TargetPoint -->

<!-- -->

<element name="TargetPoint" type="lisr:TargetPointType" substitutionGroup="lisr:SurveyResult">

<annotation>

<documentation>TargetPoint is the value of a geometry of the feature of interest that can estimated from the raw observations.</documentation>

</annotation>

</element>

<complexType name="TargetPointType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="geometry" type="gml:PointType"/>

<element name="isComplete" type="boolean"/>

<element name="quality" type="lisr:PointQualityType" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="TargetPointPropertyType">

<sequence minOccurs="0">

<element ref="lisr:TargetPoint"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- UserDefined -->

<!-- -->

<element name="UserDefined" type="lisr:UserDefinedType" substitutionGroup="lisr:SurveyResult"/>

<complexType name="UserDefinedType">

<complexContent>

<extension base="lisr:SurveyResultType">

<sequence>

<element name="name" type="string" minOccurs="0"/>

<element name="description" type="string" minOccurs="0"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="UserDefinedPropertyType">

<sequence minOccurs="0">

<element ref="lisr:UserDefined"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

<!-- -->

<!-- Value -->

<!-- -->

<element name="Value" type="lisr:ValueType" substitutionGroup="gml:AbstractGML">

<annotation>

<documentation>Estimate of a geometry or property resulted from observation of the feature of interest.</documentation>

</annotation>

</element>

<complexType name="ValueType">

<complexContent>

<extension base="gml:AbstractGMLType">

<sequence>

<element name="valueType"/>

</sequence>

</extension>

</complexContent>

</complexType>

<complexType name="ValuePropertyType">

<sequence minOccurs="0">

<element ref="lisr:Value"/>

</sequence>

<attributeGroup ref="gml:AssociationAttributeGroup"/>

<attributeGroup ref="gml:OwnershipAttributeGroup"/>

</complexType>

</schema>

1. [www.opengeospatial.org/cite](http://www.opengeospatial.org/cite) [↑](#footnote-ref-1)