

The buildingSMART Virtual Autumn Summit 2021

Today's session is titled:
Building Room Session 4: Updates to be made in Building
Domain of the IFC 4.3 Infra Extension

October 5th, 2021

Speakers:



Mirbek Bekboliev, M.Sc.

Technical Lead / bSI Building Room Steering Committee
Technical Project Manager / buildingSMART Germany

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IFC4 Schema Specs

<https://technical.buildingsmart.org/standards/ifc/ifc-schema-specifications/>

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|---|-------------------------------|---|---------------------|--------------------|---------------------|-------------------------------|-------------------------------|-------------------------------|--------------------------------------|---------------------|---------------------|
| Search: <input type="text"/> | | | | | | | | | | | |
| Version | Name (HTML Documentation) | ISO publication | Published (yyyy-mm) | Current Status | HTML download (ZIP) | EXPRESS | XSD | pSet XSD | OWL HTML | RDF | TTL |
| 4.3.dev | IFC4.3.dev | Final version expected mid 2022; published by ISO in 2023 | Continues updates | Under development | | GitHub output | | GitHub output | | | |
| 4.3.rc4 | IFC4.3 RC4 | - | 2021-06 | Under voting by SC | | | | | | | |
| 4.3.rc3 | IFC4.3 RC3 | - | 2021-03 | | | | | | | | |
| 4.3.rc.2 | IFC4.3 RC2 | - | 2020-11 | | | | | - | | | |
| 4.3.rc.1 | IFC4.3 RC1 | - | 2020-04 | | | | | - | | | TTL IFC4.3 RC1 |
| 4.2.0.0 | IFC4.2 | - | 2019-04 | Withdrawn | ZIP | EXP | IFC4x2.xsd | - | | | |
| 4.1.0.0 | IFC4.1 | - | 2018-06 | Withdrawn | ZIP | EXP | IFC4x1.xsd | - | ifcOWL IFC4.1 | RDF | TTL |
| 4.0.2.1 | IFC4 ADD2 TC1 | ISO 16739-1:2018 | 2017-10 | Official | ZIP | EXP | IFC4.xsd | - | ifcOWL IFC4 ADD2 TC1 | RDF | TTL |
| 4.0.2.0 | IFC4 ADD2 | - | 2016-07 | Retired | ZIP | EXP | IFC4 ADD2.xsd | - | ifcOWL | RDF | TTL |

Schema Review based on IFC4 Add2 TC1 (ISO)

IFC4 Addendum 2 TC1 (ISO 16739:2018)

https://standards.buildingsmart.org/IFC/RELEASE/IFC4/ADD2_TC1/HTML/

IFC4_ADD2_TC1 - 4.0.2.1 [Official]

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International home of openBIM

Industry Foundation Classes 4.0.2.1


Version 4.0 - Addendum 2 - Technical Corrigendum 1

Walt Disney Concert Hall, Los Angeles, California | Frank O. Gehry & Partners | Photo KH 2009

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Mirbek Bekboliev, M.Sc. / bSI SCTE / IFC4.3 Review

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Schema Review based on IFC4 Add2 TC1 (ISO) – Domains -> See Building related ones

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7 Domain specific data schemas

The domain specific data schemas contain final specializations of entities as shown highlighted in blue. Entities defined in this layer are self-contained and cannot be referenced by any other layer. The domain specific layer organizes definitions according to industry discipline.

7.1 IfcArchitectureDomain

7.2 IfcBuildingControlsDomain

7.3 IfcConstructionMgmtDomain

7.4 IfcElectricalDomain

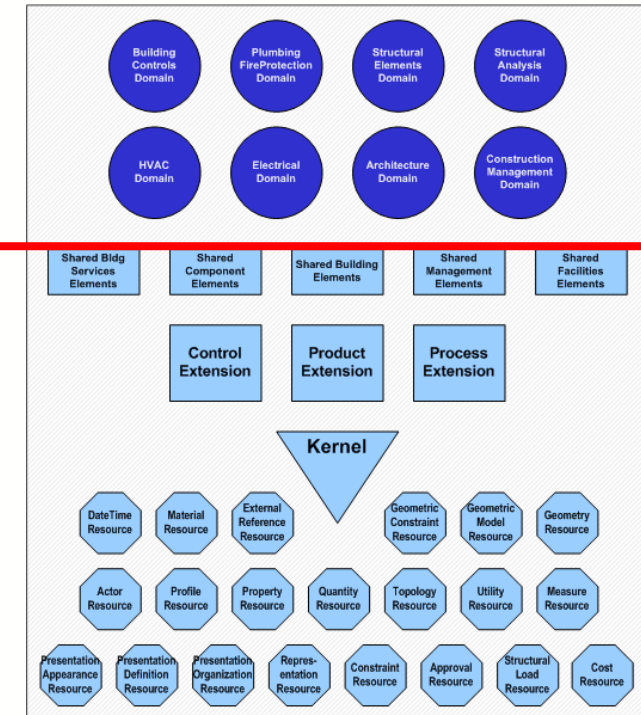
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7.6 IfcPlumbingFireProtectionDomain

7.7 IfcStructuralAnalysisDomain

7.8 IfcStructuralElementsDomain

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Schema Review based on IFC4 Add2 TC1 (ISO) – Entities, predefined Types (Enums) -> e.g. ifcSensor (see also ifcSensorType)

IFC4_ADD2_TC1 - 4.0.2.1 [Official]

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7.2.3.9 IfcSensor

Natural language names

| | |
|----|---------|
| DE | Sensor |
| EN | Sensor |
| FR | Capteur |

Change log

| Item | SPF | XML | Change | Description |
|---------------------------|-----|-----|--------|-------------|
| 4.0.0.0 | | | | |
| IfcSensor | | | ADDED | |
| 4.0.1.0 | | | | |
| IfcSensor | | | | |
| HasCoverings | | | ADDED | |

7.2.3.9.1 Semantic definitions at the entity

Entity definition

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument.

[HISTORY](#) [New entity in IFC4](#)

Attribute definitions

| # | Attribute | Type | Cardinality |
|---|----------------|-----------------------------------|-------------|
| 9 | PredefinedType | IfcSensorTypeEnum | ? |

Entity

Schema Review based on IFC4 Add2 TC1 (ISO) – Entities, predefined Types (Enums) -> e.g. ifcSensor (see also ifcSensorType)

IFC4_ADD2_TC1 - 4.0.2.1 [Official]

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7.2.3.9 IfcSensor

Natural language names

| | |
|----|---------|
| DE | Sensor |
| EN | Sensor |
| FR | Capteur |

Change log

| Item | SPF | XML | Change | Description |
|--------------|-----|-----|--------|-------------|
| 4.0.0.0 | | | | |
| IfcSensor | | | ADDED | |
| 4.0.1.0 | | | | |
| IfcSensor | | | | |
| HasCoverings | | | ADDED | |

7.2.3.9.1 Semantic definitions at the entity

Entity definition

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument.

HISTORY New entity in IFC4

Attribute definitions

| # | Attribute | Type | Cardinality |
|---|----------------|-------------------|-------------|
| 9 | PredefinedType | IfcSensorTypeEnum | ? |

Entity

Enumerations

Schema Review based on IFC4 Add2 TC1 (ISO) – Entities, predefined Types (Enums) -> e.g. ifcSensor (see also ifcSensorType)

Enumeration definition

| Constant | Description |
|------------------------|---|
| COSENSOR | A device that senses or detects carbon monoxide. |
| CO2SENSOR | A device that senses or detects carbon dioxide. |
| CONDUCTANCESENSOR | A device that senses or detects electrical conductance. |
| CONTACTSENSOR | A device that senses or detects contact, such as for detecting if a door is closed. |
| FIRESENSOR | A device that senses or detects fire |
| FLOWSENSOR | A device that senses or detects flow in a fluid. |
| FROSTSENSOR | A device that senses or detects frost on a window. |
| GASENSOR | A device that senses or detects gas concentration (other than CO2) |
| HEATSENSOR | A device that senses or detects heat. |
| HUMIDITYSENSOR | A device that senses or detects humidity. |
| IDENTIFIERSENSOR | A device that reads a tag, such as for gaining access to a door or elevator |
| IONCONCENTRATIONSENSOR | A device that senses or detects ion concentration, such as for water hardness. |
| LEVELSENSOR | A device that senses or detects fill level, such as for a tank. |
| LIGHTSENSOR | A device that senses or detects light. |
| MOISTURESENSOR | A device that senses or detects moisture. |
| MOVEMENTSENSOR | A device that senses or detects movement. |
| PHSENSOR | A device that senses or detects acidity. |
| PRESSURESENSOR | A device that senses or detects pressure. |
| RADIATIONSENSOR | A device that senses or detects pressure. |
| RADIOACTIVITYSENSOR | A device that senses or detects atomic decay. |
| SMOKESENSOR | A device that senses or detects smoke. |
| SOUNDSENSOR | A device that senses or detects sound. |
| TEMPERATURESENSOR | A device that senses or detects temperature. |
| WINDSENSOR | A device that senses or detects airflow speed and direction. |
| USERDEFINED | User-defined type. |
| NOTDEFINED | Undefined type. |

Schema Review based on IFC4 Add2 TC1 (ISO) – related Psets

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PSET_TYPEDRIVENVERRIDE / IfcSensor

Natural language names

| | |
|----|--------------------|
| EN | Sensor Type Common |
| JP | |

Properties

buildingSMART Data Dictionary

PSD-XML

| Name | Type | Description |
|-----------|---|--|
| Reference | P_SINGLEVALUE / IfcIdentifier * | <div>DEBauteiltyp</div> Bezeichnung zur Zusammenfassung gleichartiger Bauteile zu einem Bauteiltyp (auch Konstruktionstyp genannt). Alternativ zum Namen des "Typobjekts", insbesondere wenn die Software keine Typen unterstützt. |
| | | <div>ENReference</div> Reference ID for this specified type in this project (e.g. type 'A-1'). Also referred to as "construction type". It should be provided as an alternative to the name of the "object type", if the software does not support object types. |
| | | <div>FRReference</div> Référence à l'identifiant d'un type spécifié dans le contexte du projet (exemple : "type A1") pour désigner un "type de construction". Une alternative au nom d'un objet type lorsque les objets types ne sont pas gérés par le logiciel. |
| | | <div>JP参照記号</div> このプロジェクトにおける参照記号(例: A-1)。分類コードではなく内部で使用するプロジェクトタイプとして使用されるもの。 |
| | | <div>ZH参考号</div> 若未采用已知的分类系统, 则该属性为该项目中该类型构件的参考编号 (例如, 类型A-1)。 |
| Status | P_ENUMERATEDVALUE / IfcLabel / PEnum_ElementStatus* | <div>DEStatus</div> Status bzw. Phase des Bauteils insbesondere beim Bauen im Bestand. "Neu" (new) neues Bauteil als Ergänzung, "Bestand" (existing) bestehendes Bauteil, dass erhalten bleibt, "Abbruch" (demolish) Bauteil, das abgebrochen wird, "Temporär" (temporary) Bauteil und andere Bauelemente, die vorübergehend eingebaut werden (wie Abstützungen, etc.) |
| | | <div>ENStatus</div> Status of the element, predominately used in renovation or retrofitting projects. The status can be assigned to as "New" - element designed as new addition, "Existing" - element exists and remains, "Demolish" - element existed but is to be demolished, "Temporary" - element will exists only temporary (like a temporary support structure). |
| | | <div>FRStatut</div> Statut de l'élément, principalement utilisé dans les projets de rénovation et de réhabilitation. Le statut a pour valeur NOUVEAU pour un nouvel élément, EXISTANT pour un élément existant qui est conservé, DEMOLI pour un élément existant à démolir et TEMPORAIRE pour un élément temporaire (comme une structure support provisoire). |
| | | <div>JP状態</div> 要素 (主にリノベーションまたは改修プロジェクトにおいて) の状態。状態は、「新規(New)」 - 新しく追加される要素。「既存」 - 要素は存在し、かつ残りのもの。「破壊」 - 要素は存在したが、廃棄されるもの。「一時的」 - 一時的に存在する要素 (一時的にサポートしている構造のようなもの)。 |

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7.2.5.5 Qto_SensorBaseQuantities

QTO_TYPEDRIVENVERRIDE / IfcSensor

Natural language names

EN

Sensor Base Quantities

Quantities

QTO-XML

| Name | Type | Description |
|-------------|----------|--|
| GrossWeight | Q_WEIGHT | <div>EN</div> Gross WeightWeight of the element. |

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7.2.4.24 [Pset_SensorTypeConductanceSensor](#)
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Attribute definitions

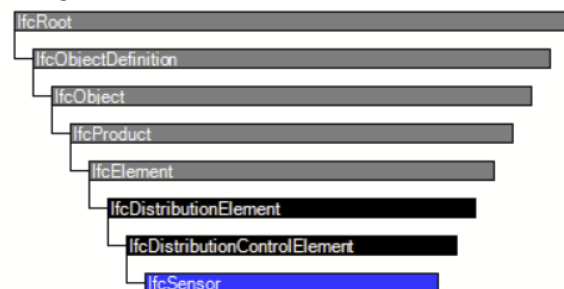
| # | Attribute | Type | Cardinality | Description |
|---|----------------|-----------------------------------|-------------|-------------|
| 9 | PredefinedType | IfcSensorTypeEnum | ? | |

Formal Propositions

| Rule | Description |
|-----------------------|--|
| CorrectPredefinedType | Either the <i>PredefinedType</i> attribute is unset (e.g. because an IfcSensorType is associated), or the inherited attribute <i>ObjectType</i> shall be provided, if the <i>PredefinedType</i> is set to USERDEFINED. |
| CorrectTypeAssigned | Either there is no sensor type object associated, i.e. the <i>IsTypedBy</i> inverse relationship is not provided, or the associated type object has to be of type IfcSensorType . |

7.2.3.9.2 Inherited definitions from supertypes

Entity inheritance



Attribute inheritance

7.2.3.9.3 Definitions applying to General Usage

Instance diagram

Concept usage

Schema Review based on IFC4.3 RC4 (Draft)

https://standards.buildingsmart.org/IFC/DEV/IFC4_3/RC4-voting/HTML/

| Infra/Rail extension - IFC 4.3 [Draft] | | | | © 1996-2021 buildingSMART International Ltd. |
|--|--|-------------------------------------|------------------------------------|--|
| Cover | 1. Scope | 5. Core data schemas | A. Computer interpretable listings | E. Examples |
| Contents | 2. Normative references | 6. Shared element data schemas | B. Alphabetical listings | F. Change logs |
| Foreword | 3. Terms, definitions, and abbreviated terms | 7. Domain specific data schemas | C. Inheritance listings | Bibliography |
| Introduction | 4. Fundamental concepts and assumptions | 8. Resource definition data schemas | D. Diagrams | Index |



Will it cause any misunderstandings or cause any issues?

5.4.2.15 IfcSpaceTypeEnum



▼ Natural language names

| | |
|----|---------------------------------|
| EN | Space Type Enum |
| FR | Énumération des types de locaux |

▼ Change log

| Item | SPF | XML | Change | Description |
|----------------------------------|-----|-----|--------|-------------|
| IFC2x3 to IFC4 4.0.0.0 | | | | |
| IfcSpaceTypeEnum | | | | |
| SPACE | | | ADDED | |
| PARKING | | | ADDED | |
| GFA | | | ADDED | |
| INTERNAL | | | ADDED | |
| EXTERNAL | | | ADDED | |

5.4.2.15.1 Semantic definitions at the type

▼ Type definition

This enumeration defines the available generic types for [IfcSpace](#) and [IfcSpaceType](#).

5.4.2.7 IfcExternalSpatialElementTypeEnum



▼ Natural language names

| | |
|----|---|
| EN | External Spatial Element Type Enum |
| FR | Énumération des types d'élément spatial extérieur |

▼ Change log

| Item | SPF | XML | Change | Description |
|---|-----|-----|---------|-------------|
| IFC2x3 to IFC4 4.0.0.0 | | | | |
| IfcExternalSpatialElementTypeEnum | | | ADDED | |
| IFC4 Addendum 2 4.0.2.0 | | | | |
| IfcExternalSpatialElementTypeEnum | | | | |
| NOTDEFINED | | | ADDED | |
| NOTDEFIEND | X | X | DELETED | |

5.4.2.7.1 Semantic definitions at the type

▼ Type definition

This enumeration defines the different types of external spatial elements.


[HISTORY](#) [New enumeration in IFC4.](#)

▼ Enumeration definition

| Constant | Description |
|----------------|---|
| EXTERNAL | External air space around the building. |
| EXTERNAL_EARTH | External volume covered by earth around the building. |
| EXTERNAL_WATER | External volume covered with water around the building. |
| EXTERNAL_FIRE | Space occupied by a neighboring building. |
| USERDEFINED | |
| NOTDEFINED | |

5.4.2.7.2 Formal representations

▼ Enumeration definition

| Constant | Description |
|--|--|
| MOVABLE | A movable wall that is either movable, such as folding wall or a sliding wall, or can be easily removed as a removable partitioning or mounting wall. Movable walls do normally not define space boundaries and often belong to the furnishing system. |
| PARAPET | A wall-like barrier to protect human or vehicle from falling, or to prevent the spread of fires. Often designed at the edge of balconies, terraces or roofs, or along edges of bridges. |
| PARTITIONING | A wall designed to partition spaces that often has a light-weight, sandwich-like construction (e.g. using gypsum board). Partitioning walls are normally non load bearing. |
| PLUMBINGWALL | A pier, or enclosure, or encasement, normally used to enclose plumbing in sanitary rooms. Such walls often do not extent to the ceiling. |
| SHEAR | A wall designed to withstand shear loads. Examples of shear wall are diaphragms inside a box girder, typically on a pier, to resist lateral forces and transfer them to the support. |
| SOLIDWALL | A massive wall construction for the wall core being the single layer or having multiple layers attached. Such walls are often masonry or concrete walls (both cast in-situ or precast) that are load bearing and fire protecting. |
| STANDARD | A standard wall, extruded vertically with a constant thickness along the wall path. <small>The value is deprecated, it is expressed by choosing the subtype <i>IfcWallStandardCase</i>.</small> |
| POLYGONAL | A polygonal wall, extruded vertically, where the wall thickness varies along the wall path. |
|  ELEMENTEDWALL | A stud wall framed with studs and faced with sheetings, sidings, wallboard, or plasterwork. <small>The value is deprecated, it is expressed by choosing the subtype <i>IfcWallElementedCase</i>.</small> |
| RETAININGWALL | A supporting wall used to protect against soil layers behind. Specific types of a retaining wall may be e.g. Gabion wall and Grib wall. Examples of retaining walls are wing wall, headwall, stem wall, pierwall and protecting wall. |
| WAVEWALL | Protective wall or screen to block overtopping and impact of waves across a breakwater |
| USERDEFINED | User-defined wall element. |
| NOTDEFINED | Undefined wall element. |



6.1.3.53 IfcWallElementedCase



▼ Natural language names

| | |
|----|---------------------|
| DE | Wand elementiert |
| EN | Wall Elemented Case |
| FR | Mur composite |

▼ Change log

DEPRECATED This definition may be imported, but shall not be exported by applications.

| Item | SPF | XML | Change | Description |
|--|-----|-----|----------|---------------------------------------|
| IFC2x3 to IFC4 4.0.0.0 | | | | |
| IfcWallElementedCase | | | ADDED | |
| IFC4 Addendum 2 Technical Corrigendum 1 4.0.2.1 | | | | |
| IfcWallElementedCase | | | MODIFIED | Status changed to <i>Deprecated</i> . |
| IFC4.2 Candidate 4.2.0.0 | | | | |
| IfcWallElementedCase | | | | |
| PositionedRelativeTo | | | ADDED | |

6.1.3.53.1 Semantic definitions at the entity

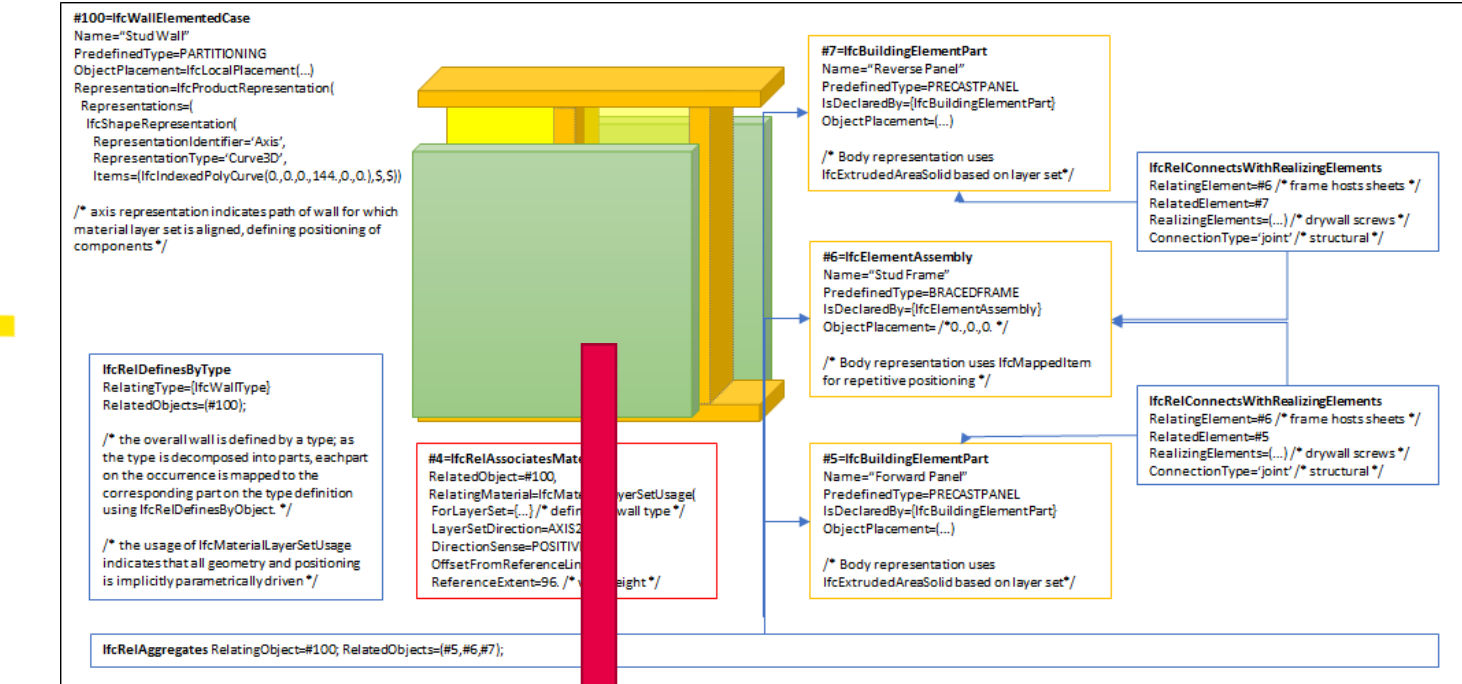
▼ Entity definition

The `IfcWallElementedCase` defines a wall with certain constraints for the provision of its components. The `IfcWallElementedCase` handles all cases of walls, that are decomposed into parts:

- having components being assigned to the `IfcWallElementedCase` using the `IfcRelAggregates` relationship accessible through the inverse relationship `IsDecomposedBy`.

Parts within the decomposition are usually be of type:

2020 | buildingSMART.org | buildingSMART International



GSM or Weather Cabins / Shelters are made of similar building types and methods...thus shelters shouldn't be regarded as an assembly, but a building.

Ceiling:

- Exterior Cladding:
Galvanized Trapezoidal Sheet Metal

- Insulation:
Rockwool

- Interior Cladding:
PVC Panel

- Connection Details

IfcElementedWall or IfcElementedCase

- Sandwich Panel

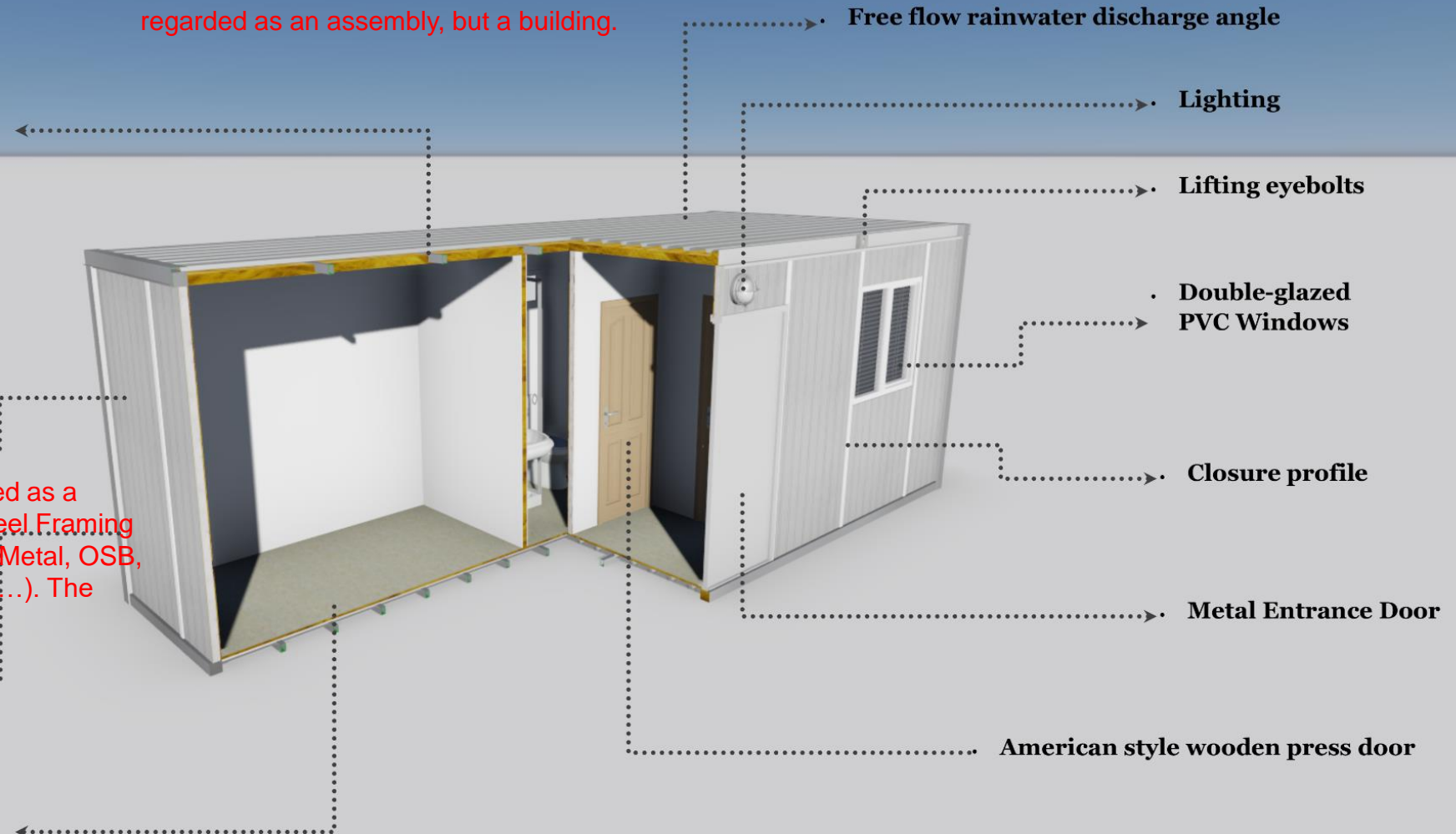
Or wall can be also constructed as a Drywall...with Light Gauge Steel Framing and Layers (Corrugated Sheet Metal, OSB, Insulation, Vapour Barrier, etc...). The same way Roof and slab!

- Corner Posts

IfcElementedSlab

Slab:

- Vinyl coating
- Betopan/Fibercement
- Connection profiles



Source: Mirbek Bekboliev

5.4.2.5 IfcElementAssemblyTypeEnum



▼ Natural language names

| | |
|----|--|
| EN | Element Assembly Type Enum |
| FR | Énumération des types d'assemblage d' éléments |

▼ Change log

| Item | SPF | XML | Change | Description |
|----------------------------|-----|-----|--------|-------------|
| IFC4.2 Candidate 4.2.0.0 | | | | |
| IfcElementAssemblyTypeEnum | | | | |
| ABUTMENT | | | ADDED | |
| PIER | | | ADDED | |
| PYLON | | | ADDED | |
| CROSS_BRACING | | | ADDED | |
| DECK | | | ADDED | |
| IFC4.2 to IFC4.3 RC1 | | | | |
| IfcElementAssemblyTypeEnum | | | | |
| MAST | | | ADDED | |
| SIGNALASSEMBLY | | | ADDED | |
| GRID | | | ADDED | |
| SHELTER | | | ADDED | |
| SUPPORTINGASSEMBLY | | | ADDED | |



Source: GSM Shelter www.paya.com.tr

It also has Posts/Columns and Beams, Walls and Doors etc.
same like previous Containerized Building

| | |
|--------------------|--|
| | or a rigid frame gantry. |
| GRID | A framework of spaced cables or bars that are parallel to or cross each other. |
| SHELTER | A structure, fairly quick to setup, move or dismantle, used to give protection, especially from the weather or intrusion. |
| SUPPORTINGASSEMBLY | An assembly intends to support Overhead Contact Line System. It includes foundation, supporting elements and suspension asse |
| SUSPENSIONASSEMBLY | A complex assembly of components used to suspend elements or cable segments. |

Ceiling:

- Exterior Cladding:
Galvanized Trapezoidal
Sheet Metal

- Insulation:
Rockwool

- Interior Cladding:
PVC Panel

- Connection Details

**IfcElementedWall or
IfcElementedCase**

- Sandwich Panel

- Corner Posts

Slab:

- Vinyl coating
- Betopan/Fibercement
- Connection profiles

Free flow rainwater discharge angle

Lighting

Lifting eyebolts

- Double-glazed
PVC Windows

Closure profile

Metal Entrance Door

American style wooden press door

**Is it
IfcElementAssembly
SHELTER?!**

or

**a Prefabricated Building
after all...**

Source: Mirbek Bekboliev

The heat recovery method can be used for gases, liquids or solids for heating or cooling processes. Heat recovery systems can be classified according to their heat exchanger:

- Recuperative systems
- Regenerative Systems
- Regenerators
- Heat pumps

<https://de.wikipedia.org/wiki/W%C3%A4rmer%C3%9Ckehafter>
German
https://en.wikipedia.org/wiki/Heat_recovery

~~Heat recovery may also be Fluid|Gas and vs.~~
7.5.2.3 IfcAirToAirHeatRecoveryTypeEnum
Unless here would be Heat Recovery Ventilation

▼ Natural language names

| | |
|----|---|
| EN | Air To Air Heat Recovery Type Enum |
| FR | Énumération des types d'échangeur air-air |

7.5.2.3.1 Semantic definitions at the type

▼ Type definition

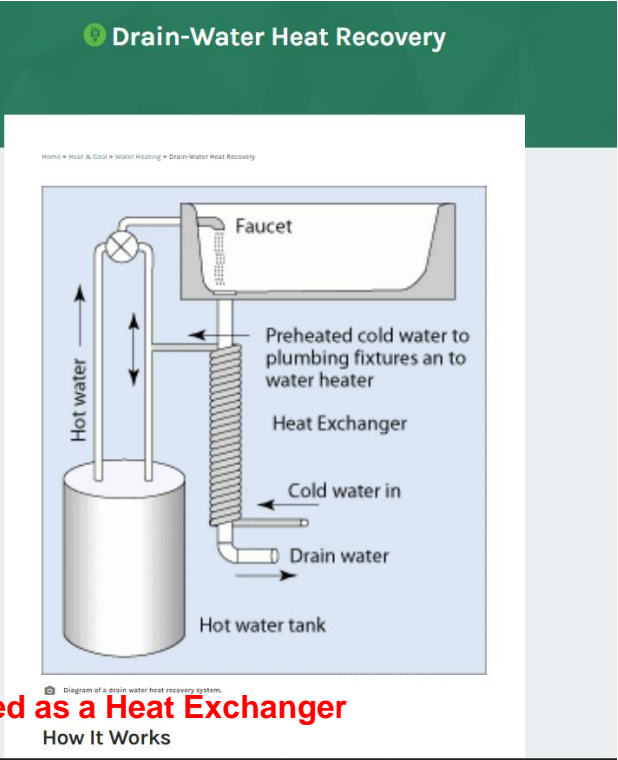
Defines general types of air-to-air heat recovery devices.

HISTORY New enumeration in IFC2x.

▼ Enumeration definition

| Constant | Description |
|--------------------------------------|--|
| FIXEDPLATECOUNTERFLOWEXCHANGER | Heat exchanger with moving parts and alternate layers of plates, separated and sealed from the exhaust and supply air stream passages with primary air entering at secondary air inlet location. |
| FIXEDPLATECROSSFLOWEXCHANGER | Heat exchanger with moving parts and alternate layers of plates, separated and sealed from the exhaust and supply air stream passages with secondary air entering at secondary air inlet location. |
| FIXEDPLATEPARALLELFLOWEXCHANGER | Heat exchanger with moving parts and alternate layers of plates, separated and sealed from the exhaust and supply air stream passages with primary air entering at secondary air inlet location. |
| ROTARYWHEEL | A heat wheel with a revolving cylinder filled with an air-permeable medium having a large internal surface area. |
| RUNAROUNDCOILLOOP | A typical coil energy recovery loop places extended surface, finned tube water coils in the supply and exhaust airstreams of a building. |
| HEATPIPE | A passive energy recovery device with a heat pipe divided into evaporator and condenser sections. |
| TWINTOWERENTHALPYRECOVERYLOOPS | An air-to-liquid, liquid-to-air enthalpy recovery system with a sorbent liquid circulates continuously between supply and exhaust airstreams, alternately contacting each airstream. |
| THERMOSIPHONSEALEDTUBEHEATEXCHANGERS | Sealed systems that consist of an evaporator, a condenser, interconnecting piping, and an intermediate working fluid that is present in both liquid and vapor phases. |
| THERMOSIPHONCOILTYPEHEATEXCHANGERS | Sealed systems that consist of an evaporator, a condenser, interconnecting piping, and an intermediate working fluid that is present in both liquid and vapor phases. |

Also Heat pumps??



Sure it could be also regarded as a Heat Exchanger

Source: <https://www.energy.gov/energysaver/water-heating/drain-water-heat-recovery> or https://en.wikipedia.org/wiki/Water_heat_recycling

7.6.2.1 IfcFireSuppressionTerminalTypeEnum



Natural language names

| | |
|----|---|
| EN | Fire Suppression Terminal Type Enum |
| FR | Énumération des types d'appareil terminal d'extinction d'incendie |

Could we also add standard Fire Extinguisher here?
Firemonitor is missing a Description

Change log

| Item | SPF | XML | Change | Description |
|------------------------------------|-----|-----|--------|-------------|
| IFC4x3_RC2 to IFC4x3_RC3 | | | | |
| IfcFireSuppressionTerminalTypeEnum | | | | |
| FIREMONITOR | | | ADDED | |

7.6.2.1.1 Semantic definitions at the type

Type definition

The IfcFireSuppressionTerminalTypeEnum defines the range of different types of fire suppression terminal that can be specified.

HISTORY New type in IFC2x2.

Enumeration definition

| Constant | Description |
|--------------------|--|
| BREECHINGINLET | Symmetrical pipe fitting that unites two or more inlets into a single pipe. A breeching inlet may be used on either a wet or dry riser. Used by fire services personnel for fast connection of fire appliance hose reels. May also be used for foam. |
| FIREHYDRANT | Device, fitted to a pipe, through which a temporary supply of water may be provided. May also be termed a stand pipe. |
| HOSEREEL | A supporting framework on which a hose may be wound. |
| SPRINKLER | Device for sprinkling water from a pipe under pressure over an area. |
| SPRINKLERDEFLECTOR | Device attached to a sprinkler to deflect the water flow into a spread pattern to cover the required area. |
| FIREMONITOR | |
| USERDEFINED | User-defined type |
| NOTDEFINED | Underined type. |

7.6.2.1.2 Formal representations

XML Specification

IfcExternalSpatialElementTypeEnum

| | |
|---------------|---|
| EXTERNAL_FIRE | Space occupied by a neighboring building. |
|---------------|---|

What is it about? Is it related with Fire and Smoke spread Simulations?

IfcAssemblyPlaceEnum

- Site
- Factory
- Mixed? As an additional
- Notdefined

IfcBuildingElementPartTypeEnum

- Insulation
- Precastpanel (Any connection with IFC4precast Group?)
- Apron
- ...

IfcBuildingSystemTypeEnum

- Foundation
- Shading
- Erosionprevention
- ...
- Biosphale?

IfcConstructionProductResourceTypeEnum

- Assembly
- Formwork (Any connection with VDI/buildingSMART 2552-11.3?) -> <https://www.vdi.de/richtlinien/details/vdibs-2552-blatt-113-building-information-modeling-exchange-requirements-formwork-and-scaffolding-systems-in-situ-concrete>
- Userdefined

IfcCoveringTypeEnum

- Cladding
- Molding
- Insulation
- Skirtingboard
- Membrane
- Coping
- Wrapping
- ...

IfcEarthworksCutTypeEnum

- Topsoilremoval
- Pavementmilling
- ...

IfcElectricApplianceTypeEnum

(due to frequency use and application in use cases):

- Oven?
- TV/Monitor?
- Coffee Machine?

IfcMedicalDeviceTypeEnum

- Airstation
- Feedairunit
- Oxygengenerator
- Oxygenplant
- Vacuumstation
- Radiology? X-Ray??
- Userdefined

IfcWallTypeEnum

- ...
- ...
- Elementedwall (until now it was deprecated, will it be revived again?
See slide above)
- Retainingwall
- Wavewall
- ...

IfcWindowTypeEnum

- Window
- ...
- Lightdome
- ...

IfcSpatialZoneTypeEnum

- Construction
- Firesafety
- Lighting
- Occupancy
- Security
- Thermal
- Transport
- Ventilation
- Reservation
- Interference
- Userdefined

Comment: Any contact
with Project at Building
Room??

Where could a „Surface Quality“ or „Visual Quality“ (e.g. for Timber or Concrete) placed??

IfcMaterialLayer

- LayerThickness
- IsVentilated
- Name
- Description
- Category
- Priority

IfcMaterialLayerSetUsage

- LayerSetDirection
- ...
- OffsetFromReferenceLine
- ...

IfcPerformanceHistory

- LifeCyclePhase -> **Which Phases???**
- PredefinedType

IfcPlant

->**Types???**

Scope

The standard includes definitions that cover data required for buildings and **bridges** over their life cycle. This release, and upcoming releases, extend the scope to include data definitions for **infrastructure assets** over their life cycle as well.

Comment: Only Bridges? Does a Bridge is not an Infrastructure asset?

7.6.2.5 IfcWasteTerminalTypeEnum



Natural language names

| | |
|----|---|
| EN | Waste Terminal Type Enum |
| FR | Énumération des type de stockage de déchets |

Change log

| Item | SPF | XML | Change | Description |
|--------------------------|-----|-----|---------|-------------|
| IFC2x3 to IFC4 4.0.0.0 | | | | |
| IfcWasteTerminalTypeEnum | | | | |
| GREASEINTERCEPTOR | X | X | DELETED | |
| OILINTERCEPTOR | X | X | DELETED | |
| PETROLINTERCEPTOR | X | X | DELETED | |

7.6.2.5.1 Semantic definitions at the type

Type definition

The IfcWasteTerminalTypeEnum defines the range of different types of waste terminal that can be specified.

HISTORY New type in IFC2x2. GREASEINTERCEPTOR, OILINTERCEPTOR, PETROLINTERCEPTOR moved to IfcInterceptorTypeEnum in IFC4.

Enumeration definition

| Constant | Description |
|-------------------|--|
| FLOORTRAP | Pipe fitting, set into the floor, that retains liquid to prevent the passage of foul air |
| FLOORWASTE | Pipe fitting, set into the floor, that collects waste water and discharges it to a separate trap. |
| GULLYSUMP | Pipe fitting or assembly of fittings to receive surface water or waste water, fitted with a grating or sealed cover. |
| GULLYTRAP | Pipe fitting or assembly of fittings that receives surface water or waste water; fitted with a grating or sealed cover that discharges water through a trap. |
| ROOFDRAIN | Pipe fitting, set into the roof, that collects rainwater for discharge into the rainwater system. |
| WASTEDISPOSALUNIT | Electrically operated device that reduces kitchen or other waste into fragments small enough to be flushed into a drainage system. |
| WASTETRAP | Pipe fitting, set adjacent to a sanitary terminal, that retains liquid to prevent the passage of foul air. |
| USERDEFINED | User-defined type. |
| NOTDEFINED | Undefined type. |

We couldn't find any suitable entity to describe **Trash Point / Garbage Container**...there was a discussion at the bSI Forum already on this topic.

or

IfcFurnitureTypeEnum

- **WasteCollectionPoint**?? HazardousWaste??!
- **Technicalcabinet** (further Purposes?) could it also be a Lab Cabinet?? Or for that reason we may need Medical and Research Purpose Cabines as additional Types??!
- **RecyclingPoint**??? (Container/Bin)

<https://forums.buildingsmart.org/t/ifc-for-waste/3044>

Space Boundaries: Current (unsolved Issues)

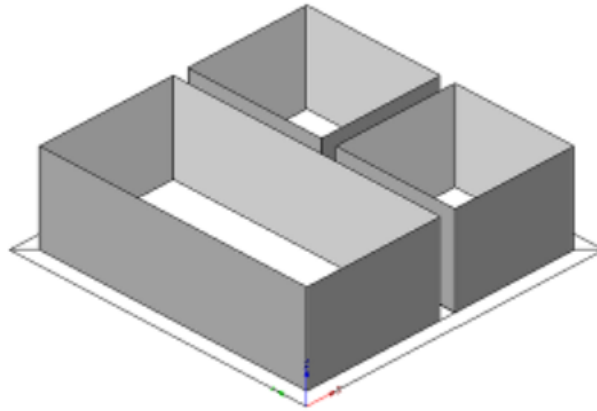


Figure 171 — Space boundary at first level

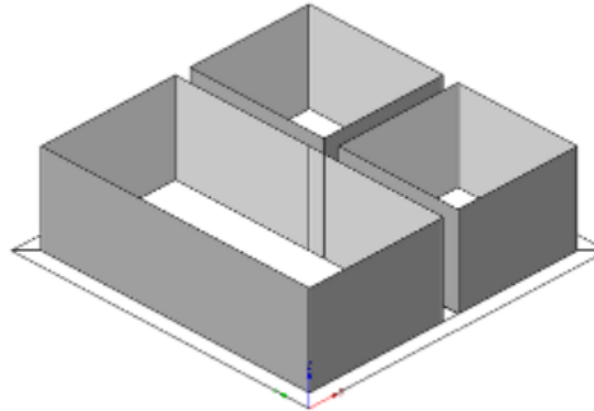


Figure 172 — Space boundary at second level

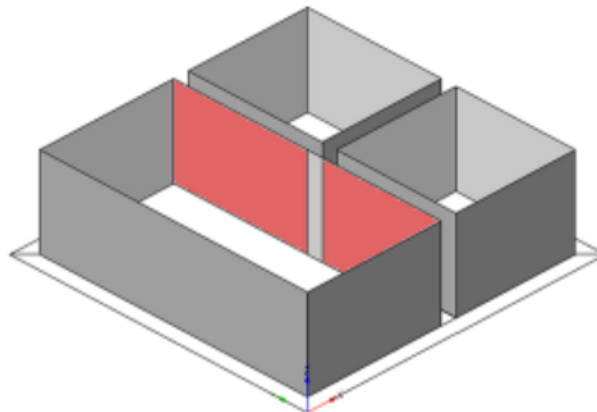


Figure 173 — Space boundary at second level type A

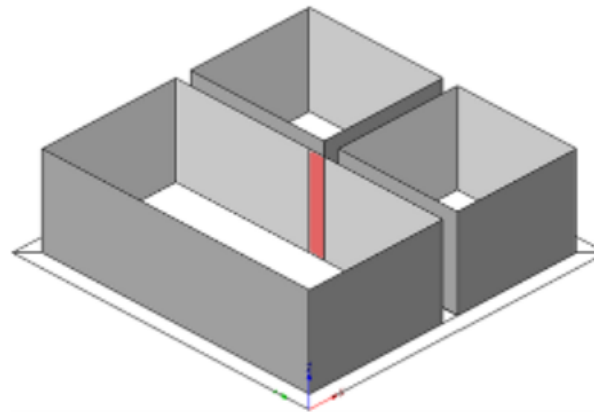


Figure 174 — Space boundary at second level type B

Source: buildingSMART International: https://standards.buildingsmart.org/IFC/RELEASE/IFC4/ADD2_TC1/HTML/schema/ifcproductextension/lexical/ifcrelspaceboundary.htm

Here are some discussions on bSI Forum:

Ideas on Raised Floor Entity from bSI Forum:

<https://forums.buildingsmart.org/t/raised-floor-entity/3715>

Usage of Pset_ConcreteElementSurfaceFinishQuantityGeneral

<https://forums.buildingsmart.org/t/usage-of-pset-concreteelementsurfacefinishquantitygeneral/3783>

IFC Textures and Colors: Current Situation

<https://forums.buildingsmart.org/t/ifc-textures-and-colors-current-situation/2862>

Definition of the level for the IfcBuildingStorey

<https://forums.buildingsmart.org/t/definition-of-the-level-for-the-ifcbuildingstorey-opinion-poll/404>

Please submit further Issues and Ideas on bSI Forum!

Inputs from Community:

It is great to see that IFC is making progress with integrating the infrastructural domains into the schemes. However, it is difficult to give any sensible feedback when one does not know the status, history and reasoning behind the decisions made, so while scanning through the IFC4.3 Infra extensions I have been formulating some questions rather than comments. For example:

- Why are axes and corresponding linear clearances/corridors not part of the ifcRoad and ifcRail domains?
- Would there be separate domains for other civil engineering works (such as bridges, tunnels and sluices) and if so shouldn't the IFC SHAREDINFRASTRUCTUREELEMENTS schema be reevaluated?

I also think that a thorough review would require more time and references from already existing OTLs to check if the IFC class definitions (ProRail and RWS for example) are exhaustive and correctly structured. But it is unclear whether that's the nature of the feedback requested. Do you know if the content needs reviewing or is it only about the structure of the schemas?

Perhaps if we have more background information, we could be of better help next time?

Greetings,
Chochanova, E.V. (Elena) (TNO)