

# ifcOWL status update

2016 buildingSMART International Standards Summit  
Rotterdam, The Netherlands  
Technical Room

Pieter Pauwels, Ghent University

12 April 2016

16:00 – 18:00

LDWG



**STANDARDISATION!**

# ifcOWL Proposal as presented in BS ISM Singapore 2015

## 1. Officialisation of Linked Data Working Group

**Remained unchanged,  
so this is still an open request!!**

## 2. Presentation of ifcOWL ontology as a recommended standard (to be further evaluated):

- ifcOWL ontology
- HTML documentation
- Proposed Recommendation

## 3. Requirements for hosting the ifcOWL online

# HTML documentation pages

← → ↻ ifcowl.openbimstandards.org/IFC4\_ADD1/index.html ☆ ☰

## ifcOWL ontology (IFC4\_ADD1)

**IRI:**

[http://ifcowl.openbimstandards.org/IFC4\\_ADD1](http://ifcowl.openbimstandards.org/IFC4_ADD1)

**Date:**

January 22, 2016

**This version:**

1.3

**Previous version:**

December 11, 2015: [http://www.openbimstandards.org/IFC4\\_ADD1/index.html](http://www.openbimstandards.org/IFC4_ADD1/index.html)

**Latest version:**

January 22, 2016: [http://ifcowl.openbimstandards.org/IFC4\\_ADD1/index.html](http://ifcowl.openbimstandards.org/IFC4_ADD1/index.html)

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**Ontology source:**

[TTL\\_OWL](#)

**Imported Ontologies:**

<https://w3id.org/list>  
<https://w3id.org/express>

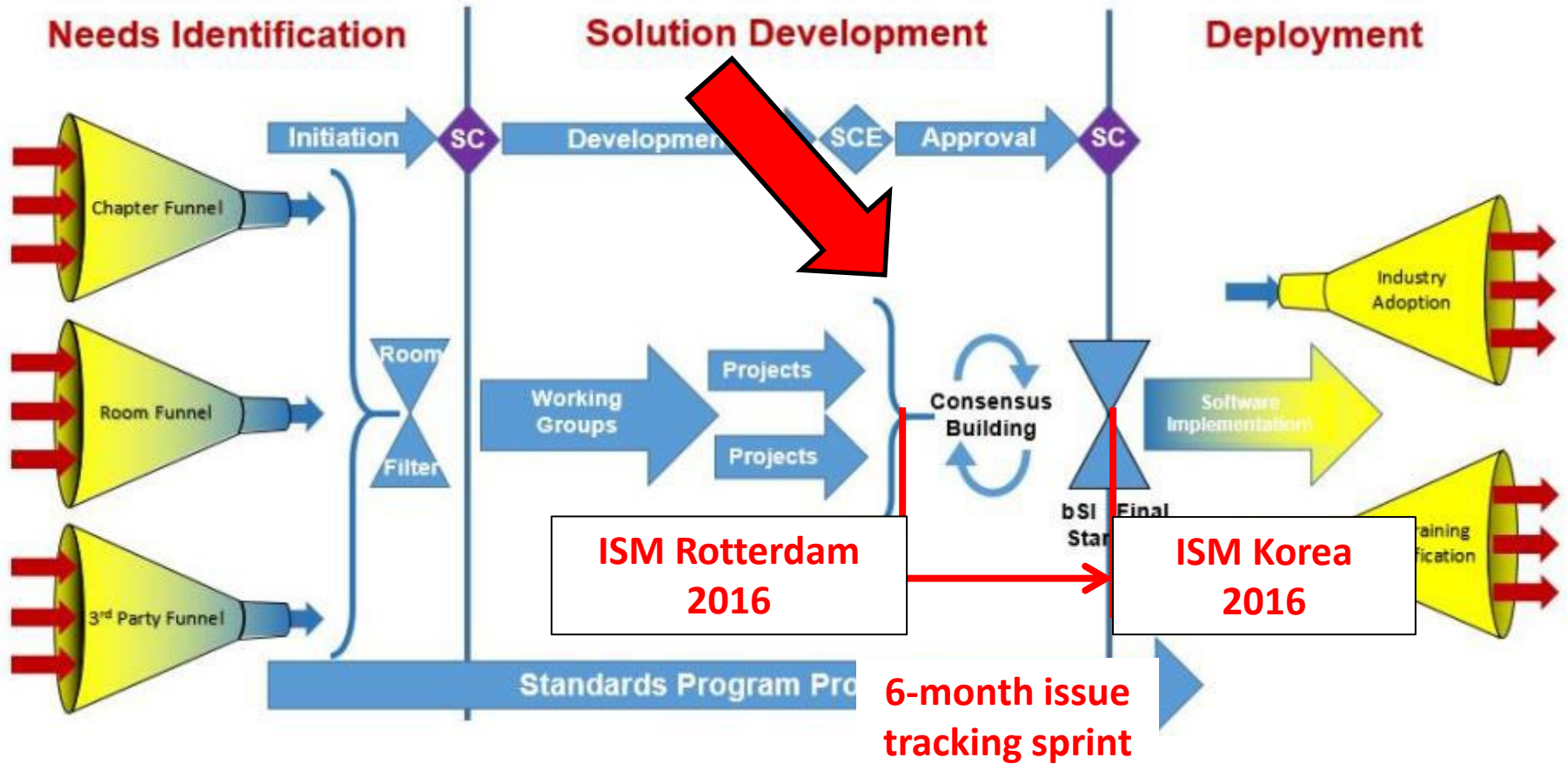
**License:**

This work is licensed under a <http://creativecommons.org/licenses/by/3.0/> license.

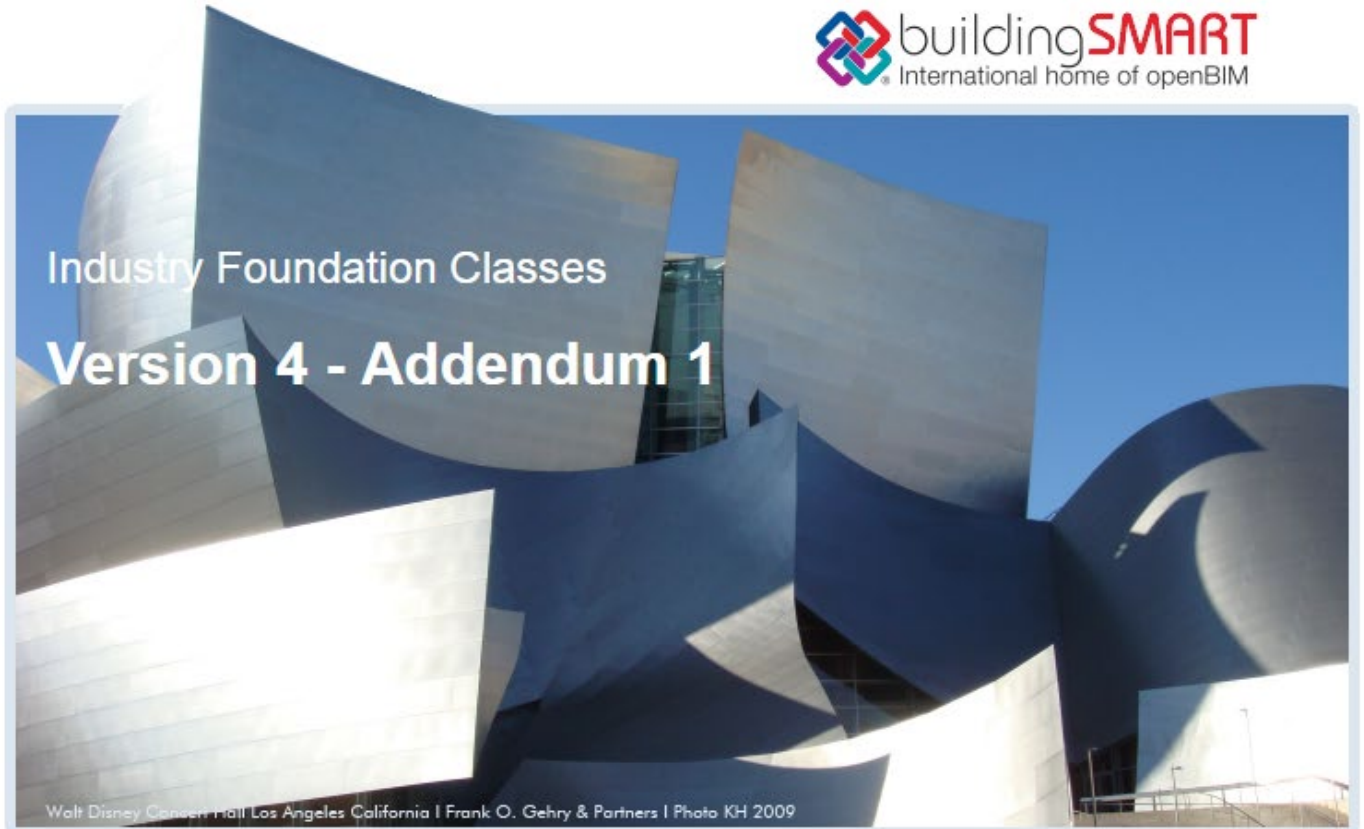
## Abstract

This ifcOWL ontology is automatically generated from the EXPRESS schema 'IFC4\_ADD1' using the 'IFC-to-RDF' converter developed by Pieter Pauwels ([pipauwel.pauwels@ugent.be](mailto:pipauwel.pauwels@ugent.be)), based on the earlier versions from Jurki Orskari

# Status in the standards process



Cover page	1. Scope	5. Core data schemas	A. Computer interpretable listings	E. Examples
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Foreword	3. Terms, definitions, and abbreviated terms	7. Domain specific data schemas	C. Inheritance listings	Bibliography
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The specification has been developed in 1999-2015 by the [Model Support Group](#) - MSG - of buildingSMART International Ltd, and contributors under the coordination of

Thomas Liebich - MSG Leader  
Tim Chinn - MSG Deputy

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By using the IFC4 specification you agree to the following [copyright notice](#)

Implementation  
in IfcDoc

file:///C:/Users/generic/Desktop/testOutputIfcDoc/ifc4/index.htm

## IFC4 - Addendum 1 [Final Standard]

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- 5.1.2.4 IfcPropertySetTemplateTypeEnum
- 5.1.2.5 IfcSimplePropertyTemplateTypeEnum
- 5.1.2.6 IfcDefinitionSelect
- 5.1.2.7 IfcProcessSelect
- 5.1.2.8 IfcProductSelect
- 5.1.2.9 IfcPropertySetDefinitionSelect
- 5.1.2.10 IfcResourceSelect
- 5.1.3 Entities
- 5.1.3.1 IfcActor
- 5.1.3.2 IfcComplexPropertyTemplate
- 5.1.3.3 IfcContext
- 5.1.3.4 IfcControl
- 5.1.3.5 IfcGroup
- 5.1.3.6 IfcObject
- 5.1.3.7 IfcObjectDefinition
- 5.1.3.8 IfcPreDefinedPropertySet
- 5.1.3.9 IfcProcess
- 5.1.3.10 IfcProduct
- 5.1.3.11 IfcProject
- 5.1.3.12 IfcProjectLibrary
- 5.1.3.13 IfcPropertyDefinition
- 5.1.3.14 IfcPropertySet
- 5.1.3.15 IfcPropertySetDefinition
- 5.1.3.16 IfcPropertySetTemplate
- 5.1.3.17 IfcPropertyTemplate
- 5.1.3.18 IfcPropertyTemplateDefinition
- 5.1.3.19 IfcProxy

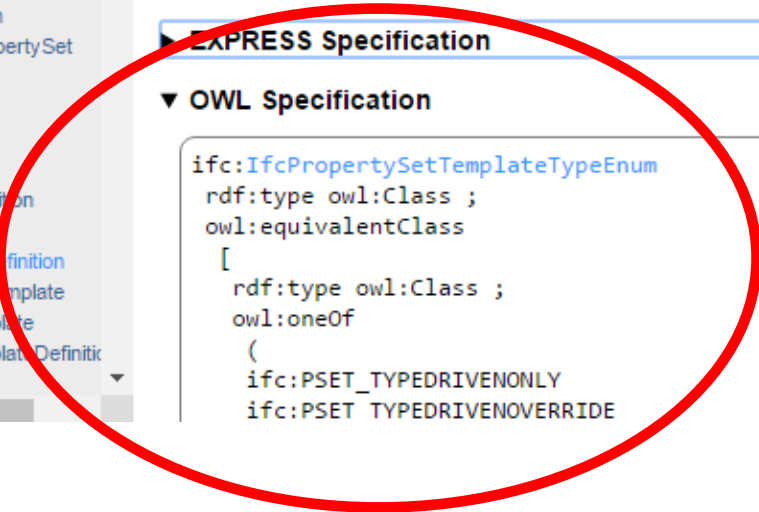
### ▼ XSD Specification

```
<xs:simpleType name="IfcPropertySetTemplateTypeEnum">  
  <xs:restriction base="xs:string">  
    <xs:enumeration value="pset_typeddrivenonly"/>  
    <xs:enumeration value="pset_typeddrivenoverride"/>  
    <xs:enumeration value="pset_occurrencedriven"/>  
    <xs:enumeration value="pset_performancedriven"/>  
    <xs:enumeration value="qto_typeddrivenonly"/>  
    <xs:enumeration value="qto_typeddrivenoverride"/>  
    <xs:enumeration value="qto_occurrencedriven"/>  
    <xs:enumeration value="notdefined"/>  
  </xs:restriction>  
</xs:simpleType>
```

### ▶ EXPRESS Specification

### ▼ OWL Specification

```
ifc:IfcPropertySetTemplateTypeEnum  
rdf:type owl:Class ;  
owl:equivalentClass  
 [  
   rdf:type owl:Class ;  
   owl:oneOf  
   (  
     ifc:PSET_TYPEDDRIVENONLY  
     ifc:PSET_TYPEDDRIVENOVERRIDE
```





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## E.2.2 Extruded solid

Format	ASCII	HTML
<a href="#">IFC-SPF</a>	<a href="#">File</a>	<a href="#">Markup</a>

### View

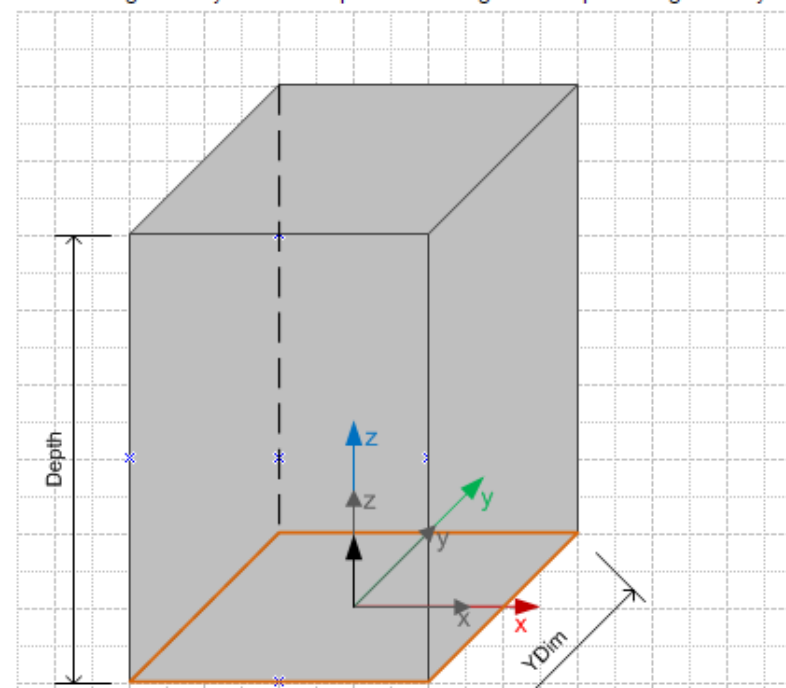
[Common Use Definitions](#)

### Entity

[IfcShapeRepresentation](#)

[IfcExtrudedAreaSolid](#)

The block geometry can be expressed using the swept solid geometry model, expressing it as an extruded solid.





Implementation  
in IfcDoc

file:///C:/Users/generic/Desktop/testOutputIfcDoc/ifc4/index.htm

## IFC4 - Addendum 1 [Final Standard]

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- E.2 Basic geometric shape
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  - E.4.4 Slab tessellated unique vertices
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  - E.5.1 Tessellation with individual colors
  - E.5.2 Tessellation with image texture
  - E.5.3 Tessellation with blob texture
  - E.5.4 Tessellation with pixel texture
- E.6 Mapped geometric shape
  - E.6.1 Mapped shape without transformation

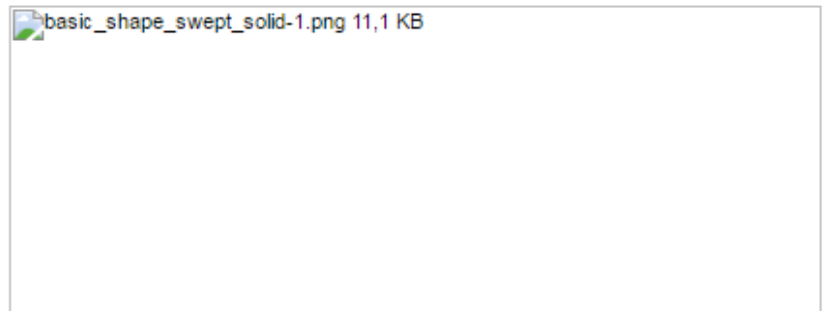
### E.2.2 Extruded solid

Format	ASCII	HTML
XML	File	Markup
STEP	File	Markup
OWL	File	Markup

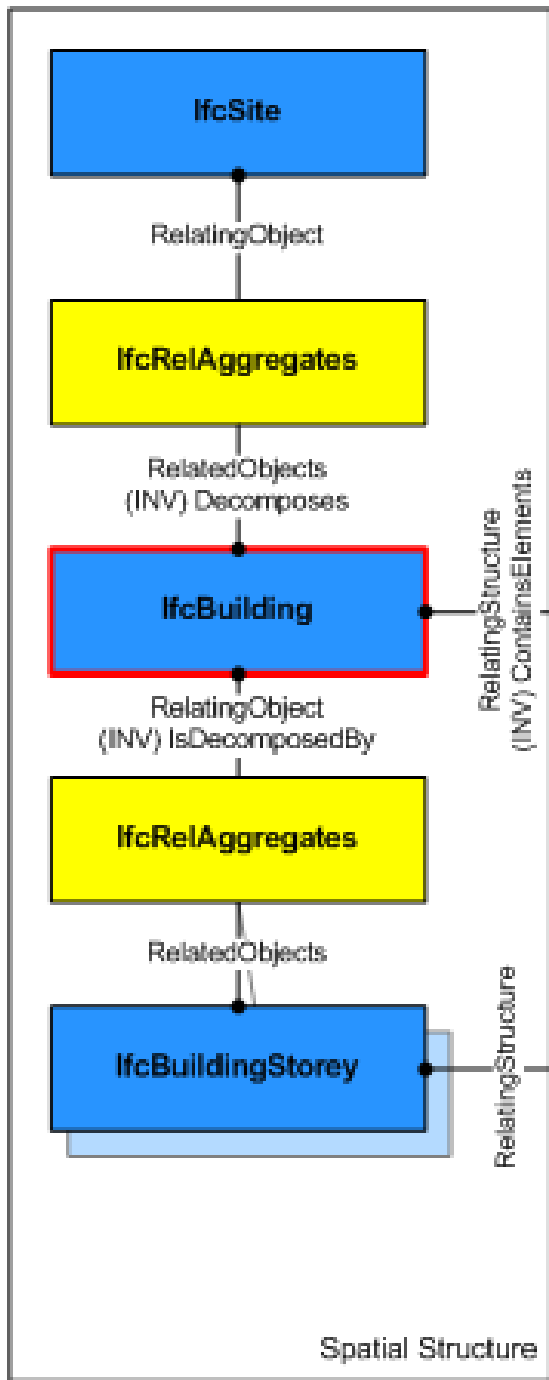
- View
- General Usage
- Design Transfer View

- Entity
- IfcShapeRepresentation
- IfcExtrudedAreaSolid

The block geometry can be expressed using the swept solid geometry model, expressing it as an extruded solid.

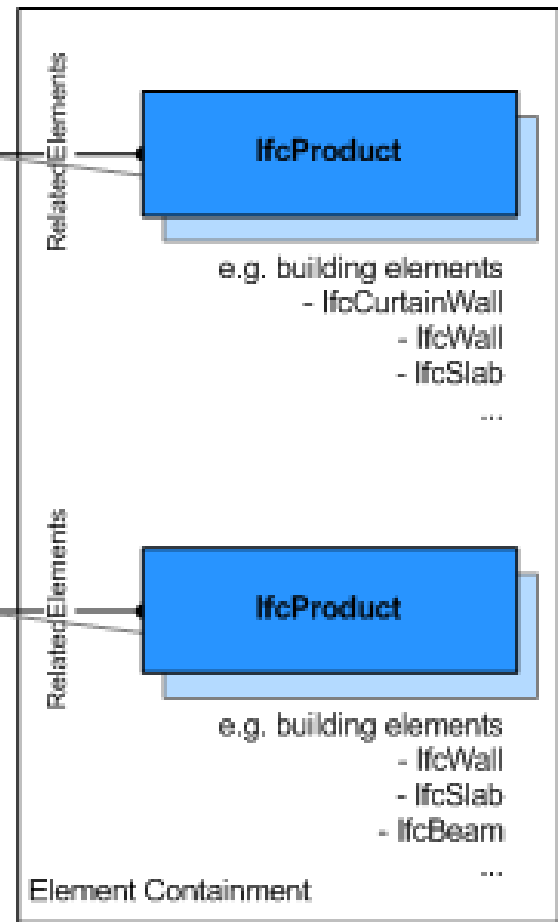


USABILITY?



RelatingStructure (INV) ContainsElements

RelatingStructure



◆ inst:IfcProject\_94

ifcowl:relatedObjects\_IfcRelDecomposes

◆ inst:IfcSite\_2421

ifcowl:relatedObjects\_IfcRelDecomposes

◆ inst:IfcBuilding\_104

ifcowl:relatedObjects\_IfcRelDecomposes

◆ inst:IfcBuildingStorey\_119

◆ inst:IfcBuildingStorey\_113

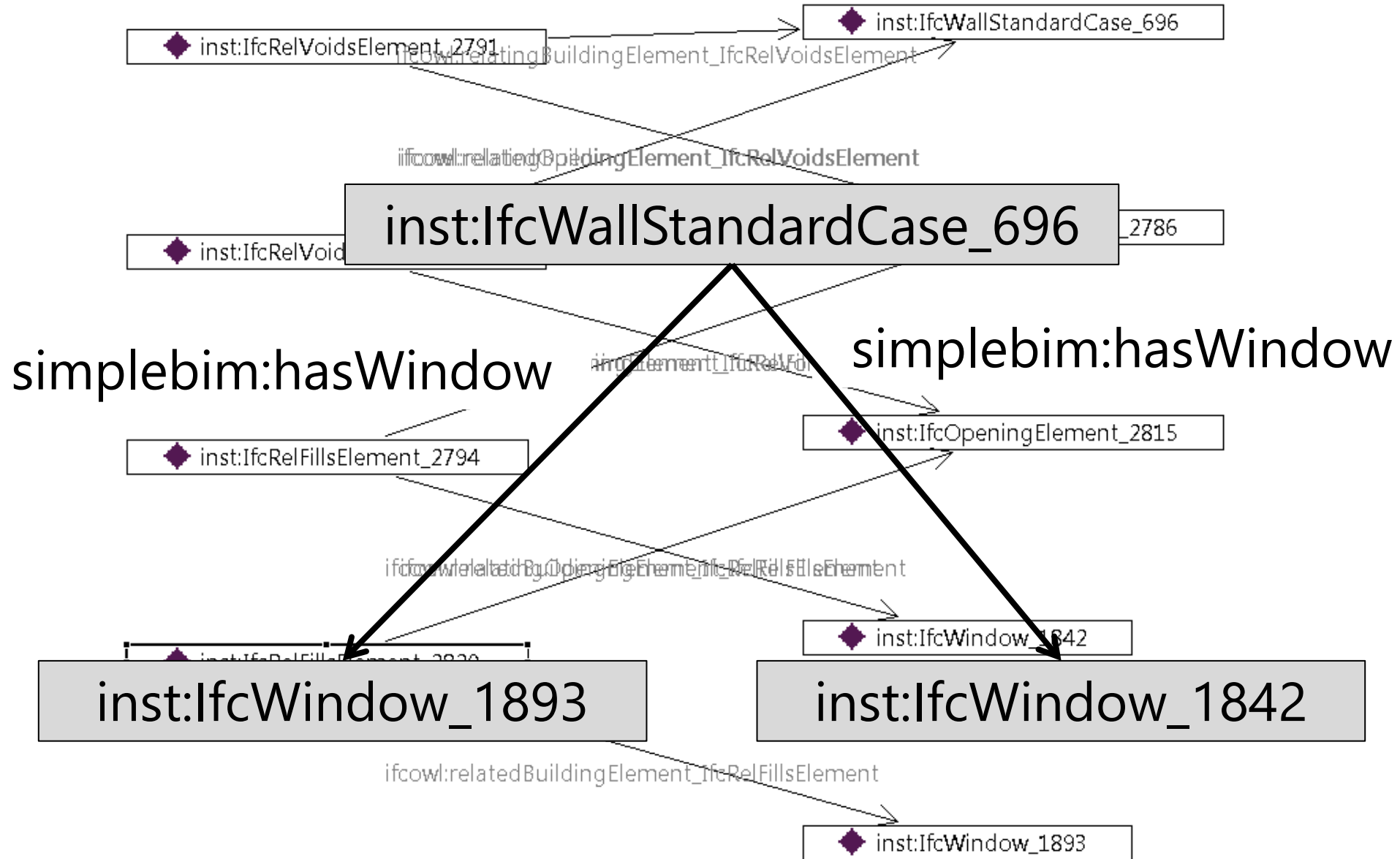
ifcowl:relatedObjects\_IfcRelDecomposes

◆ inst:IfcSpace\_505

◆ inst:IfcSpace\_350

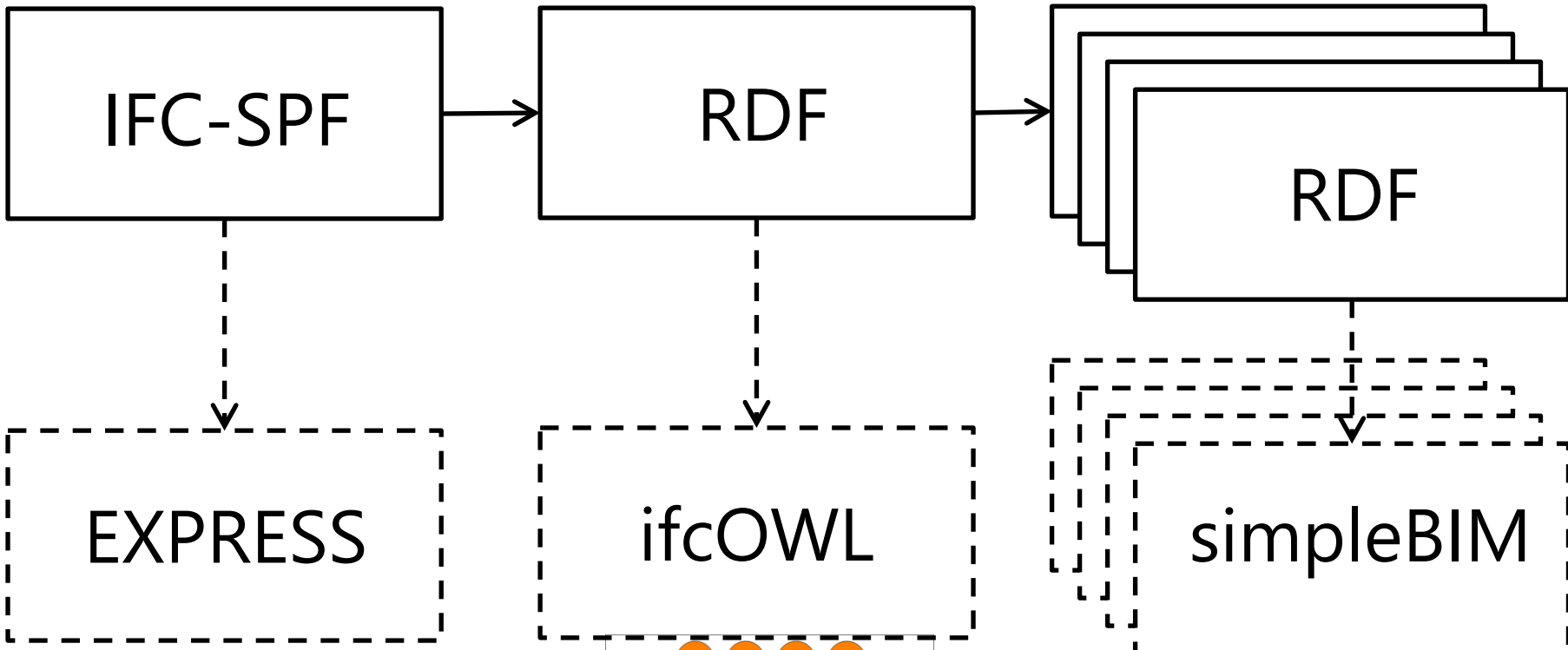
◆ inst:IfcSpace\_139

# ifcOWL

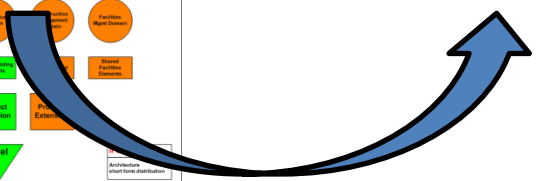


Converter?  
Rules?  
...?

ifcOWL

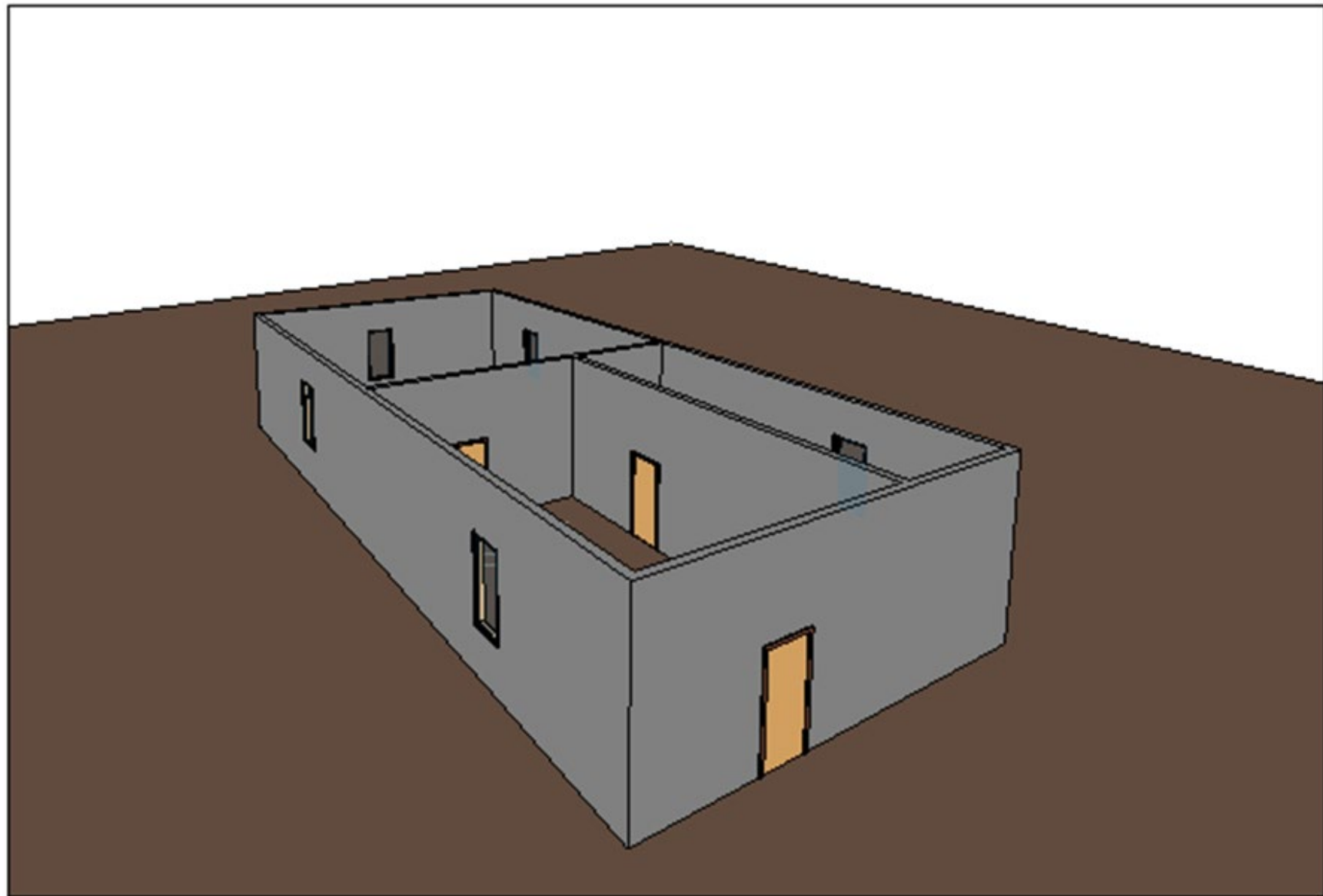


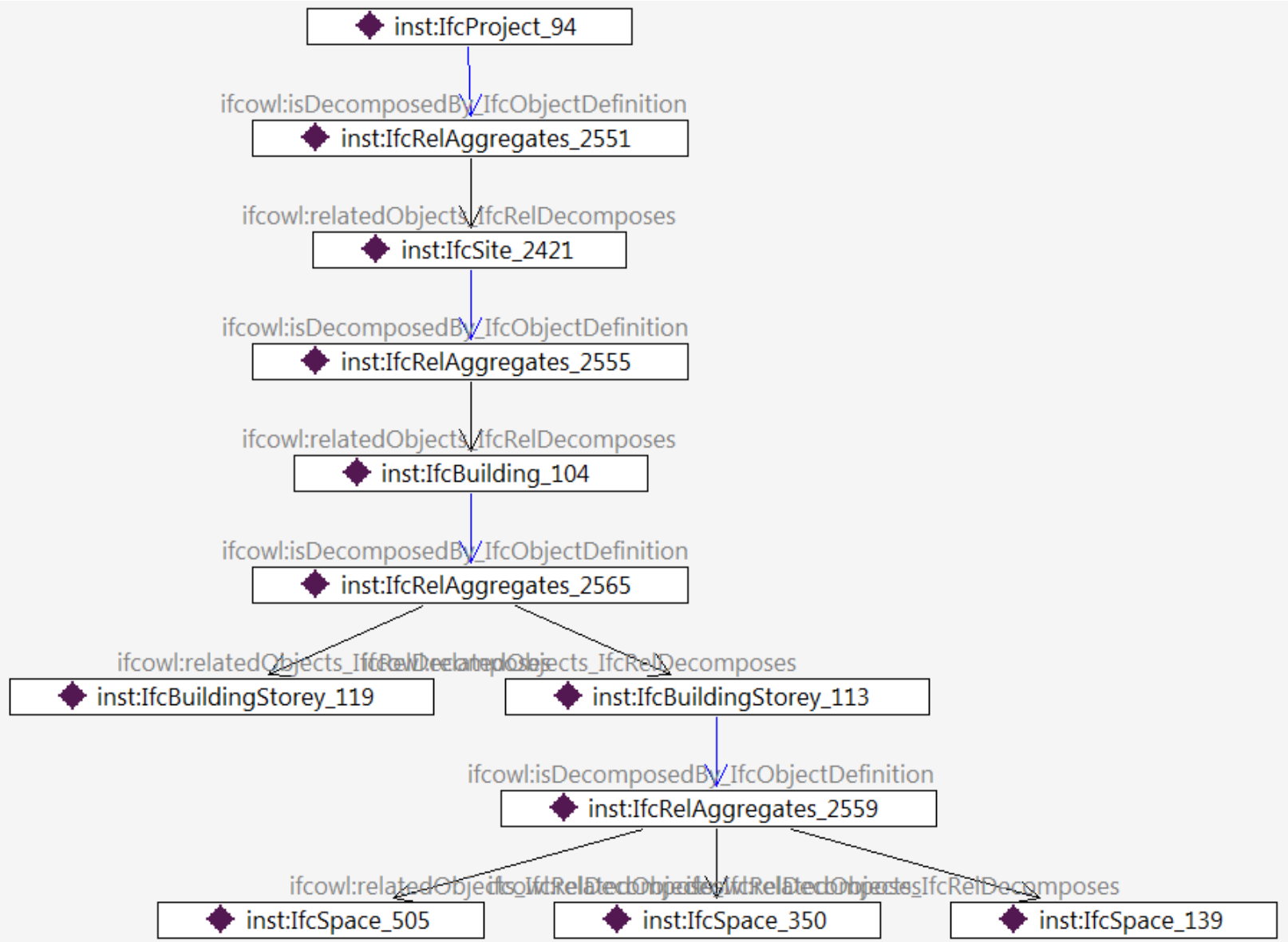
Converter?  
Rules?  
...?

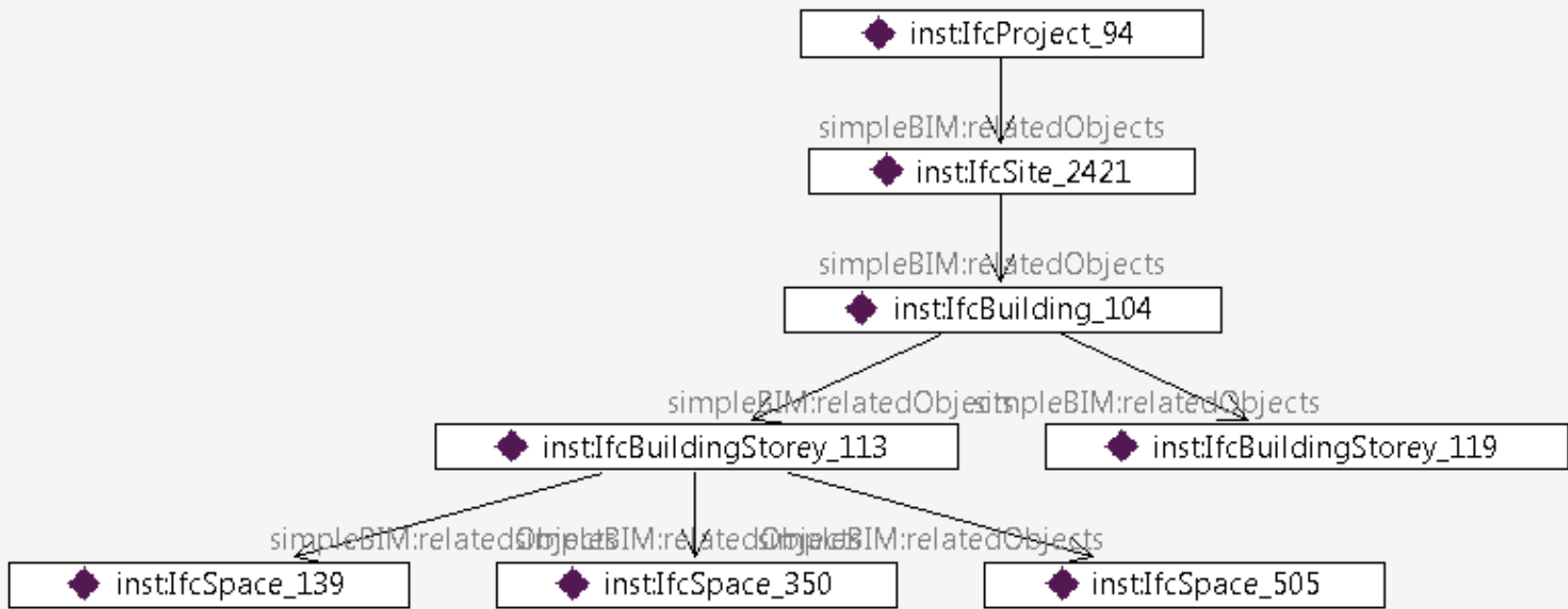


SMALL TEST







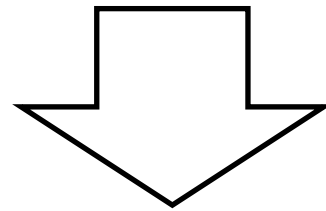


◆ inst:IfcBuilding\_104

ifcowl:globalId\_IfcRoot

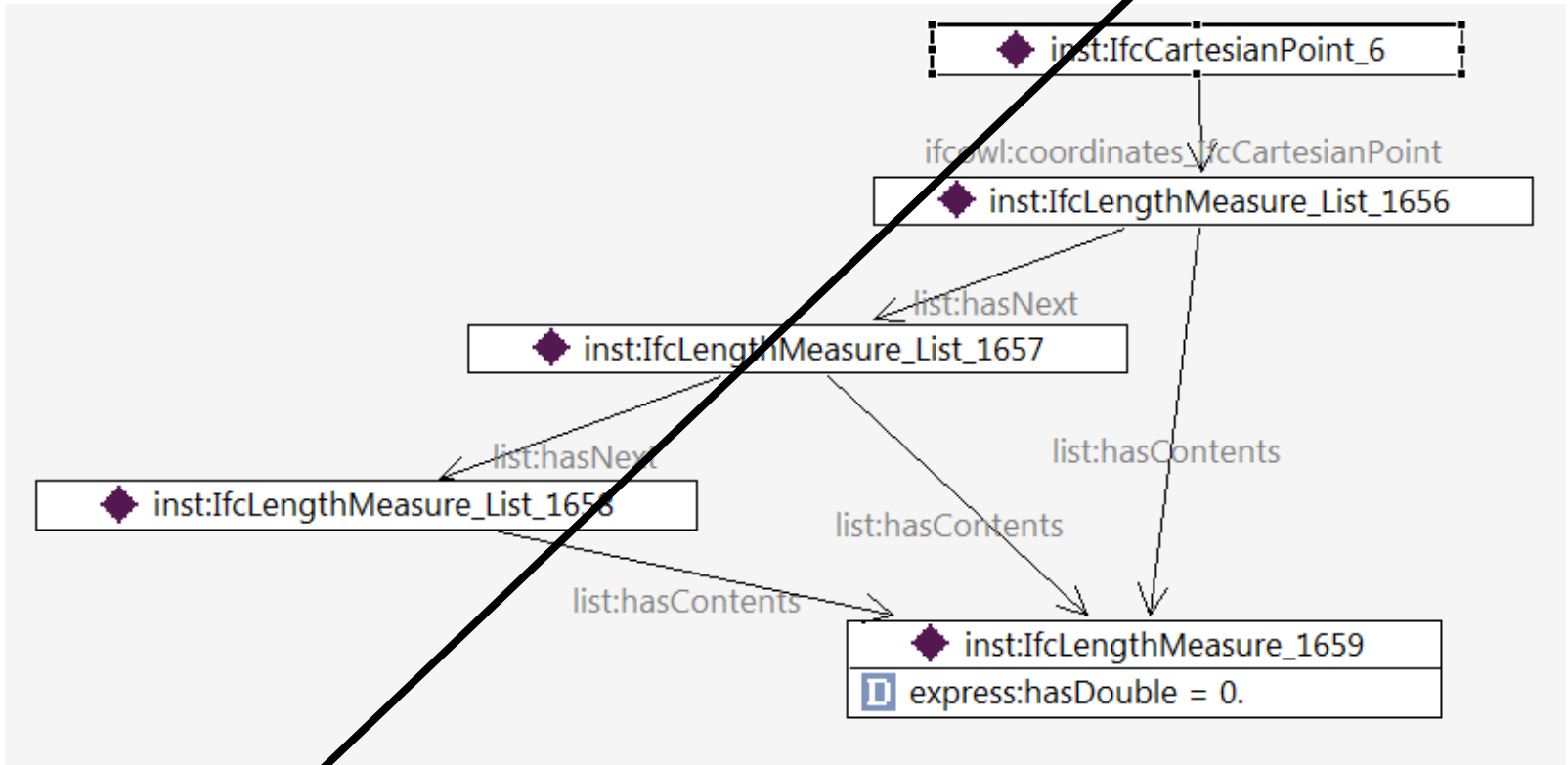
◆ inst:IfcGloballyUniqueId\_1719

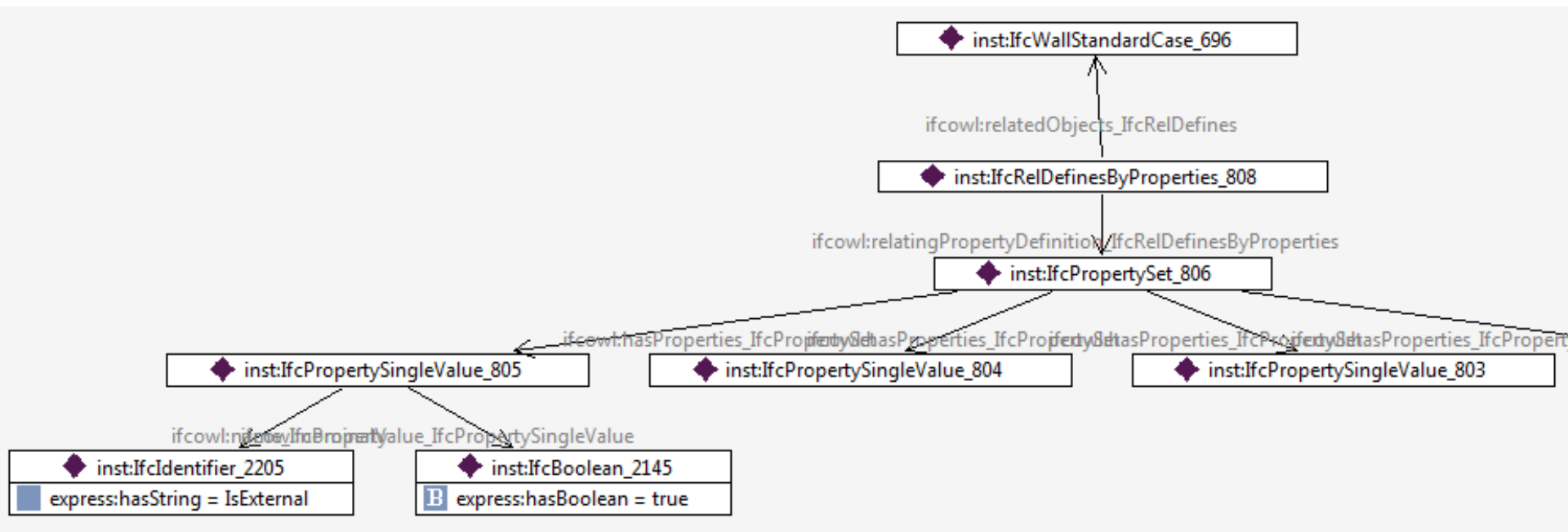
■ express:hasString = 3dW\$chZ2P2nBViVyUAoH...



◆ inst:IfcBuilding\_104

■ simpleBIM:globalId = 3dW\$chZ2P2nBViVyUAoH...



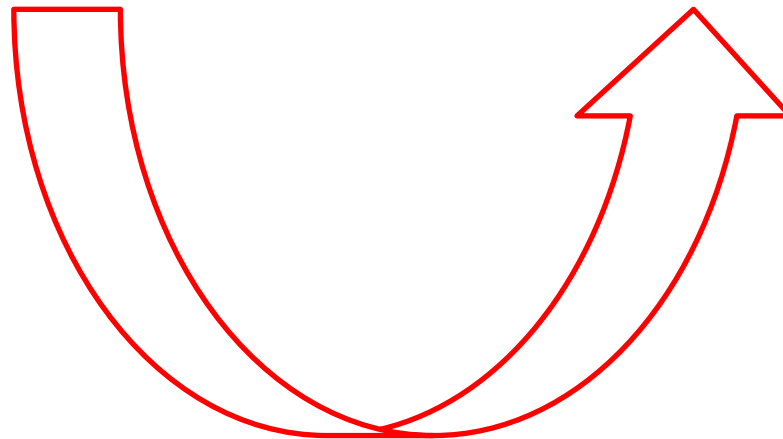


◆ inst:IfcWallStandardCase\_696

- simpleBIM:Area = 81.45110000000001
- simpleBIM:Base\_Constraint = Level: Level 1
- simpleBIM:Base\_Extension\_Distance = 0.
- simpleBIM:Base\_Offset = 0.
- simpleBIM:Base\_is\_Attached = false
- simpleBIM:Category = Walls
- simpleBIM:Enable\_Analytical\_Model = false
- simpleBIM:ExtendToStructure = false
- simpleBIM:Family = Basic Wall: Generic ...
- simpleBIM:Family\_and\_Type = Basic Wall: Generic ...
- simpleBIM:IsExternal = true
- simpleBIM:Length = 21000.
- simpleBIM:LoadBearing = false
- simpleBIM:Location\_Line = Wall Centerline
- simpleBIM:Phase\_Created = New Construction
- simpleBIM:Reference = Generic - 200mm
- simpleBIM:Related\_to\_Mass = false
- simpleBIM:Room\_Bounding = true
- simpleBIM:Structural = false
- simpleBIM:Structural\_Usage = Non-bearing



<b>Model</b>	<b>ifcOWL</b>	<b>ifcOWL</b>	<b>simpleBIM</b>	<b>simpleBIM</b>
1	767kb	10,173 triples	1,339 triples	83kb
2	16,7 MB	225,135 triples	16,836 triples	1.029kb

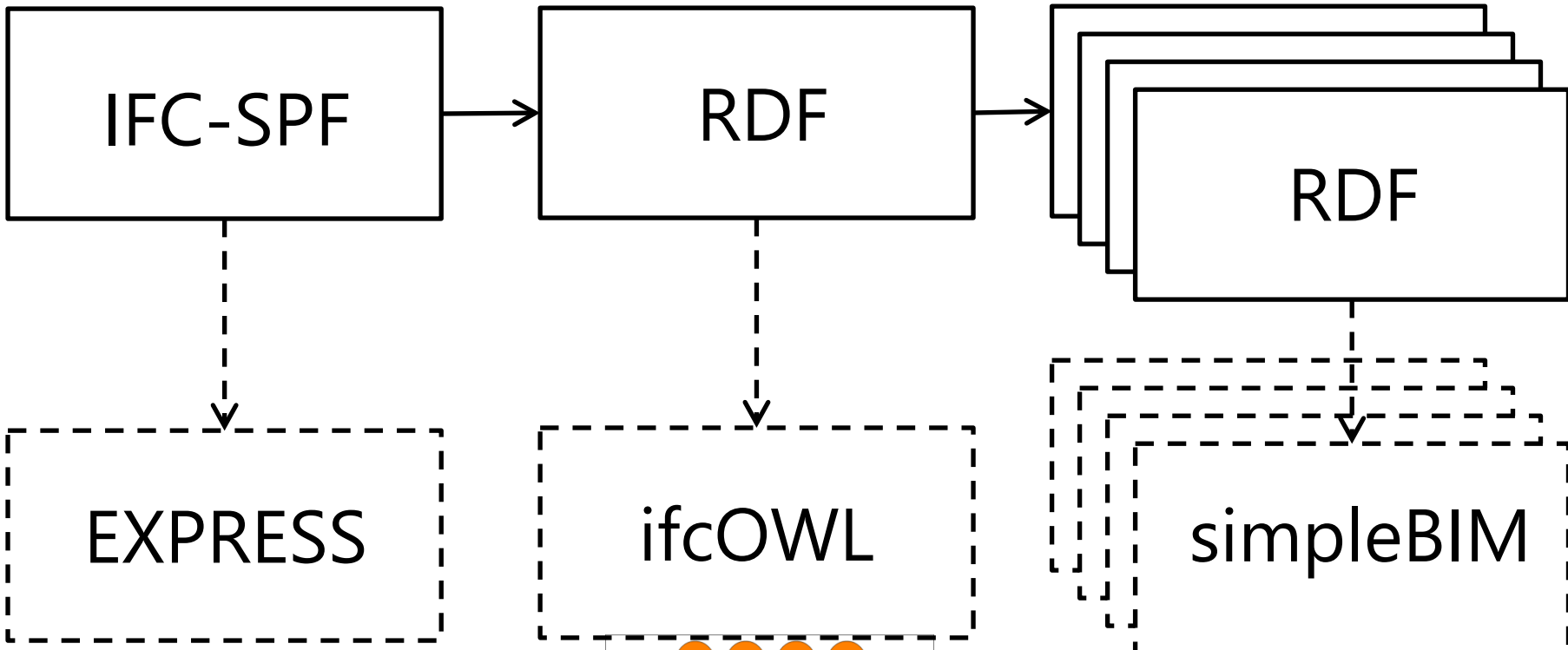


**REDUCTION TO  
8,5% file size  
10,3% triple count**

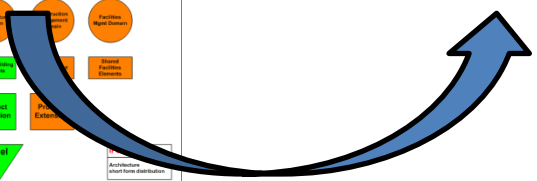
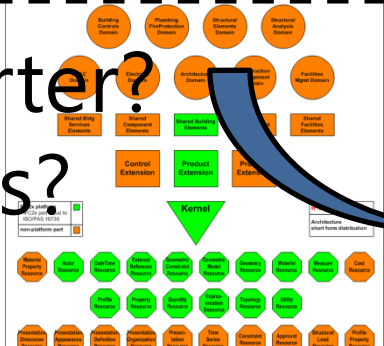


Converter?  
Rules?  
...?

ifcOWL



Converter?  
Rules?  
...?



# Thank you

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LDWG

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