

Oasys



Oasys GSA

IFC Reference

Oasys

YOUR IDEAS BROUGHT TO LIFE

13 Fitzroy Street
London
W1T 4BQ
Telephone: +44 (0) 20 7755 3302
Facsimile: +44 (0) 20 7755 3720

Central Square
Forth Street
Newcastle Upon Tyne
NE1 3PL
Telephone: +44 (0) 191 238 7559
Facsimile: +44 (0) 191 238 7555

e-mail: oasys@arup.com
Website: oasys-software.com

Oasys GSA

© Oasys 1985 – 2019

All rights reserved. No parts of this work may be reproduced in any form or by any means - graphic, electronic, or mechanical, including photocopying, recording, taping, or information storage and retrieval systems - without the written permission of the publisher.

Products that are referred to in this document may be either trademarks and/or registered trademarks of the respective owners. The publisher and the author make no claim to these trademarks.

While every precaution has been taken in the preparation of this document, the publisher and the author assume no responsibility for errors or omissions, or for damages resulting from the use of information contained in this document or from the use of programs and source code that may accompany it. In no event shall the publisher and the author be liable for any loss of profit or any other commercial damage caused or alleged to have been caused directly or indirectly by this document.

Contents

GSA to IFC	5
Nodes	5
Materials	5
Colors	5
Sections	5
Analytic layer: elements	5
Design layer: members, regions	6
Grid lines	6
Material assignments	6
IFC to GSA	6
Materials	6
Grids	6
Building elements	6
Other notes	7

GSA to IFC

Nodes

Materials

- IfcSchema::IfcMaterial, IfcSchema::IfcRelAssociatesMaterial

Colors

- IfcSchema::IfcPresentationStyleAssignment, IfcSchema::IfcStyledItem

Sections

- IfcSchema::IfcProfileDef
- IfcSchema::IfcCircleHollowProfileDef
- IfcSchema::IfcRectangleHollowProfileDef
- IfcSchema::IfcCircleProfileDef
- IfcSchema::IfcEllipseProfileDef
- IfcSchema::IfcRectangleProfileDef
- IfcSchema::IfcAsymmetricIShapeProfileDef
- IfcSchema::IfcIShapeProfileDef
- IfcSchema::IfcUShapeProfileDef
- IfcSchema::IfcTShapeProfileDef
- IfcSchema::IfcLShapeProfileDef
- IfcSchema::IfcTrapeziumProfileDef
- IfcSchema::IfcCShapeProfileDef

The above are standard sections. They can be disabled at the time of export and then arbitrary sections (by perimeter) are written:

- IfcSchema::IfcCompositeProfileDef containing instances of IfcSchema::IfcArbitraryClosedProfileDef

Analytic layer: elements

Beam types of elements are exported as

- IfcSchema::IfcProductDefinitionShape.

Tri/quad elements can be exported in three ways (option exists in export UI):

1. IfcSchema::IfcFace,
2. IfcSchema::IfcFaceBasedSurfaceModel,
3. IfcSchema::IfcExtrudedAreaSolid.

Brick element are exported as

- IfcSchema::IfcClosedShell in IfcSchema::IfcFacetedBrep.

Design layer: members, regions

Members are exported similarly to 1D elements + IfcSchema::IfcRevolvedAreaSolid is used to export arc beams.

Regions use IFC slab:

- IfcSchema::IfcSlab containing IfcSchema::IfcSlab (SweptSolid, CSG)

Grid lines

- IfcSchema::IfcGrid, IfcSchema::IfcGridAxis

Material assignments

- IfcSchema::IfcRelAssociatesMaterial

IFC to GSA

Materials

- IfcSchema::IfcRelAssociatesMaterial

Grids

- IfcSchema::IfcGrid

Building elements

Used to import beams/arcs, columns, braces into GSA as members. The following IFC elements are read

- IfcSchema::IfcBeam
- IfcSchema::IfcColumn
- IfcSchema::IfcDiscreteAccessory

- IfcSchema::IfcMember

Areas and their voids are read from these:

- IfcSchema::IfcPlate
- IfcSchema::IfcOpeningElement
- IfcSchema::IfcSlab
- IfcSchema::IfcWall
- IfcSchema::IfcWallStandardCase
- IfcSchema::IfcBuildingElementProxy

The above IFC elements contain number of encapsulated elements and combinations. Not all are supported since that would be expensive to implement. The support can be improved later. For the time being these encapsulated elements are recognized and supported to some degree:

- IfcSchema::IfcSweptAreaSolid
- IfcSchema::IfcRevolvedAreaSolid
- IfcSchema::IfcShellBasedSurfaceModel
- IfcSchema::IfcMappedItem
- IfcSchema::IfcPolyline
- IfcSchema::IfcBooleanResult
- IfcSchema::IfcBooleanClippingResult
- IfcSchema::IfcLShapeProfileDef, IfcSchema::IfcAsymmetricIShapeProfileDef, IfcSchema::IfcUShapeProfileDef, IfcSchema::IfcTShapeProfileDef, IfcSchema::IfcCShapeProfileDef, IfcSchema::IfcTrapeziumProfileDef

Other notes

The implementation is focused on Tekla. It might be useful for Revit as well, but it is primarily Revit plugin what is supposed to be used between Revit and GSA. Known issue is reference point for beams and slabs. The reference point might not appear as expected since it was not known how Tekla deals with the reference point. This issue should be fixed in GSA. Also section conversion table between Tekla and GSA should be implemented.