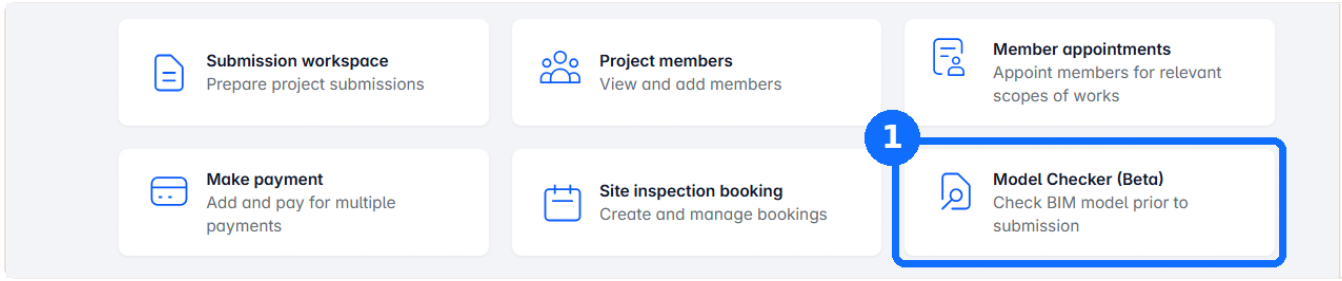
The enhanced IFC Schema check in the Submission Portal

How to read and fix Model Checker error codes

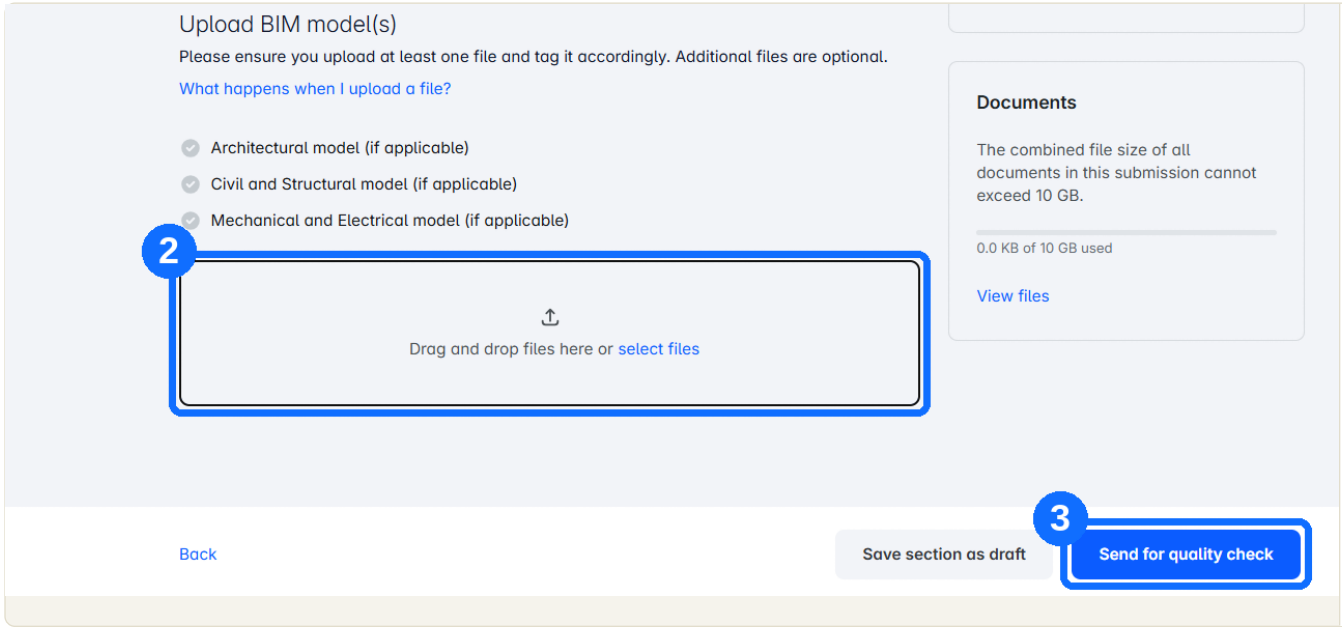
Industry CoP Oct 2026

01 | Run the check and read an error

From project home to a schema result



1 **Open the Model Checker (Beta) tile on the project home**

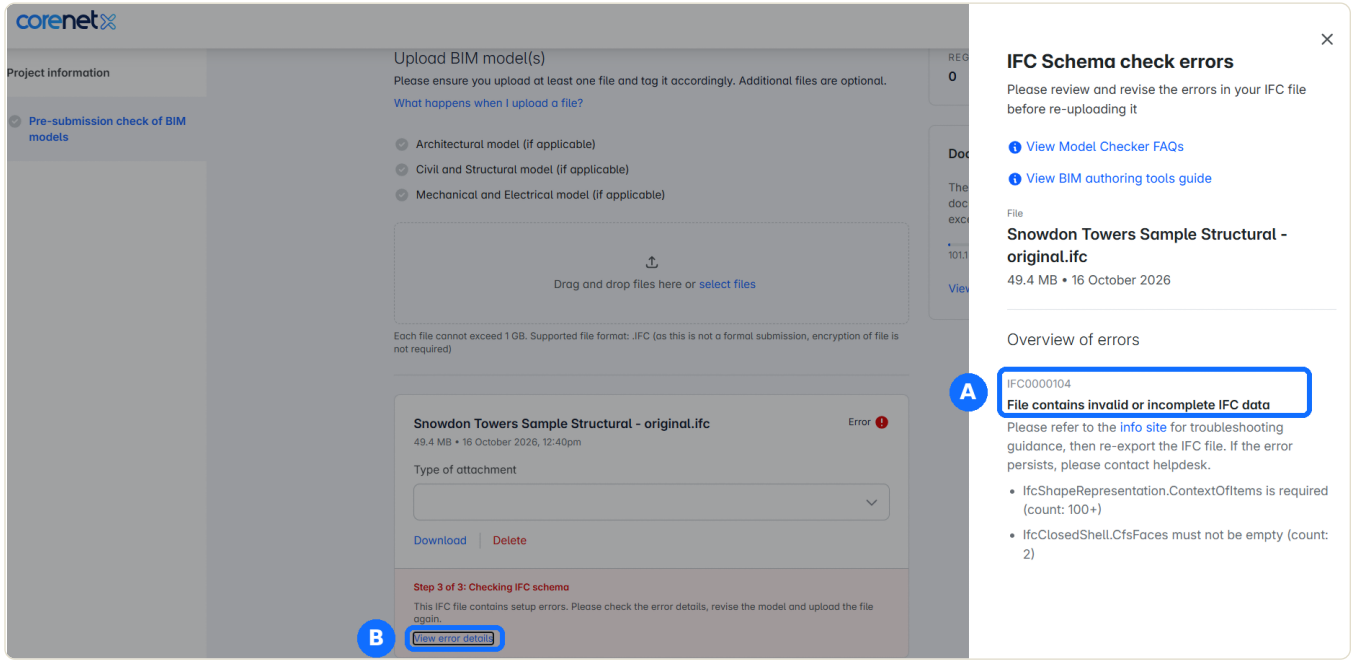


2 **Upload the .IFC file and tag its type**

Up to 800 MB per file, 10 GB per submission.

3 **Click Send for quality check**

Find the error code, then pick a path



B The card turns red at **Step 3 of 3: Checking IFC schema**. Click **View error details**.

A Read the **error code** and title, e.g. IFC0000104. The lines below name the entity and count.

PATH 1 · SELF-TROUBLESHOOT

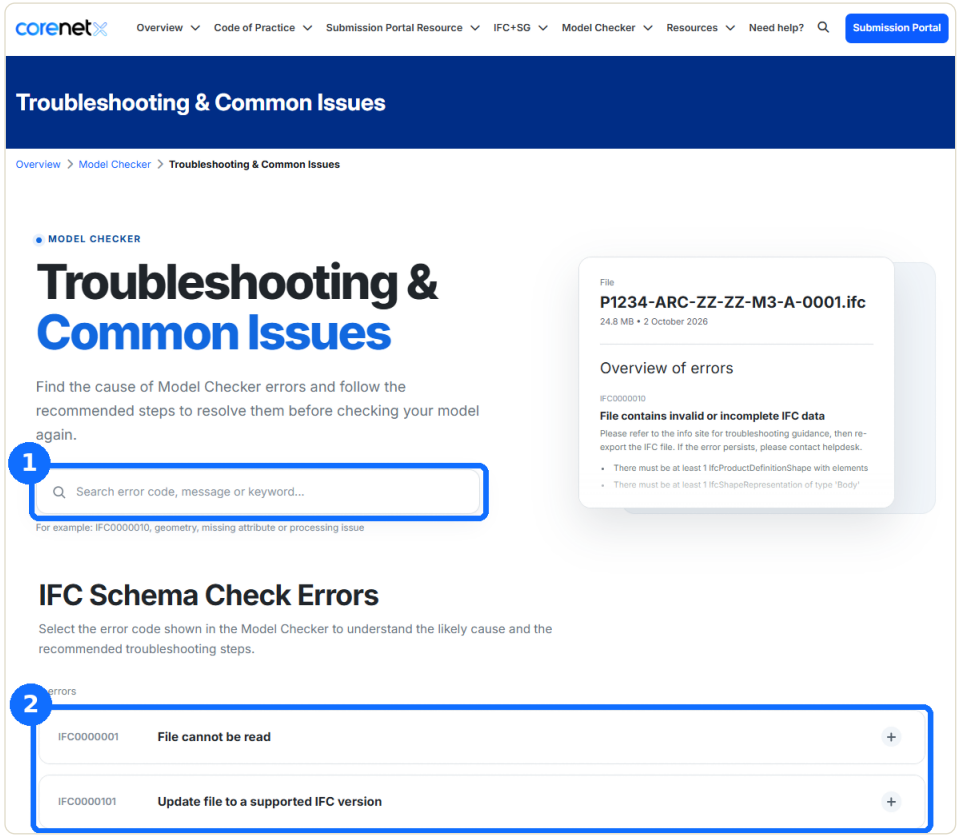
Look up the code on the info site

PATH 2 · GET HELP

Contact the helpdesk (last slide)

02 | Look up each error code and fix it

The info site explains every error code



1 **Search the code**

Type the code, message or a keyword, e.g. IFC0000104.

2 **Open the error card**

Each card gives the likely cause and the fix steps.

3 **Fix, re-export, check again**

Fix in the source model, re-export the IFC, and upload it to the Model Checker again.

What each IFC error means

IFC0000001

File cannot be read

The file is incomplete or corrupted, so the system cannot open and read it.

IFC0000101

Unsupported IFC version

The file was not exported as **IFC4 Reference View**, the only version the check accepts.

IFC0000103

Unknown or abstract entity

The file uses an entity that is not in IFC4 Reference View, e.g. one from IFC2x3, or an abstract entity.

IFC0000106

No valid IfcProject

The file has no **IfcProject**, which must sit at the top of the hierarchy. A rare case.

IFC0000102

No IfcSite

The file has no **IfcSite**. At least one is required; one per IFC file is recommended.

IFC0000104

Invalid or incomplete data

The data breaks IFC schema rules, e.g. a missing ContextOfItems. Often comes from the exporter.

IFC0000101: Update file to a supported IFC version

IFC0000001	IFC0000101	IFC0000103	IFC0000106	IFC0000102	IFC0000104
Cannot be read	Wrong IFC version	Unknown entity	No IfcProject	No IfcSite	Invalid data

WHAT IT MEANS

The file is not IFC4 Reference View, e.g. it is IFC2X3.

ROOT CAUSE

The **export settings** were not set to IFC4 Reference View, or used an unsupported MVD.

HOW TO FIX

01 Check the IFC export settings in your authoring tool.

02 Apply the recommended IFC+SG settings for that tool.

03 Export as IFC4 Reference View and check again. The Repair Tool cannot fix this one.

IFC0000103: Unknown or abstract entity type

IFC0000001
Cannot be read

IFC0000101
Wrong IFC version

IFC0000103
Unknown entity

IFC0000106
No IfcProject

IFC0000102
No IfcSite

IFC0000104
Invalid data

WHAT IT MEANS

An entity is not an official IFC classification.

ROOT CAUSE

When assigning the IFC entity, the **wrong IFC schema** was selected (IFC2X3). Some entities are not in **IFC4 Reference View**.

HOW TO FIX

01 Check the entity type named in the error.

02 Re-export with IFC+SG settings. **Do not** rename entities or change types by hand.

03 Still failing? Send the file, code and entity to the helpdesk.

How an unknown entity gets into the file

WHAT THE CHECK FLAGS

#502=IFCFLOWSEGMENT(…);

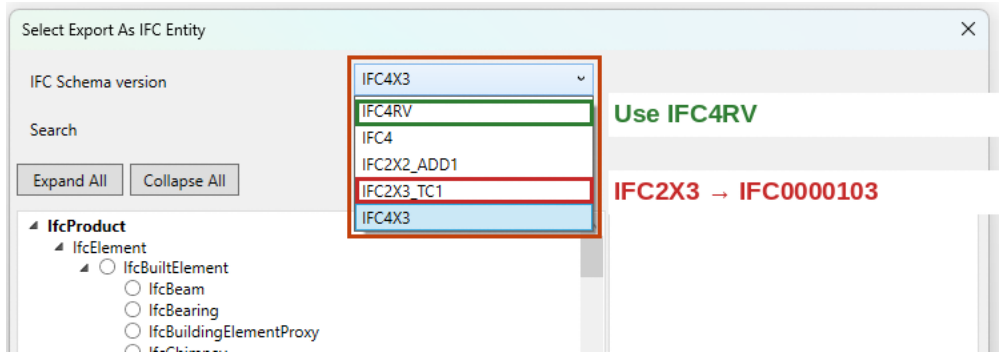
Not in IFC4 RV IFC2x3 entity. Not in IFC4 RV.

#601=IFCBEEM(…);

Unknown Typo of IFCBEAM. Not an IFC entity.

01 Wrong IFC schema chosen

IFC2X3 was picked instead of **IFC4RV**.



02 IFC file edited by hand

Entity names were changed after export, e.g. a typo like **#601**.

VALID ENTITIES · IFC4 RV (EXTRACT)

Architectural model elements

shell and core	finishing	furnishing
IfcBeam	IfcCovering	IfcFurniture
IfcColumn	IfcRailing	IfcSystemFurnitureElement
IfcChimney*	IfcShadingDevice	-
IfcRamp+	IfcCurtainWall	-
IfcStair++	IfcDoor	-
IfcRoof	IfcWindow	-
IfcSlab	-	-
IfcWall	-	-

LEGEND * new in IFC4, + includes IfcRampFlight, ++ includes IfcStairFlight

Always follow the IFC+SG mapping file

IFC+SG MAPPING SHEET (EXTRACT)

Identified Component	Identified parameters	Suggested Discipline	IFC4 Entities
Accessible Route	Amendment Status	ARC	IfcSpace
Accessible Route	Barrier Free Accessibility	ARC	IfcSpace
Accessible Route	Barrier Free Accessibility	ARC	IfcSpace
Accessible Route	Status	ARC	IfcSpace
Beam	Amendment Status	STR	IfcBeam
Beam	Beam Span Type	STR	IfcBeam
Beam	Bottom Left	STR	IfcBeam
Beam	Bottom Middle	STR	IfcBeam
Beam	Bottom Right	STR	IfcBeam
Beam	Construction Method	STR	IfcBeam
Beam	Depth	STR	IfcBeam
Beam	Left Connection Detail	STR	IfcBeam
Beam	Left Connection Type	STR	IfcBeam
Beam	Mark	STR	IfcBeam
Beam	Material Grade	STR	IfcBeam
Beam	Mechanical Connection Type	STR	IfcBeam
Beam	Member Section	STR	IfcBeam
Beam	Prefabricated Reinforcement Cage	STR	IfcBeam
Beam	ReferTo2DDetail	STR	IfcBeam
Beam	Reinforcement Steel Grade	STR	IfcBeam
Beam	Right Connection Detail	STR	IfcBeam
Beam	Right Connection Type	STR	IfcBeam
Beam	Section Fabrication Method	STR	IfcBeam

HOW TO USE IT

01 Find your component, e.g. **Beam**.

02 Export it as the entity in the **IFC4 Entities** column: **IfcBeam**.

NOT IN THE COP?

If an officer or agency asks for information not covered in the COP, use the relevant entity from **IFC4**, not IFC2x3.

Do not use IfcSite as a catch-all entity

01 · WHY IT IS NOT RECOMMENDED

01 IfcSite is part of the **spatial structure**. It stands for the site or block.

02 Agencies sometimes ask for objects the COP does not cover. Unsure of the entity, some users export them as IfcSite.

03 The object loses its real type, and each extra IfcSite looks like another site.

Correct

IfcProject
└ IfcSite
└ IfcBuilding
└ IfcBuildingStorey
└ IfcWall

IfcSite contains elements. They keep their own entity.

Not recommended

Actual object

External structure

⬇

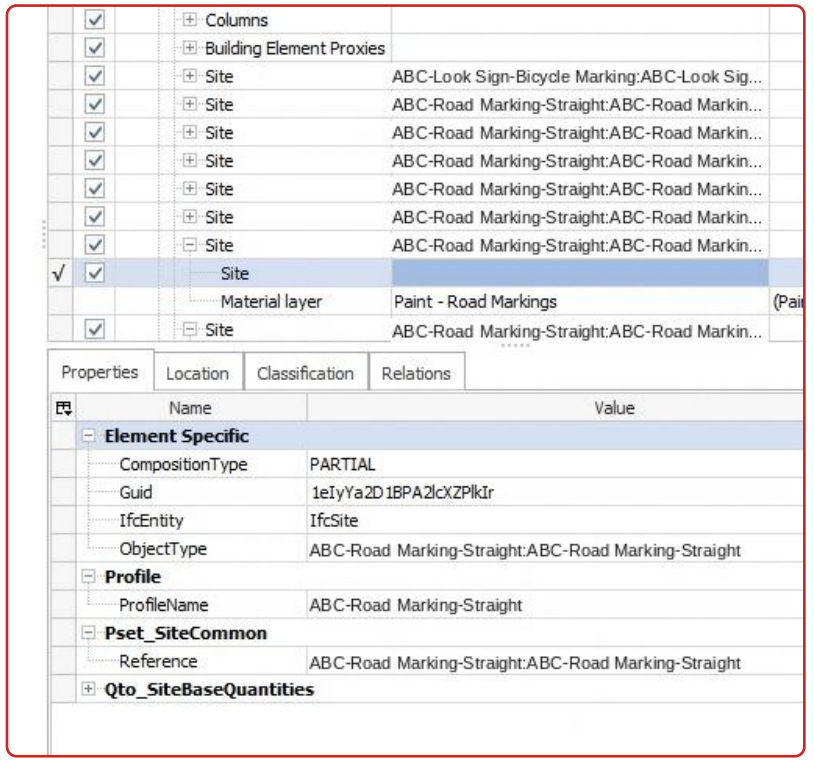
Exported as

IfcSite

WHAT TO USE INSTEAD

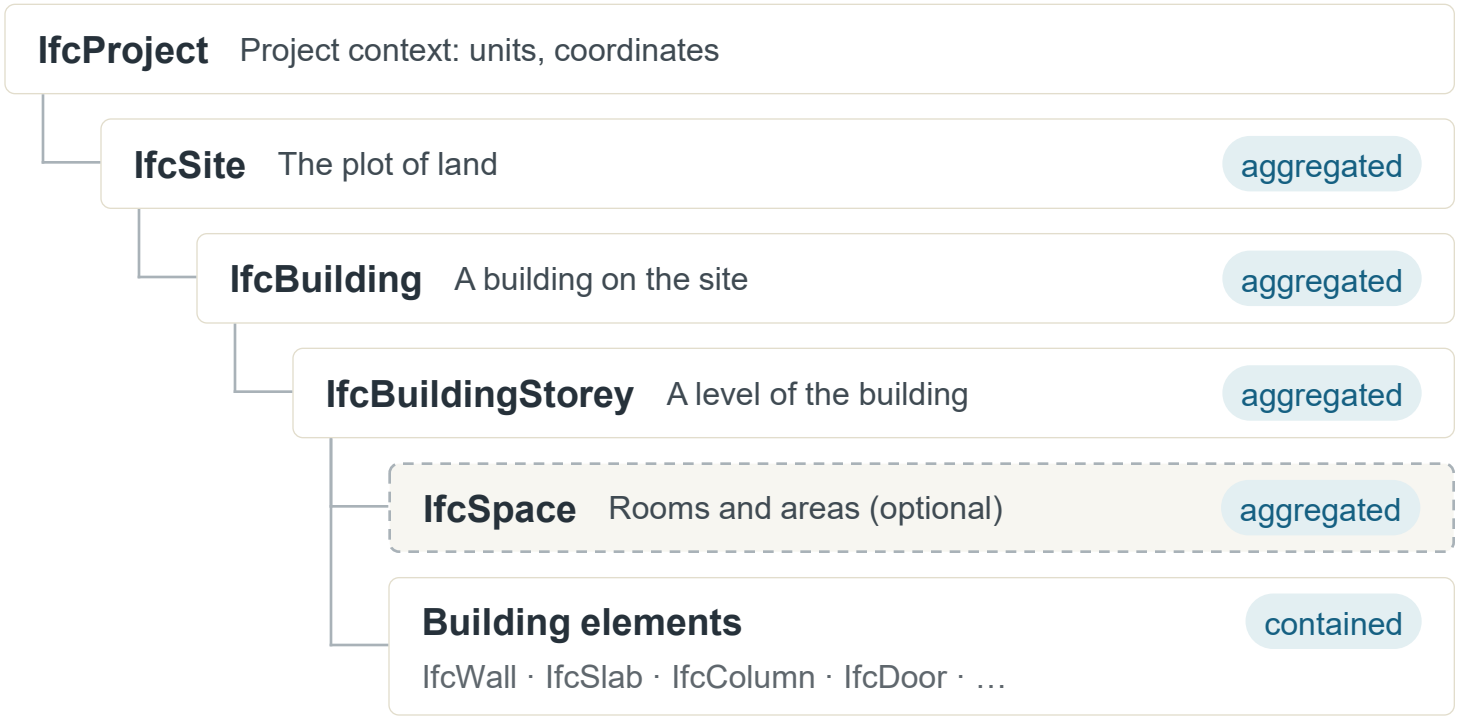
You must use IFC entities from **IFC4 only**, to avoid error **IFC0000103**. We recommend **IfcBuildingElementProxy**, or a more relevant IFC4 entity.

INDUSTRY EXAMPLE · NOT RECOMMENDED



Road markings exported as IfcSite.

The IFC spatial structure



HOW TO READ IT

Aggregated: each level is made up of the levels below it.

IfcRelAggregates

Contained: each element sits in exactly one level, usually a storey.

IfcRelContainedInSpatialStructure

FOR IFC+SG

Every file needs an **IfcProject** and at least one **IfcSite**. One IfcSite is recommended.

IFC0000106: No IfcProject in the file

IFC0000001
Cannot be read

IFC0000101
Wrong IFC version

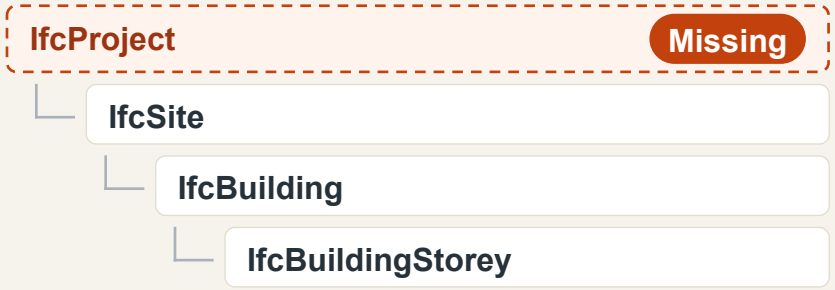
IFC0000103
Unknown entity

IFC0000106
No IfcProject

IFC0000102
No IfcSite

IFC0000104
Invalid data

WHAT IT MEANS



ROOT CAUSE

Potentially caused by the **IFC export settings**.

No cases yet. Not ruled out for **new software** or **non-BIM tools** exporting to IFC+SG.

HOW TO FIX

01 Open the file in an IFC viewer and review the hierarchy.

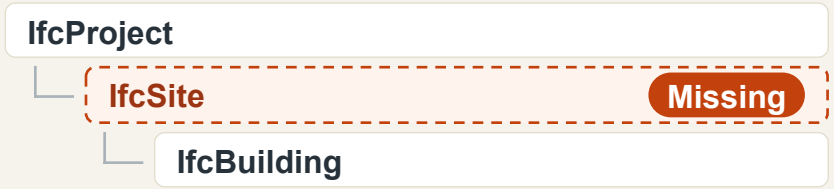
02 It must start with IfcProject › IfcSite › IfcBuilding › IfcBuildingStorey › elements.

03 Review the export settings, re-export, and check again.

IFC0000102: No IfcSite in the file

IFC0000001	IFC0000101	IFC0000103	IFC0000106	IFC0000102	IFC0000104
Cannot be read	Wrong IFC version	Unknown entity	No IfcProject	**No IfcSite**	Invalid data

WHAT IT MEANS



ROOT CAUSE

Potentially caused by the **IFC export settings**.

To date, a **very rare** case. Not common.

HOW TO FIX

01 Open the file in an IFC viewer and review the hierarchy.

02 Check for IfcProject › IfcSite › IfcBuilding › IfcBuildingStorey › elements.

03 Fix the export settings, re-export, and check again.

REMARK The system **never blocks** a file with more than one IfcSite, but we **recommend only one IfcSite**.

Why we recommend one IfcSite per IFC file

02 · WHAT IT IS

In IFC+SG, a **block** is represented by **IfcSite**. It carries the block information, such as CXBlockID and BuildabilityBlock.

Block A IFC file

IfcSite · Block A

Block B IFC file

IfcSite · Block B

For several buildings or blocks, the COP 4th Edition says: export **each block as one IfcSite, in its own IFC file**.

VOLUNTARY FOR NOW

Block by IFC representation is voluntary at this stage.

COP · BLOCK BY IFC REPRESENTATION

Block

▶ **By IFC Representation** (voluntary)

IFC Entity: IfcSite					
IFC SubType: N.A.					
S/N	**IFC+SG Property**	**Property Type**	**Unit**	**Input Limitation**	**Examples**
1	CXBlockID	Integer	-	No	1, 2, 3
2	BuildabilityBlock^	Text	-	No	**SUPERSTRUCTURE**-2-**RNL**, **BASEMENT**-1-**OTHERS**
3	PurposeGroup	Integer	-	Yes	1, 2, 3, 4, 5, 6, 7, 8
4	BuildingType	Text	-	Yes	Refer to Table

Note^: shall follow the following format: <Structure Type>-<Block no.>-<Development Categories>

The IFC entity for a block is **IfcSite**. Its properties identify the block.

IFC0000104: Invalid or incomplete IFC data

IFC0000001
Cannot be read

IFC0000101
Wrong IFC version

IFC0000103
Unknown entity

IFC0000106
No IfcProject

IFC0000102
No IfcSite

IFC0000104
Invalid data

WHAT IT MEANS

The file has one or more of these issues:

- **IfcShapeRepresentation.ContextOfItems**: the required representation context is missing.
- **IfcShapeRepresentation.RepresentationType**: the representation type is missing or incomplete.

ROOT CAUSE

The **BIM authoring software**, the **IFC exporter**, or changes made to the IFC file after export.

HOW TO FIX

01 Note the code and copy the full error message.

02 Contact the helpdesk with the IFC file, code and message.

03 Get the **IFC+SG Repair Tool**. Worked example next.

What causes IFC0000104

WHAT WE KNOW SO FAR

The issue comes from the **IFC export**. We have seen it with **Autodesk Revit**, particularly versions **2025 and 2026**.

CONDITIONS SEEN

01

Revit 2025 & Revit 2026

+

02

Export to IFC together with the linked files

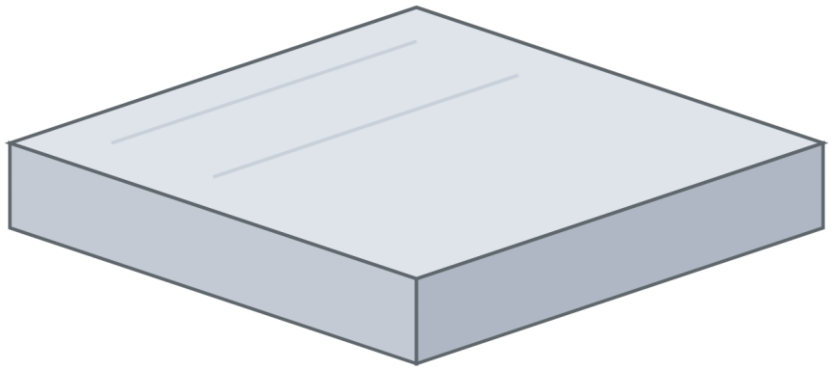
→

RESULT

IFC0000104

Invalid or incomplete IFC data

Every element has geometry, placement and a geometric context



Geometry

What it looks like

Placement

Where it is located

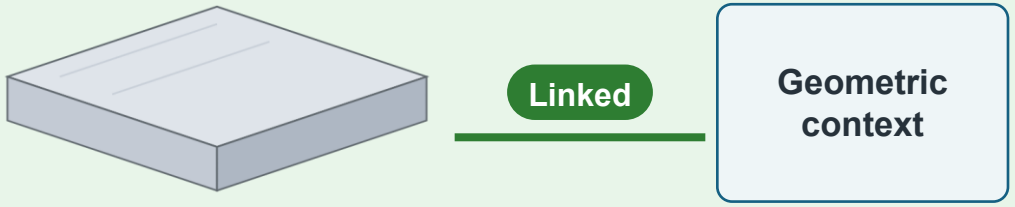
Geometric context

The shared drawing setup used to read its shape

- X, Y, Z axes
- 2D or 3D
- Precision
- Shared by many elements

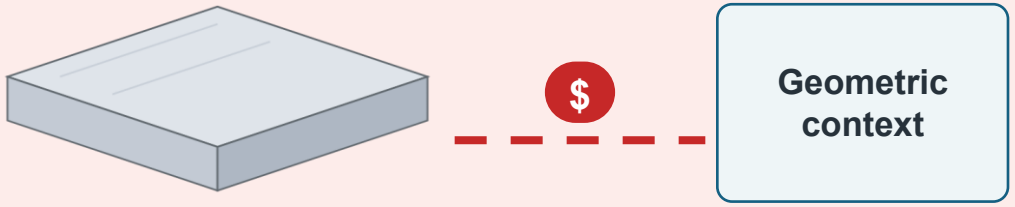
What happens when the link is missing?

VALID LINK



3D viewer (e.g. BIMcollab, BIMvision) shows the slab.
IFC information is **complete**.

BROKEN LINK



3D viewer (e.g. BIMcollab, BIMvision) may still show the slab.
IFC information is **incomplete**.

A model can look correct and still have incomplete IFC information.

Why a 3D viewer still shows it, and CORENET X does not

GENERAL 3D VIEWERS

e.g. BIMcollab, BIMvision

01 Build the 3D shape from the geometry and ignore the missing context.

02 Borrow another suitable context found in the file.

Either way, the viewer guesses.

CORENET X

IFC for regulatory submission

The model is a **regulatory submission**, not just a 3D view.

We do not guess or assume.

The information must come from the QP.

Example: where is the door?

DOOR IN THE BUILDING		BUILDING IN SINGAPORE		DOOR IN SINGAPORE
X 10 m **Y 5 m · Z 3 m**	+	**E 30,000 m** **N 40,000 m**	=	**E 30,010 m** **N 40,005 m**

SCENARIO A · SIMPLE MODEL

The file has only **one setup**. The viewer uses it for the door.

Result: the door shows in the right place.

SCENARIO B · MORE THAN ONE SETUP

The file has **one setup for 3D views** and **another for 2D plans**. The door's link is missing, so the viewer must pick one.

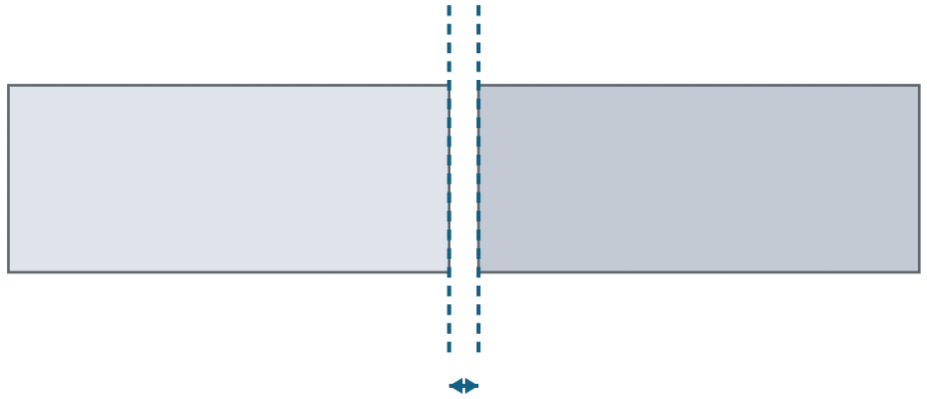
Result: it may pick the wrong one, skip the door, or show it wrongly.

The door may still land in the right place, but only by chance. **CORENET X does not rely on chance.**

Example: are these two corners touching?

Slab 1 ends at 5.000000 m

Slab 2 starts at 5.000004 m



Gap: 0.004 mm

IT DEPENDS ON HOW STRICT THE SOFTWARE IS

Less strict (0.01 mm)

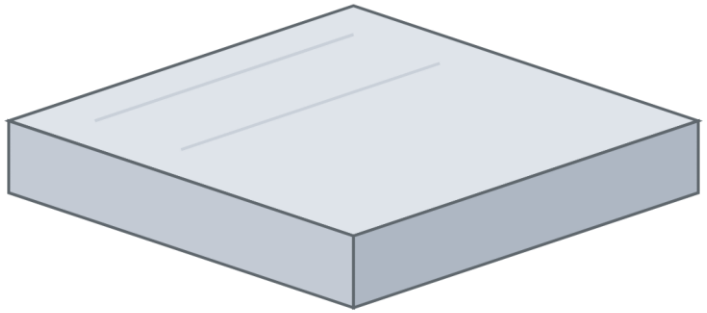
Treated as **touching**: one joined corner.

Very strict (0.001 mm)

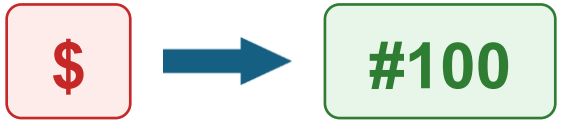
Treated as **a gap**: two separate corners.

The **geometric context** tells software how strict to be. Without it, each viewer decides for itself.

Fix the missing link, not the geometry



Dimensions, geometry, position and properties **stay unchanged**.



IFC Repair Studio finds a suitable existing context and reconnects it.

No clear match? It flags the issue for review instead of guessing.

A visible 3D model is not always a valid IFC file. Sometimes the problem is just a missing reference.

Two ways to check for IFC0000104

OPTION 1

Pre-check it yourself in a text editor

Open the IFC file in Notepad. **Notepad++** is preferred.

Search the text for a missing ContextOfItems. The next two slides show how.

OPTION 2

Ask the helpdesk for the IFC+SG Repair Tool

The Repair Tool is available on a **project basis only**.

Contact the helpdesk at **go.gov.sg/cxhelpdesk**.

Option 1: spot a missing ContextOfItems yourself

THE FOUR VALUES, IN ORDER

IFCSHAPEREPRESENTATION(ContextOfItems, RepresentationIdentifier, RepresentationType, Items)

Incorrect

#1234=IFCSHAPEREPRESENTATION($,'Body','SweptSolid',(#5678));

The first value is **$**, which means ContextOfItems is **missing**.

Correct

#1234=IFCSHAPEREPRESENTATION(#100,'Body','SweptSolid',(#5678));

#100 must point to an IfcGeometricRepresentationContext or IfcGeometricRepresentationSubContext.

Option 1: what to search for

NOTEPAD++ · FIND ALL RESULTS

One search lists **every line** with a missing ContextOfItems. Here: **367 hits** in one file.

```
Search results - (367 hits)
Search "IFCSHAPEREPRESENTATION\s*\(\s*\$" (367 hits in 1 file of 1 searched) [RegEx]
  C:\Users\ISS\Downloads\Snowdon Towers Sample Structural -plugin 1.ifc (367 hits)
    Line  49735: #50119=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#50114,#50116,#50118));
    Line  50406: #50790=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#50789));
    Line  52060: #52444=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#52439,#52441,#52443));
    Line  52584: #52968=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#52967));
    Line  53341: #53725=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#53724));
    Line  53624: #54008=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#54005,#54007));
    Line  55170: #55554=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#55553));
    Line  55876: #56260=IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D',(#56259));
```

OR SEARCH FOR, IN NOTEPAD OR NOTEPAD++

Search text	What it finds
IFCSHAPEREPRESENTATION($,	Any missing ContextOfItems
IFCSHAPEREPRESENTATION($,'Body','SweptSolid'	Missing context in SweptSolid
IFCSHAPEREPRESENTATION($,'Body','Tessellation'	Missing context in Tessellation
IFCSHAPEREPRESENTATION($,'FootPrint','Curve2D'	Missing context in FootPrint

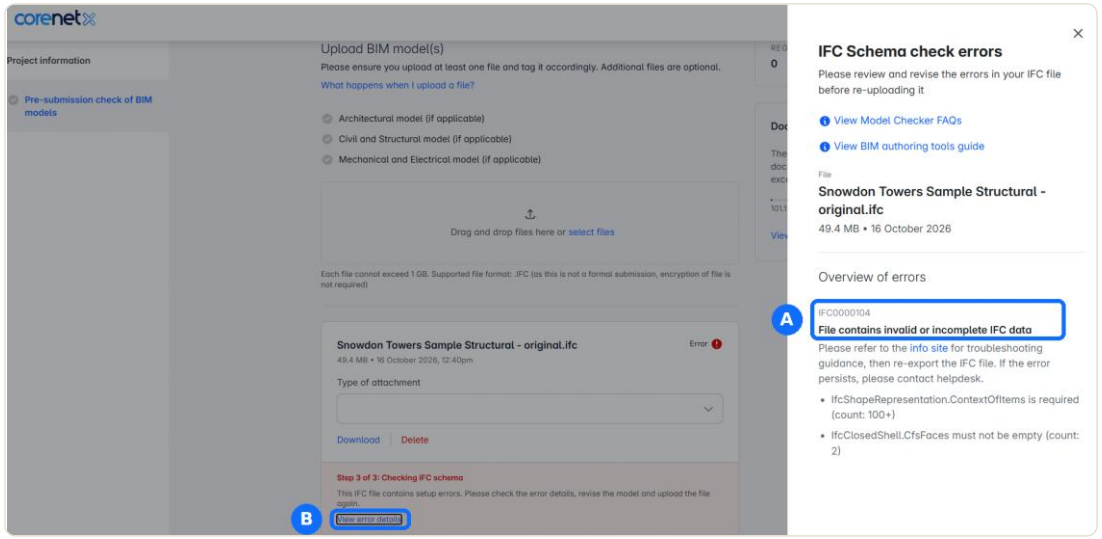
FIND ALL VARIATIONS IN NOTEPAD++

Search with this regular expression, then click **Find All in Current Document**.

```
IFCSHAPEREPRESENTATION\s*\(\s*\$
```

Option 2: get the IFC+SG Repair Tool from the helpdesk

IN THE MODEL CHECKER



ON THE INFO SITE

IFC0000104

File contains invalid or incomplete IFC data

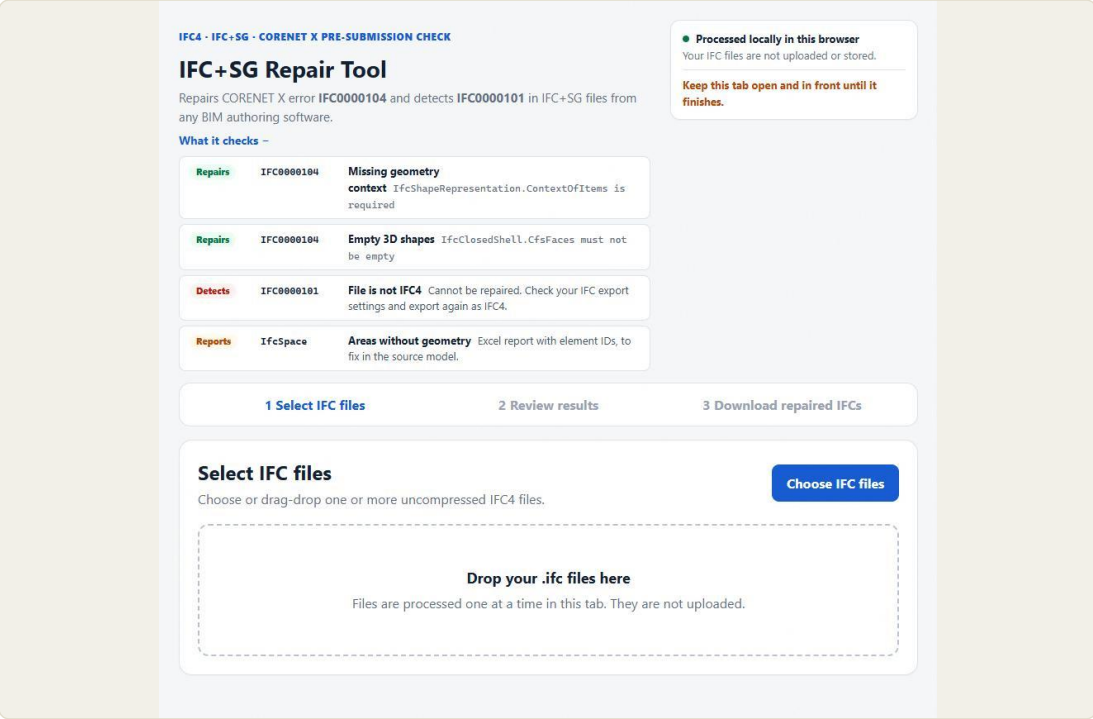
Cause: data from the authoring tool or exporter, or edits after export.

Fix: contact the helpdesk with the IFC file, the code and the full message.

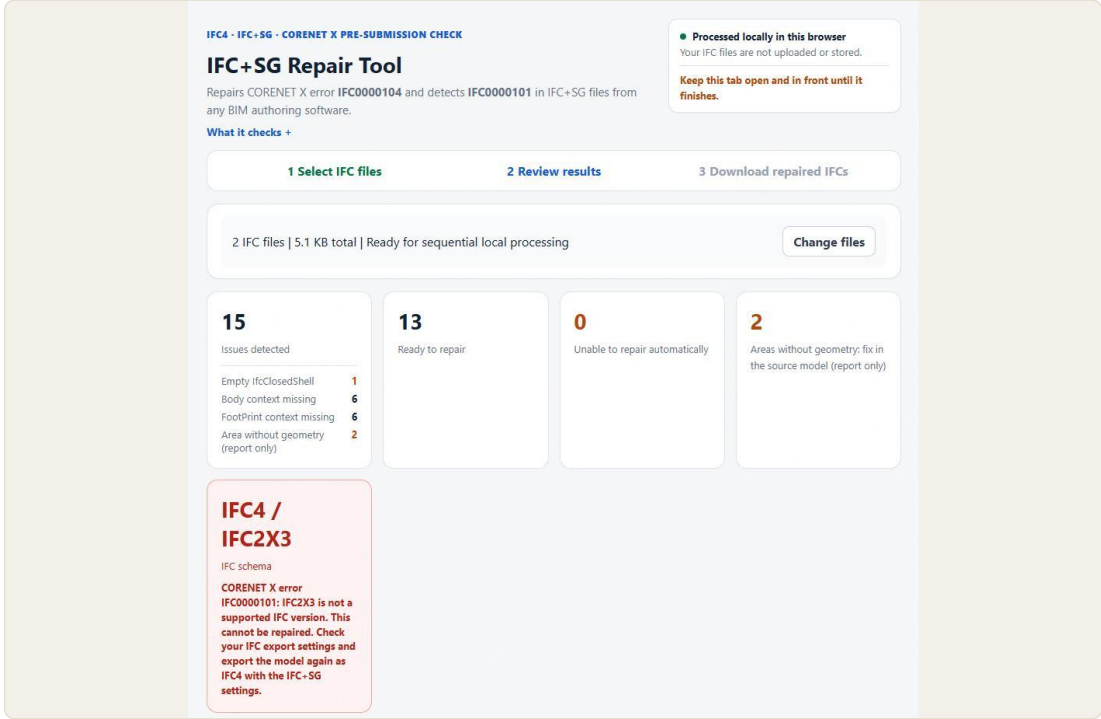
NEXT STEP

Contact the helpdesk to get the **IFC+SG Repair Tool**.

Select the files, then review what it will repair



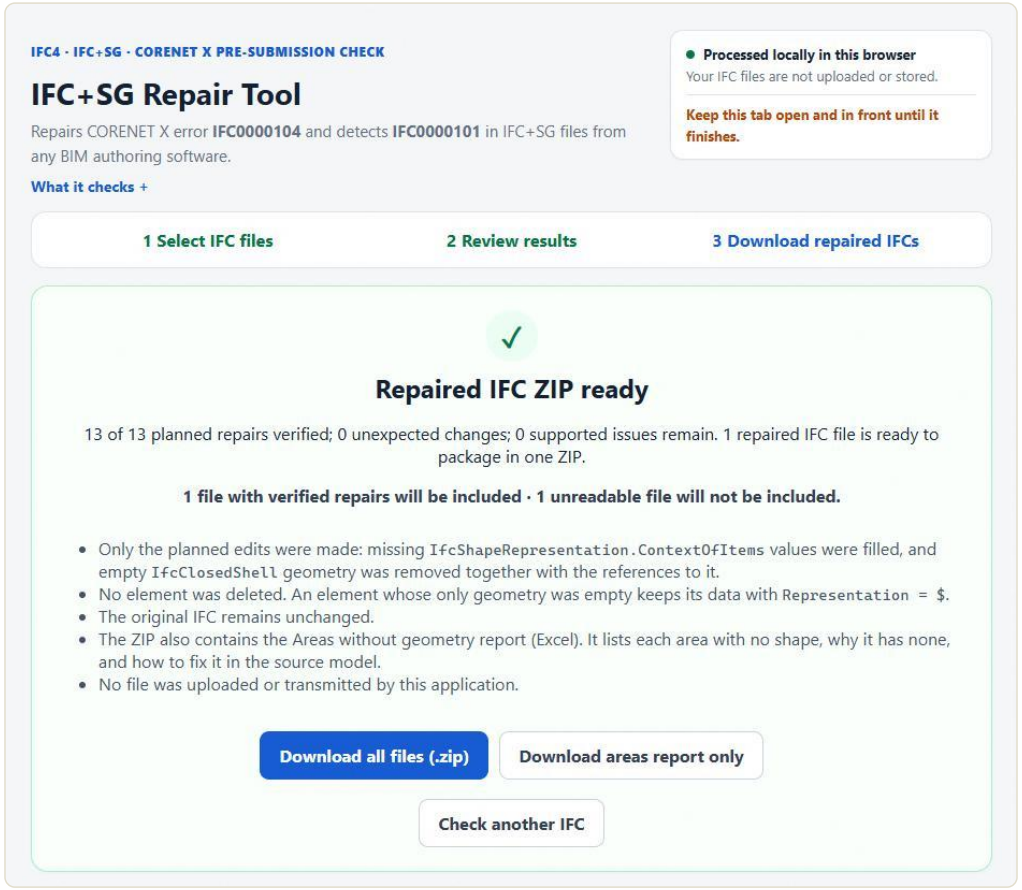
1 **Select IFC files.** Runs in your browser; files are not uploaded.



2 **Review results.** Repairs missing context and empty shells. Flags IFC2X3 (101).

Get the IFC+SG Repair Tool from the helpdesk.

Download the repaired IFC, then check it again



3 Download repaired IFC

One ZIP with the repaired IFC and the areas report.

Your original IFC stays unchanged. Fix areas with no shape in the source model.

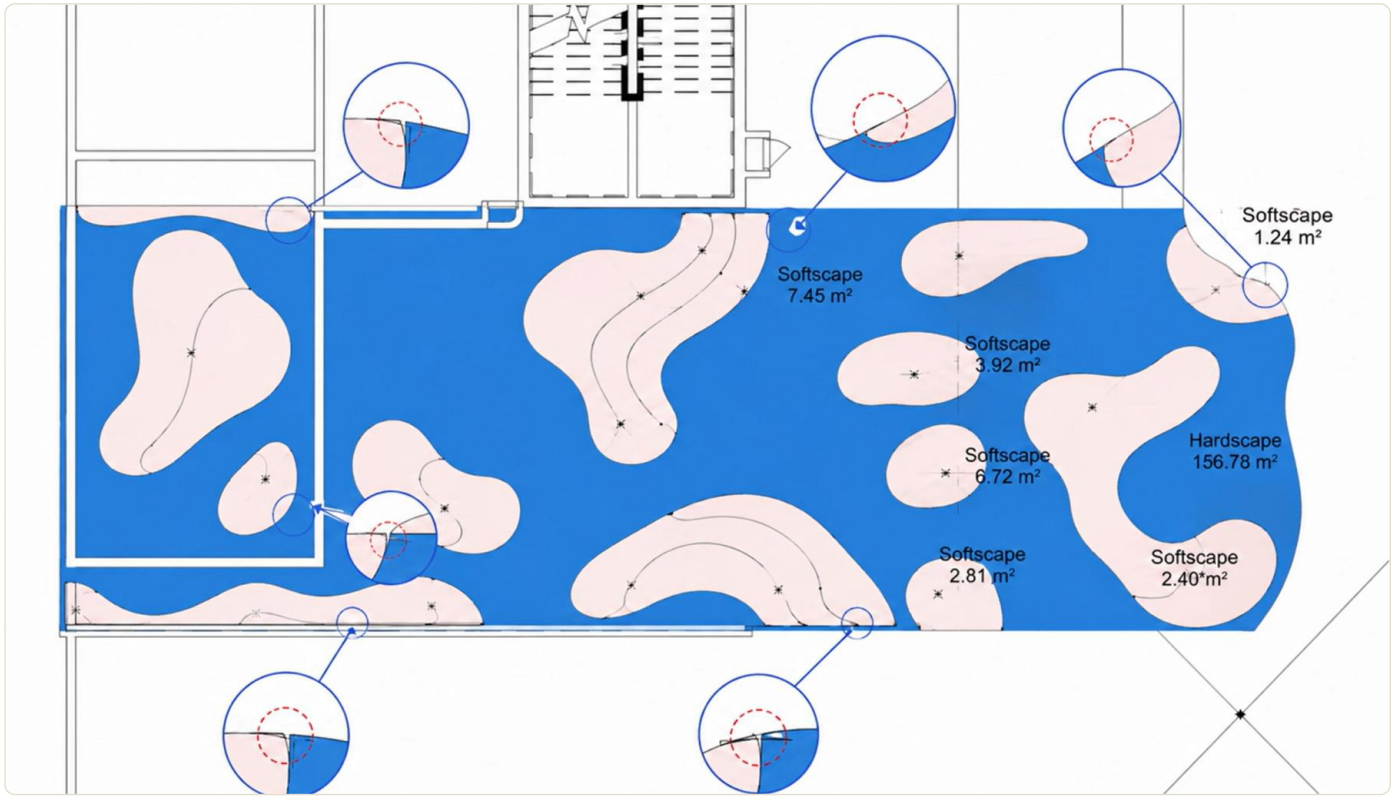
4 Upload it again

Upload the repaired IFC to the Model Checker, or submit it, to **check it again**.

Get the IFC+SG Repair Tool from the helpdesk.

IfcClosedShell: why a space can go missing

AREA BOUNDARIES IN REVIT · ZOOMED-IN GAPS AND OVERLAPS



Tracked, but not a blocker

01 Seen in **Revit (all versions)**, mostly from **area boundary lines**.

02 Revit tolerates tiny gaps, overlaps and stray lines. The area still generates.

03 IFC builds each shape from exact start and end points. A tiny gap means the shape never closes, so the **IfcSpace goes missing**.

HOW TO FIX

The Repair Tool **helps you find** these issues. Its report lists the affected spaces.

We **recommend you fix** them in Revit: zoom in and close every boundary loop.

Still seeing an error? Contact us.

HELPDESK

go.gov.sg/cxhelpdesk

01 Note the error code, e.g. IFC0000104

02 Copy the full message: every line and count

03 Attach the IFC file and send the request

04 For IFC0000104, ask for the Repair Tool

SCAN TO CONTACT US

https://go.gov.sg/cxsupport