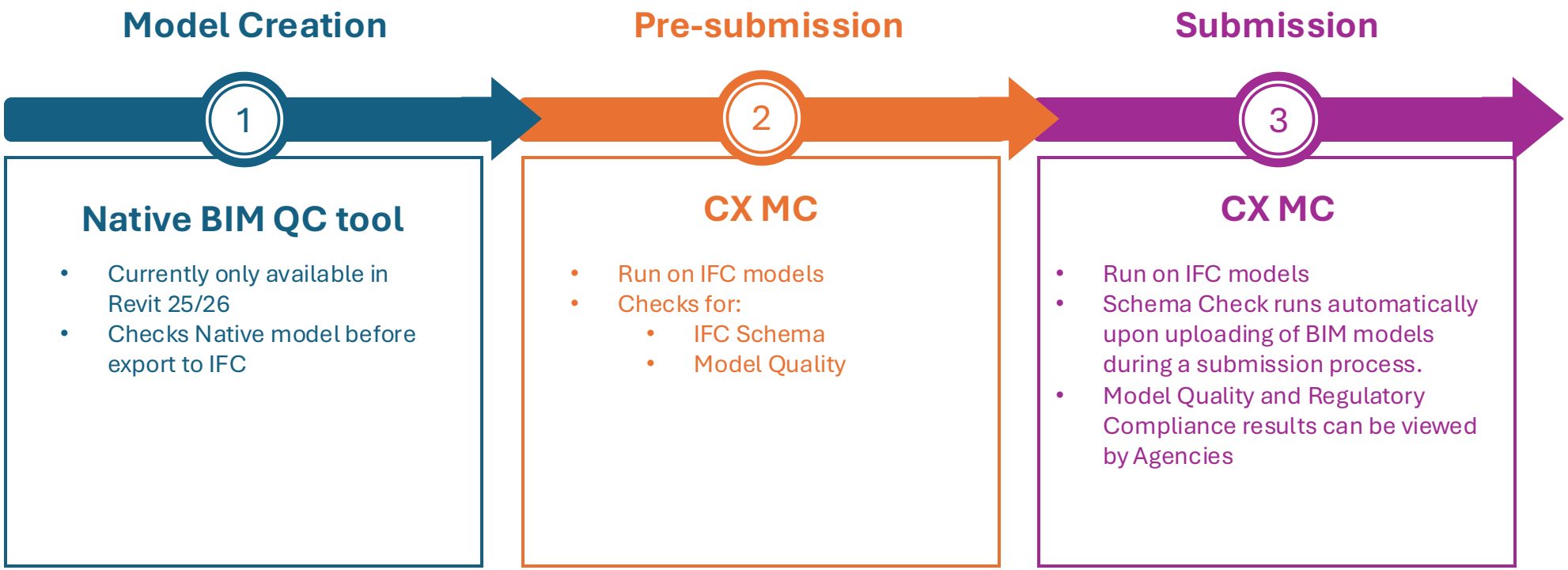
Improving **Native BIM Model Quality** for CX submissions

Sharing by : **Ms Kendra Chan** [Kendra_CHAN@ura.gov.sg]

QC throughput Model Development Journey

Several QC tools are available to for use at different model development/ submission stages. These check ensures BIM models meet the minimum quality standards specified in the CORENET X Code of Practice for effective regulatory review



Although passing of QC checks is not made mandatory, these are items identified that commonly impedes the review.

BIM Model Quality

Why it matters

- Affects how expediently / accurately we can review the submissions
- Missing / erroneous information will lead to more Written Directions (and more resubs), which add to the time and effort needed to obtain clearances

Commonly observed scenario

1st WD
Condition:

"We are unable to ascertain compliance with XX requirements. All key information are to be accurately provided in the model, in accordance with the CX COP"

→

2nd WD
Condition:

"Based on the information found in the submitted model, the proposal is not compliant. Please review the design and ensure it complies with the requirements"

Could have been avoided!

Time for one round of submissions was 'wasted', as the information was missing/wrongly represented in the model

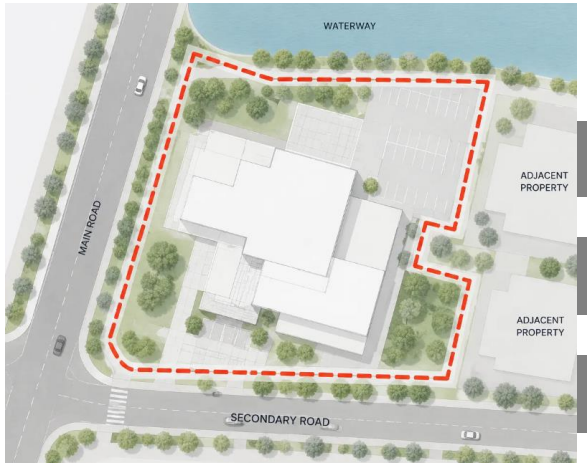
Examples of Model Quality Issues affecting URA's review



Geo-referencing of Models

WD condition issued

" Please check coordinates for Block 1 model "XXXX.ifc". The model sits at a very different location with respect to the rest of the models when federated. As such, we are also ***unable to fully ascertain*** *that the development has met all the setback requirements."*



Site Boundary

Existing Terrain

Areas

Critical elements for review missing in submission

WD condition issued

" Building Setback ***cannot be checked due to missing site boundary*** *.Please model the Site Boundary as a continuous 3D extrusion solid and exported to IfcGeographicElement, in compliance with the CORENET X COP V3.1 page 348."*

Examples of Model Quality Issues affecting URA's review

Modelling IFC+SG (Space – Area Requirement)

IFC Entity: IfcSpace					
IFC SubType: AREA_GFA					
	IFC+SG Property	Actual Values / Example			
1	AGF_DevelopmentUse [Text]	• Agriculture • Beach Area • Business Park • Business 1 • Business 2 • Cemetery • Civic & Community Institution • Commercial	• Educational Institution • Health & Medical Care • Hotel • Open Space • Park • Place of Worship • Port/Airport • Rapid Transit	• Reserve Site • Residential (Landed) • Residential (Non-landed) • Road • Special Use • Sports & Recreation • Transport Facilities	• Utility • Waterbody
2	AGF_Name [Text]	Please see pg 364 to 372 for list of AGF_Name recommended per development use.			
3	AGF_UnitNumber [Text]	• B3-01a (Example) • B2M-120D (Example) • B1M-05A (Example)		• 01-03A (Example) • 01-03b (Example) • 10-04ab (Example)	
4	AGF_BonusGFAType [Text]	• Balcony Incentive Scheme • Conserved Bungalows Scheme	• Indoor Recreation Spaces Scheme • Built Environment Transformation Scheme • Community and Sports Facilities Scheme	• Rooftop ORA on Landscaped Roofs • ORA within Privately-Owned Public Spaces (POPS) • CBD Incentive Scheme	• Strategic Development Incentive (SDI) Scheme • Facade Articulation Scheme
5	AGF_Note [Text]	Accompanying notes for QP to elaborate on use and purpose of spaces. If "Others" have been entered under AGF_Name, to fill in actual use of the area /space.			
6	AGF_UseQuantum [Text]	• Predominant • Ancillary			
7	AGF_BuildingTypology [Text]	• Flats • Condominium • Shophouse • Terrace House • Detached House • Semi-Detached House • Good Class Bungalow • Strata-Landed Housing • Serviced Apartments	• Polyclinic • Data Centre • Community Club / Centre • Adult Disability Home • Medical Centre • Public Acute Hospital • Public Community Hospital	• Private Hospital • Assisted Living Facility • Confinement Centre • Service Apartment II • Adventure Centre / Campsite • Farm • Airport • Port	• Light Industry • Clean Industry • General Industry • Special Industry
8	AGF_SupportingFacility [Text]	• Electrical Substation • Vehicular Parking Area			

Information required for review missing or not following CoP

WD condition issued

*"We are **unable to fully ascertain** that the development has met all the requirements due to **insufficient information**.*

Please refer to "Space (Area Scheme)" segment under the Glossary of "Identified Components", COP V3.1, Page 356-359". Please include the properties required in GFA/Strata spaces, such as AGF_DevelopmentUse, AGF_BonusGFAType (if any), AGF_UnitNumber (If any), AST_AreaType (if any), etc. You may refer to latest CORENET X COP V3.1 Page 362-373 for the details needed. "

*" Please review the way GFA is represented in the model and ensure that the **declared and modelled figures are in-sync** with the relevant AVF_IncludeAsGFA information."*

URA Native QC tool – Model check during design process

AUTODESK REVIT

*Currently only available for Revit 25/26

Native QC Checks at various Model Stages (URA)

☑ Template Check

1 Model Setup

☑ Content Check

2 Model Development

☑ Pre-submission Check

3 Model Completion

IFC

Conversion to IFC and upload to corenetX

corenetX

IFC QC check (Multi- Agency)

General QC checks include:

- IFC Schema
- Building naming convention
- Clash detection
- Level Consistency
- Alignment of BIM model coordinates
- IFCSpaces are drawn in model
- Parameters are:
  - In the correct format
  - Present
  - Accepted values

More information:

https://info.corenet.gov.sg/submission-portal-resource/more/model-checker

URA Native QC tool – Model check during design process

AUTODESK REVIT

*Currently only available for Revit 25/26

Native QC Checks at various Model Stages (URA)

☑ Template Check

1 Model Setup

- Required fields available in model template
- Duplicated fields
- Level naming

☑ Content Check

2 Model Development

- Required fields populated
- Required field populated with acceptable values
- Sanity Check for populated values
- Critical elements found
- Georeferencing of model and its linked files
- Keyed in GFA values matches declared values

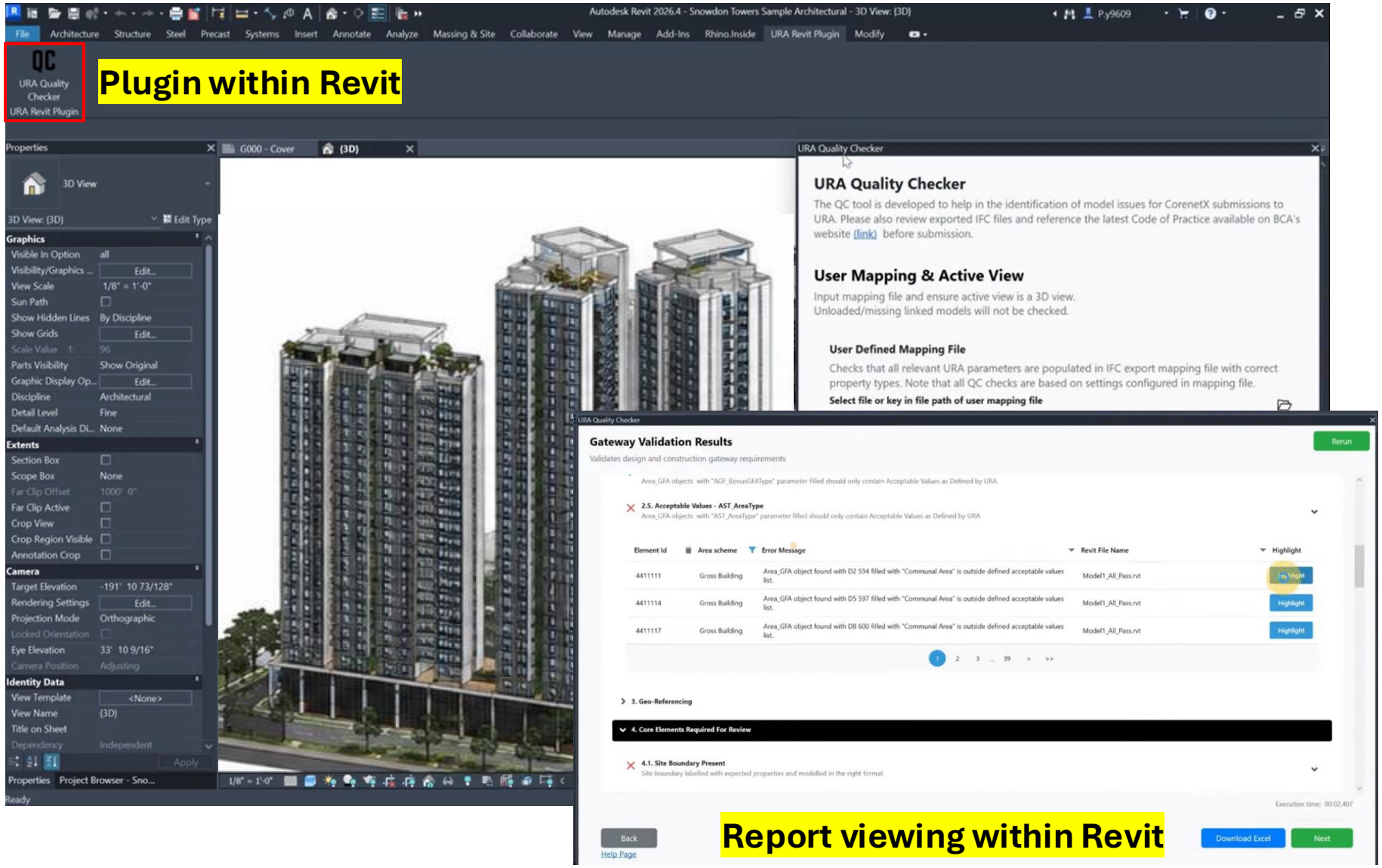
☑ Pre-submission Check

3 Model Completion

- IFC Export settings

URA QC tool (Revit Plugin)

Firms that have Revit (2025/2026 versions) can install the ‘URA QC’ plugin.
No additional licensing costs



Reports can be exported to Excel and PDF

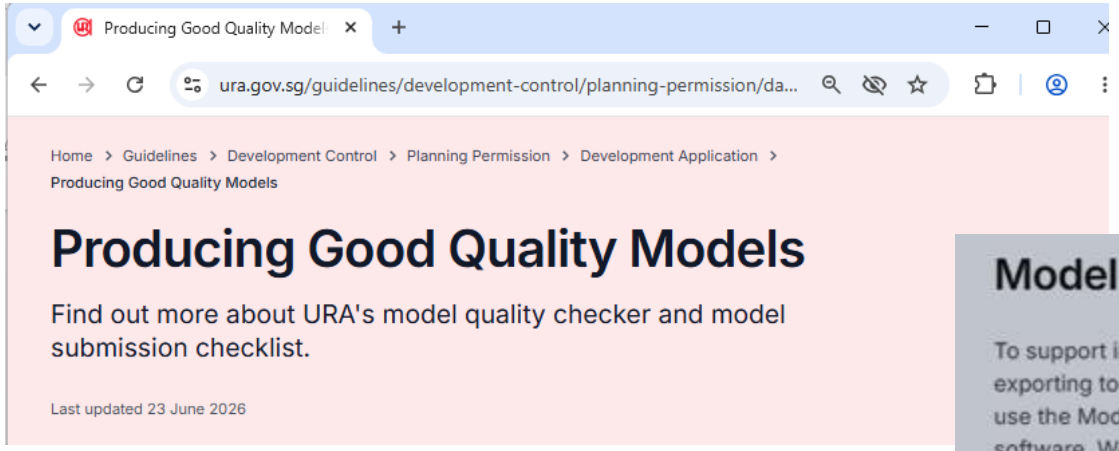
For model troubleshooting

To be submitted to URA (as part of submission package)

Contains info on the deviations (and QP’s explanation if deviations are not corrected).

URA QC tool (Revit Plugin)

Where to download?



https://www.ura.gov.sg/guidelines/development-control/planning-permission/dasub/cxmqc/

Model Submission Checklist

Download the Model Submission Checklist [DOCX, 20KB] ↗.

Checklist for common model issues

Model Quality Checker

To support industry in producing quality models at the design or model preparation stage (prior to exporting to Industry Foundation Classes or IFC+SG for submissions), QPs and BIM modelers can use the Model Quality Checker for self-checks as the models are prepared in the native authoring software. We have made available a Plugin for Revit users, compatible with 2025 and 2026 versions.

This tool automatically identifies inconsistencies with URA's modelling requirements (e.g. missing parameters, geo-referencing errors, etc.) and generates a report showing the items that modelers can review. The Model Quality Checker is not intended to replace regulatory checks at the submission Gateways.

The Plugin can be downloaded using the link below. This is a Beta release, and we encourage users to report any defects and suggestions/feedback that will help us refine and co-create a solution that serves industry's needs.

Revit Model Quality Checker Plugin

- Model Quality Checker plugin for Revit 25/26 ↗
  Please ensure that the latest Service Packs for Revit 2025 and Revit 2026 has been installed (e.g. Revit 2025.4.4, Revit 2026.4)
- User Guide ↗
- Report defects, issues or feedback / suggestions ↗
- You may also refer to the video at https://youtu.be/pKgAWyoGqbY ↗

Link for tool download request

Targeted Release in 1Q’27

Improvements to Current Functionalities

- Able to run on cloud-based models
- Updated to Latest CoP parameters
- Generate breakdown based on Detailed Use
- Compatibility with Revit 2027

Additional Functionalities

- Checks based on CORENETX Mapping File
- Overlapping Rooms/ Boundary lines
- Exports IFC and Schema checks on exported IFC files

CX Pilot Mapping

S/N	Agency	Identified Component	Identified parameters	Suggested Revit Representation	Suggested Archicad Representation	Suggested Tekla Structures Representation	Suggested Bentley OpenBuildings Representation	Suggested Discipline	IFC4 Entities	
1	BCA	Accessible Route	Amendment Status	Areas	Zone	N.A	Space	ARC	IfcSpace	*ACCESSIBLEROUTE
2	BCA	Accessible Route	Barrier Free Accessibility	Areas	Zone	N.A	Space	ARC	IfcSpace	*ACCESSIBLEROUTE
3	BCA	Accessible Route	Barrier Free Accessibility	Areas	Zone	N.A	Space	ARC	IfcSpace	*ACCESSIBLEROUTE
4	BCA	Accessible Route	Status	Areas	Zone	N.A	Space	ARC	IfcSpace	*ACCESSIBLEROUTE
5	BCA	Beam	Amendment Status	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
6	BCA	Beam	Beam Span Type	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
7	BCA	Beam	Bottom Left	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
8	BCA	Beam	Bottom Middle	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
9	BCA	Beam	Bottom Right	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
10	BCA	Beam	Construction Method	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
11	BCA	Beam	Depth	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
12	BCA	Beam	Left Connection Detail	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
13	BCA	Beam	Left Connection Type	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
14	BCA	Beam	Mark	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
15	BCA	Beam	Material Grade	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
16	BCA	Beam	Mechanical Connection Type	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
17	BCA	Beam	Member Section	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
18	BCA	Beam	Prefabricated Reinforcement Cage	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
19	BCA	Beam	ReferTo2DDetail	Structural Framing	Beam	Beam	Beam	STR	IfcBeam	N.A
20	BCA	Beam	Reinforcement Steel Grade	Structural Framing	Beam	Beam				

CORENETX Mapping File

End of Presentation