

CORENET X Connect: Preparing for Mandatory Implementation

Recap and Updates on CORENET X

Content

1. Recap of CORENET X

2. Update on processes and requirements

- Key Highlights of new RABW (Regulatory Approval Process of Building Works)
- Reviews and refinements based on industry feedback

3. Update on systems

- Key features of Submission Portal
- Introduction to Automated Model Checker (AMC) - MVP



01

Recap of CORENET X

CORENET X Implementation Timeline

CORENET X is being introduced in phases to facilitate industry transition.

Building and Construction Authority

Enhancing Industry Readiness: Adjusted corenet^x Implementation Timeline

1 October 2025

Mandatory CORENET X submission
for all new projects with Gross Floor
Area (GFA) $\geq 30,000\text{m}^2$

1 October 2026

Mandatory CORENET X submission
for all new projects, regardless of
GFA

1 October 2027

Mandatory onboarding to CORENET X
for all ongoing projects

Soft Launch

18 Dec 2023



Open to selected projects *(by invite)*

- Industry to familiarize themselves with the new system and processes before mandatory submission kicks in.
- Industry participants who are interested to make submissions via CORENET X during this period may indicate your interest at <https://go.gov.sg/cxenquiry>.

Approx +6 mths

From 1 Jun 2024

1

Open to more voluntary submissions

From 1 Oct 2025

2

Mandatory submission for all projects with GFA 30,000m²

Approx +1 year

From 1 Oct 2026

3

Mandatory submission for all new projects, regardless of GFA

Approx +1 year

From 1 Oct 2027

4

Onboard ongoing projects

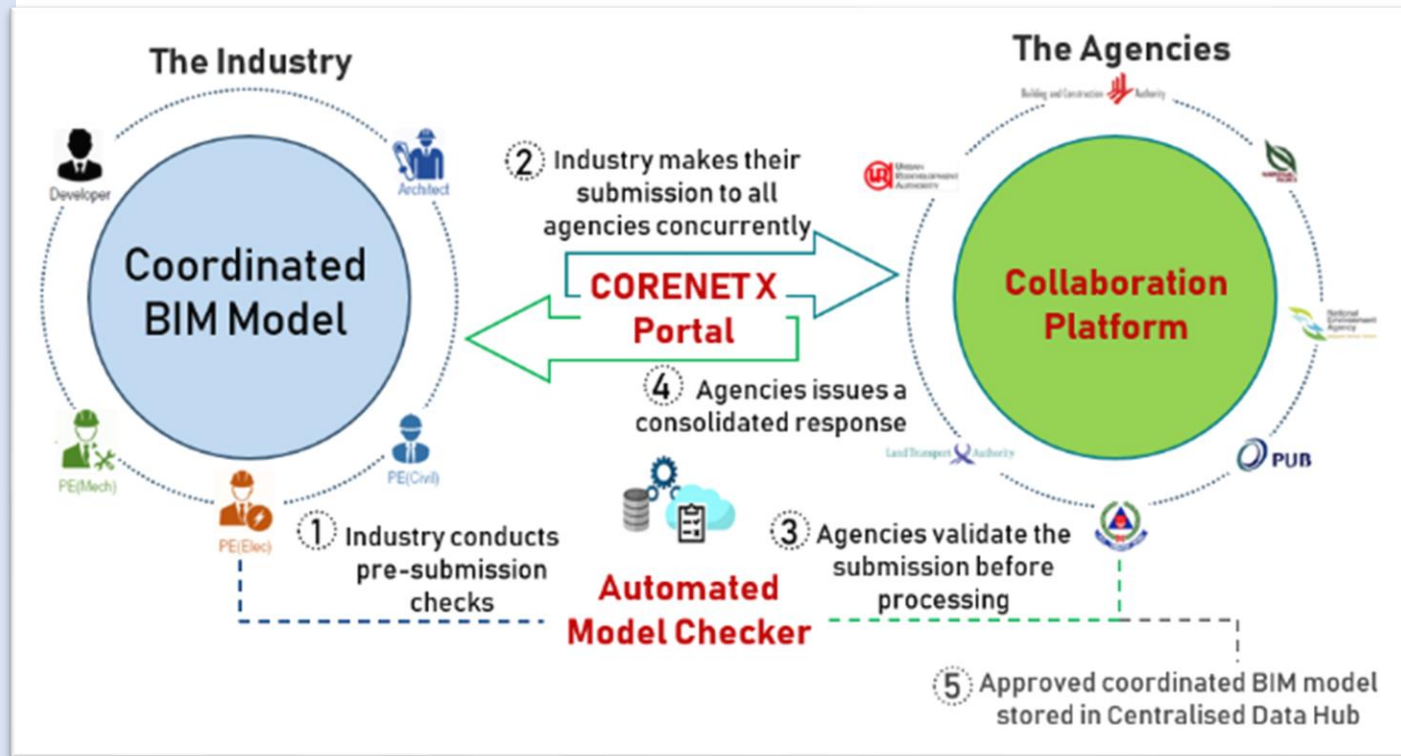
Vision of CORENET X

Future Ecosystem of Regulatory Approval of Building Works Transforming the Construction Industry

FIRST IN THE WORLD One-Stop Integrated Digital Shopfront

TRANSFORMATION of INDUSTRY

- Promote design coordination and teamwork
- Promote digitalization of construction sector
- Support IPD/IDD¹ & AMA/DfMA² imperatives



TRANSFORMATION of REGULATORY AGENCIES

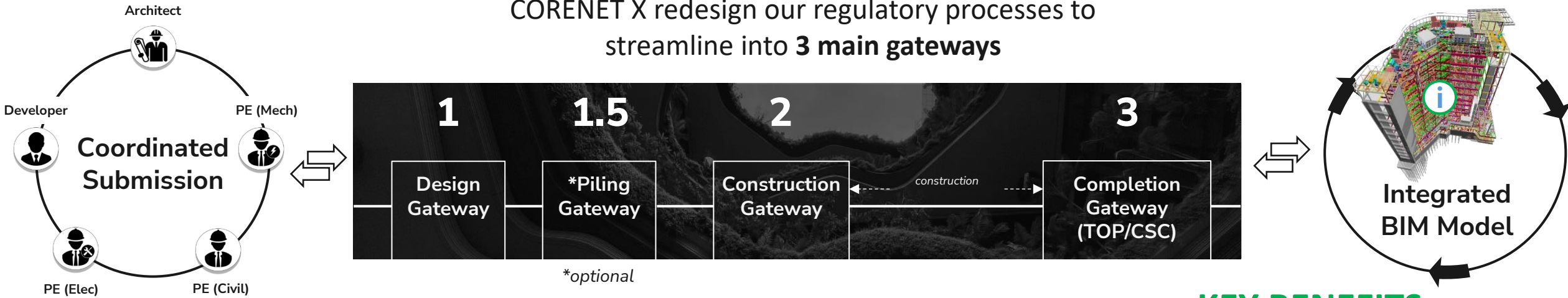
- Reduce silos, iterations & condense touchpoints
- Embrace collaboration & raise productivity amidst rising demands
- Improve accessibility & centralise information towards a Single Source of Truth

¹ IDD is the use of digital technologies to integrate work processes and connect stakeholders working on the same project throughout the construction and building life-cycle


² DfMA is a continuum of various technologies and methodologies that promote offsite fabrication from prefabricated components to fully integrated assemblies across the structural, architectural and Mechanical/ Electrical disciplines.


New Regulatory Approval Process for Building Works (RABW)


CORENET X redesign our regulatory processes to streamline into **3 main gateways**





KEY BENEFITS

 **Coordinated BIM and Plans:** Reduces confusion and miscommunication among stakeholders

Fewer Touchpoints with agencies: Streamlines diverse processes across agencies into a user centric journey, consolidating multi-touchpoints for more efficient regulatory clearance 

 **Coordinated Response from agencies:** Agencies review joint submission collaboratively and provide a consolidated response

Increased Transparency & Certainty: Project team have better transparency on the status of submissions with more certainty for project delivery and hence faster time-to-market 

 **Less abortive reworks downstream:** Upfront collaboration and coordination amongst project teams and agencies, allowing early detection of conflicts for early resolution, thereby save time and cost



Savings in Time & Cost



Obtain agencies' approvals in one go



Build with confidence & certainty

New Regulatory Approval Process for Building Works (RABW)



AT THE GATEWAYS

Coordinated submissions (consisting of various disciplines) will be submitted and reviewed collectively by agencies.
This helps to ensure cross-agency issues and conflicts are identified upfront.

1

Coordinated & consolidated response

- Agencies review, deconflict & respond collectively. Comments can be location-tagged on BIM model
- Industry no longer be required to produce comments/clearances from another Agency

2

Iterations through Written Directions

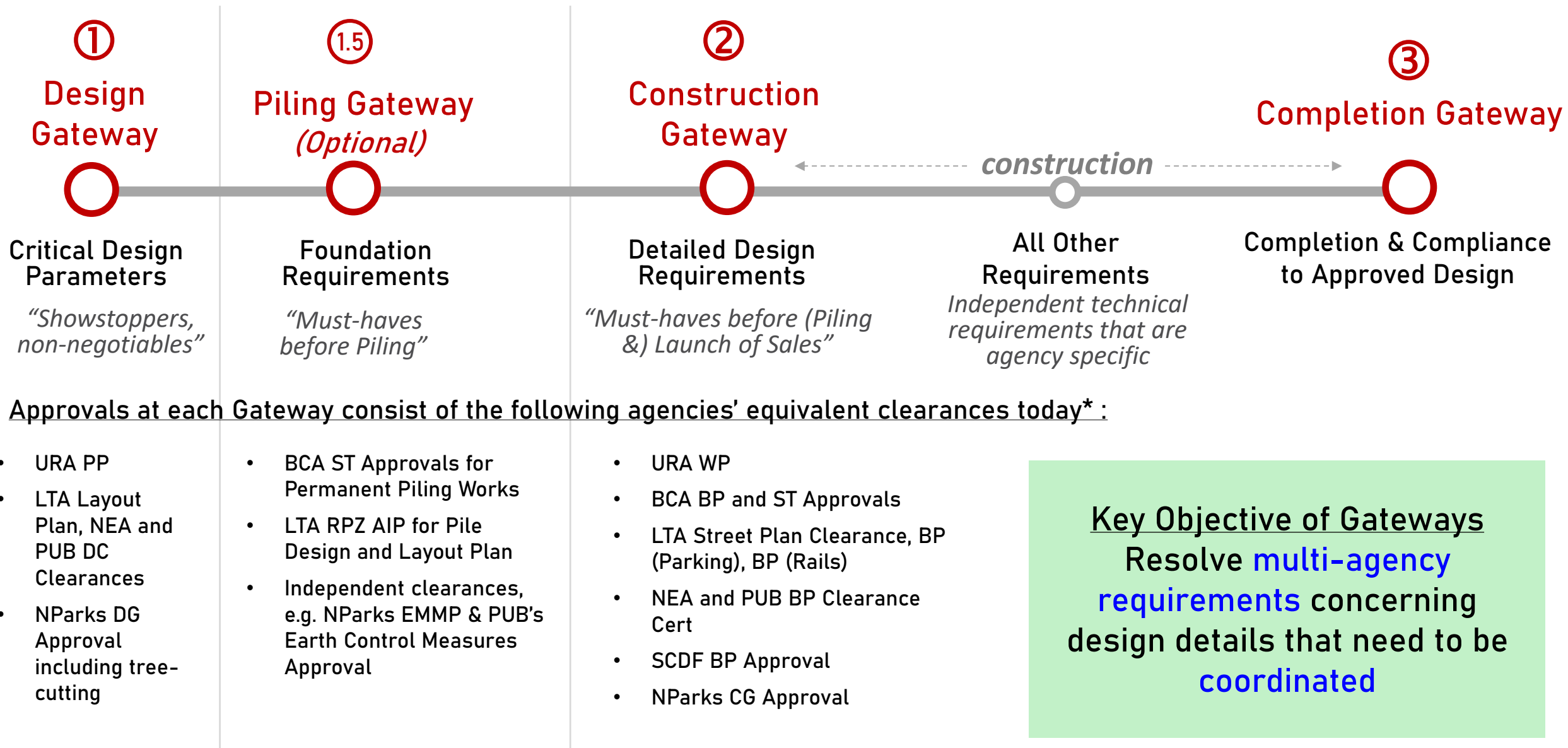
- With collective review and collaboration across Agencies, submissions should not iterate with more than 2 Written Directions at each gateway

20

Working days response time by Agencies

- Submissions go through Agencies' inter and intra-agency level reviews
- Agencies will collaborate to respond to industry collectively within 20 working days

Approvals under Consolidated CORENET X Gateways



Approvals at each Gateway consist of the following agencies' equivalent clearances today* :

- URA PP
- LTA Layout Plan, NEA and PUB DC Clearances
- NParks DG Approval including tree-cutting

- BCA ST Approvals for Permanent Piling Works
- LTA RPZ AIP for Pile Design and Layout Plan
- Independent clearances, e.g. NParks EMMP & PUB’s Earth Control Measures Approval

- URA WP
- BCA BP and ST Approvals
- LTA Street Plan Clearance, BP (Parking), BP (Rails)
- NEA and PUB BP Clearance Cert
- SCDF BP Approval
- NParks CG Approval

Key Objective of Gateways

Resolve **multi-agency requirements** concerning design details that need to be **coordinated**

* Requirements at each Gateway may not be the same as requirements for clearances today. For more info, please visit <https://info.corenet.gov.sg/regulatory-process/about-the-new-submission-process> or refer to the Code of Practice

02

Updates on processes and requirements

Key Highlights of new RABW - Design Gateway

① Design Gateway

Critical Design Parameters

“Showstoppers, non-negotiables”

Resolve key parameters

impacting design parameters & client’s brief, before proceeding to detailed design

Examples

- Master Plan land use / intensity
- Building massing (e.g. height)
- Site layout, access points
- Broad planning parameters of drainage, sewerage and sanitary works
- Greenery provision

Proceed to obtain
approval for next
Gateway

Key Things To note

- Project teams are encouraged to carry out **pre-submission consultations** as early as possible, to clarify/enquire on agency requirements and potential deviations.
- There are some submissions (e.g. NParks EMMP, NEA NIA) that are to be submitted directly to the agencies –refer to the COP for more info.
- **Demolition application**, if required, **can proceed independently from DG submission for the new development**. It will be a joint application to URA and BCA.
- After creating the initial Design Gateway draft, the QPs can start creating **drafts for any submission at any time**.

Key Highlights of new RABW - Piling Gateway (optional)

1.5

Piling Gateway

(Optional - if project team wishes to start piling works early)

Foundation Requirements

“Must-haves before Piling”

Resolve **requirements pertaining to piling and foundation works** (e.g. piling, pile caps, raft foundation, earth retaining and stabilizing structures), excluding superstructural works

Examples

- Structural design
- Earth Control Measures
- Earthworks
- Engineering assessment for piling works within Rail Protection Zone/Rail Corridor (if applicable)

→ **Start Piling**

Piling Gateway clearance pertains to the **design of permanent piling and substructure works that do not affect internal layout.**

Key Things To note

- Project team should **assess the risk involved when opting for PG** before superstructure is approved
- **PG submission can be made after DG application is submitted and processing.** But approval will only be granted after DG approval has been obtained.
- PG and CG submissions can be made concurrently.
- Phasing for structural submissions at PG is not encouraged. A **request can only be put up at the pre-submission consultation for agencies’ consideration on a case-by-case basis** if:
 - The site area covers more than 15,000sqm;
 - The project site possession are in multiple phases; or
 - The structural design involves complex building

Key Highlights of new RABW - Construction Gateway

②

Construction Gateway

Detailed Design Requirements

“Must-haves before construction & Launch of Sales”

Resolve multi-agency requirements concerning design details that need to be coordinated before work commences. This seeks to **minimise abortive works on-site downstream**

Examples:

- Superstructure design
- Detailed floor layout within building (e.g. floor, fire safety, carpark)
- Accessibility and connectivity
- Household shelters

Launch sales & start construction

Key Things To note

- Preparations for CG should start as early as possible.
- The project team, including the builder where applicable, should **discuss early on how part ST submissions should be carried out** prior to pre-consultation with BCA.
- Cater **sufficient time for the engineers** to do their design and calculations, and for **AC checking** (where applicable)

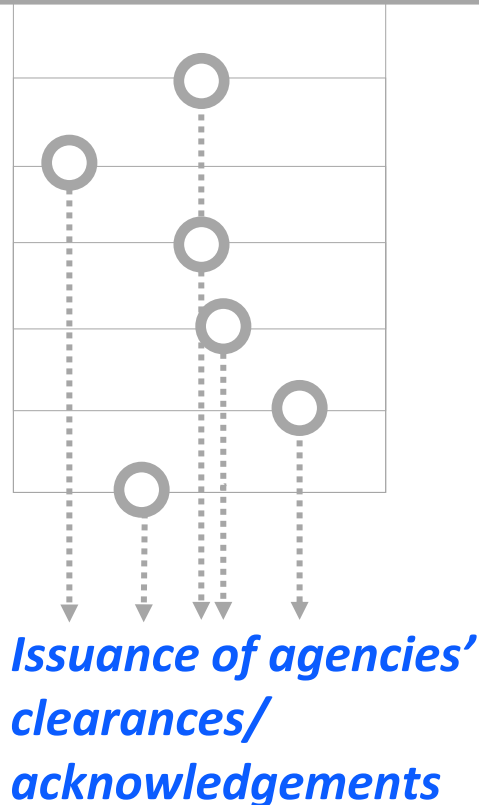
Key Highlights of new RABW – Independent submission

Independent Submissions

Technical submissions to one agency line department on **specialist details and agency-specific details** that do not affect other agencies.

Examples:

- Equipment and services (e.g. lifts, cooling tower, fire fighting system, water pumps)
- Structural details of ancillary components (e.g. barrier, cladding, curtain wall)
- C-score



Key Things To note

- It is important to understand when and which Independent Submissions need to be submitted for your project - Please study the Code of Practice carefully.
- QP(ST) can **submit ERSS, temporary traffic decking, barrier and cladding work as independent submissions** together with permit application.
 - QP can link the independent submission with existing permit if there is no change on the project parties.
 - Else QP can apply for a fresh permit together with this independent submission.

Key Highlights of new RABW - Completion

③ Completion (TOP/CSC)

Completion & Compliance to Approved Design

- Site inspection to ensure building works are **constructed as per approved plans and comply with requirements**
- Ensure completed building is **fit for occupation**

*Start occupation,
obtain Statutory
Completion*

Key Things To note

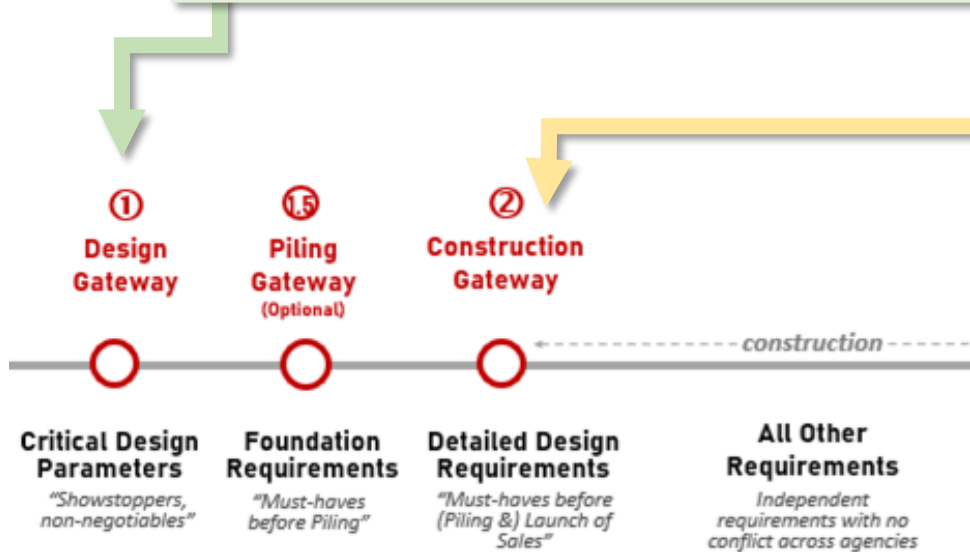
- TOP submissions are to be made to respective agencies independently and concurrently, whenever ready under Technical Clearances
- The final TOP/CSC will be issued when the project obtains all the necessary clearances from all agencies.
- A **one-stop dashboard of the project's status of TOP/CSC applications across various agencies** will be available in the CORENET X Submission Portal for **greater transparency and better tracking.**

Reviews and refinements based on industry feedback

- Potential “bottlenecks” affecting DG/CG clearance, which can lead to delay to project timeline, were identified through live submission projects & industry feedback
- Alignment across agencies on the need to phase the requirements into stages so that critical planning parameters and space provision affecting DG/CG are firmed up first and remaining details can be submitted at later stage.

① Design Gateway (DG) – Issues related to DG (start of the regulatory process)

- Certain **impact assessments (with full details)** are **required to be cleared before DG can start**. Clearance of such impact assessments typically **takes a long time**, which can cause **delay to the project**
- Some details **pertaining to operational details that developers/owners may not be able to firm up so upfront**



② Construction Gateway (CG)

- Agencies are requiring full submissions which **take time for industry to prepare and complete, resulting in a chokepoint**
- Some details **require specialists' inputs** and **can only be furnished when they are onboard later**.

Addressing Concerns of the new RABW

Impractical to complete the full structural details of the entire development in one go

BCA will allow **Part ST Submissions for qualifying large projects:**

- Full coordinated structural BIM carcass model at 1st CG submission
- Detailed structural submissions (incl detailed calculations, AC/ACO report, etc.) can be submitted in parts – 1st part in CG and remaining parts after CG as independent submission

External works clearance may delay the main development

LTA, NParks and PUB have reviewed and aligned the process:

- If required, external works can be allowed to be followed up after CG with condition that the **interfacing details** between the external works and the main development is finalised and **cleared at CG**
- Remaining details can be submitted separately after CG

Difficult to provide operational details at DG/CG without builders onboard

Agencies are reviewing the submission requirements in the COP

- **Calibrate level of details required at DG and CG** to an appropriate level, in alignment of the intent of the gateways and taking into consideration general industry practices
- In the next COP edition update, there will be **clear guidelines** on which **requirements to be submitted in 2D/ 3D**

Addressing Concerns of the new RABW

update

Full Traffic Impact Assessment process prior to DG submission may delay commencement of piling

LTA will allow a 2-stage approval process (circular released 7 Mar 25):

- Part 1 with direct impact to development e.g. improvement works to junctions immediately abutting development is to be obtained prior to DG
- Part 2 with impact beyond development e.g. other junctions required for traffic analysis not affecting development boundary before CG

update

Obtaining approval for performance-based fire engineering proposals prior to CG submission may impact project timeline

SCDF has reviewed and refined their process:

- Fire Engineering Design Brief (FEDB) should be cleared, or minimally submitted before CG. **In-principle Approval must be obtained before CG clearance issuance**
- Fire engineering report (FER) and related documents can be submitted in subsequent amendment under condition that works related to performance-based design proceed only when relevant clearances for FER are obtained

update

Design Advisory Panel process may affect timeline

URA has reviewed to adopt a more “agile” approach for DAP:

- Architect can develop design details progressively through upfront pre-submission reviews
 - Pre-DG DAP + (Stage 1) : Firm up the key design parameters
 - Pre-CG DAP + (Stage 2) : Review detailed design, submitted prior to CG

Note: The new DAP approach in CX has also been tested via a live project, which has recently cleared CG

Addressing Concerns of the new RABW

update

Projects requiring Energy Efficiency Opportunity Assessments (EEOA) report submission may delay project timeline

NEA will allow for a progressive submission:

- EEOA-NV lite report to be submitted and cleared prior to DG clearance
- EEOA-NV full report to be submitted and cleared prior to CG clearance, and conditional CG approval may be issued for incomplete reports where justifications are provided

update

Impractical to furnish Pneumatic Waste Conveyance System (PWCS) specialist details as they may not be onboarded at CG

NEA may grant conditional approval through QP declarations:

- If details are not worked out at DG, QP to confirm in writing that proposed spatial dimensions can accommodate installation of PWCS and to be in compliance with SS 642:2019
- If details are not worked out at CG, QP to declare compliance to SS 642:2019 and follow up with details no more than 6 months following CG clearance

Amendment Plan Submission



- **Major deviations** from the approved DG proposal entails a re-evaluation and will **require a fresh DG submission**, along with payment of any applicable processing fees.
- **Minor deviation** to the approved DG can be **incorporated in the subsequent Gateways** (i.e. PG or CG)

- **Material changes** to approved PG / CG will require Amendment Submission to PG / CG.
- **Immaterial changes** can be captured in subsequent Amendment Submission (if any) or in record plan (as-built plans) if there is no further amendment submission

Key Things To note

- Project team should assess the impact and extent carefully before deciding to proceed with the change.
- QPs need to assess & identify which agencies are affected and require re-approval accordingly.
- For **joint submission (eg: DG, CG)**, all **QPs involved will be notified of the amendment plan.**

Part ST Submissions



Must the full structural submission (including detailed design and calculations, AC/ACO report, etc.) for the whole project be submitted in one go at CG?

To address industry's concern that structural design takes time (especially if AC/ACO reports are required) and it is impractical to complete the full structural details in one go

- Detailed structural design and calculations of eligible projects **need not** be submitted in a single package but done through a **limited number of part ST submissions**.

Part ST Submissions – Eligible Projects

❑ Building projects:

1. Any project with a **Gross Floor Area (GFA) > 40,000sqm** is eligible for part ST submission if –
 - a. the project consists of 5 or more blocks of building of at least 4 storeys high each; or
 - b. the project consists of 3 or more blocks of building of at least 4 storeys high each, with common podium or basement.
2. Cluster housing projects with 40 or more landed units

❑ Infrastructure projects:

1. Infrastructure works that function like a building **with length > 150m** (e.g. MRT stations, transport nodes/ interchanges);
2. Infrastructure works that are mostly engineering works **with length > 400m** (e.g. viaducts, large scale drains, sewers)
3. Infrastructure works that are mostly coastal works **with length > 4,000m** (e.g. land reclamation, revetment, sea wall, bund wall)

Part ST Submissions – Submission Flow

First CG Submission (CG01) (WP, all agencies' BP and C&S Part ST 01)

1. Coordinated IFC Model comprising:
 - a) Full Architectural model
 - b) M&E model (aspects¹ that are regulated); and
 - c) Structural model (contains full structural details of structural element under Part ST 01; carcass with minimum details for structural elements in remaining Part STs)
2. Supplementary structural drawing, detailed calculations, AC/ACO report for Part ST 01

¹ M&E discipline consists of various services and trades. For submission at CG, only aspects of M&E that are regulated will need to be modelled as per the COERENET X Code of Practice. Examples include Drainage Aspects (PUB), Sewerage and Sanitary (PUB) and Exhaust for carpark, toilets and kitchens (NEA).



Approval for **subsequent** C&S Part ST can only be obtained **after First CG is approved.**

C&S Part ST 02 (C&S only, under Independent Submission Module)

1. Structural IFC Model containing full details of structures under Part ST 02
2. Supplementary structural drawing, detailed calculations, AC/ACO report for Part ST 02



Remaining Part ST submissions (Part ST 03, ST 04, etc)

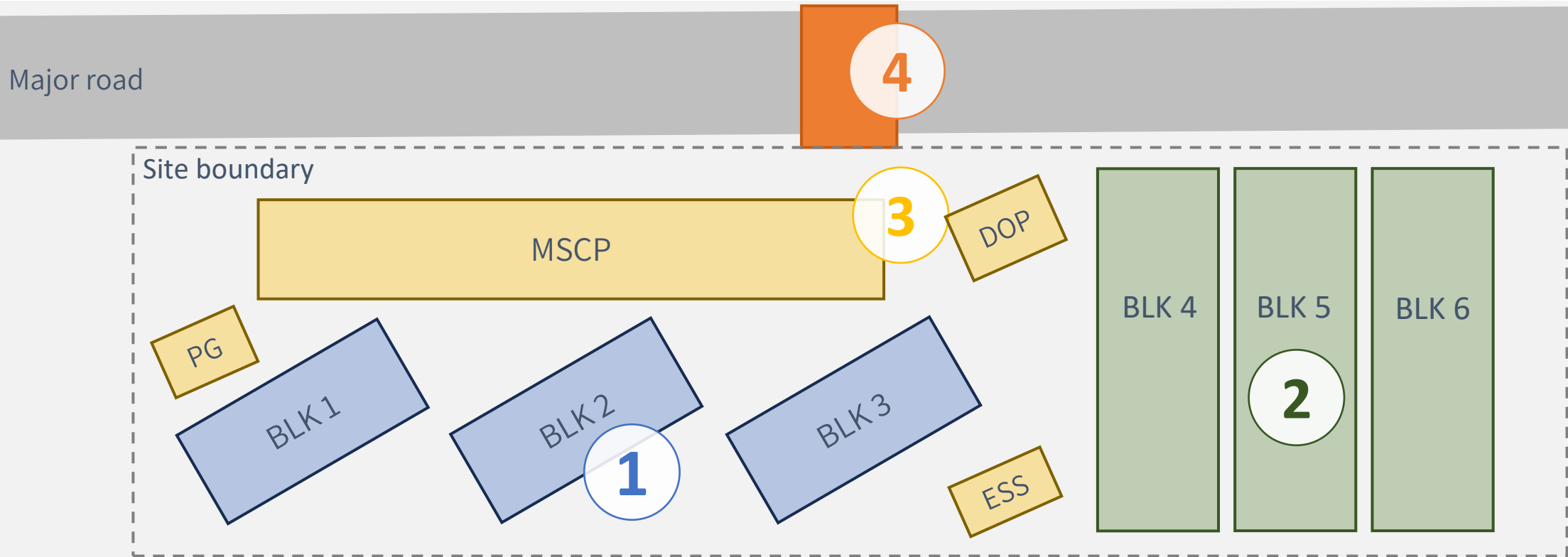
Part ST Submissions - Guidelines

Project teams should propose the Part ST Submission plan based on below guidelines and seek agencies' concurrence during pre-submission consultations, before making any submissions.

Scope of Works	Number of Part ST Submissions Allowed
Superstructure	1 no. of Part ST Submission for every 4 blocks (rounded to nearest unit) 1 no. of Part ST submission for every 40 landed units (rounded to nearest unit) <u>Example:</u> For a building project consisting of 9 tower blocks, 3 no. of Part ST Submissions of <u>equal GFA</u> is allowed. (i.e. if the total GFA is 105,000 sqm, each of the Part ST Submission should be about 35,000 sqm)
Common Basement	1 no. of Part ST Submission
Common Podium	1 no. of Part ST Submission
All ancillary works	1 no. of Part ST Submission
All external works	1 no. of Part ST Submission
ERSS	Independent submission *No change from the standard RABW (without phasing)
Cladding	
Façade	
Temporary Deck	

Part ST Submissions – Guidelines (Illustrated with Example)


Example Project: 6 HDB blocks with MSCP and ancillary works



 Part ST Submission 1: Block 1 – 3

 Part ST Submission 2: Block 4 – 6

 Part ST Submission 3: Ancillary works within site boundary

 Part ST Submission 4: External works outside site boundary

03

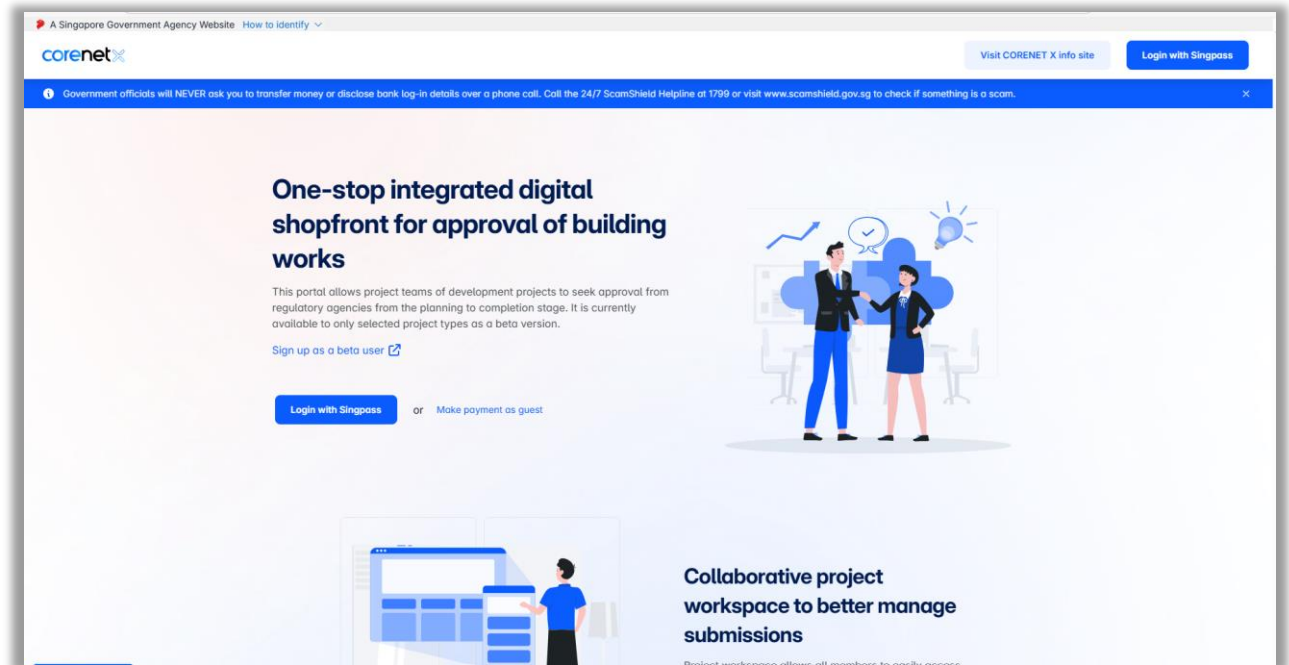
Updates on System

Key features of Submission Portal

Submission Portal

Submission Portal will replace CORENET 2.0 as the platform to make submissions to agencies for approvals

- The Submission Portal is our **web-based front-facing portal** where industry practitioners and their assistants interact with to make submissions
- CORENET X is developed through agile methodology that **progressively delivers new features and improvements** to enhance the system
- The system is **designed with users at its core, intended for a guided submission process**. It incorporates regular feedback from user testing and live submission users to enhance its usability and create a more intuitive experience



- ✓ Dashboards for greater visibility
- ✓ Guided submission process
- ✓ Auto fee computation to plan ahead
- ✓ Centralised payments to all agencies

User level view - login landing page

User login landing page showing all projects where they are involved as project members

My projects

Create project

Search by keyword

Sort by

Project reference, title or address

Recently viewed

A2546-A0022-2024

DSP for connect2

MK29-02097A

15 Apr 2024

A2546-A0013-2023

Proposed new erection of 3 storey terraced-house...

2 roads

21 Sep 2023

A2546-A0059-2024

Proposed new erection of 5 blocks of residential....

MK-, MK-, test

24 Sep 2024

A2456-A0010-2024

Proposed Reconstruction to the Existing 2-storey Detached Dwelling House With an Attic to a 2-storey Envelope Control Detached...

MK05-09327L

11 Mar 2024

A2546-A0015-2024

R3.5 Mock Testing Residential Non Landed A&A

MK11-03827A

19 Mar 2024

A2546-A0016-2023

Mock Submission Verification Testing for CX R2 Go-Live on 22 Sep 2023 - Test DG Plan App Single Step

MK11-03827A

22 Sep 2023

A2546-A0015-2023

Internal Workflow Testina for IP-CP for CX R2

A2546-A0035-2024

Mock DSP Submission for nSianCore and CP

A2546-A0019-2023

Mock Submission Verification Testina for CX

Project level view - Project overview page

Project overview page showing key functionalities


- Submission milestone dashboard enables user to track the main milestones at a glance

Project overview


Created by Seet Hee Ling Christina on 24 September 2024

PROJECT REFERENCE NO.
A2546-A0059-2024


Gateway submission process




Submission workspace
Prepare project submissions




Project members
View and add members



Member appointments
Appoint members for relevant scopes of works



Make payment
Add and pay for multiple payments



Site inspection booking
Create and manage bookings

Submission milestone dashboard

Keep track of the progress of your joint submissions. For all other applications, please view them in the submission workspace.

SUBMISSIONS	SUBMISSION STAGE	WD OUTSTANDING	ACTIONS
Plan application Design gateway	Not started	-	
Plan application Piling gateway (Optional)	Not started	-	
Plan application Construction gateway	Not started	-	
Completion TOP/CSC clearance	Not started	-	View TOP/CSC requirements

Project level view - Submission workspace

Submission workspace

- All **submissions listing** enables user to track every submission made by all members in the project
- **Search bar** allows for submissions to be filtered by status e.g. processing, cleared and by agencies

Submission workspace

Joint space for project members to manage and prepare project submissions

Direct submission process

Guided process to obtain the required agency clearances for your project

- **Plan approval**
Start the submission process with a joint application for plans approval
- **Other clearance(s)**
- **Completion**

All submissions

Create and manage your submissions

Create submission

Search by submission or ES no.

🔍 Type in keywords e.g. plan application or ES20231212-12345-DG01R00

Filter

Filter by agency, status etc

SUBMISSION	STATUS	AGENCY	LAST UPDATED	ACTIONS
Plan application (Direct Submission Process) -	New Submission - Draft	All	31 Dec 2024	View
Waiver/non-compliance -	New Submission ES20240718-50001-BC01W00 Pending payment	BCA (Building design)	18 Jul 2024	View
1-2 of 2 results				< >

Creating submissions – submission form listing

Create submission

- All **submission forms in current CN2 xfdx** will be incorporated into web-forms submitted directly within the portal
- **Submission forms are arranged into various categories** e.g. Independent submission > Agency > Agency specific forms

Select submission

Only applicable submissions will be made available for selection

Submission category

Independent submission (to individual agencies) ▼

Agency

Building and Construction Authority (BCA) ▼

Submission

Please select ▼

Civil Defence shelter plan (public/transit shelter)

Constructability Score Calculations

Instrumentation monitoring report

Structural plan and permit application

Submission of documents

Creating submissions – selecting required agencies

Creating a joint-submission form

- As every project is unique, not all agencies' submissions are required in a project
- Coordinating QPs can select the relevant agencies for the joint submission
- For agencies not selected, coordinating QPs would be prompted to declare accordingly

The screenshot shows a three-step process bar at the top: 1. Select sections required for approval (active), 2. Select additional details, and 3. Review summary. Below the bar, the title 'Select sections required for approval' is followed by the instruction 'Determine the relevant agencies for approval of the proposed building works'. A list of checkboxes follows, with 'Building control - Building design (BCA)' selected. The list includes various planning, greenery, building control, roads, rails, vehicle parking, public utilities, and environmental health options.

1 Select sections required for approval 2 Select additional details 3 Review summary

Select sections required for approval
Determine the relevant agencies for approval of the proposed building works

- ☐ Planning parameters (URA)
- ☐ Greenery provision and tree conservation - External greenery (NParks)
- ☐ Greenery provision and tree conservation - Internal greenery (NParks)
- ☒ Building control - Building design (BCA)
- ☐ Building control - Structural works (BCA)
- ☐ Building control - Buildability (BCA)
- ☐ Roads - Street plans (LTA)
- ☐ Roads - Active mobility (LTA)
- ☐ Rails (LTA)
- ☐ Vehicle parking (LTA)
- ☐ Public utilities - Sanitary works (PUB)
- ☐ Public utilities - Sewerage works (PUB)
- ☐ Public utilities - Reinforced Concrete (RC) trench (PUB)
- ☐ Public utilities - Used water pumping system (PUB)
- ☐ Public utilities - Drainage (PUB)
- ☐ Environmental health and pollution control - Environmental health (NEA)
- ☐ Environmental health and pollution control - Pollution control (NEA)
- ☐ Fire safety - Building plan (SCDF)

Joint submissions – form architecture

Form architecture

- All **key project information** will be housed in 1 section coordinated by the coordinating QP
- Other sections in a joint submission pertains to the various agencies

The screenshot displays the 'corenetX' web application interface. On the left is a vertical sidebar with a list of sections: 'Project information' (selected with a checkmark), 'Planning parameters', 'Greenery provision and tree conservation', 'Roads', 'Rails', 'Public utilities', 'Environmental health and pollution control', 'Coordinated BIM', 'Plans', and 'Fees computation'. The main content area is titled 'Project information' and shows 'Last saved on -' followed by a 'Draft' button. Below this is the 'PROJECT REFERENCE NO.' A3731-27871-2022. A 'Project details' section contains a note: 'Note: The information below are parameters potentially link to fees computation. Please ensure the information provided is accurate and to the best of your knowledge.' The 'Type of project' section has three radio button options: 'Design & Build project' (selected), 'Developer cum Builder project (where developer has financial interest in builder's company)', and 'Others'. The final section asks 'Are you applying for works that have already been built or carried out?' with 'Yes' (selected) and 'No' radio button options. On the right side of the form, there is a summary box containing: 'SUBMISSION Plan application (Design gateway)', 'SUBMISSION STAGE New submission', and 'APPOINTED PROJECT PARTY John Lim Architect'.

Joint submissions – Auto fee computation

Fee computation

- Fees will be auto computed from QPs’ inputs, mainly in Project Information section
- QPs can check the fee payable prior to payment

✓ Project information

✓ Planning parameters

✓ Greenery provision and tree conservation

✓ Roads

✓ Rails

✓ Public utilities

✓ Environmental health and pollution control

✓ Coordinated BIM

Plans

Fees computation

Fees computation

Review payable plan processing fees with breakdown by agency

TOTAL PAYABLE FEE

SGD 34,889.50

Cost breakdown by agency

ⓘ

If there are discrepancies on the amounted fees, check that all information have been filled correctly. For any changes, please contact the Project Coordinator or the appointed project party responsible for the input.

[How are the fees calculated for each agency](#)

AGENCY

Urban Redevelopment Authority (URA)

APPLICATION FEE

Plan application (Design gateway)15,889.50

Development type: Residential (non-landed)

Building works: New erection (including reconstruction)

Is the development located in a GCBA?: No

Development use: Commercial, Residential (landed)

Total no. of block(s): 2

Total no. of unit(s) in this development: 24

Total SGFA/area of plan view: 12,350.00 m²

Subtotal

15,889.50

AGENCY

National Parks Board (NParks)

APPLICATION FEE

Plan application (Design gateway)2,675.00

Development type: Residential (non-landed)

Is the proposed development within the TCA or vacant land?: Yes

Is the development located in a GCBA?: No

Is there provision of open space: No

Subtotal

2,675.00

Total payable fee (SGD)

34,889.50

SUBMISSION

Plan application (Design gateway)

SUBMISSION STAGE

New submission

35

Joint submissions – Plan fee payment

Plan fee payment must be made before submission can transit to agencies for processing

The screenshot shows the 'corenetx' submission workspace. The main section is titled 'Plan application' and shows a submission pending payment for three agencies: Building and Construction Authority (SGD 7,740.00), National Parks Board (SGD 2,140.00), and Urban Redevelopment Authority (SGD 6,420.00). A red arrow points from the 'Make payment' button for the Building and Construction Authority to a modal window titled 'Select payment method'.

Select payment method
Select your payment option and complete payment

Total payable fee
SGD 7,740.00

Select a payment method

- ☐ Bank transfer
Make a direct bank-to-bank transfer payment to agencies
- ☐ Credit/Debit card
Immediate processing for fees up to SGD 10,000 per agency by credit/debit card
- ☐ Ask someone to pay
Send a payment link for someone to complete this payment

What are the available payment modes?

- Bank transfer (takes at least 2-3 working days to be processed)
- Credit card (for each transaction up to \$10,000)
- Payment to agencies are to be transacted separately
- This is to avoid payment errors e.g. credit limits to affect multiple transactions at a time
- Users who receive a request to make payment via “Ask someone to pay” must login to transact


Submission level view – Submission timeline

Submission timeline

- **All details pertaining to the submission** are logged and displayed in reverse chronological order
- **Status display** allows easy tracking of progress of each submission
- **Actions** show the **actionable items**, e.g. apply for amendment, view responses from agencies, withdraw submission etc.

View submission timeline


Last updated on 10:00pm, 12 December 2023

 **1st Written Direction issued**
12 December 2023
Issuance of comments has been issued by the agencies. Failure to respond to comments will result in auto rejection of application.

Plan application (Direct Submission Process)

Due by18 December 2023



Comments[View responses](#)


 [Extend Written Direction](#)


[Reply to comments](#)


Response

Comments issued	<ul style="list-style-type: none">• Planning parameters (URA)• Layout plans (LTA)• Rails (LTA)
No comments issued	External Greenery (NParks)
Acknowledged	Internal Greenery (NParks)

 **Submission submitted to regulatory agencies**
10 October 2023
 ES20221010-12345-DG01R00

 **Submission pending payment**
5 October 2023

 **Pending declaration by appointed QP(s)**
20 September 2023

 **Submission created**
10 June 2022

SUBMISSION
Plan application (Direct Submission Process)

SUBMISSION STAGE
New submission

STATUS
Written Direction issued

[What is submission status?](#)

E-SUBMISSION NO.
ES20231212-12345-DS01R00

[View all members](#)

Actions
[View responses](#)
[View submission activity](#)
[Delete submission](#)

Submission level view – Responses from agencies

View Response

- Display of agencies’ responses and iterations
- Responses can be downloaded

View submission activity

View and manage your submission activity

Submission events

Written Direction

RESPONSE	SUBMISSION STAGE	DATE OF SUBMISSION	COMMENTS ISSUED	ACTIONS
1st Written Direction 8 Dec 2023	Amendment ES20231010-12345-CG02R01	-	Rails (LTA)	Download
2nd Written Direction 12 Nov 2023	Resubmission ES20231010-12345-CG01R01	17 Nov 2023	Layout plans (LTA)	Download
1st Written Direction 17 Oct 2023	New submission ES20231010-12345-CG01R00	10 Nov 2023	<ul style="list-style-type: none">• Planning parameters (URA)• Internal greenery (NParks)• Layout plans (LTA)• Rails (LTA)• Sewerage and sanitary (PUB)• Drainage (PUB)• Environmental health (NEA)	Download

1 - 3 of 3 results

< >

Project level view – TOP/CSC requirements

Track TOP/CSC items

- Track your project's progress in technical clearances working towards TOP/CSC
 - As-built submissions
 - Agencies' TOP/CSC applications
 - Certificate of supervision
 - C-forms

View TOP/CSC requirements

Please ensure that the below clearances are obtained before applying for a TOP or CSC with BCA

Technical clearance

Certificate of Supervision and As-Built

Completion of structural works

i Please obtain the necessary technical clearances from the below agencies. If the project is subject to approval by BCA under the Building Control Act, please note that these technical clearances are necessary in order for BCA to issue Temporary Building Permit (TOP) or Certificate of Statutory Completion (CSC) for the project.

	AGENCY	TOP CLEARANCE STATUS	CSC CLEARANCE STATUS	ACTIONS
▼	Planning parameters URA	Not submitted	Not submitted	View checklist
▼	Greenery provision and tree conservation NParks	2 Not required	Not submitted	View checklist
▼	Building control BCA	Not submitted	Not submitted	View checklist
▼	Roads LTA	2 Not required	Not submitted	View checklist
▼	Rails LTA	2 Not required	Not submitted	View checklist
▼	Vehicle parking LTA	2 Not required	Not submitted	View checklist
▼	Drainage PUB	Not submitted	Not submitted	View checklist
▼	Sewerage and sanitary PUB	2 Not required	Not submitted	View checklist
▼	Environmental health and pollution control NEA	Not submitted	Not submitted	View checklist
▼	Fire safety SCDF	Not submitted	Not submitted	View checklist

Project level view – TOP/CSC requirements

Certificate of supervision

- In CORENET X, COS can be submitted directly by relevant QPs
- E.g. COS of Lightning Protection System can be made directly by the appointed PE(Elect)

View TOP/CSC requirements

Please ensure that the below clearances are obtained before applying for a TOP or CSC with BCA

Technical clearance

Certificate of Supervision and As-Built

Completion of Structural works

▼	CERTIFICATE OF SUPERVISION/AS-BUILT	STATUS
▼	Certificate of Supervision of Lightning Protection system BCA	Not submitted
▼	Certificate of Supervision of Air-Conditioning/Mechanical Ventilation System BCA	Not submitted
▼	Application for approval of commissioning of civil defence shelter BCA	Not submitted
▼	Builder's certificate BCA	Not submitted
▼	As-built Environmental Sustainability documentation BCA	Not submitted
▼	As-built Buildable Design Score Calculations BCA	Not submitted
▼	As-built Constructability Score Calculations BCA	Not submitted

Project level view – TOP/CSC requirements

Completion of Structural works

- Track the ongoing ST plans and the related permits
- CORENET X will help to flag out any outstanding STs without a permit linked to it

View TOP/CSC requirements

Please ensure that the below clearances are obtained before applying for a TOP or CSC with BCA

✓ Related structural plan(s) added successfully ✕

Technical clearance

Certificate of Supervision and As-built

Completion of Structural works

⚠ There are approved structural plan(s) not tied to permit

Please ensure that all structural plan(s) are tied to an approved permit and the necessary clearances is obtained before applying for a TOP/CSC clearance.

[View approved plan\(s\) not tied to permit](#)

✓	APPROVED PERMIT(S)	RELATED STRUCTURAL PLAN(S)	C-FORM(S) STATUS	ACTIONS
✓	Permit to carry out structural works ES20231212-12345-BC01R00	<ul style="list-style-type: none">• ES20231212-12345-PG01R00 (Plan application (Piling gateway)• ES20231212-11321-BC01R00 (Structural plan and permit application)	Not submitted	Manage structural plans
✓	Permit to carry out structural works ES20231212-12345-BC02R00	<ul style="list-style-type: none">• ES20231212-11205-PG01R00 (Plan application (Piling gateway)• ES20231212-12345-PG02R01 (Plan application (Piling gateway)• ES20231212-11119-BC01R00 (Structural plan and permit application)	Not submitted	Manage structural plans
✓	Structural plan and permit application ES20231212-12111-BC02R00	ES20231212-12111-BC02R00 (Structural plan and permit application)	Not submitted	Manage structural plans
✓	Permit to carry out structural works ES20231212-11201-BC01R00	ES20231212-12345-CG01R00 (Plan application (Construction gateway)	Not submitted	Manage structural plans
1 - 4 of 4 results				< >

Introduction of Automated Model Checker (AMC)

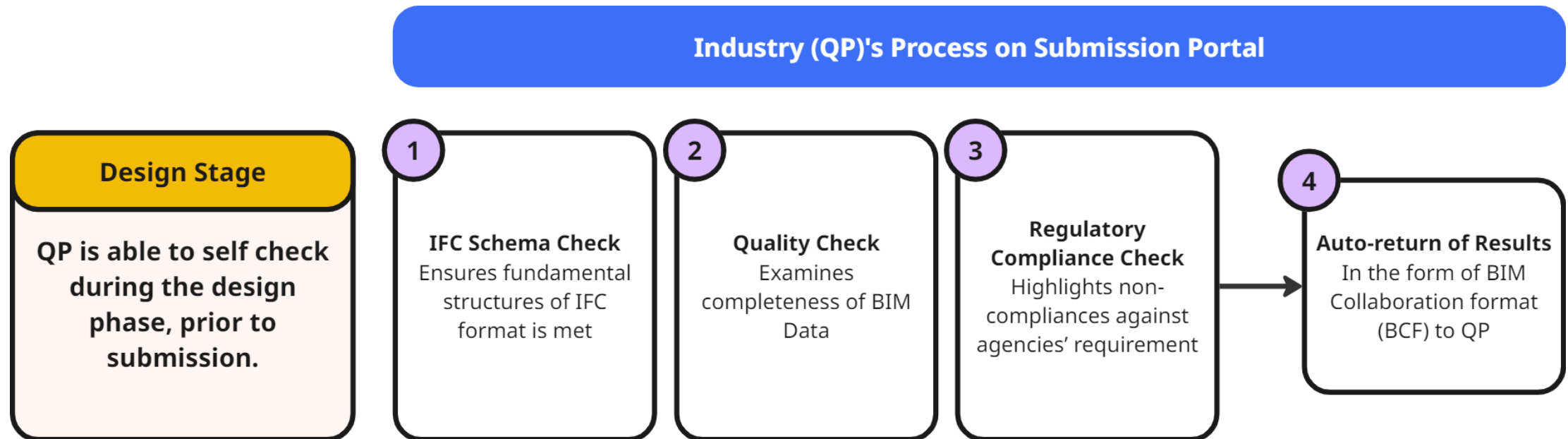
BETA

Introduction to Automated Model Checker (BETA)

MC MVP is still WIP

The CORENET X Automated Model Checker (AMC) is a rules-based engine that allows

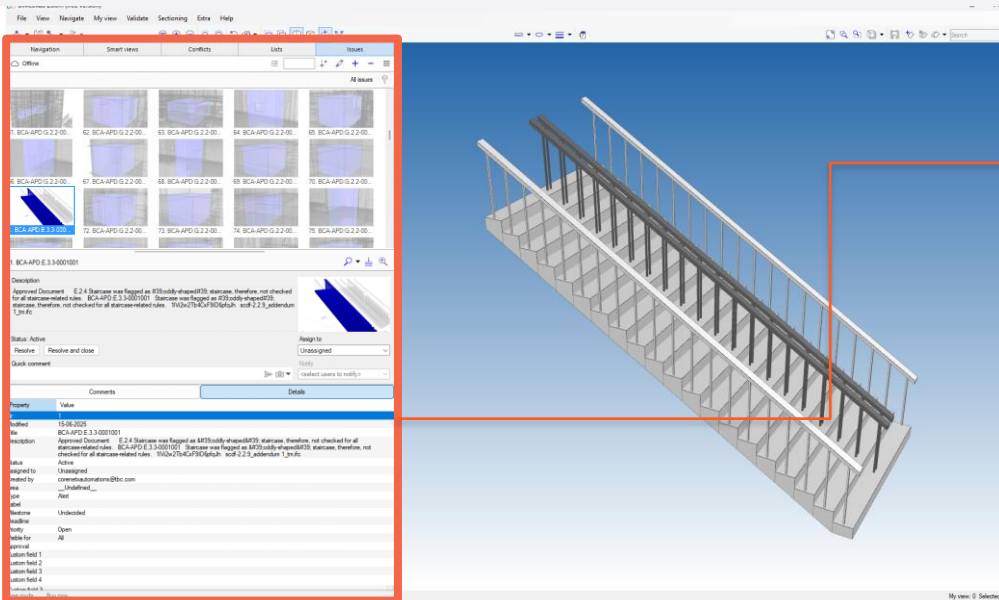
- 1) The **Industry** to **validate BIM models** for quality and regulatory compliance before actual submission.
- 2) Upon formal submission, **Agency Processing Officers** will **review AMC-generated results** before issuing response letters to the Industry.



Automated Model Checker Minimum Viable Product

MC MVP is still WIP

- The MC Minimum Viable Product (MVP) is the **early version of the MC** and covers selected rules from the different agencies. It will be **expanded and released progressively** to include more rule checks.
- MC MVP will be **made available to QP (date of MVP release will be shared when firmed)** to facilitate pre-checking of submissions, to identify issues with BIM models and non-compliances upfront, prior to submission
- Results will be returned to QP in the form of **BCF**



1 BCF Export Package to QP

1. BCA-APD:E.3.3-0001001

Description

Approved Document E.2.4 Staircase was flagged as #39;oddly-shaped#39; staircase, therefore, not checked for all staircase-related rules. BCA-APD:E.3.3-0001001 Staircase was flagged as #39;oddly-shaped#39; staircase, therefore, not checked for all staircase-related rules. 11Vi2w2Tb4Cx9ID6pfqJh scdf-2.2.9_addendum 1_tm_ifc

Status: Active

Resolve Resolve and close

Quick comment

Assign to

Unassigned

Notify

<select users to notify>

2 BCF Issue

Details

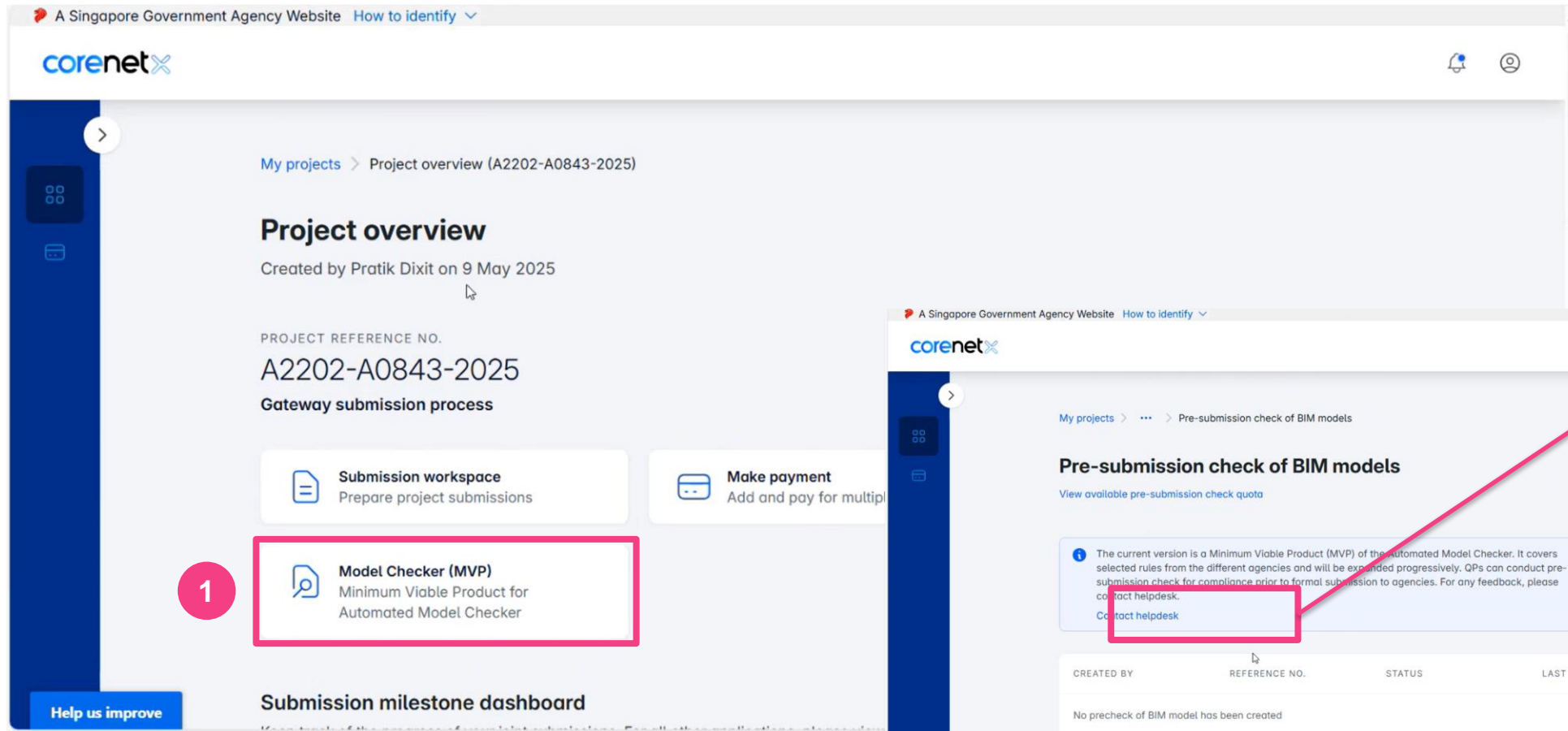
Nr	1
Modified	15-06-2025
Title	BCA-APD:E.3.3-0001001
Description	Approved Document E.2.4 Staircase was flagged as #39;oddly-shaped#39; staircase, therefore, not checked for all staircase-related rules. BCA-APD:E.3.3-0001001 Staircase was flagged as #39;oddly-shaped#39; staircase, therefore, not checked for all staircase-related rules. 11Vi2w2Tb4Cx9ID6pfqJh scdf-2.2.9_addendum 1_tm_ifc
Status	Active
Assigned to	Unassigned
Created by	corenetxautomations@tbc.com
Area	Undertined__
Type	Alert
Label	
Milestone	Undecided
Deadline	
Priority	Open
Visible for	All
Approval	
Custom field 1	
Custom field 2	
Custom field 3	
Custom field 4	

Pre-Submission Check

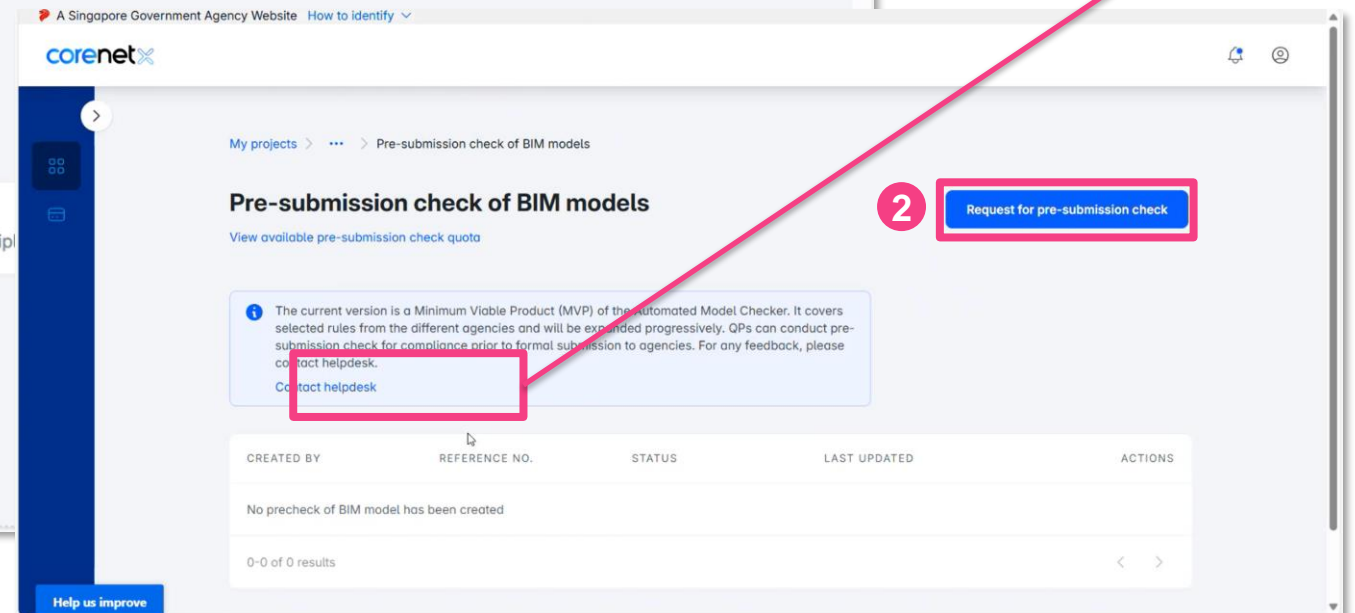
MC MVP is still WIP

To proceed with a pre-submission check, Industry practitioners will need to:

1. Select **Model Checker (MVP)**
2. Select **Request for pre-submission check**



*Should the project team has any feedback on the BETA version, you can send your feedback to **CORENET X Helpdesk***



Pre-Submission Check

MC MVP is still WIP

IFC Model processing and rendering upon BIM file upload

IFC Schema Checks will run automatically upon BIM file upload. Thereafter, Submission Portal will Preview model URL.

For both pre-submission and formal submission, Industry practitioners will be able to preview model on LBV by clicking on the link (selecting Preview model).

Process for request of pre-submission check

- ✓ Upload BIM model(s)
Select and upload one or multiple IFC file(s)
- ✓ Completion of rendering
- ✓ Proceed with BIM quality check

Upload BIM model(s)

Please ensure you upload at least one file and tag it accordingly. Additional files are optional.

- ☐ Architectural model (if applicable)
- ☐ Civil and Structural model (if applicable)
- ☐ Mechanical and Electrical model (if applicable)

Preview of BIM model

Model_xyz.ifc ✓

File size • Timestamp upload

IFC Schema Check Results

⚠ BIM model cannot be processed for rendering due to the following error(s) detected in the BIM model. Should you proceed with submission, processing by Agencies could be affected. Please check and revise the BIM model prior to submission. Please contact helpdesk should you require assistance.

[Error details](#) [Contact helpdesk](#)

Type of attachment

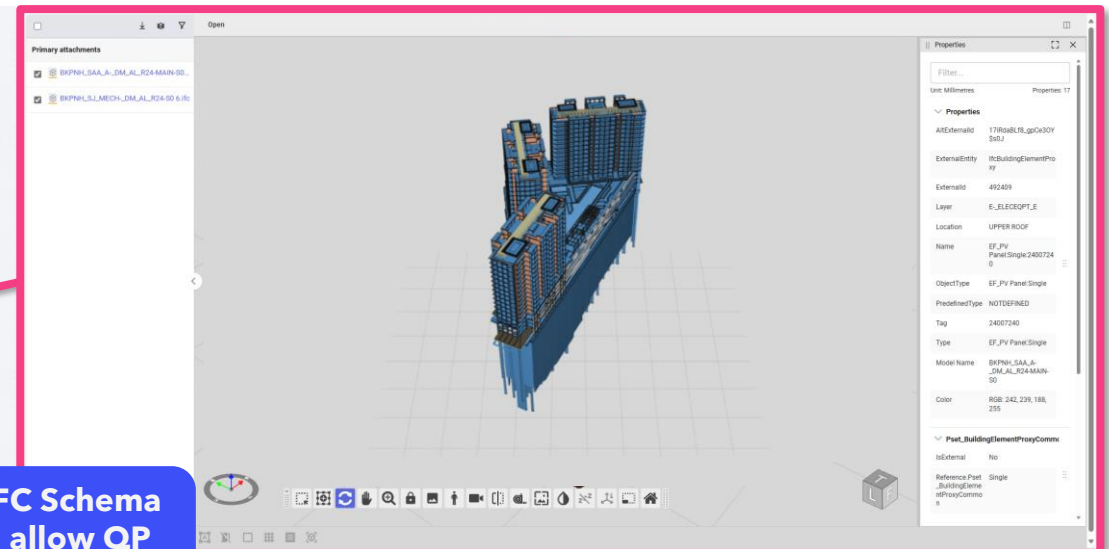
Architectural model

Preview model

[Download](#)

[Delete](#)

Passing of IFC Schema Checks will allow QP to preview the model



Pre-Submission Check

MC MVP is still WIP

Quality check of BIM model

After initiating quality check, the results will be available for download as a BCF file.

Import favorites For quick access, place your favorites here on the favorites bar. [Manage favorites now](#)

corenetX

Project information

- ✓ Pre-submission check of BIM models

Review BIM model quality

1 Status **Completed**

Reference no. QC20250603-25083224-RNMD

Last reviewed on 3 Jun 2025

2 Quality review response [Download](#)

Details

Relevant gateway • Construction Gateway

Uploaded documents

FILE TYPE	FILE NAME	FILE SIZE
-----------	-----------	-----------

Downloads

ModelChecker (1).bcfzip
[Open file](#)

See more

Process for request of pre-submission check

- ✓ Upload BIM model(s)
Select and upload one or multiple IFC file(s)
- ✓ Completion of rendering
Rendering will take some time and you will be notified upon completion
- ✓ Proceed with BIM model quality check
- ✓ View BIM model quality result
- ✓ Proceed with regulatory compliance check

Before making a Formal Submission to Agencies

MC MVP is still WIP

- **The submission process is similar to pre-submission check.** IFC Schema Checks, and Quality Checks will be run on the BIM model.
- **Regulatory Compliance Checks will be conducted** upon completion of formal submission application.
- Results for **Quality Checks** and **Regulatory Compliance Checks** will be returned in agencies' response letter to project team.

The screenshot displays the 'corenetX' web application interface. On the left, a sidebar menu lists various submission categories: 'Public utilities' (with sub-items 'Sewerage and sanitary' and 'Drainage'), 'Environmental health and pollution control', and 'Coordinated BIM' (which is currently selected). Below the menu are links for 'Plans' and 'Fee computation', and a 'Help us improve' button. The main content area is titled 'Coordinated BIM' and shows a 'Draft' status. It includes a section for 'Review BIM model quality' with instructions to check the BIM model against minimum quality requirements. A table below this section shows the current status as 'Pending review' and lists fields for 'Reference no.', 'Last reviewed on', and 'Quality review response', all of which are currently empty. On the right side, there is a 'SUBMISSION STAGE' section showing 'New Submission'. A green notification bubble at the top right states: 'Environmental health and pollution control is updated and ready for review. Email sent to all appointed members.' A pink rectangular box highlights a 'Process for submission of Coordinated BIM' section, which contains two steps: 'Upload BIM model(s)' (with instructions to select and upload one or multiple IFC files) and 'Completion of rendering' (with a note that rendering will take time and users will be notified upon completion). At the bottom right, there are two buttons: 'Save section as draft' and 'Review BIM model quality'.

A Singapore Government Agency Website [How to identify](#)

corenetX

Public utilities

Sewerage and sanitary
Submitted for review

Drainage
Submitted for review

Environmental health and pollution control
Submitted for review

Environmental health and pollution control
Submitted for review

Coordinated BIM

Plans

Fee computation

Help us improve

Coordinated BIM

Last saved on -

Draft

Review BIM model quality

Check that your BIM model(s) have met the minimum quality required prior to conduct of pre-submission check. You may refer to side panel on guidance to complete the pre-submission check application.

Status	Pending review
Reference no.	-
Last reviewed on	-
Quality review response	-

Back

Save section as draft

Review BIM model quality

Environmental health and pollution control is updated and ready for review. Email sent to all appointed members.

SUBMISSION STAGE
New Submission

Process for submission of Coordinated BIM

- ✓ Upload BIM model(s)
Select and upload one or multiple IFC file(s)
- ✓ Completion of rendering
Rendering will take some time and you will be notified upon completion

Key Insights, Learning Points and Good Practices

Key Insights from CORENET X Live Submission Projects

Mindset & Practices

INDUSTRY - Observations from live submission projects

Background

- The new regulatory process requires **upfront coordination** to minimise downstream issues faced during construction
- This is a **major shift from today's process** which allows submissions to be made in silo. Agencies' assessment and requirements are in turn conveyed in silo, often uncoordinated (or even conflicting)
- As part of CORENET X engagement efforts, the team has been engaging REDAS and key developers on the need for proper planning and to provide sufficient time for design

Observations

- While some developers have provided longer period of design, others continued to work based on **old mindset and practice, leading to rushed and low quality submissions**
 - E.g.: One project catered only 1.5 months for the design of a super high-rise residential development
- Some projects continue to make design changes, causing reworks by QPs to cater for these changes

Key Insights from CORENET X Live Submission Projects

Level of collaboration

INDUSTRY - Observations from live submission projects

Background

- The new regulatory process requires **collaboration and communication among the various stakeholders**
- This ensures the design submitted for approval is coordinated and agencies will access and review a consolidated design (comprising from a set of models).

Observations

- Designs are largely still in silos & there is limited communication to achieve effective collaboration
A shift in unit layout will mean C&S engineer needs to redo its structural design & M&E engineers to need replan its services
- **Inputs from builder is important** and it is useful for builder to be onboarded early in the project

Key Insights from CORENET X Live Submission Projects

Industry's Familiarity

INDUSTRY - Observations from live submission projects

Background

- The new regulatory process aligns agencies' level of details at key milestones, striking a balance between what is required and could reasonably be provided
- It requires coordination among the various QPs, who may each be using different authoring software
- To **ensure collaboration and interoperability, openBIM format is adopted**

Observations

- Some **project teams are unfamiliar of the level of details needed at each milestone, leading to incomplete submissions** (e.g. missing info)
- Coordinated submission requires QPs to provide correct geo-references & consistency in the storey height & naming
- Gaps observed among the various QPs (e.g. Architect, Civil and Structural Engineers)

What will be covered under the industry guidebook?

- Compilation of key learning points and best practices from observations made from live projects
 - Intended to help industry practitioners in **understanding potential areas to look out for, recommended good practices as well as common pitfalls to avoid**
-

1 Industry onboarding checklist

- Submission Portal
- IFC+SG

2 Key Takeaways

Planning your project

- Planning and coordination
- Timeline management
- Dependencies

Making a submission

- Navigating Submission Portal
- Submission Process & statutory responsibility
- Submission Quality
- Level of details for M&E Submissions

Modelling for IFC+SG

- Model federation
- Alignment of levels and zones
- Modelling Quality

Common Pitfalls and Adopting Good Practices

Key Findings on Workflow and Process

Project Planning & Coordination



Common Pitfalls Observed

➤ **Insufficient Clarity on the Scope of Work**

No consensus over who is leading the overall coordinator. In some cases, Architect and Builder each felt that the other party should be the coordinator.

➤ **Design Coordination Gaps**

No discussion among QPs over design change and its potential impacts.

➤ **Lack of Overall Project Coordination**

QP viewed that it is not their responsibility to ensure submissions by other QPs (e.g. Specialist QPs) are completed, resulting in coordination gaps and delayed project approval.



Architect repositioned building blocks and modified the layout after Piling Gateway (PG) approval. Such design changes results in:

- Structural Engineer having to redo structural calculations
- M&E Engineer needed to redesign the building services to align with the revised layout.



Recommended Practices

- ✓ Establish **clear roles** over whom should lead the design and overall project coordination respectively; this should be viewed as a **collective responsibility**
- ✓ To identify two key roles at start of project :
 - 1.The **Overall Lead Coordinator(s)**
 - 2.**Representative from each firm** to work with Lead Coordinator(s) and ensure internal alignment

Common Pitfalls and Adopting Good Practices

Key Findings on Workflow and Process

Timeline Management



Common Pitfalls Observed

➤ **Insufficient Time Catered for Submission Preparation**

Unrealistic timelines lead to rushed submissions, compromising quality and causing unnecessary iterations

➤ **Late Applications for Waiver/Pre-Consultation**

If there is intent to deviate from the requirements, it is important to factor time for waiver application or pre-submission consultation.

EXAMPLE

QP relied on past experiences and presumed that waivers would be granted at a later stage. The QP's approach of “*agency will accept it anyway*” demonstrated misunderstanding of proper submission procedures and poor timeline management.



Recommended Practices

- ✓ Timeline should be agreed within the entire project team
- ✓ **Allocate realistic timeframes** for design development
- ✓ **Plan sufficient coordination periods** between disciplines
- ✓ Account for **potential revision cycles** in the project schedule
- ✓ **Include buffer time** for pre-submission consultations and waivers, if required

Design Changes



Common Pitfalls Observed

➤ **Frequent design changes during submission**

Design changes introduced during resubmissions lead to extended approval timelines

➤ **Builders engaged after commencement of design and submission phases**

Contractor was involved halfway when the design was near completion, which resulted in consultants having to redesign to incorporate the contractor's inputs, resulting in abortive works.



Recommended Practices

- ✓ Establish **clear design freeze milestones**, project team should discuss and align on the timeline when design freeze should happen.
- ✓ **Early builder engagement** is important if design input is required from the builder

Dependency that affect Site Progress



Common Pitfalls Observed

- **Fail to understand the dependency between submissions and submissions that affect site progress**
- **Project planning did not cater for submissions needed for off-site activities**

To carry out off-site activities such as pre-cast, BCA's Structural submissions and Permit to commence structural works are required. Projects may face delays if they do not cater for this in their planning for part ST submission.



Recommended Practices

- ✓ Understand these dependencies and make **plan for your project timeline/ schedule.**
- ✓ **Start the preparation early** and this requires **close coordination between the consultants.**
- ✓ If extensive off-site activities are involved and lead time is required, consider covering the scope early in the submission timeline.

Navigating the Submission Portal

Aspect	Current CORENET 2.0	CORENET X
Appointment	QPs attach authorisation letters documenting the appointment of members in submissions	Appointment of members must be done before QPs can access submission forms of their respective scope of works
Submission Responsibilities	QPs indicate their own scope of works in authorisation letters	Project Coordinator (lead QP) of the system to collate respective QPs' submission scopes and indicate them as part of appointment process
Joint submissions vs independent submissions	Each submission made separately to different agencies	At key gateways, submissions (DC and BP) are prepared and made jointly to all applicable regulatory agencies All other submissions remain independent
Project members	Parties such as developer, RE/RTO, Accredited Checker do not interact with CORENET	Developer, RE/RTO, Accredited Checker to login and interact with the system to perform appointment and submission inputs

Navigating the Submission Portal

- Project members who currently do not need to use CORENET 2.0 but will need to access CORENET X will need to familiarise themselves with Singpass for Business (Corppass).
- As regulatory forms have digitalised on CORENET X, the appointment of QPs and the subsequent workflows such as creation of submissions will be delayed if Corppass for each firm's representatives has not been set up.



Good Practice

- For corporate entities, industry stakeholders **should set up their Corppass accounts as early as possible** including Corppass access to the CORENET X Submission Portal so that any issues that may arise can be addressed with their Corppass Admin (e.g. internal clearances required, Corppass Admin is away on leave, etc.)
- Corppass admins should **authorise their staff (Developer/Builder/QP and their assistants) to represent the company and be able to access “CORENET X Industry Portal” (<https://portal.corenet.gov.sg/>)** e-Service.

Common Pitfalls and Adopting Good Practices

Key Findings on Workflow and Process

Plan the Project TOP/CSC Journey Early



Common Pitfalls Observed

➤ **QP was informed late to make his/ her submission required for TOP/ CSC**

Currently, some of the project members may not be users of CORENET 2. However, with CORENET X, they will need to log in to make online declarations.

Therefore, it is important to ensure they are aware of these requirements to minimise potential delays.

➤ **Late Submission to BCA for TOP requirements, after all other technical clearances are obtained**



PEs assumed that COS would still be via hardcopy forms and the project team overlooked the involvement of PE(Electrical) in submitting the Certification of Supervision for Lightning Protection System. This oversight led to additional time and delay the TOP/CSC process.



Recommended Practices

- ✓ Inform the relevant project members of the actions required early
- ✓ Utilise the **TOP/CSC status dashboard** in CORENET X Submission Portal to track technical clearances/ documentation, and plan your TOP/CSC process.
- ✓ For partial TOP, **make a pre-submission consultation** to the agencies for alignment

Common Pitfalls and Adopting Good Practices

Key Findings on Workflow and Process

Submission Process & Statutory Responsibility



Common Pitfalls Observed

- **Lack of Clarity over who should be responsible for an agency submission**

QP Assistant (QPA) may not be clear on the agreed scope of work and statutory responsibility. As the assigned scope will affect access to respective parts of the submission, it is important to ensure clarity in this.

- **Initiating multiple requests to developer for members' appointments**
- **Missing Digital Signing/ Expired Netrust Digital Signing Certification**
- **Long filepath**

File located in multiple levels of sub-folders may cause error during encryption



Recommended Practices

- ✓ Align within the project team to ensure there is **clarity over each project members' scope**
- ✓ **Consolidate the request and send only 1 email notification** to the intended party
- ✓ Ensure the timely renewal of the Netrust Digital Signing Certificate

Common Pitfalls and Adopting Good Practices

Key Findings on Workflow and Process

Submission Quality

Common Pitfalls Observed

➤ **Lack of clarity in correspondence**

Generic replies such as 'complied with' or 'noted' are insufficient and may lead to additional queries.

➤ **Skipped model checks before submission**

Project teams who skip quality checks often submit models with obvious issues.

EXAMPLE

Common errors that could be visually identified and resolved before submission such as:

- Models submitted with missing files result in incomplete elements (e.g. roof)
- Federation issues e.g. building elements (e.g. drains) to appear “floating” and disjointed tower block and podium

Recommended Practices

- ✓ To conduct thorough **quality checks before submission**.
- ✓ Provide **clear responses** that detail the changes made and where to find them to facilitate processing

Model Federation



Common Pitfalls Observed

➤ **Lack of Coordination in Initial Setup**

Fails to establish and document agreed-upon coordinate settings during project kick-off leads to models being created with different reference points and orientations, causing significant coordination issues downstream.

➤ **Poor Communication of Reference Point Changes**

When project reference points are modified without proper notification to all stakeholders, teams continue working with outdated coordinates, resulting in misaligned models.



Recommended Practices

- ✓ Establish a **common project reference point at project start**, ensuring all discipline models align within the same coordinate system for accurate federation.
- ✓ Any changes to the reference point require **immediate notification to the BIM teams to maintain coordination accuracy** across all models.

Alignment of Levels and Zones



Common Pitfalls Observed

➤ **Lack of communication between project team**

Inconsistent storey names and FFL across models, often caused by poor communication between disciplines and the absence of a shared storey reference.

➤ **Overlooked workflow to manage changes**

No proper workflow in place to manage changes in storey name, FFL, and height, which can lead to inconsistencies across discipline.



Recommended Practices

- ✓ To **define and maintain a centralized standard** for **storey naming, height (“Z” value) and Finished Floor Levels (FFL)** that all disciplines consistently apply throughout the project.
- ✓ Using shared reference files help prevent discrepancies and ensures alignment across all models

Model Quality



Common Pitfalls Observed

- ✓ **BIM teams across different disciplines often work in silos**
- ✓ **Apply outdated practices to current CORENET X requirements**
- ✓ **Weak Collaboration Between QPs and BIM Teams**

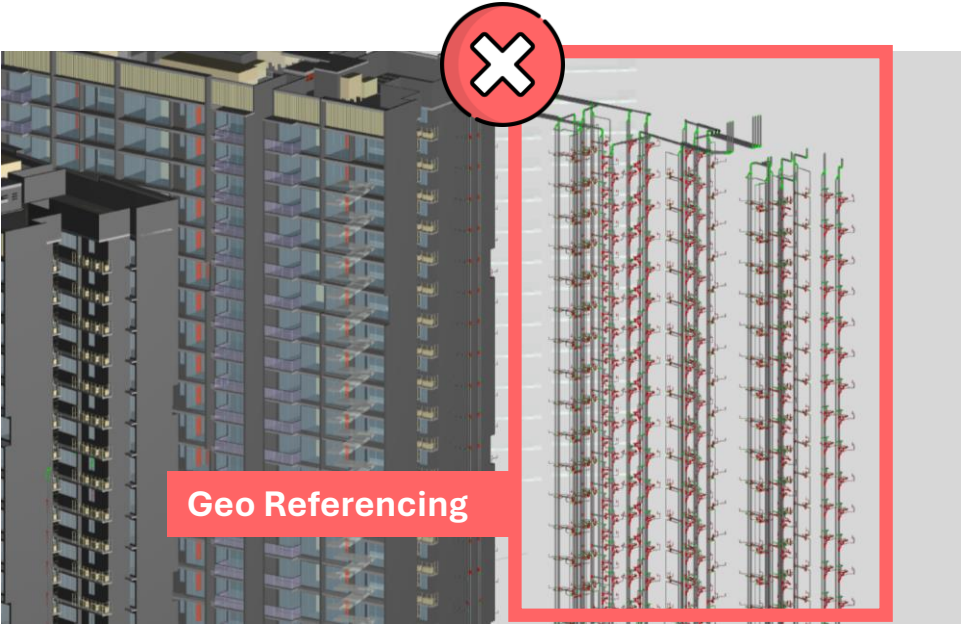
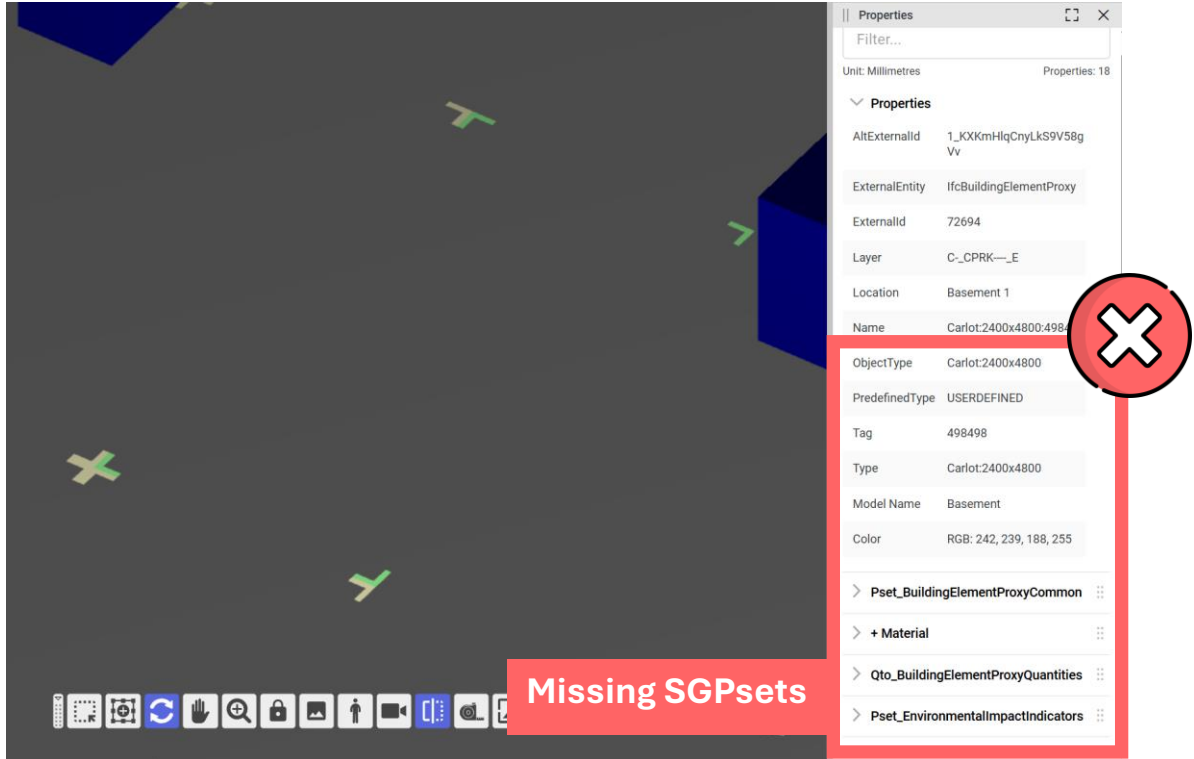
QPs are not actively engaged with the BIM team, there is a risk of misinterpreting design intent or overlooking compliance issues.



Recommended Practices

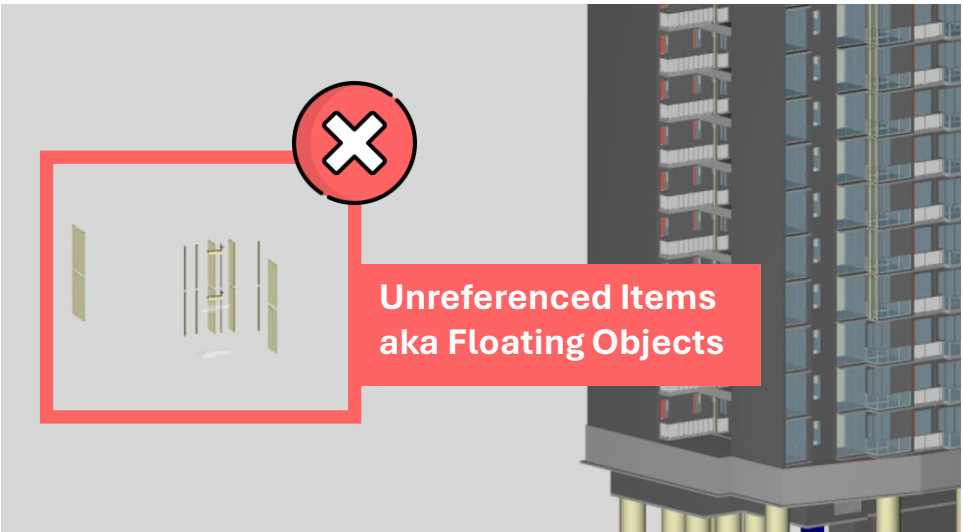
- ✓ BIM teams should **jointly plan modelling workflows**, avoiding siloed efforts that lead to inconsistent outputs.
- ✓ Open mindset is needed to adapt to **updated workflows aligned with IFC+SG** requirements.
- ✓ QPs must stay engaged with the BIM team to ensure models reflect design intent and meet regulatory expectations.

Examples of poor modelling observed



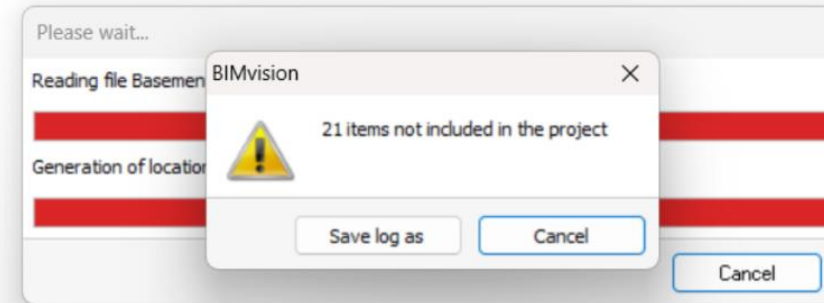
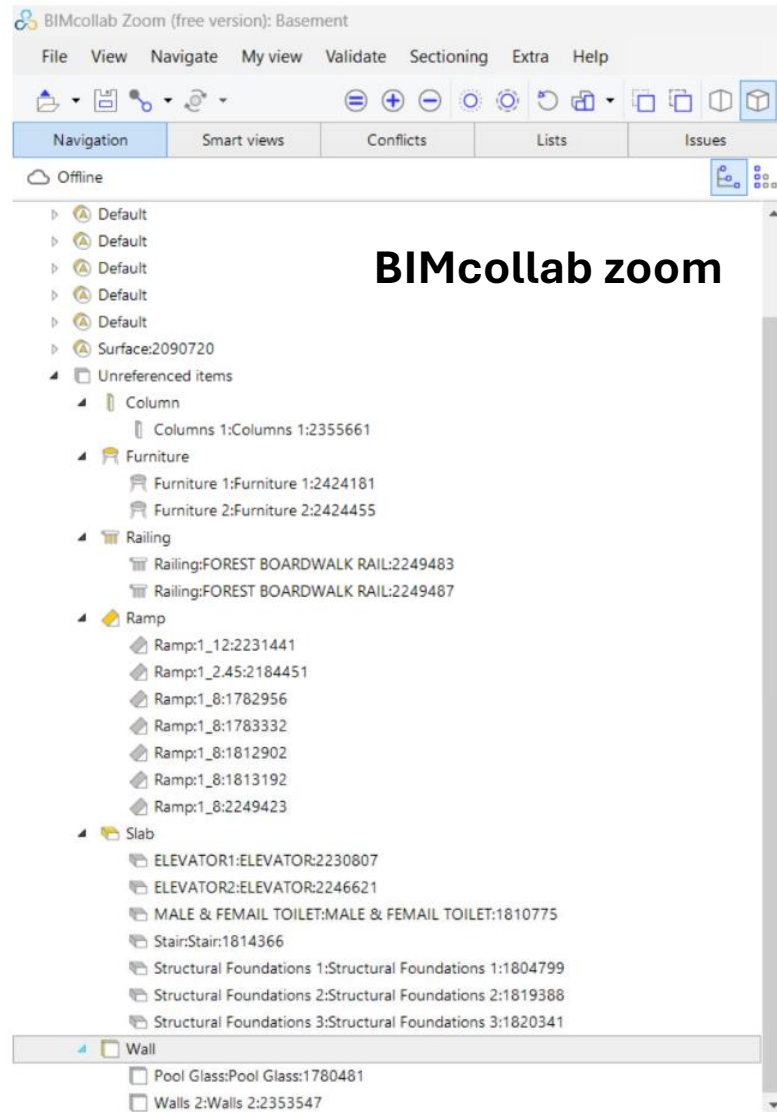
Agency	Identified Component	Identified parameters	Discipline	IFC4 Entities	IFC Sub Types (* = USERDEFINED)	Property Set	Property Name	Property Type	Property Unit	IFC4 Material	Sample Value for Reference
BCA	Parking Lot	Barrier Free Accessibility	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	BarrierFreeAccessibility	Boolean	N.A	N.A	TRUE/FALSE
BCA	Parking Lot	Family Parking Lot	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	FamilyLot	Boolean	N.A	N.A	TRUE/FALSE
BCA	Parking Lot	Length	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxyDimension	Length	Length	mm	N.A	N.A
BCA	Parking Lot	Width	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxyDimension	Width	Length	mm	N.A	N.A
LTA	Parking Lot	Car Parking Served By Car Lift	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	CarParking_ServedByCarLift	Boolean	N.A	N.A	TRUE/FALSE
LTA	Parking Lot	Mechanised Parking System	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	MechanisedParkingSystem	Boolean	N.A	N.A	TRUE/FALSE
LTA	Parking Lot	Length	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxyDimension	Length	Length	mm	N.A	N.A
LTA	Parking Lot	Width	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxyDimension	Width	Length	mm	N.A	N.A
LTA	Parking Lot	Lot Number	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	LotNumber	Label	N.A	N.A	N.A
NPARKS	Parking Lot	Open At Grade	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	OpenAtGrade	Boolean	N.A	N.A	TRUE/FALSE
NPARKS	Parking Lot	Perforated	ARC	IfcBuildingElementProxy	*CARLOT	SGPset_BuildingElementProxy	Perforated	Boolean	N.A	N.A	TRUE/FALSE

Industry mapping file



Examples of poor modelling observed

Addressing the unreferenced items



GUID	Entity	Type	Type Name	Tag	Element ID
3\$xFnYrP340\$0\$gGPEd2TU	Column	Column	Columns 1:Columns 1:2355661		2355661
3LkrxsgHBPFSclW9WldVPo	Furniture	Furniture	Furniture 1:Furniture 1:2424181		2424181
119tBFU17JafdgExM\$OdRq	Furniture	Furniture	Furniture 2:Furniture 2:2424455		2424455
1cMjXIUmU\$gwr25ZtaGbp	Railing	Railing	Railing:FOREST BOARDWALK RAIL:2249483		2249483
1X2M14T9b5kA0aRwFUFJC	Railing	Railing	Railing:FOREST BOARDWALK RAIL:2249487		2249487
3t3WeHib\$81xb61b16YaMm	Ramp	Ramp	Ramp:1_8:1782956		1782956
1J8CkQk4OQ74FL9R40zeAp	Ramp	Ramp	Ramp:1_8:1783332		1783332
3gDUG7Uwjw0F80xNhPnOPb	Ramp	Ramp	Ramp:1_8:1812902		1812902
05rUttPSlnTQbTKuDObY_\$	Ramp	Ramp	Ramp:1_8:1813192		1813192
11gtSNUQi4OfGepGNdBexd	Ramp	Ramp	Ramp:1_2.45:2184451		2184451
2Adrd6FwHFGz16aUAIv7mk	Ramp	Ramp	Ramp:1_12:2231441		2231441
3hyuoMaLNsjt2_ois8mU6zS	Ramp	Ramp	Ramp:1_8:2249423		2249423
21fsxksCcH6F2f6fdjPD2P	Slab	Structural Foundations 1:Structural Foundations 1:1804799			1804799
3iDDUJFwN3bg_mmr34fiqN	Slab	MALE & FEMAIL TOILET:MALE & FEMAIL TOILET:1810775			1810775
1x\$gKCCAmNFFQY42CCv6Mt	Slab	Stair:Stair:1814366			1814366
2DXFN\$EQFax\$YXWwj17UI	Slab	Structural Foundations 2:Structural Foundations 2:1819388			1819388
1viftPiHbdPg\$0tZa_acY8	Slab	Structural Foundations 3:Structural Foundations 3:1820341			1820341
1WoEzU22N8MFoN\$wboFhd	Slab	ELEVATOR1:ELEVATOR:2230807			2230807
3YozuaeGIBYrgDdKBW6Gr	Slab	ELEVATOR2:ELEVATOR:2246621			2246621
0vBsqiM4kF_keVJzocjiYg	Wall	Pool Glass:Pool Glass:1780481			1780481
1qfVRExHXcg0FnuuLjyzla	Wall	Walls 2:Walls 2:2353547			2353547
21					

BIMvision

Onboarding IFC+SG Checklist

S/N	Task	Status	Remarks
BIM Authoring Software and Features			
1.	Ensure the latest Revit patch is installed	<input type="checkbox"/>	Refer to link for details
2.	Ensure the latest Revit interoperability tool is installed	<input type="checkbox"/>	Refer to link for details
3.	Ensure the Revit-IFC app is installed For Revit 2025 user > Please uninstall the above if you have issue activating the Revit-IFC dialog box > refer to link for details	<input type="checkbox"/>	Refer to link for details
4.	Ensure the Revit IFC exporter is the latest version	<input type="checkbox"/>	Refer to link for details
Component Creation and IFC+SG Information Population			
5.	Study the IFC+SG regulatory requirements for different gateways	<input type="checkbox"/>	Refer to link for key gateways details Refer to link for Code of Practice (COP) details
6.	Study how to prepare an IFC+SG model Please refer to link for Glossary of Identified Components	<input type="checkbox"/>	Refer to link for details
7.	Ensure you download relevant IFC+SG toolkits and resource files	<input type="checkbox"/>	Refer to link for details
8.	Use third-party applications to help in IFC+SG model preparation	<input type="checkbox"/>	Refer to link for details
Multi-disciplinary Coordination and Model Quality			
9.	Be sure to read through the model submission good practice guide	<input type="checkbox"/>	Refer to link for details
10.	Be sure to read through the multi-disciplinary coordination good practice guide	<input type="checkbox"/>	Refer to link for details
11.	Be sure to read through the checking levels (z-coordinates) good practice guide	<input type="checkbox"/>	Refer to link for details

S/N	Task	Status	Remarks
12.	<p>Be sure to review the exported federated IFC files before submission</p> <p>When using an IFC Viewer (BIMVision or BIMCollab Zoom), make sure it is the latest build. (Note: Registration may be required, but both viewers are free.)</p> <p>BIMVision > Click link to download BIMCollab Zoom > Click link to download</p> <p>Essential Points for Model Quality: -</p> <ul style="list-style-type: none"> • Ensure IFC models can be federated together as intended. • Ensure components are exported to the correct IFC entity and subtype with the relevant IFC+SG properties and property sets. • Ensure there is only one IfcSite per IFC file when exporting with linked files. (Tip for Revit user: In the Revit IFC exporter > Additional Content tab > linked files, select 'Export in same IfcSite') • Ensure there are no unreferenced items. (Tip: Make sure all elements created in Revit are referenced to a level datum) <ul style="list-style-type: none"> ◦ If you notice any unreferenced items, locate and resolve their referencing issues. (Tip for Revit User: When you encounter this warning while opening an IFC file in BIMVision, download the log and use the element ID (tag) or GUID to locate the elements in Revit) • Ensure all level datums are aligned across all models (i.e. datum names must be unique (including the GUIDs), with the same Finished Floor Level) 	<input type="checkbox"/>	Refer to link for details

Industry Support, Resources & Upcoming Events

Internal checklist for firms

People

- ✓ **Building a CORENET X core team**
 - equip CORENET X experts as “go-to” persons
- ✓ **Manage the change & evaluate effectiveness of the training plan** – track KPIs
- ✓ **Plan for the manpower and resources needed** - support the changes

Process

- ✓ **Understand the RABW process & Agencies' requirements** –
 - Attend RABW training
 - Study the Code of Practice
 - Make a voluntary submission
 - Map the new RABW into internal workflows & conduct impact assessment

Technology

- ✓ **Ensure system readiness** –
 - Attend IFC+SG training, create and map internal templates to meet IFC+SG requirements
 - Familiarise with the Submission Portal Training Environment

Trainings and Courses for Industry

1

	Mode of Lessons	Trainers
CORENET X Regulatory Approval for Building Works (RABW) Course <i>Understanding the new RABW Processes</i>	Physical	The Architect's Academy by Singapore Institute of Architects (SIA)
		BIMAGE
		BCA Academy
		AcePLP(AIA)
	Self-paced Online Learning	Bluskai

2

	Software	Trainers
IFC+SG Training <i>Preparing OpenBIM submissions using IFC+SG</i>	Revit	AcePLP Pte Ltd, BIMAGE consulting, SP Pace Academy, Innocom
	Tekla	AcePLP Pte Ltd
	Archicad	Graphisoft
	Bentley	Bentley, AcePLP(AIA)

Please scan the QR code below to find out more:



<https://go.gov.sg/cxtrainingcourses>

CORENET X Code of Practice

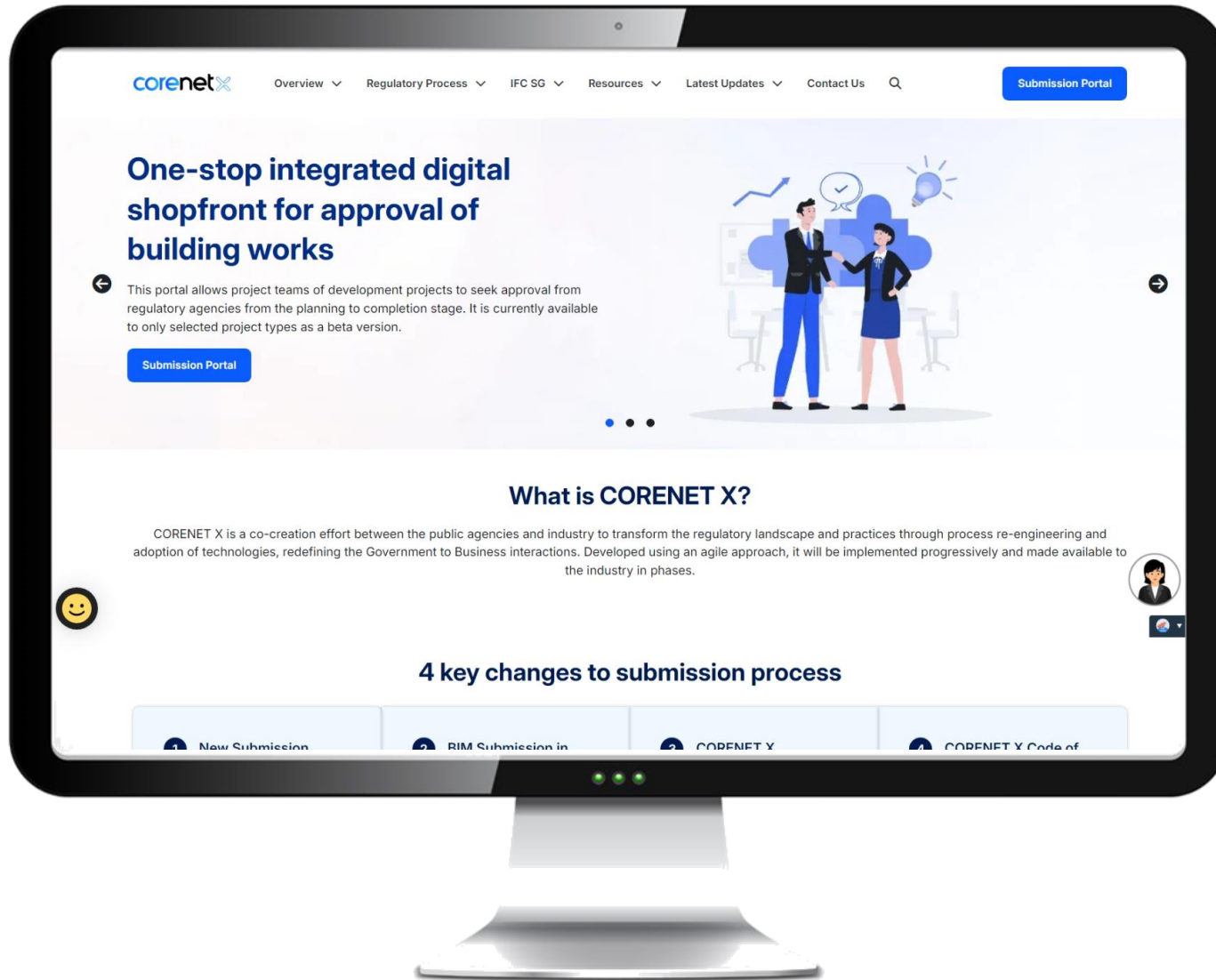
- First edition was **released on September 2023**
- Intended to help industry practitioners in understanding **how to prepare multi-agency regulatory submissions across the key submission gateways in CORENET X**
- Includes **recommended procedures** and **good practices** to address common BIM issues
- This Code of Practice does not substitute Handbooks, Circulars or other regulatory publications of our regulatory agencies.
- **Complements other resources on the CORENET X website**, including the IFC+SG Resource Toolkit

[Latest Version Here]

**The 2nd edition is
now available!**



CORENET X Website & Self-Help Resources



- Interactive COP
- Submission Portal Guides
- IFC+SG
- Training & Funding
- Past Events & Material
- Circulars
- **NEW** List of firms that have onboarded CORENET X

More details on CORENET X can be found at:
<https://go.gov.sg/cx>



CORENET X Training Environment

Training Environment for Simulated Hands-on



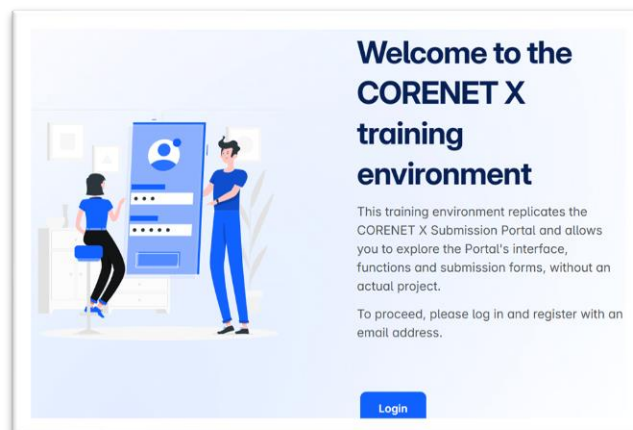
Training environment replicates the CORENET X Submission Portal



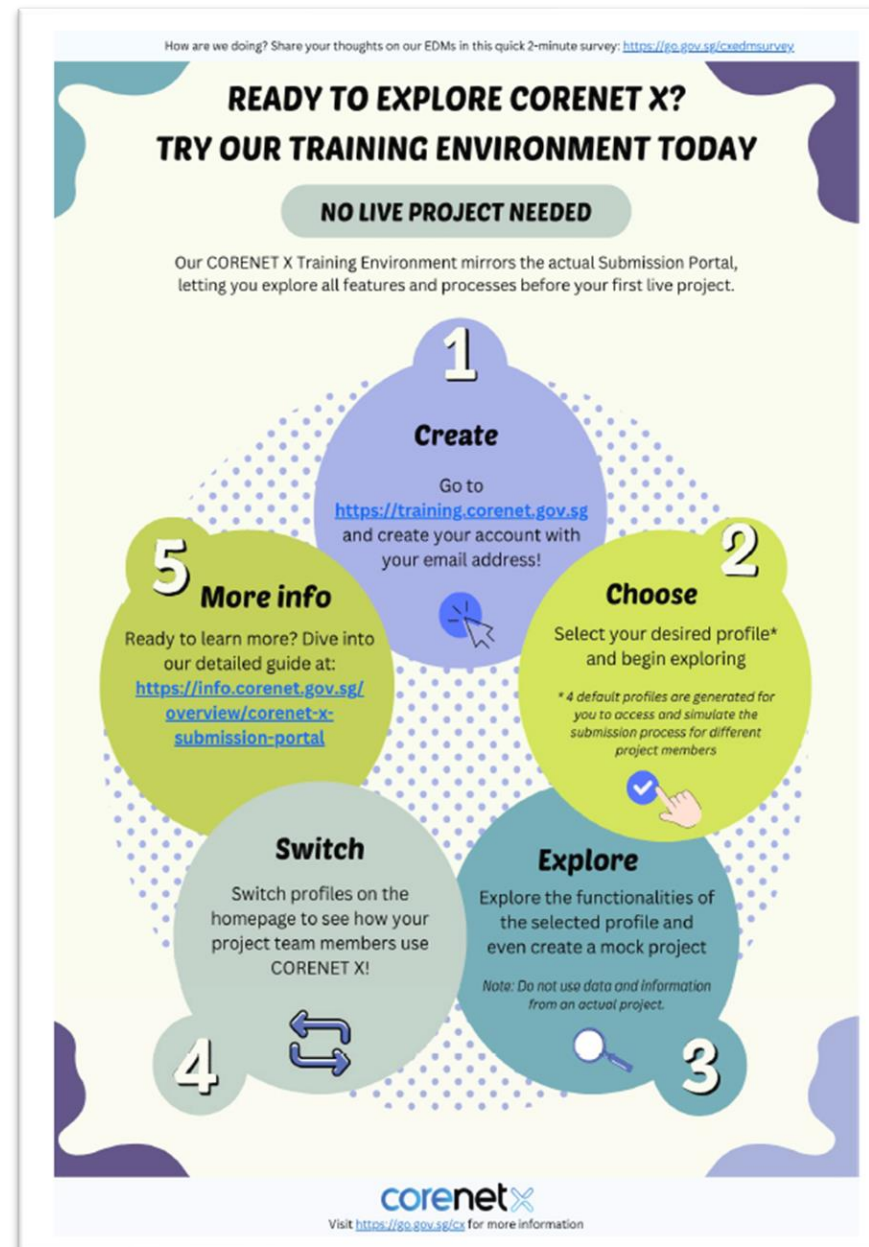
Allow industry users to explore the Submission Portal's interface, functions and submission forms without an actual project.



Training guide provided to help industry navigate the simulation environment
(<https://info.corenet.gov.sg/overview/corenet-x-submission-portal>)



<https://training.corenet.gov.sg>



CORENET X Helpdesk, Clinic & FAQ

To provide troubleshooting channels and FAQ resources for industry support and reference



Clinic-Dedicated Platform for CORENET X Consultations

- Platform to provide support for CORENET X and RABW queries
- Address project-specific submission and regulatory requirements
- Deliver hands-on guidance in partnership with BIM training providers



Helpdesk-Specialised Technical Support for Issue Resolution

- Serve as first point of contact for industry users
- To provide frontline support, managing queries, issues and feedback from industry
- Diagnose and resolve technical problems and track issues through to completion



FAQ - For Immediate Solutions and Quick Reference

- Updated regularly with latest CORENET X information and developments
- Enable quick access to standard solutions and resolution guidance
- Serve as comprehensive knowledge repository for industry

Thank You

