



# Getting Ready for CORENET X



# AGENDA

*Check-in*

- 1 CORENET X Essentials:**  
A recap on important details
- 2 Technological Enablers:**  
The tech behind CORENET X
- 3 Understanding the new RABW:**  
Deeper dive into the 3-Gateway Process
- 4 Ongoing Projects:**  
Learnings & Best Practices
- 5 Taking Action:**  
Getting prepared for CORENET X
- 6 Quiz:**  
Test your understanding!

*Break +  
Q&A*





Check-in

# CORENET X: Redefining the way we work - YouTube



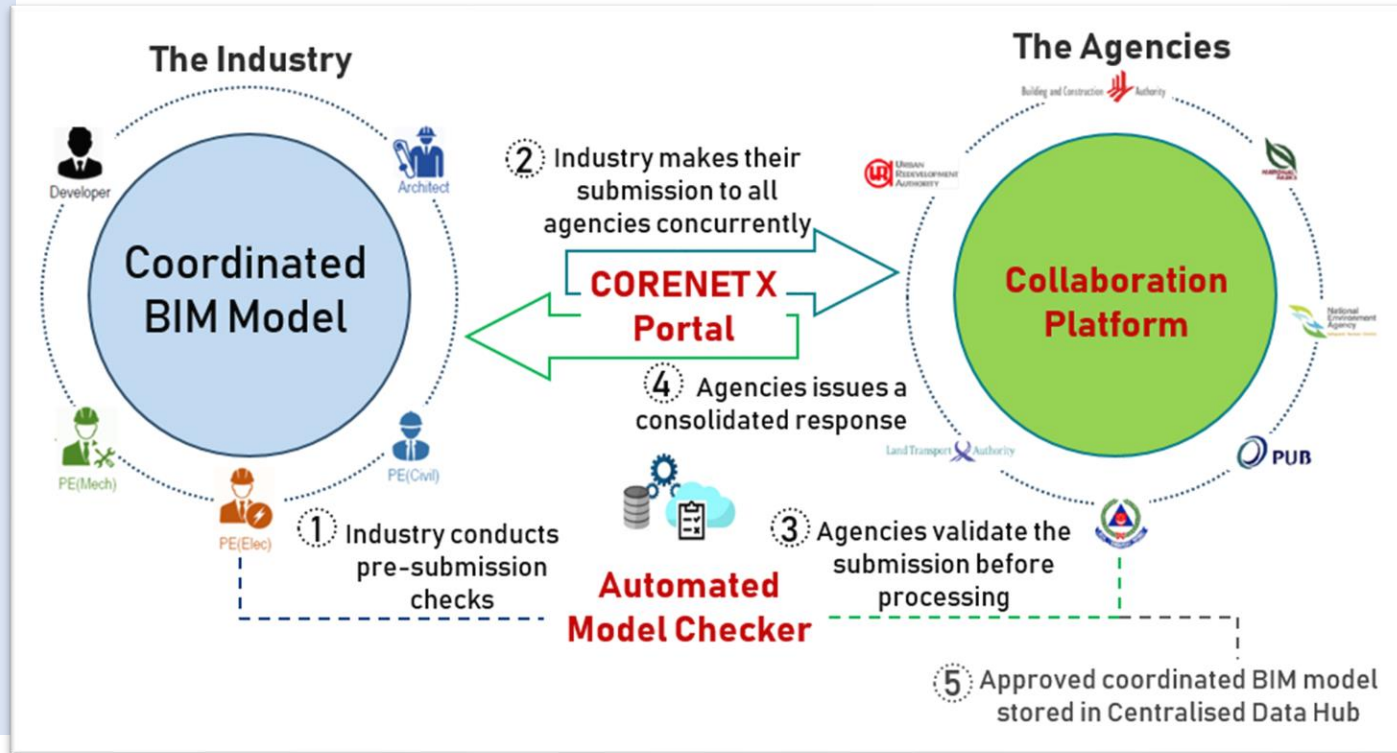
# Vision of CORENET X

A future ecosystem of regulatory approval for building works that accelerates the transformation of the construction industry

## FIRST IN THE WORLD One-Stop Integrated Digital Shopfront

### TRANSFORMATION of INDUSTRY

- Promote design coordination & teamwork
- Promote digitalisation of construction sector
- Support IDD<sup>1</sup> & DfMA<sup>2</sup> imperatives



### TRANSFORMATION of REGULATORY AGENCIES

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

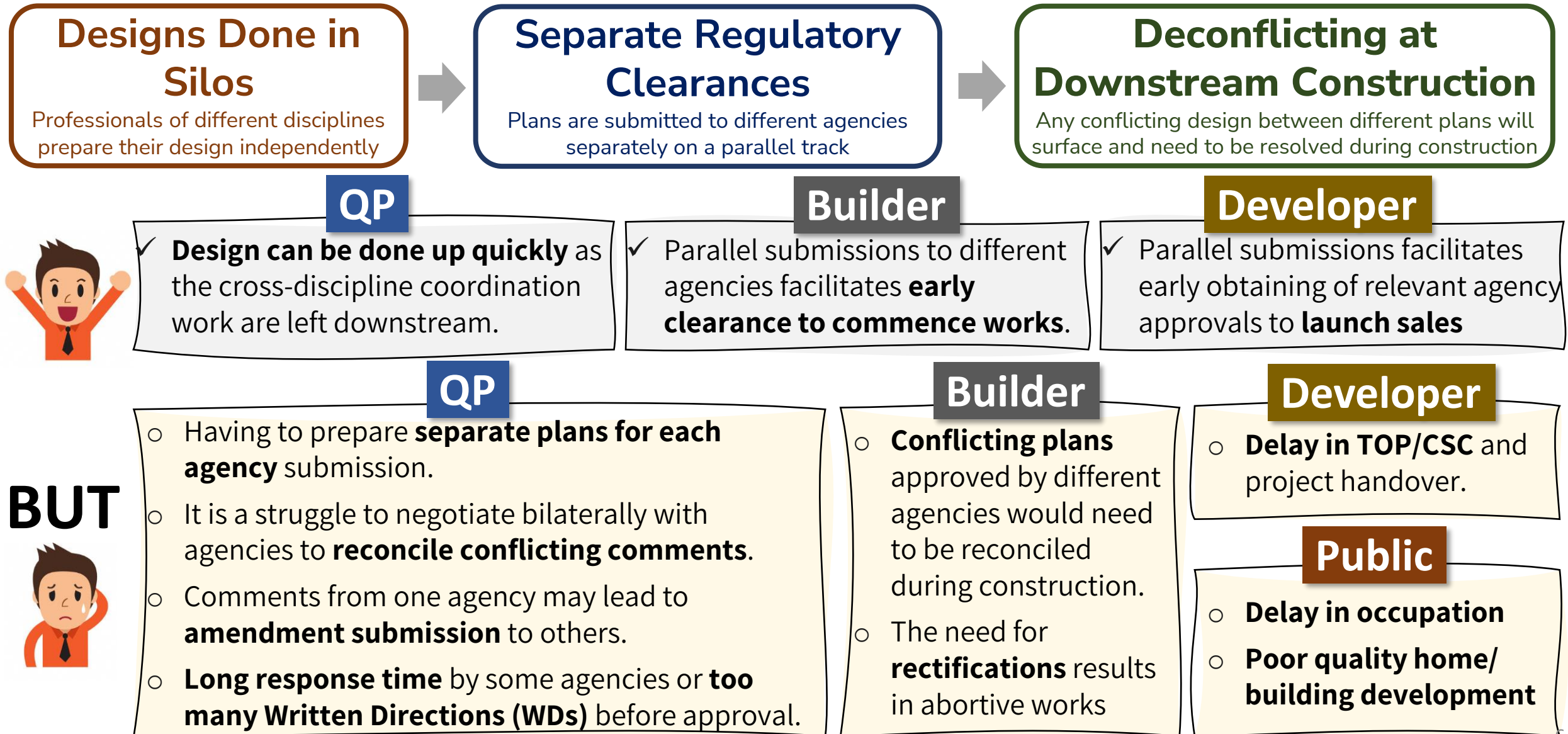
<sup>1</sup> IDD is the use of digital technologies to integrate work processes and connect stakeholders working on the same project throughout the construction and building life-cycle

<sup>2</sup> 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.



# Key Impetus for Change

Industry's pain points due to the existing separate and concurrent regulatory approval process



# Service Journey with the Industry

Co-created with industry stakeholders the new Regulatory Approval for Building Works (RABW) process

## SERVICE JOURNEY 1.0

PHASE 0: DISCOVERY PHASE  
Service Journey Blueprint  
(mid Oct 18)

~4 months

Kick-Off

Interviews

Workshops

## SERVICE JOURNEY 2.0 (26 WEEKS)

KICK OFF:  
Commissioning  
(mid Jul 19)

PHASE 1:  
Envision  
(Aug 19)

PHASE 2:  
Design  
(Oct 19)

~4 wks

~8 wks

~10 wks

~4 wks

NOW

Kick-Off/  
Commissioning  
Checkpoint

Visioning  
Checkpoint

Design  
Checkpoint

Endorsement  
of Action Plan

Visioning Workshop

Detailed Design Workshop(s)

## IMPLEMENTATION

PHASE 3:  
Implementation  
(Since Dec 19)



Engaged **6** TACs



Engaged **57** firms

- Comprising Developers, Consultants (architectural, C&S and M&E), and Builders

7 Sessions involved

**106** industry reps  
**39** agency reps

Consulted

**56** BIM Managers

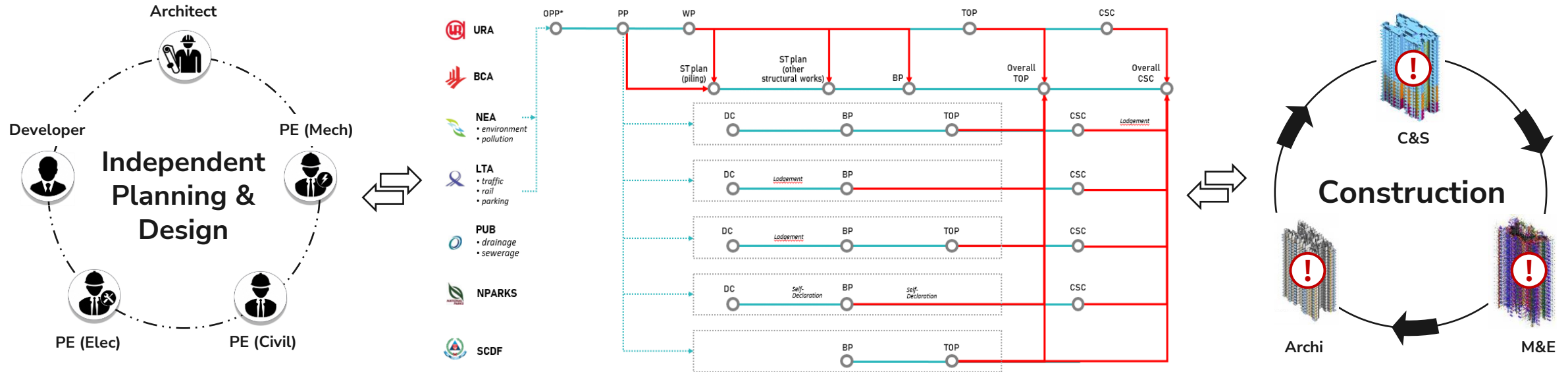


# CORENET X Essentials:

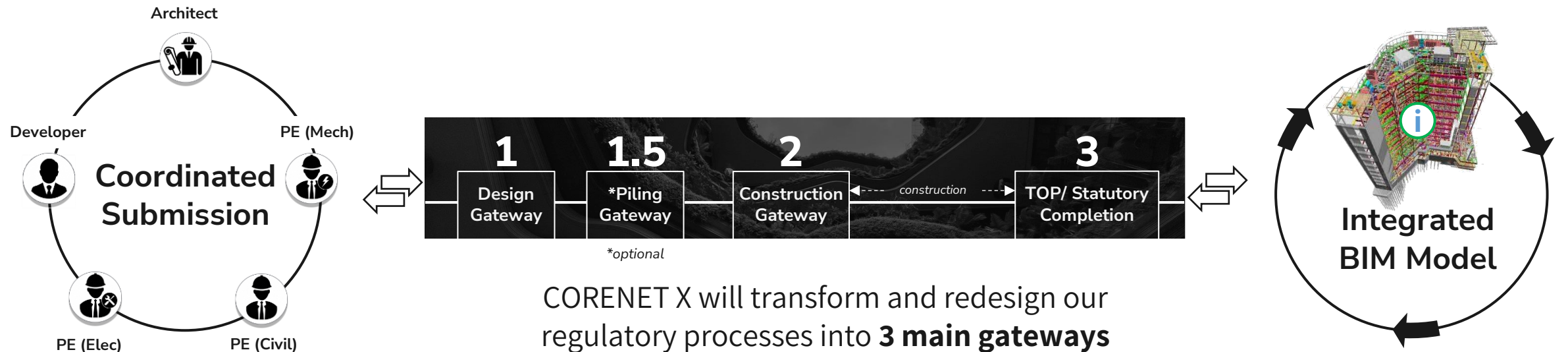
A recap on *important* details



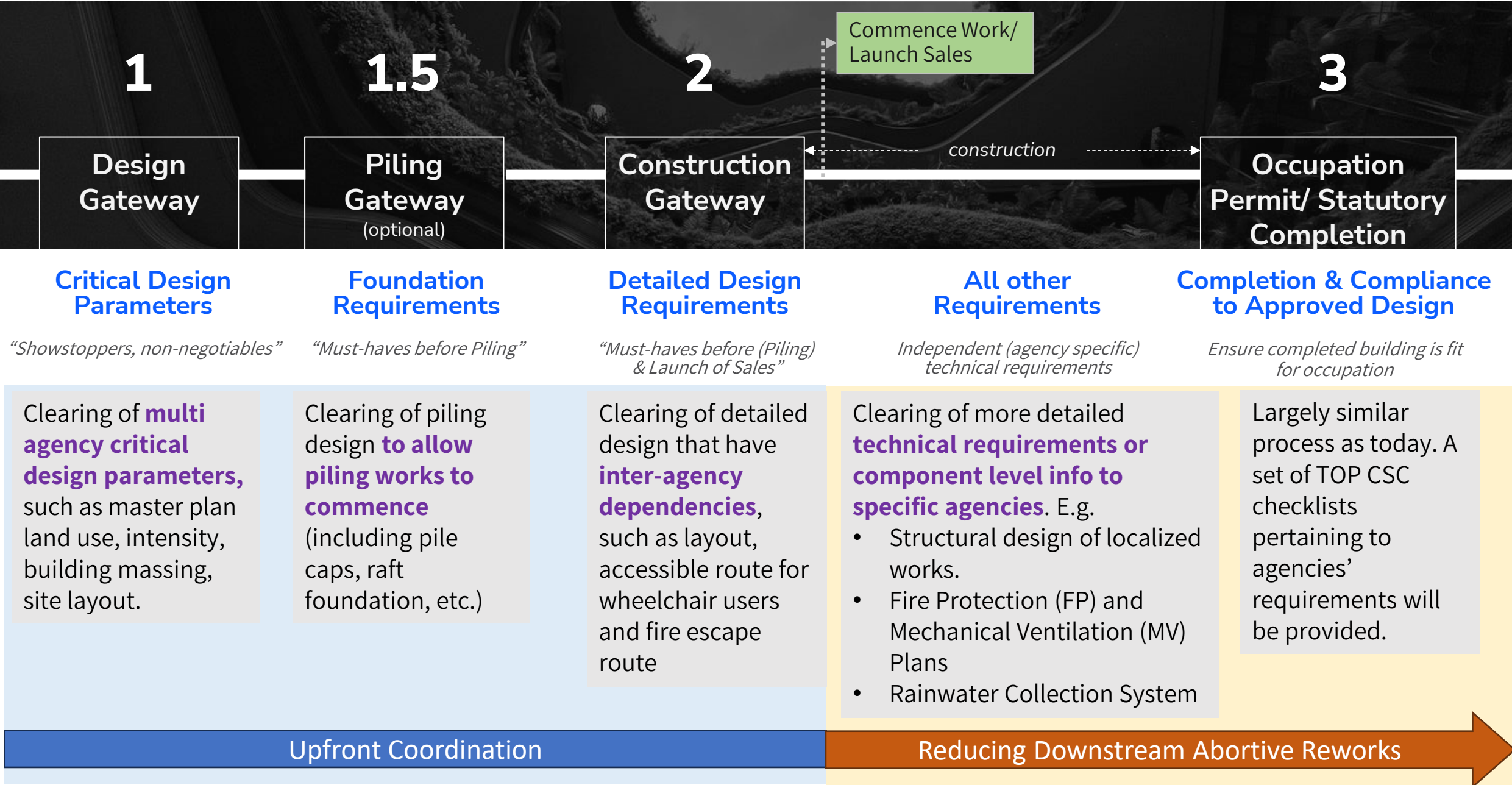
# Today's Separate & Concurrent Approval Process



# New Regulatory Approval Process for Building Works (RABW)

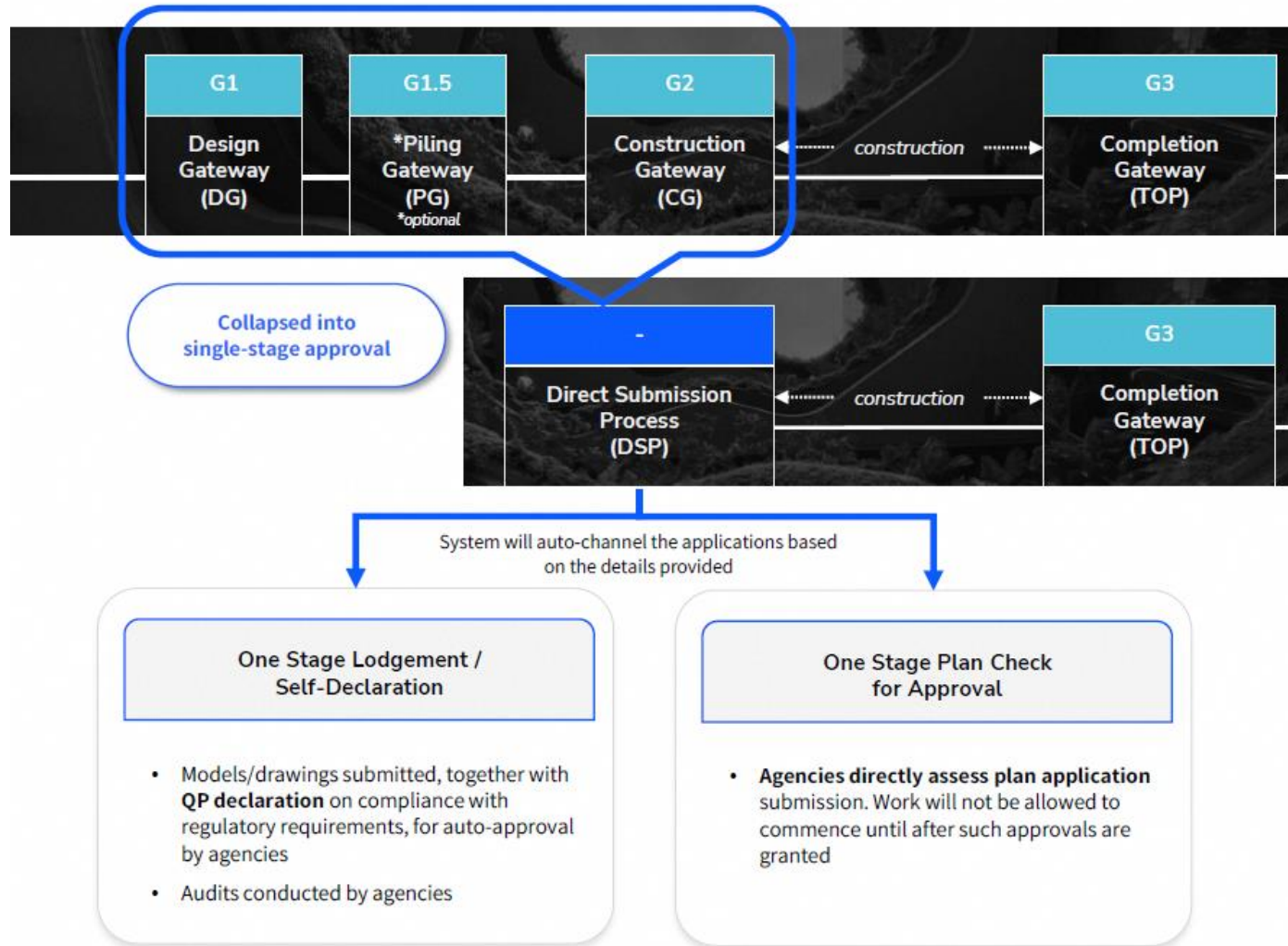


# 3-Gateway Regulatory Approval Process



# Direct Submission Process

**Differentiated approach for simple building works that need not be subjected to the typical RABW 3-Gateway process** (e.g. single-unit residential landed development, standalone pavilion/ linkway, etc.)



## Direct Submission Process

- Only eligible projects will be put under DSP
- Through a guided submission process, QP will answer a set of eligibility questions to determine whether project will be auto-channeled to either:
  - Lodgment/self-declaration/simplified submission scheme OR**
  - One-stage plan check**for the respective agencies
- Independent submission for agency-specific requirements is still available and supported under DSP

# Key Benefits of the New RABW Process

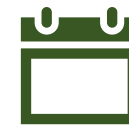
The new RABW process brings about **significant benefits** to the industry, public (home/building owners) and the Whole of Government (WOG)



**Get It Right the First Time!**



**Faster & Coordinated Approvals**



**Less Abortive Works & Faster Project Delivery**

**QP**

- ✓ Less touch points and iterations with agencies.
- ✓ No longer need to convey one agency's comments/clearances to another.
- ✓ Less need for waiver applications.

**Builder**

- ✓ Less design conflicts to resolve during construction.
- ✓ Less rectification works downstream.

**Developer**

- ✓ More certainty on project timeline
- ✓ Cost avoidance due to less reworks

**Public**

- ✓ Shorter waiting time to move in
- ✓ Better quality home/building development



# Supporting Mechanisms for the New RABW

## PRE-SUBMISSION CONSULTATION

Industry can seek guidance from Agencies prior to and at any point in the Gateway submissions



## WAIVERS

Industry may apply for deviations from compliance for Agencies' assessment and decision prior to Gateway submissions

## ESCALATION MECHANISM

Industry can seek upfront resolution on inter-agency regulatory conflicts at the **Inter-agency Coordinating Committee (IACC)**





# Service Level Agreements agreed across Regulatory Agencies

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, good quality and largely compliant submissions should not iterate with more than 2 Written Directions at each gateway

3

## **Gateways RABW serve as building block process**

- The gateway process facilitates the sequential layering of information in BIM models
- Design Gateway clears macro-level design before details get cleared at Construction Gateway, reflecting a building block process

20

## **Working days response time by Agencies**

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

# Phased Implementation to Onboard Industry

## Transitional Period and Voluntary Submission

**18 Dec 2023**  
*Soft Launch*



**Open to selected projects** *(by invite)*

- Industry to familiarize themselves with the new system and processes before mandatory submission kicks in
- Project teams are guided as they navigate through the new process and new system
- Learning points from pilot projects used to refine processes. Reinforce industry and agencies change management

**1 June 2024**  
*Voluntary Phase*



**Open to more voluntary submissions**

## Phased Implementation for Mandatory Submission

**1 Oct 2025**  
*Mandatory submission Phase 1A*



**Mandatory for new projects with GFA  $\geq$  30,000 m<sup>2</sup>**

**1 Oct 2026**  
*Mandatory submission Phase 1B*



**Mandatory for all new projects**

**1 Oct 2027**  
*Mandatory submission Phase 2*



**Mandatory for ongoing projects**

- Start with mandatory submission for **new projects** that have not made any prior submissions via the current CORENET 2.0
  - **Phase 1A (1 Oct 2025):** Large-scaled new projects with GFA  $\geq$  30,000m<sup>2</sup>
  - **Phase 1B (1 Oct 2026):** All new projects (regardless of size)
- **Phase 2 (1 Oct 2027):** Followed by mandatory submission for **ongoing projects** that have obtained some clearances via the current CORENET 2.0



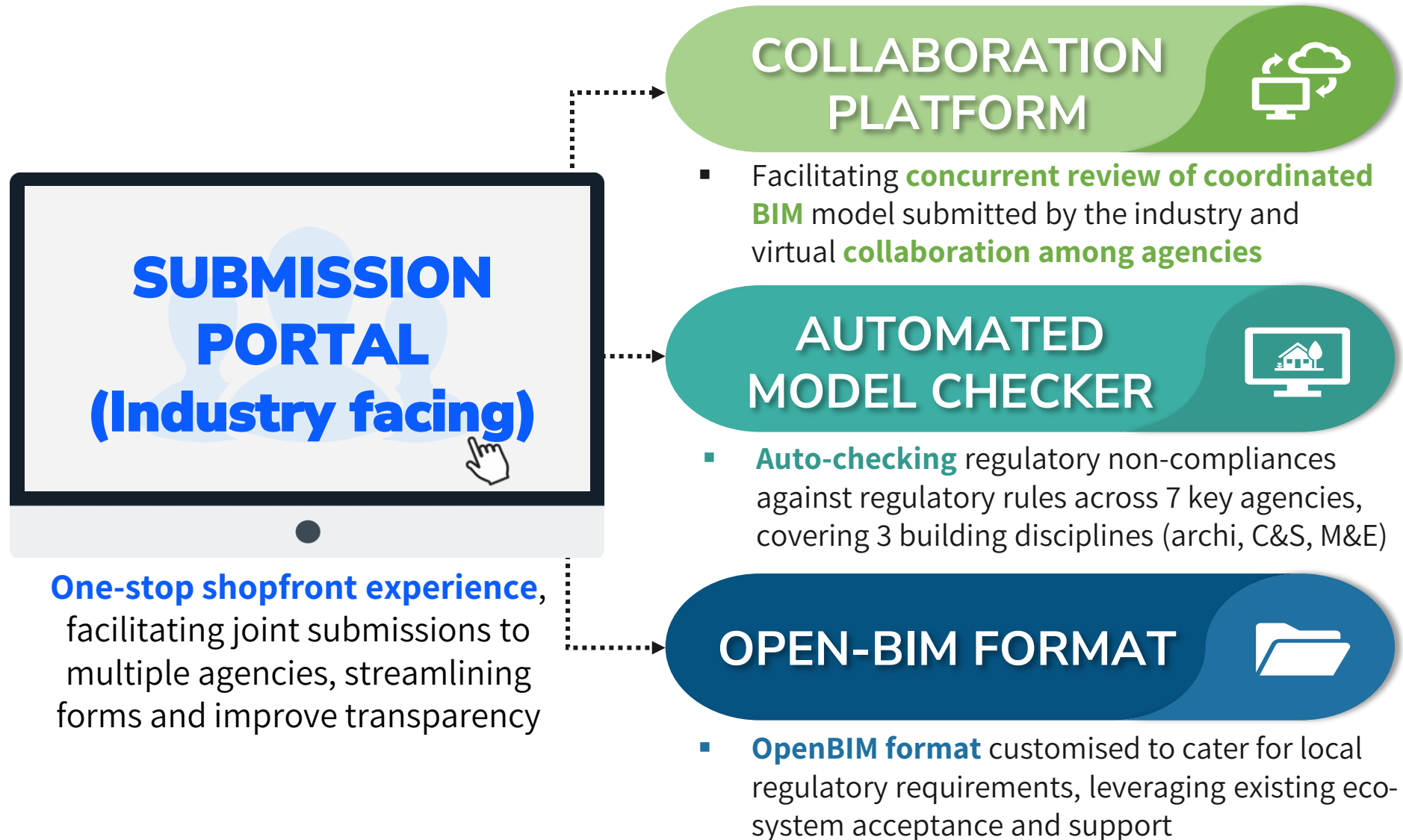
# Technological Enablers

The tech behind CORENET X



# Technological Enablers for CORENET X

Agencies have worked together to leverage technologies and develop the essential technological tools to **enable collaboration and automation**, and to **enhance user experience**



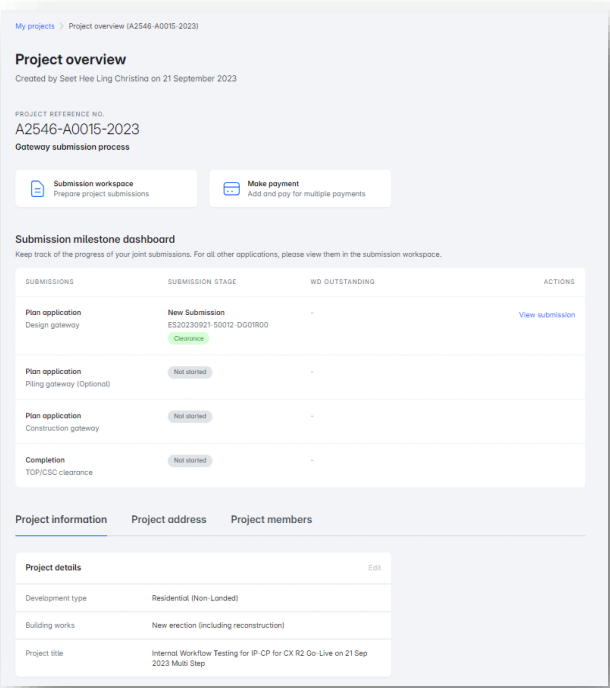
# Submission Portal



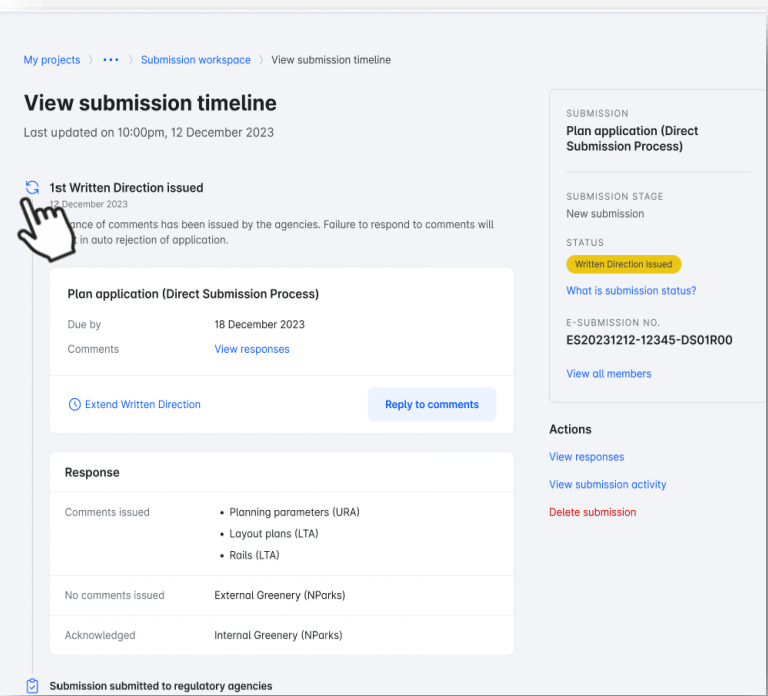
The Submission Portal is our front facing portal interacting with the industry users and has incorporated feedback from users to improve its user friendliness.

## Improve clarity and transparency

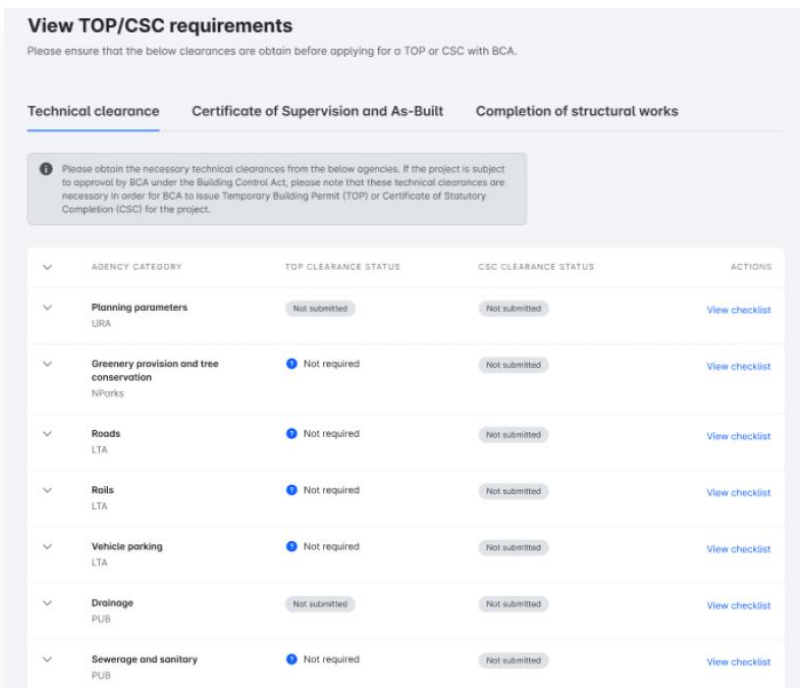
- Development of project dashboard and submission timeline, providing clarity and transparency
- Project information can be accessed by all project members (including non-QPs)



Project Dashboard



Submission Activity timeline



TOP/CSC status table



# Submission Portal

## Better user's navigation

- Relevant application forms will be auto-populated based on project typologies
- Common project information will only need to be provided once

**SUBMISSION  
PORTAL  
(Industry facing)**

### Step by step guide to setup the project

[Dashboard](#) > [My projects](#) > Project overview (A3731-27871-2022)

Project created successfully

## Project overview

Created by Alfonso Bergson on 2 March 2022

PROJECT REFERENCE NO.  
A3731-27871-2022

### Let's start with the basics

Start adding in necessary information before beginning submissions.

- ✓ Project information [Action](#)
- ✓ Project address [Add](#)
- ✓ Project members [Add](#)

[Project information](#) [Project address](#) [Project members](#) [Approved plans](#)

### Guided process on the submission

## 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

# Submission Portal

## One stop service for Payment to 7 key regulatory agencies

- Payments to different agencies are consolidated under Submission Portal
- Payment link of the submission can be easily shared with the relevant parties for their follow up



### Computation of fees

#### Fee computation

Review payable plan processing fees with breakdown by agency

TOTAL PAYABLE FEE  
**SGD 14,570.00**

Cost breakdown by agency

**AGENCY**  
**Building and Construction Authority (BCA)**

**APPLICATION FEE**  
Plan application (Direct Submission Process)  
Submission scheme: Plan application  
Above sub-level SGFA/Area of Plan View: 5,000m²

|          |           |
|----------|-----------|
| Subtotal | 13,500.00 |
|----------|-----------|

**AGENCY**  
**Urban Redevelopment Authority (URA)**

**APPLICATION FEE**  
Plan application (Direct Submission Process)  
Submission scheme: Lodgement

|          |          |
|----------|----------|
| Subtotal | 1,070.00 |
|----------|----------|

SUBMISSION  
Plan application (Direct Submission Process)

SUBMISSION STAGE  
New Submission

### Fees to each agency are consolidated

#### View submission timeline

Last updated on 23 October 2023

**Submission pending payment**  
10 October 2023  
Submission will only be submitted to the regulatory agencies after payment is made.  
[View submission](#)

**Urban Redevelopment Authority**

Amount payable: SGD 15,889.50  
Status: Pending payment

[Ask someone to pay](#) [Make payment](#)

**National Parks Board**

Amount payable: SGD 2,675.00  
Status: Pending payment

[Ask someone to pay](#) [Make payment](#)

SUBMISSION  
Plan application (Design gateway)

SUBMISSION STAGE  
New submission

STATUS  
[Pending payment](#)

What is submission status?

E-SUBMISSION NO.  
**ES20231212-12345-DG01R00**

[View all members](#)

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

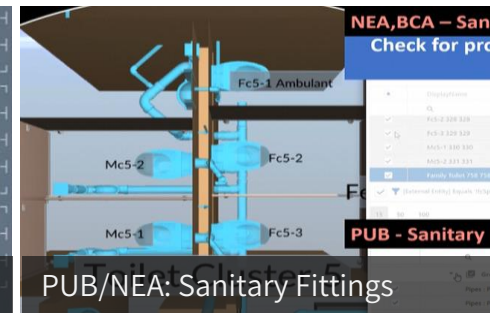
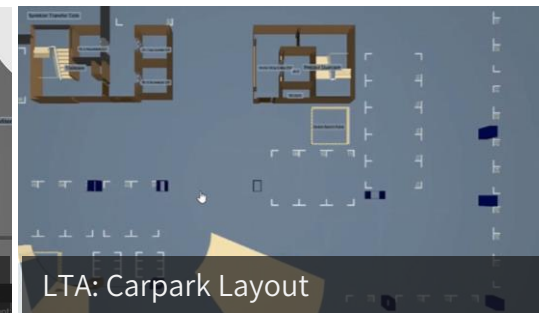
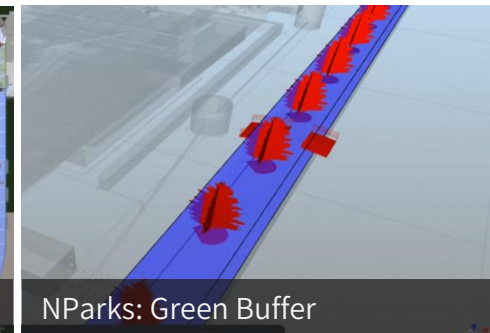
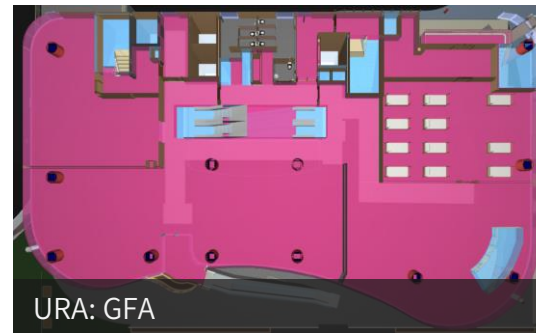
## COLLABORATION PLATFORM



- ✓ **Extraction of different views** / areas of interest for review from the same model
- ✓ **Concurrent review & virtual collaboration** among agencies on the platform
- ✓ **Issuance of coordinated response** to industry



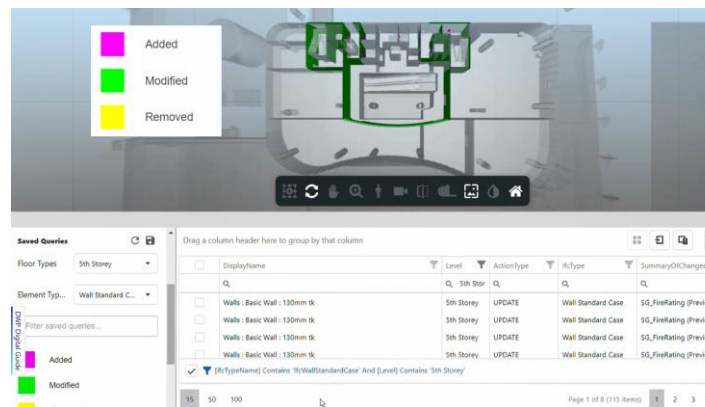
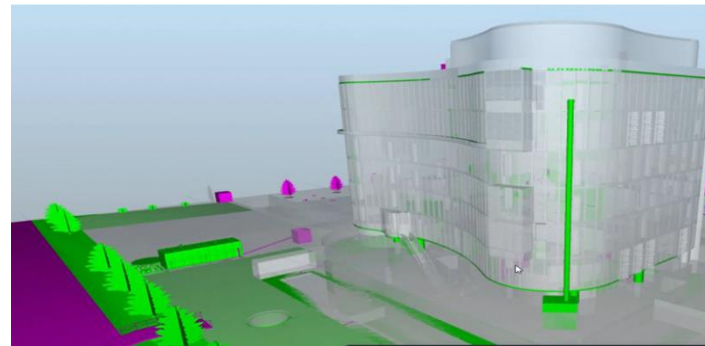
Extracted Views from BIM Model for different agencies



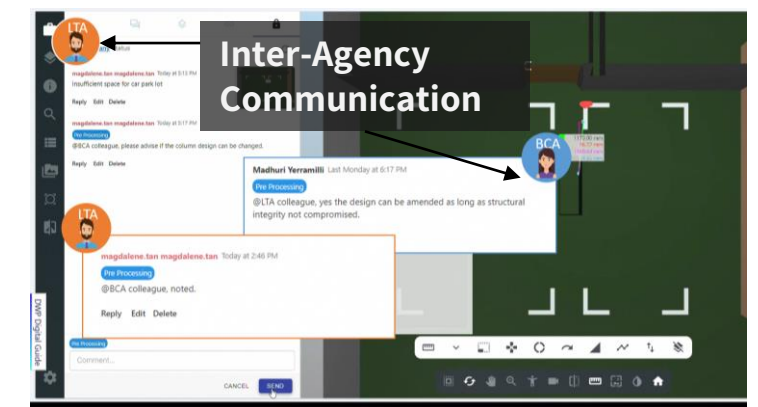
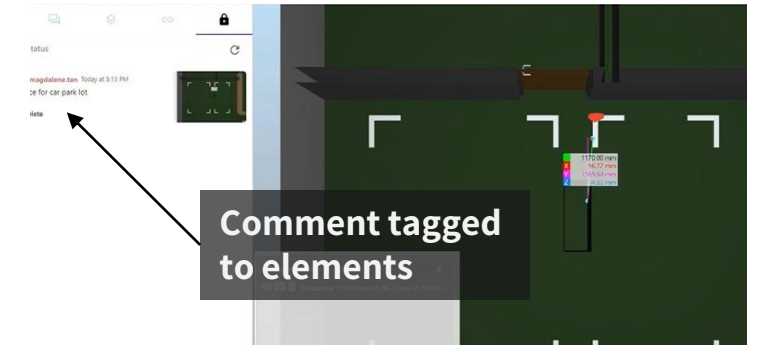
## COLLABORATION PLATFORM



### Highlighting Amendments



### Virtual Collaboration



✓ **Extraction of different views** / areas of interest for review from the same model

✓ **Concurrent review & virtual collaboration** among agencies on the platform

✓ **Issuance of coordinated response** to industry



## AUTOMATED MODEL CHECKER



✓ **Auto-Checking** for regulatory non-compliance against rules across 7 key agencies, and across 3 building disciplines (Architectural, C&S, M&E)

✓ **Allow for pre-checks** by industry prior to submission

### Sample views extracted from prototype



Highlight non-compliance - Door did not meet minimum door width requirement

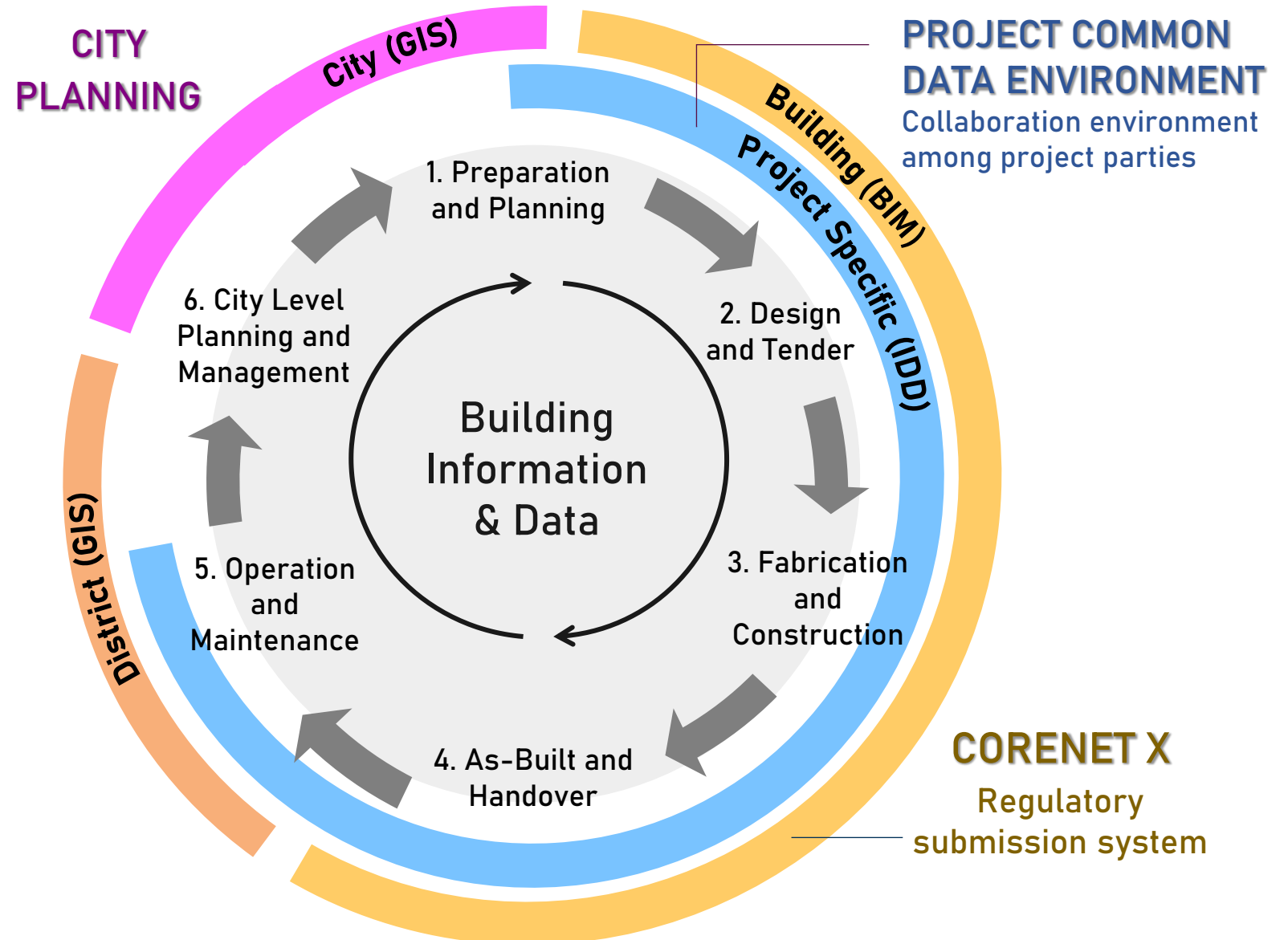


Summary report on number of non-compliances detected



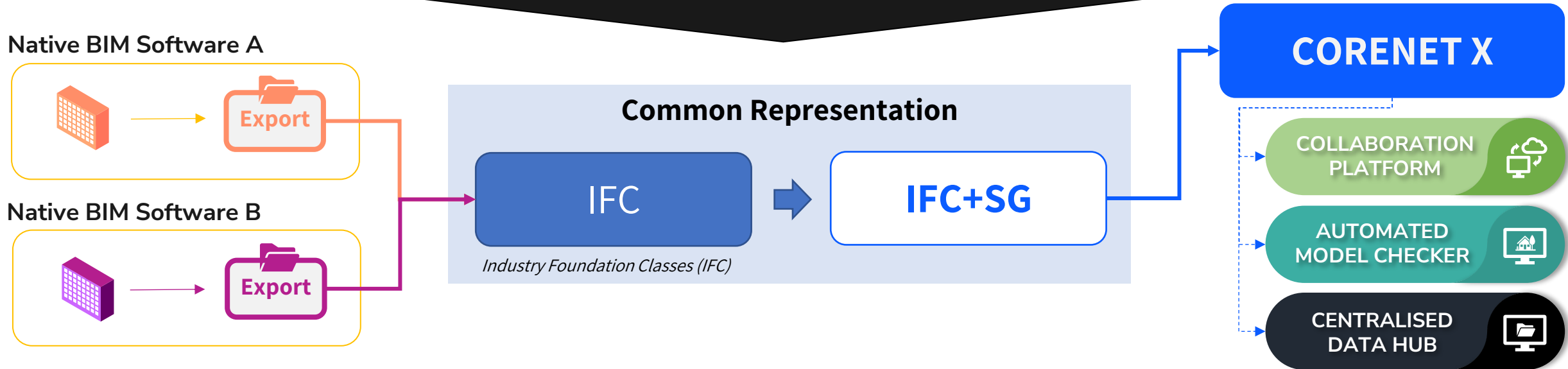
# Interoperability and Open Data Standards

- Data requirements and data footprint throughout the value-chain
- Data flows through the entire value chain, supporting the different applications and use cases



# IFC+SG

An **OpenBIM** format customised for local context



01

## Non-Standard Format

- Multiple solutions/ systems needed to process different formats
- Increased costs and maintenance
- Does not fully cater to gov regulatory requirements

02

## IFC

- ISO standard specifications for digital construction info
- Enables info exchange in a consistent and repeatable way

03

## IFC+SG

- Adapting IFC to **cater for local Regulatory Requirements**
- Leverage existing eco-system acceptance and support

04

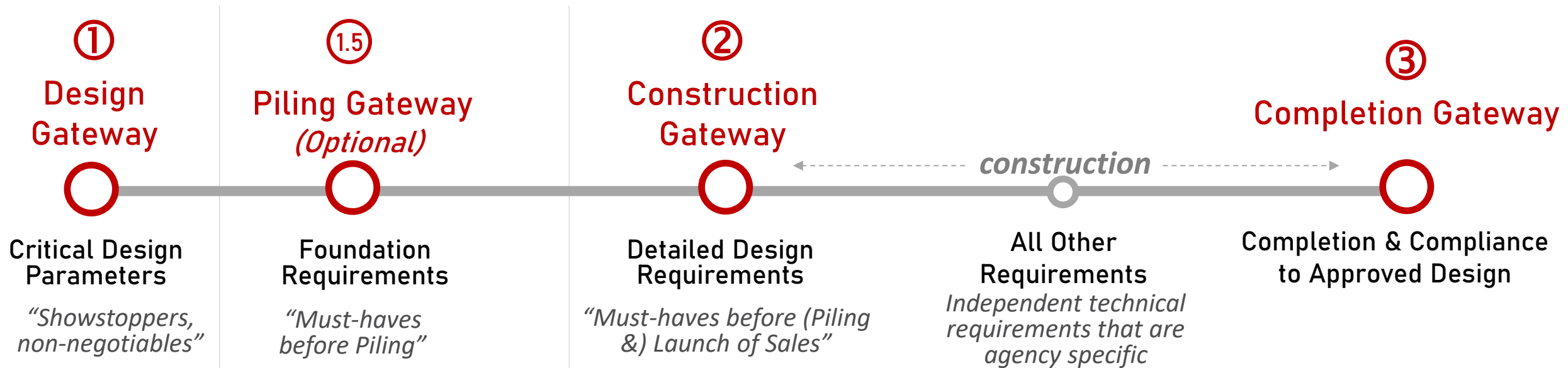
## IFC+SG in CX

- **Localised information of interest**
- Supports CP and AMC



# Understanding the new RABW

# 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

**However, requirements at each Gateway are not 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

## 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**.



# 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

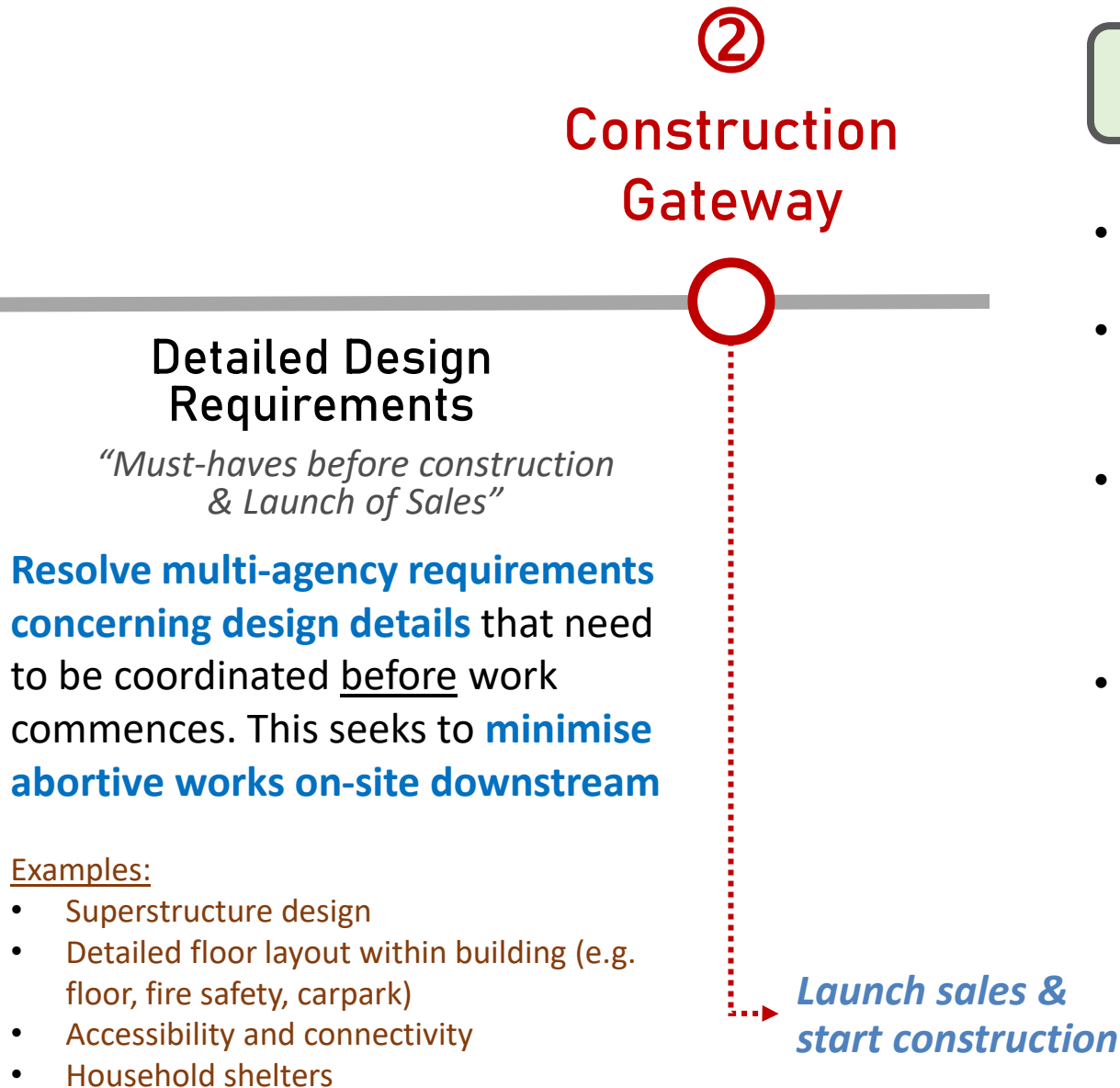
#### Examples

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

→ **Start Piling**

### 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 Things To note

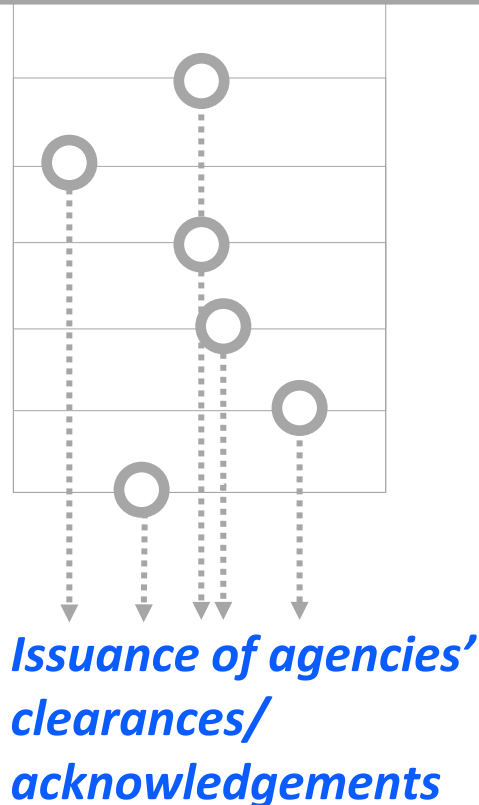
- Preparations for CG should start **as early as possible**.
- Cater **sufficient time for the engineers** to do their design and calculations, and for **AC checking** (where applicable)
- Detailed structural design and calculations of eligible projects **need not be submitted in a single package** but done through a **limited number of part ST submissions**.
- 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.

## 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.

## ③ Completion Gateway (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. This is the same as today's practice.
- The final TOP/CSC from BCA 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**.

# 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 which agencies are affected and require re-approval.
- For joint submission (eg: DG, CG), all QPs involved will be notified of the amendment plan.



# Regular Reviews Responding to Industry Concerns

*Addressing concern that projects may be delayed because the industry is unfamiliar with the new requirements.*



- ✓ A **temporary 6-month extension** will be granted to qualifying projects submitted fully on CORENET X during the transition phase **between 18 Dec 2023 - 31 Dec 2025** to:
  - Additional Buyer's Stamp Duty (ABSD) remission timeline
  - Project Completion Period (PCP) timeline

*Addressing impact of CORENET X on payment milestones for consultancy services.*



- ✓ **Payment milestones** under Annex C of the Standard Consultancy Agreement for **public sector consultancy services** have been reviewed to **align with the new submission gateways** under CORENET X
- ✓ The TACs agreed to **take reference from public sector and make the necessary adjustment for private projects**

# Enhancement of RABW and COP Incorporating Industry Feedback

**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 1<sup>st</sup> CG submission
- Detailed structural submissions (incl detailed calculations, AC/ACO report, etc) can be submitted in parts – 1<sup>st</sup> part in CG and remaining parts after CG as independent submission

**External work clearance may delay the main development**

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

- For projects that face difficulties, **only interfacing details** between the external works and the main development need **to be 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

# Common Myths about CORENET X

**DEBUNKED**

OVERHEARD ON SITE -  
**CORENET X MYTHS**

eh, you sure anot?

**1** Isn't CORENET X just a system upgrade from CORENET 2.0?

Nope! More than just a system upgrade, **CORENET X revamps today's regulatory approval process.**

In CORENET X, agencies have streamlined approvals to **three key gateways**. QPs will have to collaborate across disciplines and prepare coordinated building plans for regulatory submissions. Agencies will also provide a consolidated response to the project team at each gateway.

**2** QPs will need to prepare the same details as per today's URA's PP or agency's DC at the Design Gateway.

No. The Gateway clearances are fundamentally different from the current processes and are intended to **facilitate the sequential layering of information** in the coordinated building plans.

At the Design Gateway, project teams will clear **key macro-level design parameters** affecting multiple agencies. Further details will only be required in subsequent gateways or at independent submissions where requirements are agency-specific.

**3** Work on-site will be delayed because clearances from all agencies must be obtained at the gateways.

- The intent of the new process is to **identify and address major planning issues early in the design process** to reduce costly abortive work during construction.
- To avoid delays to the commencement of work, the new regulatory process includes an **optional Piling Gateway** to allow projects to **commence piling works ahead of obtaining the full clearance at the Construction Gateway**. Agency-specific technical requirements will also be submitted independently.

The **CORENET X Code of Practice** contains more information on submission requirements for external works or project-specific issues such as projects within a Railway Protection Zone (RPZ) or requiring a Design Advisory Panel (DAP). Find the Code of Practice at [go.gov.sg/cx-cop](https://go.gov.sg/cx-cop).

## Other Common Misconceptions

### Are waivers still allowed?

Yes, waiver application is allowed. CORENET X encourages upfront planning and hence waiver applications should not be an after-thought after plan approval or before TOP/ CSC application.

### Is it true that structural submission must be fully done in CG?

Structural submissions for temporary works and ancillary works can be done as independent submissions, concurrently with PG/ CG. For large development that fulfils the criteria, part ST submissions can be allowed.

### Is it true that all M&E details must be furnished under CG?

While CORENET X requires coordination among disciplines, it is not true that all the M&E details must be provided upfront.

CORENET X is meant for regulatory submissions and not up to construction details. Only relevant aspects requiring multi-disciplinary coordination need to be included in CG submission.

One example of independent submissions is SCDF's fire protection/mechanical ventilation plan. To balance between the modelling efforts and information required, not every detail must be provided in BIM. Please refer to CORENET X Code of Practice for more details.



# Ongoing Projects

Learnings & Best Practices

# Key Learning Points from CORENET X Pilot Projects



## Developers – Time vs Quality

### Observations

- Developers **may not factor in and cater adequate time for upfront planning and design.**
- Project team tends to **compromise on the quality and completeness of the submission** to meet with tight deadline.
- This impedes the review process by agency officers, **resulting in unnecessary iterations** (more WDs) and **ultimately lengthening project approval.**

### Learning points / Good Practices

- ✓ Developers should attend the RABW training and understand the new approval process. It requires more upfront design and coordination, which is different from today's approval process.
- ✓ **Timeline should be discussed and agreed upon as a team.** Project team should take into consideration the necessary resources and efforts required by each discipline at the various milestones. Factor in **time/cost savings from less rework/abortive works downstream** because of better upfront coordination.
- ✓ Developer PMs can drive project **success by balancing stakeholder expectations, championing quality submissions over rushed deadlines, and fostering a collaborative environment** where early planning and cross-discipline coordination become the norm rather than the exception.



# Key Learning Points from CORENET X Pilot Projects



## Consultants – Inter-disciplinary Dependency and its Impacts

### Observations

- **Designs are still largely done in silos**, with limited communications among some teams for effective multi-disciplinary collaboration.
- QPs often do not have comprehensive understanding **of the interdependencies of their work and impact on other disciplines**.
- Example: In a project, a minor shift in the unit layout by the architect triggered significant changes in structural and M&E designs, resulting in additional time spent on redesign. The architect was unaware of the implications, while the engineers did not communicate the impact.

### Learning points / Good Practices

- ✓ **Timely and clear communication** among all project parties is important to ensure cohesion and accuracy.
- ✓ Agree on and put in place a **design change SOP** as a team. Communication across discipline helps to assess the impact of change and allows decision makers to make an informed decision (e.g. additional time and effort required for rework and resubmission).
- ✓ **Each discipline plays an important role.** Involve the engineers early in the design process.

# Key Learning Points from CORENET X Pilot Projects



## Consultants – Project Timeline Planning

### Observations

- Consultants that are **unfamiliar with the changes** under CORENET X **find it difficult to effectively plan** the time and effort required at each milestone.
- This leaves decision makers unclear/misinformed about the project timelines and resources required. Due to **inadequate planning**, the project team may **struggle with resources** and/or **late discovery of certain submission requirements** leading to **insufficient preparation and last-minute scrambling**.

### Learning points / Good Practices

- ✓ Consultant PMs can ensure their team's CORENET X readiness by tracking training completion for all team members, including the QP.
- ✓ **Each consultant discipline (Archi, C&S, M&E) must be familiar with the new process** and should not be solely reliant on the project coordinator to **plan out the submission timeline, scope of work to be completed and resource required at each stage**. It should be **discussed as a team**.
- ✓ **Plan for concurrent activities where possible to save time** (e.g. Preparation for PG and CG can be concurrent rather than sequential). **Any time saved by one discipline is time saved for the whole team**.

# Key Learning Points from CORENET X Pilot Projects



## Consultants – Project Timeline Planning

### Observations

- Preparations (mainly by the Architect) for **Design Gateway resubmissions may take longer than expected**, especially for firms that are unfamiliar with the new regulatory approval process.
- If engineers only starts preparing/submitting for Piling Gateway after Design Gateway approval, project timeline may be extended.

### Learning points / Good Practices

- ✓ Project teams should be aware of the processes that can take place concurrently. Piling Gateway can be prepared and submitted while pending Design Gateway approval, but approval for PG will only be granted after DG is cleared.
- ✓ If the main building layout is confirmed, the project team may wish to submit the Piling Gateway submission to seek comments concurrently while addressing comments from the ongoing Design Gateway application.
- ✓ However, project team should assess the risk if they choose make concurrent submissions as comments provided by agencies at DG may affect the plans submitted for PG and vice versa.

# Key Learning Points from CORENET X Pilot Projects



## Consultants – Coordination & Collaboration

### Observations

- Consultants **make last minute changes and uploaded uncoordinated models** without informing other project members. Such actions will undermine earlier collaboration efforts and lead to unnecessary Written Directions (WDs) for the submission.

### Learning points / Good Practices

- ✓ Project managers can implement design change SOP with impact assessment requirements, incorporating regular coordination meetings to avoid last-minute uncoordinated changes.
- ✓ A quality management framework should be established prior to submission to coordinate any changes and leverage available BIM Viewers (such as BIMvision, BIMcollab etc.) **to federate and pre-check models by each discipline.**
- ✓ Ensure that the **relevant data for each BIM component in the model follows Section 4 of the CORENET X Code of Practice** and has also been successfully exported to IFC format.

# Key Learning Points from CORENET X Pilot Projects



## Builders – Submission Sequence & Construction Scheduling

### Observations

- For large projects, **submission sequence may significantly impact construction schedule** (both works onsite and offsite). **Project team may underestimate the time required for pre-fabrication processes and plan poorly.**
- Builders and QPs that are unfamiliar with the new process struggle to leverage on it. For example, project team may be unaware that full demolition can be made concurrently with the new erection submission, etc.

### Learning points / Good Practices

- ✓ Builders should work with consultants and **adopt a collaborative approach to timeline planning.** This involves:
  - ❖ Jointly establishing key milestones for CORENET X submissions and ensure all project members are aware of the time required for submission preparation and clearance before construction starts.
  - ❖ **Leverage the visibility on CORENET X portal to monitor submission progress.** For projects that rely on off-site fabrication, project team should plan for submissions as per the construction schedule
  - ❖ Ensure all project parties including the Developer & Builder are familiar with the new Regulatory Approval Process.

# Key Learning Points from CORENET X Pilot Projects



## Interacting with the New Submission Portal

### Observations

- Each entity's (Developer, Builder, QPs, etc.) Corppass admin **must ensure that their employees have access to Corppass and are authorised to represent their firm on CORENET X.**
- 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.

### Learning points / Good Practices

- ✓ All industry stakeholders **should set up their Corppass accounts as early as possible**, 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" e-Service.**



# Addressing the Pitfalls Identified from Pilot Submissions



## Allowing Ease of Navigation with New System and Process

- Roll out digital and interactive CORENET X Code of Practice
- Set up the Training Environment that mirrors the actual CORENET X submission system for industry's hands-on practice



**Familiarity with the new system and requirements**



## Sharing of Best Practices and Common Pitfalls

- Compilation of learning points from pilot projects for sharing. Example of best practice: Impose design freeze to minimise reworks and the time taken to obtain final approvals



**Learning from past projects and avoiding common mistakes**



## Process Refinement and System Enhancement

Reduce dependencies between submissions

- Demolition application and new erection proposal can be concurrent
- Piling Gateway may proceed while Design Gateway is pending



**Relieving the time pressure faced by project teams**



## Industry Engagement and Outreach to Align the Mindset and Practices

- Developers need to adjust their expectation and mindset to allow more time for design and planning
- Early involvement of builders to incorporate inputs into design



**Adjustment to current industry practices and mindset**



# Taking Action:

Getting prepared for  
CORENET X

# Training Courses for Industry Practitioners

1

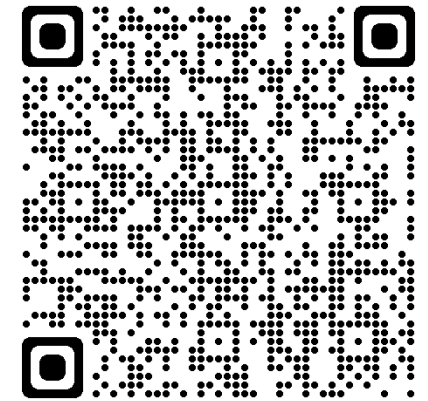
|  | Mode of Lessons            | <u>Trainers</u>  |
|--|----------------------------|--|
| <b>CORENET X Regulatory Approval for Building Works (RABW) Course</b><br><br><i>Understanding the new RABW Processes</i> | Physical                   | The Architect's Academy by Singapore Institute of Architects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

2

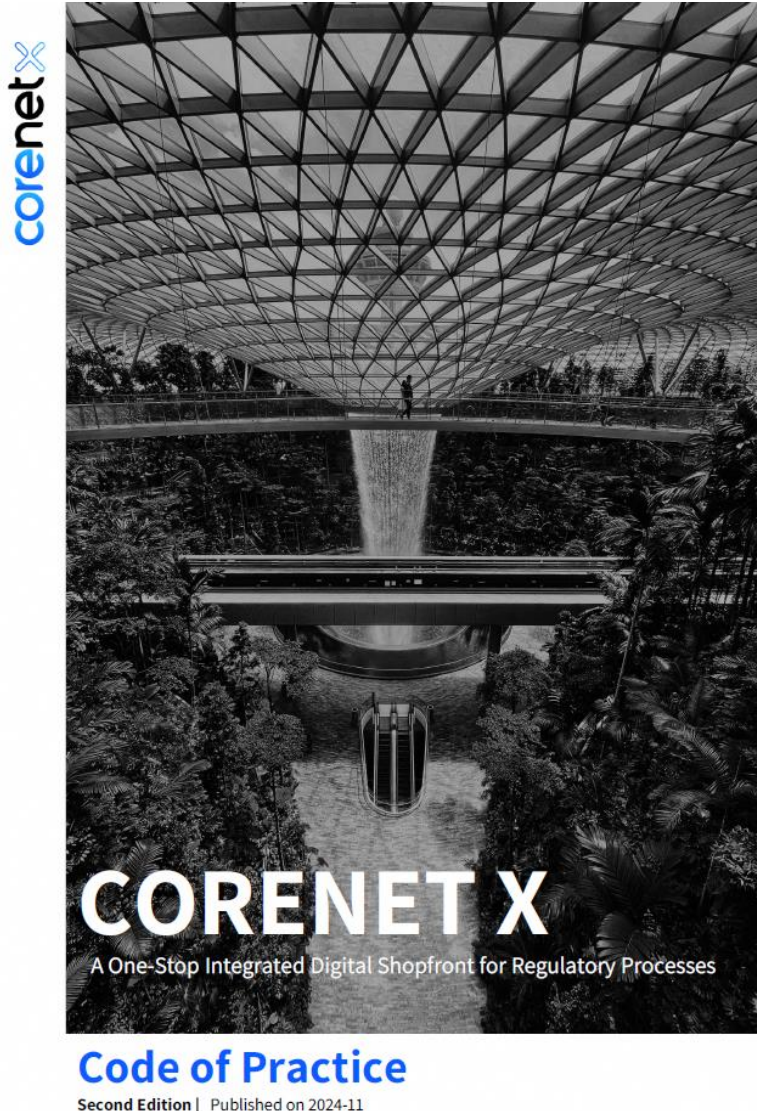
|   | Software | <u>Trainers</u>   |
|---|----------|---|
| <b>IFC-SG Training</b><br><br><i>Preparing OpenBIM submissions using IFC-SG</i> | Revit    | AcePLP Pte Ltd, BIMAGE consulting, SP Pace Academy, Innocom |
|   | Tekla    | AcePLP Pte Ltd  |
|   | Archicad | Graphisoft  |
|   | Bentley  | Bentley,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

Please scan the QR code below to find out more:

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



# Code of Practice



- “When/What/How” to provide info for CORENET X submissions
- **The Code of Practice provides the following:**
  - Overview of submission process
  - How to prepare and configure a model for IFC+SG submission
  - Information on submission requirements
- **Information on submission requirements categorised by:**
  - Agency’s requirements
  - Gateways
  - Building aspects (e.g. structural design, materials etc.)
  - Components (e.g. staircase, road, tree etc.)
- 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

# Code of Practice

## CORENET X Code of Practice TABLE OF CONTENTS

|   | Page            |
|---|-----------------|
|    |                 |
| Preamble  | 4               |
| How to use this Code of Practice  | 5               |
|  <b>Section 1:</b><br>Introduction to CORENET X (CX)   | 6               |
|  <b>Section 2:</b><br>General Requirements   | 12              |
|  <b>Section 3:</b><br>Specific Requirements by <ul style="list-style-type: none"><li>➤ Regulatory Agencies</li><li>➤ Key Gateways</li><li>➤ Other Building Works</li></ul> | 24<br>82<br>156 |
|  <b>Section 4:</b><br>BIM Data Representation (IFC-SG) and Modelling Good Practice   | 186             |
| CORENET X Website and FAQs  | 380             |
| Acknowledgements  | 381             |

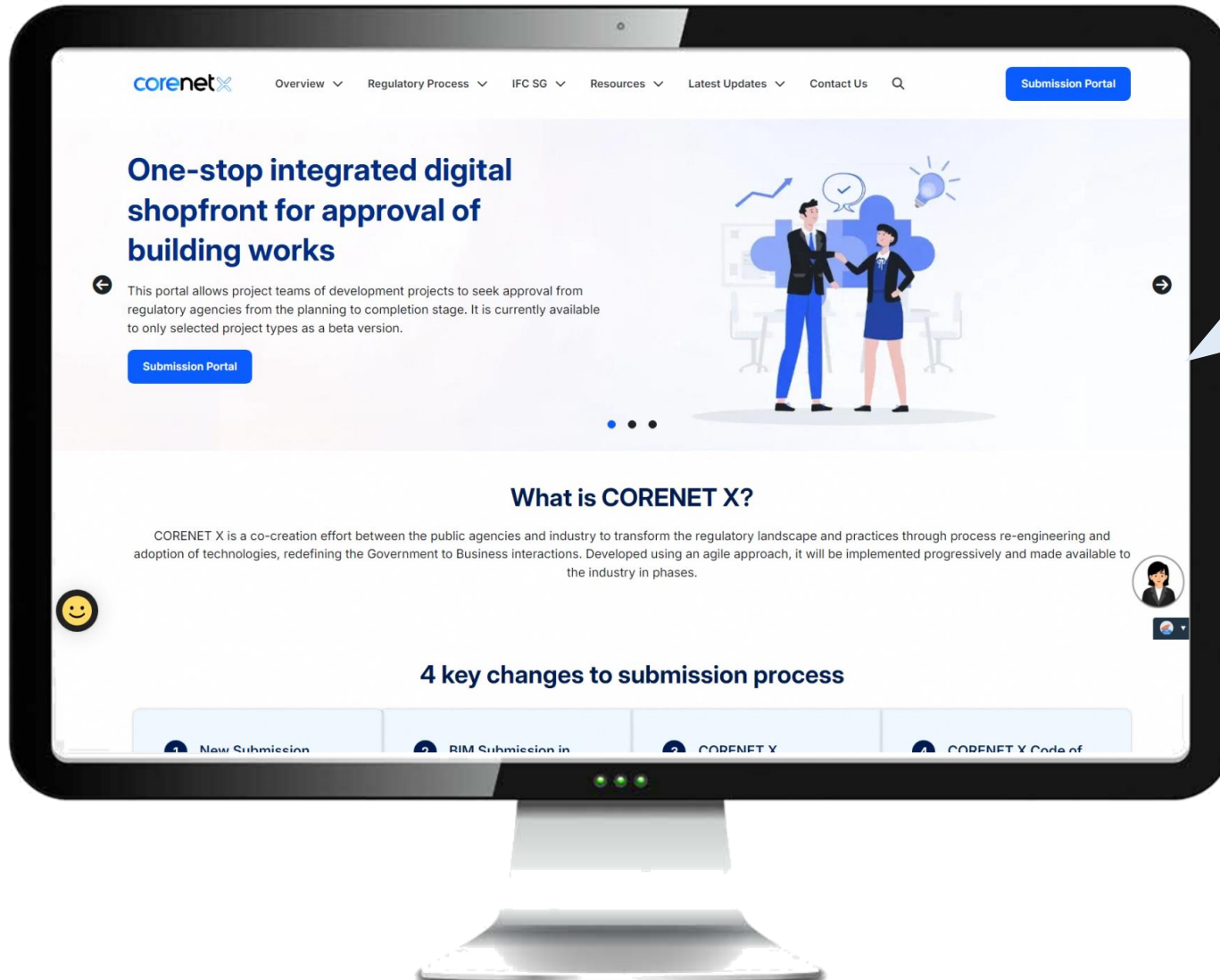
✓ Detailed requirements for preparing regulatory submission organised in **both by agencies and by key gateways for ease of reference.**

✓ We have also clarified requirements at each key gateway and **where submissions can be made independently to a specific agency.**

✓ Requirements for BIM Data Representation (IFC+SG) has been detailed for **more than 60 identified components.**

✓ Good practices for modelling have been provided so that **industry practitioners can adopt these guidance in their workflows.**

# CORENET X Website & Resources



- Interactive COP
- Submission Portal Guides
- IFC-SG
- Training & Funding
- Past Events & Material

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





# CORENET X Training Environment

Try out CORENET X at <https://training.corenet.gov.sg/> without a live project!

corenetX | Training environment

Welcome

This training environment mirrors the CORENET X Submission Portal and is set up to allow our industry users to explore the new functions and process, even without an actual project.

[View conditions and limitations of training environment](#)

**Access CORENET X training environment using the generated profile(s)**  
Default profiles are generated below to allow you to access and to simulate the submission process. Please select the desired profile you wish to access the environment as by selecting "Use profile".

| NAME OF PROFILE     | ROLE / REGISTRATION NO.  | NRIC      | FIRM N.        |
|---------------------|--|-----------|----------------|
| Daniel              | Architect<br>A2504 (BOA)   | S6992504Z | MOCK<br>T92DAE |
| Lisa Civil Engineer | Professional Engineer (Civil)<br>E0974 (PEB)   | S2100974D | MOCK<br>T92DAE |
| Mark Developer      | Developer (Organisation)<br>(Main acting personnel)  | S7228003S | MOCK<br>T92DAE |
| Bob the Builder     | Licensed Builder (Technical Controller) / Licensed Builder (Approved Person)<br>GB2923 (BLS) | S2362923V | MOCK<br>T92DAE |

1-4 of 4 results

1

Add member details

2

Add responsibilities

Add member details

A notification email will be sent to the added project member. Additional information will be retrieved from the member's Myinfo data upon their authorisation.

Roles

Role

Please select

+ Add additional role

corenetX | Training environment

You are currently in the CORENET X training environment as your selected profile Daniel / Architect. As this is a training environment, there might be certain functionalities that might not work as expected. To switch to another profile, please select "Return to homepage".

[Return to homepage](#)

Project information

Planning parameters

Greenery provision

Roads and Vehicle Parking

Rails

Public utilities

Environmental health and pollution control

Coordinated BIM

Plans

Fee computation

Project information

Last saved on -

Draft

PROJECT REFERENCE NO.

AA2504-A0031-2025

Note: The fields below contain parameters that link to fee computation. Please ensure your inputs are accurate and to the best of your knowledge.

Project details

Type of project

Design & Build project

Developer cum Builder project (where developer has financial interest in builder's company)

Others

Are you applying for works that have already been built or carried out?

Yes

No

Roleplay different roles

Familiarise with member appointment process

Create mock submissions

51



# Quiz:

Test your understanding!

# THANK YOU!

If you have any feedback, suggestions and queries on CORENET X, please feel free to write to us at <https://go.gov.sg/cxenquiry>

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

