

Why the Need for Transformation?

Key Differences between CORENET and CORENET X

Process



CORENET today

Individual consultants submit plans to various regulatory agencies separately. This may result in uncoordinated design and discrepancies.

Agencies receive submissions at different points in the project and assess them independently, with different approval process and response times. This may result in conflicting comments that project parties would have to reconcile.

CORENET X in the future

Project team collaborates upfront to de-conflict their designs, and submit one coordinated model to agencies in the openBIM format.

All agencies review the submission collectively at the same time, and provide one coordinated response to the project team.

Technology



e-Submission platform serving as a conduit for submissions from industry practitioners to regulatory agencies.

The entire submission experience will be redesigned, improving user experience. Industry practitioners to preview and check the project's coordinated BIM model before submission.

Agencies will also use a Collaboration Platform to collectively review each project's coordinated BIM model at the same time.

Benefits #1

TRANSFORMATION OF INDUSTRY

- ➔ Promote design coordination and teamwork
- ➔ Support IDD¹ and DfMA² imperatives
- ➔ Promote digitalisation of the Built Environment

- ¹ Integrated Digital Delivery (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 Design for Manufacturing & Assembly (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.

Benefits #2

TRANSFORMATION OF REGULATORY AGENCIES

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



Be Part of the CORENET X Journey

➔ **2018** | CO-CREATION BETWEEN INDUSTRY & AGENCIES

➔ **2021** | ANNOUNCEMENT OF CORENET X

➔ **2022** | PILOTS, STANDARDS, TRAINING

➔ **END 2023** | LAUNCH OF CORENET X

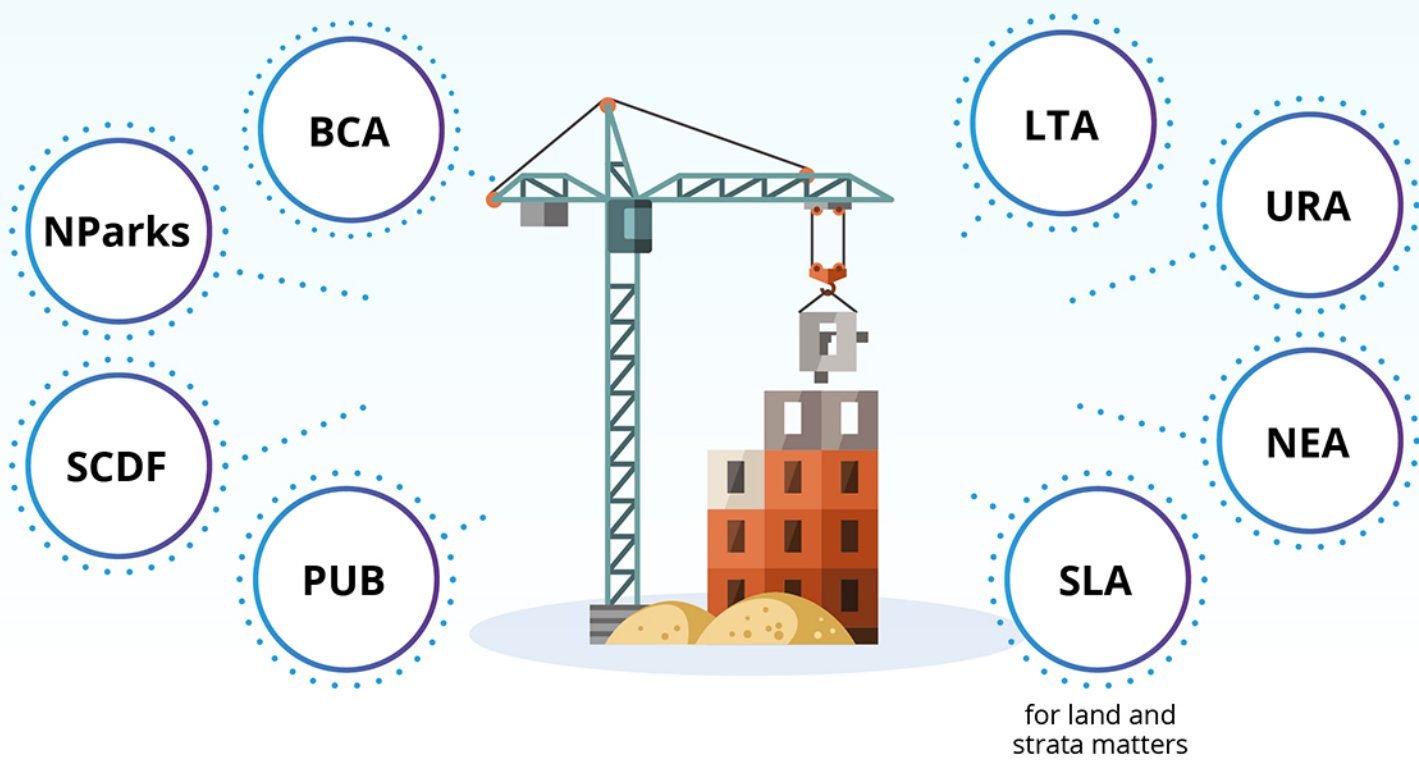


Key Transformation #1

Redesigned Process

Current regulatory approval process

All building developments in Singapore are regulated by **8 key regulatory agencies**



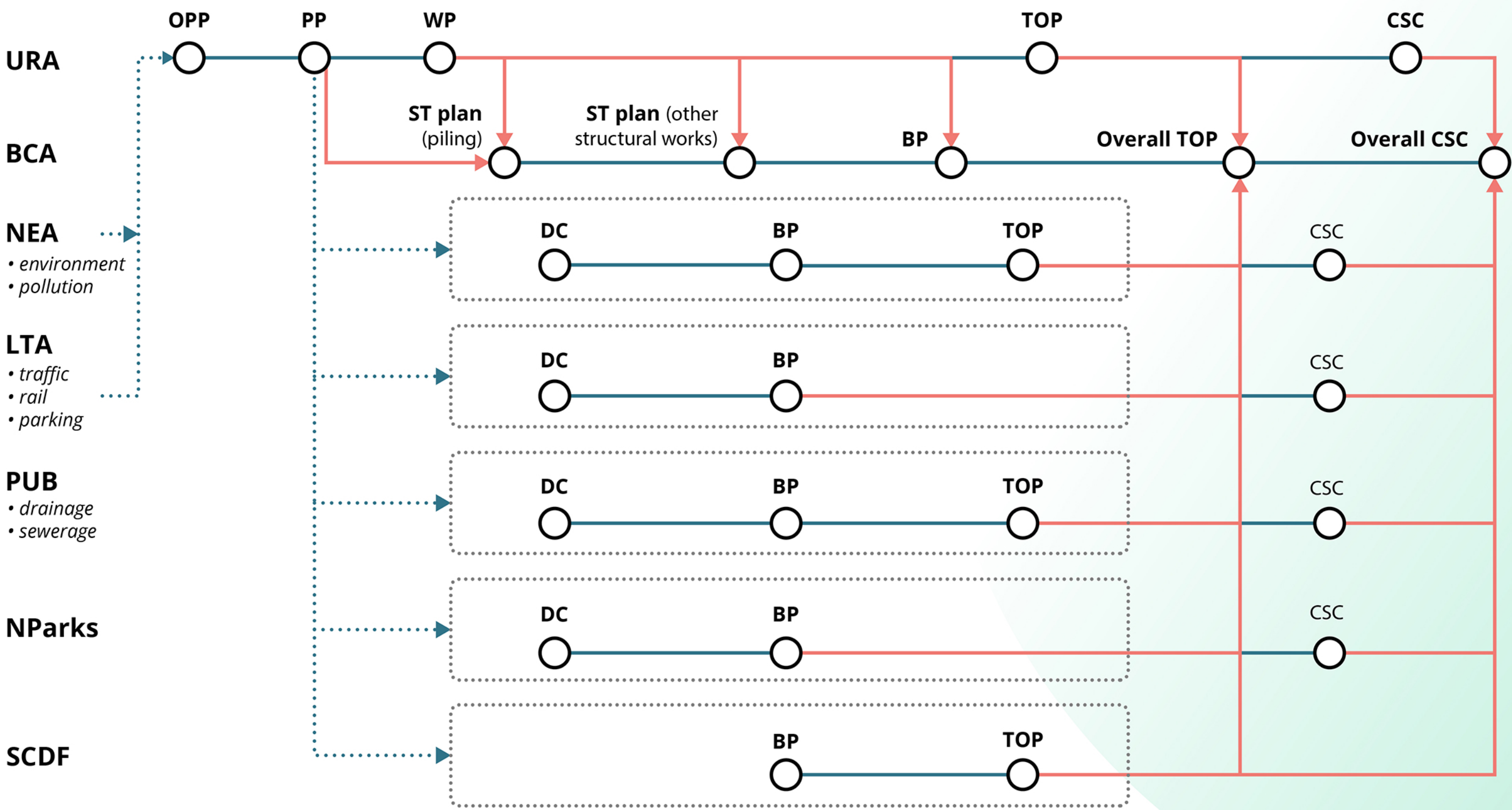
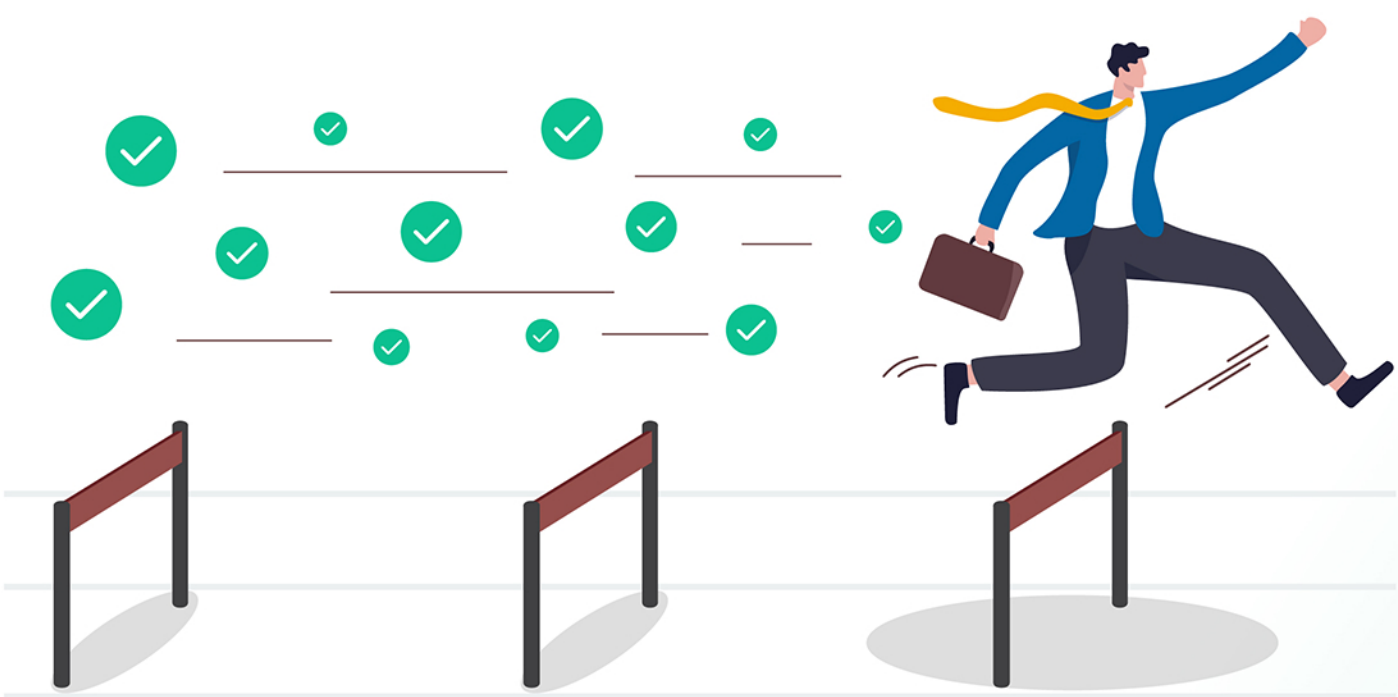
Currently, building professionals (e.g. architects, civil and structural engineers, mechanical and electrical engineers) can make **separate submissions** to individual agencies based on project progress.



Projects are required to obtain **regulatory approvals** from the relevant agencies at various milestones of the project.



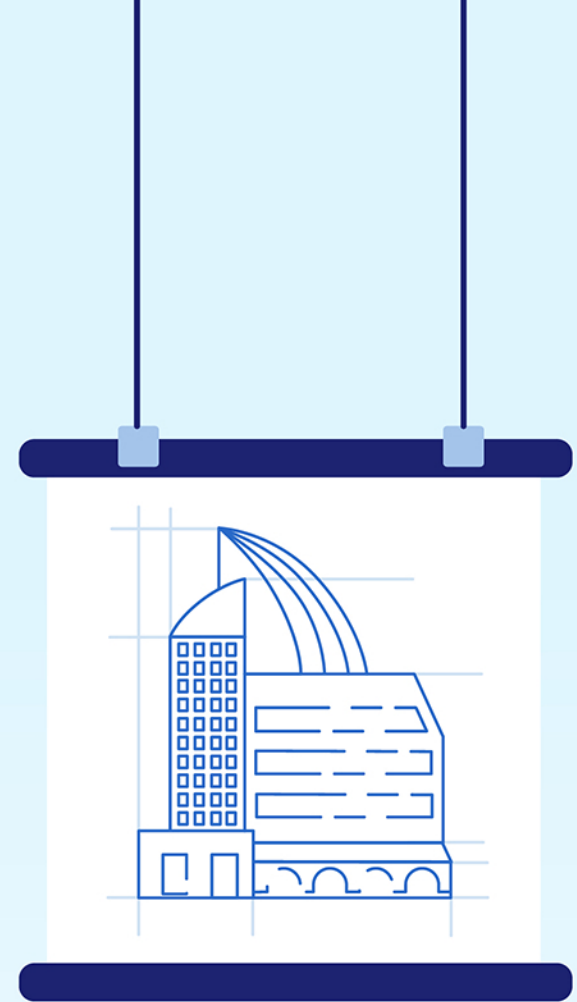
Under the current approval process, a typical building project will need to undergo **over 20 approval gates** across **8 agencies**.



CHARACTERISTICS OF CURRENT PROCESS

- Review in silos through over 20 approval touchpoints with separate responses
- Fast, but disjointed
- Uncoordinated design, submissions in silos
- Abortive works from conflicting plans
- Overall lower productivity

Envisioned Future Regulatory Approval Process



The new regulatory approval process streamlines the multiple touchpoints into key submission gateways.

- ➔ **At these gateways**, coordinated submissions (consisting of various building disciplines) will be submitted and reviewed collectively by agencies. This helps to ensure cross-agency issues and conflicts are identified upfront.
- ➔ **Agency-specific requirements** (e.g. technical details of building components) can then be supplemented at later stages and be reviewed by the individual agency.

This new process aims to provide clarity on the dependency to each stage, ensuring the imposition of requirements are timely, allowing specific details to be submitted separately without affecting the overall approval at each milestone.



1 Design Gateway

CRITICAL DESIGN PARAMETERS

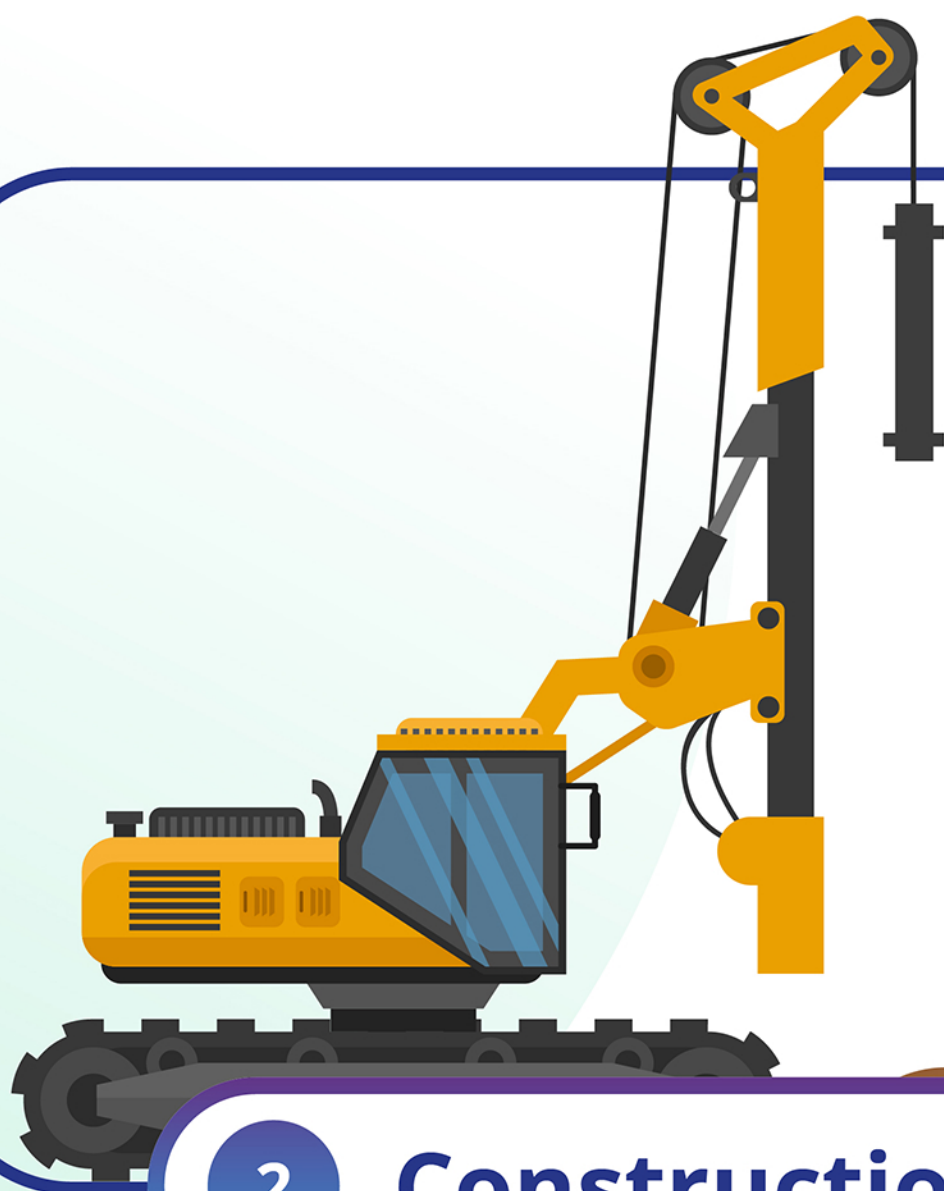
Clearing of key design parameters, such as Master Plan land use, intensity, building massing, site layout etc so that the project team can move on to develop details



1.5 Piling Gateway (optional)

FOUNDATION REQUIREMENTS

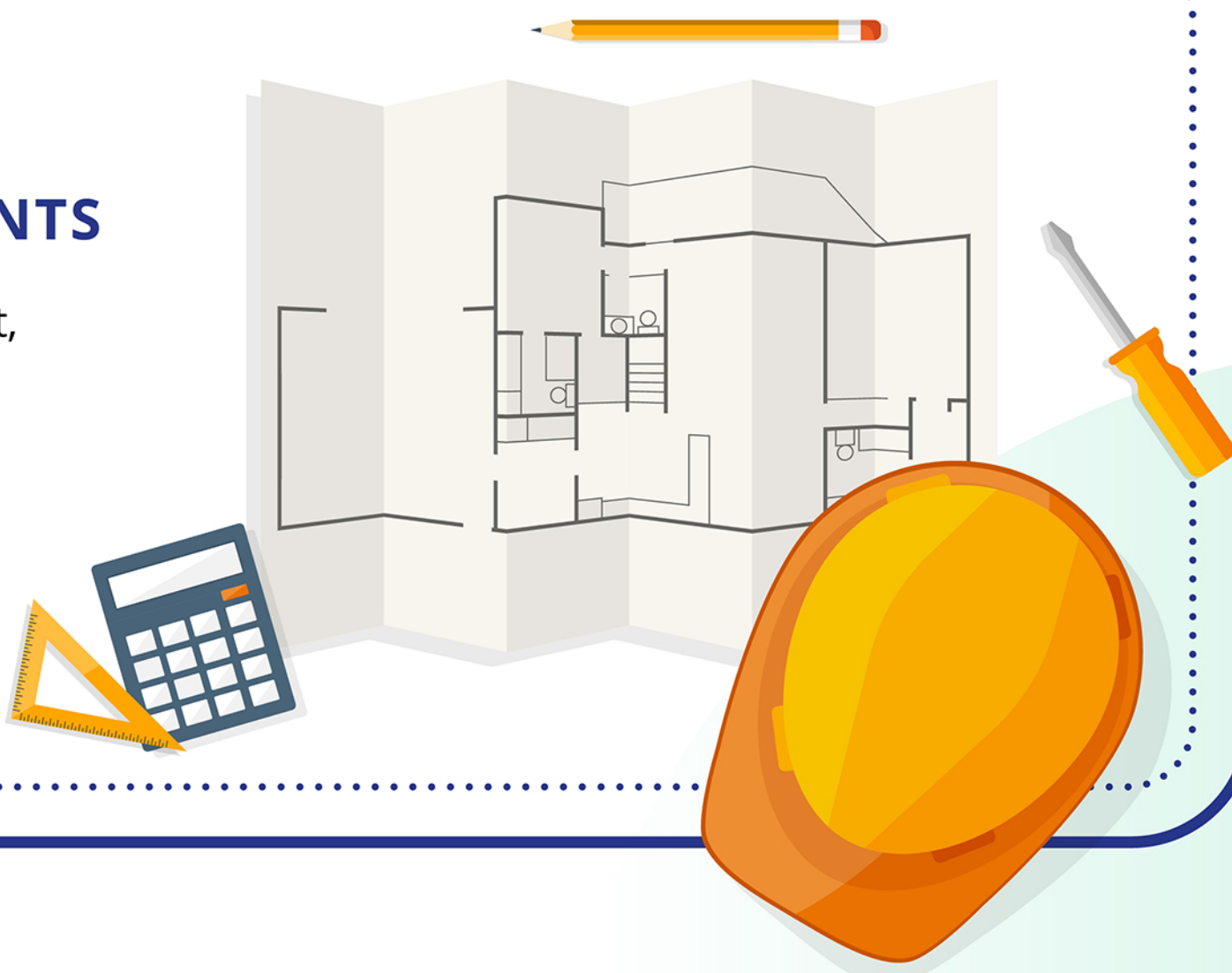
Optional Gateway for clearing of Major Requirements to allow piling to proceed



2 Construction Gateway

DETAILED DESIGN REQUIREMENTS

Clearing of Detailed Design of the development, such as layout, accessible route for people on wheelchairs and fire escape route



CONSTRUCTION



ALL OTHER REQUIREMENTS

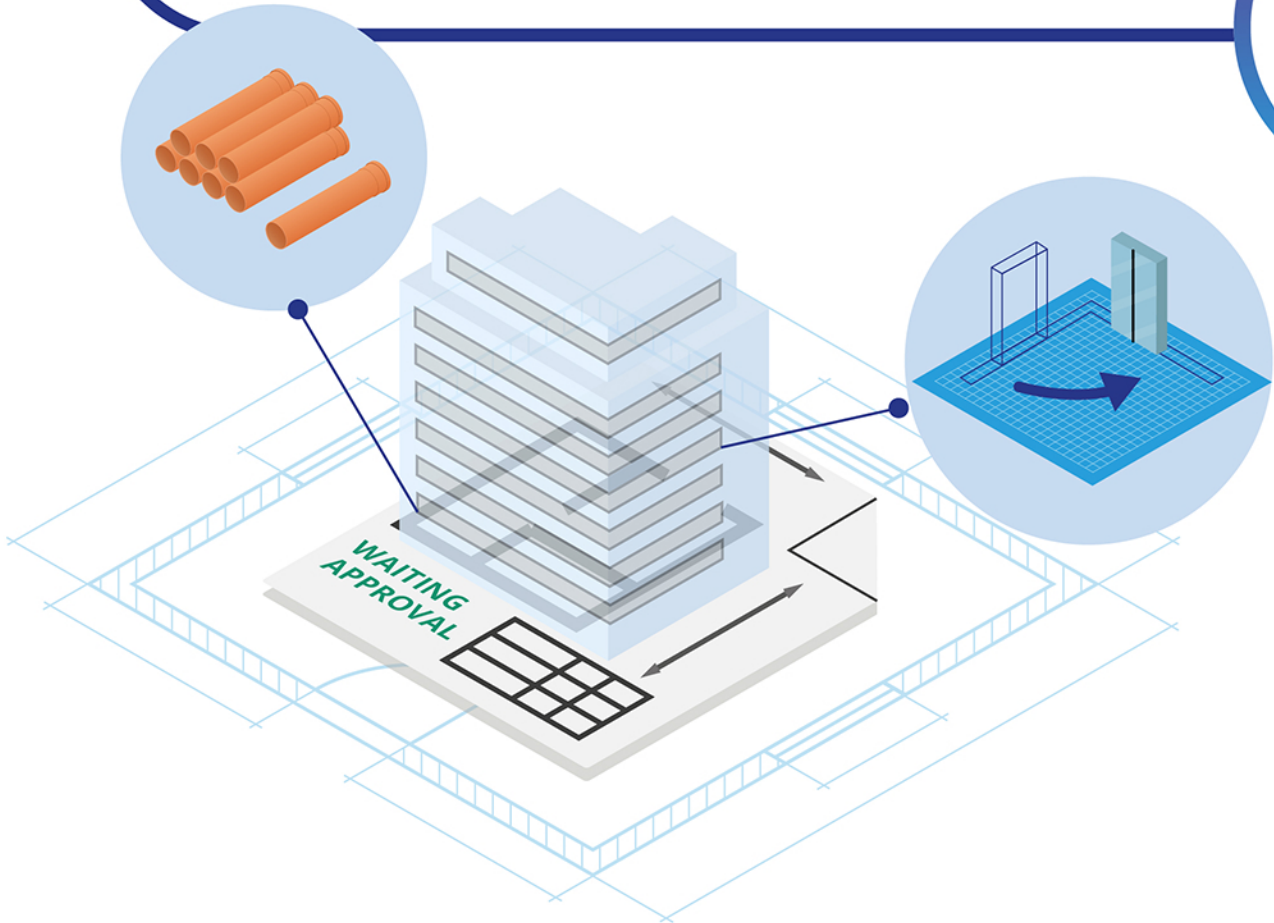
Independent requirements with no conflict across agencies

These requirements can be submitted independently to different agencies. There are typical technical details or component level info that would only be relevant to a specific agency.

3 Occupation Permit / Statutory Completion

COMPLIANCE TO APPROVED DESIGN & STATUTORY COMPLETION

Submission of As-Built model and application for Temporary Occupation Permit / Certificate of Statutory Completion.



CHARACTERISTICS OF ENVISIONED FUTURE PROCESS



Review collectively through 3 main gateways to provide 1 coordinated response



Accurate and consistent



Upfront coordination, single BIM submission



Lesser reworks

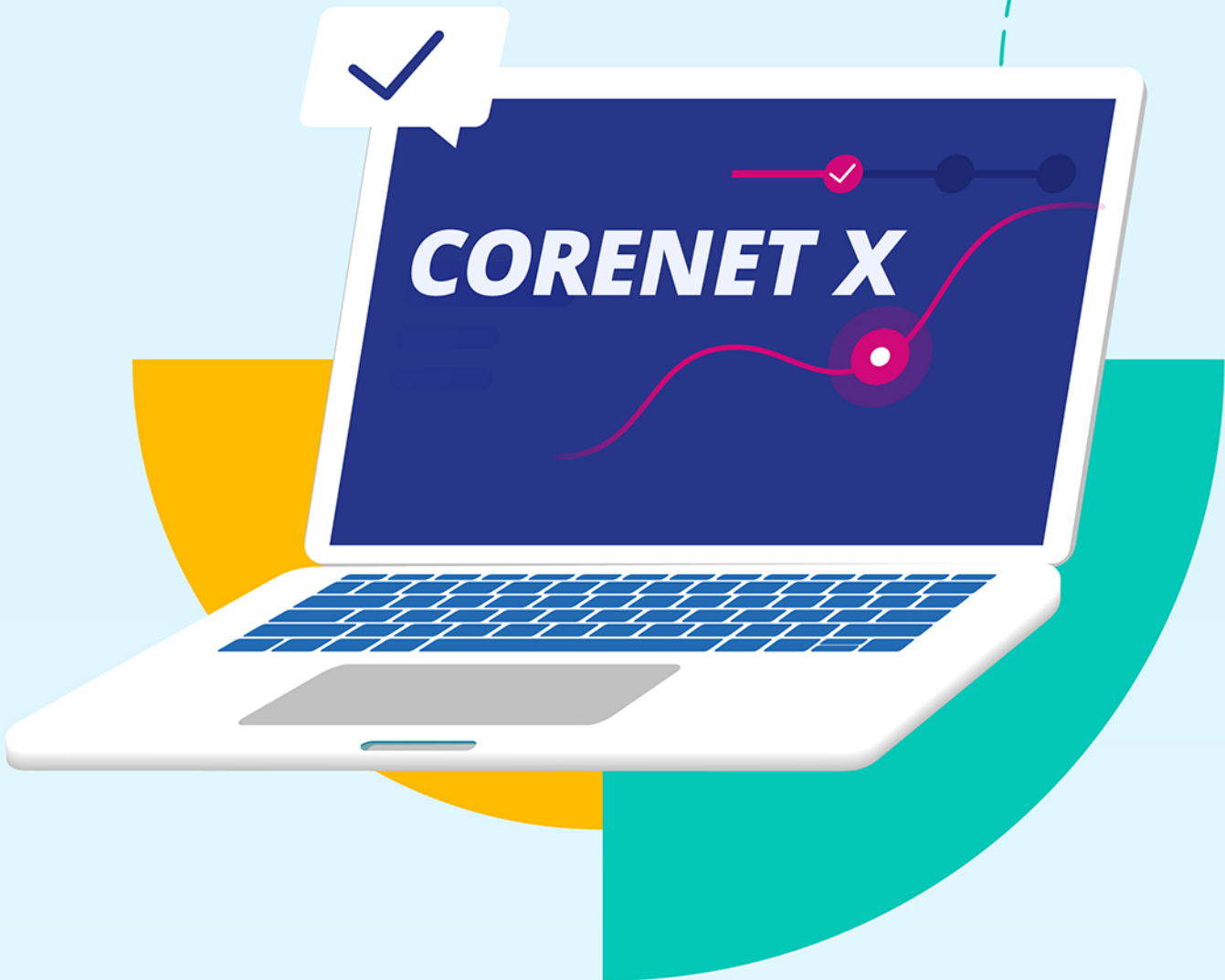


Overall higher productivity

Key Transformation #2

Technological Enablers

Through an industry-facing portal, CORENET X will utilize technological enablers to bring about collaboration, automation and interoperability.



Project Team creates coordinated BIM

Project Team conducts pre-submission checks

openBIM Format

OPEN FORMAT FOR INTEROPERABILITY

The openBIM format is a platform-neutral and vendor-neutral solution. It will enable the industry to continue using the software of their choice to design and coordinate.

MODEL PREVIEW DURING SUBMISSION

CORENET X will allow QPs to preview their models prior to submission and incorporate auto-checking capabilities for ease of access.

BIM Viewer

PRE-CHECK PRIOR TO SUBMISSION

Improves the efficiency of code checking and enables self-checking by consultants prior to submission.

Automated Model Checker

This upfront validation will aid industry and agencies in checking for regulatory compliance and improve the accuracy and consistency in code interpretation

Project Team makes submission for the project

LEVERAGING TECHNOLOGY TO EXTRACT RELEVANT INFORMATION

New Submission - Today, QPs need to prepare different sets of plans for different agencies. Leveraging technology, QPs will prepare one coordinated model and agencies will extract relevant information. This reduces the need for manual annotations on plans.

Amendment Submission - Today's amendment plans require QPs to prepare the submission highlighting deviations from earlier approved submissions. This process is currently carried out by QPs manually.

Going forward, QPs will only need to submit the amended model. Agencies will conduct model comparison with the previously approved model to identify amendments made.

Collaboration Platform (for inter-agency collaboration)

COLLABORATION AMONG AGENCIES

Aims to transform the current way agencies review plans, bringing agencies together to concurrently access the same coordinated BIM model.

Agencies will then collaborate within the same Collaboration Platform, and provide a coordinated response to the industry.

Agencies review the submission collectively

Agencies issue a consolidated response to the Project Team

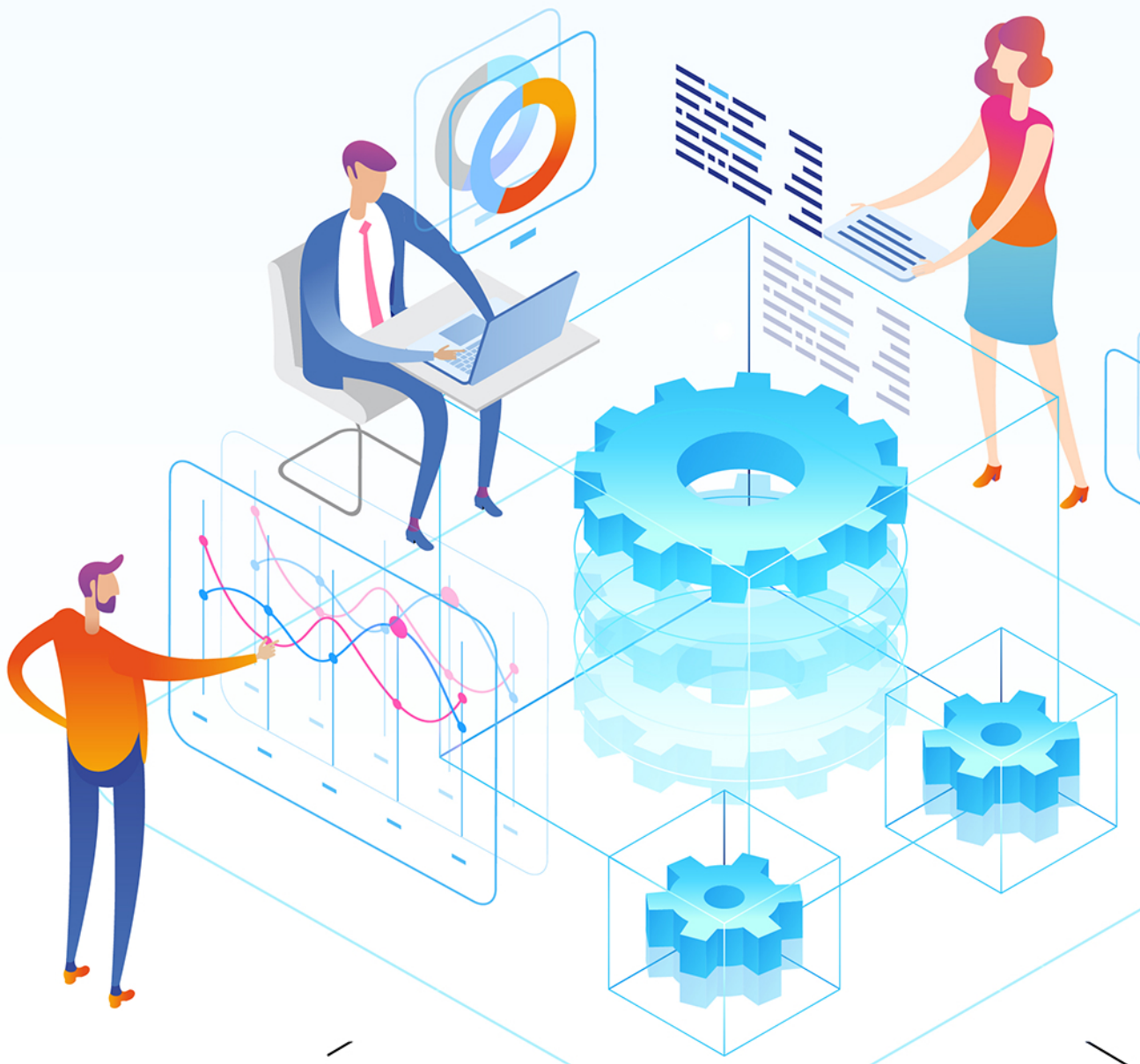
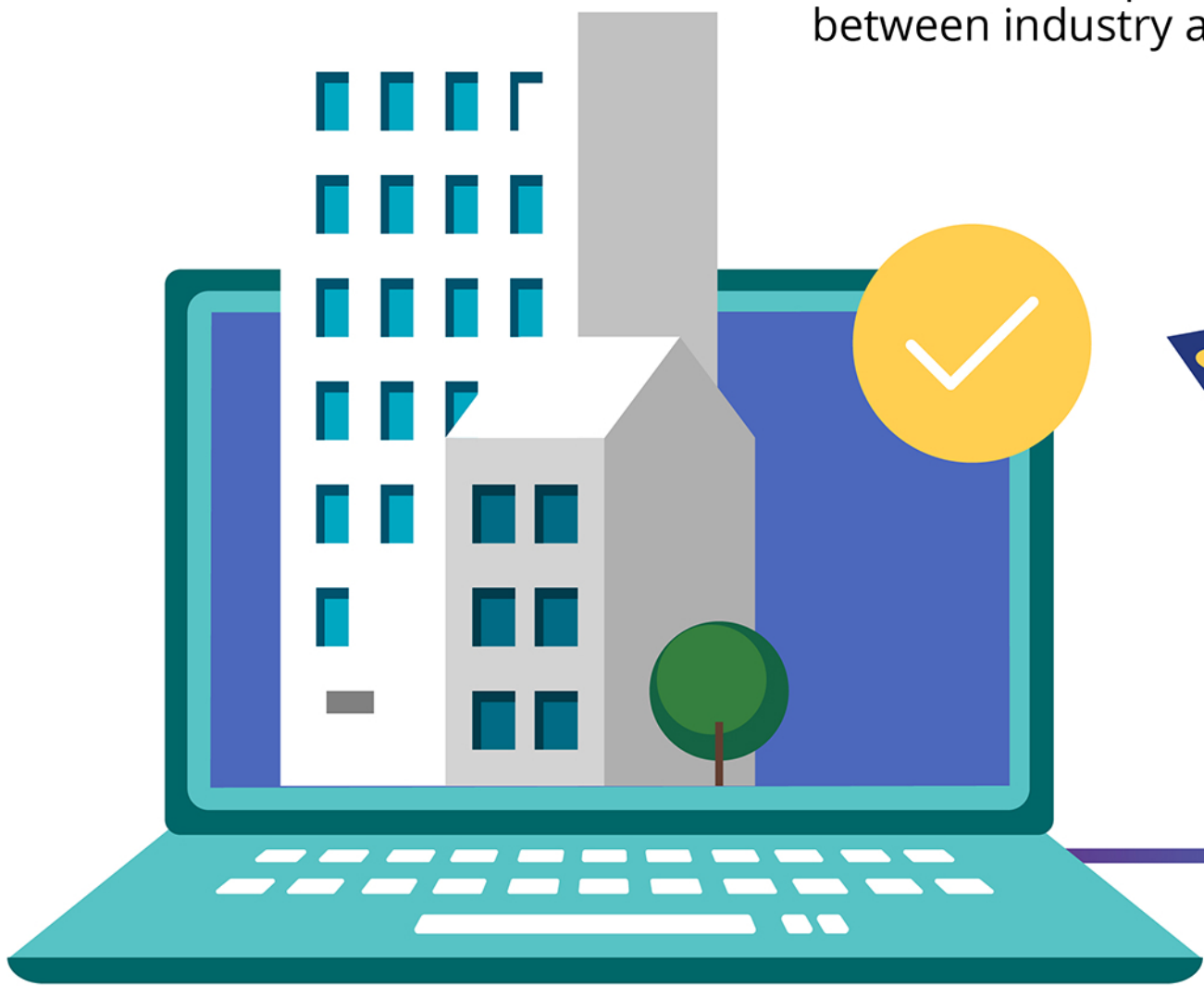
ENABLES CLEARER COMMUNICATION

Today's Written Direction and comments from agencies are provided in a list to the QPs.

Leveraging technology, the comments will also be provided in the BIM Collaboration Format (BCF), which allows tracking and tagging of comments directly to the BIM model.

This aims to improve the current communication between industry and agencies.

BIM Viewer



Get Ready for Transformation

For QPs and non-QPs, you need to be clear of how the regulatory processes will change, as it would directly or indirectly transform the project delivery process for you and your fellow project stakeholders.

You may need to prepare your in-house resources and workflows to transit to the new regulatory processes.

Get started with the
CORENET X Intro Toolkit

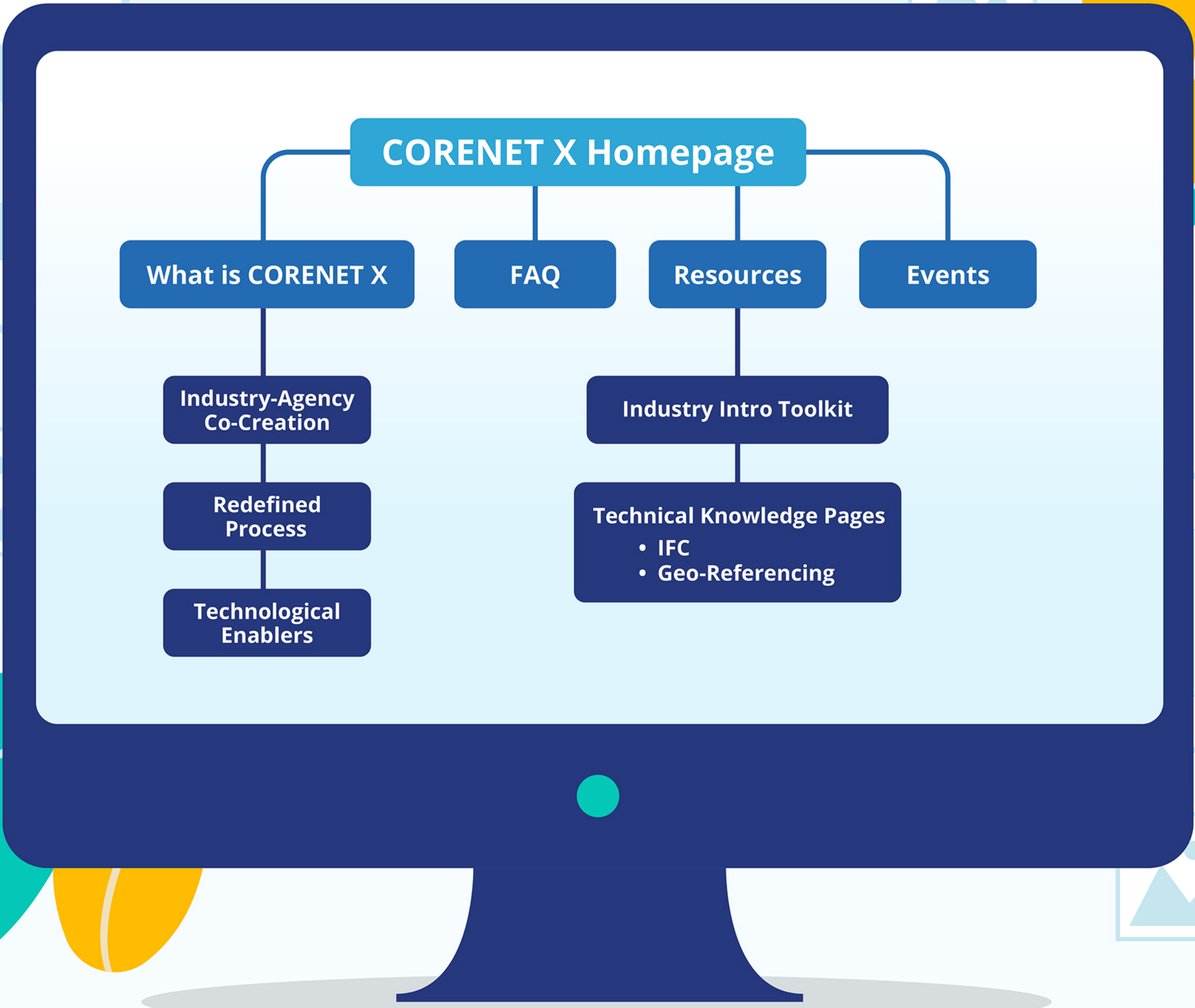
Have more questions?
Check out our FAQ or write to us here

Ready to learn?

Firm up your basic technical skills with our IFC and Geo-Referencing webpages

As CORENET X is still developing, we will update our Resources webpages

[Register](#) for our CORENET X webinars



CORENET X Website
<https://go.gov.sg/cx>

