

SJ Campus

Top Management Sponsor, Sustainability & Resilience Office

Head Digital Management Office

Managing Director, Surbana Technologies

Senior Director, Special Projects, Group CEO's Office

Director, Threesixty Cost Management

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2022

SJ Campus Design Approach

01 Environmental Resilience



SJ Campus is a flagship of optimized passive design and is the largest Green Mark Super Low Energy office, by floor area, to date. It will be a testbed of cutting-edge technology and functional design.

02 Social Resilience



"Live, work and play", including a diversity of workspace options to support a variety of work styles, from focused tasks to creative collaboration, will develop a sense of community and work ethic.

03 Health Resilience



Large windows and atria blend the studios with a verdant, natural setting; with ergonomic design in the interior. Social spaces, exercise facilities and inviting circulation spaces help cultivate good physical and mental health; aspiration to achieve WELL v2 Shell and Core certification

- 1. First building to achieve Green Mark Platinum Super Low Energy, with highest GFA.
- 2. Targeted to achieve WELL Core Platinum rating.
- 3. Signatory to advancing net zero carbon.
- 4. Southeast Asia's first public sustainability-linked bond.
- 5. Using Digital and Technology to support



No Building Without Challenges



Environment Resiliency



Social Resiliency

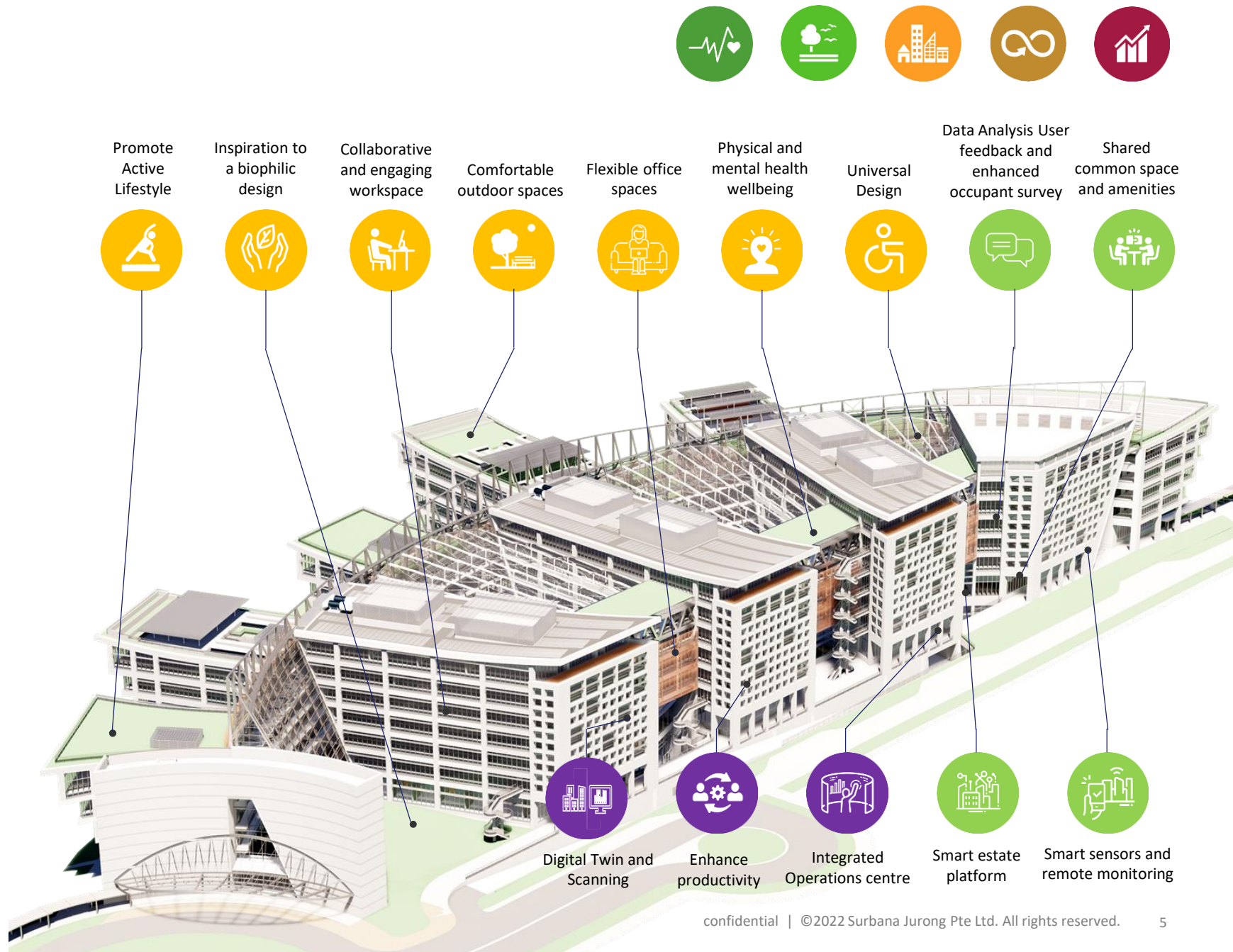
SJ Campus app platform works seamlessly reducing downtime and keeps me up to date with campus activities



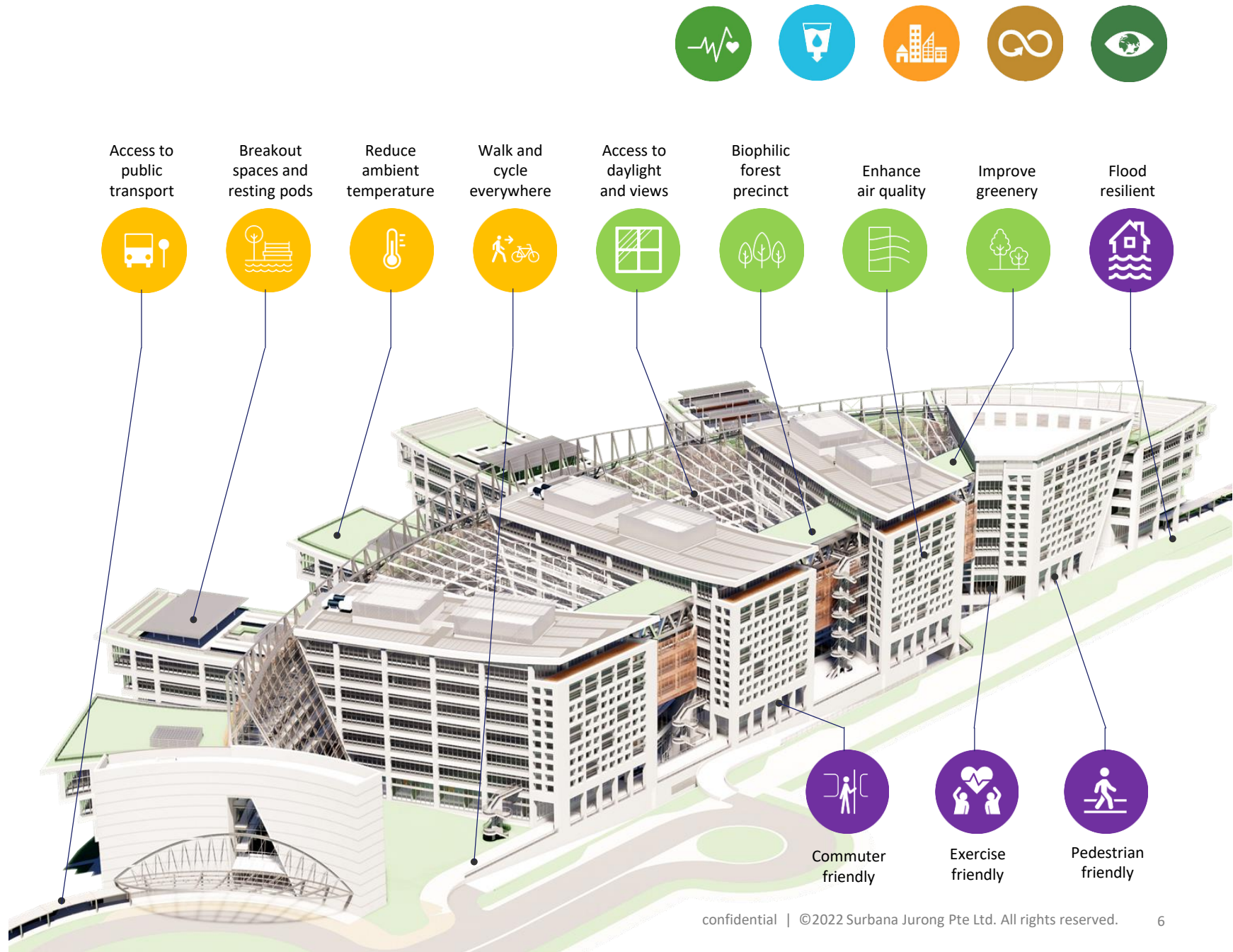
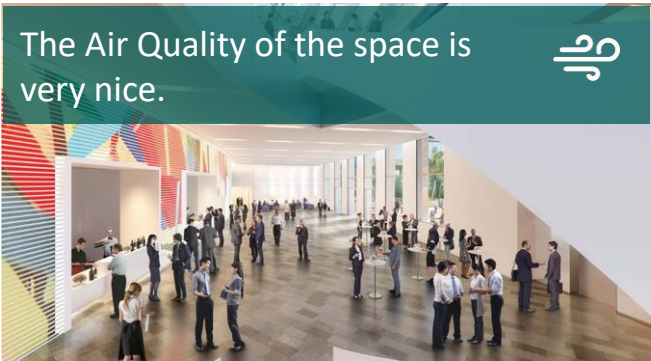
Excellent workspace with great view. The environment makes me very productive working here



Living within nature. It is great to have outdoor coffee breaks and collaborations

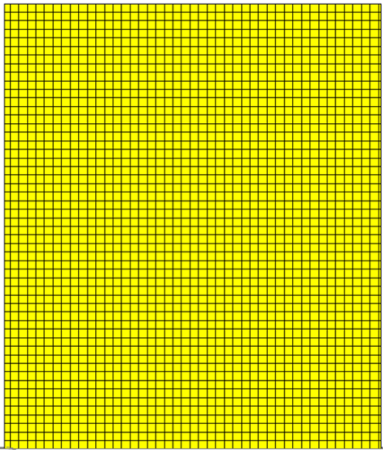


Health Resiliency

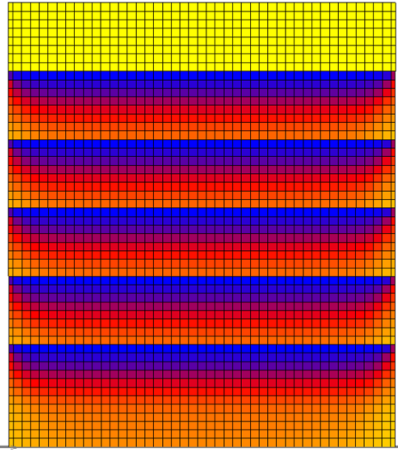


Our Approach: Massing tailored to site and Context

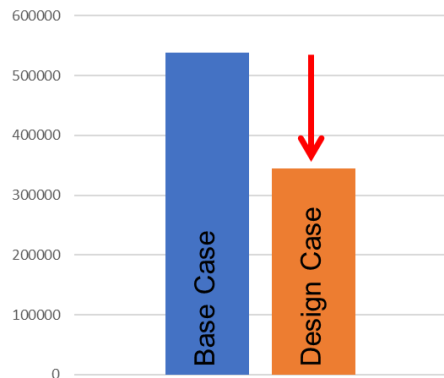
Self Shading from Eastern Façade



Baseline



Design



36% reduction in
solar radiation through self
shading

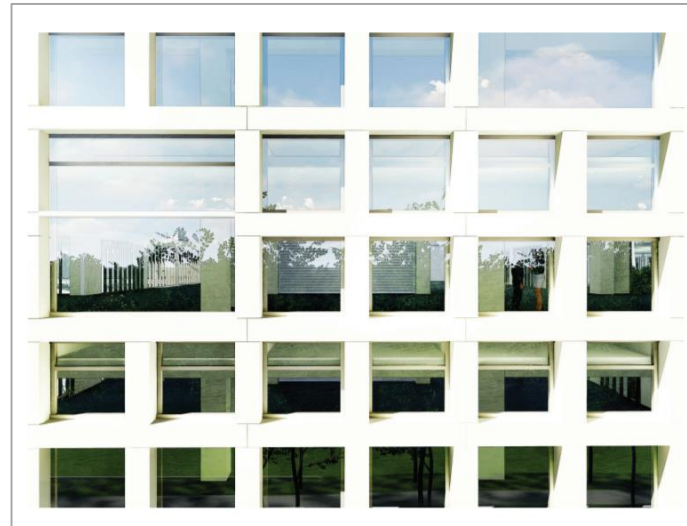


Our Approach: Massing tailored to site and Context

Optimizing Window To Wall Ratio on Western facade



◀ Shading on Atrium



Treatment on Western
Façade ▶



Smart Lighting and Controls

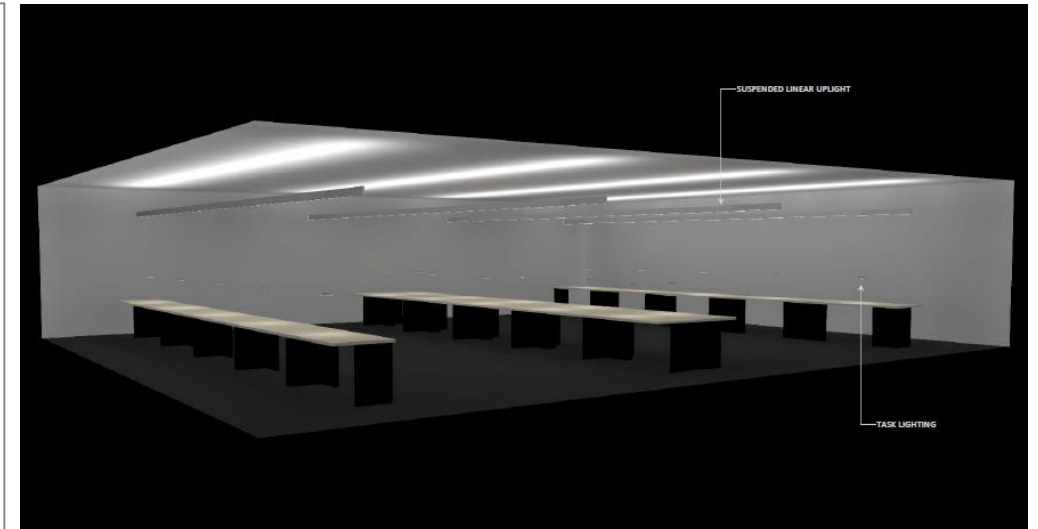
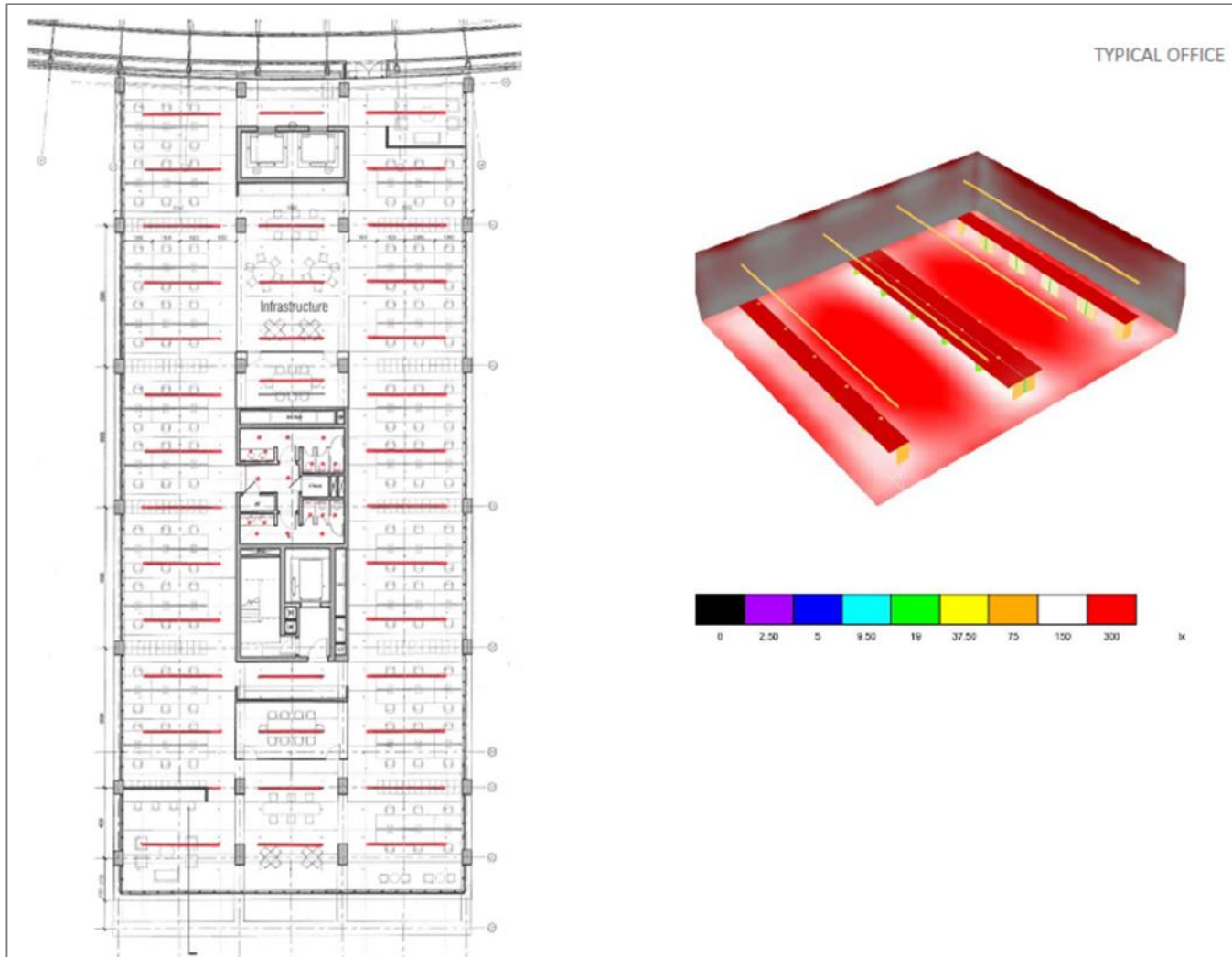


Photo Sensor



Motion Sensor

Lighting energy savings is more than 45% compared to SS code

Air Distribution and Demand Control Ventilation

EC Fans



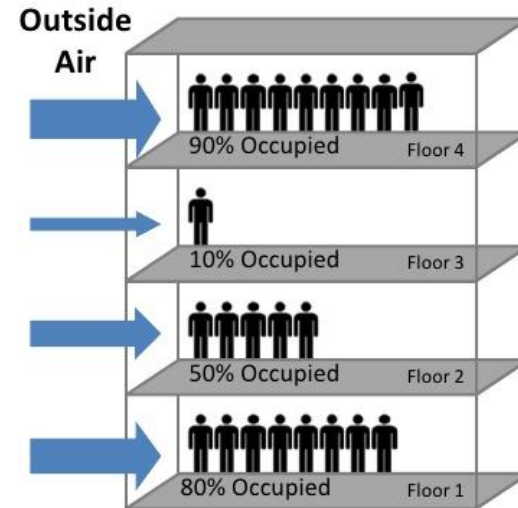
EC Fans



Axial Flow Fans

- Use of high efficiency EC & Axial flow fans to achieve best-in-class Air-distribution efficiency
- Achieve air distribution efficiency of < 0.25 W/CMH

Demand Control Ventilation

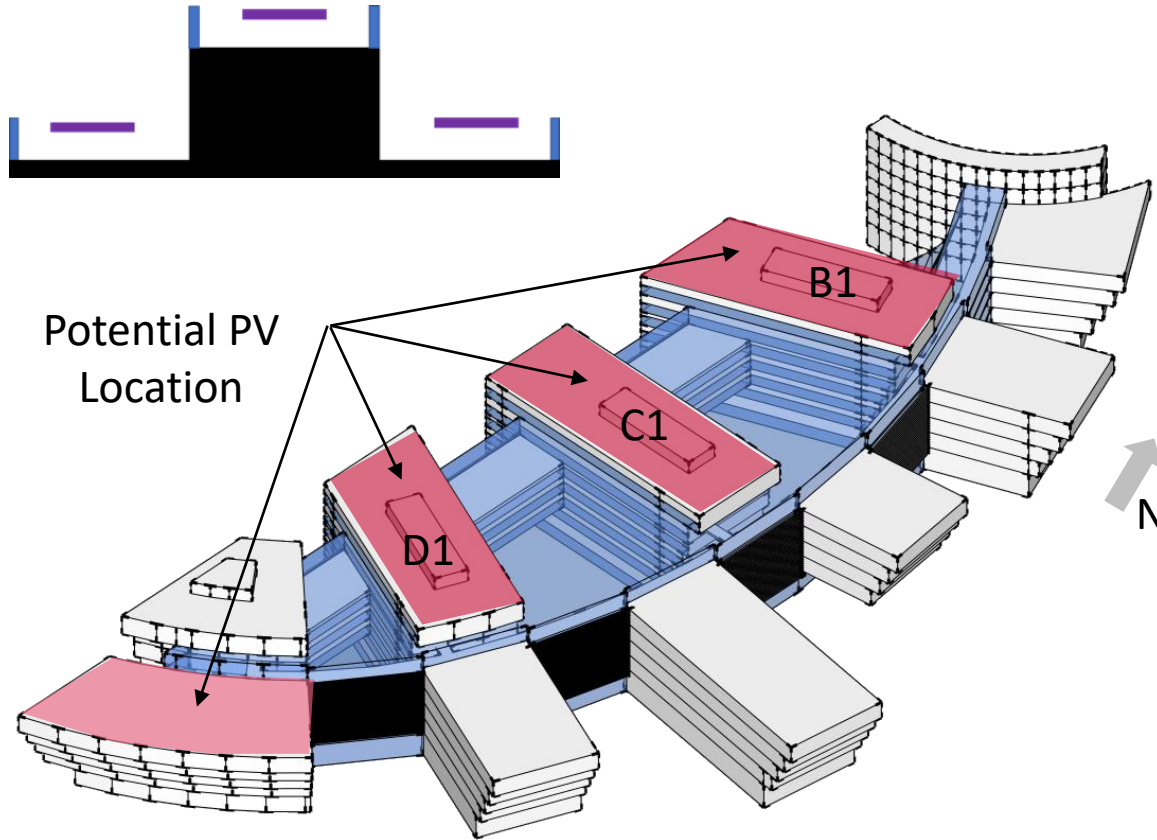


- Ventilation level is determined by CO2 Level (ppm)
- Adjust fresh air intake based on occupancy

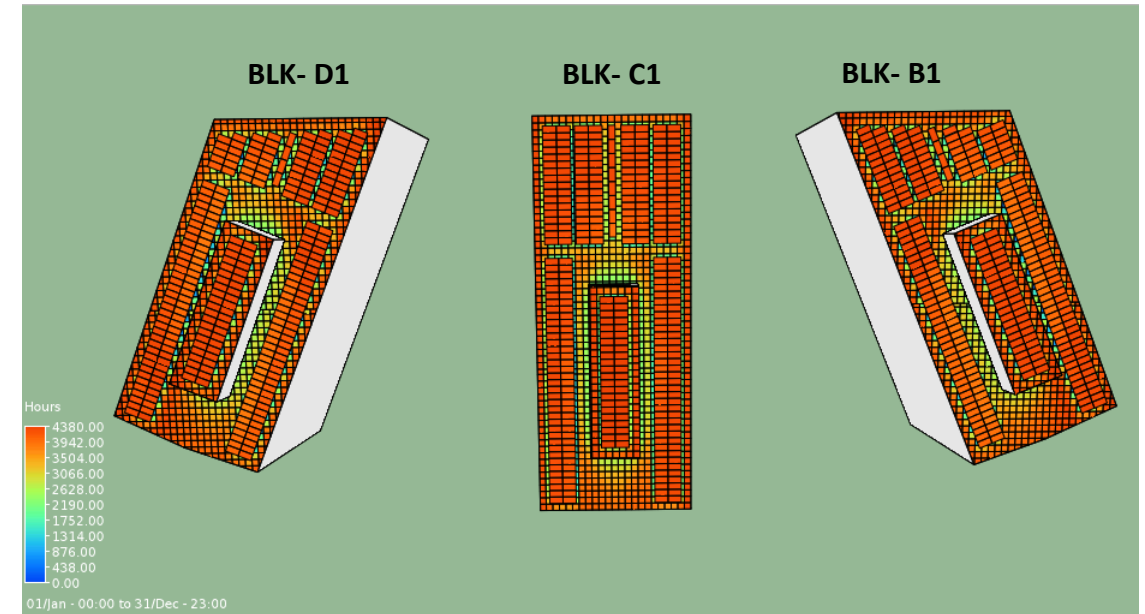
Live Energy and Water dashboard

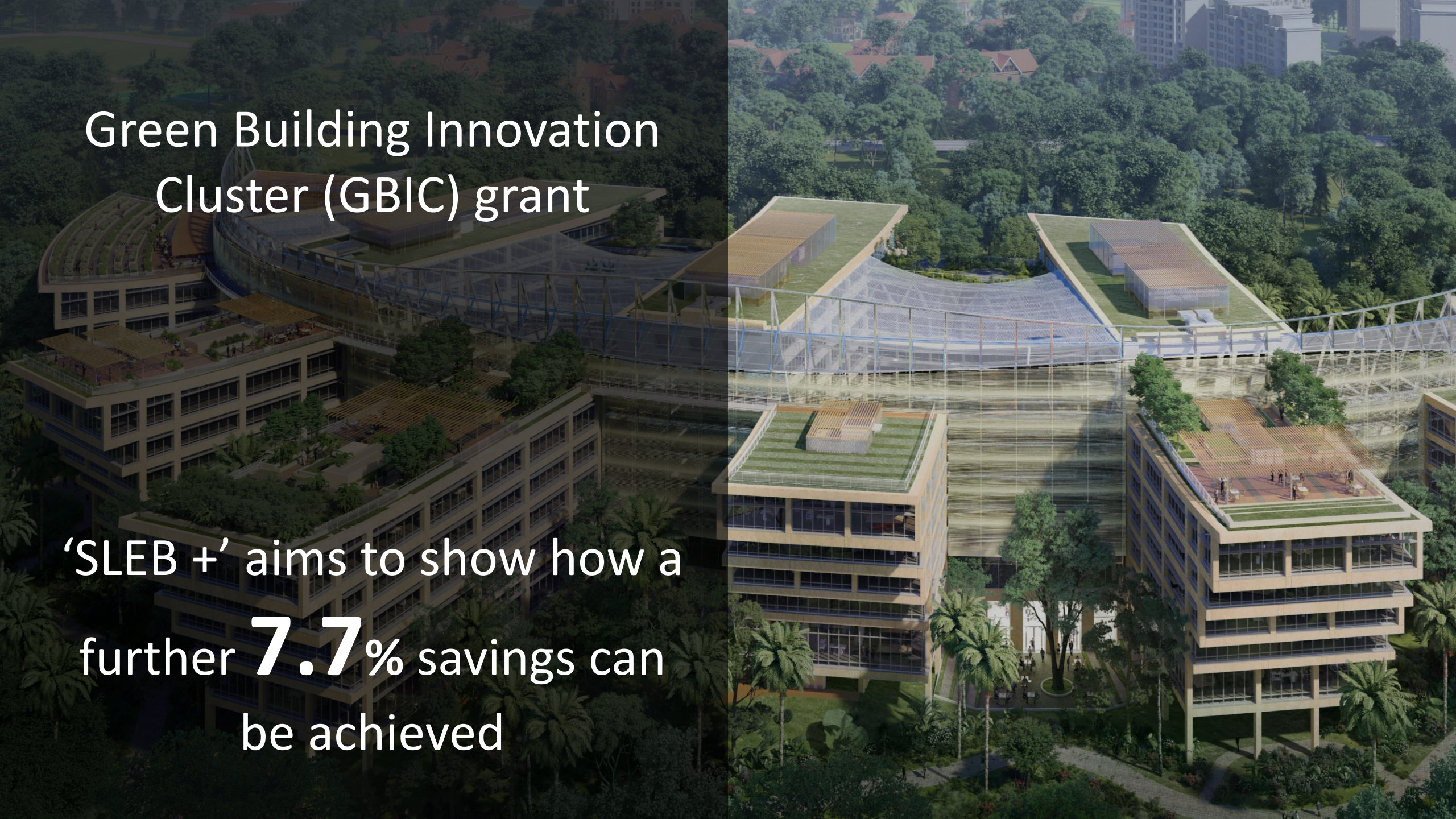


Solar PV Analysis



Total Energy Generation (MWh/Year) **389**



An aerial photograph of a modern architectural complex. The central feature is a large, curved structure with a glass facade, likely an indoor sports arena or stadium, which is partially covered by a translucent, grid-like roof. Surrounding this central structure are several multi-story buildings with flat roofs that are integrated with lush green landscaping, including trees and shrubs. The entire complex is situated within a dense, green environment, with more trees and some distant buildings visible in the background. The lighting suggests a bright, sunny day.

Green Building Innovation Cluster (GBIC) grant

‘SLEB +’ aims to show how a
further **7.7%** savings can
be achieved

SJ Campus - GBIC demonstration technologies

UFAD

is a base design across all office areas in Surbana Jurong Campus.

One demonstration floor is proposed to be an alternative system which is smart, wireless and ductless system.

IoT INDOOR ENVIRONMENTAL QUALITY



Many small-timescale and discrete IEQ studies over 18 months throughout

Adaptive AI- optimizing both chilled water and air distribution system for UFAD system.

Campus wide application - Significant energy savings

SMART LIGHTING



One demonstration floor for digital / wireless lighting ... leveraging API for more reactive ventilation control.

SMART WASHROOMS



In 14 number of the 36 number of washrooms (covering both Male and Female facilities).

SMART ELECTRICAL OUTLET SERVICES

One demonstration floor is proposed accounting for desktop based smart sockets.

Energy Reduction: Should the demonstration technologies be scaled up Campus-wide -
7.7 % savings over SLEB

THE STAGE HAS BEEN SET @ SJ for IDD

IDD for SJ Campus Project

The Five chosen Areas of IDD implementation for SJ-Campus

1

**Computational
Design**

Shape Grammar,
Generative, AI,



2

**BIM
Documentation**

CDE, AR-MR-VR
Green Building



3

**VDC
Processes**

ICE, PPM,
AR-MR-VR



4

**DfMA
Construction**

PPVC, PBU,
Buildability



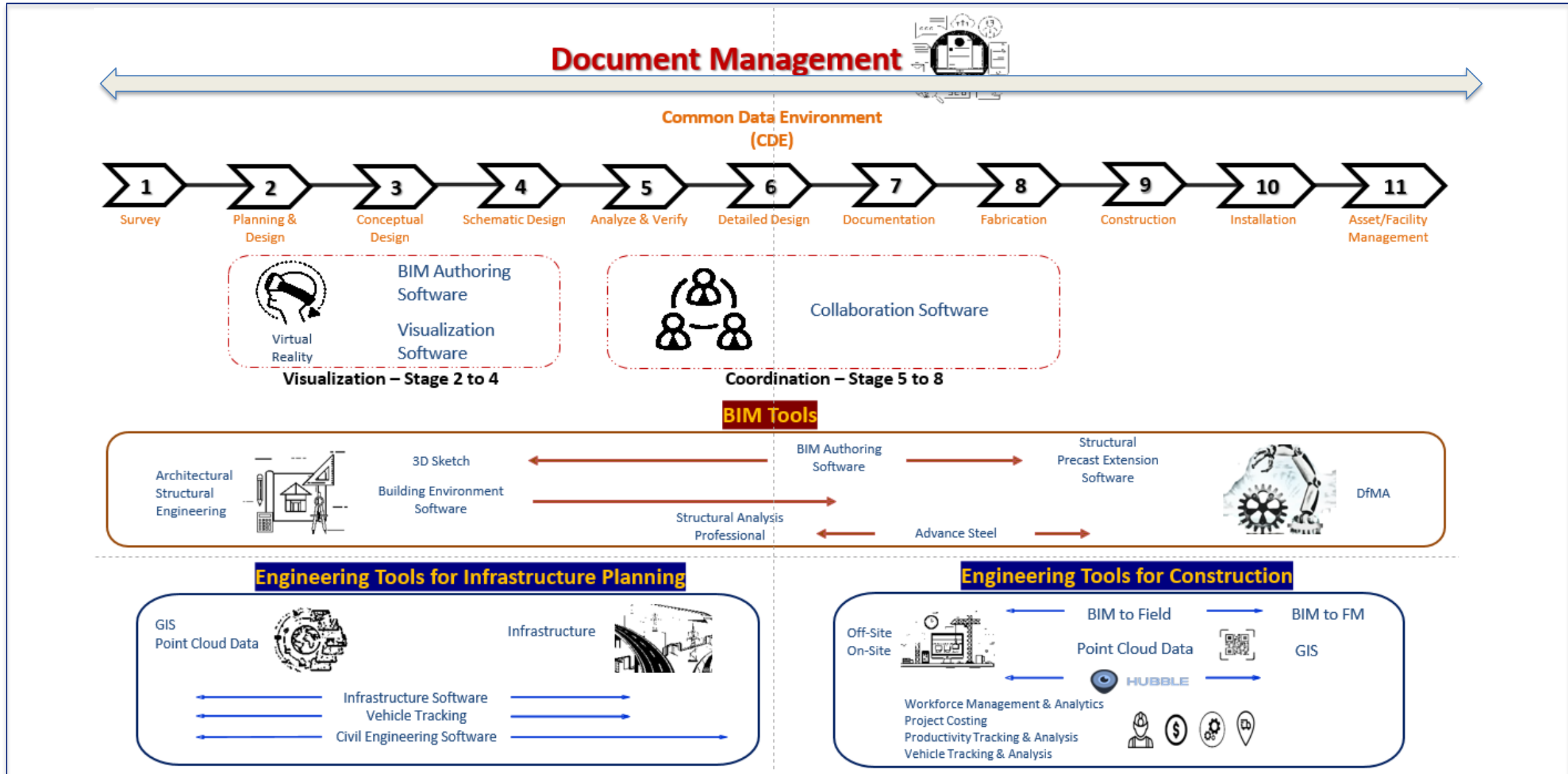
5

**BIM-FM
Asset-Management**

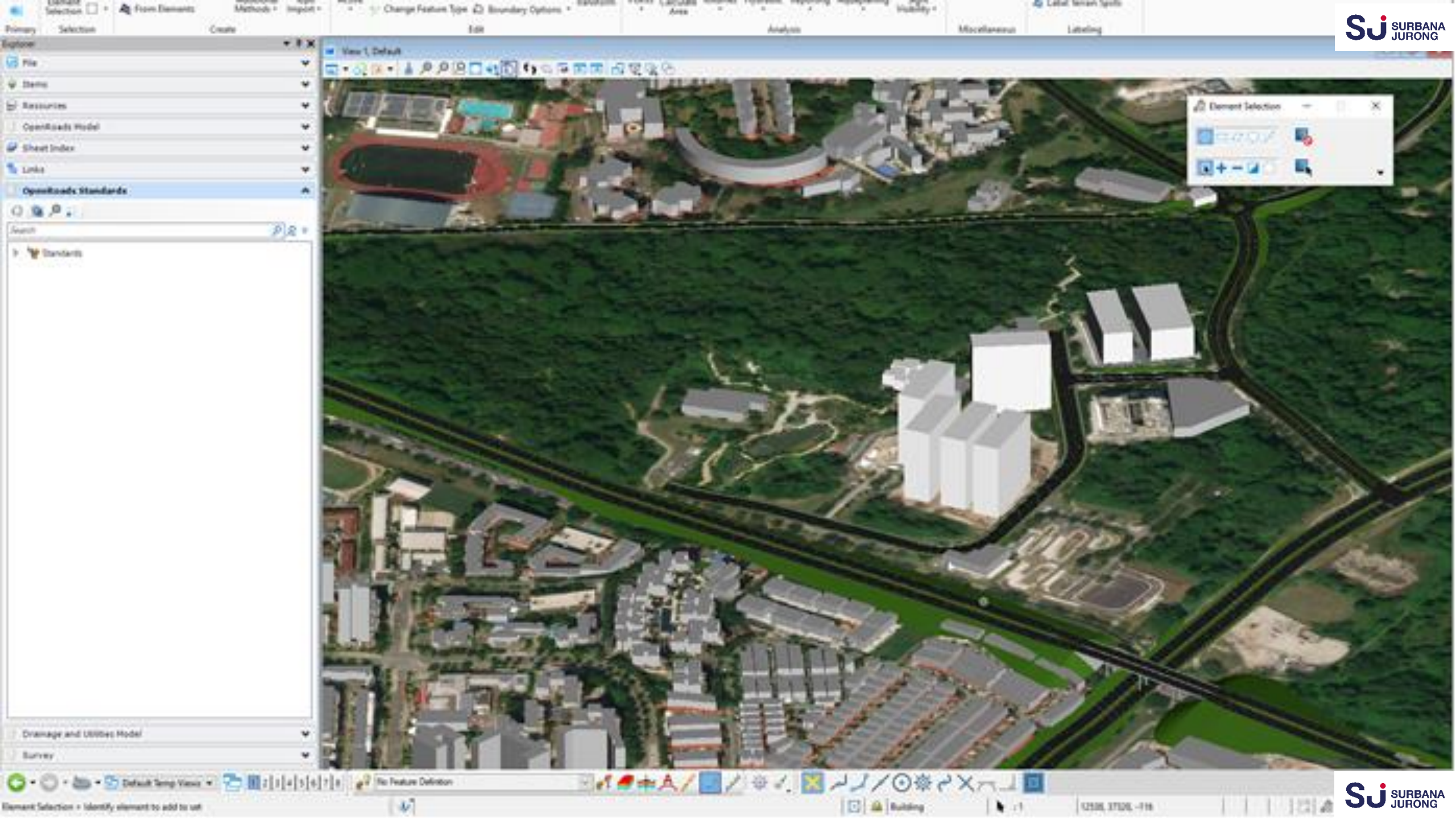
IOT, Sensor,
Sustainable



An Example of Industry Collaboration Using IDD

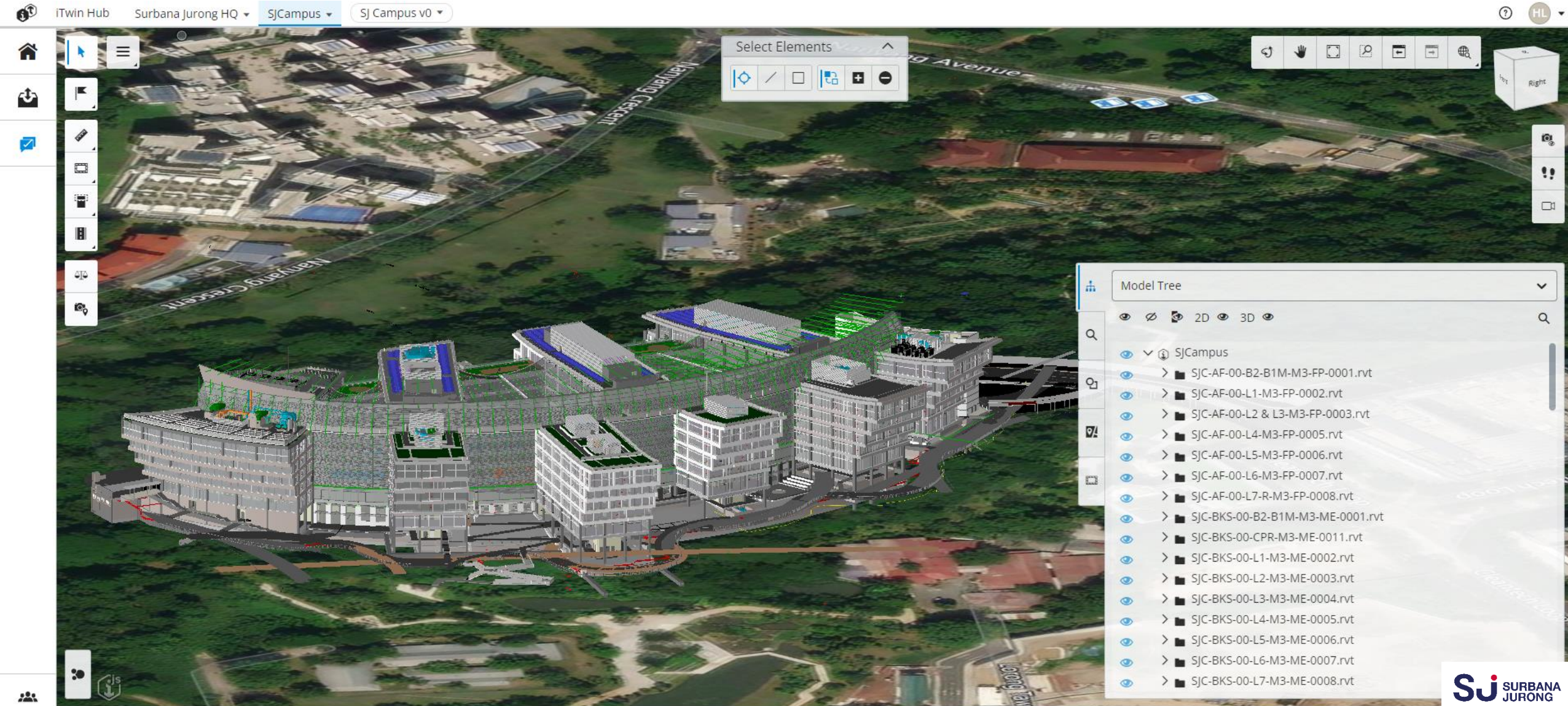






Design Coordination & Review

Detailed Design



Design Coordination & Review - Tools

Sectioning



Design Coordination & Review - Tools

Measurements

ITwin Hub Surbana Jurong HQ **SJ Campus** SJ Campus v0

Select Elements

Measurement

- Distance
- Area
- Location
- Radius
- Angle
- Perpendicular Distance

Distance Measurement [44.852 m]

Distance: 44.852 m

Run: 0.425 m

Rise: -44.85 m

Slope: -10553.21% (-1 : 0.009)

ΔX: 0.2902 m

ΔY: 0.3105 m

Start Coordinates: 12242.92, 37216.48, 155.93

End Coordinates: 12242.63, 37216.79, 111.08

Messages Identify element Snap Mode Scope: Element

Sj SURBANA JURONG

Design Coordination & Review - Tools

Interrogation

The screenshot displays a BIM software interface for design coordination and review. The main view shows a 3D model of a building with internal insulation highlighted in blue. The interface includes a top toolbar with various tools, a left sidebar with navigation icons, and a right-hand panel displaying properties for the selected 'INTERNAL INSULATION' element.

Top Bar: iTwin Hub, Surbana Jurong HQ, SJ Campus, SJ Campus v0

Right Panel: INTERNAL INSULATION [25-114]

Duct Insulation

> Duct Insulation

Selected Item(s)

Category: Duct Insulations
 Code:
 Model: SJC-BKS-00-LR-M3-ME-0009.rvt
 Physical Material:
 User Label: INTERNAL INSULATION

> Identity Data

> Constraints

End Middle Elevation: 0.0
 Horizontal Justification: Center
 Middle Elevation: 0.0
 Related to Mass: false
 Start Middle Elevation: 0.0
 Vertical Justification: Top

> Dimensions

> IFC Parameters

> Mechanical

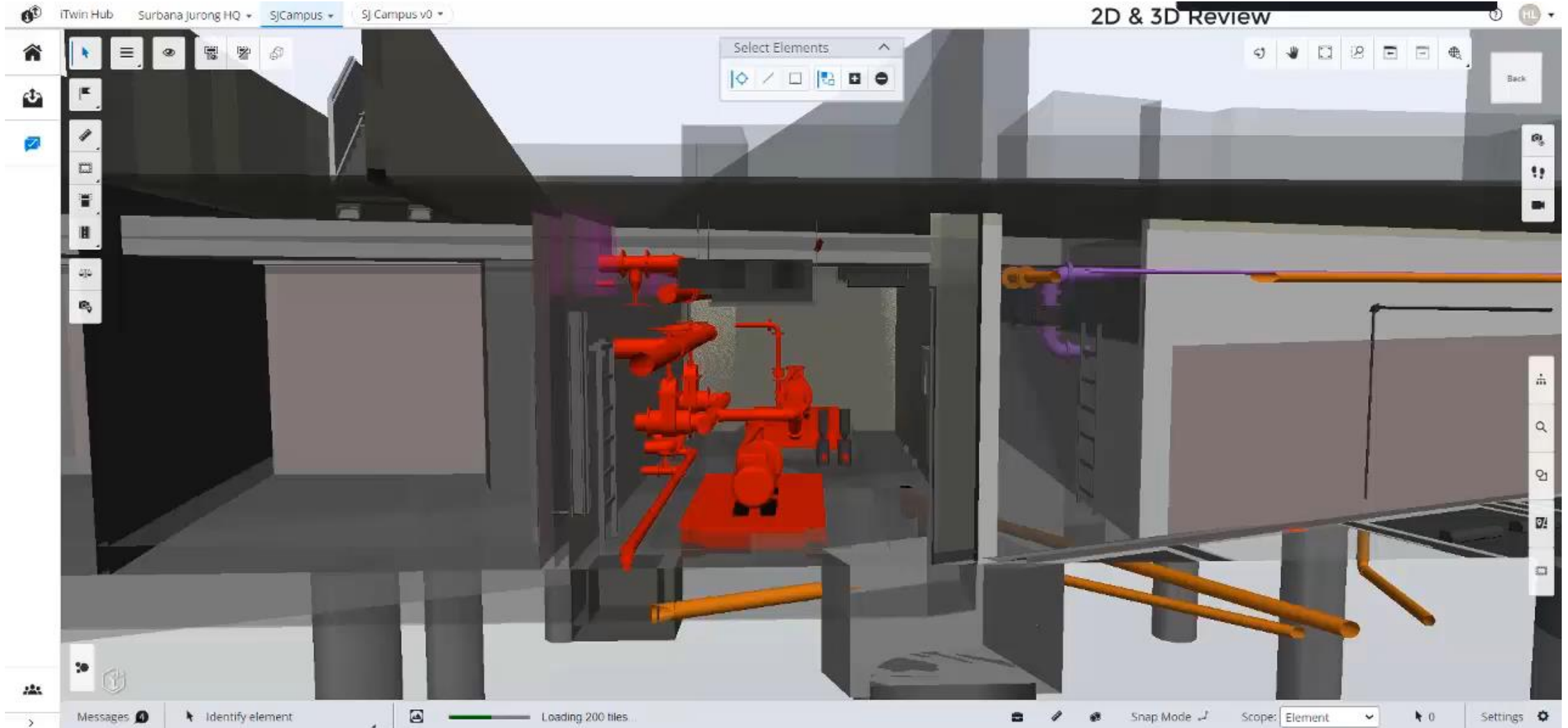
Insulation Thickness: 100.0 mm
 Insulation Thickness: 100.0 mm
 System Abbreviation: SAD
 System Classification: Supply Air
 System Type: Supply Air

> Phasing

> Structural

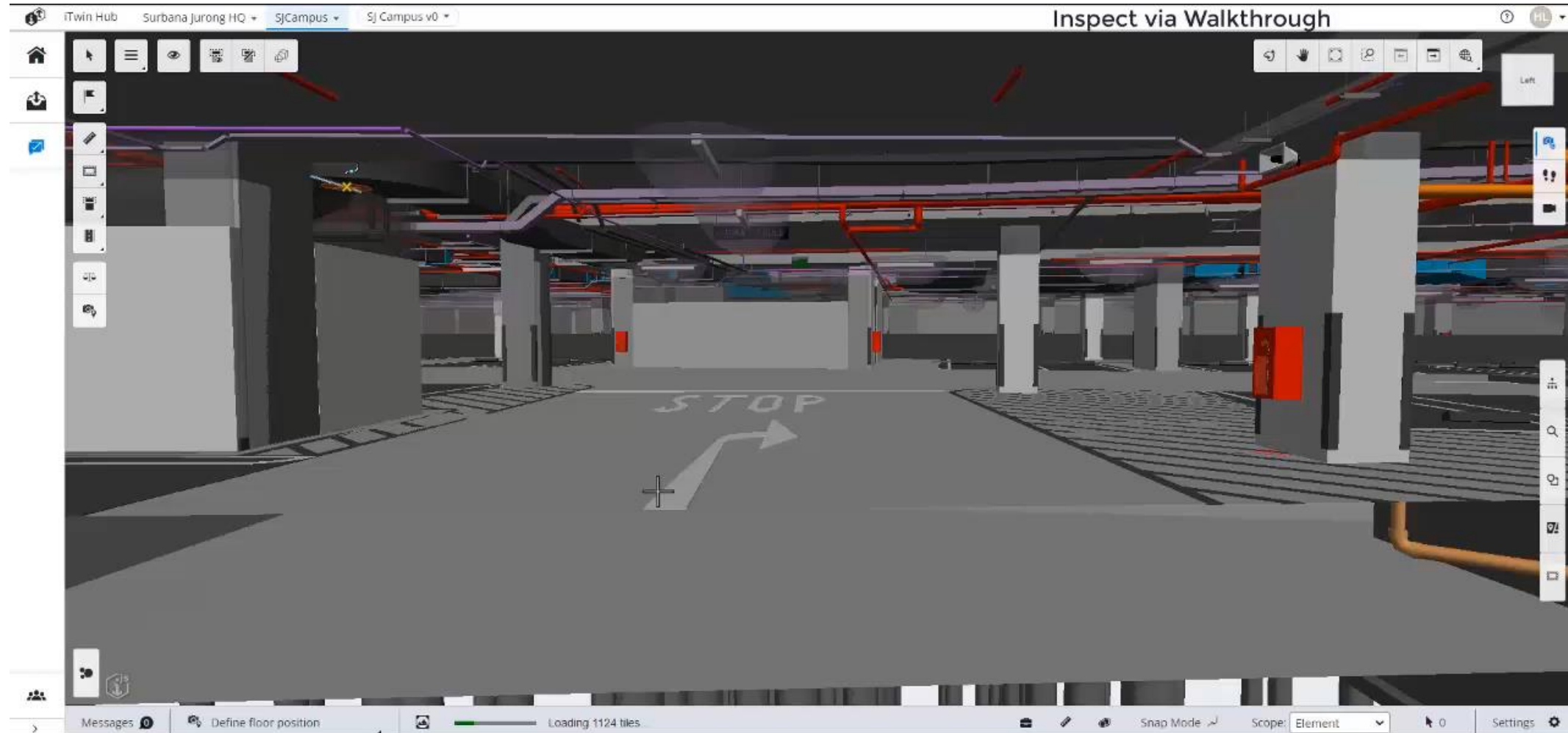
Design Coordination & Review - Tools

2D & 3D Review



Design Review Issues and Markups

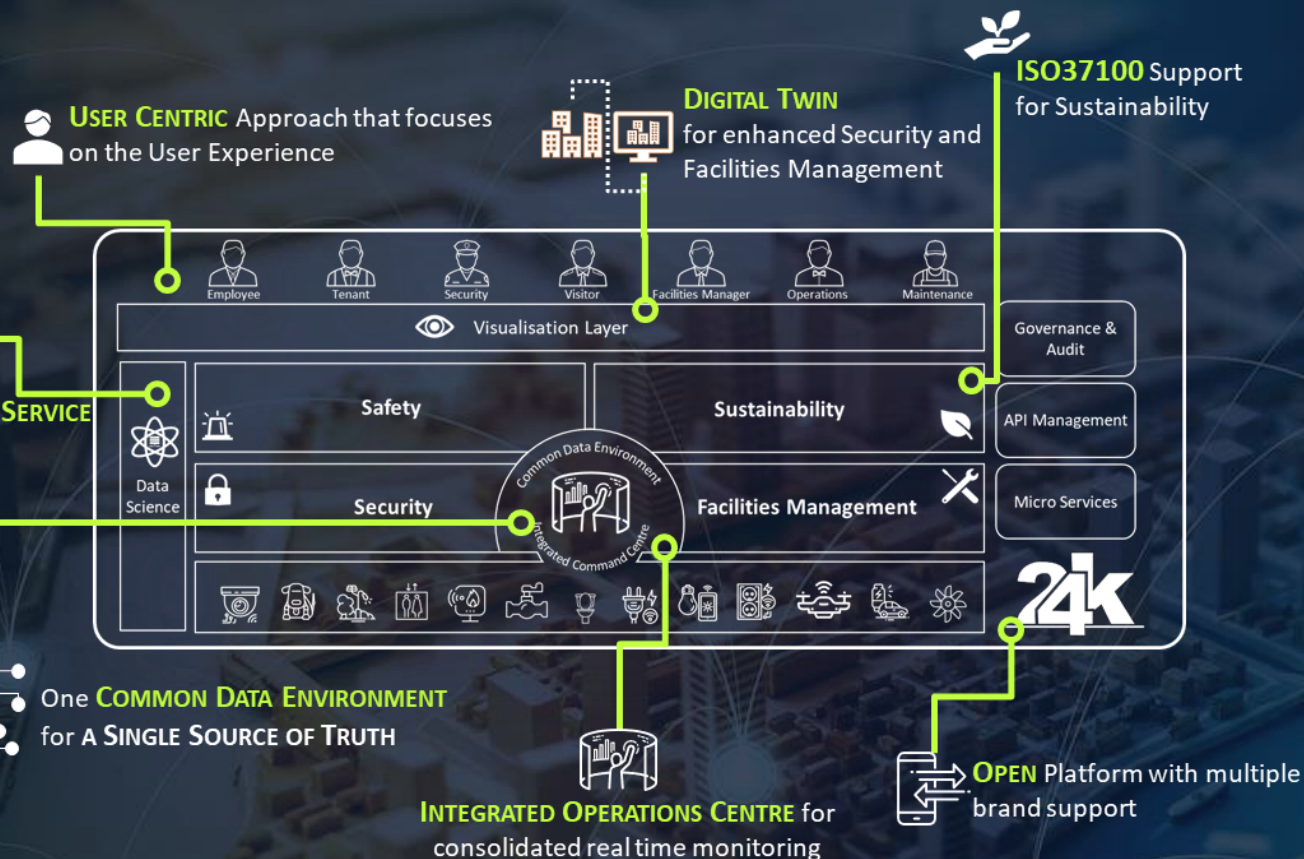
Walkthrough, Issues Collaboration and Central Management





24K Integrated Platform

Enabling Technology to Optimise Resources



FEATURES & BENEFITS

Mobile Support

Access information on the go for the ground team.

Benefit – Improved Productivity

Common Data Environment

Secure data storage with machine learning capabilities.

Benefit – One source of Truth

Data Analytics

Extend asset operating lifespan via preventive maintenance.

Benefit – Actionable insights for continuous improvement

Workflow Support

Auto trigger of service calls

Benefit – faster response time, reduce operational downtime

Consolidated Dashboard

Centralised view of connected devices and systems

Benefit – Single view of multiple systems and buildings

Modular & Scalable

Add device and systems when needed.

Benefit – A platform that will grow with the business

Real Time Monitoring

Get alerted the moment an incident occurs.

Benefit – Improved Situational Awareness

Open & Brand Agnostic

Supports multi brand in client environment.

Benefit – Single platform to manage multi brand environment



24K Integrated Platform consolidates data from with IoT devices to provide situational awareness for facilities management

Open and Modular Platform that can support multiple assets. Scalable from a single building to an entire city





Applications as a
Service
(APPaaS)

Smart Apps for better user experience and manpower optimisation

Delight Factor Measurement

The client is looking for a seamless method to manage the expectations of tenants in the campus and with the Community App, the pulse of the tenants can be easily captured.



Recording &
Inspections and Fault
Reporting



24x7 Operations



Toilet eFeedback System
eInspection Module



Sensors Network



Type of Sensors

- People counting sensor
- Footfall analysis
- Scent detection
- Toilet paper monitoring
- Wireless cleaner attendance taking
- Smart Soap Dispenser Monitoring
- Self-cleaning Cubicles
- Cleaning robot
- Toilet feedback system

Benefits

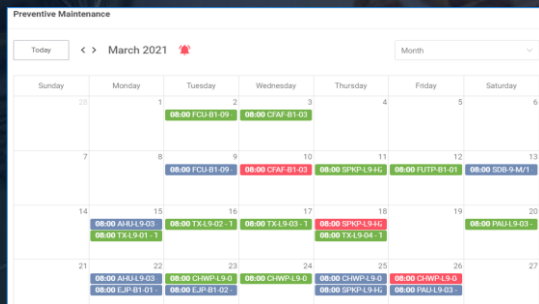
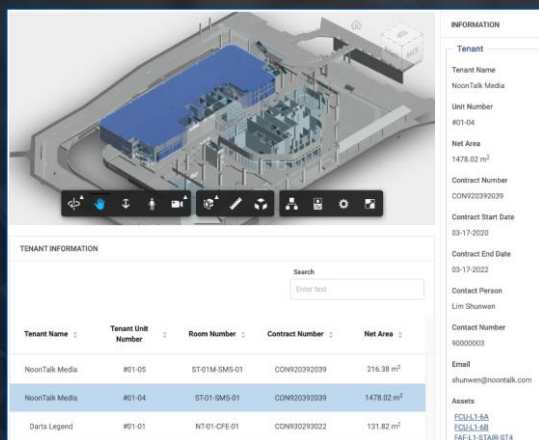
- ✓ Better management of resources
- ✓ Able to increase productivity
- ✓ Improved Client Satisfaction
- ✓ Improved employee Satisfaction
- ✓ A common, modular and integrated platform to onboard future app without having to manage different silo systems and better monitoring





BIM FM leverages on digital technologies and Internet of Things (IoT), to achieve greater productivity, enhanced customer experience and cost reduction in Facility & Asset Management.

BIM Facilities Management (BIM FM) helps facility managers and owners to make a data backed decisions by providing easy access to key asset and building information and performance



- Space information
 - Tenant
 - Tenant Contract
 - Space Arrangement
 - Space Summary
- Space Management



Operation Management

Work Order
(Corrective Maintenance
Preventive Maintenance



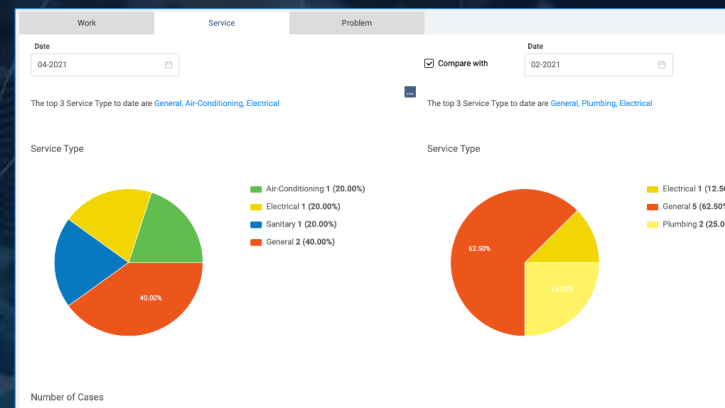
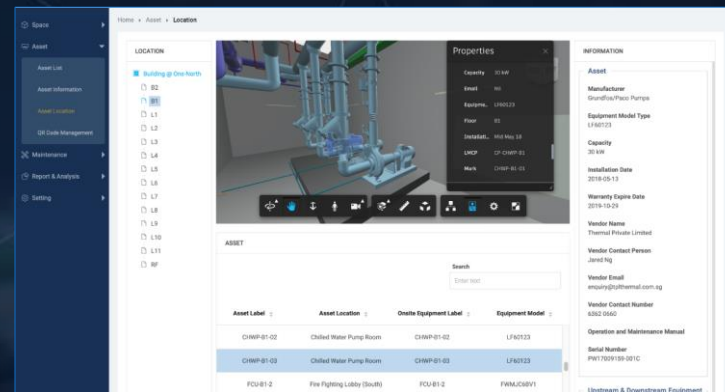
- Asset List
- Asset Property
- Asset Location
- QR Coder Management

Asset Management



Report Management

- Work History
- Problem Type Statistics
- Fault Reporting Trend
- Response Time Summary
- Type of Work Statistics
- Faulty Asset Statistics
- PM Statistics
- Report Generation



BIM FM is where Model Integrates Data



- ✓ Optimize asset operational lifespan
- ✓ Improve building performance
- ✓ Enhance occupant experience
- ✓ Reduce operating cost.

Conclusion

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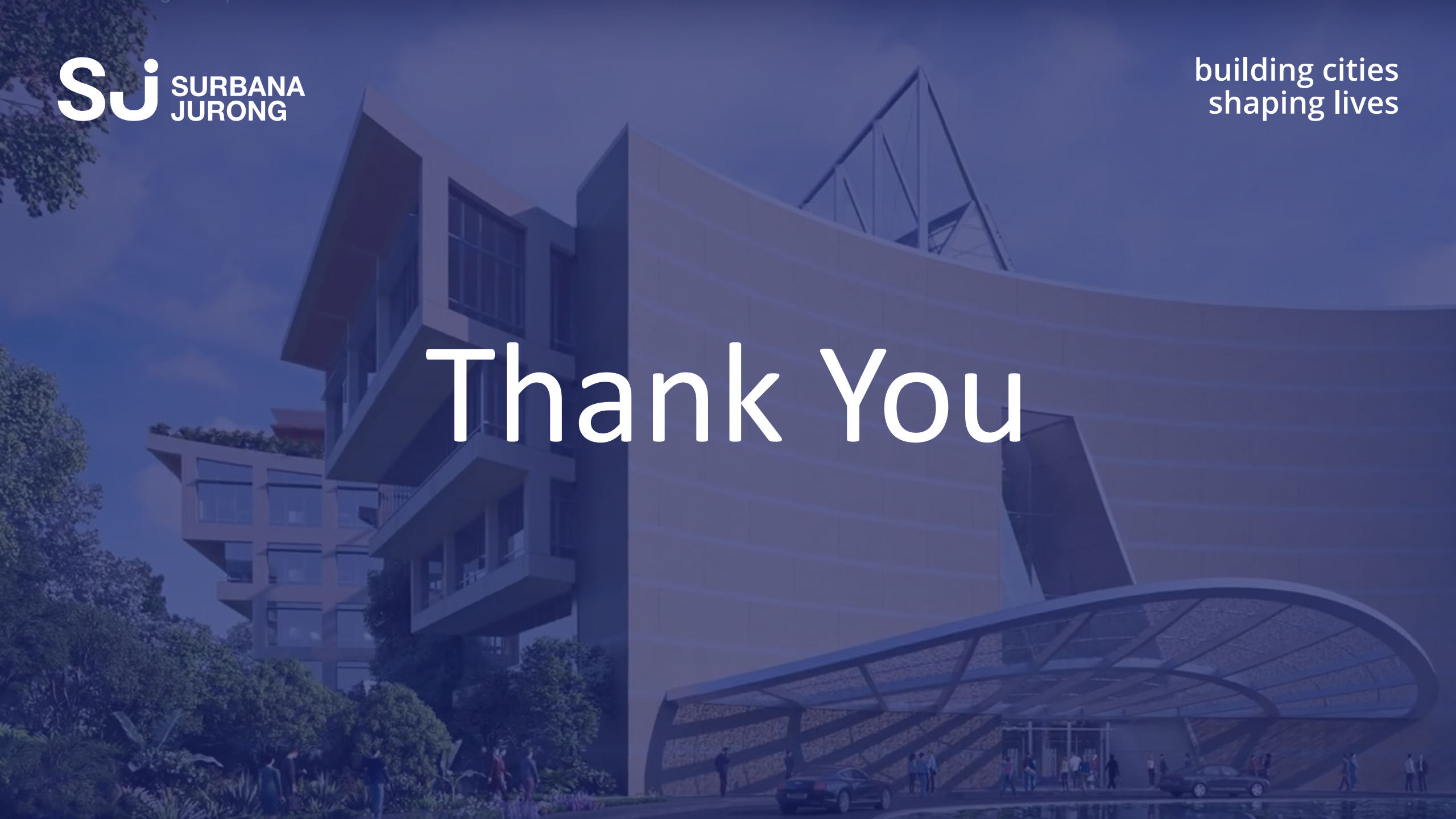
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A large, modern building with a curved, light-colored facade and a glass-enclosed entrance. The building is surrounded by greenery and people are visible near the entrance.

Thank You