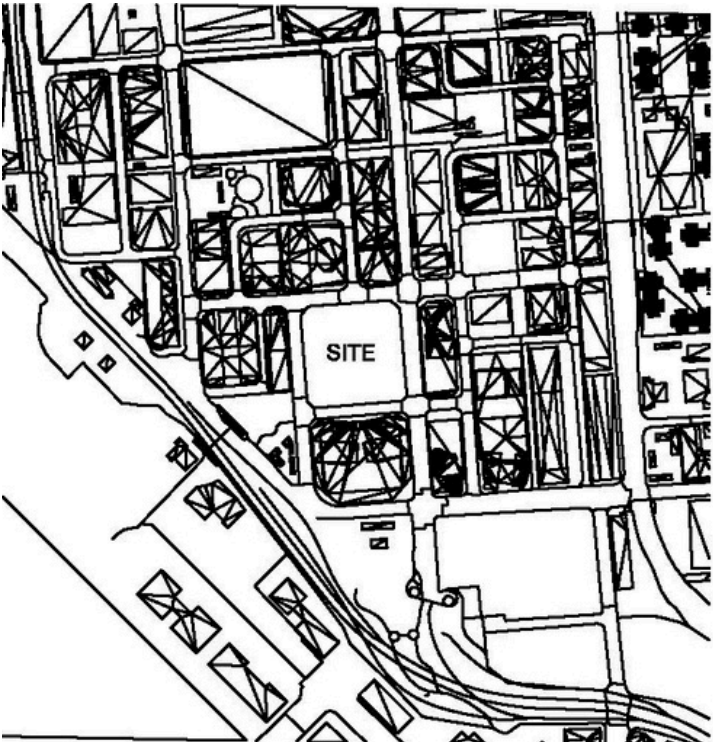


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Location Plan 1:10000



About the Project Development

Design Concept:

- Environmentally-friendly 🌱
- Interactions between students and teachers 👍
- Welcome to public 🏡

Building Form & Spatial Arrangement: We chose a circular form to be the foundation.

Connectivity: In the design process, we keep connectivity as one of our priority. In each level there are two staircase on the two side of the building in order to avoid any possible congestion in times of emergency. We have installed enough vehicle parking lot that satisfied the requirement need. On top of that, to encourage zero carbon transportation, we also installed bike parking lots.

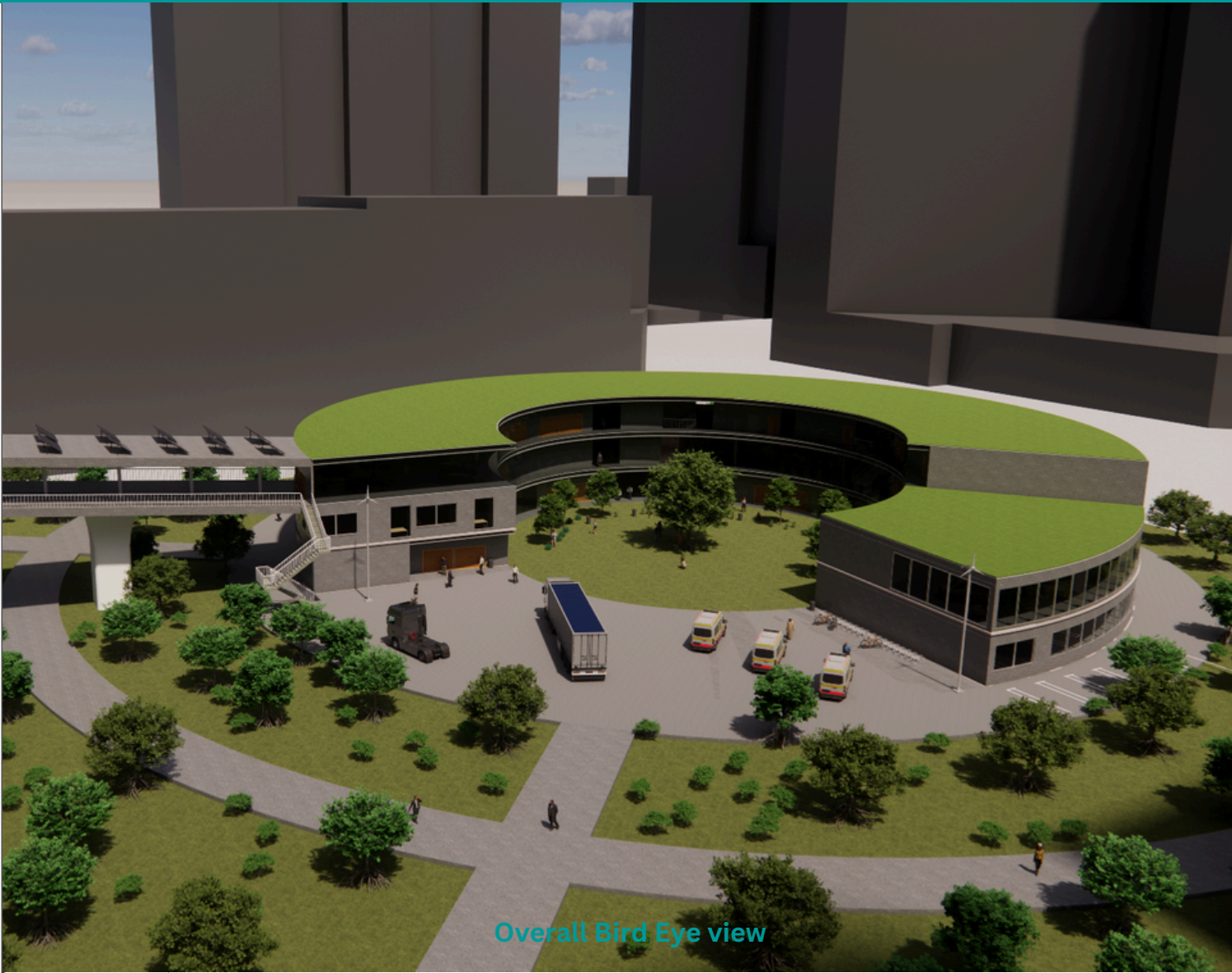
BIM Uses in Design, Coordination, Engineering, Analysis and Optimisation: In the design process, we attempted to follow the CIC standardized BIM workflow, analysis and simulation.

BIM Collaboration Approach: In this project, our team used Revit to create Architectural model and MEP Model. Tekla for structural model. For team collaboration, we use Trimble Connect as our CDE platform with IFC & BCF to facilitate data sharing.

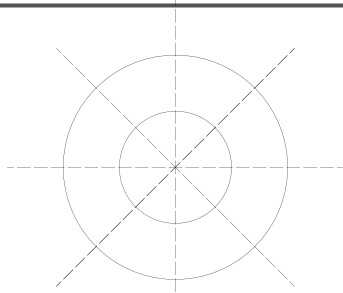
Quality of Design: BIM empowered our team to visualize our design digitally and in an intuitive way. Allow our team to collaborate more efficiently.

Sustainability: Our team designed large area of window, allowing introducing natural light inot the indoor area which reduce needs of lighting. For the partition material, bamboo is being considered which has lower carbon footprint comparee to concrete.

Constructability: Considering the site being located in an urban area, the on site construction time has to minised to reduce nuisance to nearby neighbours. We decided to utulize DfMA and MIC for the floor slab and toilet respectively. They greatly reduce the construction time and increase efficiency.

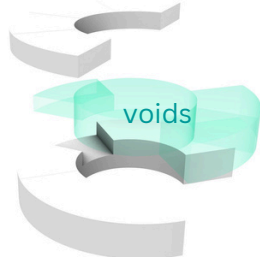


Overall Bird Eye view



Grids

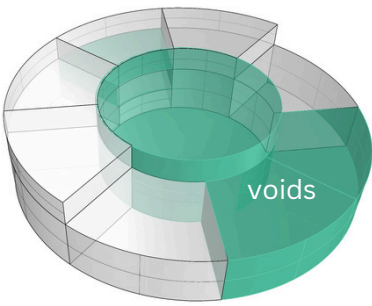
A donut shape divided by the grids (dotted lines) to create the form.



Solid / Void 1.

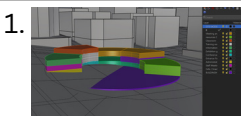
The centre is subtracted to be the garden. And there are voids in front and behind to maximize the wind flow.

Building Form and Space : The school is in a circular form. We aim to maximize the sunlight penetration, so that sunlight can reach every corner of the building, whether the exteriors or the interiors.

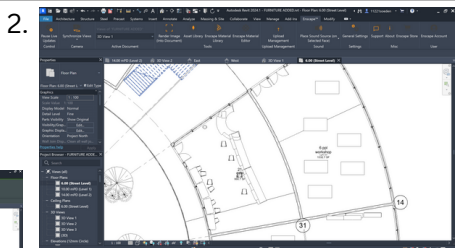
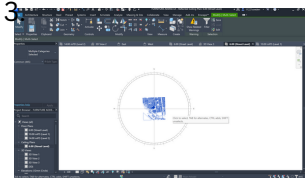


Solid / Void 2.

The voids shown allow sunlight and wind to pass through, giving space for natural elements to be involved in the design. In turn, the design becomes environmentally-friendly.

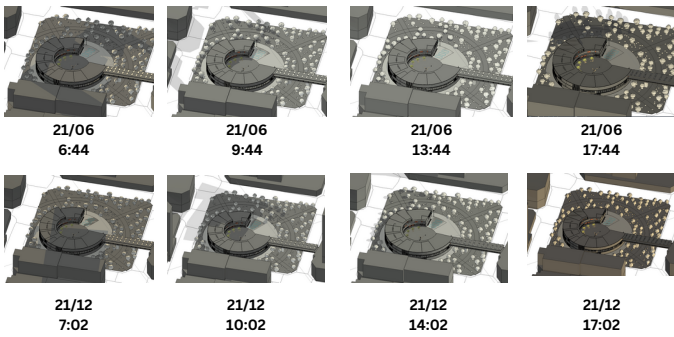
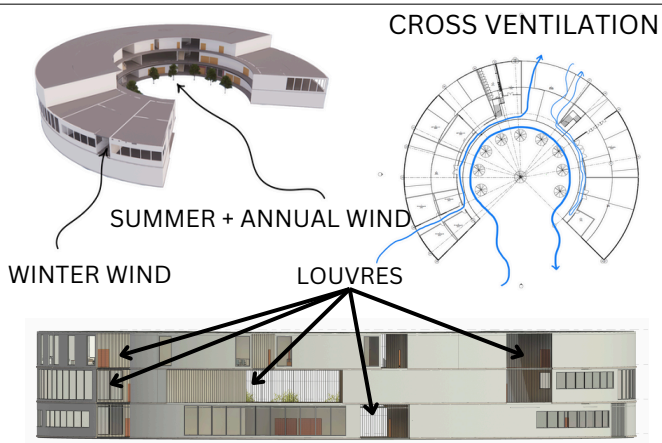


MASSING in RHINO



SOA ADJUSTMENTS assisted by REVIT calculation

Quality : With the great help of Revit , we are able to calculate the SOA instantly and adjust the scale of the massing. In the other hand, we can improve our design by using the powerful simulation of Revit.



At morning, the shadow has the largest cover area over the site. Placed at a position where can obtain the maximum sunlight



Plank Wood

Oak Wood

Sustainability: By selecting low carbon material and optimising natural light usage, the carbon footprint can be reduced greatly.

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Exterior Perspective :
Exterior louvres let wind pass through in.



Interior Perspective :
Interior glass walls let light come in.

Design Authoring:

Tekla Structures

Revit

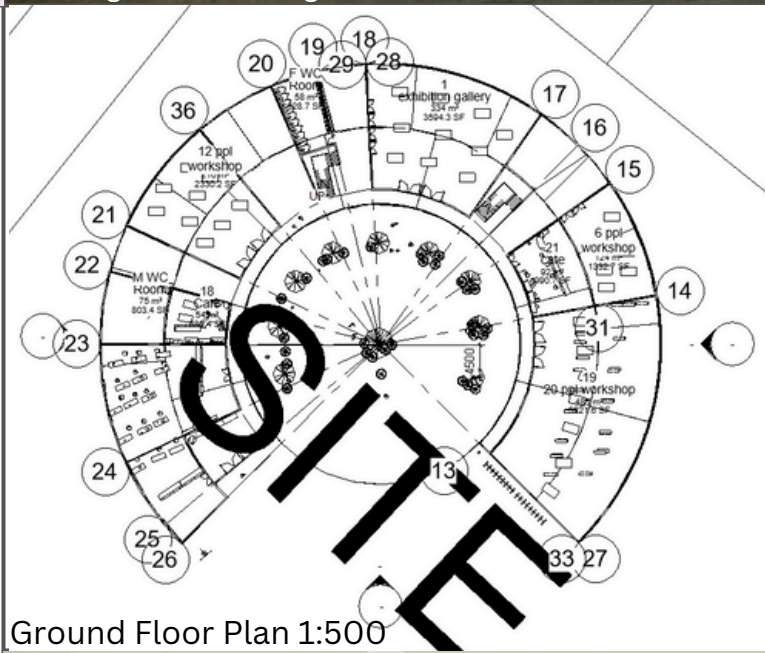
CDE:

Trimble Connect

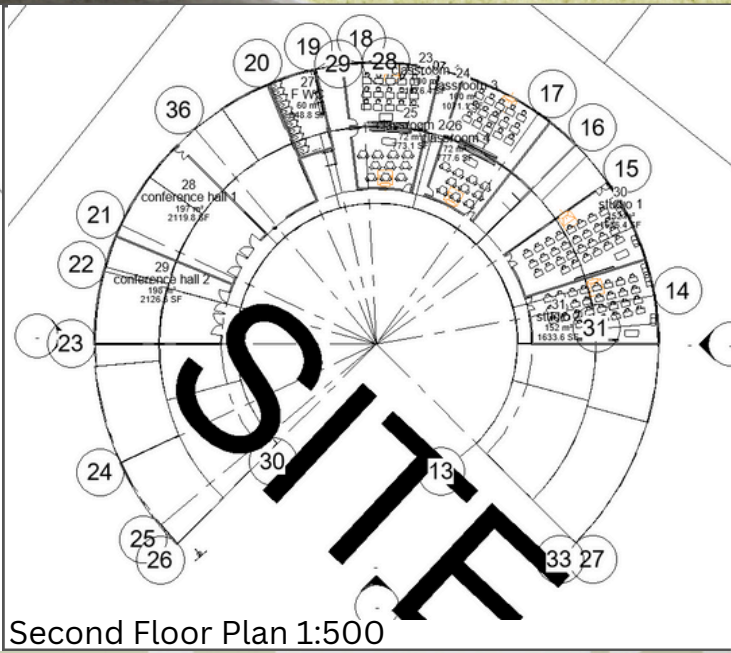
Workflow diagram showing the design authoring process from Revit to Trimble Connect, including stages like Shared, Work in Progress, Review/Authorize, and Archive.

Screenshot of the Trimble Connect web interface showing project explorer and data management tools.

Diagram illustrating the integration of EDMS, Workflow management, CDE, and 2D & 3D coordination.



Ground Floor Plan 1:500



Second Floor Plan 1:500

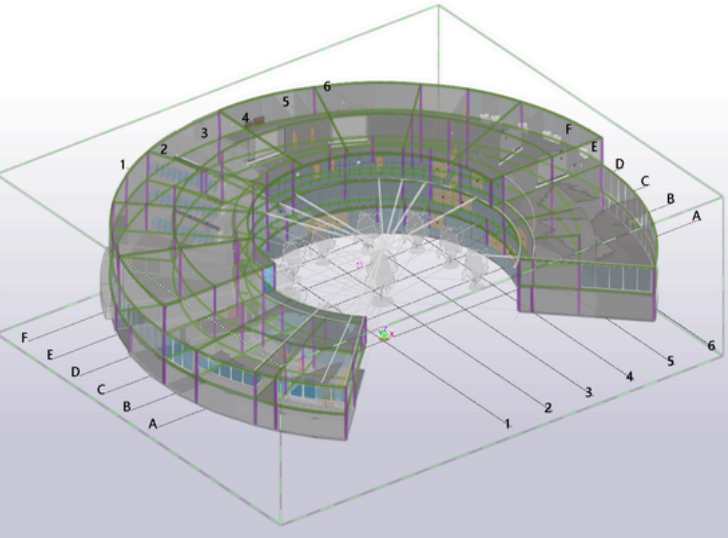
BIM model iteration & Work process coordination:

Trimble Connect [CIC] BIM BIM有力					
Explorer: 00 General - Architectural Models					
Name	Modified by	Modified on	Size	Tags	
BIM Library_Furniture	Kary Onli	May 19, 2024	27.33 MB		
BIM Archi Model with Furniture_v3...	Joe Cheung	May 21, 2024	62.34 MB		
Finalized version (layout confirmed...	Allen Ng	May 22, 2024	66.48 MB		
Finalized version with staircase.rvt	Allen Ng	May 24, 2024	67.84 MB		
Finalized version, please use this ver...	Joe Cheung	May 22, 2024	66.48 MB		
first draft.rvt	HK_Ed	May 18, 2024	47.49 MB		
first draft_user1.rvt	Tim Yau Choi	May 18, 2024	47.82 MB		
Pu/NATURE ADDED_2.rvt	Tim Yau Choi	May 26, 2024	85.75 MB		
level 1.dwg	Joe Cheung	May 16, 2024	36.51 KB		
level 2.dwg	Joe Cheung	May 17, 2024	59.32 KB		
level 3 from kary.rvt	Joe Cheung	May 17, 2024	40.1 MB		
level 3.dwg	Joe Cheung	May 17, 2024	48.69 KB		
VERSION_Ceiling/Bed/Plantation...	Tim Yau Choi	May 25, 2024	72.77 MB		



Interior Platform View :
For visitors or students and teachers to rest and enjoy the natural wind and sunlight.

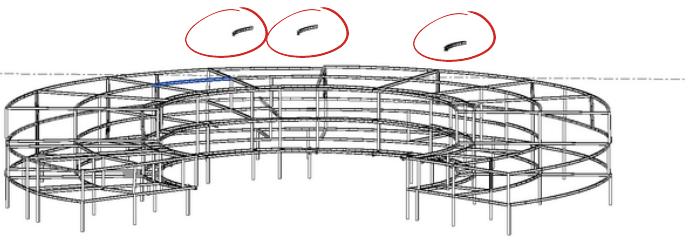
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Use of Tekla

- 1. structural model design (column, beam etc.)
- 2. adding bolt
- 3. welding size design
- 4. rebar detailing

structural design



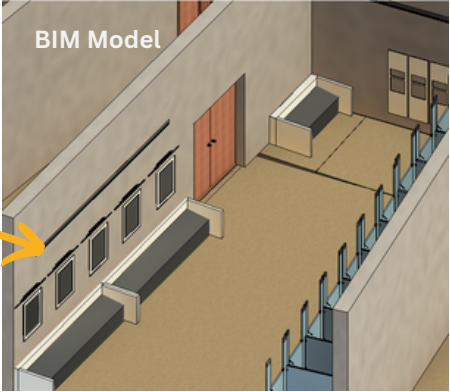
Autodesk limitation

- 1. import ifc file from tekla → rogue data
- 2. data lost (lost of beam and column)

DfMA is being used in slabs of every floor to reduced on-site construction time and reduce resource wastage in in-stitu construction



Sink system integrated with mirrors and soap dispensers (DfMA)



BEAM Plus



In addition to meeting the **required prerequisites** for each category, our project plans to achieve additional credits and bonuses in the following areas:

Category	Score	
IDCM	6+3B	(IDCM 3, 10, 11, 13, 14, 16, 17)
SS	12+6B	(SS 1, 2, 3, 4, 5, 8, 9, 10)
MW	7+5B	(MW 2, 3, 4, 5, 9, 10, 11)
EU	10	(EU 1, 2, 3, 5)
WU	4	(WU 2, 4, 5)
HWB	6+4B	(HWB 1, 2, 3, 4, 5, 10)

Score Attempted

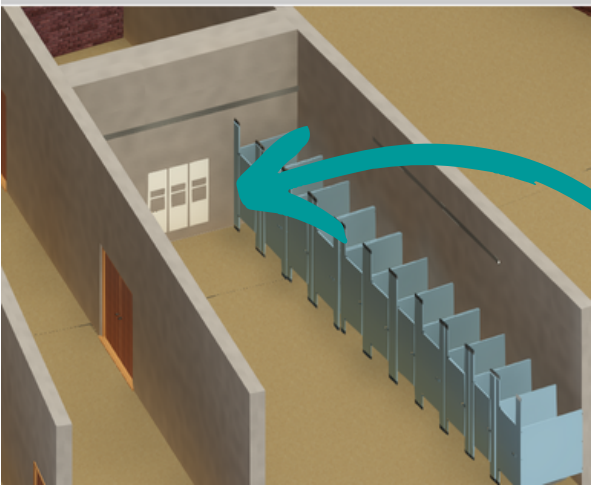
55.105

Target Rating

Silver



Use of MiC and DfMA for Toilet Design

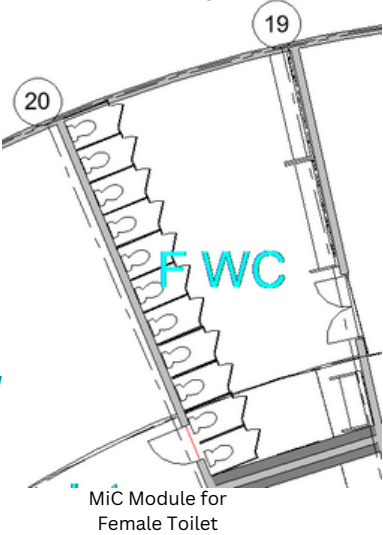


Advantages:

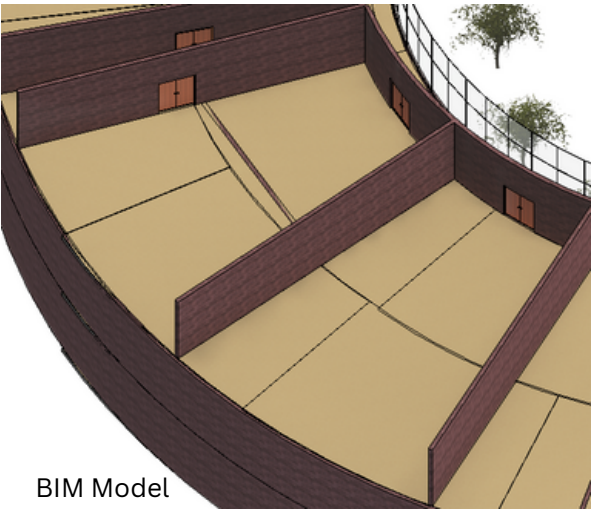
- 1. Improve *manufacturing efficiency* and on-site *installation speed*
- 2. *Minimise wet trade* construction
- 3. *Reduce cost*



Adopted a **Modular-integrated Construction (MiC)** and **Design for Manufacture and Assembly (DfMA)** for the toilets in CIC Innovation Academy



Use of MiC for Slab Design



BIM Model

The Characteristics:

- 1. Fabricated off-site in a controlled factory environment
-> *quality assurance*
- 2. Slab panels designed with integrated services conduits
-> *reducing on-site coordination*
- 3. Use of lighter-weight precast slabs
-> *easing transportation and installation*



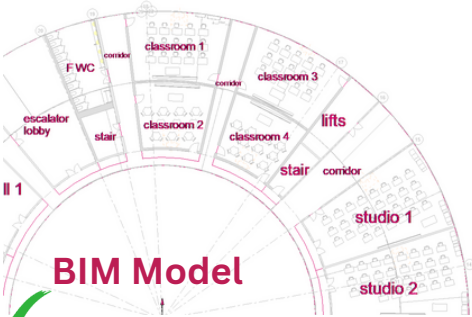
Concrete Slab



Clean

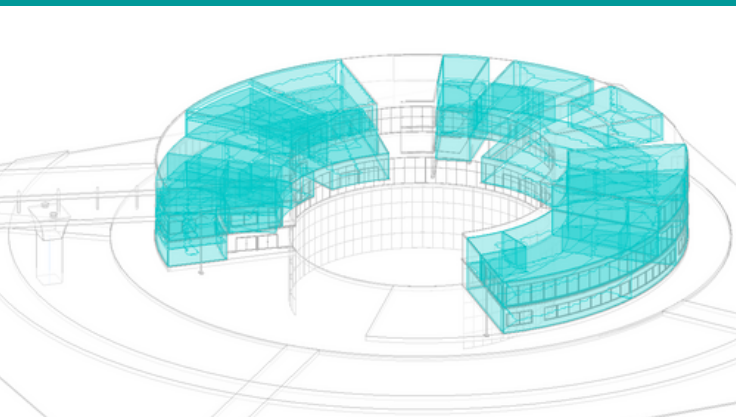


Accelerated

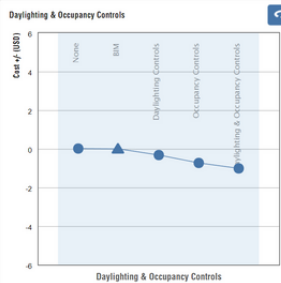


BIM Model

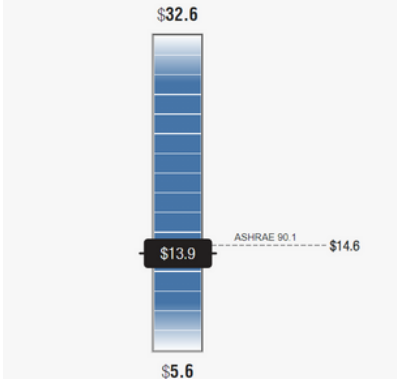
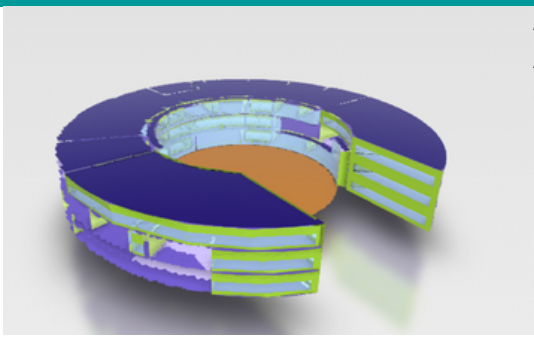
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After completing the model, energy analysis is being conducted in Revit. First we created a energy model and run the analysis.

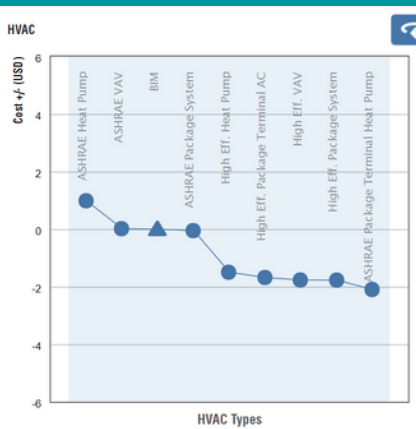


The initial design actually peofrm worse with daylight, therefore we inncrease the window area tomaximizing the daylight utilization.

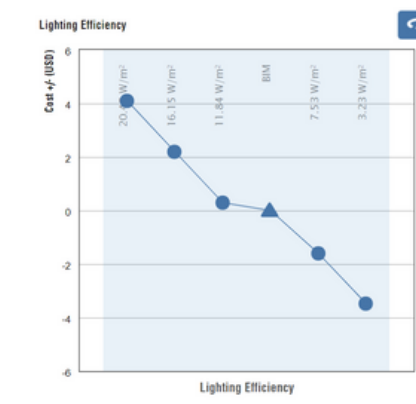


The analysis gave out the results of the running cost of the building. (14.6 usd per annual)

After the analysis, Autodesk Insight display wide array of data for us to optimize our buildings.



Take reference with the results, we installed heat pump in the building to reduce running cost.



We decided to use lighting fixture with higher power given the analyzing results

OpenBIM & Creative BIM use



AR/MR Visualization in IFC format

Trimble Connect [CIC BIM BIM/7]

View content for: All objects

GROUP BY:	Name	Count	Class	Material	Material	Area	Volume
	Dry Type Transformer - 400(230) - NEM...	1	IFCBUILDINGELEMENTPRO...	<Unnamed>		5.59 m²	0.75 m³
	Dust Insulation/Fire Clad:1424211 (1)	1	IFCCOVERING	Insulation - Fire Clad	Insulation - Fire Clad	1.25 m²	0.06 m³
	Dust Insulation/Fire Clad:1424212 (1)	1	IFCCOVERING	Insulation - Fire Clad	Insulation - Fire Clad	0.96 m²	0.05 m³
	Dust Insulation/Fire Clad:1424213 (1)	1	IFCCOVERING	Insulation - Fire Clad	Insulation - Fire Clad	1.84 m²	0.09 m³
	Dust Insulation/Fire Clad:1424214 (1)	1	IFCCOVERING	Insulation - Fire Clad	Insulation - Fire Clad	0.09 m²	0 m³
	Dust Insulation/Fire Clad:1424215 (1)	1	IFCCOVERING	Insulation - Fire Clad	Insulation - Fire Clad	0.87 m²	0.04 m³

Data table improving take-off process



AI-driven Reality Capture for site conditioning modeling & design review

Trimble Connect [CIC BIM BIM/7]

MEP to slab

Name	Distance	Important
MEP1-1	57 mm	
MEP1-2	57 mm	
MEP1-3	57 mm	
MEP1-4	57 mm	
MEP1-5	57 mm	
MEP1-6	57 mm	
MEP1-7	57 mm	
MEP1-8	57 mm	
MEP1-9	57 mm	
MEP1-10	57 mm	
MEP1-11	57 mm	
MEP1-12	57 mm	
MEP1-13	57 mm	

Details

Type: Clash

Status: Complete

Number of clashes: 2155

Tolerance: 10 mm

Options: Ignore clashes within the same object type

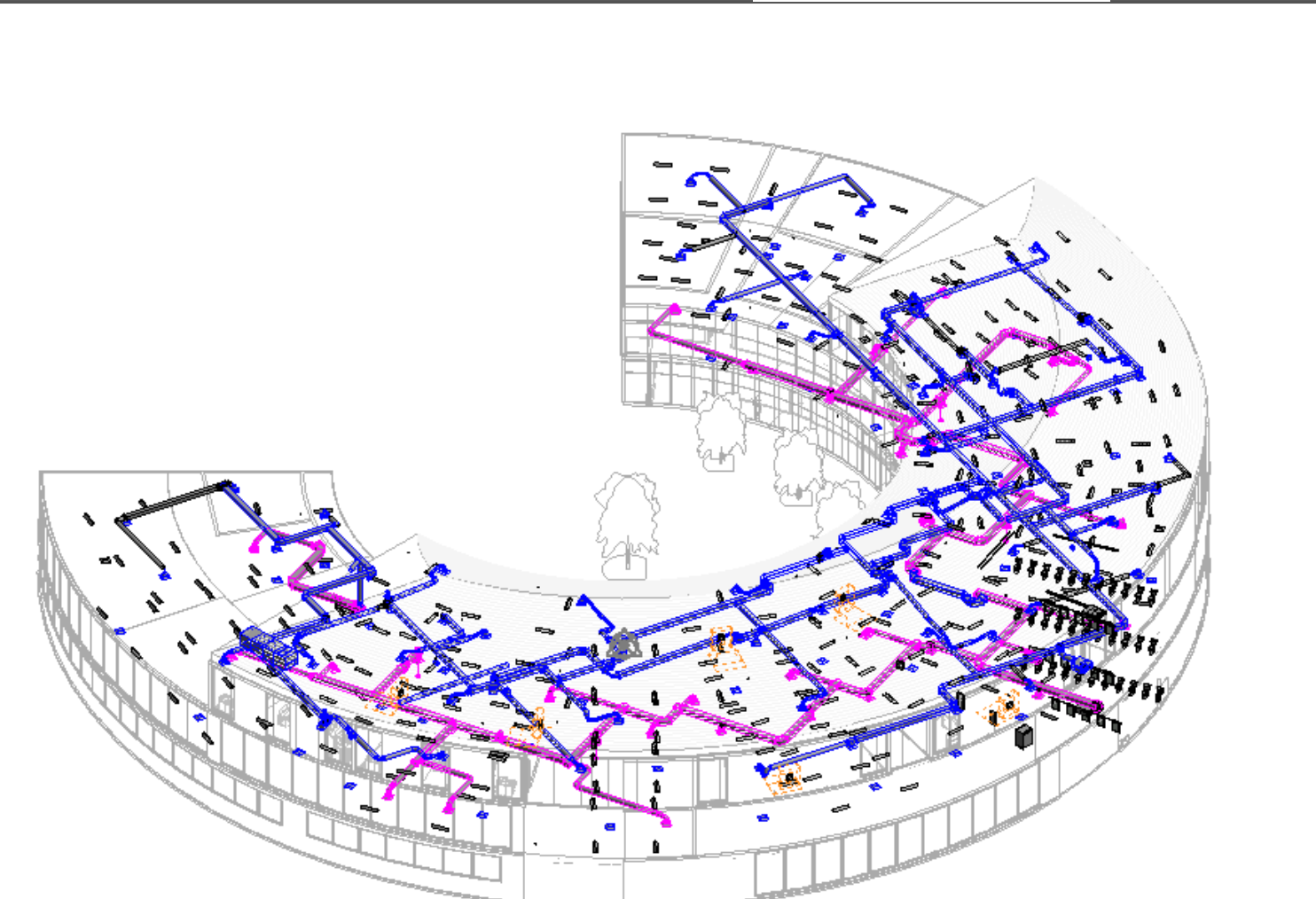
Shared with: No users

Created: May 27, 2024 by Allen Ng

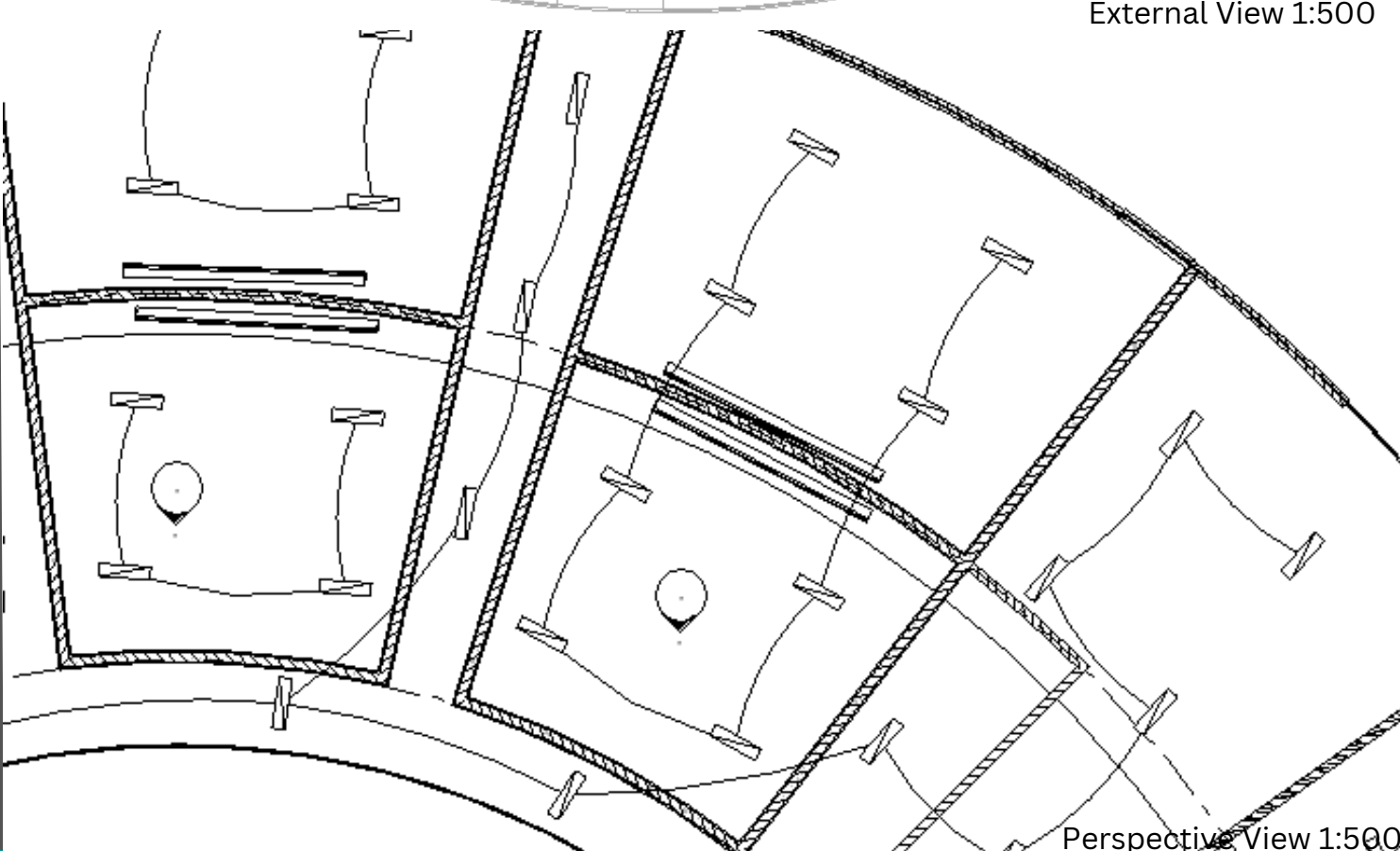
Models: New MEP Model (1), Final Architectural Model (1)

Edit and re-run test

Clash Analysis & To-do



External View 1:500



Perspective View 1:500