SBEnrc: Digital Engineering Theme

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Our Partners

Sustainable Built Environment National Research Centre AUSTRALIA

DE theme in SBEnrc

2017. P2.51. Developing a Cross Sector Digital Asset Information Model Framework for Asset Management

- Determine the effectiveness of existing asset information classification and structuring systems in supporting the practical requirements of asset managers.

2018. P2.64. Unlocking Facility Value through Lifecycle Thinking

- Demonstrates the value of lifecycle thinking and evidence-based decision making in facility asset management.

2020. P2.72. Leveraging an Integrated Information Lifecycle Management Framework – Building and Infrastructure Sectors

- Industry best practices and international standards related to structured and integrated data.

DE theme in SBEnrc

2021. P2.82. Digitally-enabled Asset Life-cycle Management

- A DE-enabled asset life-cycle management process and prototype (MetaBIM) to ensure that DE/BIM models can stay alive after construction and handover.

2023. P2.92. Smarter and greener built assets through digitalisation and AI

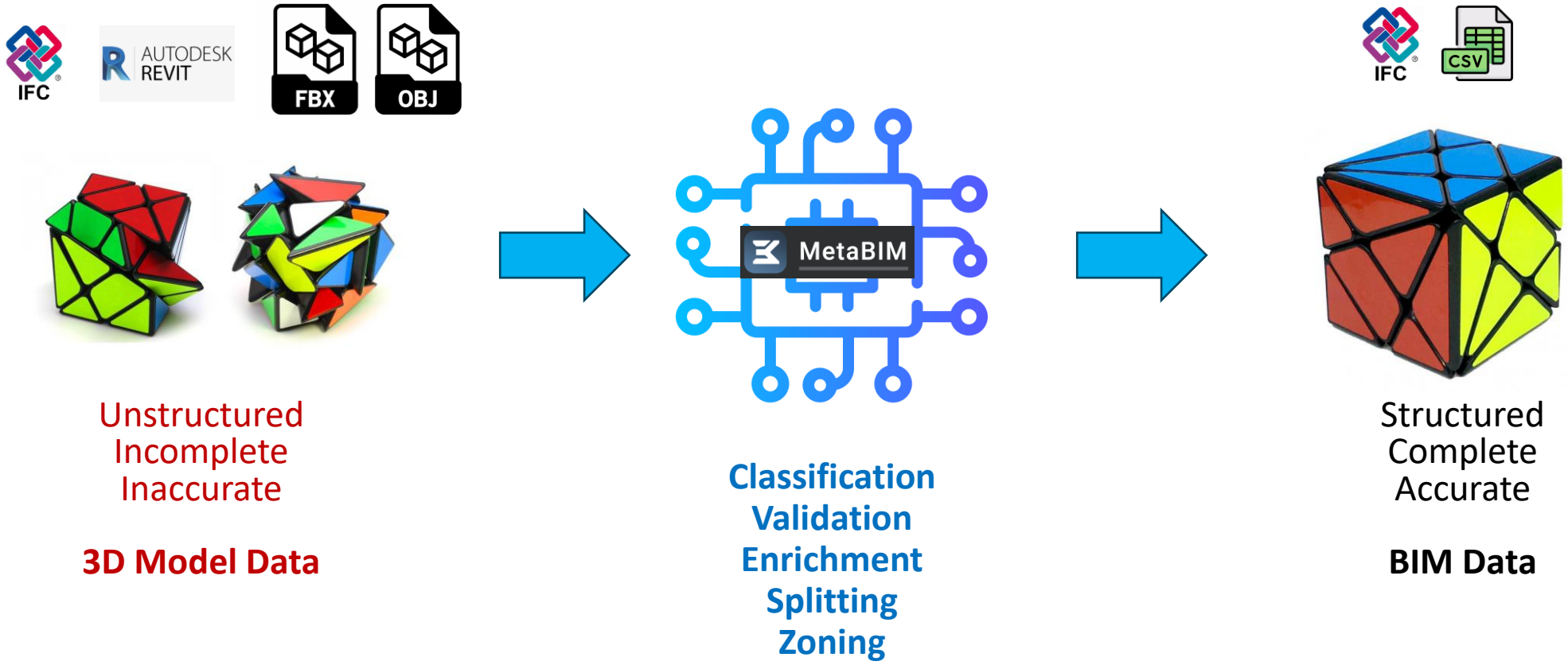
- To embed life cycle assessment (LCA) approach into digital twin (digital models with appropriate IoT sensors if required) to assess life cycle emissions of built assets, including housing, building and infrastructure assets.

MetaBIM: Unlocking the power of your BIM data

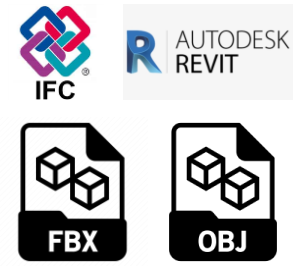
Dr Jun Wang
Western Sydney University
2024.06

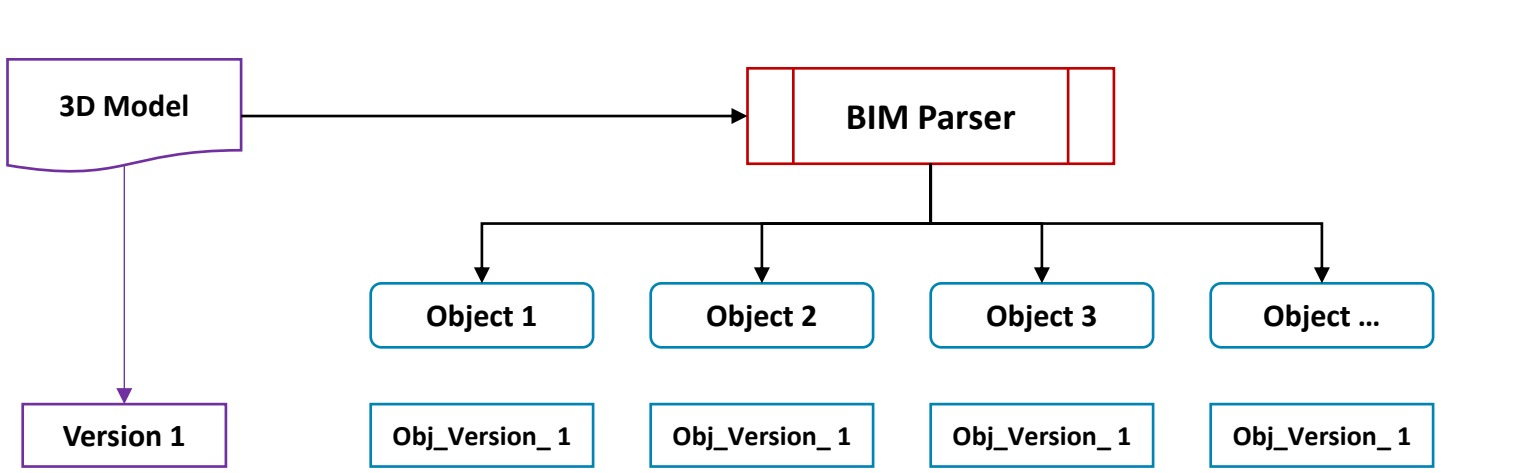
MetaBIM

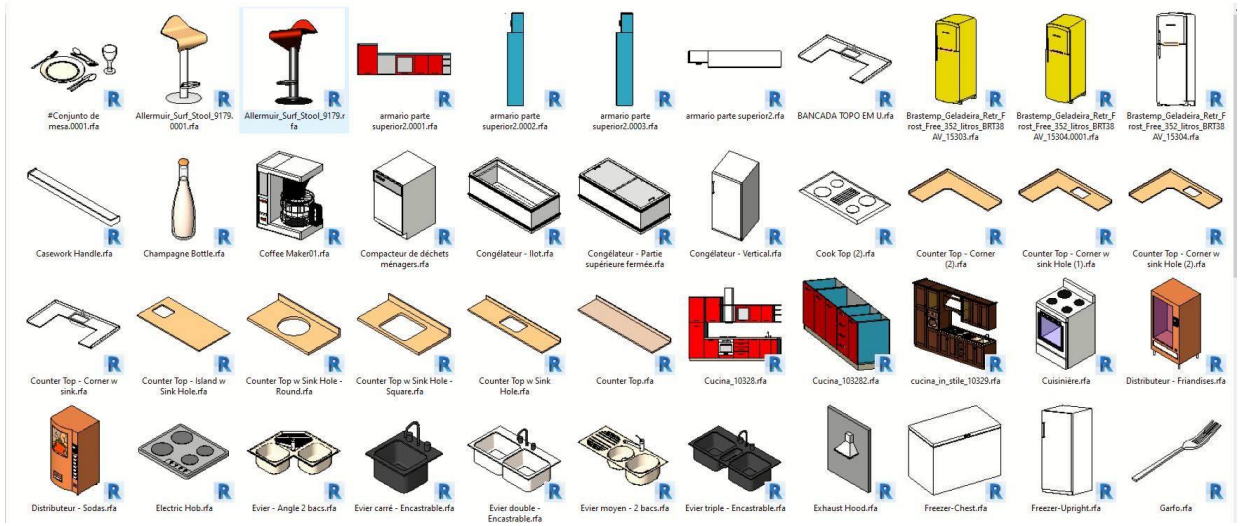
MetaBIM is designed in-house from the ground up to be fully customisable.



MetaBIM: Data Parser







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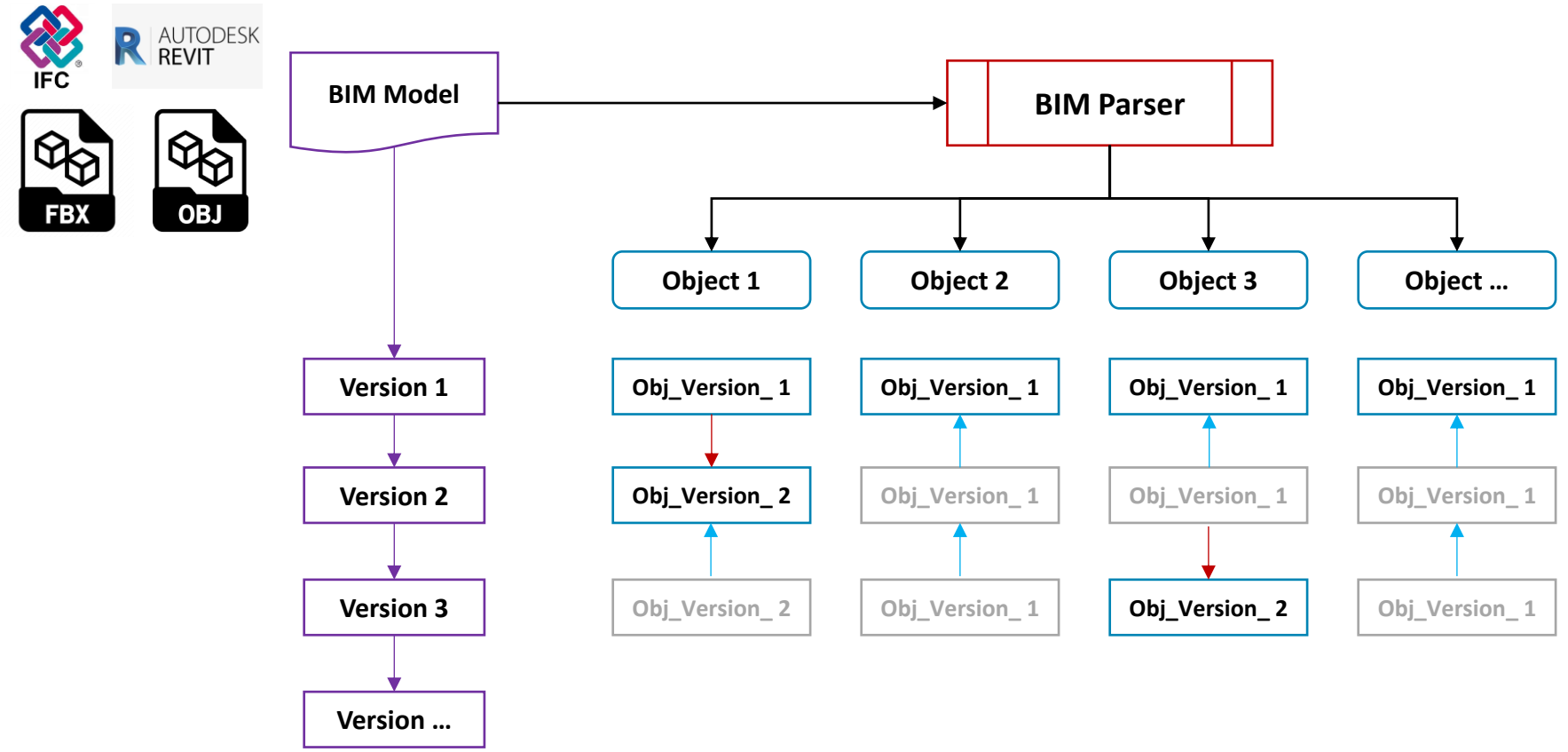

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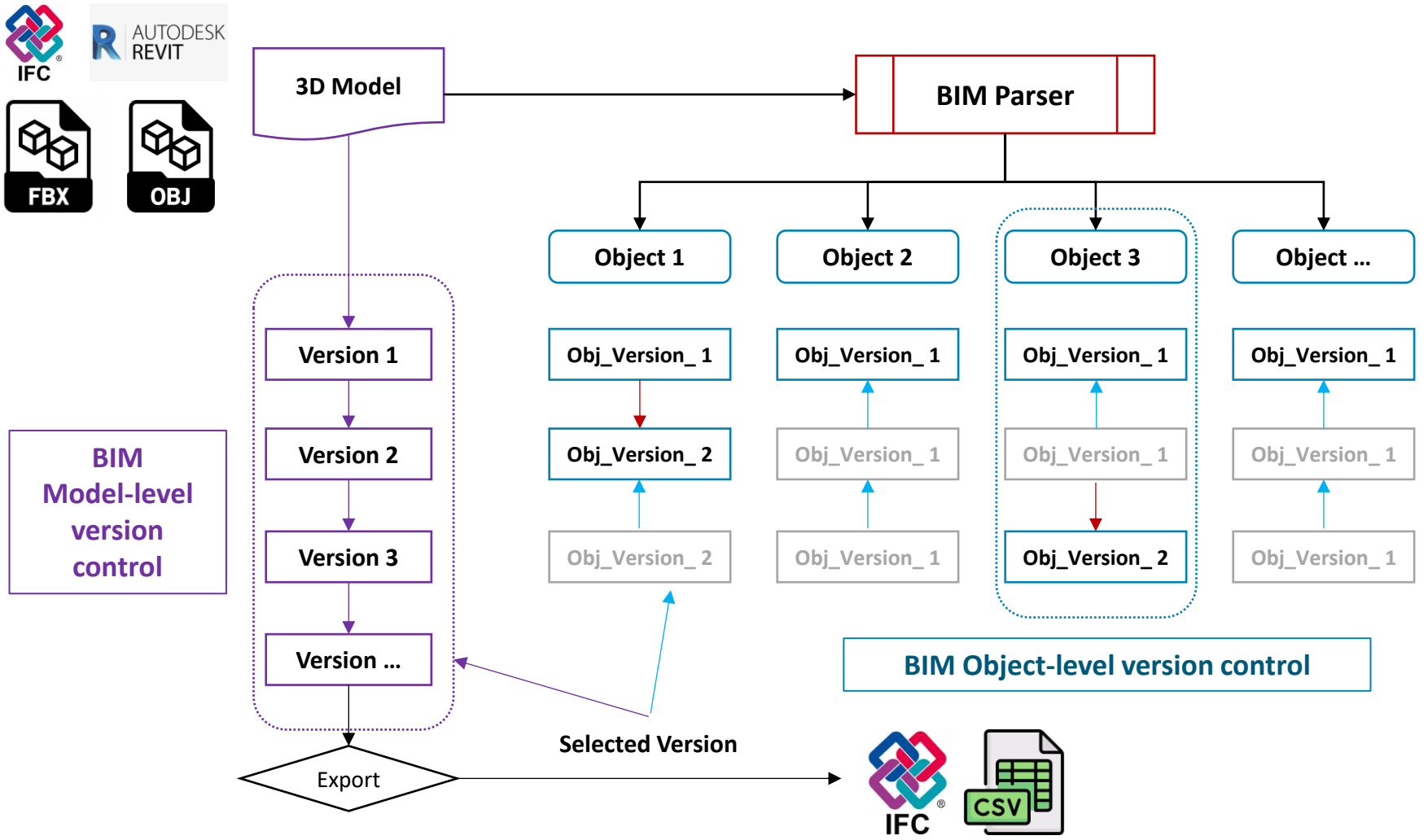
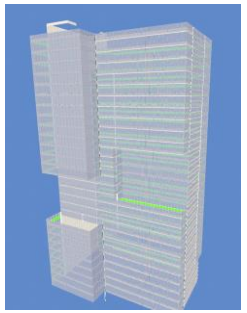
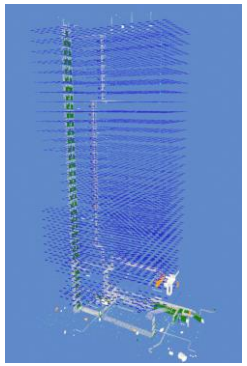


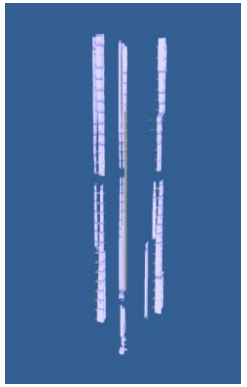
Great efficiency in:

- Storage
- Query
- Comparison
- Auditing

MetaBIM: Data Parser Performance

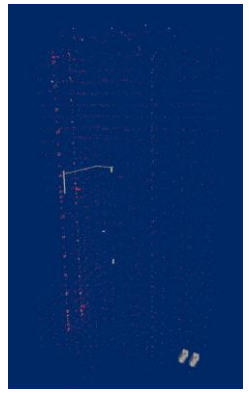


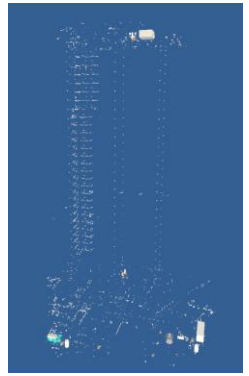


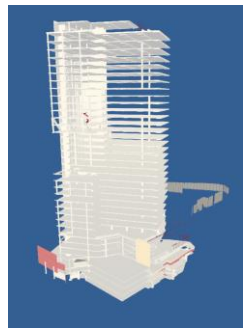


BIM Models	Revit Model Size (MB)	IFC Size Optimised (MB)	Tree Size (MB)	IFC Elements	BIM Objects	Triangles/Vertices (Million)
Architecture	578	40.8	67.1	125,935	25,378	3.1/6.8
Electrical	40.8	37.4	33.1	54,052	12,715	9.6/16.5
Fire Protection	113	66.5	71.4	47,209	15,213	36/46.2
Hydronic	93.9	128	58.5	27,201	9,081	19.2/26.7
Mechanical	110	7.35	8.89	8,954	2,937	0.22/0.3
Structural	99.7	28.1	16.1	11,263	3,821	1.1/1.6

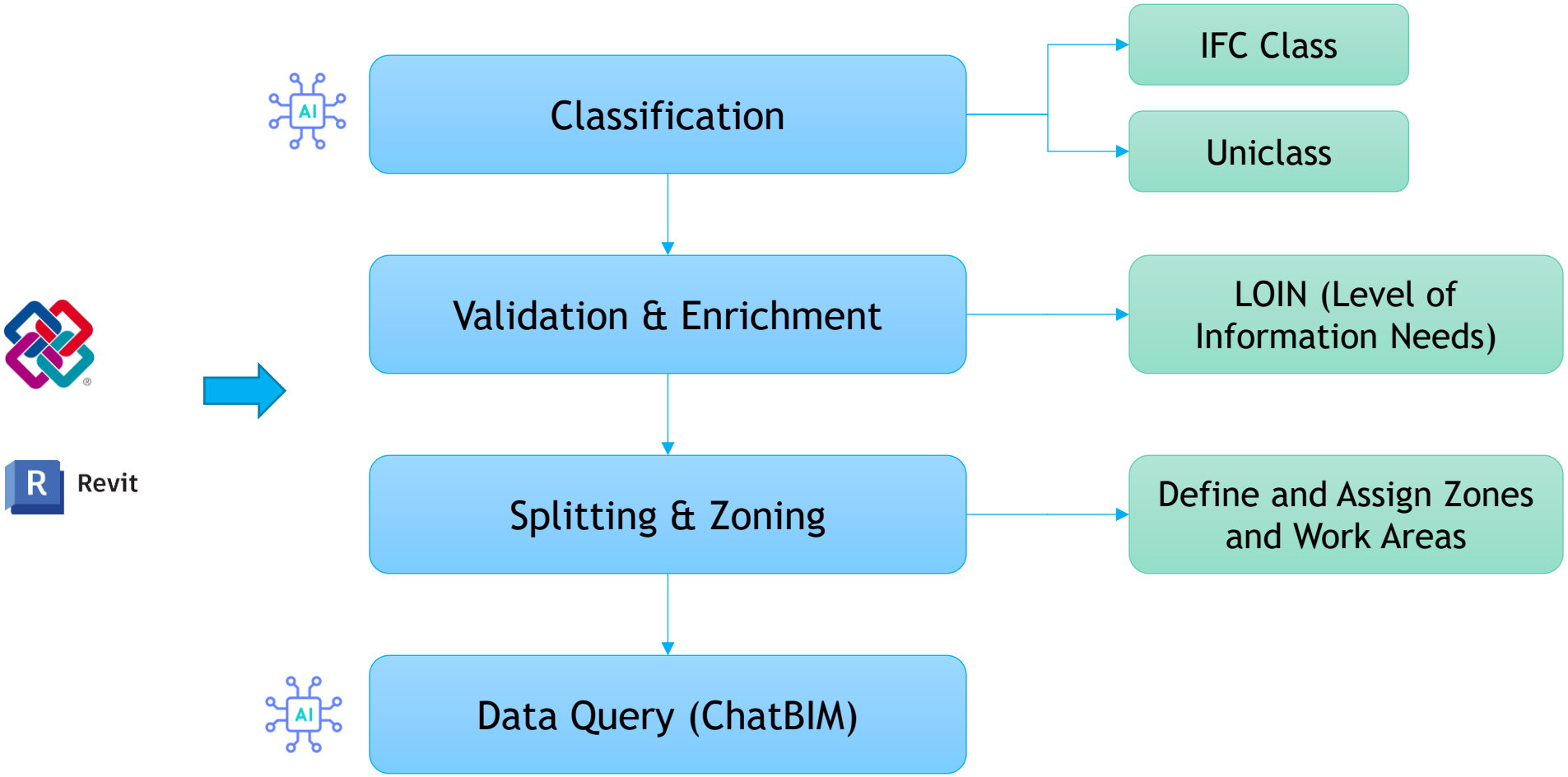
Model Conversion (Second)	Hierarchy Building (Second)	Parser (Second)	Total Server Processing Time (Second)	First Loading Time (Second)	Reloading Time (Second)	Download Time (Second)
15	152	17	**184**	34	6	2-6
41	35	6	**82**	7	2	2-6
51	411	7	**469**	11	2	2-6
271	128	4	**403**	3	1	2-6
122	12	4	**138**	4	1	2-6
44	6	1	**51**	7	1	2-6



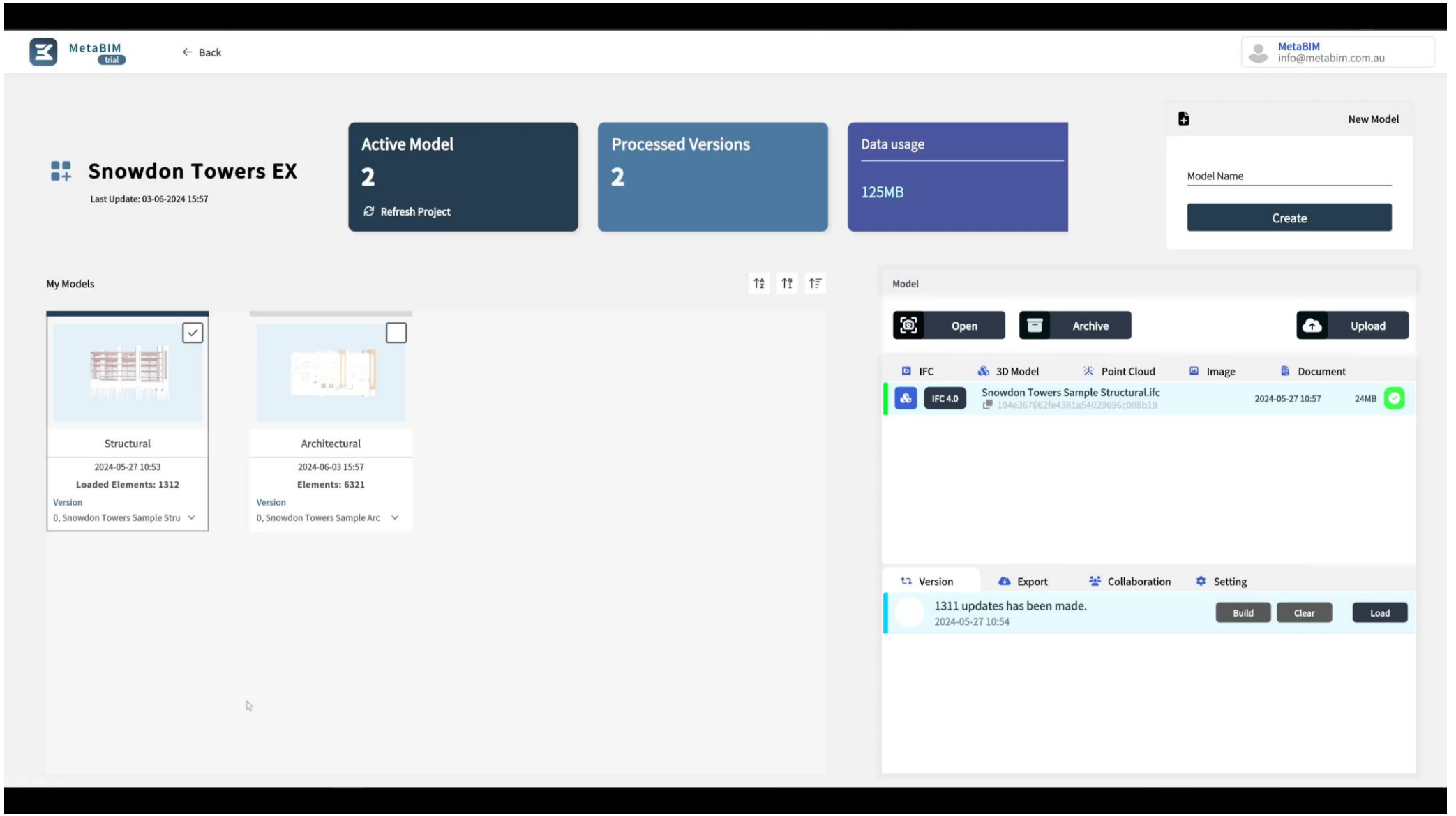




MetaBIM: Processor



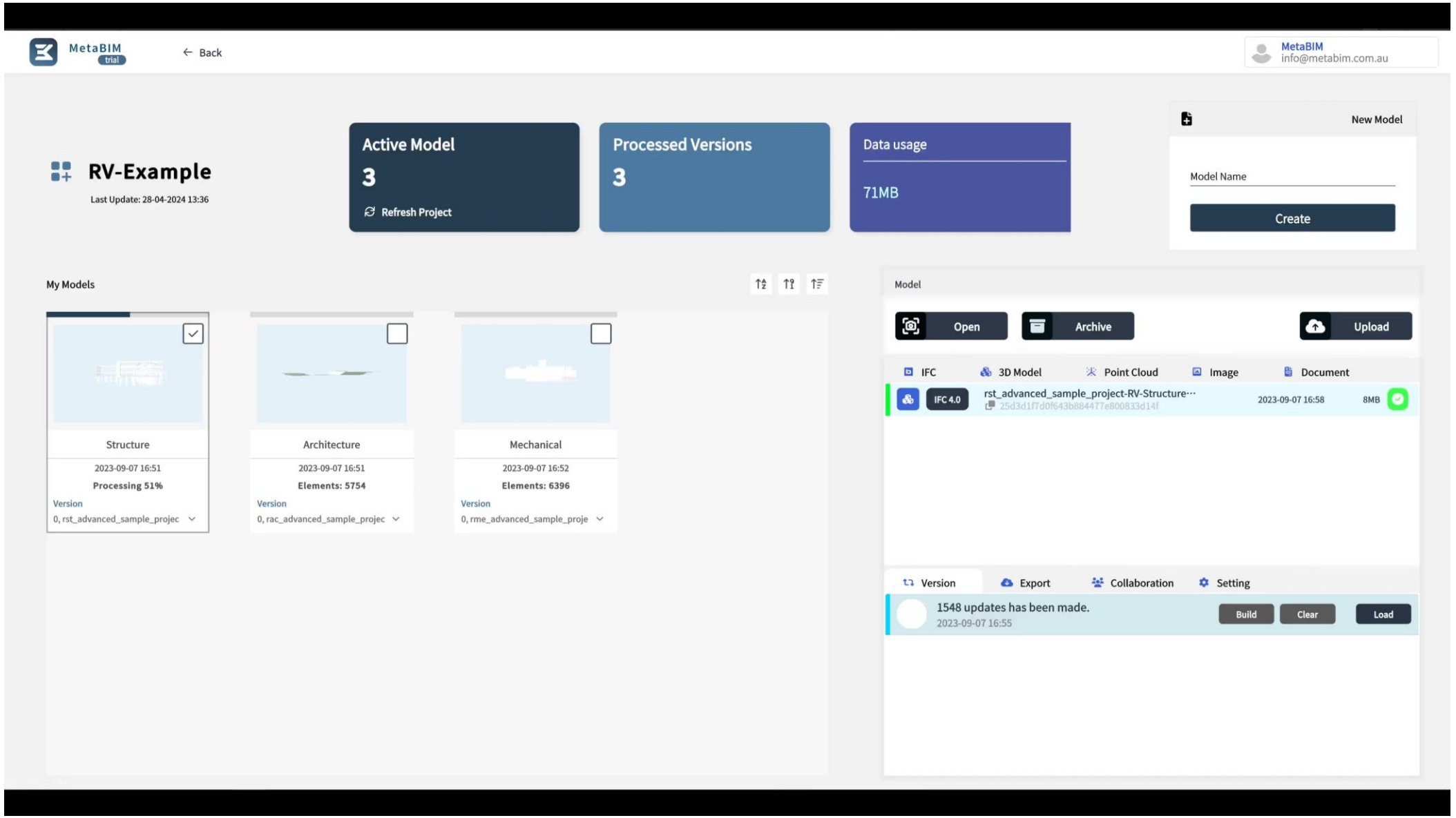
MetaBIM: Classification



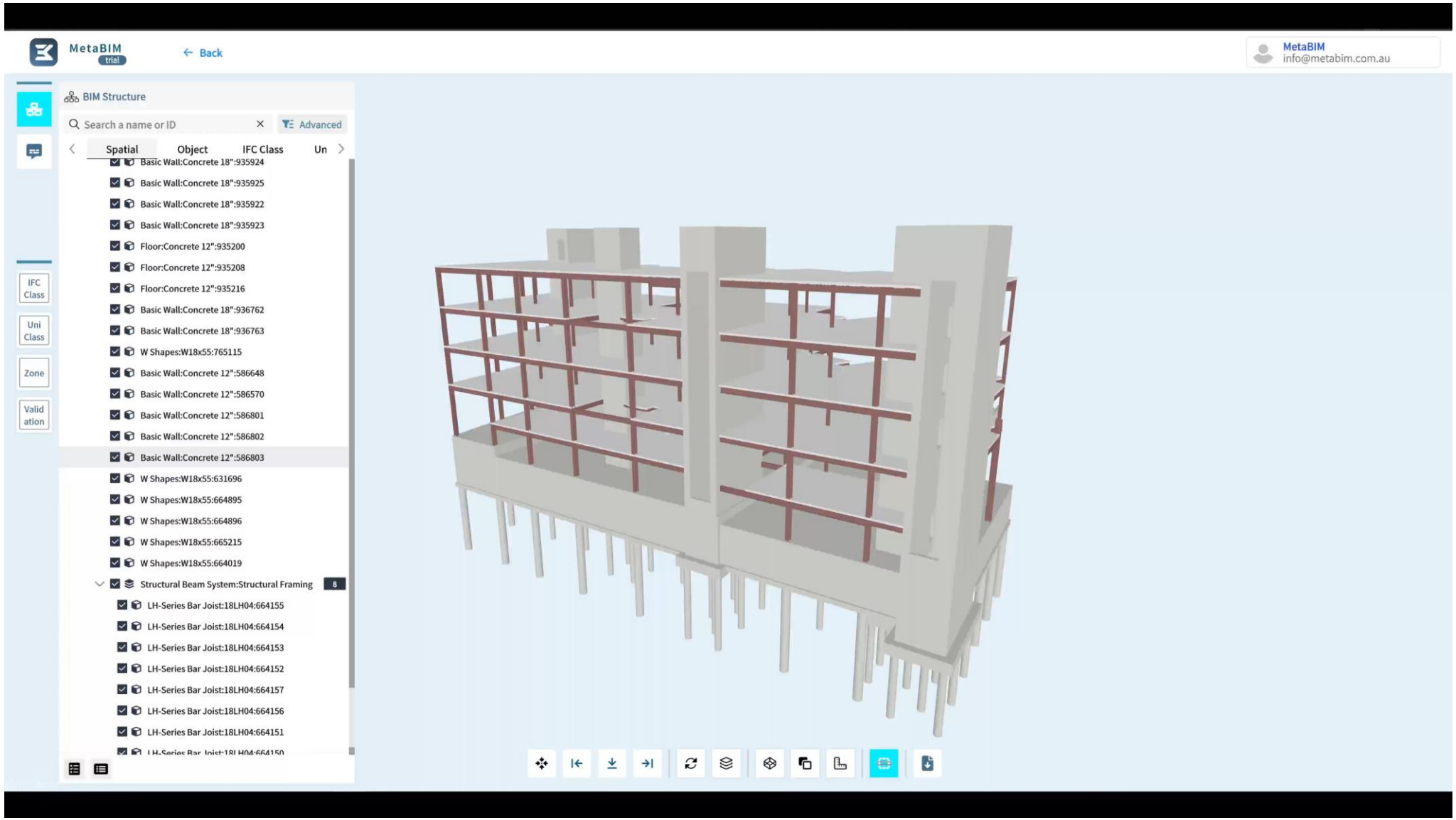
MetaBIM: Validation & Enrichment

IfcWall	
Properties	***Values***
GlobalId	~
Uniclass	Level 3 classification
Status	New, Existing, Demolish, Temporary
FireRating	~
AcousticRating	[30, 50]
Combustible	TRUE, FALSE
IsExternal	TRUE, FALSE
LoadBearing	TRUE, FALSE
ExtendToStructure	TRUE, FALSE
ThermalTransmittance	[0, 100] W/(m2·K)
FireExit	TRUE, FALSE
SelfClosing	TRUE, FALSE
SmokeStop	TRUE, FALSE
Compartmentation	TRUE, FALSE
IfcColumn	
Properties	***Values***
GlobalId	~
Uniclass	Level 3 classification
Status	New, Existing, Demolish, Temporary
Slope	[0, 90] degree
FireRating	~
IsExternal	TRUE, FALSE
LoadBearing	TRUE, FALSE
ThermalTransmittance	[0, 100] W/(m2·K)

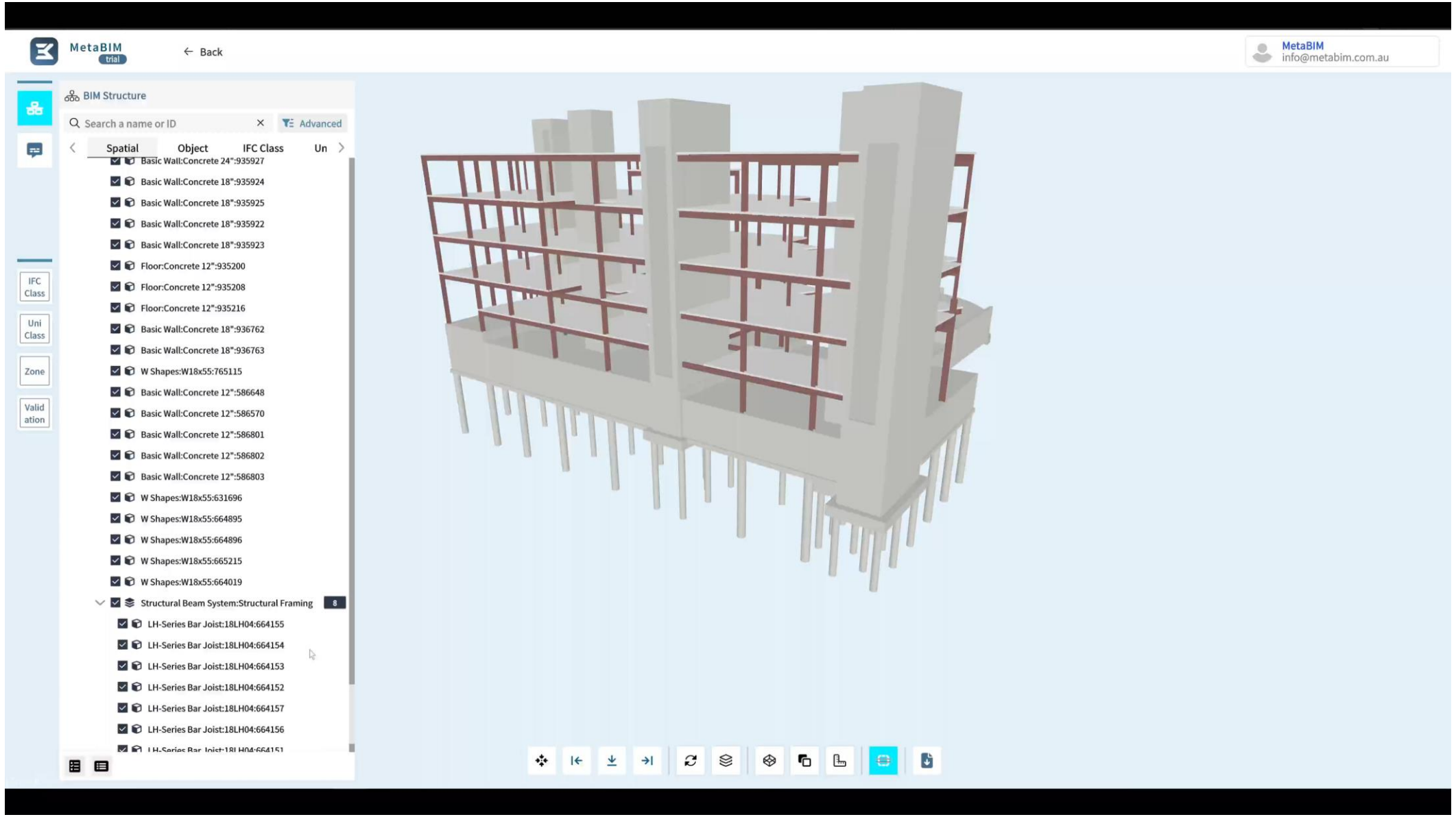
MetaBIM: Validation & Enrichment



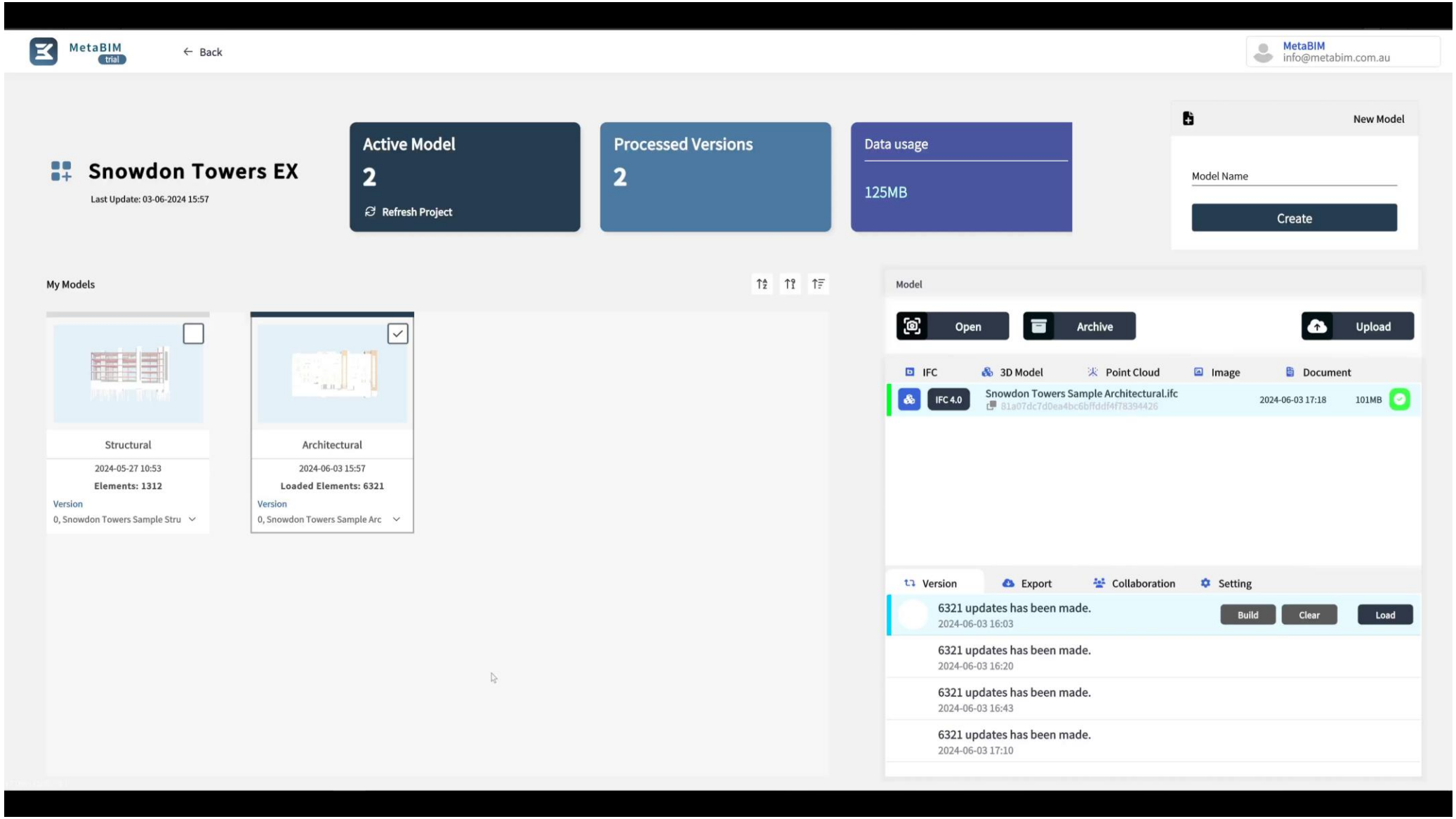
MetaBIM: Splitting



MetaBIM: Zoning

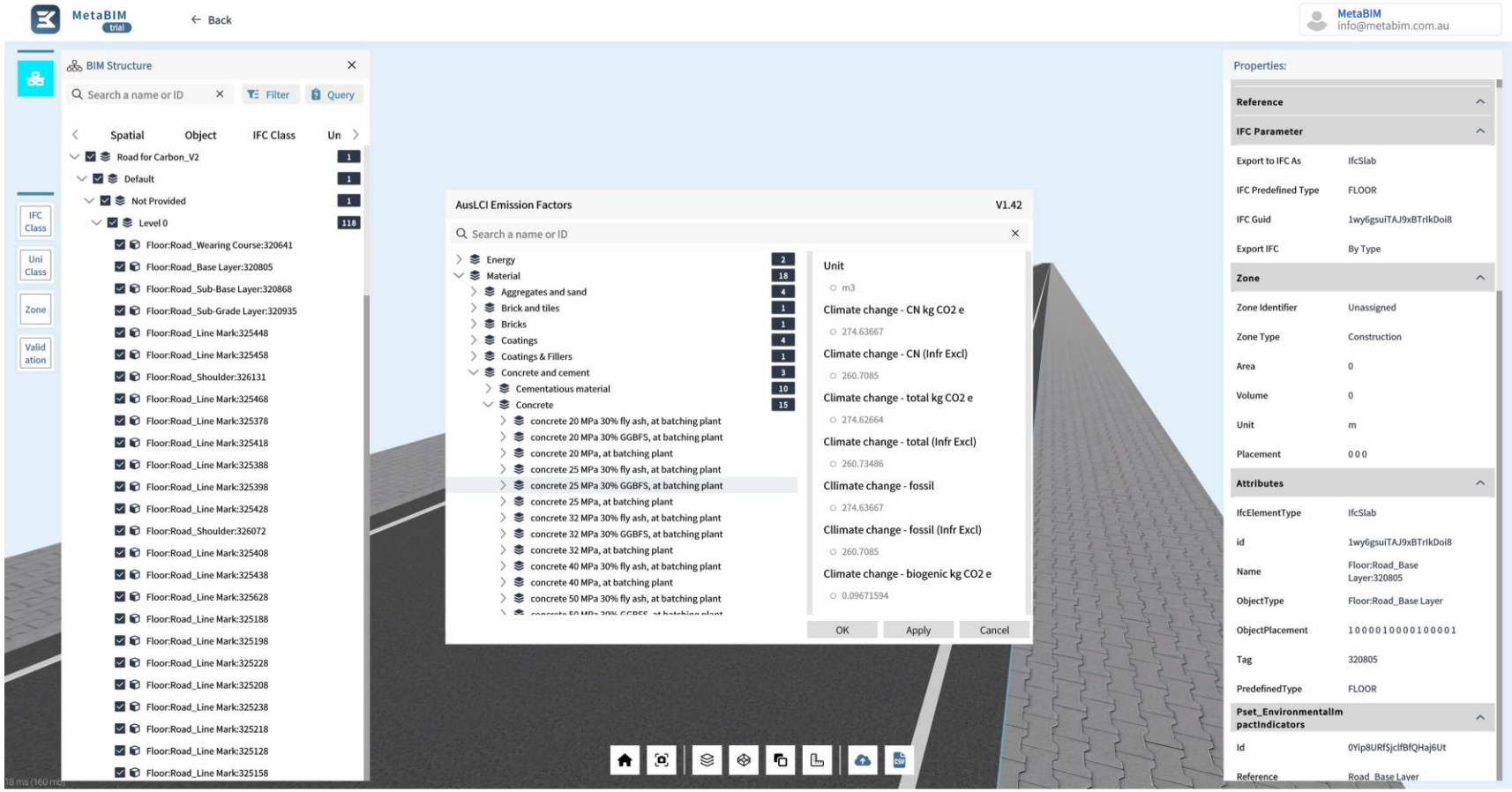


MetaBIM: Data Query (ChatBIM)



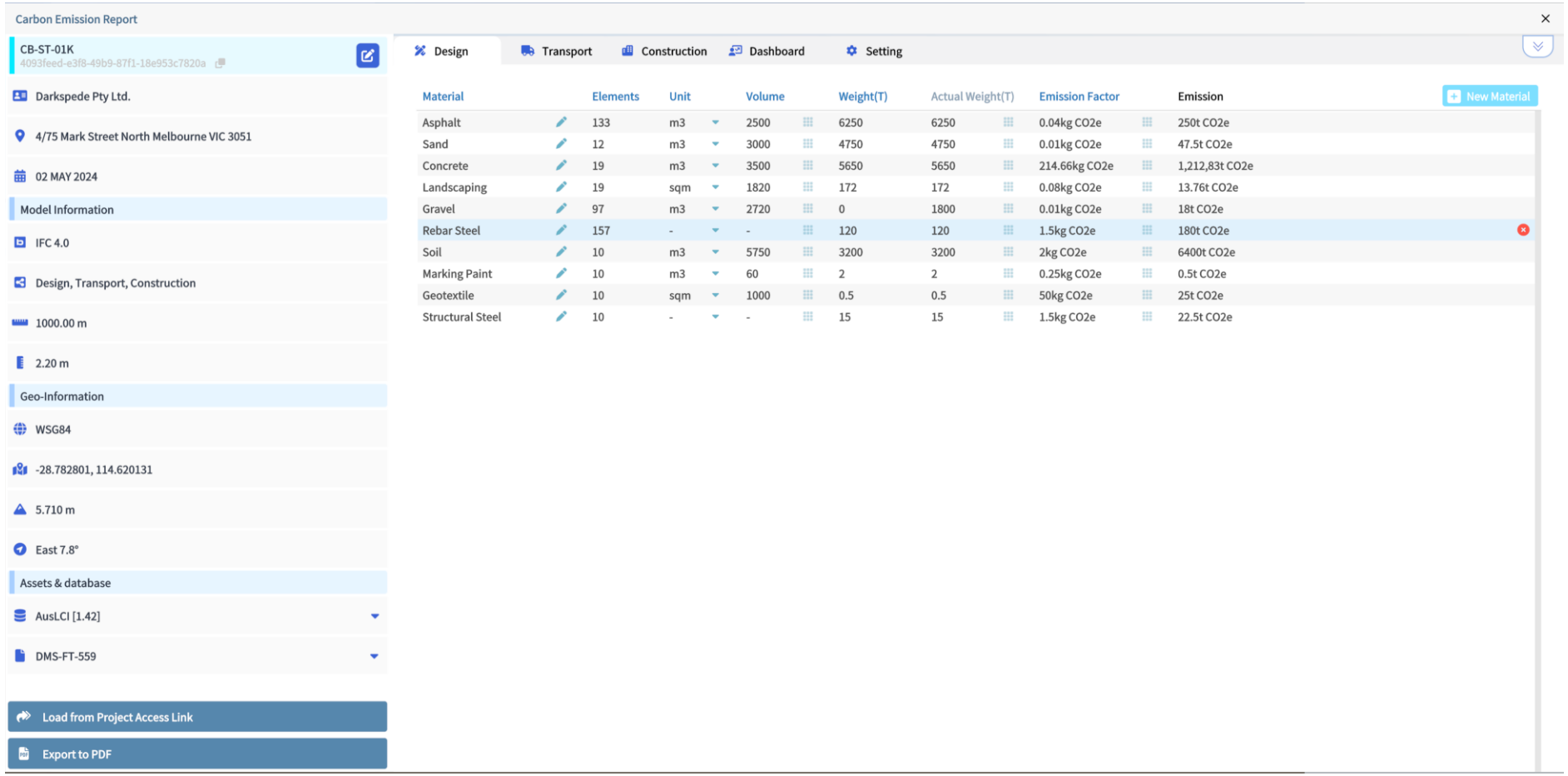
Ongoing Development

EasyCarbon



MetaBIM (Data Foundation)

Ongoing Development



EasyCarbon

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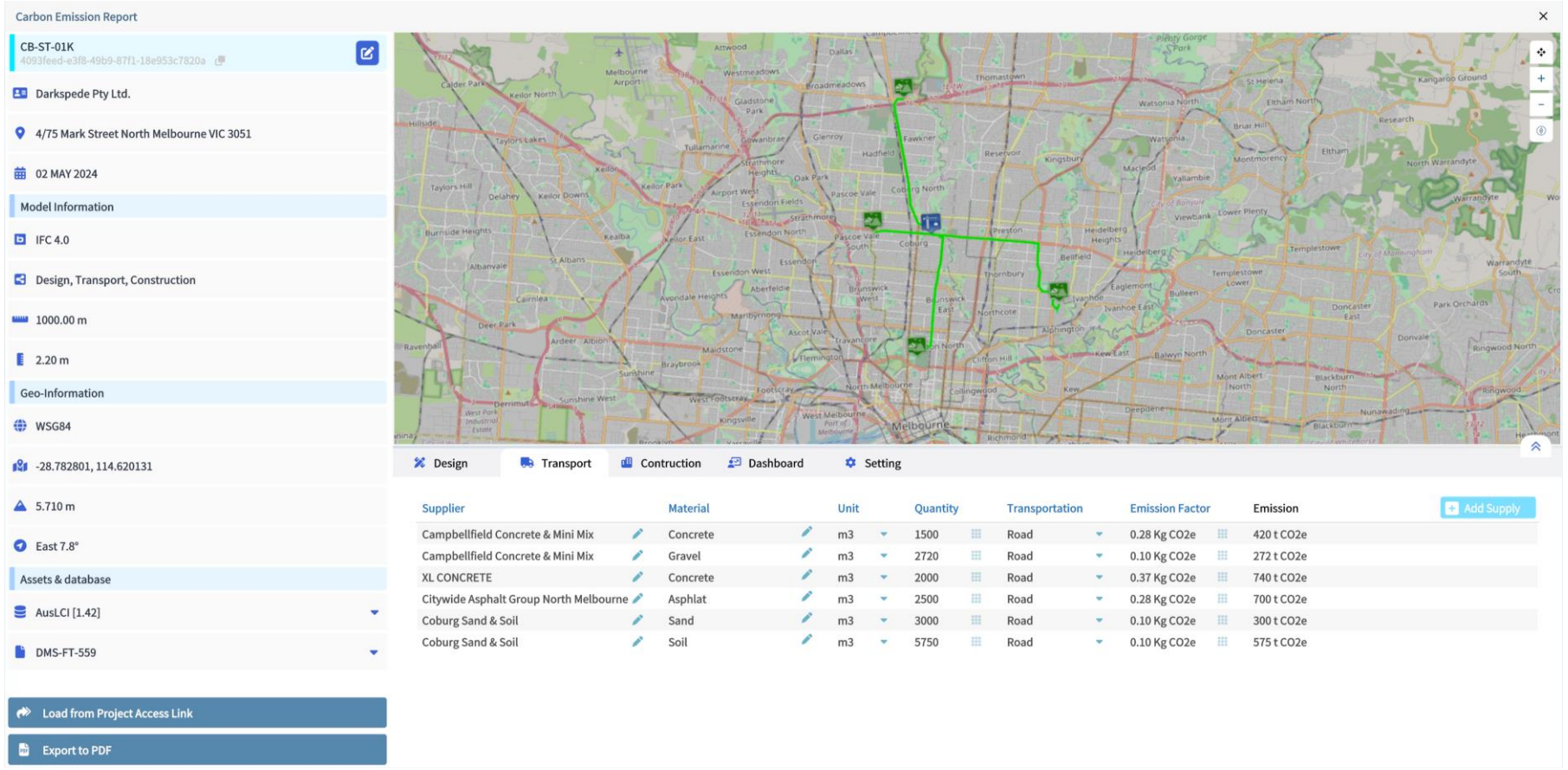

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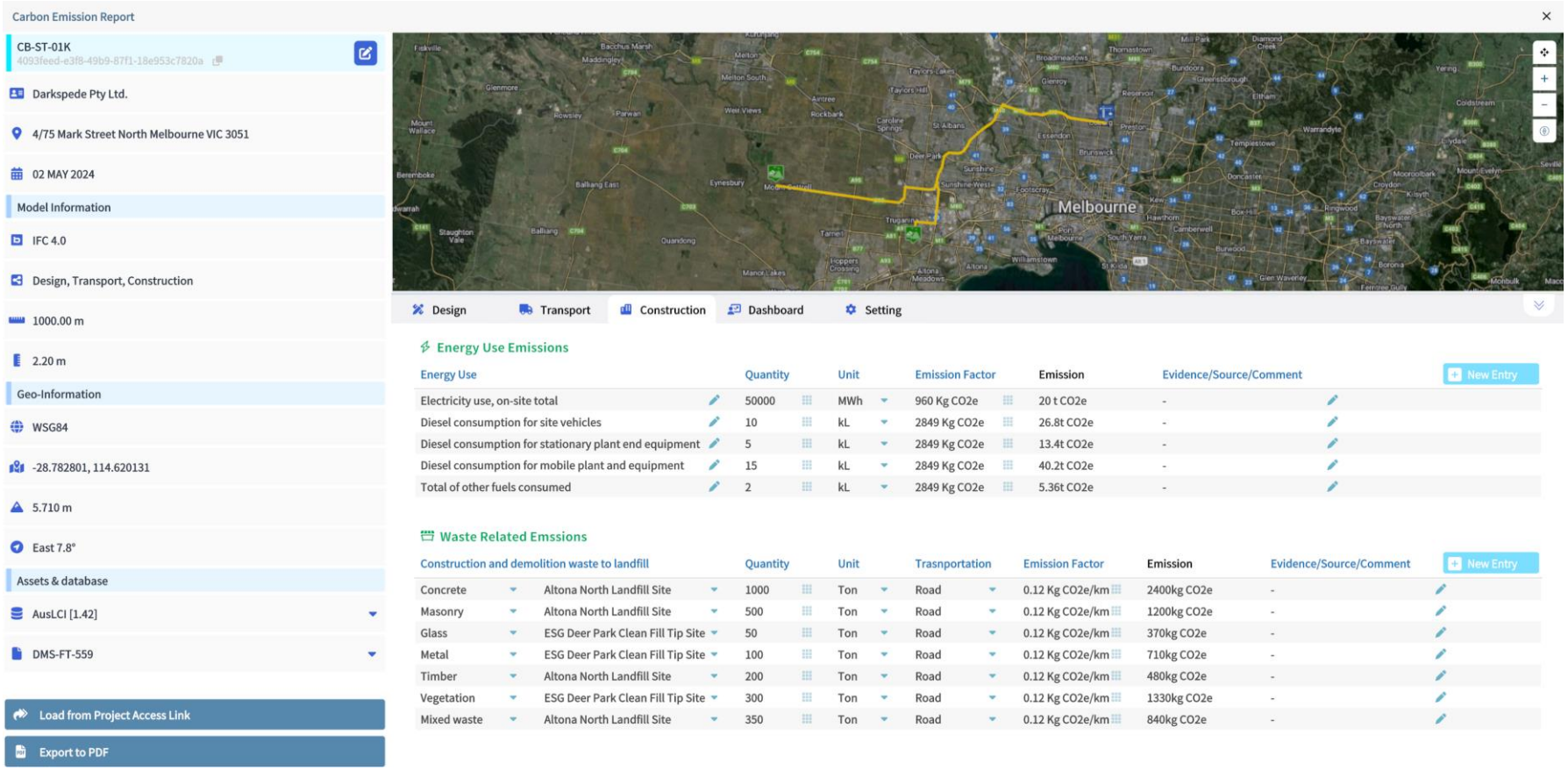

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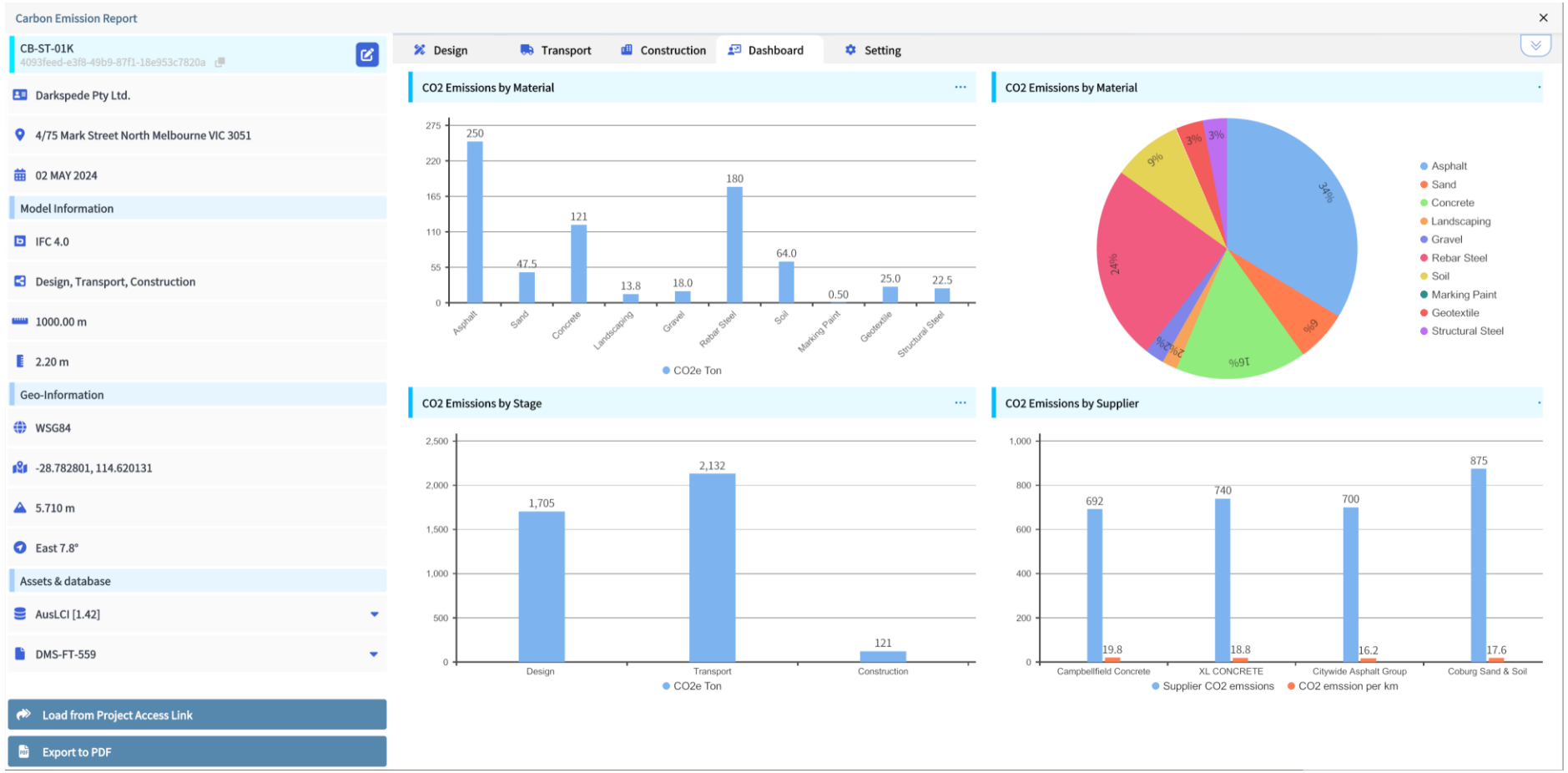
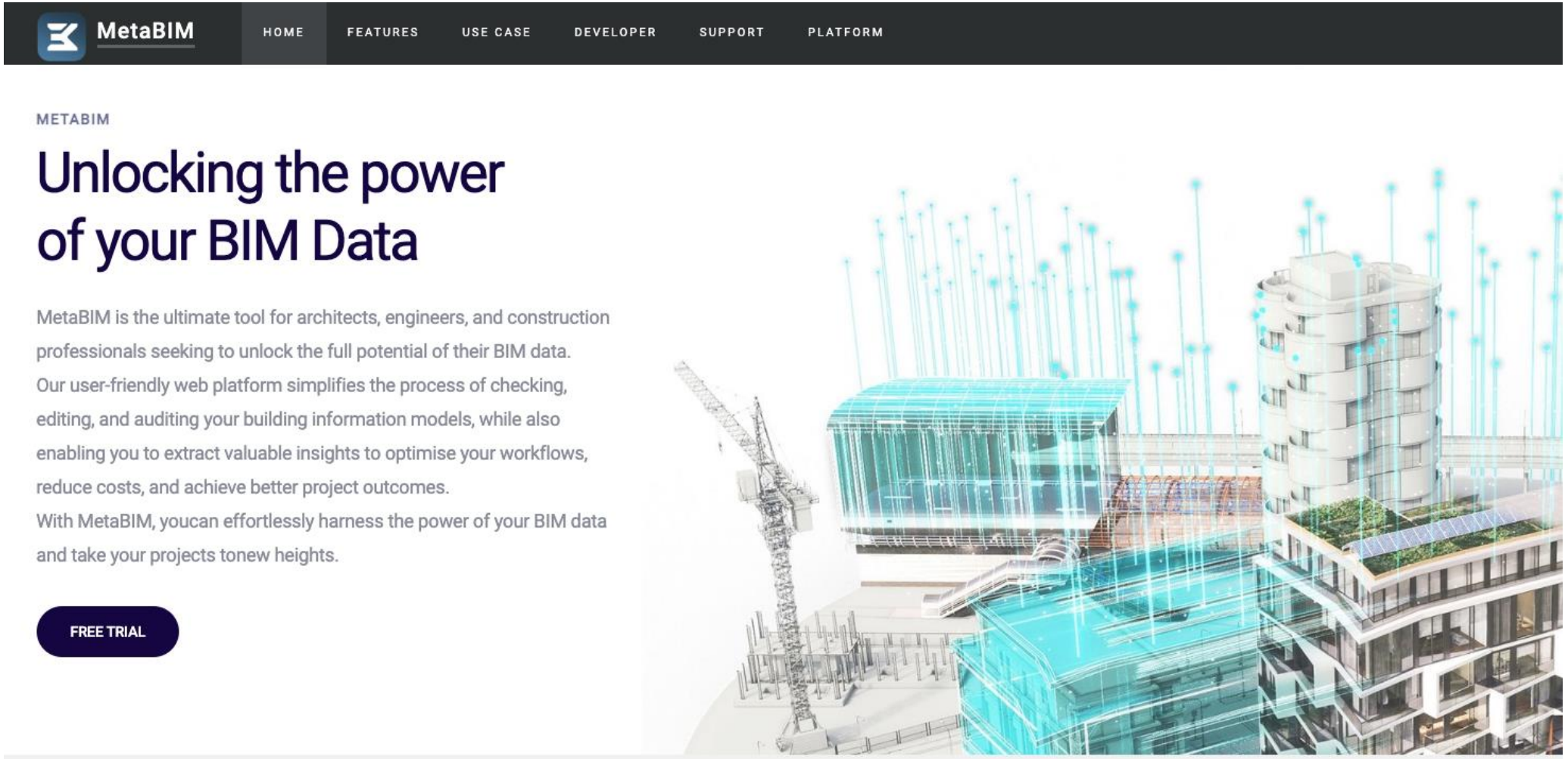


MetaBIM (Data Foundation)

Further Information…

https://metabim.com.au/



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