ODE office for digital engineering

Together we digitize **design** - **construction** – **facility management**

Jaka Senekovič BSc Civil Engineering

From 10/2020 **ODE informationstechnik gmbh: BIM Manager**
BIM Management, BIM overall coordination, openBIM implementation, Process management, BIM Consulting

- 2TDK: BIM Manager Contractor, BIM overall coordination
- RSA Angath: BIM Asistent Contractor, BIM overall coordination
- IMST: BIM Manager ÖBB, BIM Management
- Wiener Linien: BIM standardisation
- ÖBB: BIM standardisation (Ebenüurth, Gramatneusiedel)
- Municipality of Vienna: BIM standardisation

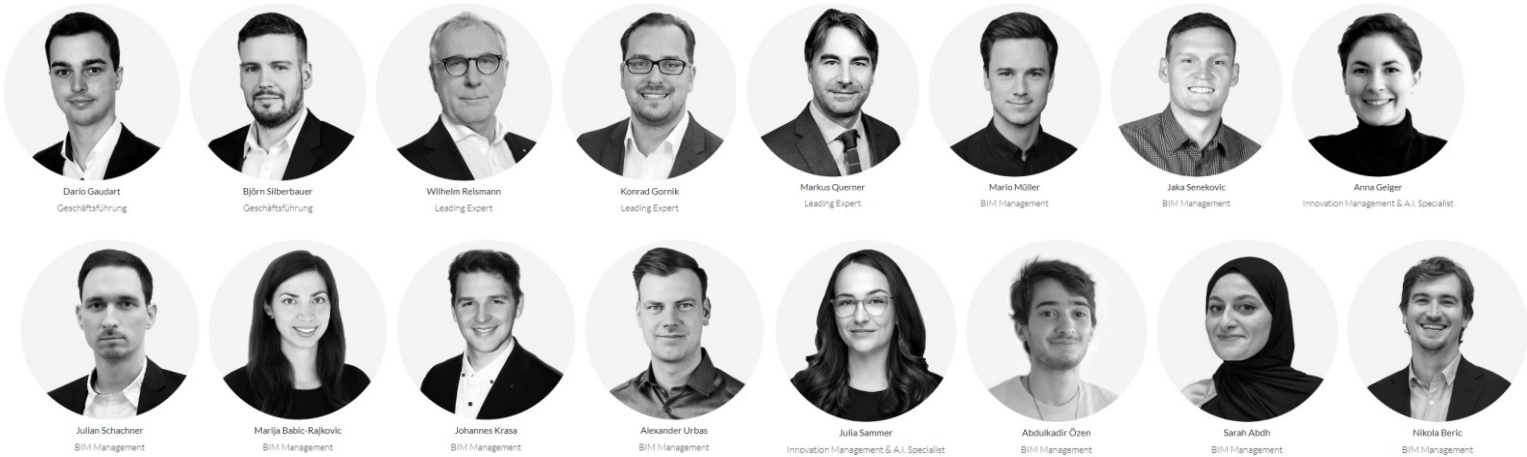
10/2017-10/2020 **Lineal d.o.o.: BIM Koordinator**
BIM overall coordination, BIM Modeler

- 2TDK: BIM Coordinator, BIM overall coordination
- Railway line Maribor - Šentilj: BIM overall coordination, BIM Technical Coordinator
- Non-Level Crossing Marija Gradec: BIM overall coordination, BIM Technical Coordinator
- Vranduk - Ponirak motorway: BIM overall coordination
- Bridge Počitelj: BIM overall coordination

ode
OFFICE FOR DIGITAL ENGINEERING

ODE office for digital engineering

Together we digitise design - construction - facility management



Dario Gaudart
Geschäftsführung

Björn Silberbauer
Geschäftsführung

Wilhelm Reismann
Leading Expert

Konrad Gornik
Leading Expert

Markus Querner
Leading Expert

Mario Müller
BIM Management

Jaka Senekovic
BIM Management

Anna Geiger
Innovation Management & A.I. Specialist

Julian Schachner
BIM Management

Marija Babic-Rajkovic
BIM Management

Johannes Krasa
BIM Management

Alexander Urbas
BIM Management

Julia Sammer
Innovation Management & A.I. Specialist

Abdulkadir Özen
BIM Management

Sarah Abdh
BIM Management

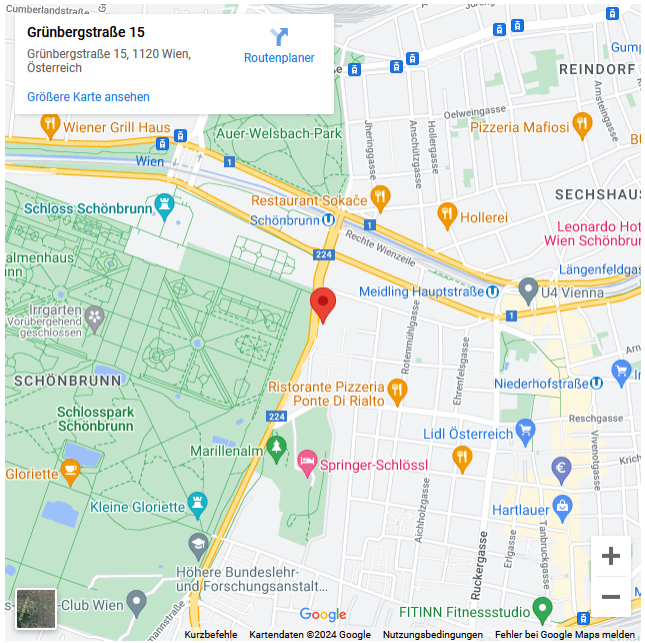
Nikola Berlic
BIM Management

buildingSMART International

zt

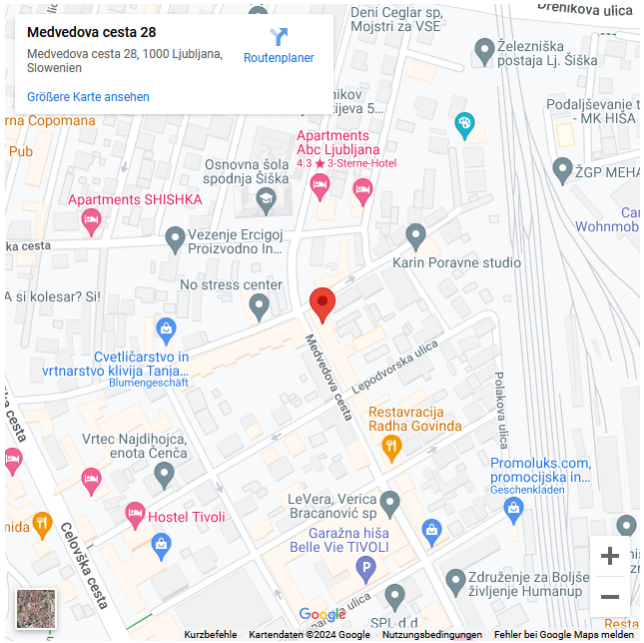
ODE office for digital engineering

AT – 1120 Wien
Grünbergstraße 15, Stiege 1, 5. OG
+43 660 6762328
office@ode.or.at



ODE - Branch office Ljubljana

SI – 1000 Ljubljana
Medvedova cesta 28
+43 664 60169736
office-si@ode.or.at



ode
OFFICE FOR DIGITAL ENGINEERING

2TDK

ACMS Architekten

APG

Asfinag

Baubetrieb Digital

BEMO

Yapi Merkezi

BIG

buildingSMART Austria

Campus RO

ecoplus

Euro Vienna

iC Elea

TU Wien

iC

Kolektor

ÖBB

ÖIAV

ÖSTU Stettin

querkraft

Wiener Infrastruktur Projekt

Salzburg AG

Stadt Wien

Stadt Wien - MA19

Stadt Wien - MA34

Stadt Wien - MA44

Stadt Wien - Wiener Wohnen

Wiener Linien

ode
OFFICE FOR DIGITAL ENGINEERING

Selected reference projects













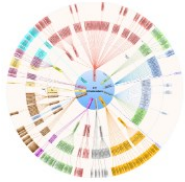
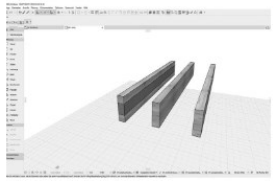










BRISE-Vienna

Building Regulations Information for Submission Envolvement

City of Vienna

UIA URBAN INNOVATIVE ACTIONS

EUROPEAN UNION
European Regional Development Fund

This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative

ode OFFICE FOR DIGITAL ENGINEERING

TU WIEN

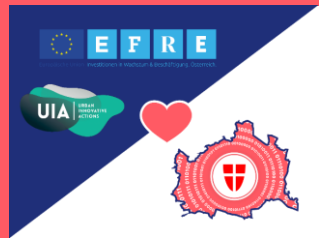
zt:

WH MEDIA
ein unternehmen der wienholding

BRISE-Vienna …

… was a **research and development project** that combines high-tech options such as Building Information Modeling **(BIM)**, Artificial Intelligence **(AI)** and Augmented Reality **(AR)** into a comprehensive and continuously end-to-end digital **building approval process**.

Funded research and development project of the EU initiative “Urban Innovative Actions”



City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

BRISE-Vienna Project Partner

Stadt Wien

TU WIEN TECHNISCHE UNIVERSITÄT WIEN

ode OFFICE FOR DIGITAL ENGINEERING

WH MEDIA ein unternehmen der wienholding

zt: Kammer der ZiviltechnikerInnen | ArchitektInnen und IngenieurInnen Wien. Niederösterreich. Burgenland.

Project Management Service center for EU-Funding milestone ag EuroVienna experts for EU projects

Vienna is growing – Vienna is building

Initial Position

- ~ 13,000 annual applications
- Growing requirements
- Increasing complexity
- Rising duration of applications

Submission on paper

Digital Building Application

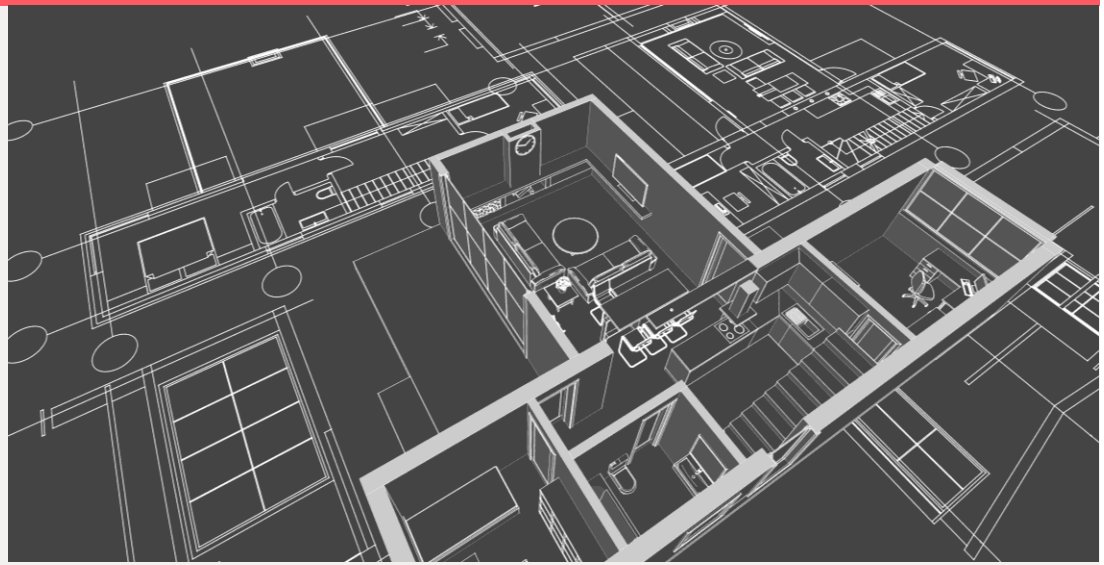
https://www.itex.se/sakra-lyft/

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Administrative Procedures Maturity Levels

Important targets of digitalization processes

- Fast
- Efficient
- Sustainable
- Transparent



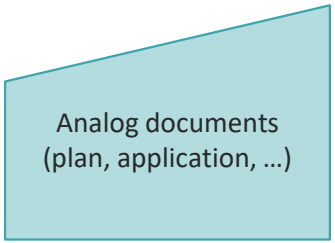
Some of the results from the BRISE-Vienna project can also be transferred to other administrative areas and processes

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

BRISE-Vienna

Administrative Procedures Maturity Levels

Level 0

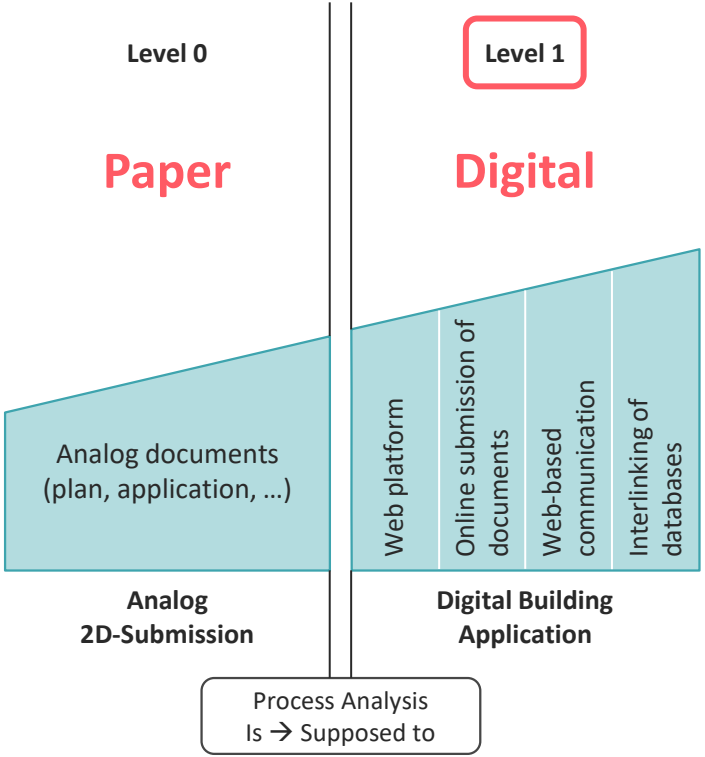


Analog
2D-Submission

This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative

BRISE-Vienna

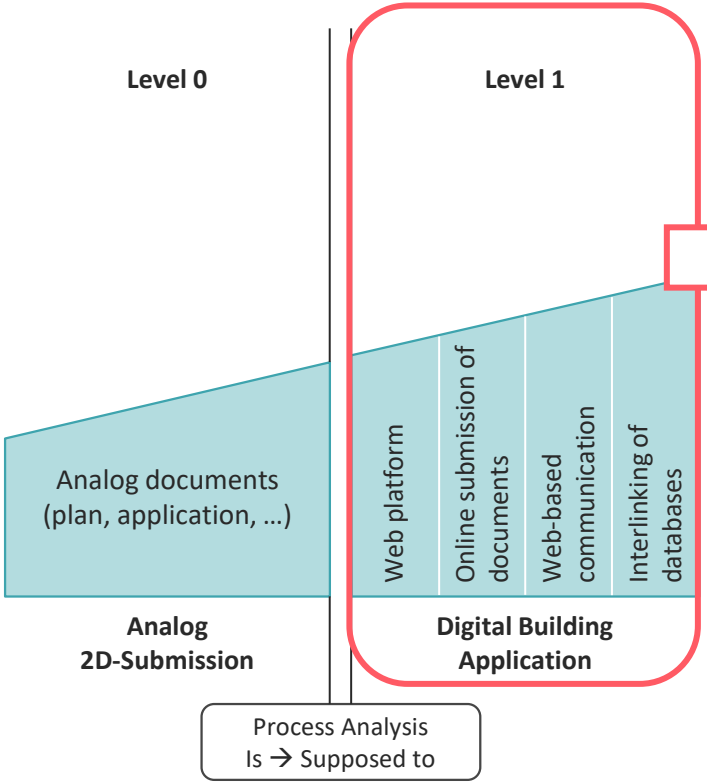
Administrative Procedures Maturity Levels



This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative

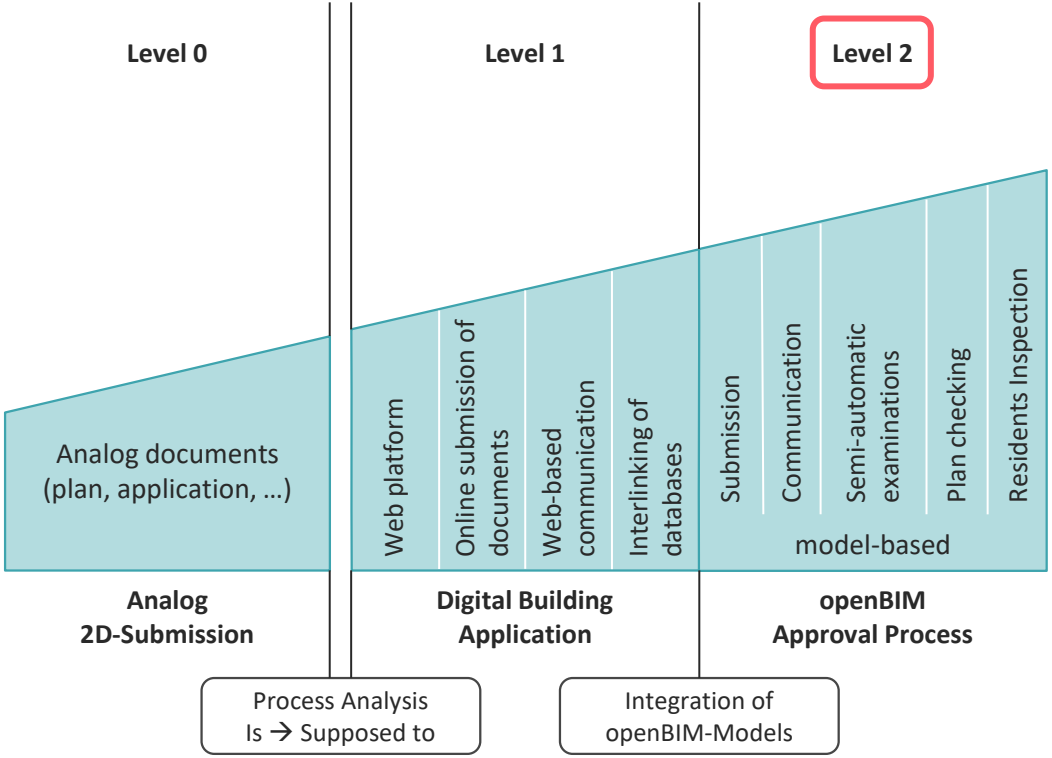
BRISE-Vienna

Administrative Procedures Maturity Levels



BRISE-Vienna

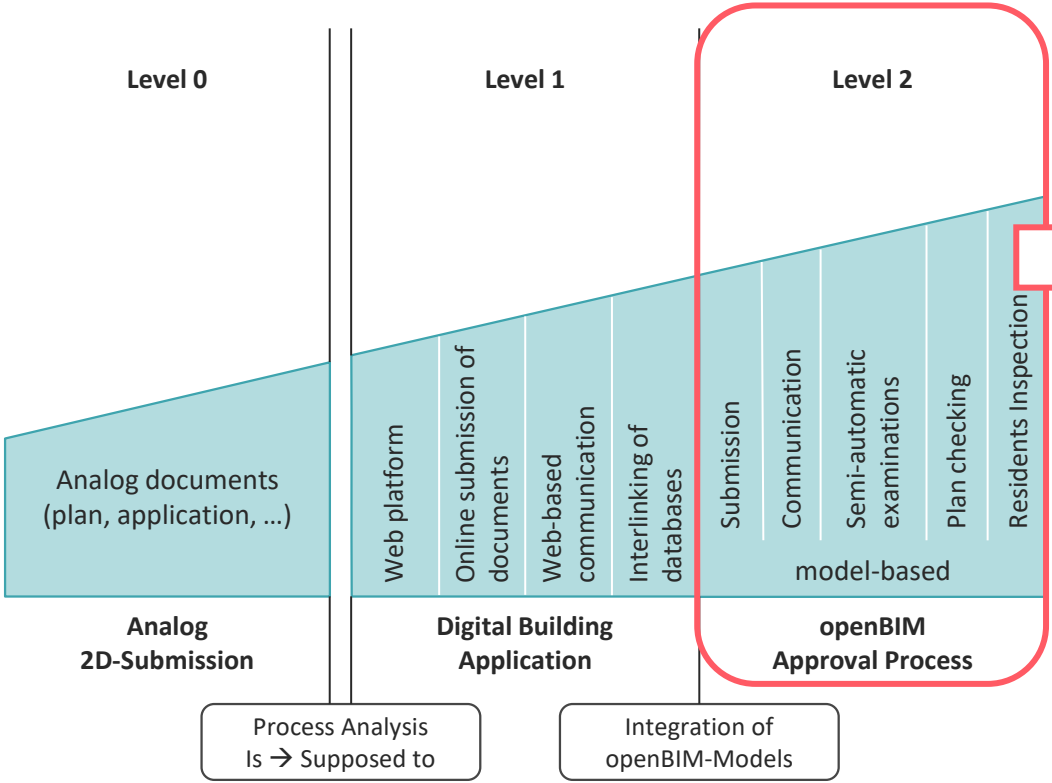
Administrative Procedures Maturity Levels



City of Vienna
EUROPEAN UNION European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

BRISE-Vienna

Administrative Procedures Maturity Levels



City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

The Technologies

Building Information Modeling (**BIM**)

Artificial Intelligence **(AI)**

Augmented Reality (**AR**)

City of Vienna
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Technologies in the new process

Building Information Modeling (BIM)

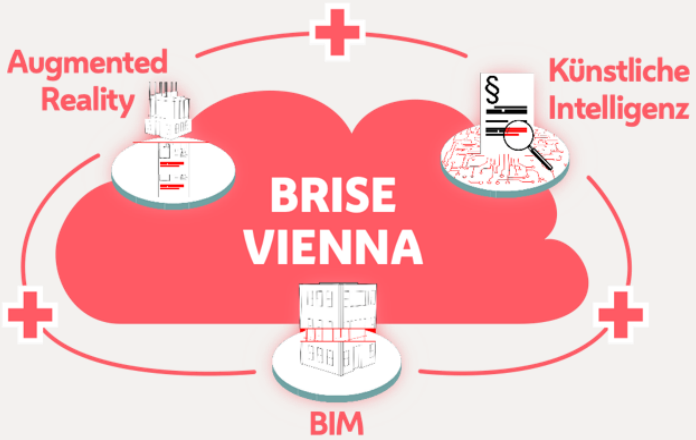
… enables partially automated checking based on 3D models

Artificial Intelligence (AI)

… for support with documents and in the building permission procedure

Augmented Reality (AR)

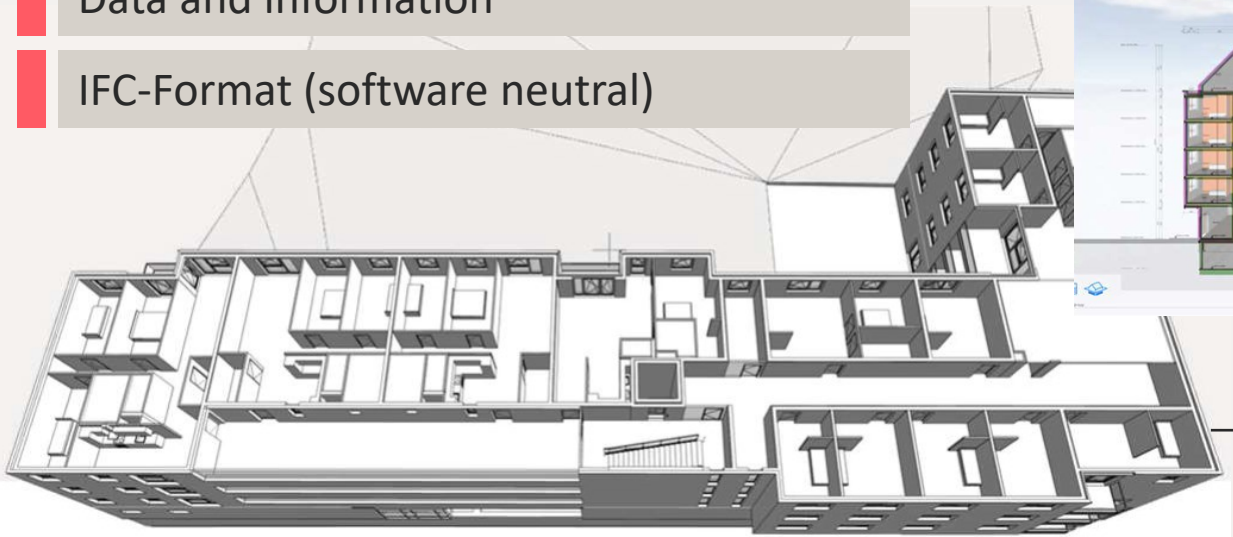
… assisting participants with comprehensible visualizations of construction projects



City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Building Information Modeling (BIM)

- 3D building models
- Data and information
- IFC-Format (software neutral)

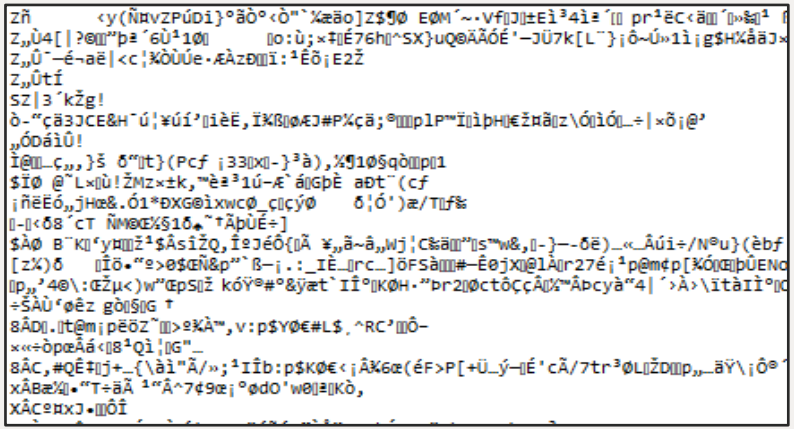


- Geometry
- Alphanumerik Data

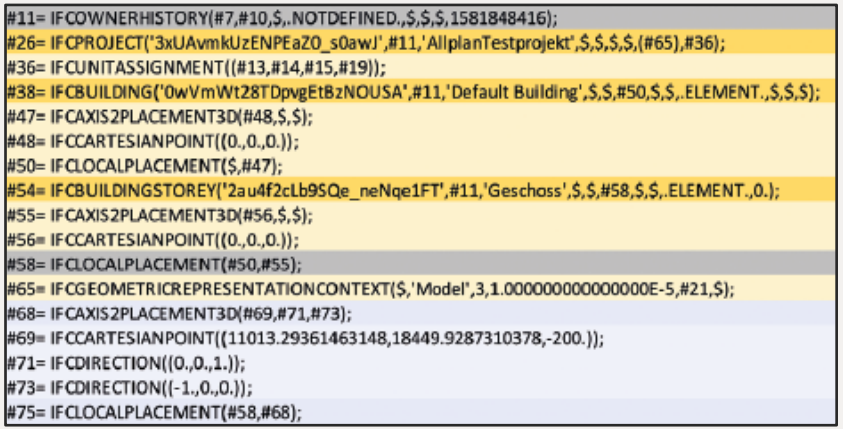
City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Why openBIM?

- No restrictions for building applicants (authoring software)
- Long-term usability (IFC Data Structure acc. ISO 16739-1)



Revit-File (closedBIM) in text editor



IFC-File (openBIM) in text editor

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Why openBIM?

Industry Foundation Classes (IFC)

- **Established**: across software platforms
- **Neutral**: manufacturer independent
- **Stable**: IFC is an ISO-Standard since 2013
- **Compliant**: international uniform data structure for the building industry

ISO 16739

IFC = Industry Foundation Classes

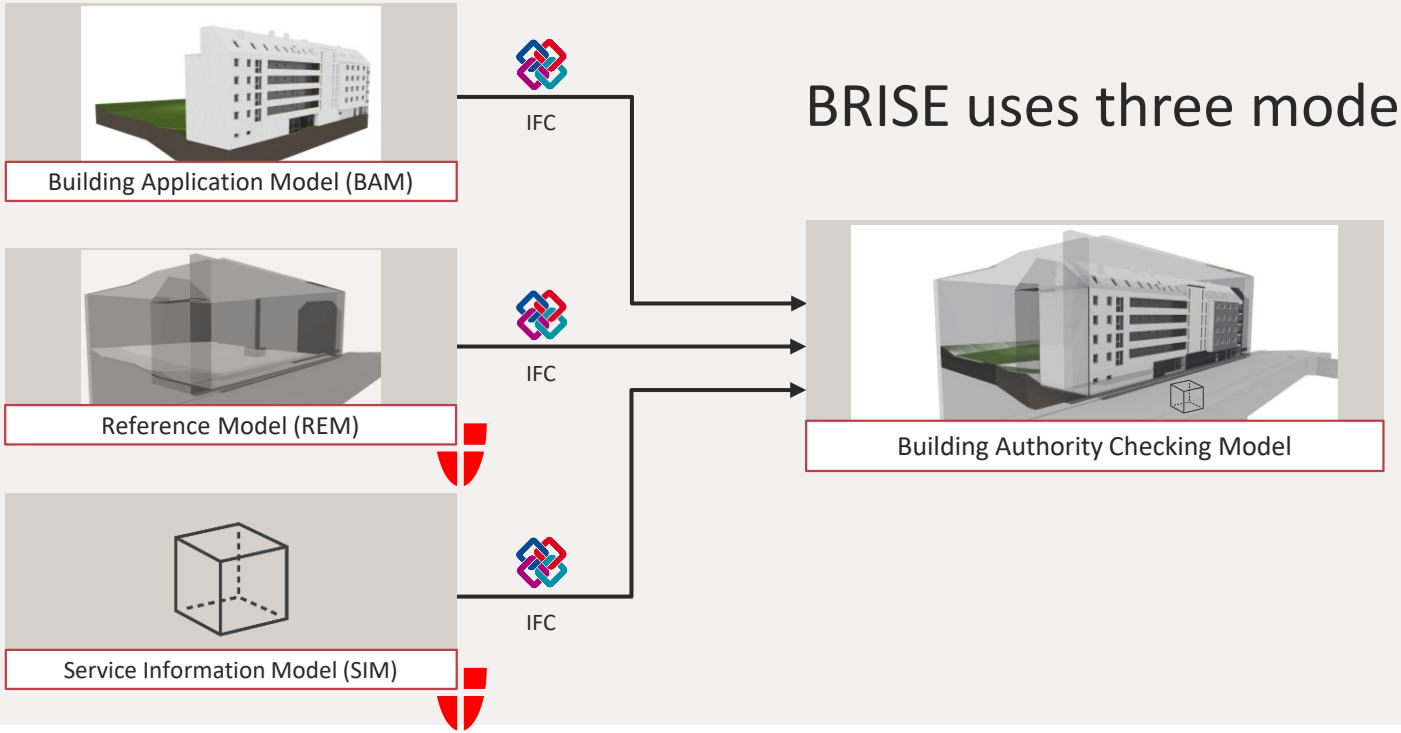
bSDD = buildingSMART Data Dictionary

A 6241-2

buildingSMART Austria

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

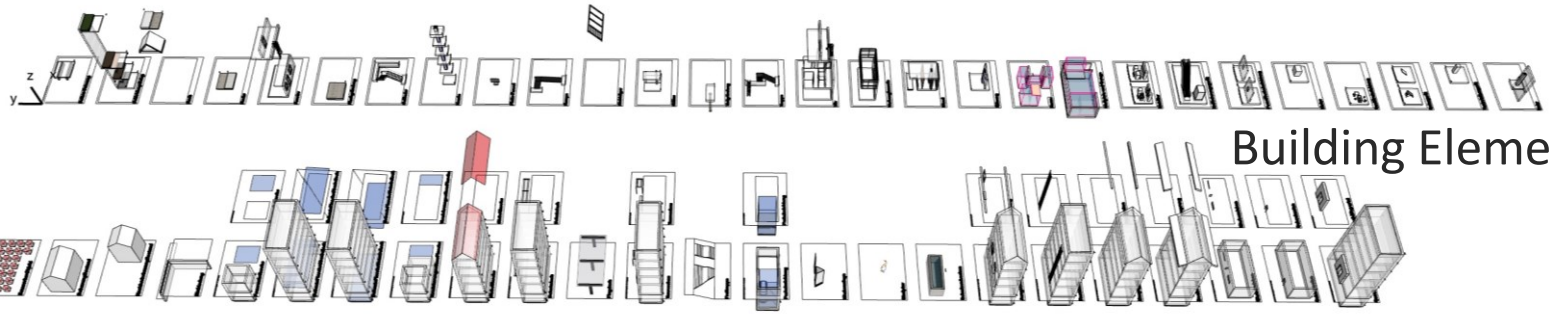
Models in BRISE



City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

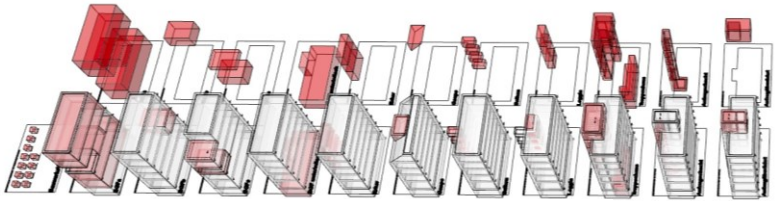
BRISE-Vienna

The Building Application Model (BAM)

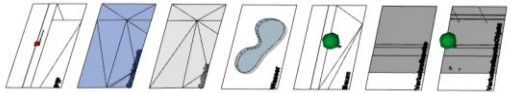


Building Elements

Building Applicant Objects



Building Volumes

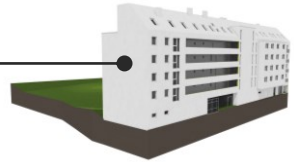


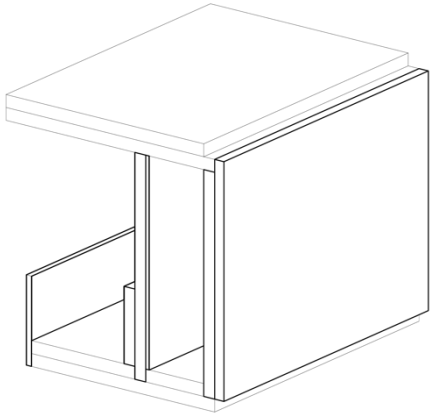
Surrounding

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

The Building Application Model (BAM)

Level of Geometry LOG: Example Wall



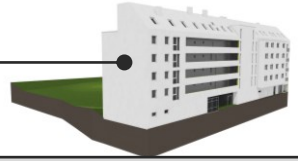
Geometric definition:		Example:
Definition: Vertical construction usually in masonry or in concrete which bounds or subdivides a construction works and fulfills a load bearing or retaining function.	**Explanation element class:** The wall represents a vertical construction that bounds or subdivides spaces. Wall are usually vertical, or nearly vertical, planar elements, often designed to bear structural loads. A wall is however not required to be load bearing.	

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

BRISE-Vienna

The Building Application Model (BAM)

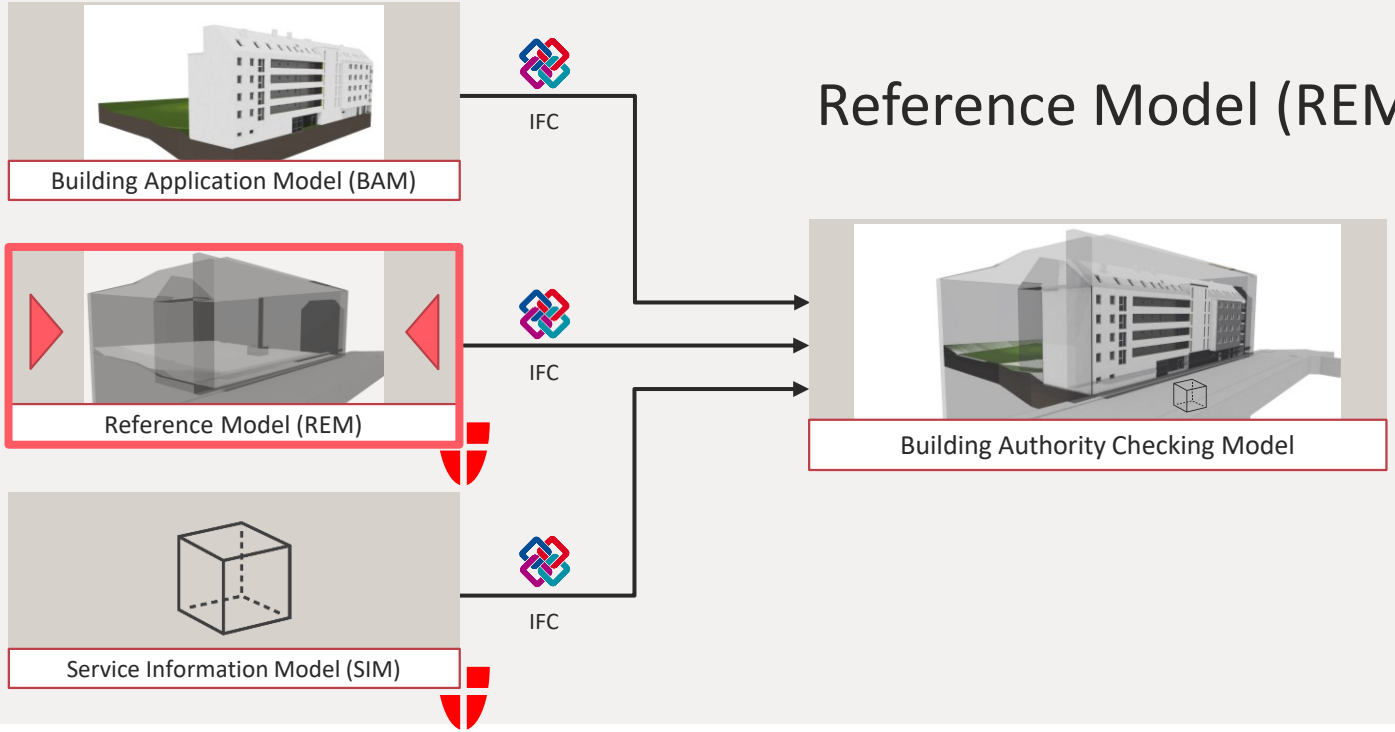
Level of Information LOI: Example Wall



Property Name	Property Origin	Used in	WBO	OIB
IsExternal	IFC-Standard	sound insulation; heat protection	WBO §116, §118	OIB RL5, RL6
ExtendToStructure	IFC-Standard	statics	WBO §89, §90	OIB RL1
Status	IFC-Standard	procedure definition	WBO §60	
LoadBearing	IFC-Standard	statics	WBO §89, §90	OIB RL1
Compartmentation	IFC-Standard	fire protection	WBO §91, §92, §93,…	OIB RL2
FireRating	IFC-Standard	fire protection	WBO §91, §92, §93,…	OIB RL2
ThermalTransmittance	IFC-Standard	heat protection	WBO §118	OIB RL6
SurfaceSpreadOfFlame	IFC-Standard	fire protection	WBO §91, §92, §93,…	OIB RL2
ElementMainMateriality	buildingSMART AT	statics	WBO §89, §90	OIB RL1
AufbautenNummer	BRISE	sound insulation; heat protection	WBO §116, §118	OIB RL5, RL6
SchallschutzWert	BRISE	sound insulation	WBO §116	OIB RL5
Fassadengestaltung	BRISE	projecting components	WBO §83	
Stuetzmauer	BRISE	permission free	WBO §62	

City of Vienna
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

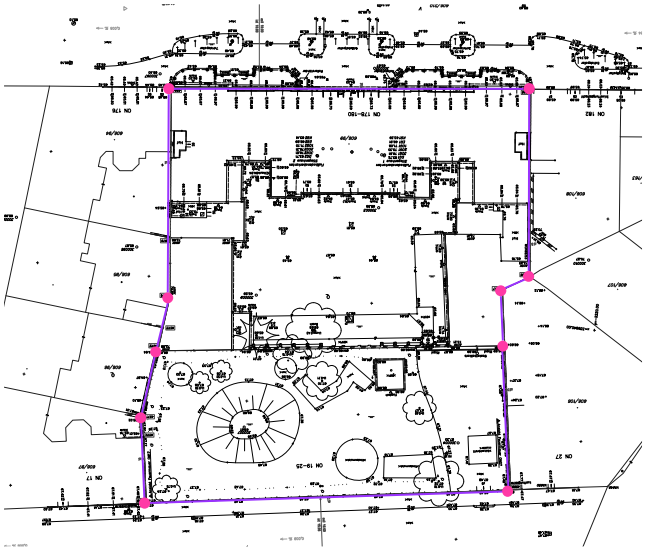
Models in BRISE



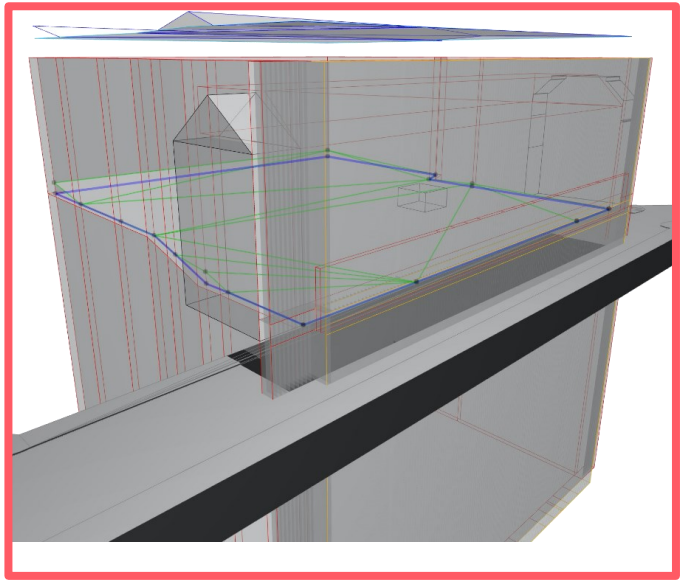
City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

The Reference Model (REM)

Verified Measurement Plan

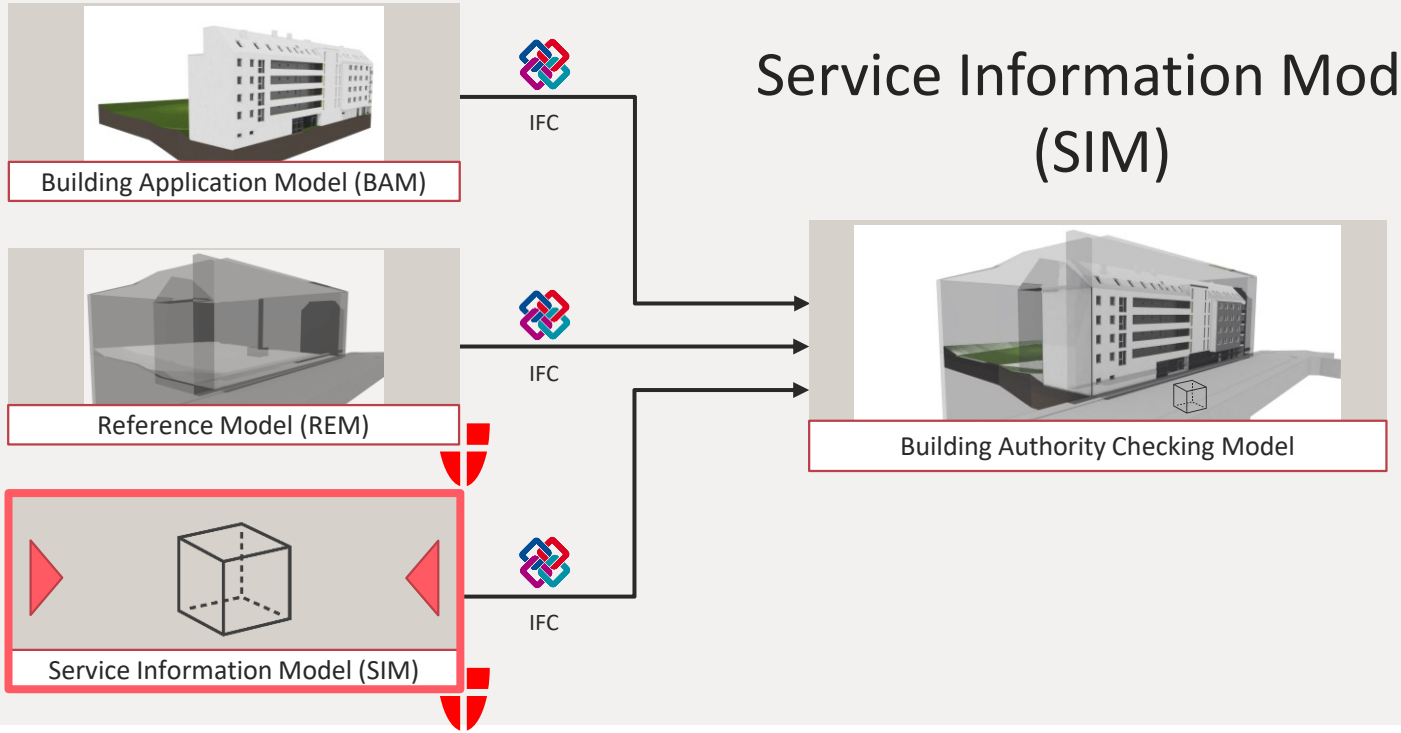


Reference Model



City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Models in BRISE

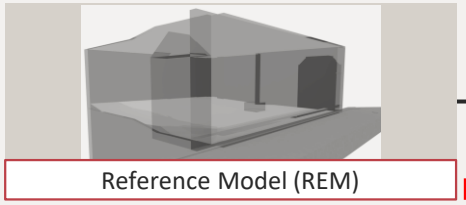


City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Models in BRISE

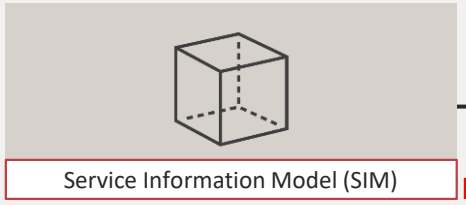
Building Application Model (BAM)

IFC



Reference Model (REM)

IFC



Service Information Model (SIM)

IFC

The Model Checking

Building Authority Checking Model

Check Rules and Check Routine

Evaluation Legal Matter

What should be checked?

Legal Matter: §/Art./Lit.

Wiener Bauordnung (WBO)	**Wiener Garagengesetz** (WGG)	**OIB-Richtlinien** (OIB-RL)
Vienna Building Code	**Vienna Garage Law**	**Austrian OIB-Directives**

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Evaluation Legal Matter

What should be checked?

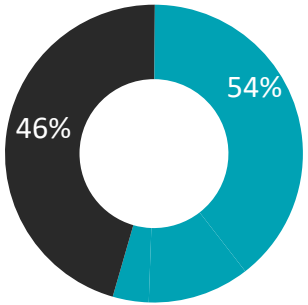
Legal Matter: §/Art./Lit.

Wiener Bauordnung (WBO)

Wiener Garagengesetz (WGG)

OIB-Richtlinien (OIB-RL)

54% of the entire legal material contains content that is relevant for a digital check.



City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

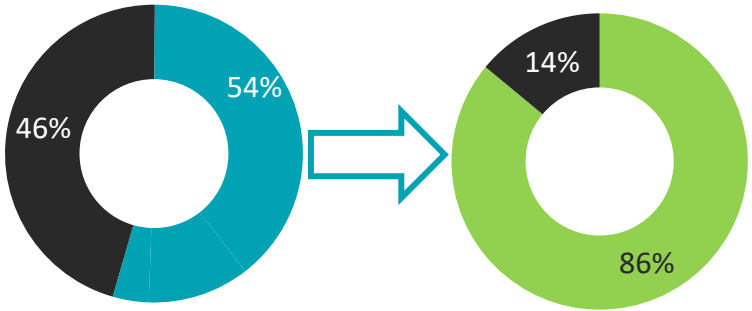
Evaluation Legal Matter

What should be checked?

Legal Matter: §/Art./Lit.

- **Wiener Bauordnung** (WBO)
- **Wiener Garagengesetz** (WGG)
- **OIB-Richtlinien** (OIB-RL)

54% of the entire legal material contains content that is relevant for a digital check.



86% of the relevant legal material was mapped in check queries.

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Checking Rules

structural I building law
Legal Matter: §/Art./Lit.

Example Accessibility: WGG §8/1

„Bei Anlagen zum Einstellen von mehr als 30 Kraftfahrzeugen ist für jeweils angefangene 50 Stellplätze ein Stellplatz für Personenkraftwagen von behinderten Menschen (Behindertenstellplatz) herzustellen.“

Vienna Garage Law
"In the case of places for parking for more than 30 motor vehicles, a parking space for cars belonging to disabled people (disabled parking space) must be created for each started 50 parking spaces."

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Checking Rules

structural I building law
Legal Matter: §/Art./Lit.

Example Accessibility: WGG §8/1

„Bei Anlagen zum Einstellen von mehr als 30 Kraftfahrzeugen ist für jeweils angefangene 50 Stellplätze ein Stellplatz für Personenkraftwagen von behinderten Menschen (Behindertenstellplatz) herzustellen.“

Level of Geometry (LOG)

Level of Information (LOI)

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Checking Rules

Building Application Model

structural I building law

Legal Matter: §/Art./Lit.

Example Accessibility: WGG §8/1

„Bei Anlagen zum Einstellen von mehr als 30 Kraftfahrzeugen ist für jeweils angefangene 50 Stellplätze ein Stellplatz für Personenkraftwagen von behinderten Menschen (Behindertenstellplatz) herzustellen.“

Level of Geometry (LOG)

> Individual parking spaces as geometry

Level of Information (LOI)

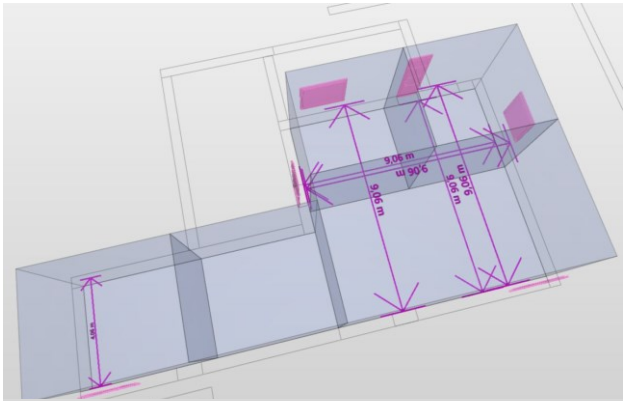
> Identification of an accessible parking space using the property „HandicapAccessible“

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

BRISE-Vienna

Checking Rules

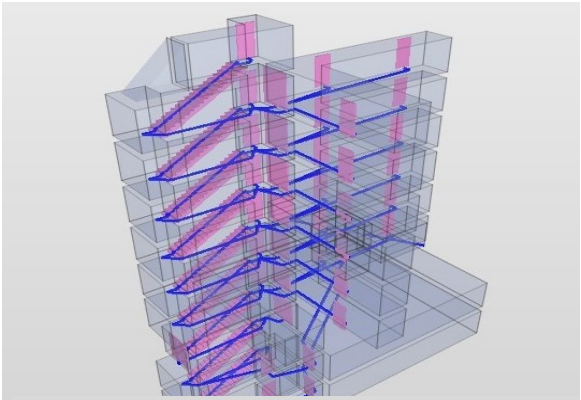
Type 1
automatic checking rule



Natural Lightning

API-Programming TU Wien

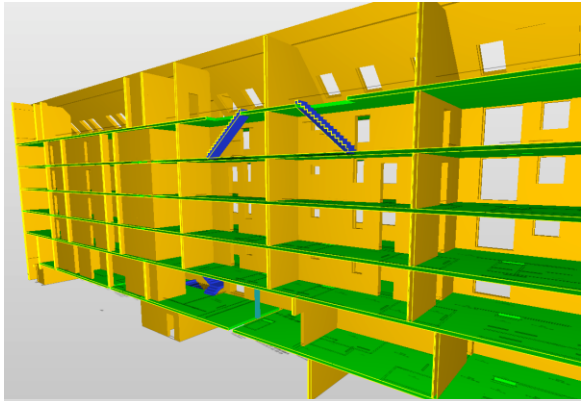
Type 2
partial automatic checking rule



Escape Route Analysis

API-Programming TU Wien

Type 3
Assisting checking rule



Static – load-bearing structure

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

The Pilot Operation Phase

and the results

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

BRISE-Vienna

Pilot Operation Phase

13 Projects from Planning offices

- 9 Residential buildings
- 2 Dormitories
- 1 Barracks building
- 1 Office building

1 to 6 structures

3 to 9 floors

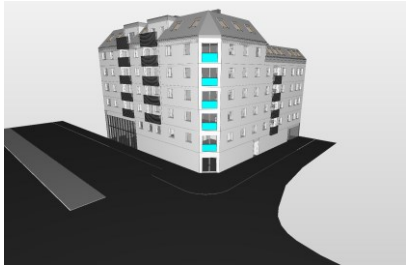
10 up to nearly 300 residential or office units

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Pilot Operation Phase

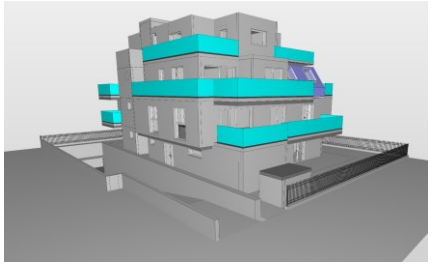
Student projects

- 5 ArchiCAD-Models
- 3 Revit-Models
- 3 Allplan-Models










In collaboration with

htl Mödling

Department Civil Engineering
Environmental Engineering

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

Results from BRISE pilot operation phase

The BRISE-Vienna research and development project has successfully laid the foundation for further developments

- Artificial intelligence applications will soon be incorporated into the Digital Building Application, development is already in progress
- Automated model pretesting would be a great benefit to all
- Checking rules need to be evaluated and revised
- 3D visualization along the process improves understanding
- **A lot of development is still necessary for productive operation**

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

View in to the Future

City of Vienna
UIA
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode
OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA
ein unternehmen der wienholding

https://uia-initiative.eu/en/uia-cities/vienna-call4

Österreichischer Verwaltungspreis 2021
JURYPREIS

2021 Administration Price in the categories Innovative Service Design/Digital Services

eAWARD

2022 Business Price in the categories Cooperation and Organization

BRISE-Vienna

City of Vienna
UIA Urban Innovative Actions
EUROPEAN UNION
European Regional Development Fund
This project is co-financed by the European Regional Development Fund through the Urban Innovative Actions Initiative
ode OFFICE FOR DIGITAL ENGINEERING
TU WIEN
zt:
WH MEDIA ein unternehmen der wienholding

Presentation made by
Roman Schneider, M.Sc., Eng.
City of Vienna Building Authority