Working Group Sustainable Construction
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Inffeldgasse 13 – PZ02

Model Documentation

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13.05.2021

Table of Contents

1 Abbreviations

BIM	Building Information Modelling
IFC	Industry Fondation Classes
LOD	Level Of Development
MEP	Mechanical Electrical Plumbing

2 Overview

2.1 Project Information

project information	
project name	PZ02 (Produktionstechnikzentrum 2)
operator	TU Graz (Technische Universität Graz)
project adress	Inffeldgasse 13 8010 Graz Austria
architecture	Hans Mesnaritsch
client	BIG (Bundesimmobiliengesellschaft)
type of use	production technology centre
building type	new construction
storeys	9
net floor area	7199 m²

PZ02 is part of the “Produktionstechnikzentrum”, a complex consisting of several buildings, used as laboratories and administrative purposes of the TU Graz. The ground floor facilitates lecture halls and seminar rooms, the upper floors laboratories, administration offices, seminar rooms and more. A data centre, which serves the entire Inffeldgasse-Campus at the TU Graz, is in the basement. The whole facility is heated and cooled by geothermal energy.

3 Project Contacts

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4 BIM Information Exchange

The model is available as a native Revit 2020 file (*.rvt) as well as in the IFC2x3 Coordination View and IFC4 Reference View format.

5 3D Modelling Protocol

The BIM model is an architectural model with LOD of around 300. Currently, no MEP model is available, breakthroughs are not modelled.

5.1 Reference Information and Coordinate Systems

Absolute height is given as meters above the Adriatic. Coordinate values are given in reference to the projection UTM 33N.

component	value
local grid origin	east: 5211856,852 m north: 535127,486 m
base point elevation	359,50 m
project north	328,26° clockwise from true north

5.2 Model structure

Wall and floor assemblies are usually separated into 3 objects, which represent an outer or inner covering as well as a core layer. These elements are named following the convention outlined in *5.3 Naming convention*. The outer façade, as well as indoor glass portals, are modelled as curtain walls.

5.3 Naming convention

character code	description
DAA	roof covering
DET	structural floor
DVO	covering above the structural floor
DVU	covering below the structural floor
FAS	facade
FEA	outside facing window
FEI	inside window
FUE	individual foundation
FUP	plate foundation
FUS	strip foundation
STE	rectangular column
STR	round column
TUA	outside facing door
TUI	inside door
UEZ	suspender beam
UNZ	down-stand beam
WAN	non-load bearing wall, core layer
WAT	load bearing wall, core layer
WVA	wall covering outside
WVI	wall covering inside

5.4 Materials

An element or layer can either have a single Material (“MS”) or a composite material (“MC”). Composite materials themselves consist of two or more single materials. In the native model, the material composition can be found in the material description. In the IFC model, this information is only available stored in parameters specified in *5.5 IFC file*. Thermal Conductivity is sometimes not given, either because it is meaningless (e.g. perforated ceiling) or because the information is missing.

5.4.1 Material attributes

Since IFC2x3 is not suitable for storing additional material information, custom parameters were created. These are used for IFC elements and describe either the material layers (e.g. for walls) or materials (e.g. for beams) in each element. Further parameters are defined, that describe the material properties. Values in those parameters follow the same order as the materials are originally listed in the layer or material list. Thermal Conductivity is sometimes not given, either because it is meaningless (e.g. perforated ceiling) or because the information is missing.

5.5 IFC file

parameter	unit	type	applicable to	additional information
QT-layer(s)	-	text	basic walls, roofs, ceilings, floors, foundations, facade panel	layer(s) or material(s) are listed in one line separated by a semicolon corresponding material properties are listed in the same order with the same seperation symbol
QT-material(s)	-	text	beams, columns, mullions, curtain wall elements (not windows, doors, facade panel), stairs	
QT-frame material; wing material	-	text	windows, doors (including curtain wall elements which are exported as doors or windows)	
QT-thickness	m	text	basic walls, roofs, ceilings, floors, foundations, facade panel	
QT-volume	m^3	text	stairs	
QT-density	kg/m^3	text	walls, doors, curtain wall elements which are exported as doors or windows, stairs, columns, floors, ceilings, mullions, curtain wall elements, roofs, foundations	
QT-thermal conductivity	W/mK	text	walls, stairs, columns, floors, ceilings, mullions, curtain wall elements, roofs, foundations	
QT-composite material components		multiline text	used wherever composite materials are present (pretty much everywhere, except doors)	each line corresponds to one composite material following a syntax[1]

[1] MCXXX; 00.000%_MSXXX xxx_0kg/m^3_0W/mK; 00.000%_MSXXX xxx_0kg/m^3_0W/mK; ...
Meaning: composite material name; percentage by volume_first single material name_density_thermal conductivity; percentage by volume_second single material name_density_thermal conductivity; ...

5.5.1.1 only native *.rvt file

In addition to the parameters listed above, the following parameters on the material level are available in Revit.

Revit parameter	unit
density	kg/m³
thermal conductivity	W/mK
waste category	-
eurostat	-
PCR	-

5.6 Units

All units of measurement are metric.

measurement	unit	symbol
length	metres	m
area	square metres	m²
volume	cubic metres	m³
mass	kilogramms	kg
power	watts	W

5.7 BIM and CAD Standards

The model was created in accordance with the Austrian Standard ÖNORM A 6241-2.