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Session Creating a BIM model Case study – Educational building

Presenter: Benjamín González Cantó - Corporate Development Director at CYPE 21 May 2024





REPUBLIKA SLOVENIJA MINISTRSTVO ZA OKOLJE, PODNEBJE IN ENERGIJO





How to use BIM modelling software to create a model of an educational building.



CYPE HEALTH AND TOPOGRAPHY SAFETY 6 MEP स्टिन् MEP INFRASTRUCTURES PLANNING STRUCTURES DATABASES €\$ Architecture DOCUMENTATION ARCHITECTURE MEP VIRTUAL URBAN PLANNING REALITY **BIM**server.center **Structures** \$ Management ENERGY SIMULATION **BILL OF QUANTITIES** ٥J CONSTRUCTION MANAGEMENT AUGMENTED REALITY RENDER ELEMENTS MANUFACTURER SYSTEMS

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Ciljno usposabljanje: Zbiranje, analiza in koristna uporaba podatkov, ki smo jih pridobili v procesu izdelave energetskih izkaznic

CLASH DETECTION

ACCESSIBILITY

CYPE Workflow



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Ciljno usposabljanje: Zbiranje, analiza in koristna uporaba podatkov, ki smo jih pridobili v procesu izdelave energetskih

Previous steps

- Creating an account on BIMserver.center
- Installation of the following programmes :
- IFC Builder

https://store.bimserver.center/en/app/1/ifc_builder

CYPETHERM Eplus

https://store.bimserver.center/en/app/29/cypetherm eplus



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Creating a project in BIM

BIMserver.center

It's what you do



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Generation of a BIM model





CYPETHERM EPlus





- Libraries



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- Zones

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Building Floor plans Analysis				۵. ا
3 Or Arrow Services S	Ar conditioning systems Air conditioning syste	ace of Cut ace The Copy wards Paste Check the model Errors	Export COM(theck	View Edges Update
Roofs	systems : sur conditioning systems : con	Zone		30 Junizerencenter
Doors Glazed openings Skylights Zones Zones Zones		Reference Z01 Name Occupied Classification of the zone Occupied		
Germinal units Germinal units		Operational conditions and indoor comfort		۵
S01 - PB Classroom1		Heating 😝 Heating 🗹 Cooling 🛃 Cooling School		
Floor slabs		Ventilation and infiltration		6
		Ventilation: Mechanical. Type of flow: Mechanical intake. Infiltrations: Yes.		
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		Daily DHW demand 200.0 I/day		
		Condensation		6
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- Thermal Bridges

	Edges processing X	
	Linear thermal bridge analysis to calculate the corresponding transmittance, depending on the characteristics of the adopted construction systems. This analysis will be carried out taking into account the specifications that are applicable depending on the code that has been selected to calculate the thermal transmittance in linear thermal bridges. The import of building information models (BIM) focuses on the geometric description of the building; their technical information is introduced using specific software. Therefore, to detect linear thermal bridges, the program must carry out a two-step process. For the first step, 'Edges' are imported as purely geometric entities, obtained from the intersection of various building elements. In the second step 'Edges processing' linear thermal bridges are obtained from the edges, taking into account the building description from a thermal analysis point of view (zones, space description, etc.) Configuration Do you wish to continue?	
Accept	Cancel	



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- Systems

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- Analysis

Calculation opti	ons X
Simulation type Demand/	Consumption ~
☑ With thermal bridge exp	ort
Partition simplification	
Vertical	
Horizontal	
Margin of setpoint tempera	atures 🕑
Heating 0.2 °C (Cooling 0.2 °C
Simulation period	
Accept	Cancel



Results

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Calculation 3D options Model Analyse EnergyPlus ⁵⁰ Warnings Results file file file file file	Consumption Building report envelope														Shi	3 are In	iprovemer measure
Analysis	Reports															Sh	are
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Building	Object building(Demand)																~ 1
Z02_Unoccupied	Heating energy and minimum temperatures																
	Zone					Surface	Jan	Feb	Mar /	Apr N	May Jur	Jul	Aug	Sep Oc	t Nov	Dec	Total
	Z01_Occupied	Z01 Occupied					13.98	11.88	8.8 3	.94 0	.92 0.1	•	0.02	0.51 3.8	5 8.89	12.84	65.74
	Z02_Unoccupied				°C		2.2	2.8	5.7 1	0.2 1	3.6 15.	7 18.9	16.5	15.2 10.	6 7.2	3.9	
	Total				kWh/	m ² 2895.79	13.98	11.88	8.8 3	.94 0	.92 0.1	-	0.02	0.51 3.8	5 8.89	12.84	65.74
	Cooling energy and maximum temperatures																
	Zone					(m	Jai	n Feb	Mar	Apr I	May Ju	in Jul	Aug	Sep O	ct Nov	Dec	Total
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	Z02_Unoccupied					°C	9.	1 8.3	11.5	17	19.4 21	.5 24.3	2 24	19.6 16	.7 12.4	10.2	
	Total kWh/m ² 2895.79							•	- 1	0.04 0.3	31 1.9	2.09	0.04 -		-	4.4	
	Results																
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	Minimum outdoor temperature	°C	-12.9	-20.7	-5.7	-0.1	3	6.5	10	.1	3.2	6	-0.4	-5.	1 -9	9.2	
	Maximum outdoor temperature	°C	9.9	8.5	15.6	25.6	28	30	33	.3	32.5	26.6	24.1	15	10).6	
	Average outdoor relative humidity	%	79	83	70	72	73	74	6	9	71	81	82	88	ç	12	
	Minimum indoor operative temperature	°C	2.2	2.8	5.7	10.2	13.6	15.7	7 18	.9	16.5	15.2	10.6	7.2	3	.9	
	Maximum indoor operative temperature	°C	19.6	19.5	19.8	23	23.8	24.1	1 25	i.1	24.7	23.8	22.1	19.	8 19	9.6	
	Average indoor air temperature	°C	11.3	11.6	13.3	15.7	18.2	19.6	5 22	.3	22	18.7	16.2	13.	7 1	2	
Z	Average indoor relative humidity	%	38	40	39	49	55	61	6	0	57	64	55	49	1	15	
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- Sharing results in the CDE

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Building Floor plans Analysis																🥥 🤣	
Image: Calculation 3D options Image: Calculation 3D Model Image: Calculation 3D file Image: Calculation 3D fi	Demand Consumption Building report Reports													s	S hare	mprovement measure Share	
の曲曲	Building																
Building	Object building(Demand)	Object building(Demand)															
Z02_Unoccupied	Export in 'IFC' for	mat						×									
	Generate the application results and upload them as a contrib	oution to	the pro	ect locat	ted on Bl	Mserver	center.	ar	Apr	May .	Jun Jul	Aug	Sep C	Oct No	v De	c Total	
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	Accept						Can	cel .	-	0.04	0.31 1.9	2.09	0.04	-		4.4	
	Results		lan.	Eab	Mar	Apr	May	lun	Int	Aug	San	0.5	• N	lav	Dec	Total	
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	Maximum outdoor temperature	°C	9.9	8.5	15.6	25.6	28	30	33.3	32.5	26.6	24.	1	15	10.6		
	Average outdoor relative humidity	%	79	83	70	72	73	74	69	71	81	82	1	88	92		
Ž.	Minimum indoor operative temperature	°C	2.2	2.8	5.7	10.2	13.6	15.7	18.9	16.5	15.2	10.	6 7	.2	3.9		
×	Maximum indoor operative temperature	°C	19.6	19.5	19.8	23	23.8	24.1	25.1	24.7	23.8	22.	1 1	9.8	19.6		
	Average indoor air temperature	°C	11.3	11.6	13.3	15.7	18.2	19.6	22.3	22	18.7	16.	2 1	3.7	12		



- Visualizar resultados en el CDE

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TIMEPAC Education Buildi \vee	Contributions	Notifications	Work team	History		
Educational 🔇 🔓 🔩 Share	Search	Tags	Sort by activity	✓		≡~
	Name	Description	Author	Tags	Last change	Included files
	Energy simulation Slov		Benjamín González Cantó	Energy analysis	37 minutes ago	8 (14 MB)
Add collaborator	School Center.ifc		Benjamín González Cantó	Architectural design	an hour ago	6 (5 MB)
Pending to be managed						
O O Issues Requirements						
2						





If you would like more information, please visit www.timepac.eu or contact us at

benjamin.gonzalez@cype.com

Thanks for your attention!



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