



MIASTOPROJEKT
WROCLAW

WEBINAR
Cyfrowe zarządzanie
projektem inwestycyjnym

Luty 2023



MIASTOPROJEKT WROCŁAW

Miastoprojekt Wrocław sp. z o.o. jest ogólnopolską firmą inżynierską specjalizującą się w zarządzaniu projektami, opracowywaniu projektów budowlanych i wykonawczych oraz dostawie rozwiązań energetycznych dla firm. Jest pionierem wprowadzania w Polsce nowoczesnych rozwiązań oraz standardów projektowania i zarządzania projektami takich jak cyfrowy proces BIM w obszarach 3D, 4D i 5D.

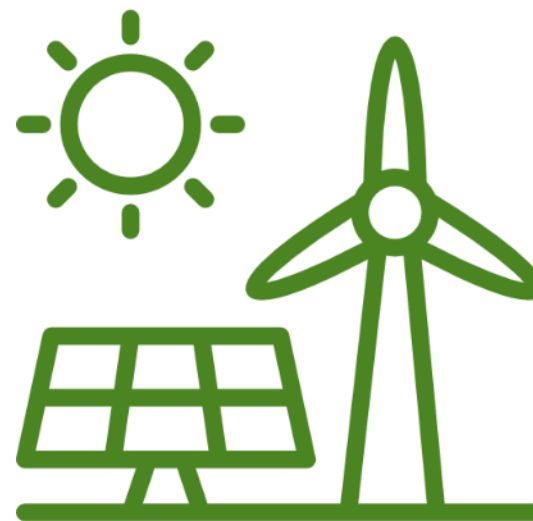
Realizując naszą misję angażujemy się w wiele ważnych przedsięwzięć, jak choćby w realizację programu pod nazwą „Cyfryzacja procesu budowlanego w Polsce” realizowanego przez Ministerstwo Rozwoju we współpracy z PWC i wspieranego przez Komisję Europejską, którego zwieńczeniem było opracowanie zatytułowane „Mapa drogowa dla wdrożenia metodyki BIM w zamówieniach publicznych”, czy też pełnienie funkcji „Zarządzającego Projektem” w pierwszym w Polsce projekcie publicznym realizowanym w standardzie BIM pod nazwą „Budowa Ośrodka Narciarstwa Biegowego i Biathlonu w Szklarskiej Porębie – Jakuszykach”. Obsługujemy zamówienia z rynku publicznego i prywatnego. Nasi specjaliści realizują liczne projekty w branżach: przemysłowej, ochrony zdrowia, sportu i rekreacji, rynku biurowego i hotelarskiego. Od ponad 70 lat rozwijamy i wdrażamy nowoczesne rozwiązania, aby świadczyć usługi na najwyższym poziomie.



OBSŁUGIWANE SEKTORY



PRZEMYSŁ



ENERGIA



BIURA HOTELE
APARTAMENTY



SPORT



ZDROWIE



OBSZARY DZIAŁALNOŚCI

PLANOWANIE FINANSOWANIE



- Ekspertyzy
- Studia wykonalności
- Master plany
- Koncepcje
- Budżetowanie
- Źródła finansowania

PROJEKTOWANIE



- Projektowanie BIM
 - Projekty budowlane,
 - Projekty przetargowe
 - Projekty wykonawcze
- BIM 4D i 5D - harmonogramy budowy i rzeczowo-finansowe cyfrowego bliźniaka

ZARZĄDZANIE



- Organizacja przetargów
- Zarządzanie budową
- Nadzory: inwestorskie, BHP, jakościowe, finansowe
- Odbiory i uruchomienia
- Rozliczenie inwestycji, w tym rozliczenie dotacji UE

EKSPLOATACJA I UTRZYMANIE



- Obsługa gwarancyjna
- Utrzymanie ruchu
- Optymalizacje energetyczne istniejących obiektów
- Optymalizacje istniejącej technologii produkcji i logistyki

Prezentacja prowadzących



BIO Paweł Krecz

MA & BSc (Hons) Construction Management

Ścieżka zawodowa

- **Miastoprojekt Wrocław Sp. z o.o.** | Consultant
- **Bentley Systems** | Strategic Product Manager
- **Bexel Consulting** | Consultant
- Morgan Sindall plc, SKANSKA S.A., Elektrim-Megadex, REMAK S.A.

związany z Miastoprojekt Wrocław od 2022 roku

Paweł Krecz jest konsultantem Miastoprojekt Wrocław w zakresie cyfryzacji procesów budowlanych w obszarze planowania wizualnego i kosztorysowania (4D/5D BIM). Dostarcza specjalistyczne szkolenia, usługi doradcze oraz wspiera wdrożenia procesów cyfrowych od strony strategicznej i technicznej.

Przez wiele lat związany był z technologią SYNCHRO 4D jako konsultant oraz menadżer produktu. Wspiera inicjatywy OpenBIM, interoperacyjność formatów BIM, rozwój modelu IFC oraz standaryzację PAS1192 z ramienia British Standards Institution.

Paweł posiada ponad 25 lat doświadczenia w budownictwie ogólnym, projektach infrastrukturalnych, energetyce oraz sektorze wodnym jako inżynier, specjalista ds. zarządzania projektem oraz konsultant technologii cyfrowych. Pracował między innymi w Polsce, Indiach, Stanach Zjednoczonych oraz na Wyspach Brytyjskich.

Jego wykształcenie to mieszanka energetyki, socjologii i zarządzania budową.





BIO Tomasz Podzielny

M.Sc & Eng. Architecture | Projectmanager / Architekt

Ścieżka zawodowa

- **MIASTOPROJEKT WROCŁAW** | Projectmanager
- **Metroplan Polska** | Projectmanager / Senior Architect
- **PCC Rokita SA** | Projectmanager
- **Saller Bau GmbH** | Projectmanager
- **Womak Holding** | Projectmanager
- **Ozone** | Architekt

w Miastoprojekt Wrocław od 2021 r.

Tomasz Podzielny posiada ponad dwudziestoletnie doświadczenie w przygotowaniu inwestycji budowlanych od fazy przygotowawczej przez realizacyjną aż do uzyskania pozwolenia na użytkowanie i uruchomienia instalacji. Posiada uprawnienia budowlane w specjalności architektonicznej i realizuje projekty o charakterze przemysłowym i technologicznym - głównie chemicznym. Jest specjalistą w zakresie projektowania BIM 3D, 4D i 5D. Specjalizuje się w harmonogramowaniu oraz opracowaniu budżetów inwestycyjnych na bazie modelu BIM 3D. Znajomość procesów inwestycyjnych i technologicznych umożliwia mu precyzyjne planowanie prac i wdrażanie procesów optymalizacyjnych (value engineering) oraz tworzenie wariantów prowadzenia robót i analiz budżetowych. Tomasz ma doświadczenie w pełnieniu funkcji inżyniera zgodnie ze standardem FIDIC w formułach EPCM, EPC oraz Construction, a prywatnie jest zarządzany przez swojego Yorka.





BIO Andrzej Warcholak

Prawnik | Dyrektor ds. rozwoju

Ścieżka zawodowa

- **Miastoprojekt Wrocław sp. z o.o.** | Dyrektor ds. rozwoju
- **Saller Bau GmbH** | Przedstawiciel ds. zakupu nieruchomości
- **Prospector sp. z o.o.** | Prezes zarządu

w Miastoprojekt Wrocław od 2015 r.

Andrzej Warcholak jest dyrektorem ds. rozwoju Miastoprojekt Wrocław sp. z o.o., działającej na rynku zarządzania inwestycjami budowlanymi i projektowania – w tym projektowania BIM 3D, 4D, 5D oraz szeroko pojętym rynku energetycznym.

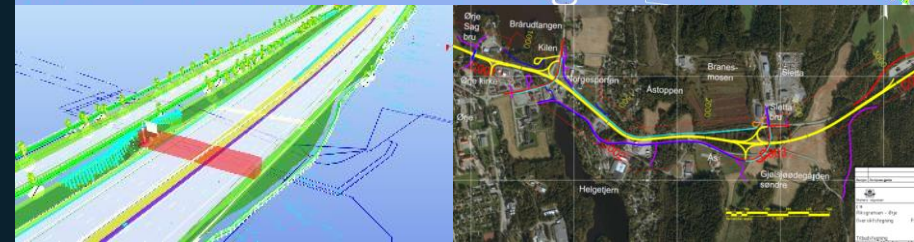
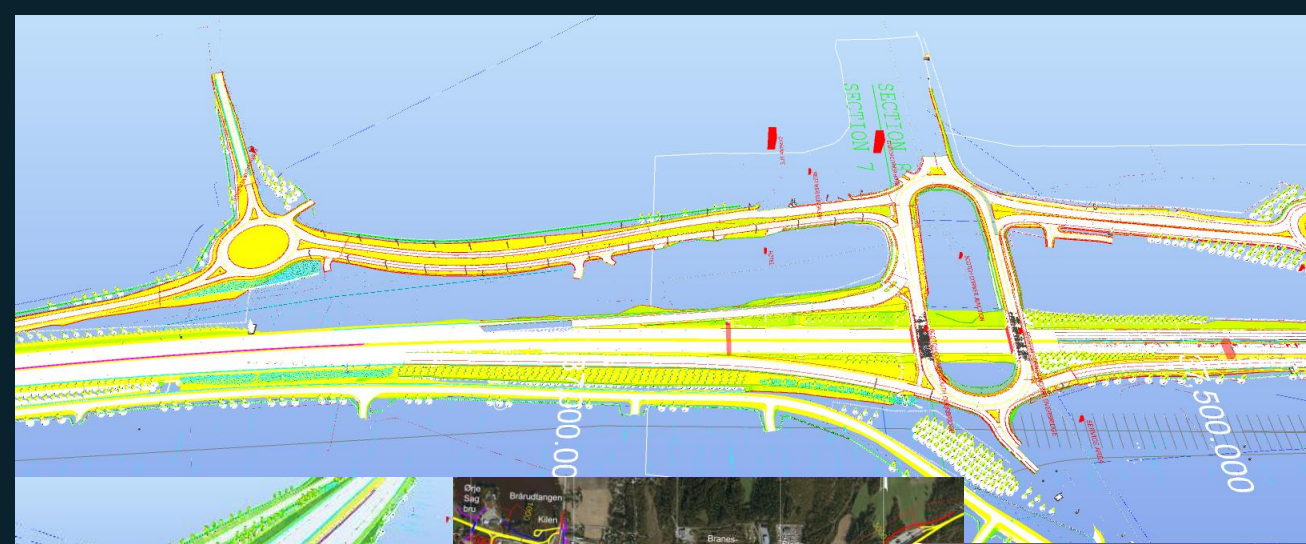
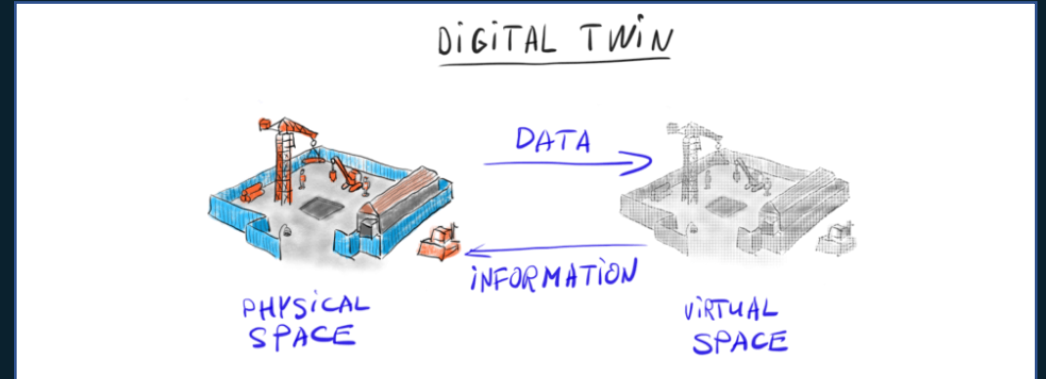
Zajmuje się doradztwem w przedmiocie zarządzania projektami inwestycyjnymi w formułach EPCM, EPC i Construction oraz doradztwem prawnym w zakresie organizacji projektów budowlanych. Od ponad 20 lat działa na rynku inwestycji budowlanych, a w ostatnich 8 latach koncentruje się na rynku przemysłowym, wspomagając firmy polskie i zagraniczne w realizacji zamierzeń inwestycyjnych.

Andrzej jest prawnikiem z doświadczeniem w dziedzinie inżynierii zarządzania, a dobre rozumienie rynku ułatwia mu dodatkowe wykształcenie managerskie. Lubi zagadnienia związane z planowaniem, analizą danych i szukaniem rozwiązań opartych na danych. Uwielbia ludzi i naukę języków.

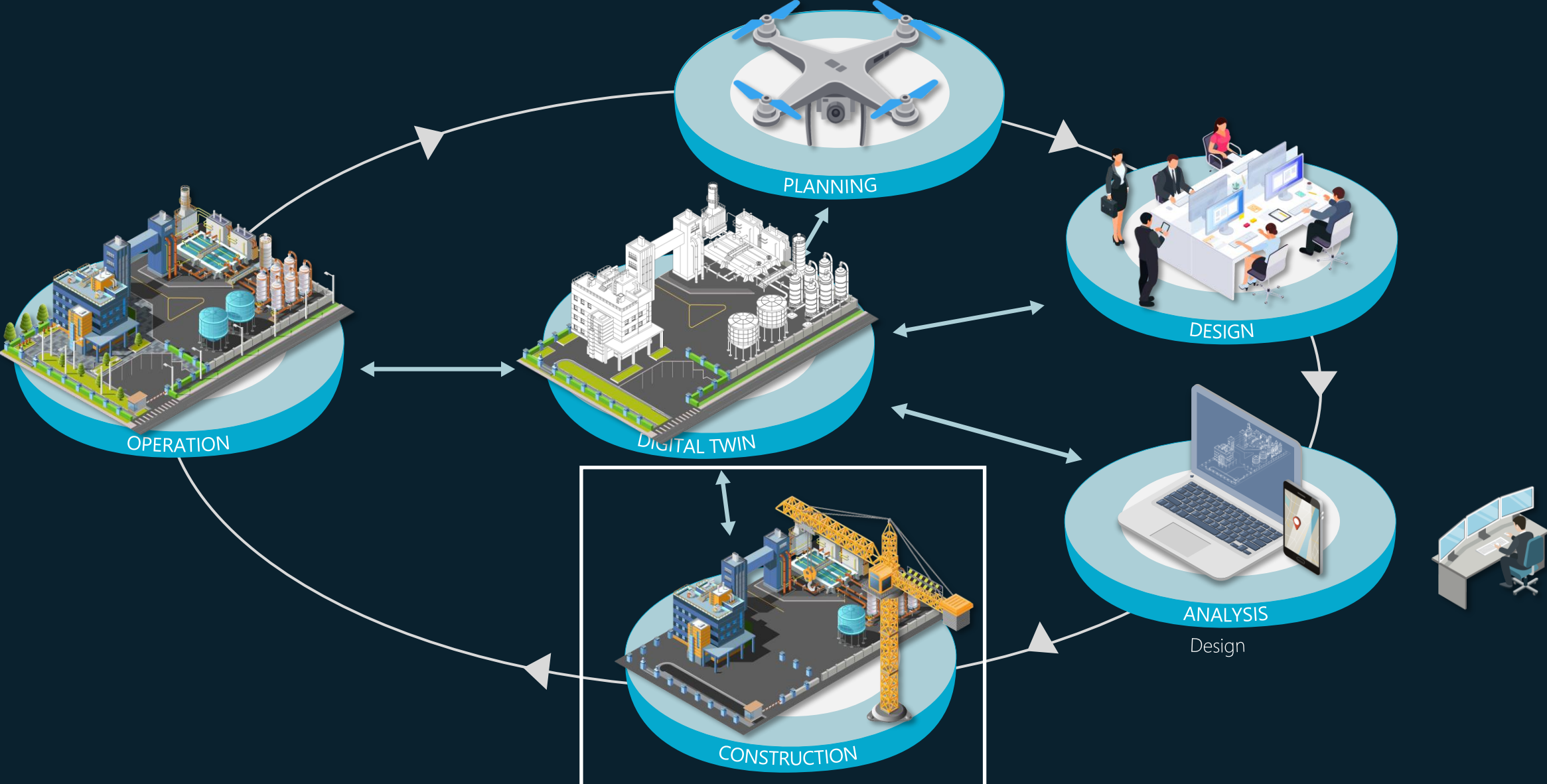


Zintegrowane cyfrowe zarządzanie projektem inwestycyjnym

Wirtualizacja



Cyfrowy bliźniak



Cele cyfryzacji

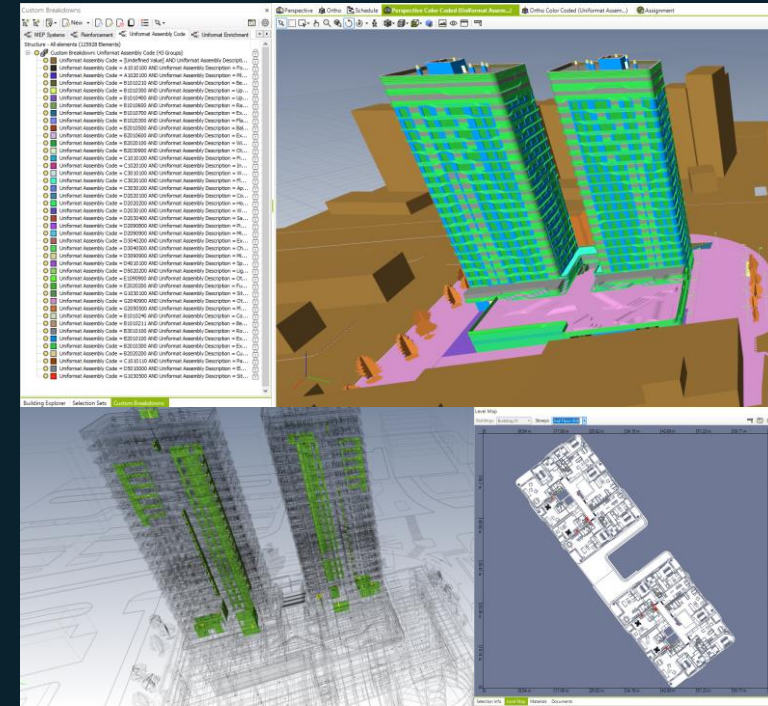
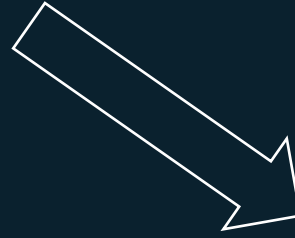
- **Redukcja ryzyk i obciążeń**
- **Zwiększona wydajność**
- **Sprawdzalne założenia (zadanie bliźniaka)**
- **Eliminacja konfliktów koordynacyjnych**
- **Skupiona odpowiedzialność**
- **Oszczędności na zasobach**
- **Wygrany kolejny projekt**



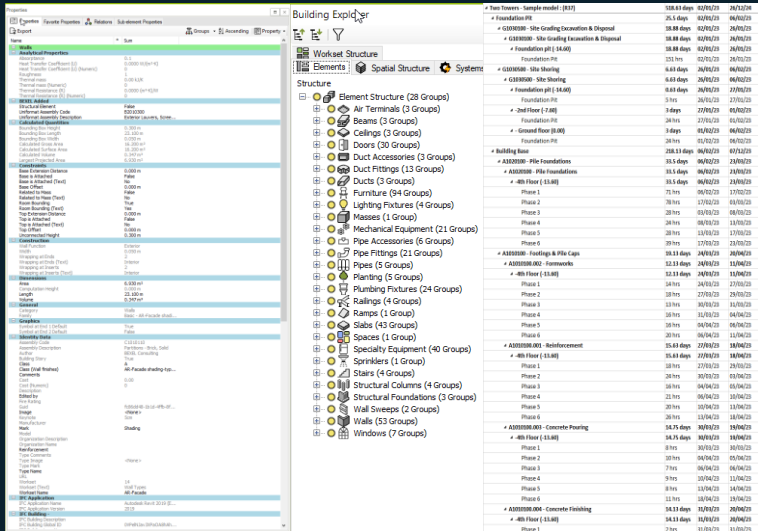
Dynamiczny model BIM (3D+)



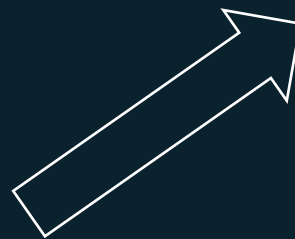
3D



BIM



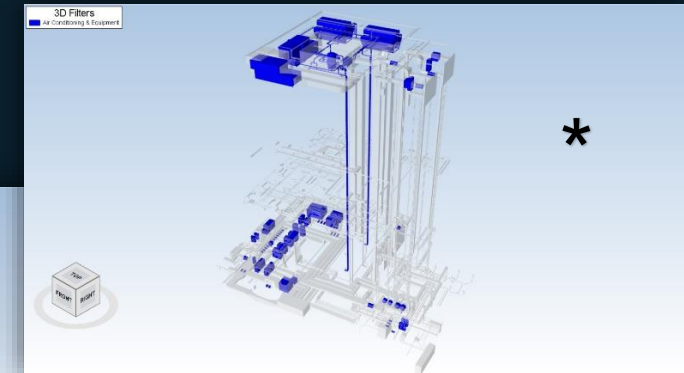
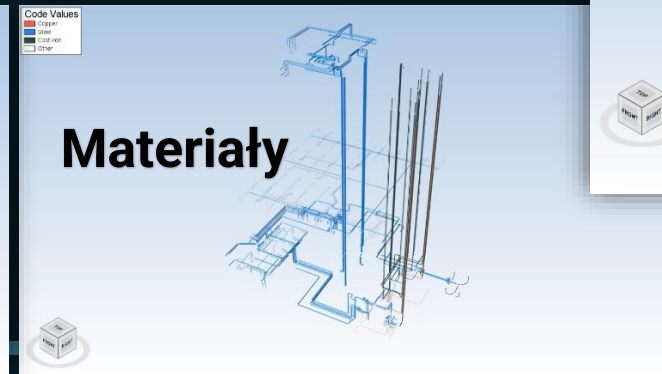
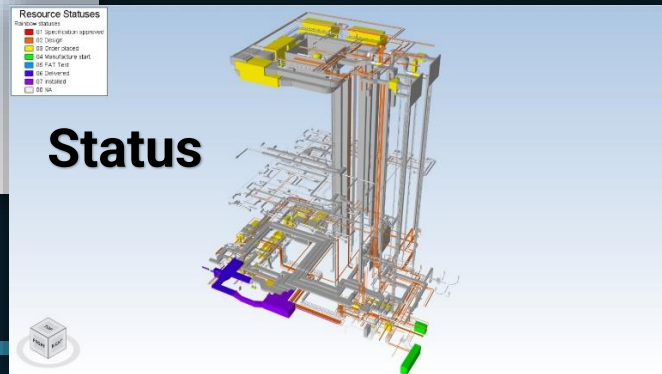
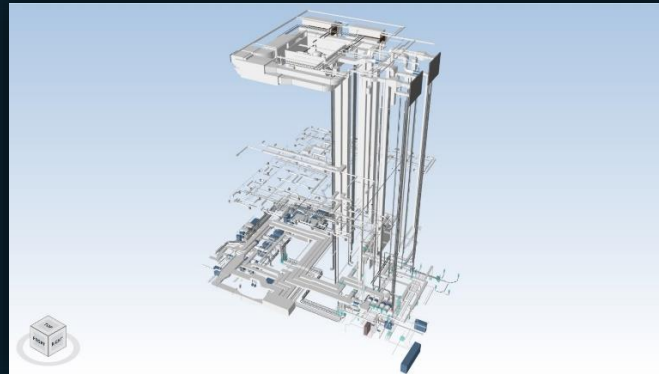
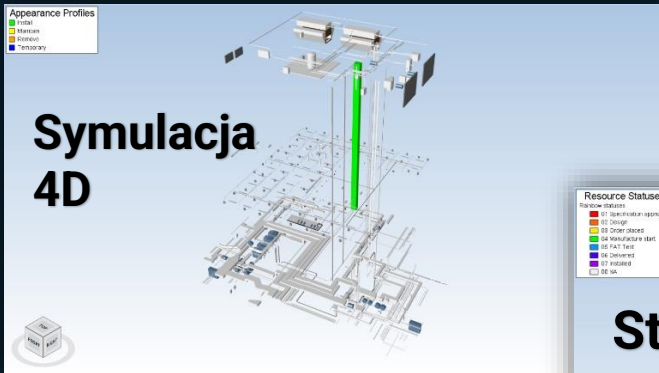
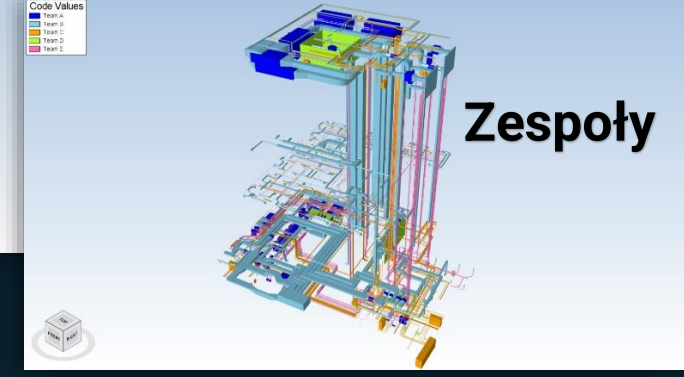
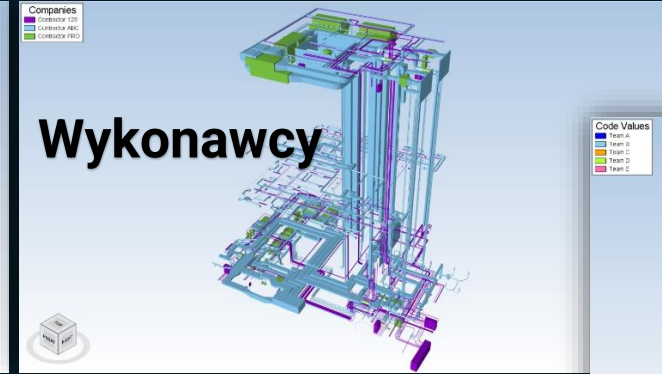
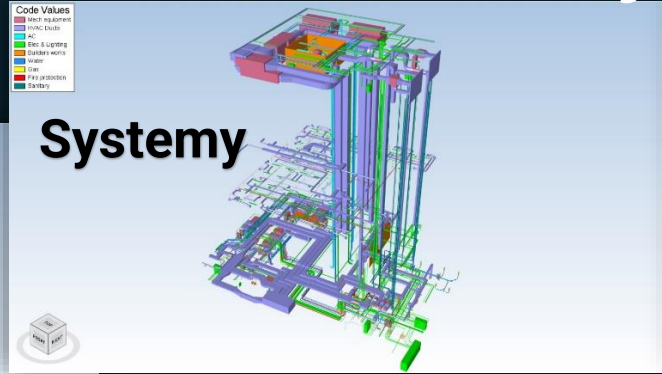
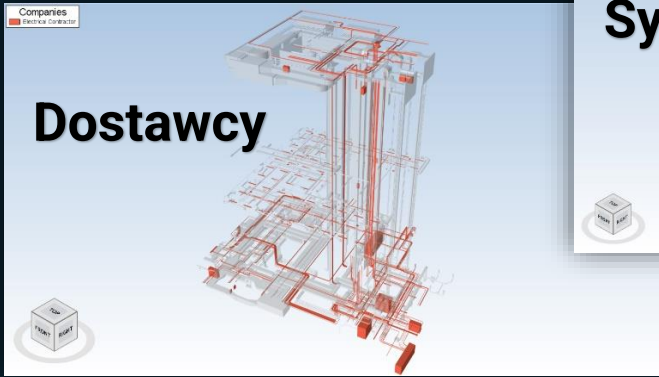
Dane



4D = Harmonogram

5D = Koszt

Wizualizacja i analiza danych



Specyfikacje i Podręczniki Dostarczania Informacji

The screenshot shows the Revit software interface. On the left is the Building Explorer with a tree view of project elements. In the center is the IFC Model Checker window, displaying a table of element names and their status. At the bottom, there are various toolbars and a task pane.

Category	Property Naming Pattern	Example (Not required)	Property Name
Curtain Walls	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	AR-Basic_Wall_Block-190mm	Family
Air Terminals	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	ME-Exhaust_Grille_Rectangular_Hosted_Horizontal-600x600mm	Links
Beams	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	SI-Concrete_Rectangular_Beam-600x900mm	Test regular expression online
Cable Tray Fittings	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Ladder_Vertical_Inside_Bend	https://regex101.com/
Cable Trays	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Ladder_Cable_Tray	Regex documentation
Ceilings	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	AR-Compound_ceiling-600x600mm	https://docs.microsoft.com/en-us/dotnet/standard/base-types/regular-expressions
Conduit Fittings	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Conduit_Body_Type_Aluminum	
Conduits	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Rigid_Nonmetallic_Conduit_[RNC_Sch_80]	
Curtain Panels	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	AR-System_Panel	
Curtain Wall Mullions	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	AR-Rectangular_Mullion-30x150mm	
Duct Fittings	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	ME-Rectangular_Duct_Endcap	
Ducts	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	ME-Mitered_Elbows/Tees	
Electrical Equipment	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Circuit_Breaker_Switchboard-762x965mm	
Electrical Fixtures	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	EL-Duplex_Receptacle-Plain	
Flex Ducts	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[0-9]{1,2}\$	ME-Flex_Round	
Furniture	*AR-([A-Z]{a-z})*_[A-Z]{a-z})*-[A-Z]{a-z})*\$	AR-Chair-Viper	
Lighting Devices	*[A-Z]{2}-([A-Z]{a-z})*_[A-Z]{a-z})*-[A-Z]{a-z})*-[A-Z]{a-z})*\$	EL-Lighting_Switches-Single_Pole	
Lighting Fixtures	*EL-*\$	EL-Pendant_Light_Linear_2_Lamp-277V_2400mm	
Masses	*M-*\$	SI-Sporhallig-portalie	
Mechanical Equipment	*ME-*\$	ME-Water_Heater_Tankless - ME-Water_Heater-2.3L	
Parkings	*[A-Z]{2}-*\$	AR-Parking_Space-5480x2740mm-90_deg	
Pipe Fittings	*PL-*\$	PL-Transition_Generic-Standard	
Pipes	*PL-*\$	PL-Opening Cut	
Planting	*RPC-*\$	RPC_Tree-Deciduous - Golden_Chain-5.5_Meters	
Plumbing Fixtures	*PL-*\$	PL-Lavatory_Wall_Mounted-Public-485x335mm	
Rallings	*[A-Z]{2}-*\$	AR-Guardrail_Pipe	

Property Checker involves two checks:

- Checking the family names, sources names, building names and storey names using regex pattern.
- Checking the existence of properties, their values, property type as well as checking the value using the condition.

Condition Examples	Condition Sub-Type	Example	Supports case sensitive(*)
Category	Equal	['CATEGORY'] = 'Door'	TRUE
Family Name	Equal	['FAMILY'] = 'Beam'	TRUE
	NotEqual	['FAMILY'] != 'Beam'	TRUE
	Contains	['FAMILY'] = '%Beam%'	TRUE
	BeginsWith	['FAMILY'] = '%Beam'	TRUE
HasProperty	EndsWith	['FAMILY'] = '%Beam'	TRUE
	Regex	match([FAMILY], M_K.*Angle Web.*)	TRUE
	Equal	['Area']	TRUE
MaterialName	Equal	['MATERIAL'] = 'Concrete - Cast in Situ'	TRUE
	NotEqual	['MATERIAL'] != 'Concrete - Cast in Situ'	TRUE
	Contains	['MATERIAL'] = '%Cast%'	TRUE
	BeginsWith	['MATERIAL'] = 'Concrete%'	TRUE
	EndsWith	['MATERIAL'] = '%Situ'	TRUE
PropertyBool	Regex	match([MATERIAL], 'Co.ste')	TRUE
	AnyOf	in([MATERIAL], 'Metal - Sunscreen', 'Concrete - Cast in Situ')	TRUE
PropertyNumeric	AnyOf	['Structural'] = false	TRUE
	Equal	['Area'] = 100.50	TRUE
	NotEqual	['Area'] != 100.51	TRUE
	Greater	['Area'] > 100.52	TRUE
	Less	['Area'] < 100.53	TRUE
	GreaterEqual	['Area'] >= 100.54	TRUE
PropertyText	LessEqual	['Area'] <= 100.55	TRUE
	AnyOf	in([Area], 100.56, 150.200)	TRUE
	Equal	['Structural Usage'] = 'Non-bearing'	TRUE
	NotEqual	['Structural Usage'] != 'Non-bearing'	TRUE
	Contains	['Structural Usage'] = '%Non-bearing%'	TRUE
	BeginsWith	['Structural Usage'] = 'Non%'	TRUE
	EndsWith	['Structural Usage'] = '%bearing'	TRUE
Negation	Regex	match([Structural Usage], 'Non.*ng')	TRUE
	AnyOf	in([Structural Usage], 'abc', 'ade', 'ss')	TRUE
Conjunction	I(Query)		
Disjunction	LeftQuery and RightQuery		

*All conditions are case-insensitive by default

*For single value conditions which support case-sensitive values, you can put the '/' at the beginning of the value to make condition case-sensitive (For example: [FAMILY] = '/Beam')

*For multi value conditions which support case-sensitive values, you can put the '/' at the element in brackets (For example: in([MATERIAL], '/c', 'Metal - Sunscreen', 'Concrete - Cast in Situ')

*If single value condition contains '%', you must escape it with character '\' (For example: [FAMILY] = 'Be%am')

*If single value condition contains '\' you must escape it with another '\' character (For example: [Path] = 'C:\User\Documents')

*For Regex use standard Regular Expression language. For more information, please visit <https://docs.microsoft.com/en-us/dotnet/standard/base-types/regular-expressions>

* Also in column Condition in Category Element sheets, you can rename the name of the property with '\$' character. (For example: if the value of the property length is currently being checked, then you can change the name 'length' with character '\$'. [Specific Weight] < 7800 and ([S] < 6) or ([Specific Weight] >= 7800 and [S] >= 6))

Testy kolizji przestrzennych

Selection Sets

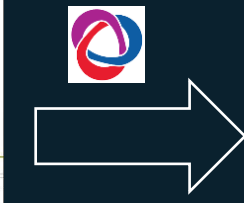
- Selection Sets (9 Groups)
- Clash (3 Groups)
- Construction phases (3 Groups)
- Main Views (8 Groups)
- Source Selection Sets (2 Groups)
- UniformFlat (66 Groups)
- Uniform Selection Sets (2 Groups)
- Manually selected facade elements (2...)
- Structural elements for substructure (...)

Clash Detection

Run Clash Detection | Clash View Mode | Update

Jobs: Structural Vs HVAC Systems

Name	ID:1	Storey:1	Category:1	Family:1	ID:2	Storey:2	Category:2	Family:2
Clash1	10623	02 - Floor	Beams	ST-Concrete_Rectangula...	10623	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash2	10601	02 - Floor	Beams	ST-Concrete_Rectangula...	10601	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash3	10685	02 - Floor	Beams	ST-Concrete_Rectangula...	10685	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash4	10673	02 - Floor	Beams	ST-Concrete_Rectangula...	6171	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...
Clash5	11024	02 - Floor	Beams	ST-Concrete_Rectangula...	6176	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...
Clash6	10648	02 - Floor	Beams	ST-Concrete_Rectangula...	6180	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...
Clash7	10648	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash8	10649	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash9	11024	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash10	10676	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash11	10676	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash12	11024	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash13	10698	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash14	11014	02 - Floor	Beams	ST-Concrete_Rectangula...				
Clash15	10683	02 - Floor	Beams	ST-Concrete_Rectangula...				



Wymiana danych z projektantem

Clash Detection

Run Clash Detection | Clash View Mode | Update

Jobs: Structural Vs MEP

Name	ID:1	Storey:1	Category:1	Family:1	ID:2	Storey:2	Category:2	Family:2
Clash10	10676	02 - Floor	Beams	ST-Concrete_Rectangula...	10676	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash11	10676	02 - Floor	Beams	ST-Concrete_Rectangula...	10676	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash12	11024	02 - Floor	Beams	ST-Concrete_Rectangula...	11024	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash13	10698	02 - Floor	Beams	ST-Concrete_Rectangula...	10698	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash14	11014	02 - Floor	Beams	ST-Concrete_Rectangula...	11014	02 - Floor	Beams	ST-Concrete_Rectangula...
Clash15	10683	02 - Floor	Beams	ST-Concrete_Rectangula...	10683	02 - Floor	Beams	ST-Concrete_Rectangula...

Clash matrix - Excel

Clash	ID:1	Storey:1	Category:1	Family:1	ID:2	Storey:2	Category:2	Family:2	Distance	Comments
Clash1	10623	02 - Floor	Beams	ST-Concrete_Rectangula...	10623	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash2	10601	02 - Floor	Beams	ST-Concrete_Rectangula...	10601	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash3	10685	02 - Floor	Beams	ST-Concrete_Rectangula...	10685	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash4	10673	02 - Floor	Beams	ST-Concrete_Rectangula...	6171	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...	-0.027m	New
Clash5	11024	02 - Floor	Beams	ST-Concrete_Rectangula...	6176	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...	-0.028m	New
Clash6	10648	02 - Floor	Beams	ST-Concrete_Rectangula...	6180	01 - Entry Level	ME-Supply_Diffuser_Side...	ME-Supply_Diffuser_Side...	-0.014m	New

Reporty

Clash Detection

Run Clash Detection | Clash View Mode | Update

Jobs: Structural Vs MEP

Name	ID:1	Storey:1	Category:1	Family:1	ID:2	Storey:2	Category:2	Family:2	Distance	Comments
Clash10	10676	02 - Floor	Beams	ST-Concrete_Rectangula...	10676	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash11	10676	02 - Floor	Beams	ST-Concrete_Rectangula...	10676	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash12	11024	02 - Floor	Beams	ST-Concrete_Rectangula...	11024	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash13	10698	02 - Floor	Beams	ST-Concrete_Rectangula...	10698	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash14	11014	02 - Floor	Beams	ST-Concrete_Rectangula...	11014	02 - Floor	Beams	ST-Concrete_Rectangula...		
Clash15	10683	02 - Floor	Beams	ST-Concrete_Rectangula...	10683	02 - Floor	Beams	ST-Concrete_Rectangula...		

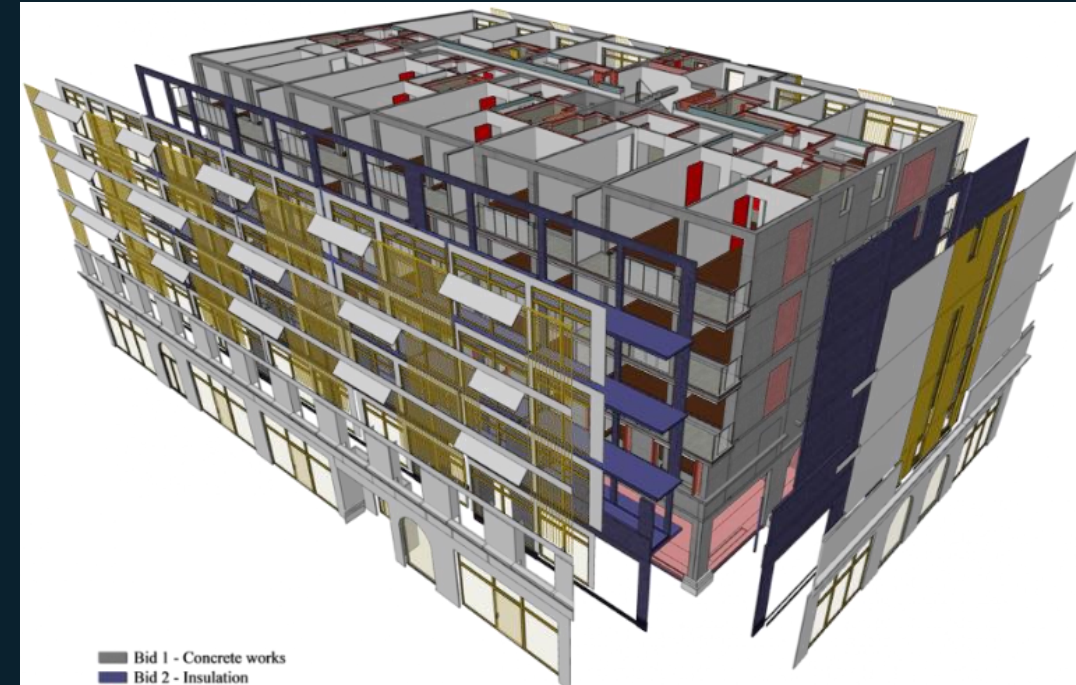
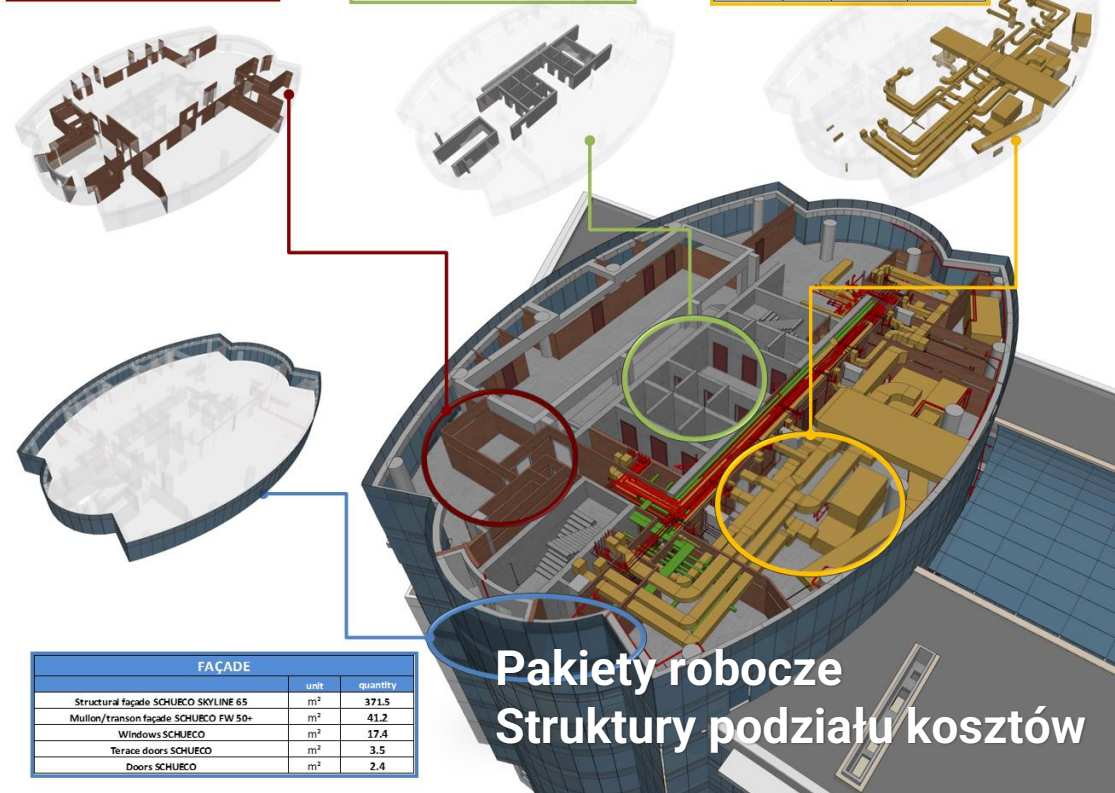
Analiza

Zarządzanie kosztami (5D)

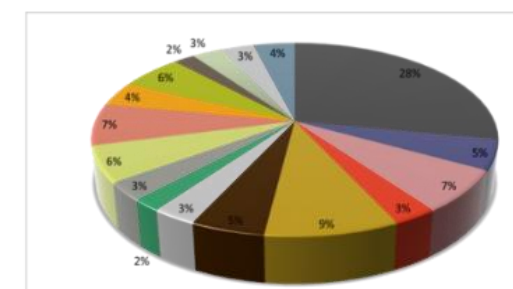
PARTITION WALLS		
	Unit	quantity
Level 11		274.8
Brick wall 12 cm	m ²	225.7
Brick wall 25 cm	m ²	45.0
Gypsum wall 12cm	m ²	4.1
Level 12		676.8
Brick wall 12 cm	m ²	581.3
Brick wall 25 cm	m ²	45.0
Gypsum wall 12cm	m ²	2.6
Level 13		676.2
Brick wall 12 cm	m ²	581.3
Brick wall 25 cm	m ²	45.0
Gypsum wall 12cm	m ²	2.6

CONCRETE WALLS B-60			
	Concrete (m ³)	Reinforcement (kg)	kg/m ³
Level 11	136.5	3589.1	262.2
Wall 25cm	13.9	3466.9	248.7
Wall 30cm	8.5	2331.6	275.6
Wall 40cm	52.3	13880.3	265.5
Wall 50cm	61.9	16124.3	260.7
Level 12	136.6	35817.7	262.2
Wall 25cm	0.1	14.6	221.4
Wall 30cm	13.9	3466.9	248.7
Wall 40cm	8.5	2331.6	275.6
Wall 50cm	52.3	13880.3	265.5
Wall 50cm	61.9	16124.3	260.7
Level 13	140.0	3461.9	246.6
Wall 15cm	0.1	14.6	221.4
Wall 25cm	13.9	3466.9	248.7

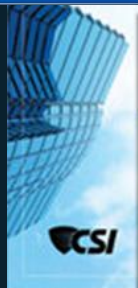
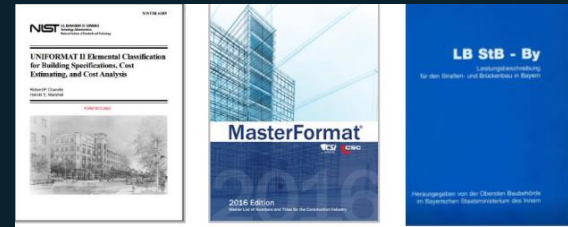
HVAC			
	unit	quantity	fit/kg
Level 1	m ²	574.70	86.2
Level 2	m ²	1787.66	268.1
Level 3	m ²	706.83	106.0
Level 4	m ²	598.88	89.8
Level 5	m ²	621.58	93.2
Level 6	m ²	634.43	95.2
Level 7	m ²	762.61	114.4
Level 8	m ²	737.63	110.6
Level 9	m ²	780.12	117.0
Level 10	m ²	1520.52	228.1
Level 11	m ²	1177.16	176.6
Level 12	m ²	1640.64	246.1



- Bid 1 - Concrete works
- Bid 2 - Insulation
- Bid 3 - Masonry
- Bid 4 - Interior doors
- Bid 5 - Façade - tiling
- Bid 6 - Parquetry
- Bid 7 - Façade - painting
- Bid 8 - Gypsum partitions
- Bid 9 - Ceramic tiling
- Bid 10 - Painting
- Bid 11 - HVAC
- Bid 12 - Plumbing
- Bid 14 - Electrical
- Bid 15 - Lifts
- Bid 16 - Telecommunications
- Bid 17 - External utilities
- Bid 18 - Firefighting



Klasyfikacje kosztowe



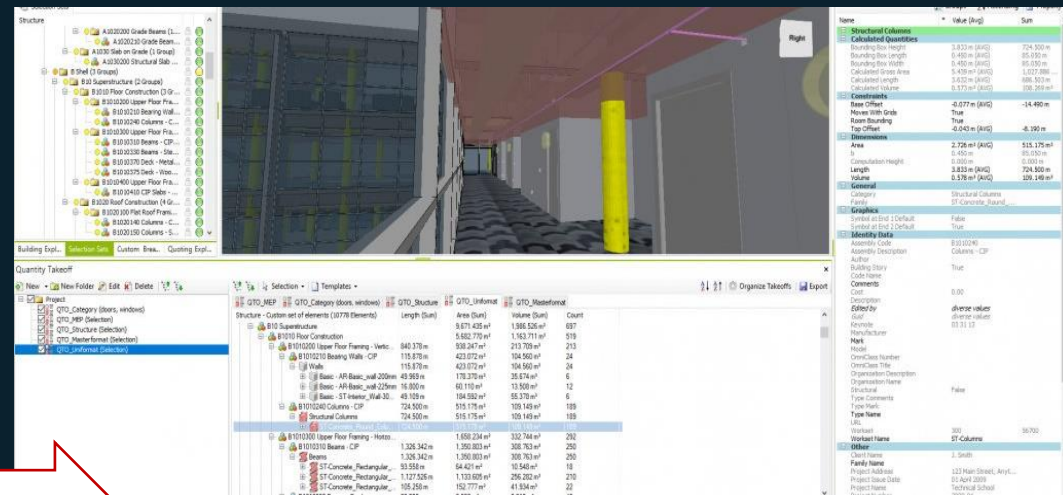
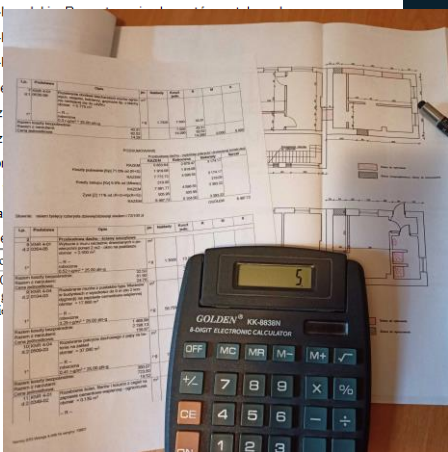
Quantity Takeoff Report

Outline Level	Structure - All elements (1028 Elements)	Area (Sum) (Unit)	Area (Sum) (Value)	Volume (Sum) (Unit)
1	ST-Columns	m ²	545.22	m ³
1.1	ST-Concrete_Round_Column - ST-Round_Column-300mm	m ²	6.64	m ³
1.2	ST-Concrete_Round_Column - ST-Round_Column-450mm	m ²	534.88	m ³
1.3	ST-Concrete_Round_Column - ST-Round_Column-750mm	m ²	23.71	m ³
1.4	ST-UC_Universal-Column - ST-UC-356x368x129	m ²	0.00	m ³
2	ST-Floors	m ²	6,458.65	m ³
2.1	AR-Roof-400mm	m ²	55.60	m ³
2.2	ST-Concrete_Slab_CIP-200mm	m ²	3,078.30	m ³
2.3	ST-Roof	m ²	1,584.21	m ³
2.4	ST-Slab_on_Grade-200mm	m ²	1,740.54	m ³
3	ST-Foundations	m ²	223.79	m ³
3.1	ST-Pile_Cap_2_Pile - ST-Pile_Cap-800x1800x900mm	m ²	69.12	m ³
3.2	ST-Pile_Cap_4_Pile - ST-Pile_Cap-2000x2000x900mm	m ²	139.05	m ³
3.3	ST-Pile_Steel_Pipe - ST-Diameter-400mm	m ²	12.06	m ³
3.4	ST-Pile_Steel_Pipe - ST-Diameter-500mm	m ²	23.56	m ³
4	ST-Framing	m ²	2,476.60	m ³
4.1	AR-Steel_Beam_Angle_Web - AR-Beam	m ²	0.00	m ³
4.2	AR-Wide_Flange - AR-Flange_beam-W310X28.3	m ²	0.00	m ³
4.3	ST-Concrete_Rectangular_Beam - ST-Rectangular_Beam-300x600	m ²	63.37	m ³
4.4	ST-Concrete_Rectangular_Beam - ST-Rectangular_Beam-400x800	m ²	4.23	m ³
4.5	ST-Concrete_Rectangular_Beam - ST-Rectangular_Beam-400x800	m ²	1,910.42	m ³

Przykłady klasyfikacji kosztowych (standaryzacja)

Klasyfikacje kosztowe

KNNR - KOSZTORYSOWE NORMY NAKŁADÓW RZECZOWYCH		ilość	B	I	E	U	max
		norm					
N001 - Roboty ziemne		1031					
N002 - Konstrukcje budowlane budownictwa osóbnego		1237					
N003 - R	Grupy robót						
N004 - Ir	Roboty budowlane						
N005 - Ir	KNK 7-28						
N006 - N	Drobne roboty budowlane występujące przy montażu maszyn, dźwigów i urządzeń przemysłowych						
N007 - K	KNKRB 2						
N008 - R	KNNR 2						
N009 - R	KNNR-W 2						
N010 - R	KNP 1						
N011 - M	KNP 2						
N011 - U	KNP 7-01						
	KNP 7-02						
	KNP 7-03						
	KNP 7-05						
	KNP 8						
	KNR 0-12						
	KNR 0-12h96						
	KNR 0-14						
	KNR 0-16						
	KNR 0-17						
	KNR 0-18						
	KNR 0-19						
	KNR 0-20						
	KNR 0-23						
	KNR 0-24						
	KNR 0-26						
	KNR 0-27						
	KNR 0-30						
	KNR 2-02						
	KNR 2-02s						
	KNR 2-02u1						
	KNR 2-02u2						
	16						



	D0102001200 Concrete columns, grade C30/37, Ø600 mm		D0102001200 Concrete slabs with drop panels, grade C20/25, (slab thickness 250mm)		D0103001700 Concrete beams, grade C25/30
m ³	154.34	m ²	1211.08	m ³	115.60
Façade panels, ceramic glazed 1050x300x18mm:		Façade panels, ceramic glazed 1050x300x24mm:		Façade panels, ceramic glazed 1050x300x24mm:	
E101020001050 - Type F1		E101020001110 - Type F1		E101020001130 - Type H1	
E101020001060 - Type F2		E101020001070 - Type F2		E101020001140 - Type H2	
E101020001080 - Type F3		E101020001090 - Type F4			
E101020001100 - Type F5					
m ² F1 = 17.14		m ² G1 = 222.03		m ² H1 = 103.42	
m ² F2 = 211.48		m ² G2 = 67.39		m ² H2 = 103.42	
m ² F3 = 332.88					
m ² F4 = 401.57					
m ² F5 = 4.29					

(R)Ewolucja metod

Przedmiary (zrzuty ilościowe)

The screenshot displays a BIM software interface with the following components:

- Custom Breakdowns Panel (Left):** Shows a hierarchical structure of elements (84441 Elements) categorized into various system groups such as Domestic Cold Water, Domestic Hot Water, Exhaust Air, Fire Protection, and Hydronic systems.
- 3D View (Center):** A perspective view of a building structure with a complex MEP system overlaid, showing ductwork and equipment.
- Quantity Takeoff Panel (Bottom):** A table summarizing the quantities of elements. The table is titled 'Structure - Custom set of elements (86164 Elements)' and includes columns for Length (Sum), Area (Sum), and Count.

Structure - Custom set of elements (86164 Elements)	Length (Sum)	Area (Sum)	Count
Workset Name = FP-Smoke_Extraction			1199
System Type Name = [Undefined Value]		47.139 m ²	4
Mechanical Equipment		47.139 m ²	4
System Type Name = FP-Smoke_Extraction			1195
Air Terminals	98.500 m	35.985 m ²	196
Duct Accessories		46.238 m ²	18
Duct Fittings			538
Ducts	1,182.797 m	2,366.158 m ²	443
Workset Name = FP-Sprinkler		1,232.514 m ²	16209
System Type Name = FP-Fire_Protection_Sprin...		1,232.514 m ²	16209
Pipe Fittings		0.000 m ²	7005

Kosztorys i zasoby

The screenshot displays the Revit software interface with several key components:

- Custom Breakdowns Panel:** Lists 11 groups of MEP systems, including Domestic Cold Water (12 Groups), Domestic Hot Water (24 Groups), Exhaust Air (17 Groups), Fire Protection Other (2 Groups), Hydronic Return (586 Groups), Hydronic Supply (950 Groups), and Sanitary (76 Groups).
- Quantity Takeoff Panel:** Shows a tree view for '02 (WBS) QTO Based Cost Structure' and '03 MEP (Selection)'. It lists items like Mechanical Equipment, Air Terminals, Duct Accessories, Duct Fittings, Ducts, and Pipe Fittings with their respective quantities and areas.
- Properties Panel:** Shows the 'Name' and 'Sum' properties for the selected items.
- 3D Model:** A perspective view of a building's MEP systems, including ductwork and equipment.
- Tables:** Two detailed tables are overlaid on the model, showing extensive data for various MEP components, including their names, quantities, and associated costs.

Quantity Takeoff Summary:

Item	Length (Sum)	Area (m²)	Count
Mechanical Equipment	98.500 m	35.985 m²	196
Air Terminals		46.238 m²	18
Duct Accessories			538
Duct Fittings			443
Ducts	1,182.797 m	2,366.158 m²	16209
Pipe Fittings		0.000 m²	7005

**Automatyzacja tworzenia kosztorysu i zasobów
(uwzględnia także koszty ogólne projektu,
'niewidzialne' w modelu)**

Wizualizacja kosztów i raporty

Cost Version
Uniform (Auto-assigned)

Classification Level 1
A-Substructure
B-Shell
C-Interiors
D-Services
E-Equipment & Furnishings
G-Building Shellwork

Building Name
All

Storey Name
All

Workset Name
All

Category
All

Cost Version
Uniform (Auto-assigned)

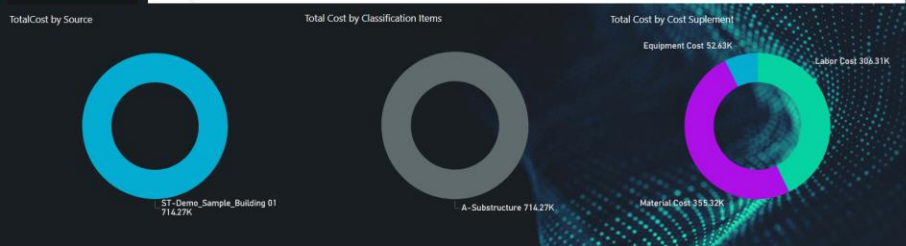
Classification Level 1
A-Substructure
B-Shell
C-Interiors
D-Services
E-Equipment & Furnishings
G-Building Shellwork

Building Name
All

Storey Name
All

Workset Name
All

Family
All



5D ESTIMATION

3,494,452.49\$
Material Cost

3,914,622.41\$
Labor Cost

526,678.67\$
Equipment Cost

7,935,753.57\$
Total Cost

0.00\$
Other Cost

0.00\$
Subcontractor Cost

Classification	Qty	Unit	Quantity	Material Cost	Labor Cost	Equipment Cost	Other Cost	Subcontractor Cost	Total Cost	Element Count
01 11 1000000000 Concrete forms, pile cap, square or rectangular, plywood, 4 use, includes erecting, bracing, stripping and cleaning	m ²	440.64	440.64	6,517.00	110,763.29	0.00	0.00	0.00	117,280.29	14
02 21 1000000000 Reinforcing steel, in place, including, #6 to #12, #12.5, grade 60, 102 (pound for accessories, cut material for accessories)	kg	9,836.23	9,836.23	0.00	20,776.29	0.00	0.00	0.00	30,152.58	70
03 11 0100000000 Structural concrete, ready mix, normal weight, 200MM, includes local aggregate, sand, portland cement and water, excludes all additional job materials	m ³	182.50	182.50	0.00	0.00	0.00	0.00	0.00	20,038.77	14
03 11 0200000000 Structural concrete, placing, pile caps, sheet piles, under 3.05m, includes mobilization or demobilization	m ³	182.50	0.00	10,066.03	248.74	0.00	0.00	0.00	10,314.77	70
01 06 0100000000 Piling special cast, cast-in-place concrete piles, piles with steel shell, steel	m ²	216.00	0.00	4,075.15	0.00	0.00	0.00	0.00	4,075.15	216
02 21 1000000000 Excavating, bulk tank measure, 0.20m ³ = 2.20m ³ tank, hydraulic excavator, 1.5m ³ bucket	m ³	182.50	0.00	1,408.58	1,982.02	0.00	0.00	0.00	3,440.60	70
01 62 1613 0000 Piles, steel, pipe piles, concrete filled, 40cm diameter, 23.76kg, 4.7, excludes mobilization or demobilization	m	390.40	72,638.99	37,790.50	20,965.53	0.00	0.00	0.00	131,434.02	96
01 62 1613 0001 Piles, steel, pipe piles, concrete filled, 40cm diameter, 26.76kg, 4.7, excludes mobilization or demobilization	m	738.00	106,974.72	51,947.65	28,348.73	0.00	0.00	0.00	187,331.11	120
01 62 1613 0002 Piles, steel, pipe piles, points, standard, 40cm diameter	m	96.00	14,732.32	28,072.24	0.00	0.00	0.00	0.00	44,804.56	96
01 62 1613 0003 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0004 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0005 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0006 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0007 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0008 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0009 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0010 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0011 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0012 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0013 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0014 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0015 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0016 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0017 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0018 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0019 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0020 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0021 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0022 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0023 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0024 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0025 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0026 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0027 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0028 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0029 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0030 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0031 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0032 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0033 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0034 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0035 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0036 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0037 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0038 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0039 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0040 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0041 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0042 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0043 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0044 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0045 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0046 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0047 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0048 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0049 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0050 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0051 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0052 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0053 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0054 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0055 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0056 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0057 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0058 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0059 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0060 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0061 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0062 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0063 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0064 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0065 Piles, steel, pipe piles, points, standard, 40cm diameter	m	120.00	28,894.80	25,167.36	0.00	0.00	0.00	0.00	54,062.16	120
01 62 1613 0066 Piles, steel, pipe piles, points, standard, 40cm diameter	m	1								

Zarządzanie harmonogramem (4D)

ZONE 01 Project Sections → **METHODOLOGY Level 01** → **METHODOLOGY Level 02** → **ZONE 02 Chainage**

Task Name: Demoparkulac Grafika
 Duration: 1486 wks
 Start Date: 14/03/2021
 Finish Date: 30/10/2021

Task Name: Kolegijne na Gndn
 Duration: 48 wks
 Start Date: 14/03/2021
 Finish Date: 19/10/2021

ZONE 01 Buildings → **ZONE 02 Sectors** → **METHODOLOGY Level 01 Model categories** → **METHODOLOGY Level 02 Model sub-categories** → **ZONE 03 Levels** → **ZONE 04 Subsectors**

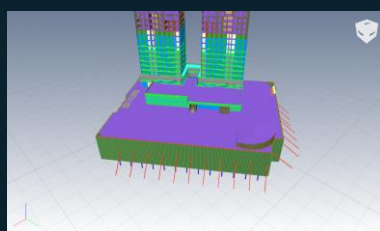
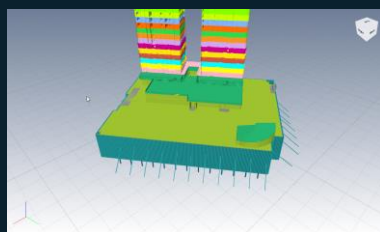
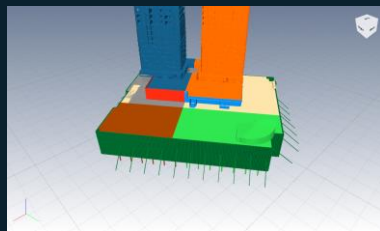
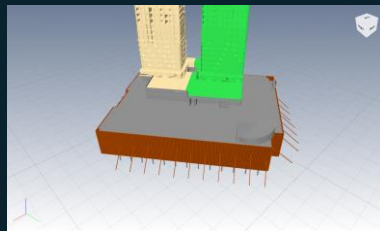
Task Name: Best Sample Project V02 V1
 Duration: 232 wks
 Start Date: 14/03/2021
 Finish Date: 21/02/2022

Task Name: Best Sample Project V02 V1
 Duration: 232 wks
 Start Date: 14/03/2021
 Finish Date: 21/02/2022

Show Critical Path

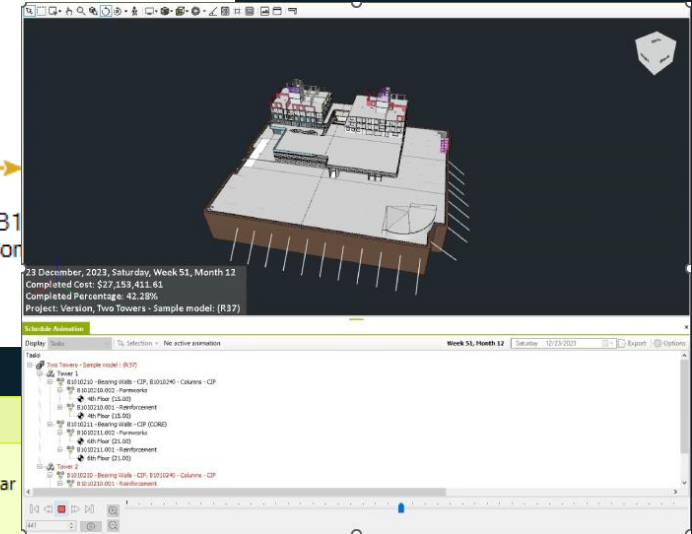
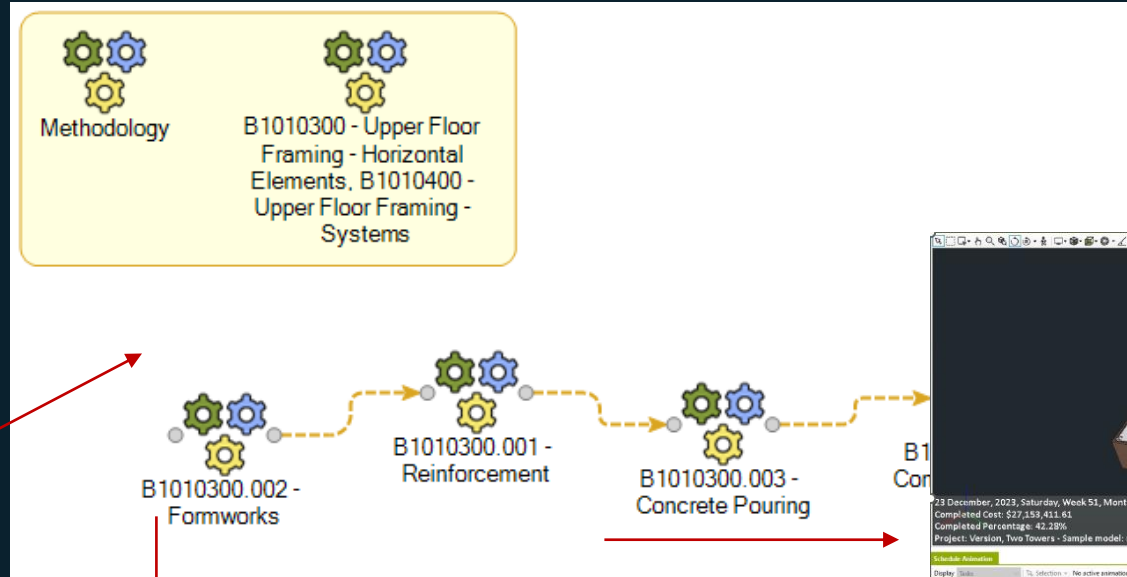
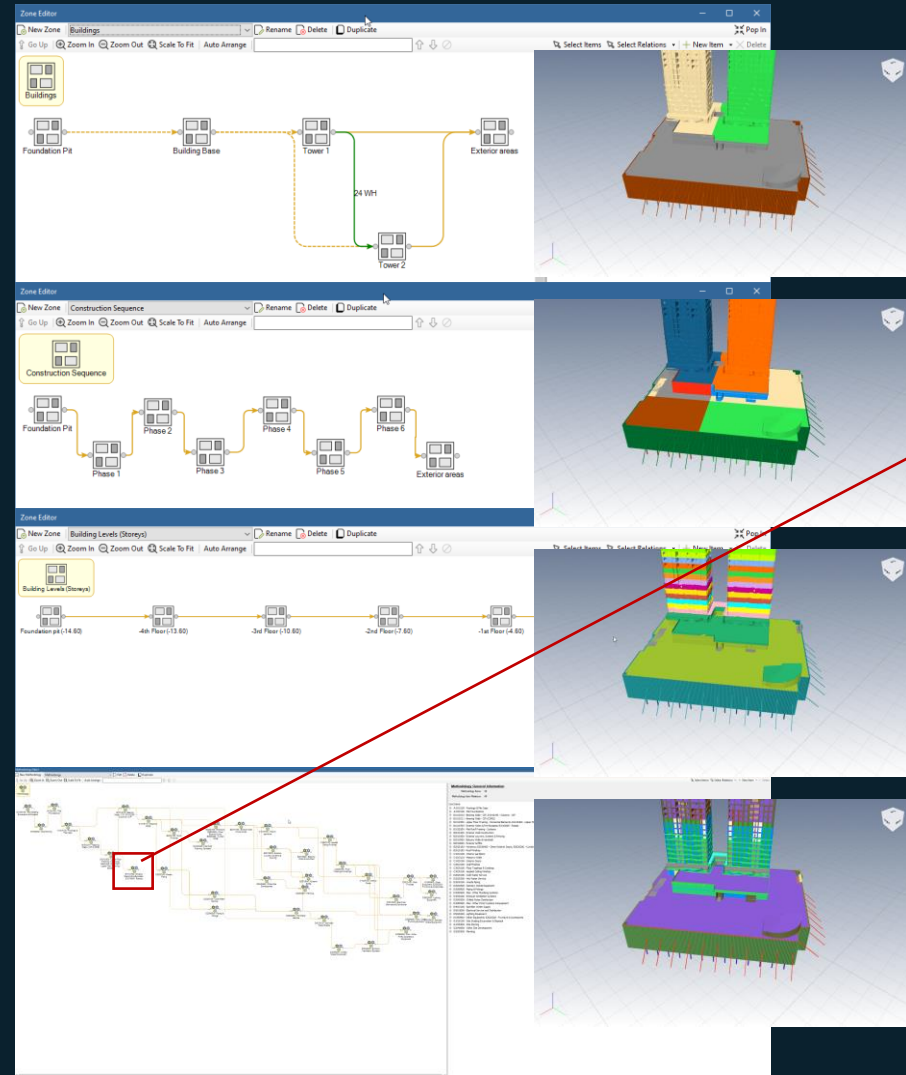
Metoda generatywna (założenia konstrukcyjne)

The 'Zone Editor' interface is shown in three panels. The top panel, 'Buildings', shows a flowchart with nodes for Foundation Pt, Building Base, Tower 1, Tower 2, and Exterior areas, connected by arrows. The middle panel, 'Construction Sequence', shows a sequence of phases from Phase 1 to Phase 6. The bottom panel, 'Building Levels (Story)', shows a list of levels from -1st Floor to 21st Floor. Each panel includes a 'Zone General Information' sidebar with statistics like 'Zone Items' and 'Zone Item Relations'.



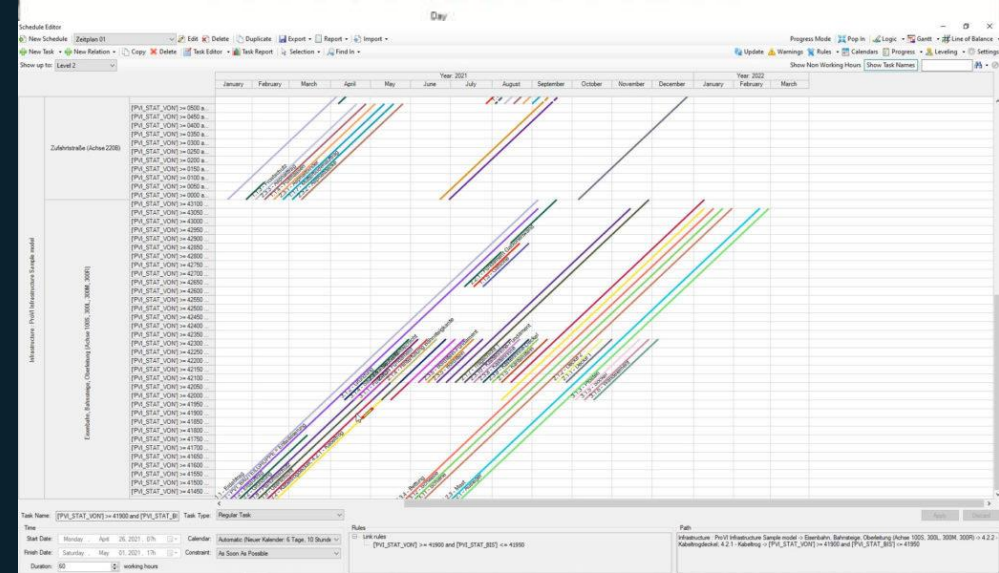
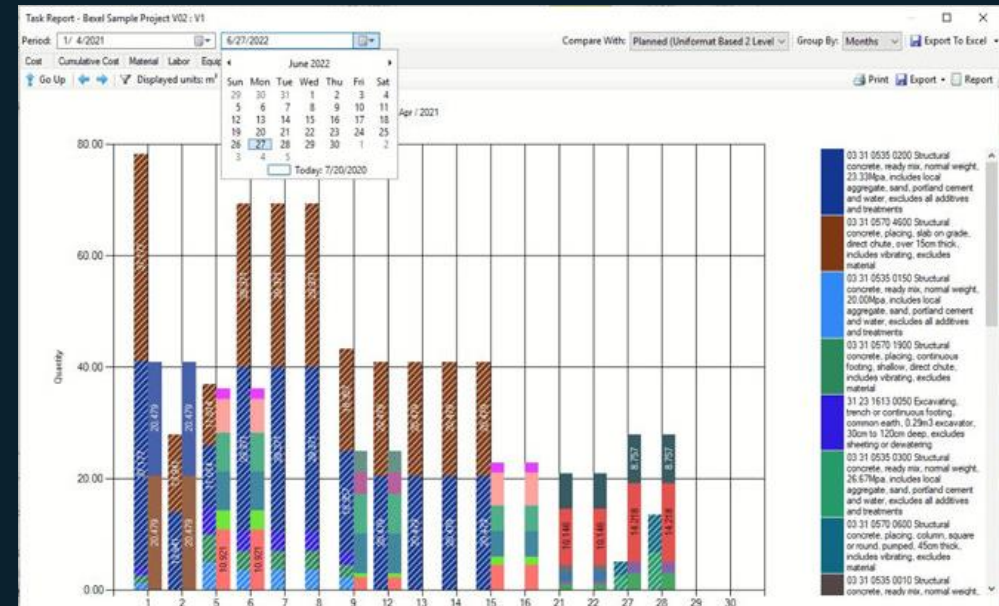
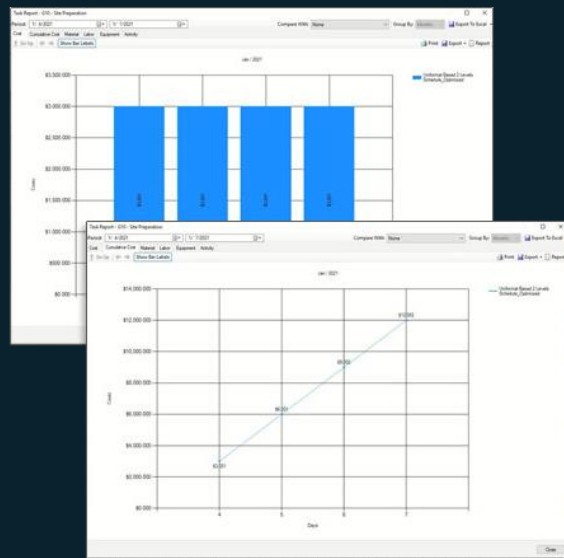
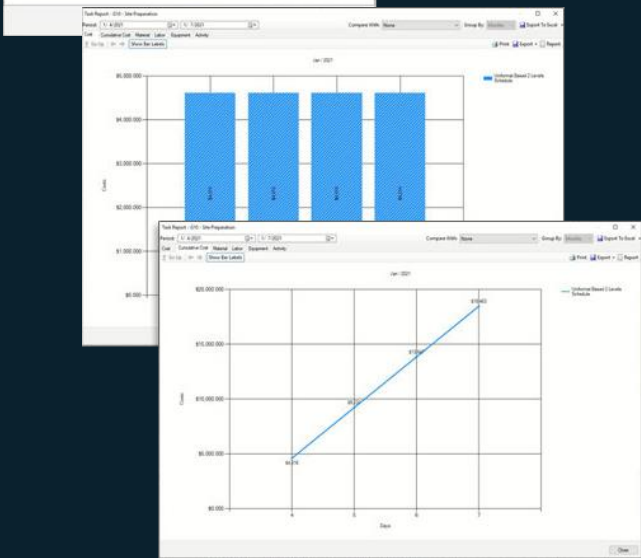
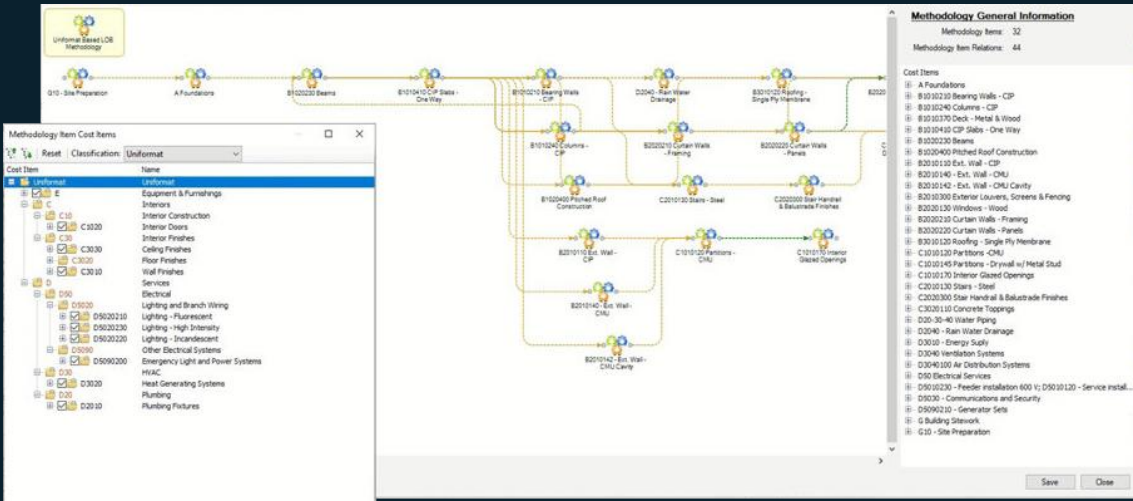
The screenshot shows a 3D model of a building with a schedule animation overlay. The animation displays the following information:
23 December, 2023, Saturday, Week 51, Month 12
Completed Cost: \$27,153,411.61
Completed Percentage: 42.28%
Project: Version, Two Towers - Sample model: (R37)
Below the model, a 'Schedule Animation' panel is visible, showing a tree view of tasks for 'Two Towers - Sample model: (R37)'. The tasks include 'Tower 1' and 'Tower 2', each with sub-tasks for 'Bearing Walls - CIP', 'Formworks', and 'Reinforcement' at various floor levels (4th, 6th, 8th). The interface also shows a 'Display' panel with 'No active animation' and a 'Task' panel with a list of tasks.

Metoda generatywna (na podstawie kosztorysu)



B1010300.002		Formworks	
B1010300.002.001		ST-Superstructure-Concrete-Rectangular 25x32.5cm	
\$6.49	72	Area	m ²
			(2*[h]+[b])*[Length]
			[FAMILY] = 'ST-Superstructure-Concrete-Rectangular Beam - 25x32.5cm'

Optymalizacja



Raportowanie

The image displays a comprehensive reporting interface for a construction project, featuring several key components:

- Task Report - Best Sample Project V02 : V1:** A central window showing activity quantities over time. The Y-axis represents Quantity (0.00 to 2,000.00) and the X-axis represents Month (Jan 2021 to Mar 2022). A legend lists activities such as '31 23 1642 0000 Excavating, bulk bank material, 0.30m x 22 Mech/Hour, hydraulic excavator, truck mounted' and '03 31 0535 0200 Structural concrete, ready mix, normal weight, aggregate, sand, portland cement and water, excludes all additives and treatments'.
- Activity Quantities Chart:** A stacked bar chart showing the distribution of activity quantities across months.
- Resource Histograms:** Multiple charts showing resource usage for various activities, with a legend for resource types like 'Structural concrete, ready mix, normal weight, aggregate, sand, portland cement and water, excludes all additives and treatments'.
- 3D Construction Models:** Several views of the project structure, including site preparation, foundations, and structural elements, with labels like '1461_300_320_UN_CES_3_178_1_POPRS_004' and '1443_300_320_UN_CES_3_178_1_POPRS_002'.
- Summary Tables:** Tables providing detailed data for specific activities, including quantities and resource requirements.
- Task List:** A detailed list of tasks on the left, such as 'G10 - Site Preparation', 'A1010130 File Caps', and 'B1010210 Bearing Walls - CP', with associated durations and phases.



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