HOW CAN WE ACHIEVE DESIGN FREEDOM WITH BIM

PODCASTS
BIM AND SMART CONSTRUCTION THEORY

STUDENTS: MARIA PAPADIMITRAKI, ALEXANDER LOPEZ

FACULTY: PROF. MAITE BRAVO

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01.
PODCAST OBJECTIVES

Examine and investigate:

- how complex geometries and free forms can be combined with BIM
- which are the different software tools used nowadays and
- how these tools can be developed in the future in order to become wider spread and more intuitive to the average architect and designer.

EXAMPLES OF BUILDINGS WITH DESIGN FREEDOM



The Sydney Opera House, Australia, Jorn Utzon, 1957-1973



Heydar Aliyev Center, Baku, Azerbaijan, Zaha Hadid Architects, 2007 – 2012



Guggenheim Museum, New York, USA, Frank Lloyd Wright's, 1943-1959



Stuttgart Main Station, Germany, Ingenhoven architects, 1997 - today



Guggenheim Museum, Bilbao, Spain, Frank Gehry, 1991-1997



The National Museum of Qatar, Doha, Jean Nouvel, 2003-2019

02.
EXPERT I

ELIZA PERTIGKIOZOGLOU

- PhD Student @McGll University in Montreal, Canada
- Former Digital and a Senior Digital Design Consultant from at Trimble Consulting (previously Gehry Technologies) from 2018-2021
- Master's at Harvard University in Design and Technology, 2016-2018
- National Technical University of Athens, Bachelor and Master, 2009-2017
- The Oslo School of Architecture and Design (AHO), 2014



EXAMPLES OF FRANK GEHRY'S BUILDINGS



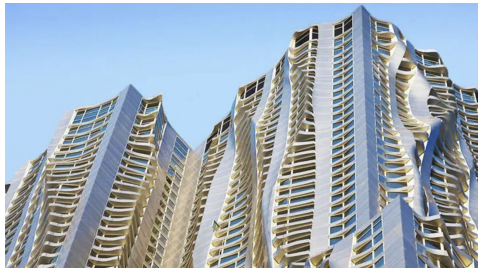
Walt Disney Concert Hall, Los Angeles



Museum of Pop Culture, Seattle, Washington



Weisman Art Museum, Minneapolis



New York by Gehry, residential Building, USA



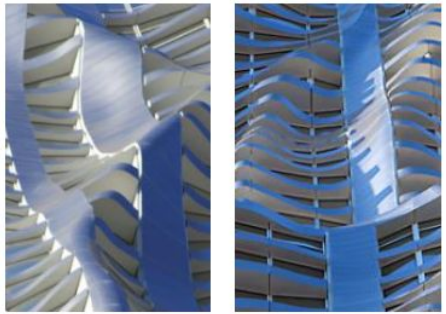
Guggenheim Museum, Bilbao, Spain



EXAMPLE PROJECTS OF TRIMBLE CONSULTING



Louvre Museum Abu Dhabi, Ateliers Jean Nouvel



Beekman Tower, New York, Gehry Partners



National Museum of Qatar, Ateliers Jean Nouvel



Foundation Louis Vuitton, Paris, Gehry Partners

Source: https://trimbleconsulting.com/

Main Questions:

1. How your **journey in architecture started**?
2. Tell us more about your second **Master's at Harvard University in Design and Technology**. What motivated you to start these studies?
3. How and at what extent are **Trimble Consulting** (former Gehry Technologies) and **Frank Gehry Architects interacting** with each other?
4. Can you describe us the **typical workflow** of a project in Frank Gehry Architects? **Which tools** are they using in the **early design stages**?
5. Which **software programs** are they using in **early design stages** and **when** is **BIM involved?**
6. Does the standardization and **the application of BIM** help or contradict design methodologies for form exploration. Is there a way that BIM could complement design freedom?
7. The current tools for achieving complex geometries are not very intuitive to the average designer and they are mostly used by computational designers. Could you think of a **way to achieve this design freedom with less complex, yet more intuitive methods**?
8. How do you envision the **future of architectural design**? Do you believe that **AI, AR or VR** could e**xpand design creativity** in the future and if yes in which way?

Interview Script:

\\Introduction

Hello everyone! My name is Maria Papadimitraki and I am here with my colleague Alexander Lopez. We are both studying currently at the Master's Program of IAAC in Advanced Computation for Architecture & Design.

We would like to welcome you to our podcast titled "How can we achieve design freedom with BIM". In this podcast we are willing to investigate how complex geometries and free forms can be combined with BIM, which are the different software tools used nowadays and how these tools can be developed in the future in order to become wider spread and more intuitive to the average architect and designer.

\\Short Bio

Today we have the honor to host Ms. Eliza Pertigkiozoglou, who is an architect, computational designer, former Digital Design Consultant at Gehry Technologies (renamed Trimble Consulting) and currently a PhD Student @McGill University in Montreal, Canada. Her research interests currently focus on the role of computational tools as mediators in the design process.

Eliza, firstly we would like to thank you very much for accepting our invitation.

\\Questions

1. Tell us about how your journey in architecture started. What drove you to study architecture at first place?

2. Can you tell us more about your second Master's at Harvard University in Design and Technology? What motivated you to start these studies and to dig into the field of technological driven design?

3. As we mentioned before you have also worked at Gehry Technologies (renamed Trimble Consulting) in Los Angeles as a Digital and a Senior Digital Design Consultant from 2018-2021. As we all architects know, his works are considered among the most important of contemporary architecture and what characterises them is definitely design freedom. We would like to know more about the collaboration between the different departments in Frank Gehry Architects? How and at what extent are Gehry Technologies and Frank Gehry Architects interacting with each other? Are they placed in the same building?

Interview Script:

4. Can you describe to us the typical workflow of a project in Frank Gehry Architects? Which tools are they using in the early design stages? Are hand sketches and physical models still the starting tools for form finding?

5. Which software programs are they using in the early design stages and how are they merging this design with BIM? At which phase of the design is BIM involved?

6. As architecture and construction balance quality and quantity versus cost, we would like to investigate if the standardization and application of building information modeling processes help or contradict design methodologies for form exploration. Is there a way that BIM could complement design freedom?

7. We believe that the current tools for achieving complex geometries are not very intuitive to the average designer and they are mostly used by computational designers. Could you think of a way to achieve this design freedom with less complex, yet more intuitive methods?

8. Eliza, tell us more about your current PhD Studies. After all this hands-on approach you had in the past (that you were developing different design software tools and digital workflows) what drove you now to follow a new path and to start investigating also the history and the theoretical background of digital design?

9. And a last question regarding the future. How do you envision the future of architectural design? Do you believe that AI, AR or VR could expand design creativity in the future and if yes in which way?

\\Conclusion

Eliza thank you very much for accepting our invitation for this podcast, which was part of the BIM & Smart Construction Theory Course of MaCAD, driven by the faculty of Maite Bravo. It was such an honor to have you. Thank you for your time and for supporting our investigation. Have a nice day. Bye bye.

03.
EXPERT II

DOMINGA GARUFI

- BIM Manager in Werner Sobek, Stuttgart (2020-today)
- BIM Coordinator/ Architect in Werner Sobek, Stuttgart (2019-2020)
- BIM Coordinator/ Architect in HPP Architects, Stuttgart (2017-2018)
- ITECH Master Studio Programme, Stuttgart (2015-2017)
- AA School of Architecture London, Master of Science, Sustainable Environmental Design (2012-2013)
- Università degli Studi 'Mediterranea' di Reggio Calabria, Degree in Architectural Science and Construction Eng. (2006-2011)



EXAMPLES OF WERNER SOBEK PROJECTS



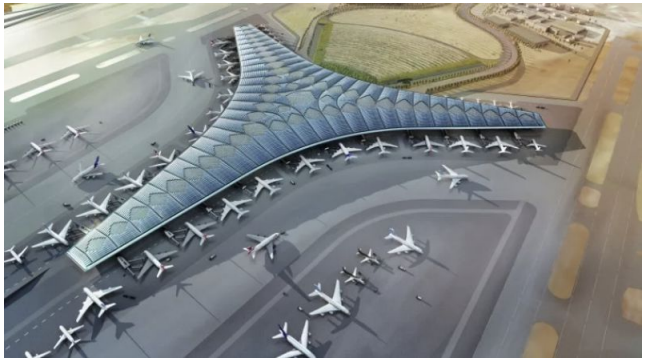
National Museum of Qatar

Architecture: Atelier Jean Nouvel, Paris/France

Planning time: 2011-2014

Construction time: 2013-2019

Services by Werner Sobek: consulting, site supervision and interface management of building envelope, full engineering and 3D detailed design and fabrication design for the secondary structure, parts of the primary steel structure and the 3D FRC panels fixings.



Kuwait International Airport (Terminal 2)

Architecture: Foster + Partners, London / Great Britain

Planning time: 2016-2020

Construction time: since 2017

Services by Werner Sobek: structural engineering of the main structure (including construction documents and concrete shop drawings), Facade engineering, BIM



TK Elevator Test Tower

Architecture and Object planning: Werner Sobek & Helmut Jahn

Planning time: 2013-2014

Construction time: 2014-2017

Services by Werner Sobek: Design, Object planning, Structural engineering, Facade engineering

Source: https://www.wernersobek.com/

Main Questions:

1. How your **journey in architecture started**? What drove you to study architecture in the first place?
2. Master's in **Computational Design and Digital Fabrication at the University of Stuttgart**. What **motivated** you to start these studies and to dig into the field of Computational Design, Robotics and Digital Fabrication?
3. BIM Manager at Werner Sobek Engineering. Werner Sobek collaborates with leading architectural practices such as Zaha Hadid Architects , Jean Nouvel, Ingenhoven, UNStudio and Populous. Can you describe to us the **typical workflow of such a project in Werner Sobek**?
4. Could you describe to us the **workflow** you followed in the **National Museum of Qatar**? In which phase of the design were Werner Sobek engineers involved?
5. Which **software programs** are you using in the **early design stages**? And at **which phase** of the design is **BIM** involved?
6. Could you think of a way to achieve this **design freedom** with **less complex**, yet **more intuitive methods**?
7. How do you envision the future of architectural design? Do you believe that AI, AR or VR could expand design creativity in the future and if yes in which way?

Interview Script:

\\Introduction

Hello everyone! My name is Maria Papadimitraki and I am currently studying at the Master's Program of IAAC in Advanced Computation for Architecture & Design.

I am happy to welcome you to the podcast titled "How can we achieve design freedom with BIM". In this podcast we are willing to investigate how complex geometries and free forms can be combined with BIM, which are the different software tools used nowadays and how these tools can be developed in the future in order to become wider spread and more intuitive to the average architect and designer.

Today I have the honor to host Ms. Dominga Garufi, who is an architect and BIM Manager at Werner Sobek. Dominga, firstly thank you very much for accepting the invitation.

\\Questions

1. Tell us about how your journey in architecture started. What drove you to study architecture in the first place?

2. As I have seen in your CV you have also accomplished the ITEC Master's Program at the University of Stuttgart? Can you tell us more about these studies and what motivated you to dig into the field of Computational Design, Robotics and Digital Fabrication?

3. As I mentioned in the introduction before, you are working as a BIM Manager at Werner Sobek. Werner Sobek collaborates with leading architectural practices such as Zaha Hadid, Populous, Jean Nouvel and UNStudio. Can you describe to us the typical workflow of such a project in Werner Sobek? For example, could you describe to us the workflow you followed in the National Museum of Qatar? In which phase of the design were Werner Sobek involved?

4. Which software programs are you using in the early design stages? And at which phase of the design is BIM involved?

Interview Script:

5. As architecture and construction balance quality and quantity versus cost, we would like to investigate if the standardization and application of BIM helps or contradicts design methodologies for form exploration. Is there a way that BIM could complement design freedom?

6. We believe that the current tools for achieving complex geometries are not very intuitive to the average architect or designer and they are mostly used by computational designers. Could you think of a way to achieve this design freedom with less complex, yet more intuitive methods?

7. And a last question regarding the future. How do you envision the future of architectural design? Do you believe that Artificial Intelligence, Augmented Reality or Virtual Reality could expand design creativity in the future and if yes in which way?

\\Conclusion

Dominga thank you very much for accepting the invitation for this podcast, which was part of the BIM & Smart Construction Theory Course of MaCAD, driven by the faculty of Maite Bravo. It was such an honor to have you. Thank you for your time and for supporting our investigation. Have a nice day. Bye bye.

04.
PODCAST OUTCOMES

20XX

- Lorem ipsum dolor sit amet
- consectetur adipiscing elit
- sed do eiusmod tempor
- incididunt ut labore et dolore magna aliqua

20XX

- Ut enim ad minim veniam
- quis nostrud exercitation ullamco laboris nisi ut aliquip ex
- ea commodo consequat
- Duis aute irure dolor in reprehenderit in voluptate velit esse cillum
- dolore eu fugiat nulla pariatur

- Excepteur sint occaecat cupidatat
- non proident! Lorem ipsum dolor sit amet
- consectetur adipiscing elit
- sed do eiusmod tempor incididunt ut
- labore et dolore magna aliqua

20XX

- Duis aute irure dolor in reprehenderit in voluptate
- velit esse cillum dolore eu fugiat
- nulla pariatur Excepteur sint
- occaecat cupidatat non proident!

20XX

Thank you!