AUTODESK. UNIVERSITY

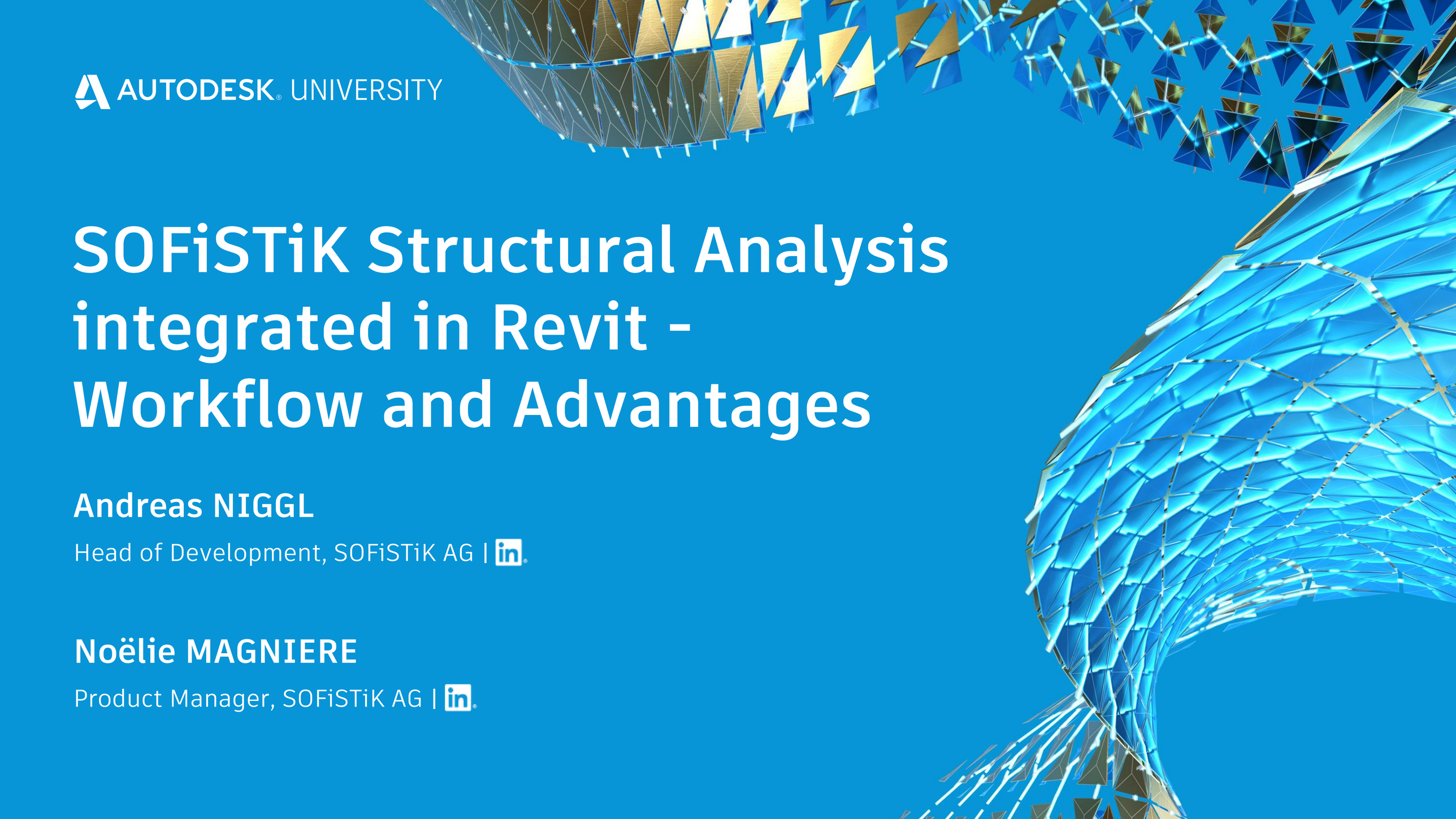
SOFiSTiK Structural Analysis integrated in Revit - Workflow and Advantages

Andreas NIGGL

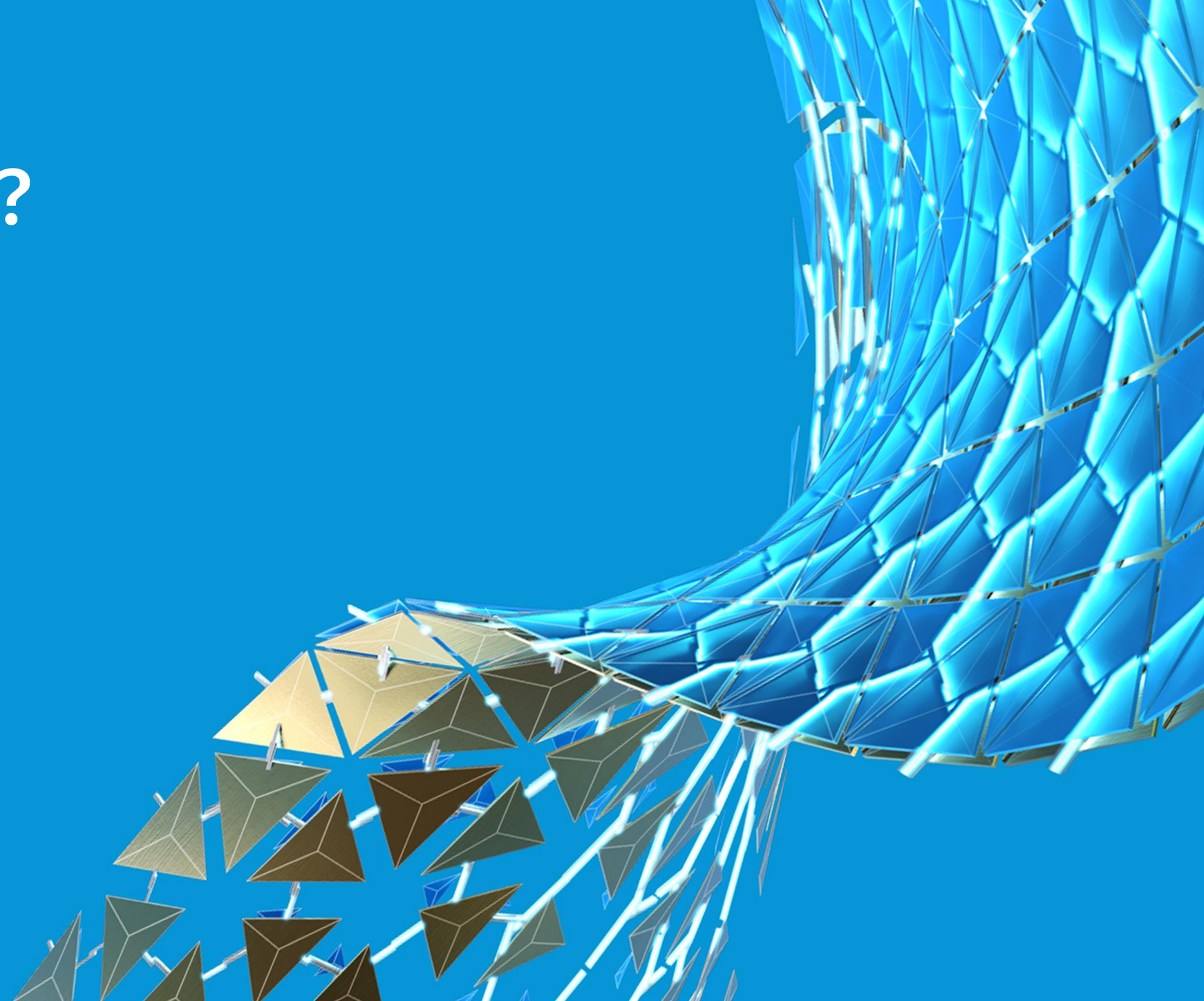
Head of Development, SOFiSTiK AG |

Noëlie MAGNIERE

Product Manager, SOFiSTiK AG |



Who are we?



About the speaker

Andreas Niggl

After receiving his PhD in Structural Engineering at the Technical University of Munich, Andreas is working in software development for SOFiSTiK AG, a leading European supplier of software for analysis, design and detailing.

Currently, he is leading a team which integrates structural analysis into Revit, allowing the user to keep within this platform for all structural work from analysis to detailing.

About the speaker

Noëlie Magnière

Noëlie Magnière is a product manager at SOFiSTiK AG, a leading European supplier of software for analysis, design and detailing in structural engineering. There, her primary focus are solutions for a seamless integration of structural analysis in BIM workflows.

She has Master of Science degrees from Ecole Centrale de Lyon and from Bern University of Applied Sciences. After a few years leading academical R&D projects in Switzerland, Noëlie moved to Germany and is working since then at the interface between software users and the development team.

AU Las Vegas 2018

“Revit: The Hub for Structural Analysis in a Collaborative Environment”

Thomas Fink, Andreas Niggl

Lusail Katara Hotel, Doha, Katar
General planning: Kling Consult consultancy for Design and Civil Engineering | Client: Katara Hopitality, Hoha (Qatar) | Software: Autodesk Revit Structure, SOFiSTiK FEM Software

3rd Bosphorus Bridge, Istanbul, Turkey
Conceptual Design: Michel Virlogeux, Jean-Francois Klein, T-ingénierie

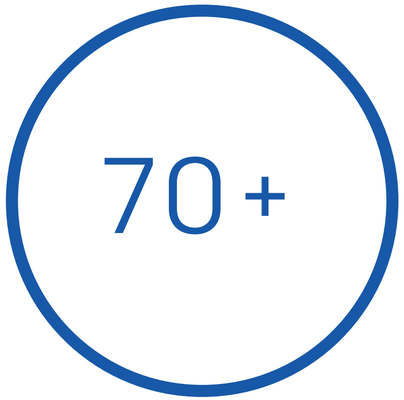
Brasília National Stadium, Brasil
Client: Novacap, Brasilia | Structural design, roof and esplanade: schlaich bergermann partner | Architects: gmp· Architekten von Gerkan, Margund Partner, Castro Mello Arquitetos, São Paulo

Software for better design

Bridge | Building | Steel & Lightweight | Tunneling | Geotechnics
One tool – One database – Modular Structure

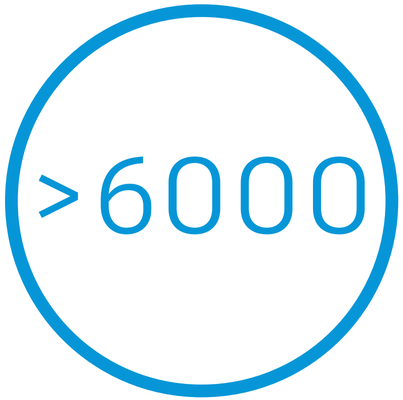
SOFiSTiK facts & figures

FOUNDATION



EMPLOYEES

PARTNERS &
COMPETENCE CENTERS



CUSTOMERS

SOFiSTiK and Autodesk

SOFiPLUS	Reinforcement Detailing	Analysis + Design	Bridge Infrastructure Modeler
AUTOCAD	REVIT	REVIT	REVIT
Graphical input based on AutoCAD	2D reinforcement sheets out of 3D-Rebar models in Revit	Structural analysis of buildings and member design directly in Revit	BIM for parametrized bridge design and detailing

We don't just develop...

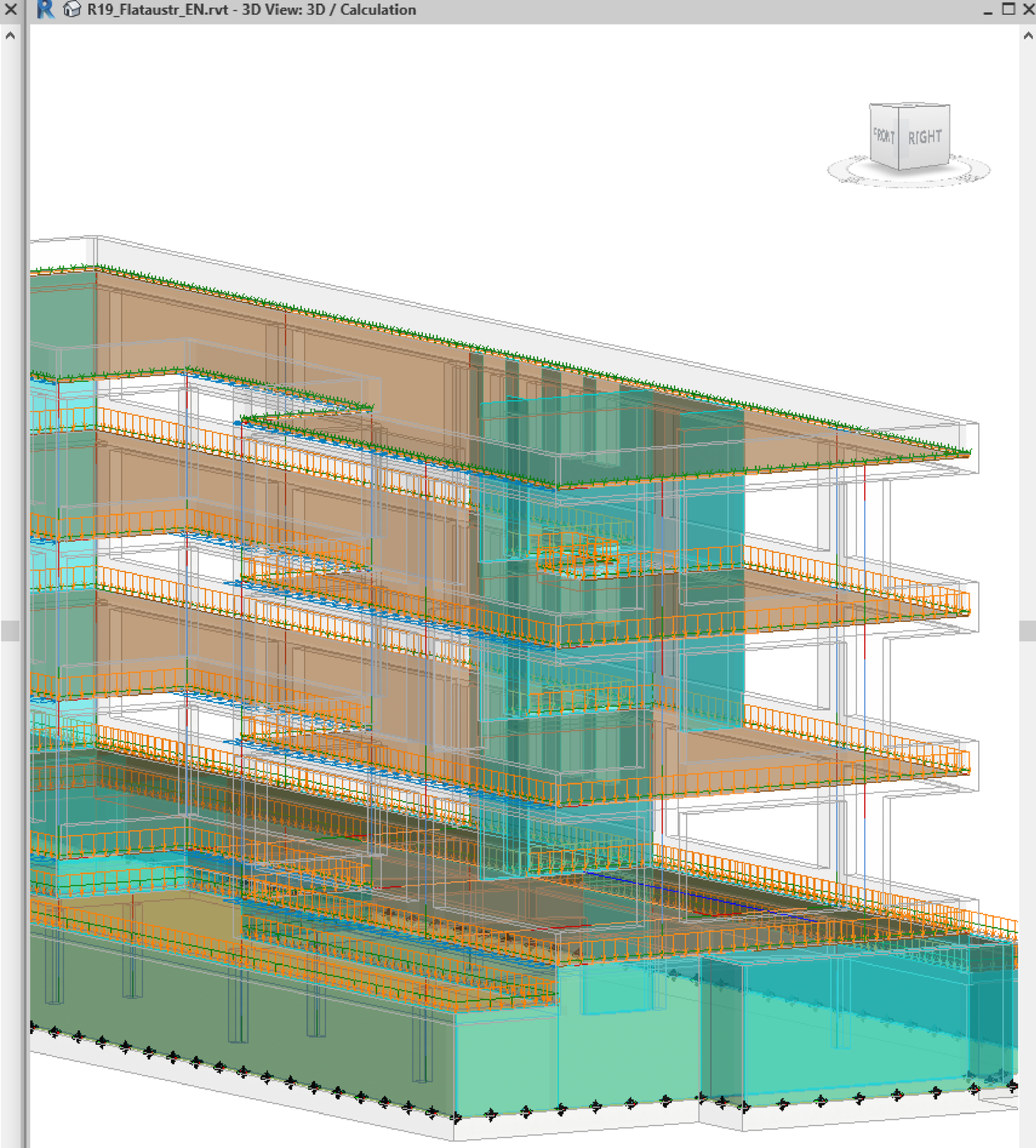

We build too...

SOFiSTiK Headquarter, Nuremberg

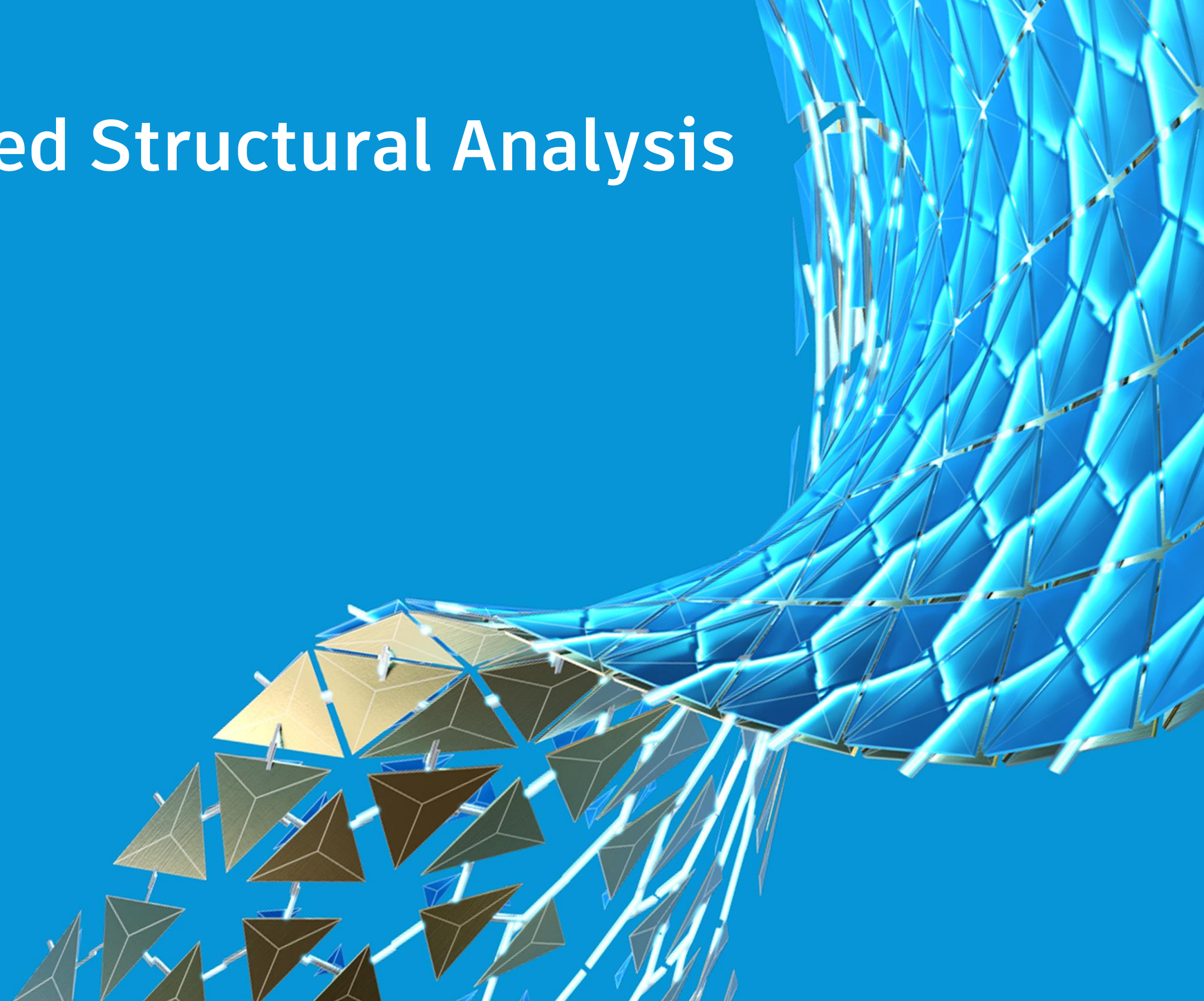
SOFiSTiK AG

SOFISTIK AG


R19_Flataustr_EN.rvt - 3D View: 3D / Architectural
RIGHT
SOFiSTiK


R19_Flataustr_EN.rvt - 3D View: 3D / Calculation
FRONT
RIGHT

BIM-integrated Structural Analysis - WHY ?



This is the only way that allows efficient planning
“It is important that the model becomes the ‚single source of truth‘”

Sebastian Sailer – EBP Schweiz

SOFiSTiK User Report: *State of the Art Underground Parking Design*

SOFiSTiK

State Of The Art Underground Parking Design

Autodesk® Revit® and SOFiSTiK software solve complex static problems in challenging projects

The client (the Migros cooperative) demanded BIM and presented the architects of Werknetz Architektur, as well as the engineers of EBP Schweiz AG with the opportunity to fully exploit the capabilities of their software. The result was an excellent planning quality, smooth coordination in every phase of the project and only a nine months construction time.

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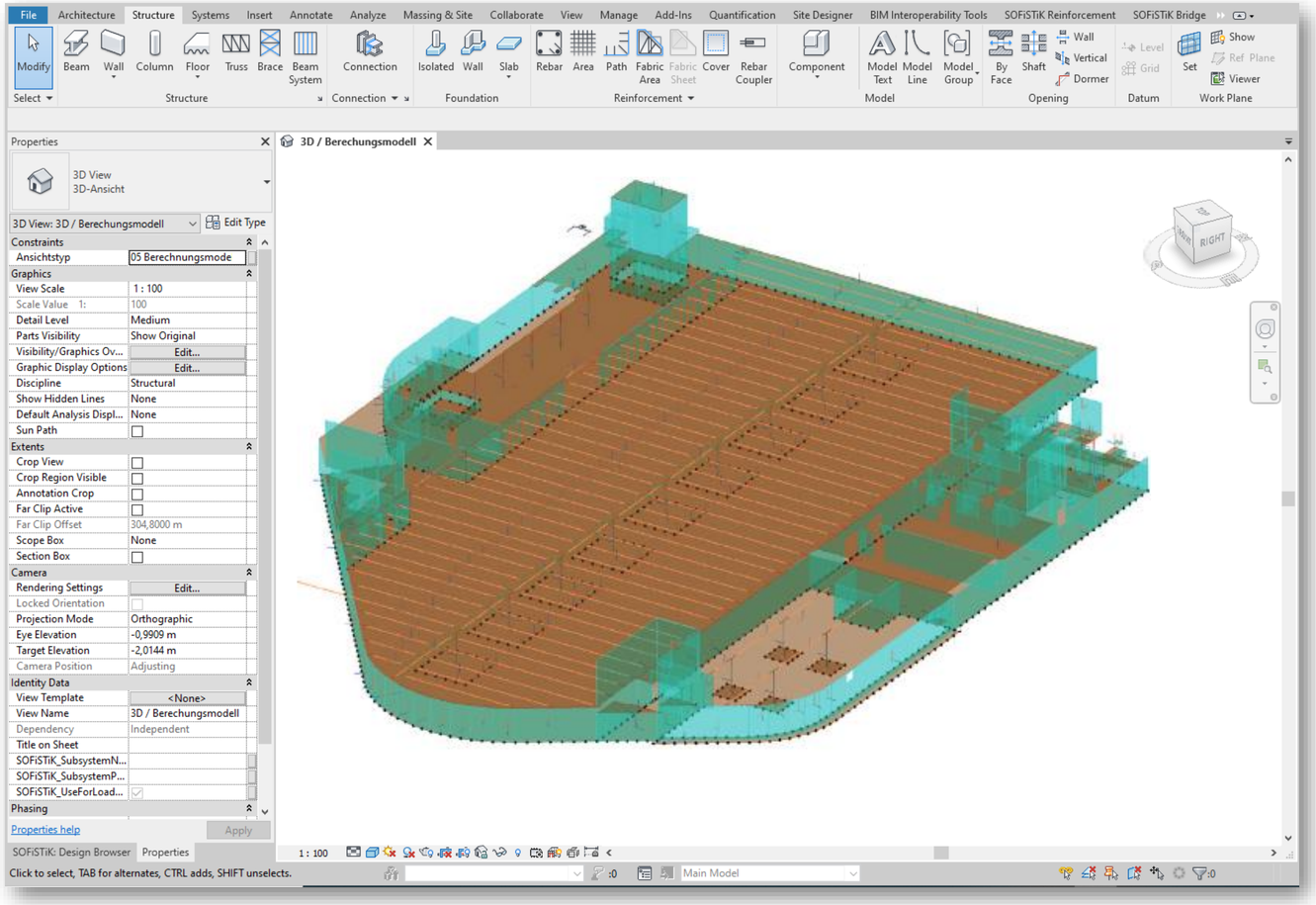
Standards assure efficiency

The EBP engineering division is in the Building Information modeling (BIM) business since 2012 and had a leading role in the creation of the first



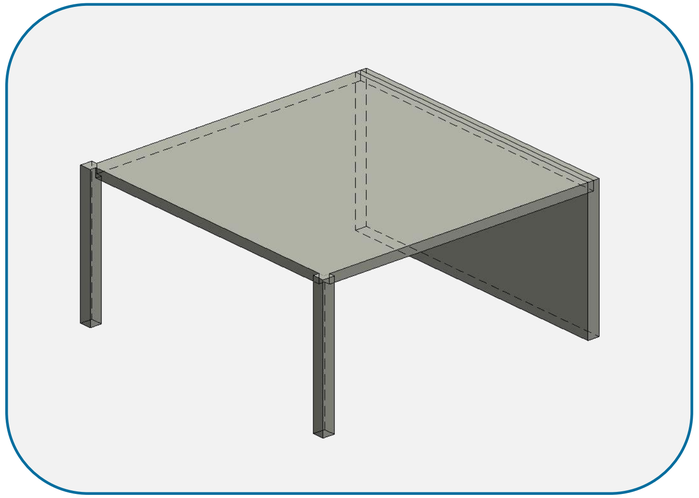
EBP Schweiz AG's Analytical model in Revit

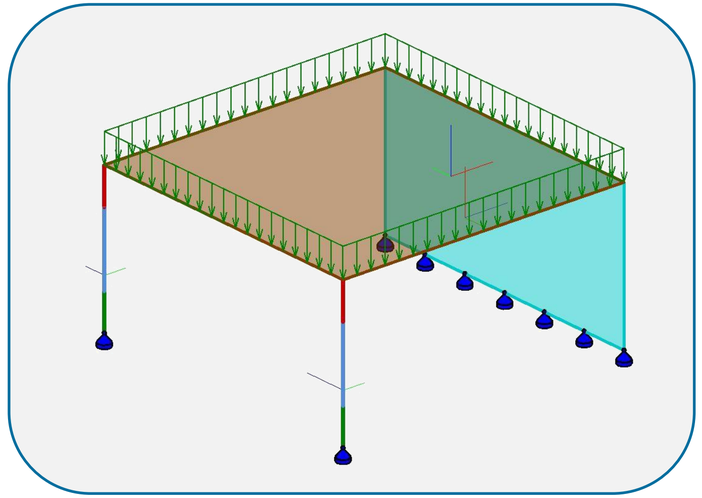
Source: SOFiSTiK User report *State of the Art Underground Parking Design*

Traditional Structural Analysis Workflow

- *Drawings*
- **.dwg*
- **.ifc*
- *direct Link*

Manual Modelling





Architecture

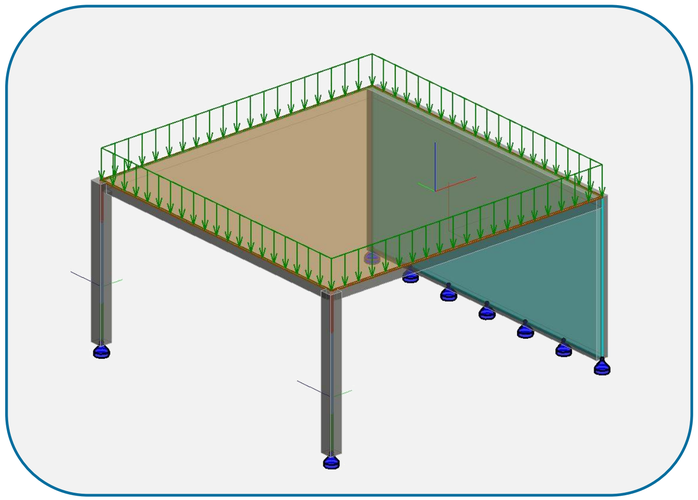
Manual Changes

Structural Analysis

- *Phone*
- *E-Mail*
- **.ifc*
- *direct Link*

BIM-integrated Structural Analysis Workflow

Architectural changes



Automatic! Analytical adjustments

One Single Model
=
Revit Solution!

Advantages

EFFICIENCY

- **Avoids separate and repetitive input of analysis model**
- **Immediate reaction on modifications in architectural model**

DATA CONSISTENCY

- **Avoids synchronization and parallel storage of data**
- **Coordination of analysis with BIM-Model**

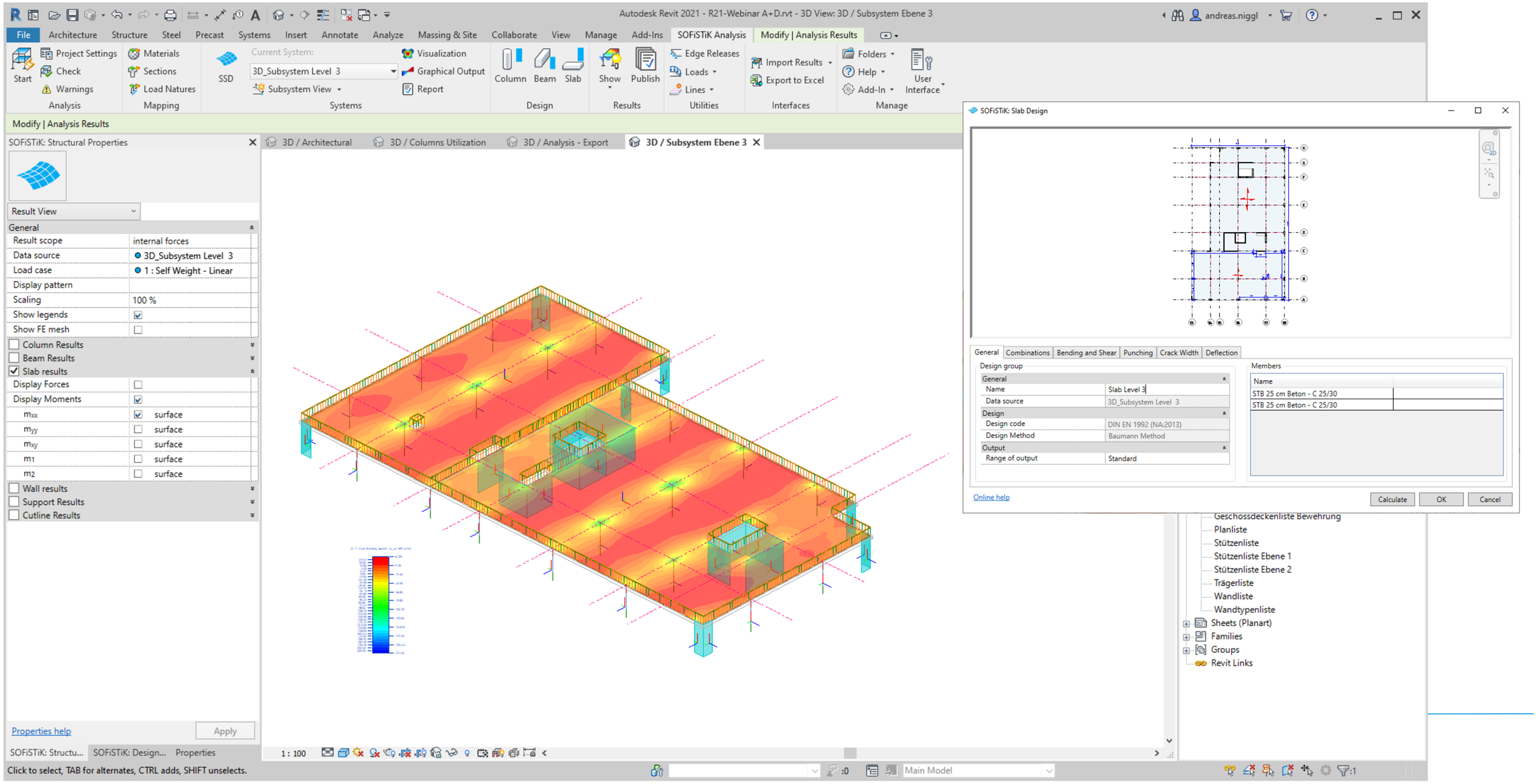
INSIGHTS

- **Assess results in the authoring BIM-System**
- **Combine model data with analysis results and raise additional information**

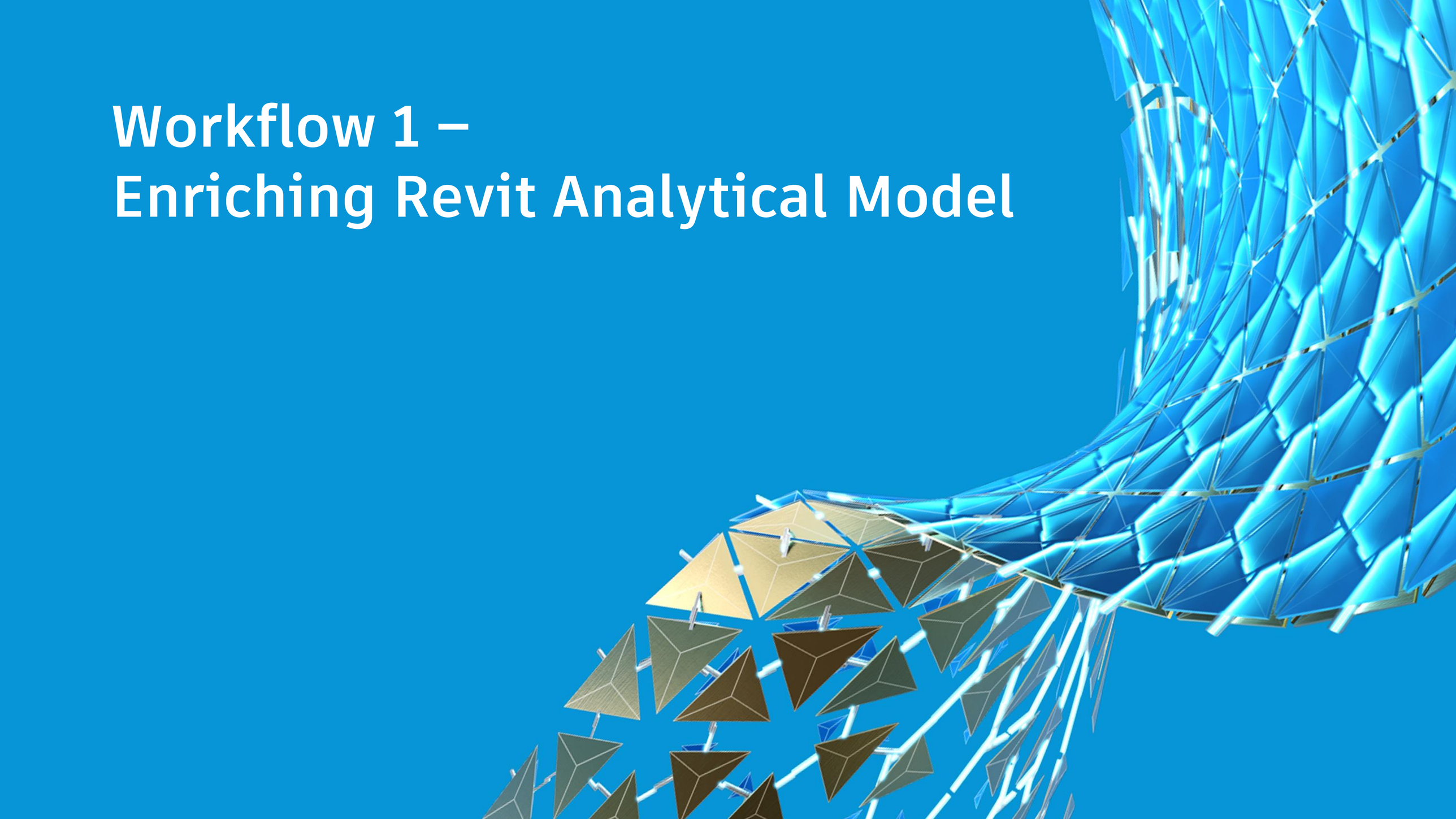
COLLABORATION

- **Share structural analysis data through Revit Cloud Worksharing**
- **Collaboration within/out of domain of structural engineers**

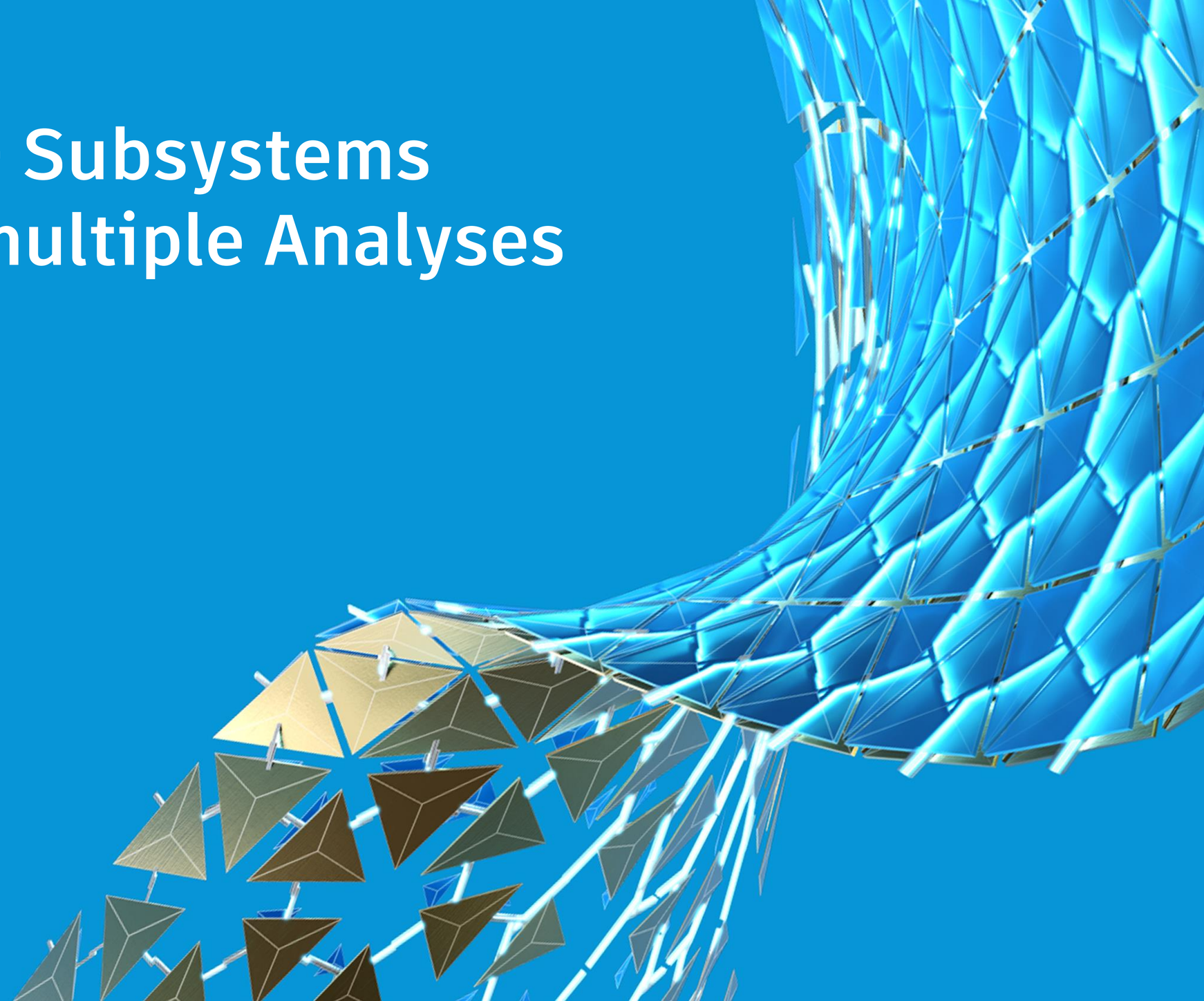
SOFiSTiK Analysis + Design for Revit 2021



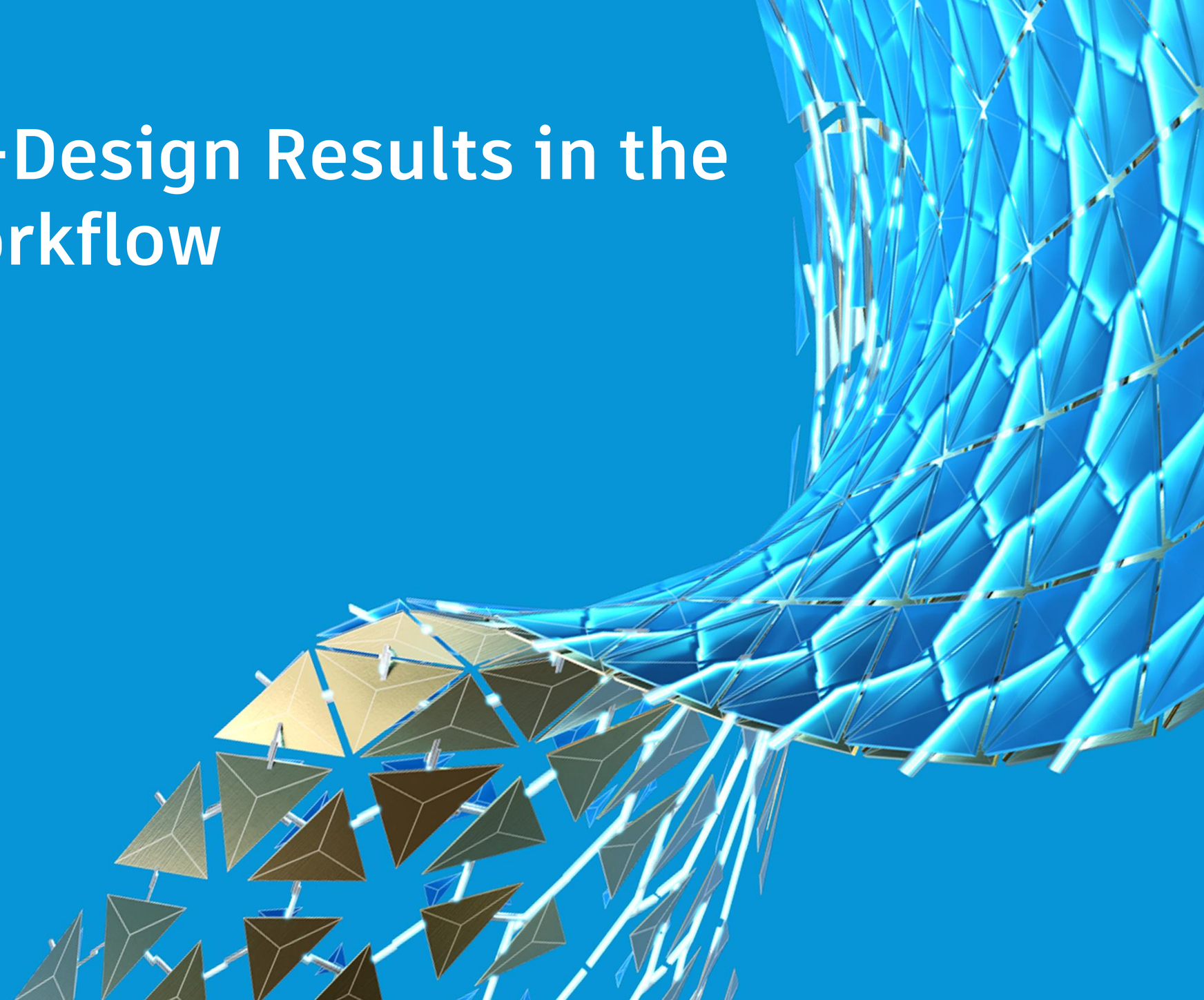
Workflow 1 –
Enriching Revit Analytical Model



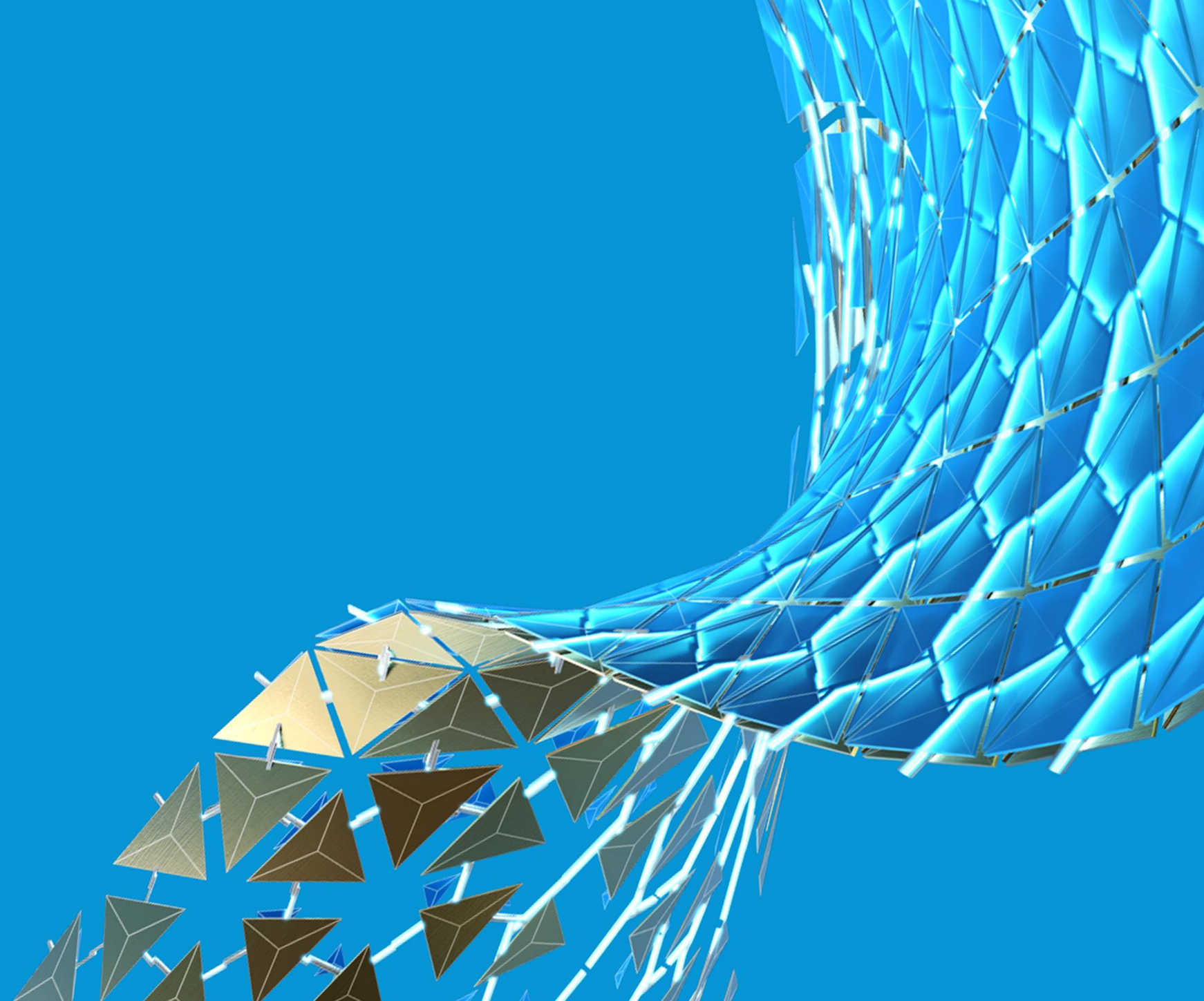
Workflow 2 – Subsystems
One Model, multiple Analyses

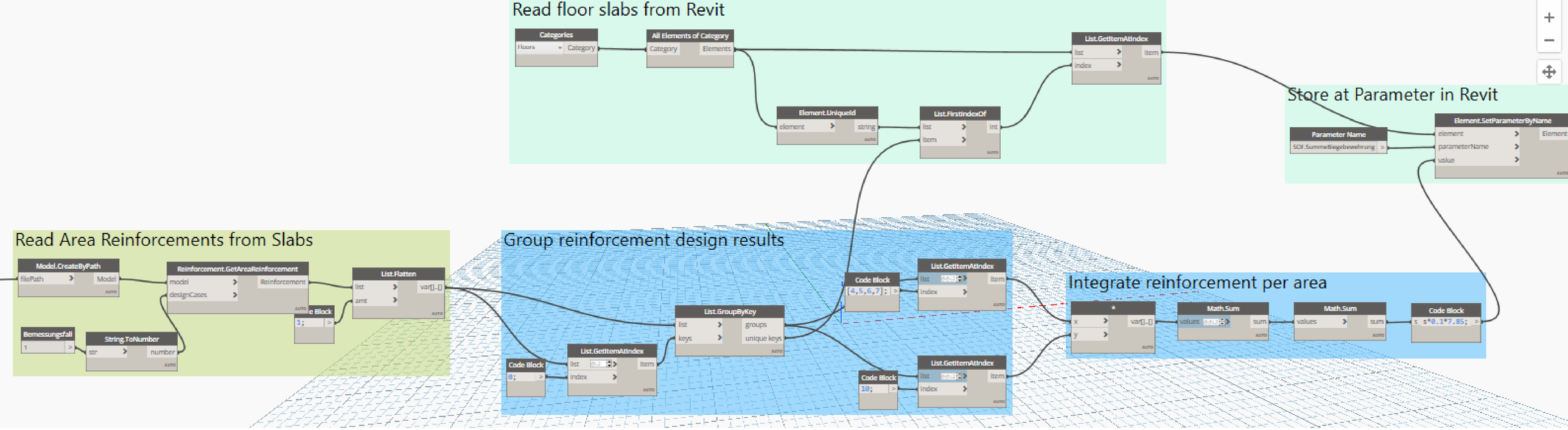


Workflow 3 –Design Results in the Modeling Workflow



What else?

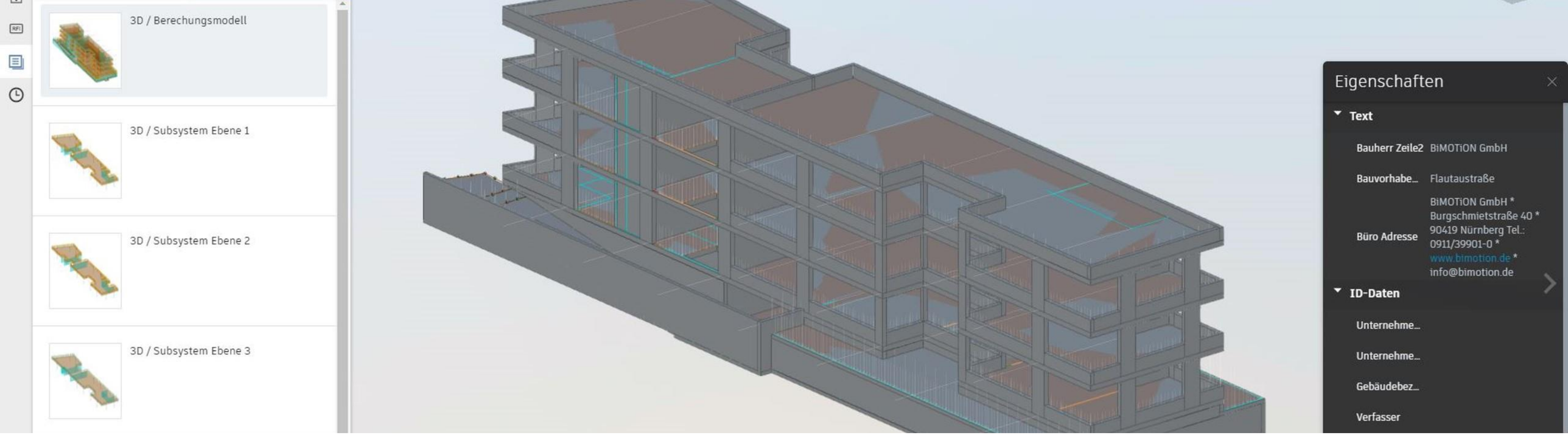




Dynamo for Automation and Results Evaluation

SOFiSTiK Analysis + Design provides Dynamo interface to automate analysis and process results data

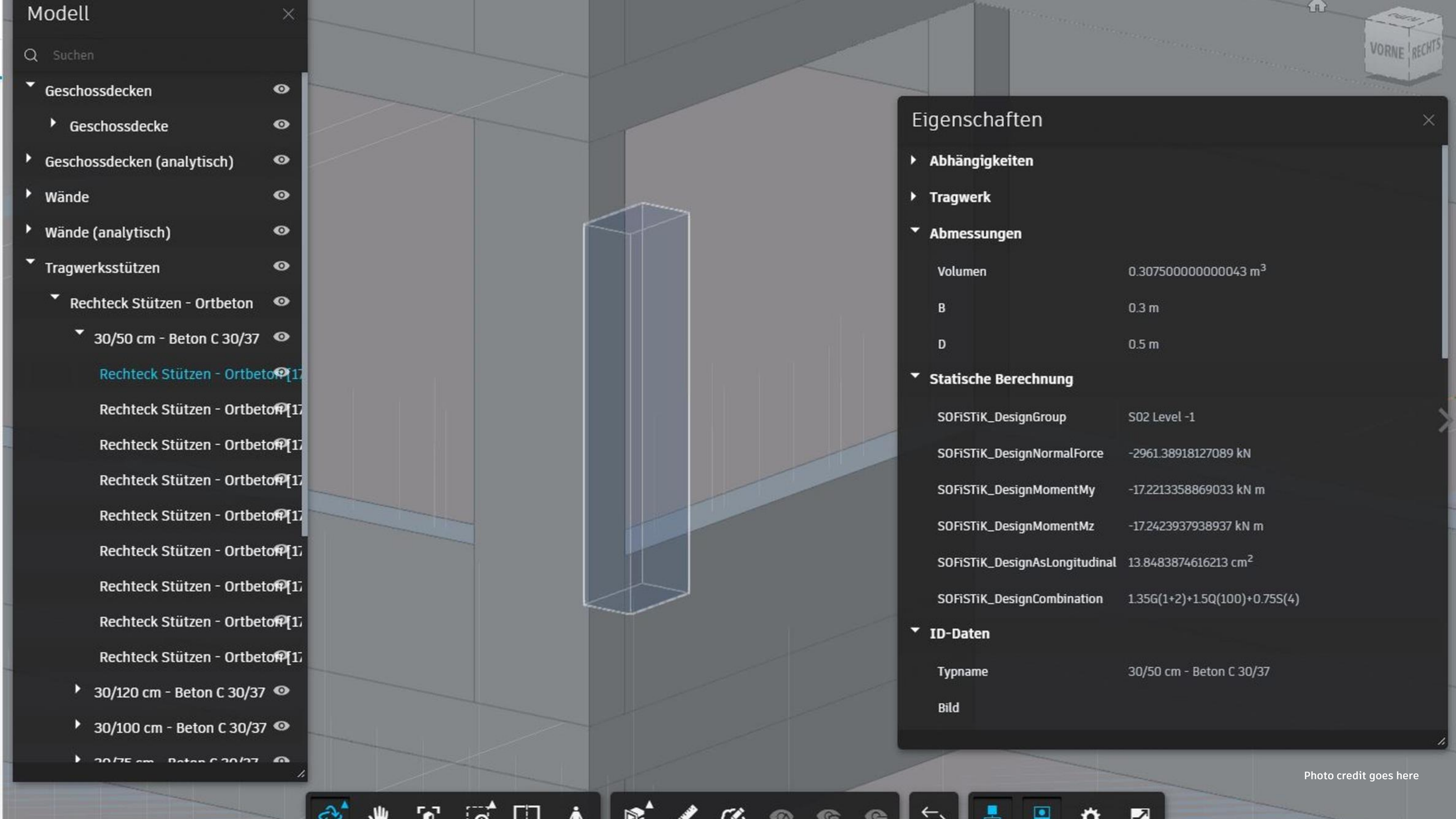
- Process and Export results in customized format (Excel, JSON)
- Transfer selected results back to Revit, e.g. in Parameters (Punching design, Area reinforcements)
- Setup analysis driven design loop



Collaboration through BIM 360

All analytical properties, calculation controls and optionally results are stored in .rvt and can be shared through Revit Cloud Worksharing

- Collaboration on analysis within domain and between different domains
- Sharing of main / subsystems on BIM 360 Document Management
- Visualization of selected analysis results on BIM 360 viewer


Modell
Suchen
Geschossdecken
Geschossdecke
Geschossdecken (analytisch)
Wände
Wände (analytisch)
Tragwerksstützen
Rechteck Stützen - Ortbeton
30/50 cm - Beton C 30/37
Rechteck Stützen - Ortbeton
30/120 cm - Beton C 30/37
30/100 cm - Beton C 30/37
Eigenschaften
Abhängigkeiten
Tragwerk
Abmessungen
Volumen 0.307500000000043 m³
B 0.3 m
D 0.5 m
Statische Berechnung
SOFiSTiK_DesignGroup S02 Level -1
SOFiSTiK_DesignNormalForce -2961.38918127089 kN
SOFiSTiK_DesignMomentMy -17.2213358869033 kN m
SOFiSTiK_DesignMomentMz -17.2423937938937 kN m
SOFiSTiK_DesignAsLongitudinal 13.8483874616213 cm²
SOFiSTiK_DesignCombination 1.35G(1+2)+1.5Q(100)+0.75S(4)
ID-Daten
Typname 30/50 cm - Beton C 30/37
Bild
VORNE
RECHTS
Photo credit goes here

Our users in the spotlights

Successful in BIM with SOFiSTiK


SOFiSTiK

Working with SOFiSTiK
A User Report

Impulses, Ideas, Inspirations

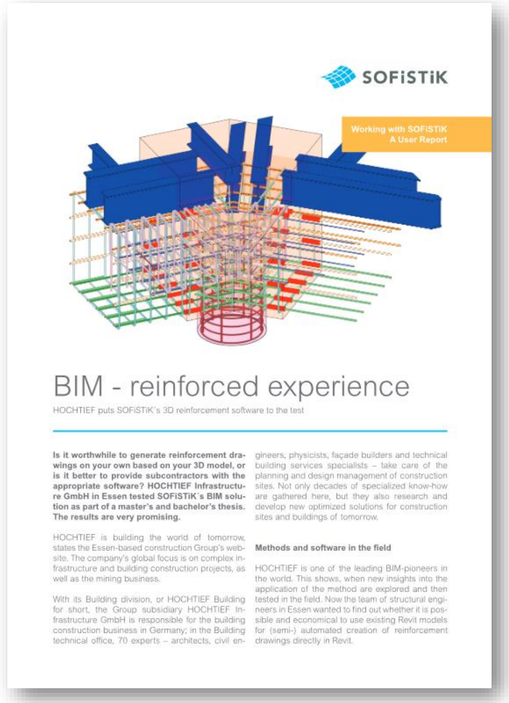
Autodesk® Revit® and SOFiSTiK pass the "endurance test" at IDK Kleinjohann Cologne

Autodesk Revit and SOFiSTiK underwent an endurance test at the IDK engineering office in Cologne, as they were used for planning and calculating the extension of their company's building. The results were convincing: for the purpose of structural and reinforcement planning, the software is exactly what is needed when it comes to efficiency and effectiveness. The possibility to create parametric components allows for new-found flexibility; and an innovative partner such as SOFiSTiK fits perfectly with the business philosophy of IDK.

"We are willing to stay one step ahead and try new things", says Christian Richert; one of the partners of IDK Cologne. With more than 50 employees in Cologne, Berlin and Düsseldorf, the company has carried out numerous large-scale projects over the past 55 years. Thereby, their focus is on the "balance between economy, ecology and technical performance". The persistent willingness to change is part of the company's DNA and the enthusiasm of the company´s management is contagious, positively influencing their employees.

The convincing SOFiSTiK-Revit-Interface

Their first contact with Autodesk Revit is almost ten years ago, but only after an increasing number of architects began working with Revit in the field of Building Information Modelling (BIM) the decision was made to purchase it. Additionally, SOFiSTiK was purchased to carry out structural calculations. "The advanced interface had us convinced", says Christian Richert. The implementation of the software consisted of a compact training for all employees, followed up with 'learning by doing'. Questions were gathered and later addressed in a refresher training. New employees, who already


SOFiSTiK

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BIM - reinforced experience

HOCHTIEF puts SOFiSTiK´s 3D reinforcement software to the test

Is it worthwhile to generate reinforcement drawings on your own based on your 3D model, or is it better to provide subcontractors with the appropriate software? HOCHTIEF Infrastructure GmbH in Essen tested SOFiSTiK´s BIM solution as part of a master's and bachelor's thesis. The results are very promising.

HOCHTIEF is building the world of tomorrow, states the Essen-based construction Group's website. The company's global focus is on complex infrastructure and building construction projects, as well as the mining business.

With its Building division, or HOCHTIEF Building for short, the Group subsidiary HOCHTIEF Infrastructure GmbH is responsible for the building construction business in Germany; in the Building technical office, 70 experts – architects, civil engineers, physicists, façade builders and technical building services specialists – take care of the planning and design management of construction sites. Not only decades of specialized know-how are gathered here, but they also research and develop new optimized solutions for construction sites and buildings of tomorrow.

Methods and software in the field

HOCHTIEF is one of the leading BIM-pioneers in the world. This shows, when new insights into the application of the method are explored and then tested in the field. Now the team of structural engineers in Essen wanted to find out whether it is possible and economical to use existing Revit models for (semi-) automated creation of reinforcement drawings directly in Revit.


SOFiSTiK

Working with SOFiSTiK
A user report

Let´s do integral planning

Working with Autodesk and SOFiSTiK software, Thomas Lorenz ZT GmbH, Graz handles complex BIM-projects

What software allows for efficient structural planning in 3D?
FH-Prof. DI Dr. Thomas Lorenz did not expect that the answer to this question would lead him and his office directly to Building Information Modelling (BIM). Since then BIM has become the method of choice for most of the office's projects. Especially useful: SOFiSTiK static solutions are integrated in Autodesk Revit, this way work can be done in a single model which not only saves time, but also improves planning quality.

FH-Prof. DI Dr. Thomas Lorenz has always been the kind of person to think outside the box. In fact, already during his first assignment as a start-up consultant back in 2003, he combined structural planning and construction supervision. This way of thinking enabled the growth of his business in a unique manner: his team was encouraged to introduce ideas and interests; often leading to new directions for the company. Today the Thomas Lorenz ZT GmbH (TL ZT) has 56 employees functioning within the departments of planning, design, construction management and administration. Furthermore, the company is positioned on both national and international levels as a specialist in project management, general planning and structural planning. In addition to this, they are especially contracted to take on local construction supervision for particularly challenging architectural building constructions as well as technologically demanding infrastructure projects.

The 3D Idea

Before BIM (Building Information Modelling) even became a buzzword, one of the employees in the static department was bitten by the '3D-bug' and


SOFiSTiK

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Source: SOFiSTiK User Reports - https://www.sofistik.com/infocenter/user-reports

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