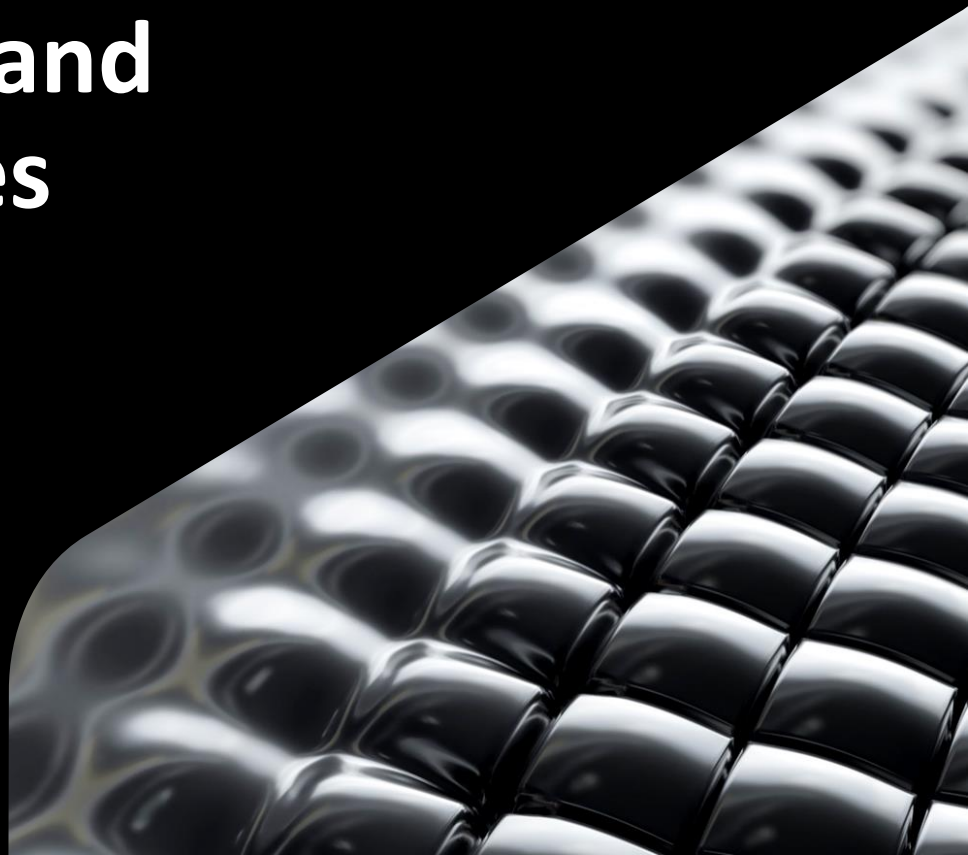
AUTODESK UNIVERSITY

3D Rebar Stadiums and Multilevel Structures

A Practical Walk-Through



Stevens CHEMISE
Product Line Manager| @stevens_chemise

Daniel GHEORGHE
R&D Product Specialist

Ionel BADEA
Manager - Structural Engineer department

Stevens CHEMISE

- Structural Engineer
- Product Line Manager at Graitec Innovation , part of the Graitec Product Management Team, located in Paris, FRANCE
- 15 Years experience in several BIM Software companies
- Main technical expertise on Revit, Navisworks, Autodesk Construction Cloud for Architects or structural engineer, workflow between Autodesk products and Graitec design analysis software.

Daniel GHEORGHE

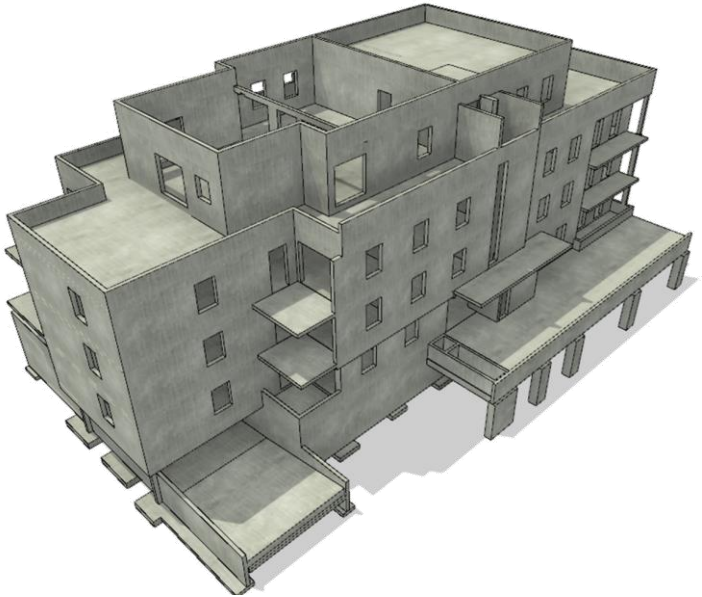
- Structural Engineer
- R&D Product Specialist at Graitec Romania
- Certified Professional and ATC Instructor
- Proficient with Autodesk Construction Cloud , Dynamo for Revit, Advance Steel, Navisworks

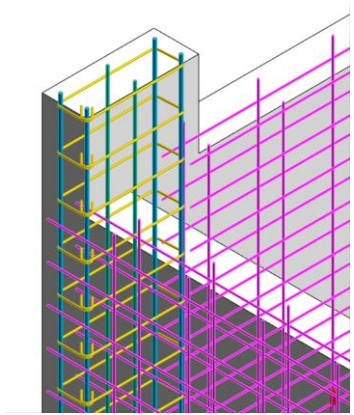
Ionel BADEA

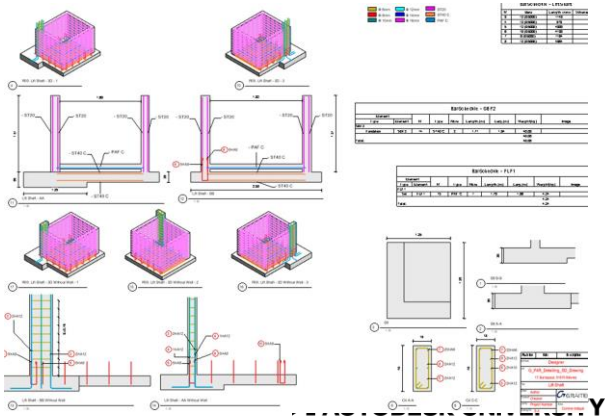
- Manager of the Structural Design Department at Popp & Asociatii
- Technical expert and verifier certified by the Ministry of Development, Public Works, and Administration , Roumania
- Member in the Romanian Association of Structural Design Engineers, major professional alliance
- Involved in large-scale projects
  - Buildings with more than 35 floors and 3 to 5 basement
  - Stadiums with over 30,000 seats
  - Extension of the main airport in Romania …
- Promoting new materials and technologies in the construction industry

Typical Personas

- Rebar Draftsmen
- Rebar detailers
- Structural engineers
- BIM Modeler
- BIM Manager for structural project







Learning Objectives

- Understand key concepts on which Rebar in Revit is based
- Learn best practices to run a Rebar project in Revit
- Generate parametric rebar cages for RC members and edit Rebar objects
- Speed up rebar drawings generation and customization with dedicated detailing tools.
- Discover best practices used by Popp&Asociatii, an experimented Romanian engineering office company

GRAITEC

Applied Software®

AUTODESK
Platinum Partner

EUROPE AND NORTH AMERICA

700
EXPERTS WORLDWIDE

EST
1986

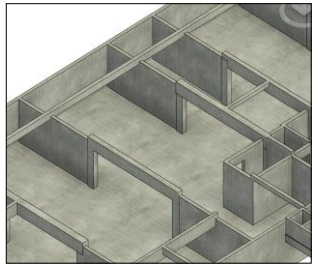
30+
OFFICES

18
COUNTRIES

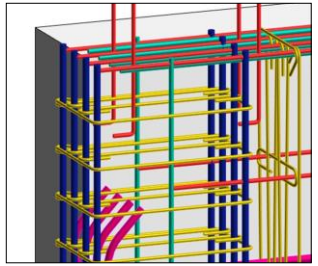
+300M$
Revenue

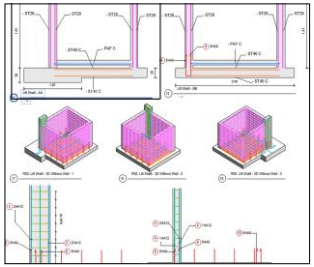
3D Reinforcement , Why ?

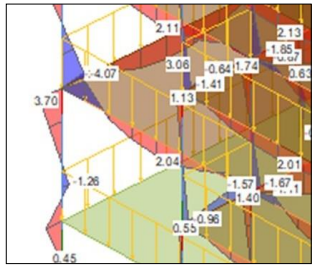
- Consistency and quality of reinforcement drawings
- Workflow and link with the Revit formwork model
- Quantity take Off
- Clash detection
- Workflow with design software
- Workflow with Fabrication



1	4	HA8 (B500A)	5.56	
2	19	HA6 (B500A)	1.94	
3	2	HA8 (B500A)	5.79	
4	4	HA8 (B500A)	5.55	
5	2	HA8 (B500A)	1.23	
6	2	HA8 (B500A)	1.70	







POWERPACK for Revit

Provides a broad suite of commands to increase productivity

8

LANGUAGES

Constructive Dispositions, Design codes ….

+80

TOOLS FOR ALL REVIT USERS

For Architects, MEP, Structural users (Link To Excel, Family Manager, Element lookup …)

+50

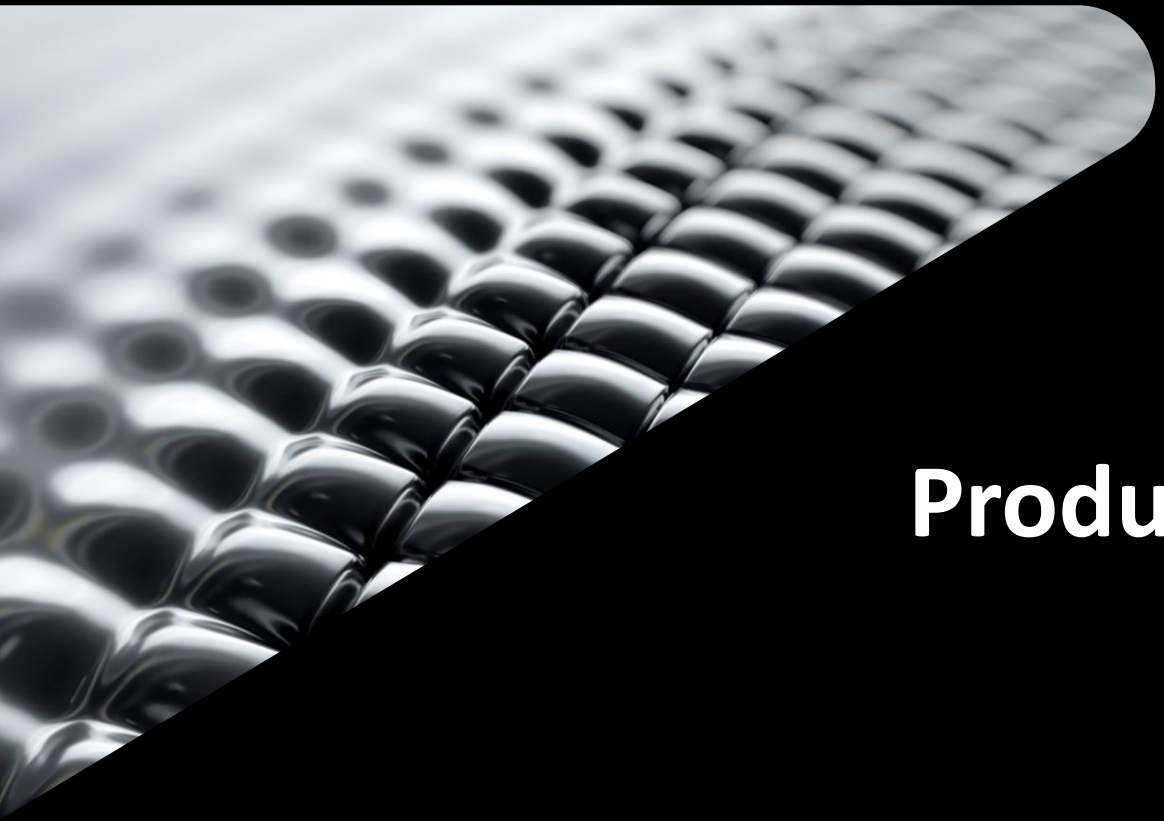
Dedicated tools for rebar detailing

Features to speed up rebar cages generation and detailing drawings

+20k

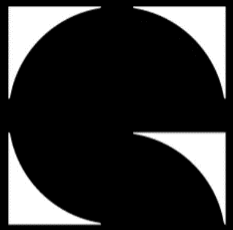
USERS

PowerPack users around the globe



Product Key Features

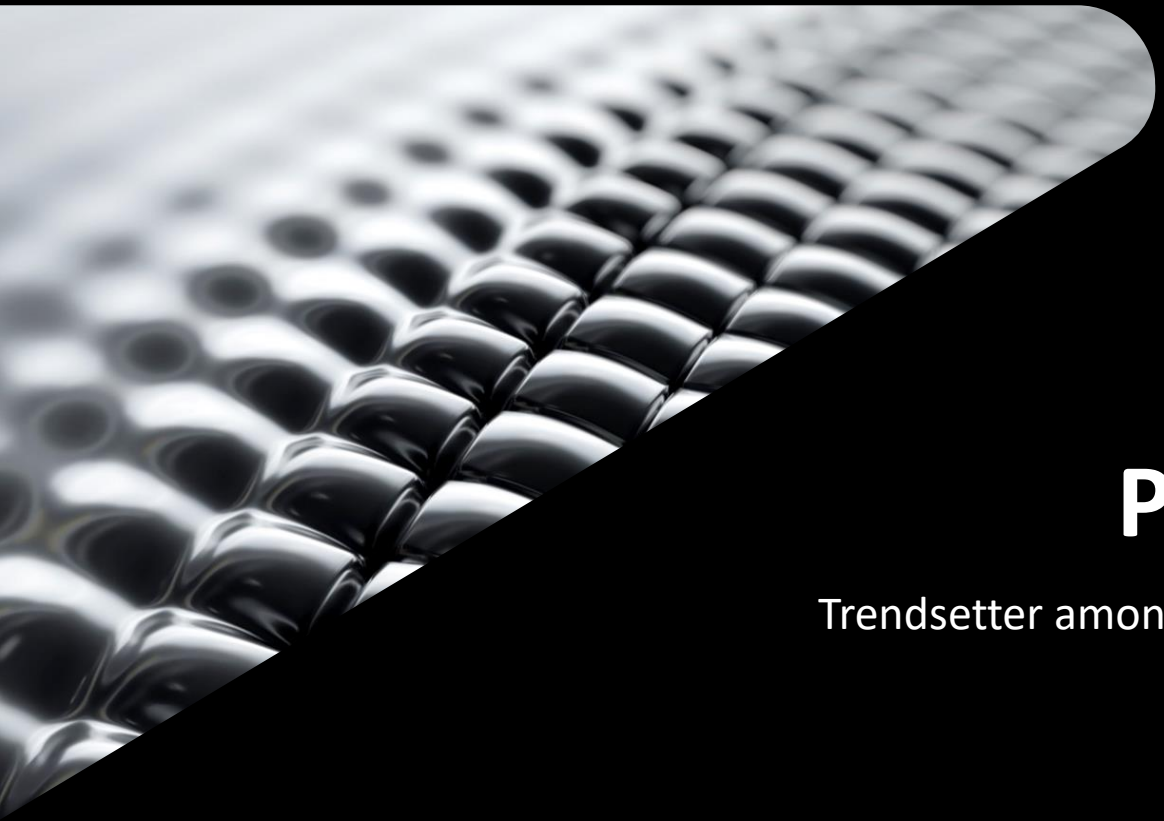
Overview



GRAITEC

POWERPACK

for Revit



Popp & Asociatii

Trendsetter among the Romanian Design Companies

POPP & ASOCIATII

20

YEARS

experience in the construction design market

4 M

SQUARE METERS

designed

500

CLIENTS

from public or private sectors

75

EMPLOYEES

in the Popp Group of companies

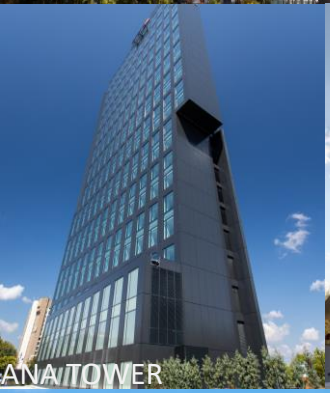
Selected projects

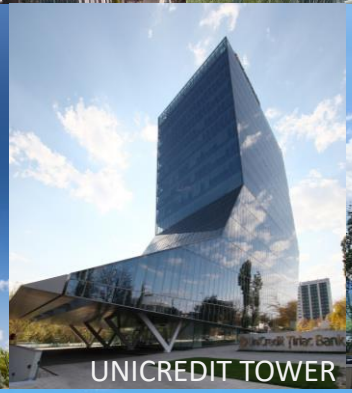
From office buildings to stadiums

ORHIDEA TOWER


EQUILIBRIUM


CITY GATE TOWERS


ANA TOWER


UNICREDIT TOWER


URBAN PLAZA


BRASOV AIRPORT

GIULEȘTI STADIUM


STEAUA STADIUM

Provided services:

- **Structural design**
- **BIM services**
- **Geotechnical Engineering**
- **Technical Consultancy**
- **Project Management**
- **Construction Materials' Testing**

3D Rebar Stadiums

Steaua Bucharest Stadium

Steaua Bucharest Football Stadium

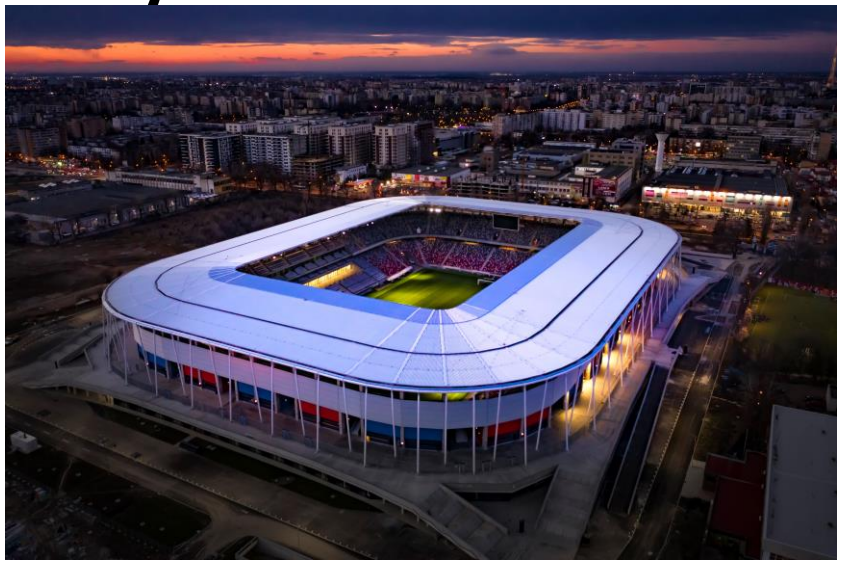
Overview:

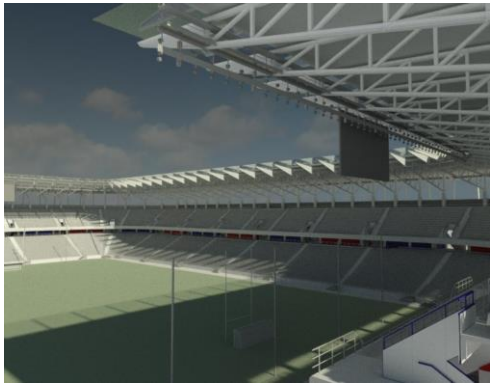
- Seats: 31 000
- Destination: football and rugby stadium
- Area: 80 000 sqm
- Duration of execution: 2018-2020
- Cost: 95 000 000 €

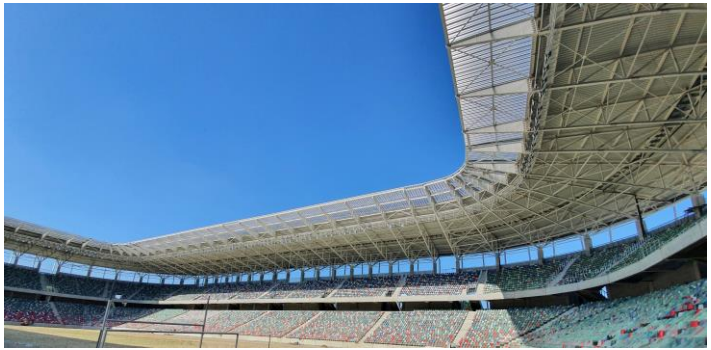
Additional spaces:

- Hotel
- Restaurant
- Museum
- VIP areas
- TV studio
- Shops

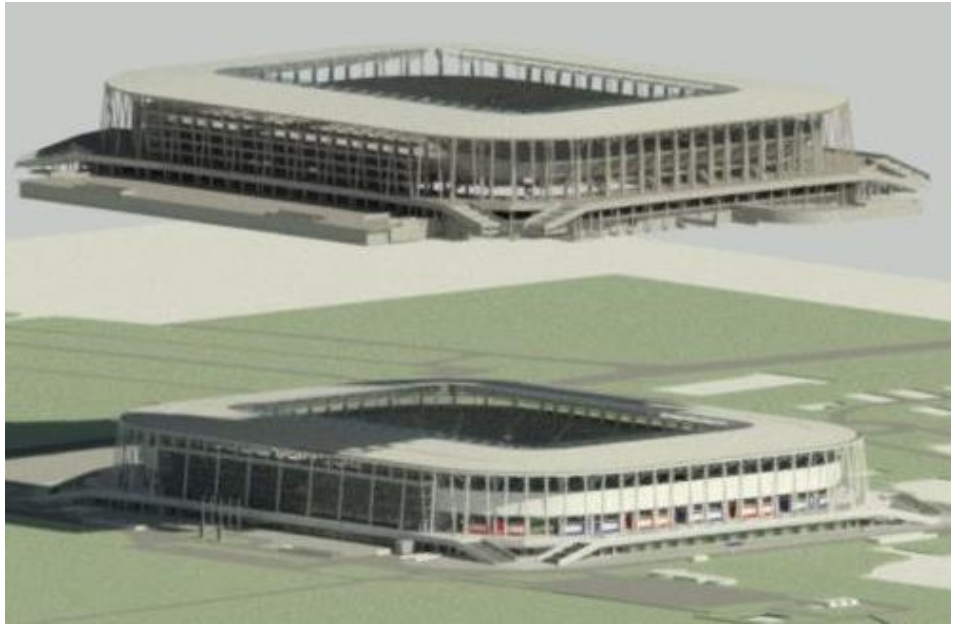
Revit Complex Model vs. Reality

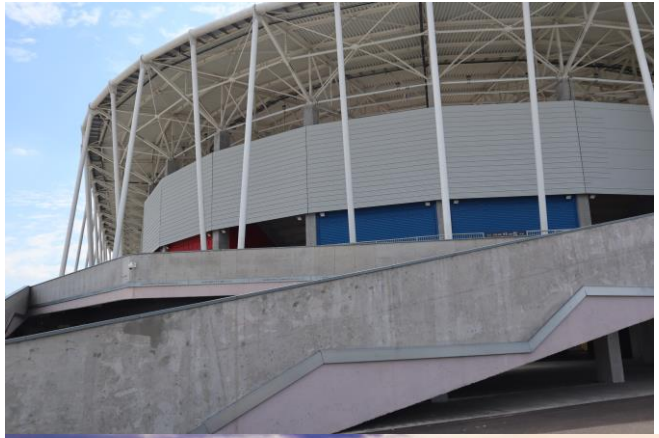




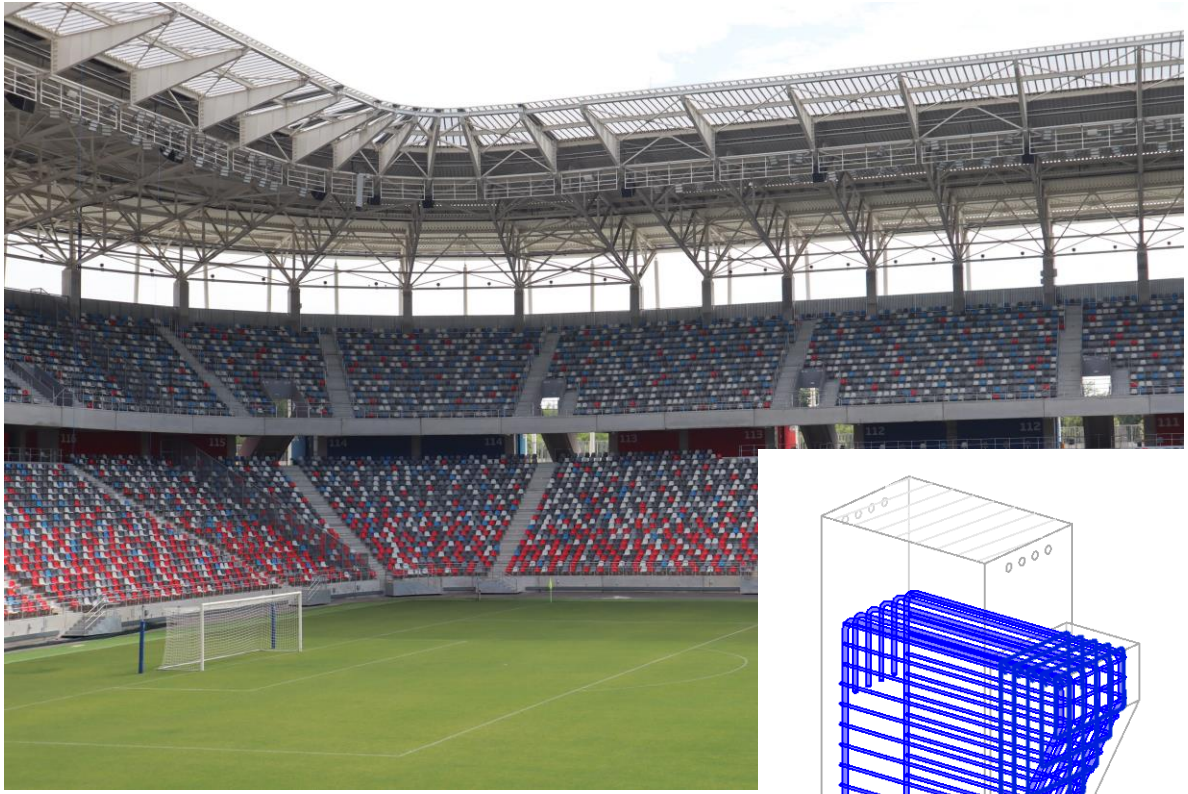


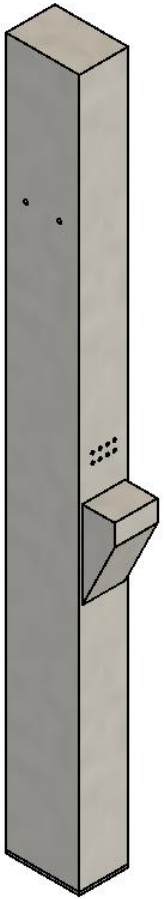
- LOD 300
- LOD 350
- LOD 400

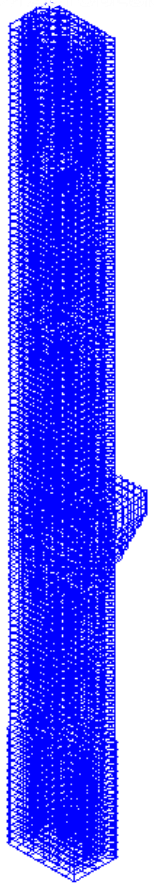




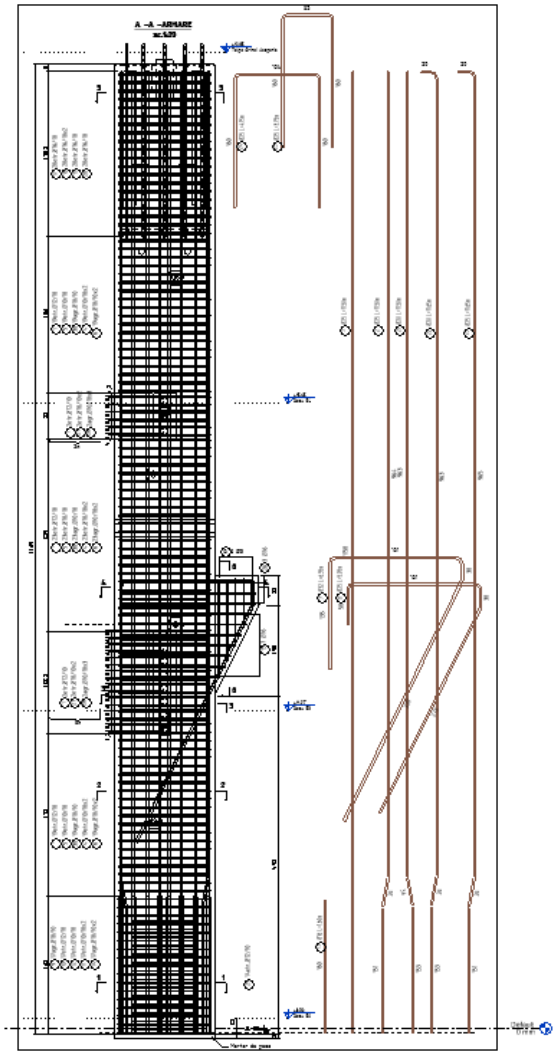
- Structural Revit Model vs. Architectural Revit model

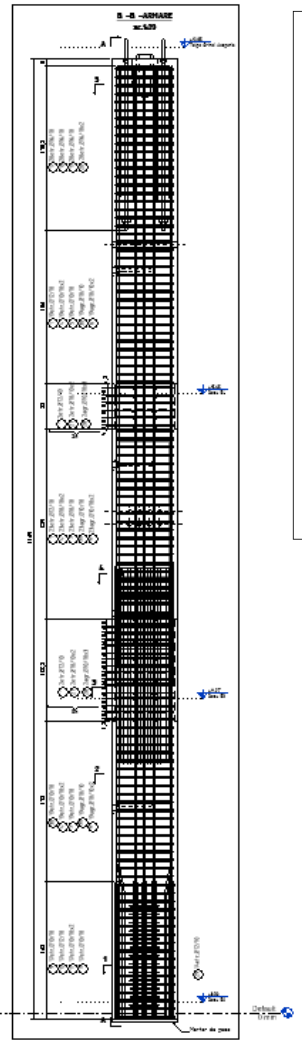


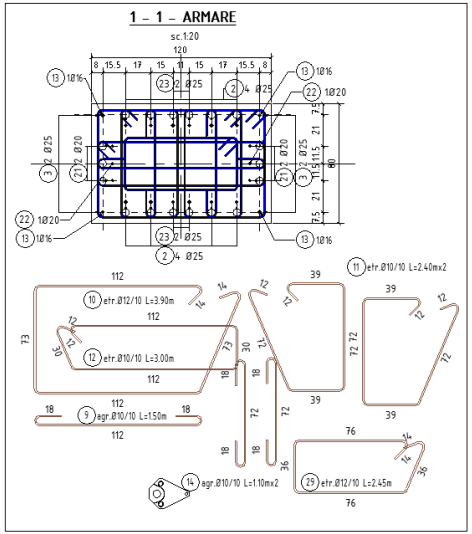


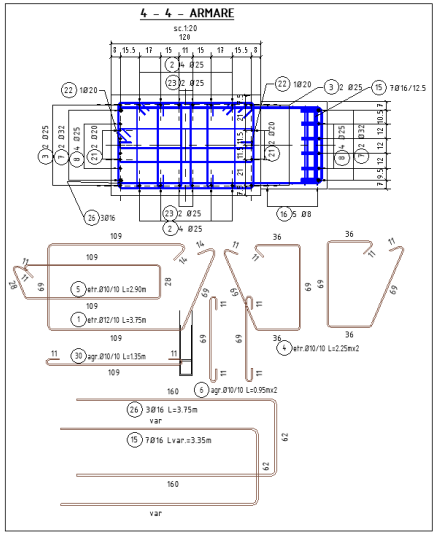


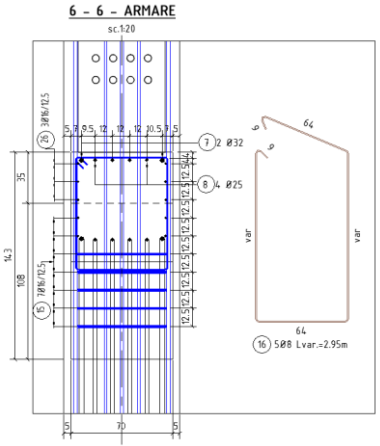
- Prefabricated concrete columns
- Reinforcement detalis using Revit tools



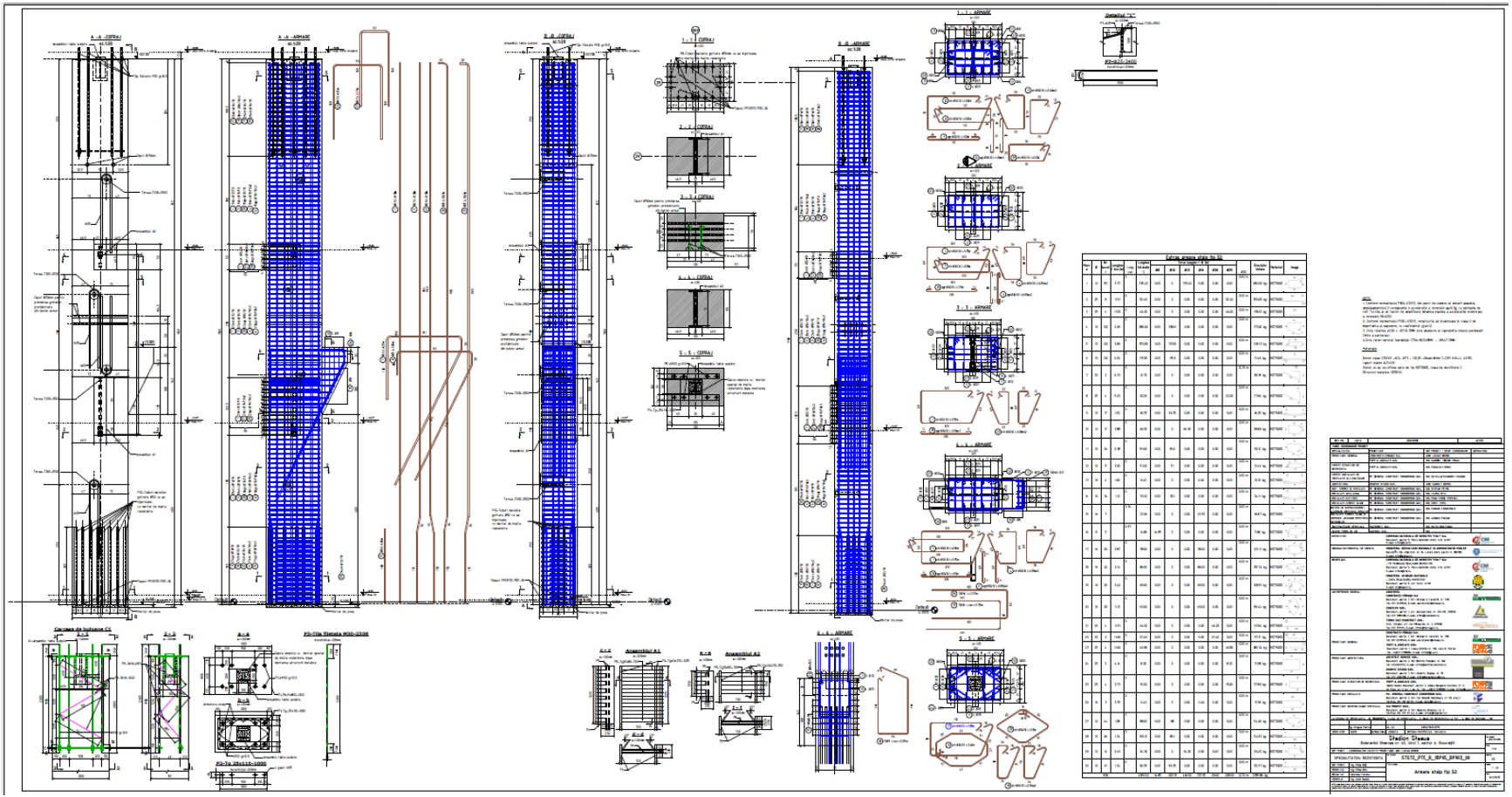




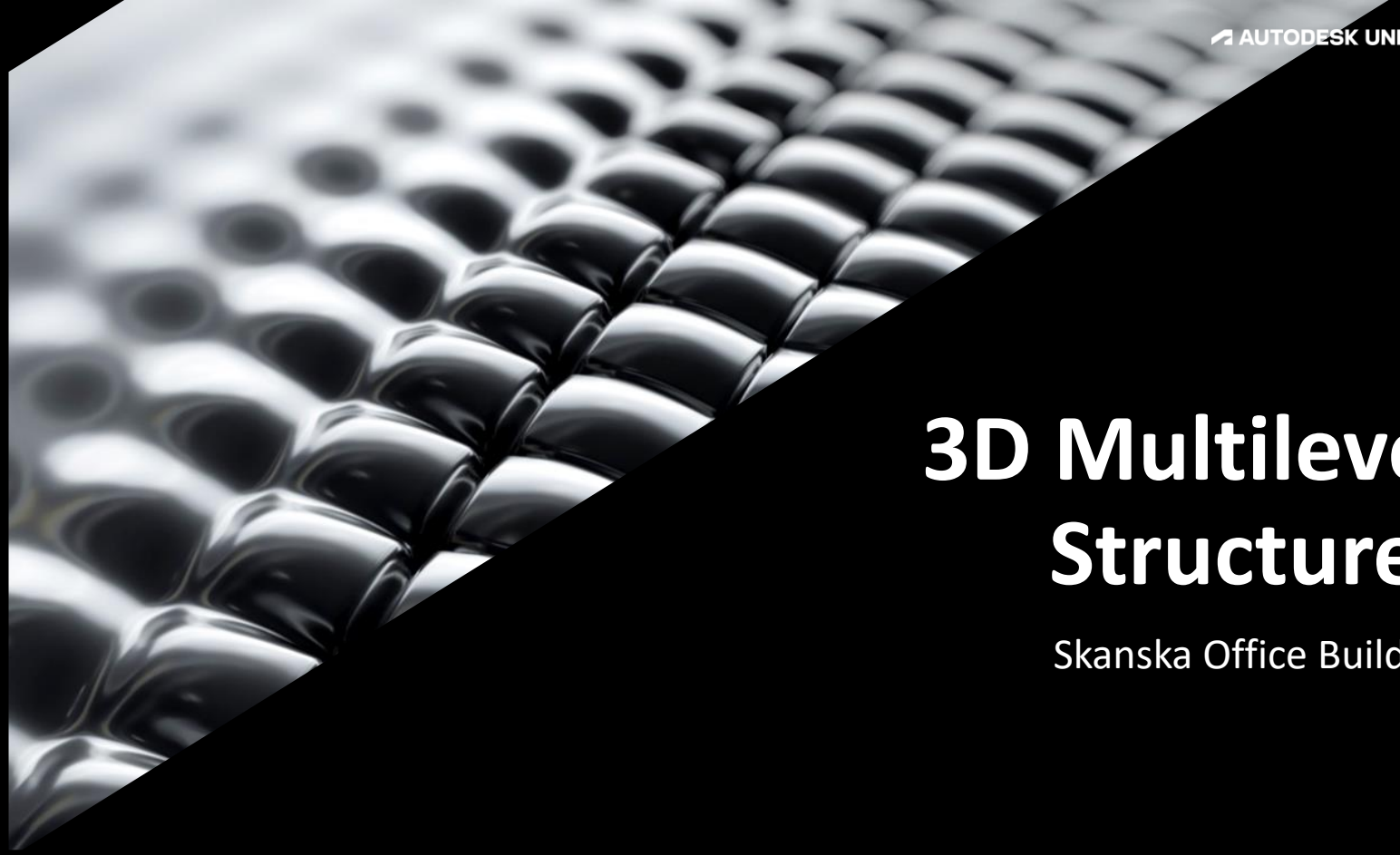




- Reinforcement details using Revit tools and Graitec Power Pack



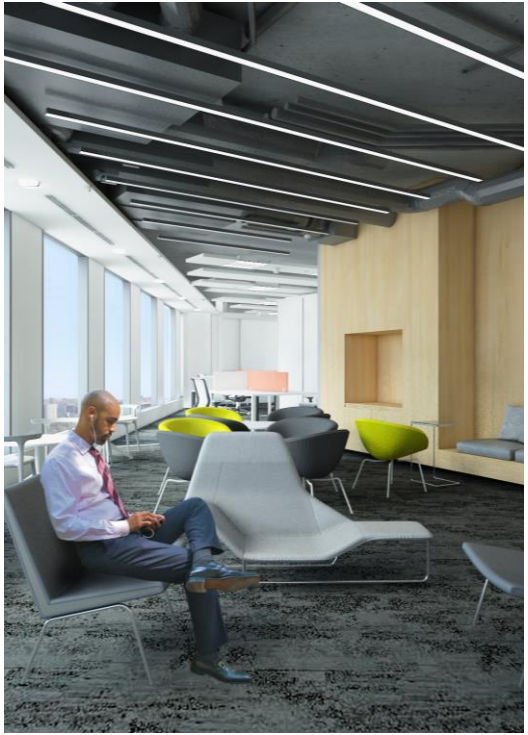
Execution drawing



AUTODESK UNIVERSITY

3D Multilevel Structures

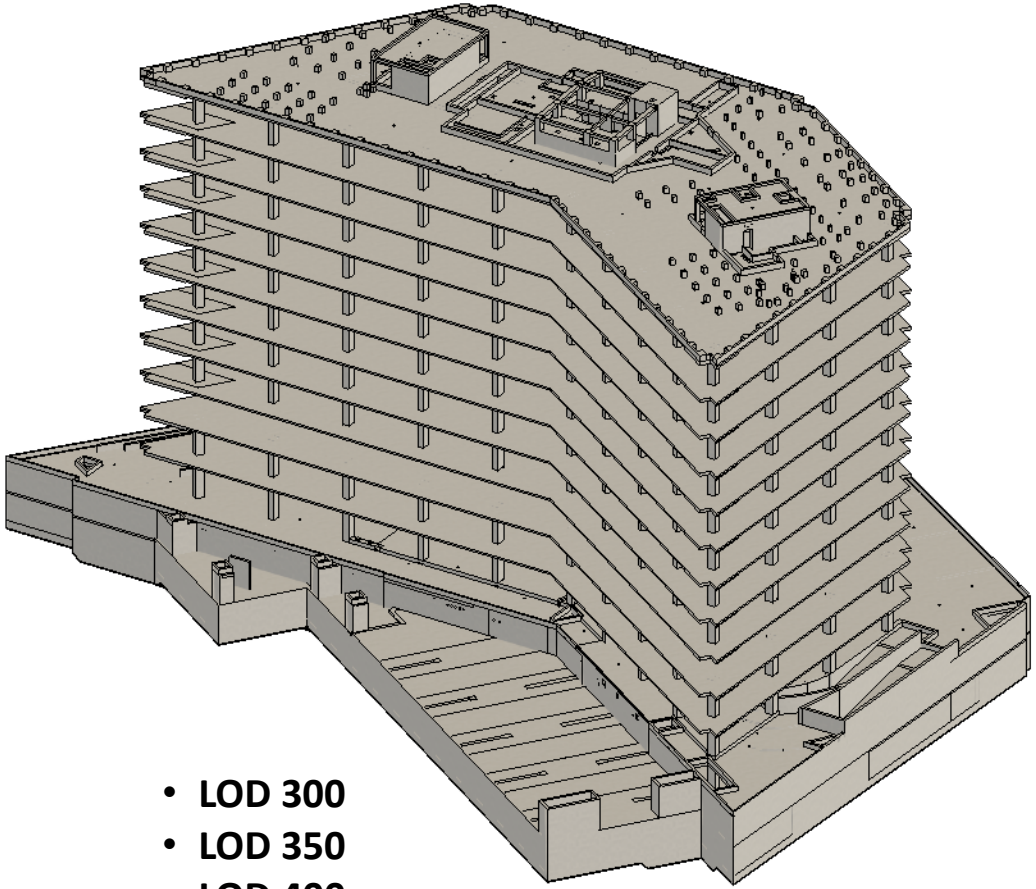
Skanska Office Building



Overview:

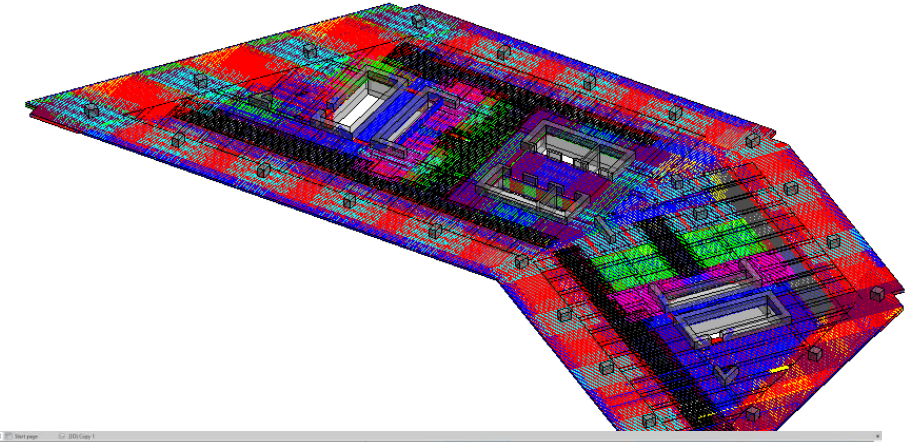
- Destination: office building
- Area: 31 000 sqm
- 2BS+GF+10ST

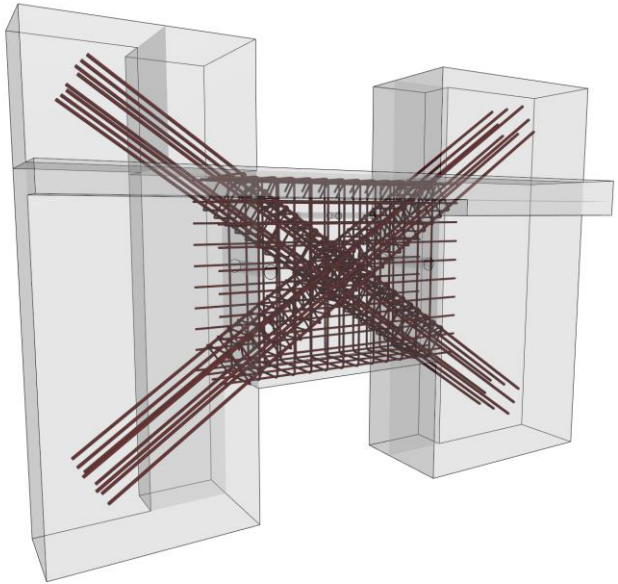
- Full 3d structural model
- Reinforcement details
- Clash detection
- Quantity take off and cost control
- Constructability

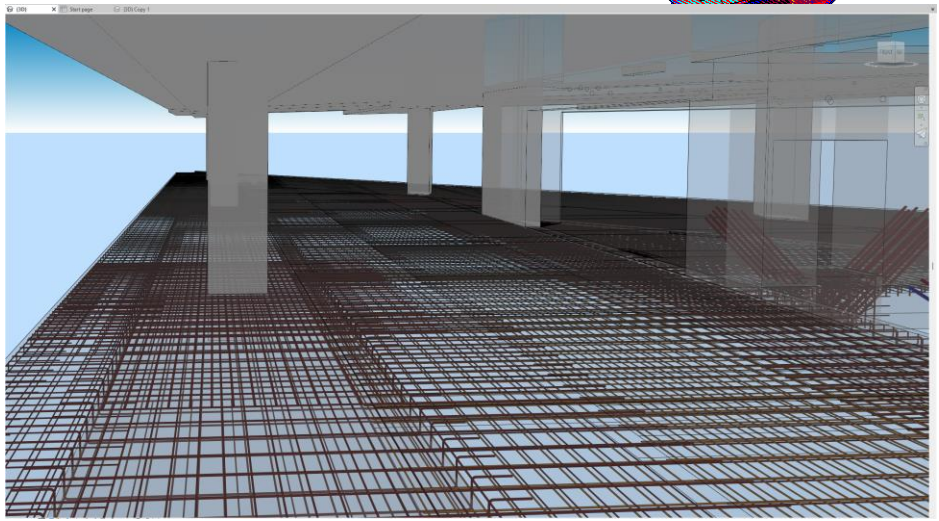


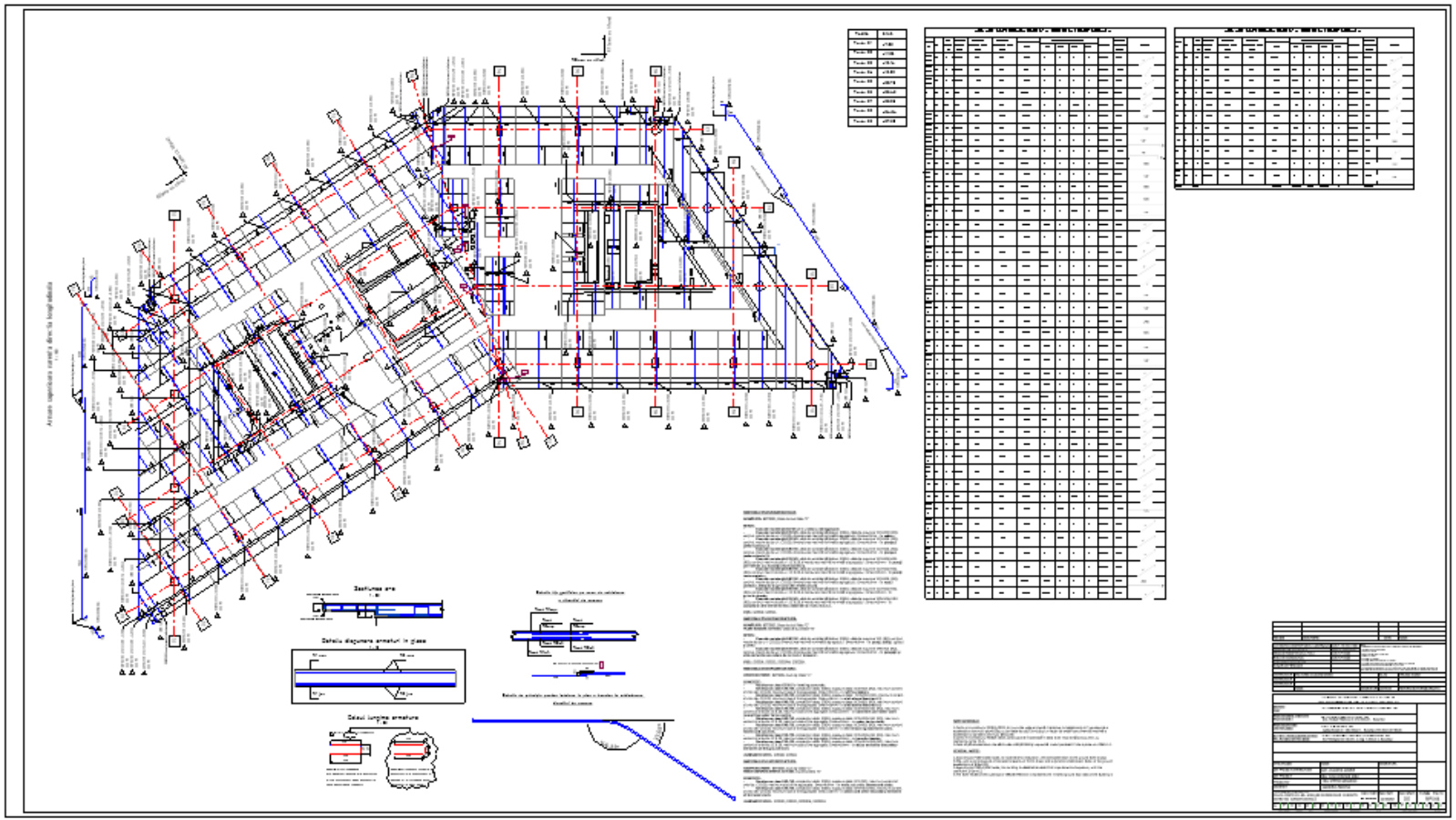
- **LOD 300**
- **LOD 350**
- **LOD 400**

- Slab reinforcement and details
- Coupling Beam complex reinforcement for seismic zone
- Reinforcement collision avoided



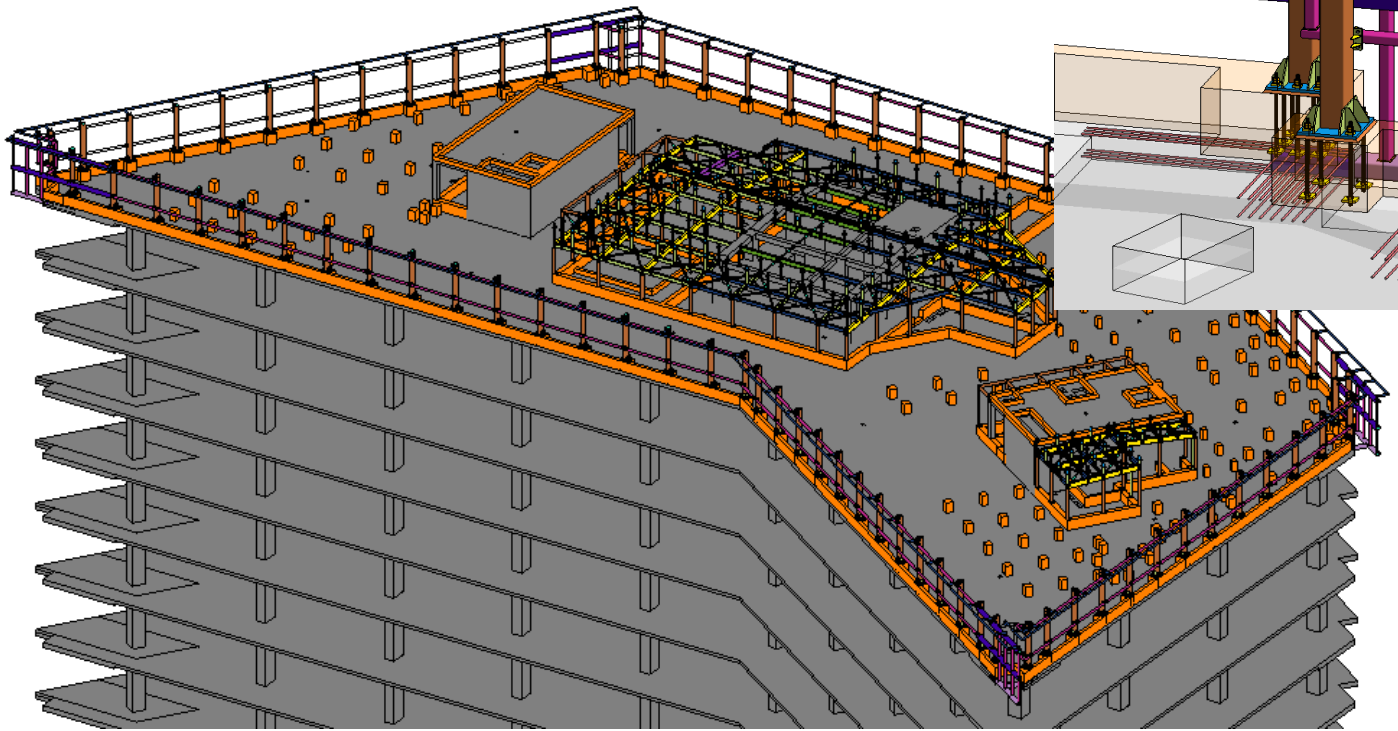


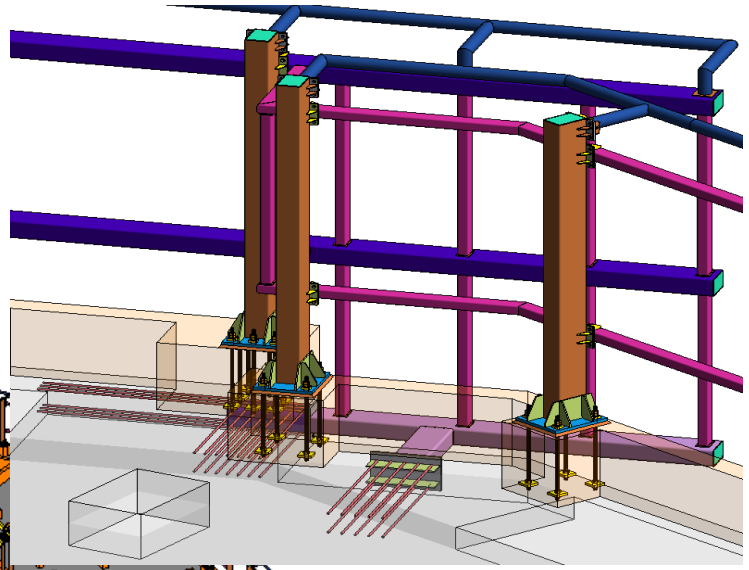


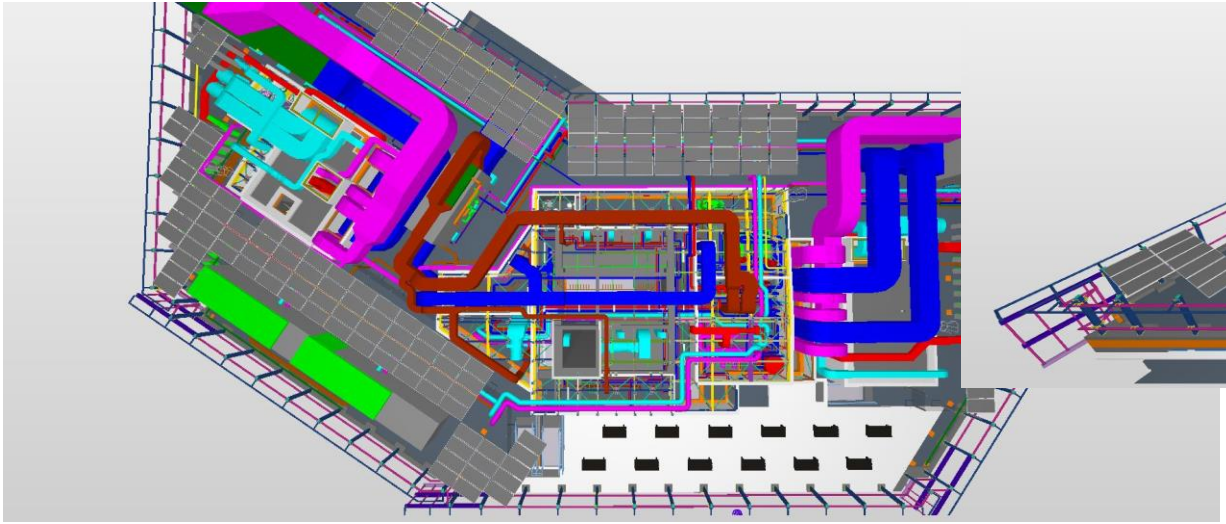


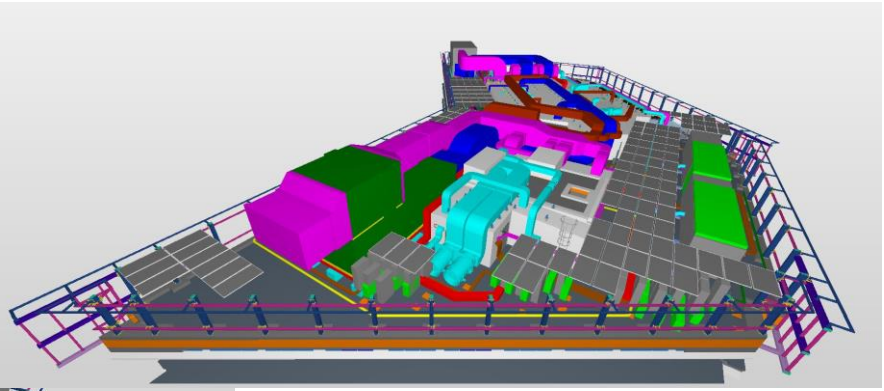
- Slab Execution Drawing

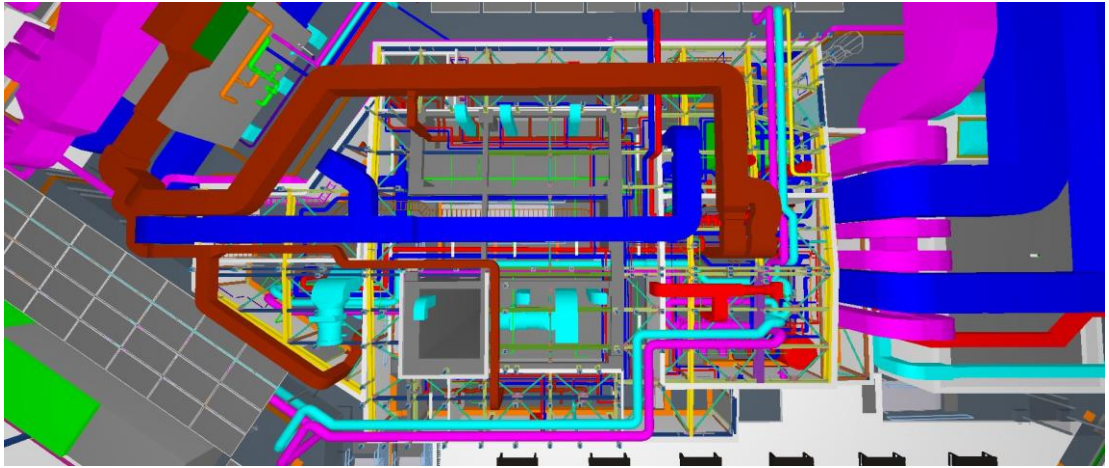
- Clash detection
- IFC usage for coordination





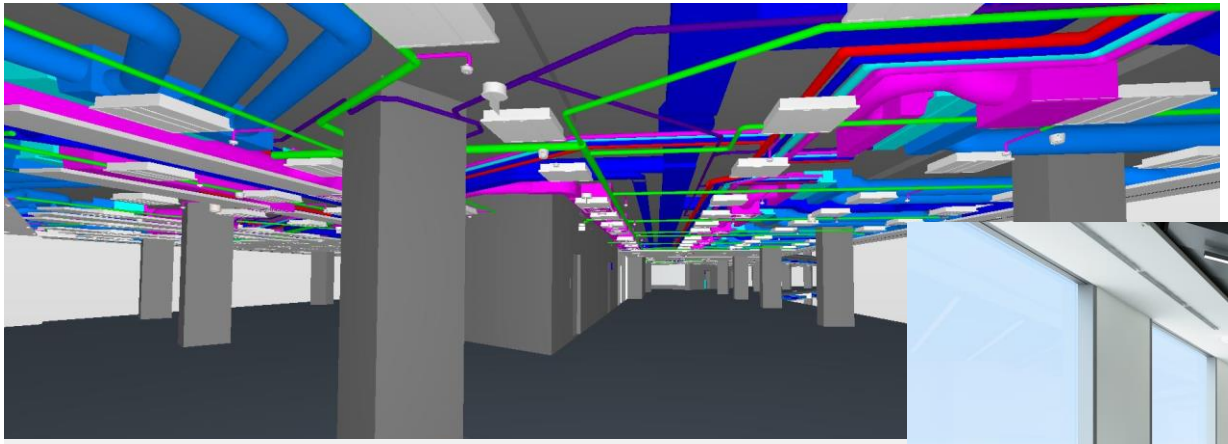


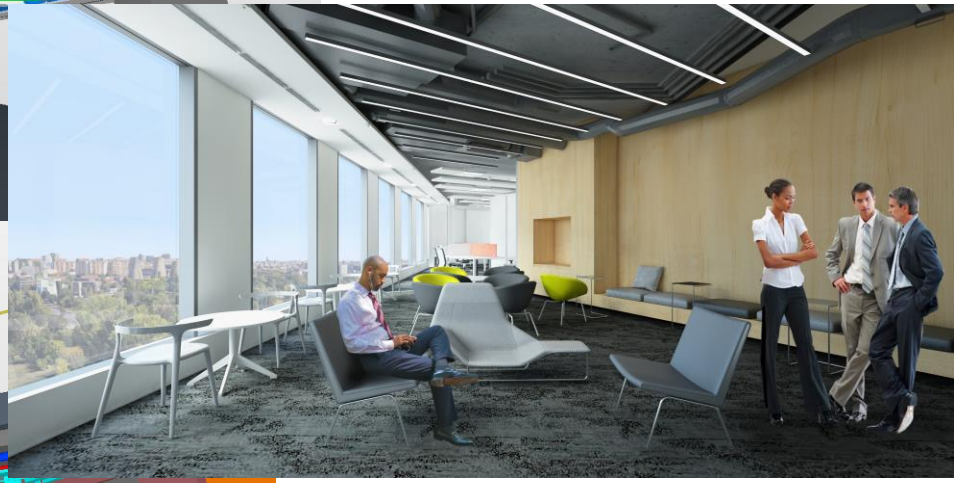


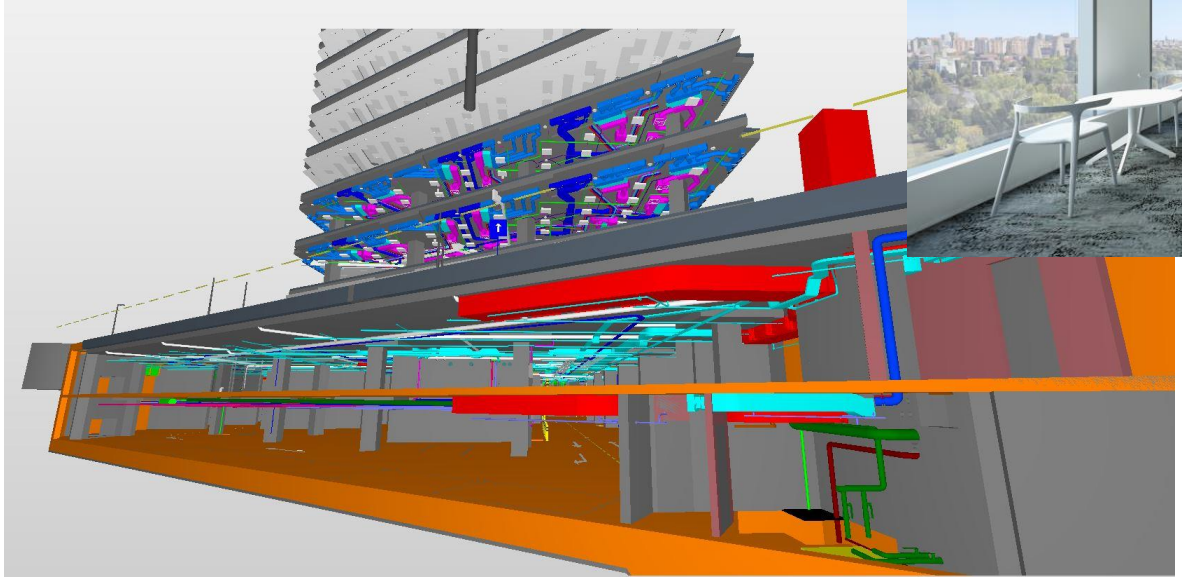


Advanced design and coordination using:

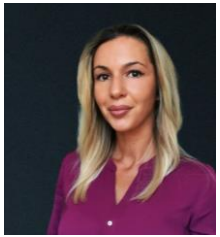
- Revit
- MagiCad
- Navisworks
- Graitec PowerPack







Popp&Asociații Advanced Revit Users



Ana-Maria Suliman

- Advanced Revit user
- Autocad Expert

Nina Ilie

- Experience Revit user
- Autocad Expert

Rodica Botîrcă

- Advanced Revit user, team player

Gabriela Furcela

- ≥ 40 years as draftsman experience
- Revit expert
- Team leader, mentor

Claudiu Burcă

- Experience Revit user
- Advanced skills in collaborate design

Mihaela Matei

- Advanced Revit user
- Autocad Expert

Bogdan Ghiță

- Experience Revit user
- Advanced skills in collaborate design