AEC10342: Design-driven 3D Rebar in Revit Structure with automated drawings and schedules

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Comfort and Safety

- Emergency Exits
- Mobile / Cell Phones ➔ silent!
- 1 Hour Session

- Enjoy 😊
Class summary

- Structural engineers use many object-level design tools to effectively perform their designs.
- These tools can range from off-the-shelf structural design software to simple spreadsheets.
- As Building Information Modeling (BIM) adoption grows and general-purpose structural frame analysis software is being integrated with BIM workflows, connecting object-level design tools are not.
- There is an opportunity to drive BIM design information from these design tools in order to better streamline and connect engineer to BIM workflows.
- GRAITEC's Revit-based software will bridge this gap between engineers and designers to get real benefit from BIM for RC structures.
Key learning objectives

At the end of this class, you will be able to:

- Start from an Autodesk Revit® model and see how to import and manage FEM results
- Complete structural design assumptions in Revit®!
- Design reinforced concrete members in Revit®
- Get the 3D structural rebar, drawings and reports automatically produced in Revit®
- Effectively manage design changes in Revit®
- Publish all the information in A360
- **30 years** expertise developing CAD, BIM and Design solutions for **structural engineers and designers**

- **25 offices in** USA, Canada, UK, France, Germany, Italy, Czech Republic, Romania, Russia, Poland

- **Global coverage** with authorized reseller network

- One of the **biggest worldwide Autodesk partners**
Established software developer of high performance BIM Solutions

Full portfolio of Autodesk products and BIM suites

Deliver technology solutions and customer success services

AEC, Manufacturing and Infrastructure markets globally
Connected BIM Workflows

- ADVANCE Design
- REVIT
- Autodesk Advance Steel
- Autodesk A360
- ArchiWizard
Workflows
Traditional Workflow: Engineer to Designer

Engineers
- FEM Software
- Revit
- AutoCAD
- Excel / Hand Calc’s

Drawings
- Geometry: .rvt
- 3D DWG
- Solids
- IFC
- ...

Designers
- Revit
- AutoCAD
Typical BIM Workflow
Get FEM results in Revit®
Get the FEM results in Revit®

- You need to download and install the GRAITEC BIM Connect
Get the FEM results in Revit®

- And also to download & install the “Structural Analysis Toolkit” for Revit®!
Get the FEM results in Revit®
SHOW TIME
Summary – Getting FEM Results in Revit®

- Manually apply loads to Revit model
- Synchronization of model, loads & design changes
- Benefit from Autodesk Cloud services
- Sophisticated intelligent ‘BIM Workflow’!
Creating 3D rebar and drawings using out-of-box tools
Creating 3D rebar & drawings in Revit
Creating 3D rebar & drawings in Revit

- Revit is a powerful tool for managing the analytical model (manually or automatically)
- New in 2015/2016 tools facilitate creation of 3D rebar
- Repetitive process for creating:
  - 3D rebar model
  - Drawing views
  - Sheet layouts
  - (even with 3rd Party Apps)
- Rebar results are independent of the engineers design!
Introducing GRAITEC RC BIM Designers...
Introducing GRAITEC RC BIM Designers...
SHOW TIME
Summary - GRAITEC RC BIM Designers…

- Integrated Design capability
- Local Design Codes
  - Euro Codes + National Annex / US Codes / Canadian Codes / …
- Automated design and creation of 3D Rebar based on ‘actual’ loads saved in the model
- Standard & Customizable Design Reports
- Customizable Country Specific Defaults & Templates for Drawing Views and Sheet Layouts
BIM Designers in a Multi-platform workflow
Same Solution for Multiple Platforms
Same Solution for Multiple Platforms
Summary – Multiple Platform BIM Designers

- Supports multi-user and multiple workflow scenarios
- Transfer and management of sophisticated engineering data in any direction
- Plugged-in at any stage of the project process
- Streamlined intelligent Structural BIM workflows
- Automate downstream processes… document creation, etc.
Publication of the documents in A360®!
<table>
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<tr>
<th>Solutions</th>
<th>A360 VIEWER</th>
<th>A360 DRIVE</th>
<th>A360 TEAM</th>
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<tbody>
<tr>
<td>Customer needs</td>
<td>Visualization, sharing and communication</td>
<td>Individual cloud storage and sharing platform</td>
<td>Project team collaboration platform</td>
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<td>Storage</td>
<td></td>
<td>5GB (25GB if existing Subscription)</td>
<td>10 GB / member (pooled at Team level)</td>
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<td>Platform (localized)</td>
<td>Web (not localized)</td>
<td>Web (localized)</td>
<td>Web (not localized) and mobile apps (iOS &amp; Android-localized)</td>
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<td>Main features</td>
<td>Upload from desktop, Dropbox, Box and Google drive</td>
<td>Access from AutoCAD, Inventor, 3DS Max</td>
<td>Collaboration on projects</td>
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<td>View 3D et 2D models</td>
<td>Integrated to AutoCAD 360</td>
<td>Messages, project calendar, polls, wiki pages</td>
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<td>Print</td>
<td>Organized data (versioning)</td>
<td>Organized data (versioning, tags)</td>
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<td>Share model (1 month link validity)</td>
<td>Object properties (from the model)</td>
<td>Search and comment the objects from the model</td>
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<td>Discussion</td>
<td>Comments on files / models</td>
<td>Manual synchronization with A360 DRIVE</td>
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<td>Automatic synchronization desktop – cloud</td>
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<td>Activity history</td>
<td>Update alerts</td>
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<td>Update alerts</td>
<td>Box, Dropbox and Buzsaw integration for mobile apps</td>
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</table>

Professional Viewer (LMV): Large Model Viewer for more than 100 file formats (including Revit models).
SHOW TIME
Summary – Publication in A360®

- Easily store and share your data with all stakeholders with A360 Drive®
- Dedicated functionalities in Revit® to publish in A360®.
- Manage project activity in the cloud with A360 Team®
- Access your data from different devices: computer, mobile, tablet…
- Streamlined intelligent BIM workflow
- Automate downstream processes… document creation
Connected BIM Workflows
Data(bases) linked to Models
- In the near future…
What about other types of geometry?
What about other types of geometry?

- Class ES9949: Design –Driven 3D reinforcement generation in Revit® - Wednesday 1st at 1PM
- Class 11025: BIM ready fabrication for 3D rebar cages – Wednesday 1st at 3PM
Conclusion
GRAITEC RC BIM Designers Bring disruptive changes to the industry:
GRAITEC RC BIM Designers Bring disruptive changes to the industry:

- Analysis results are part of the BIM model (workflow)
- Engineers can take design decisions (Country code driven) in the Design environment (Revit)
- Engineers and Detailers communicate via a connected Model, not drawings (thanks to RC BIM Designer)
- Detailers do not need to create drawings (or models) from scratch
- Drawings do not need to be recreated when a design changes
- Take advantage of Cloud services for documents, models (also for revision to support traditional 2D review/approval workflow)
Session Feedback

- Via the Survey Stations, email or mobile device
- Best to do it right after the session
- Instructors see results in real-time