Oasys | STRUCTURAL

IStructE

Innovative Engineering for Repetitive Structures

Transform repetitive design into creative opportunity - making everyday engineering more efficient and inspiring with Oasys Structural and Grasshopper.

November 2025

Housekeeping

Before we get started

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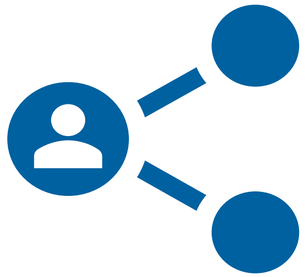
Q&A

Catch up
on-demand



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Repetitive structures are everywhere:
But designing them doesn’t have to be.

Agenda

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Intro
Digital shift – and why you should care
The challenge with repetitive structures
Making the repetitive interesting
Innovating with Oasys-GH
Case studies and other practical applications
Getting started

Speakers

Oasys

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P. Eng.

Head of Structural Products, Associate Director

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CEng MIStructE

Principal Structural Engineer and Product Manager

Shirley Feng

MSc

Application Specialist

Abishek Festus Winston

BE

Support Analyst

Paradigm shift in the industry

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As structural engineers, we're always under pressure to deliver ever faster and more sustainable solutions – all while keeping costs low and quality high.
Especially for repetitive structures, typically perceived as 'easy' and 'straightforward'.

- Fast delivery
- Sustainable
- High quality
- Cost effective
- Data-driven

Digital engineering
x
Structural engineering

The challenge with the repetitive

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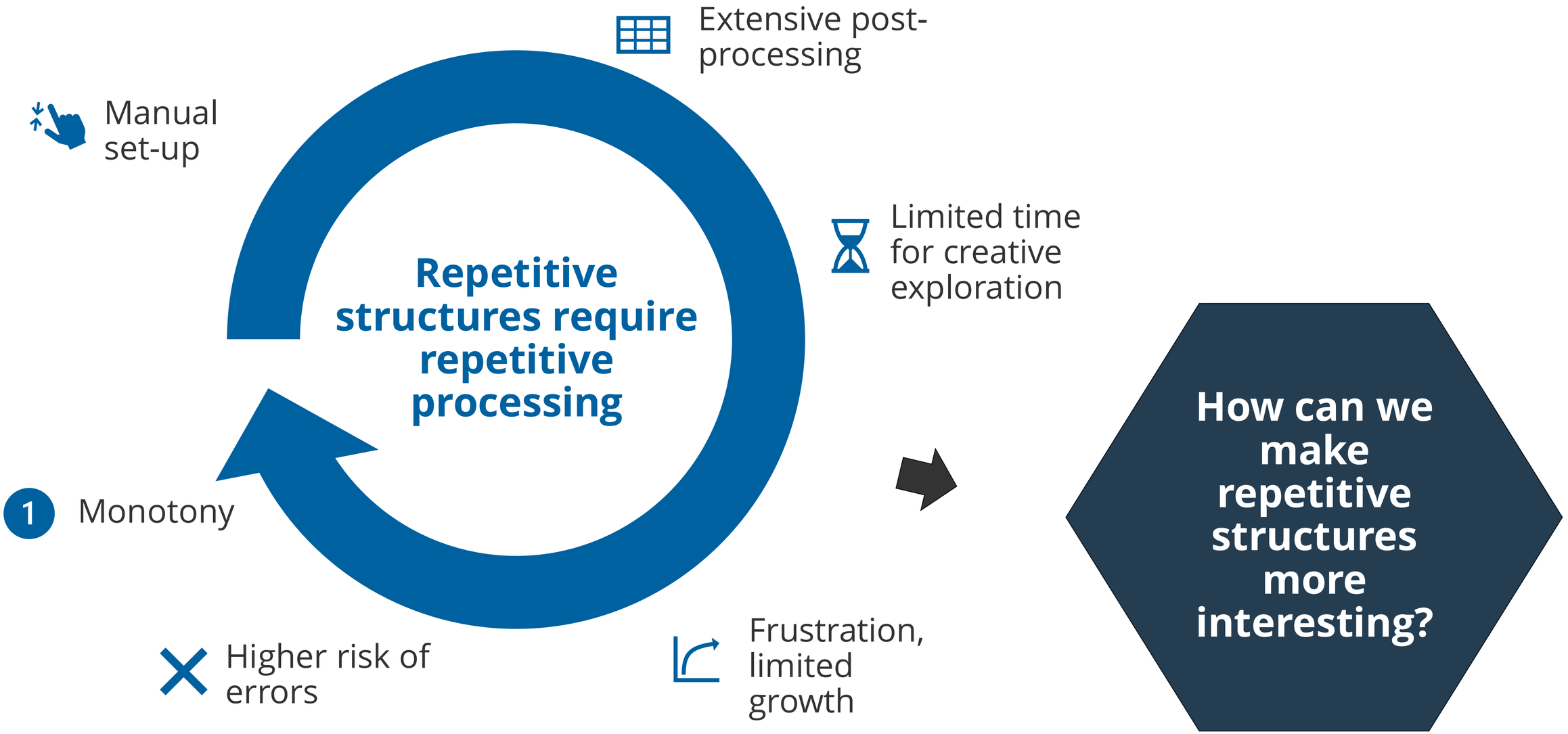

Making the repetitive interesting

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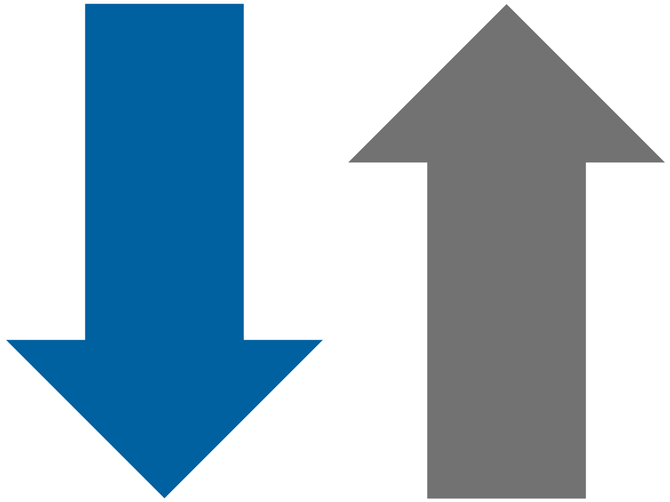
Minimise the time (and the times) you spend:

- **Setting up analysis models**
- **Connecting datasets**
- **Performing the same pre - and post-processing**



Maximise your:

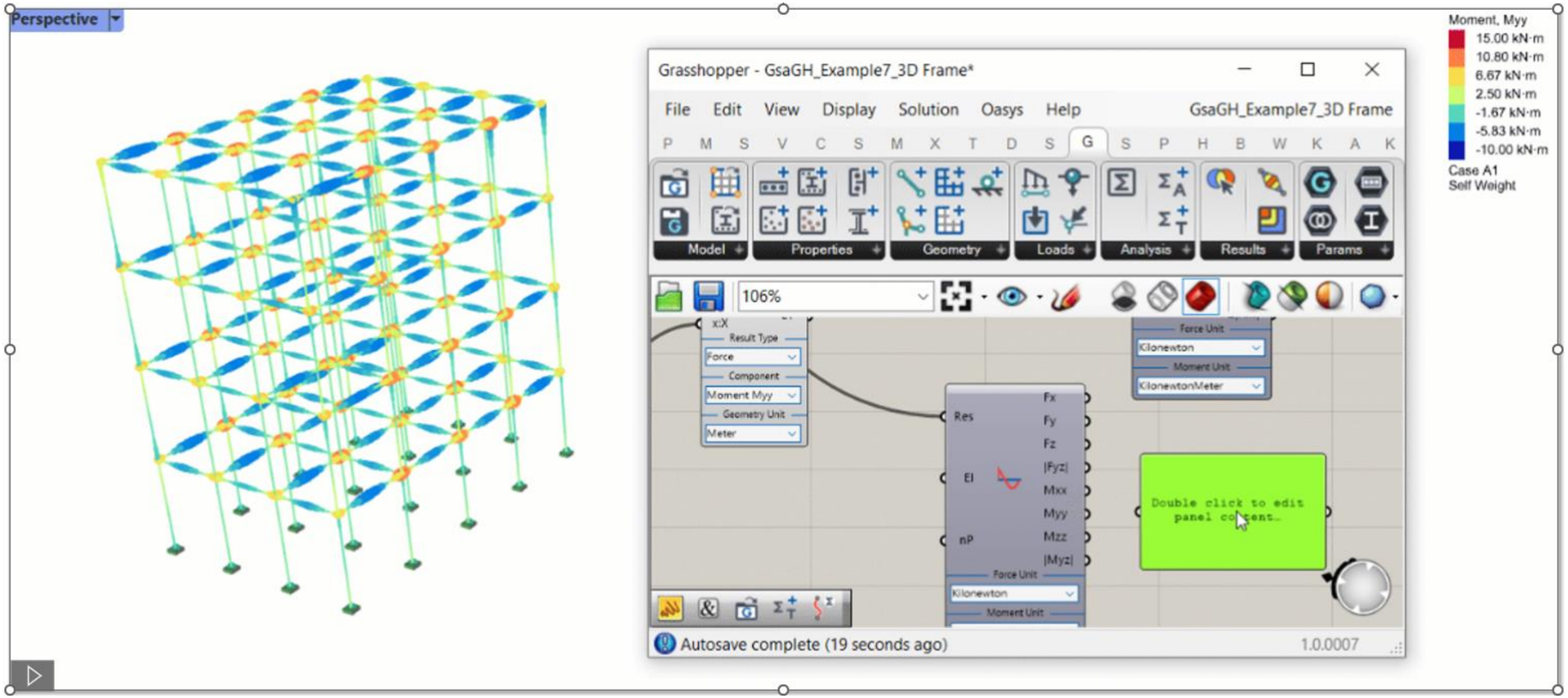
- **Optioneering**
- **Automate metric generation and benchmarking**
- **Visualise your results dynamically**

Grasshopper, when combined with the right tools, offers an easy way for structural engineers to build efficient workflows for the repetitive.

Oasys +  + 

Innovate with Oasys + Grasshopper

Validated structural analysis and design meets parametric design



With the Oasys plugins, you can build and tune models from the Grasshopper canvas. Interesting, intuitive, fast and flexible workflows.

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GSA-GH

AdSec-GH

Compos-GH

Innovate with Oasys + Grasshopper

Oasys

Overview of the Oasys Structural tools: from global analysis to section checks, all accessible from Grasshopper.

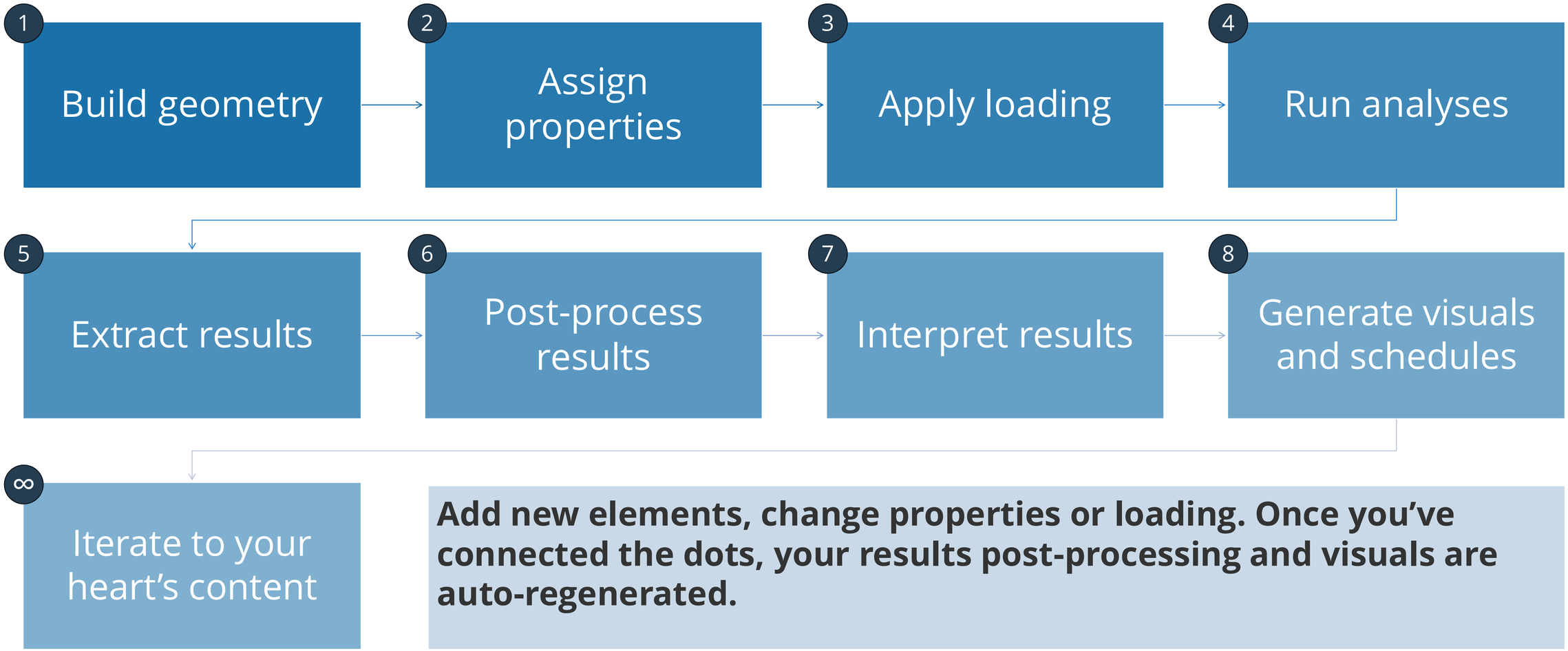
Full structural analysis for frames, bridges and complex structures

Advanced non-linear RC, steel and composite sections

Composite beam design, commonly used for steel-concrete floors

Innovate with Oasys + Grasshopper

Automating with Oasys + Grasshopper is as easy as connecting the dots – ‘dots’ that you can easily reuse in projects again and again



Add new elements, change properties or loading. Once you’ve connected the dots, your results post-processing and visuals are auto-regenerated.

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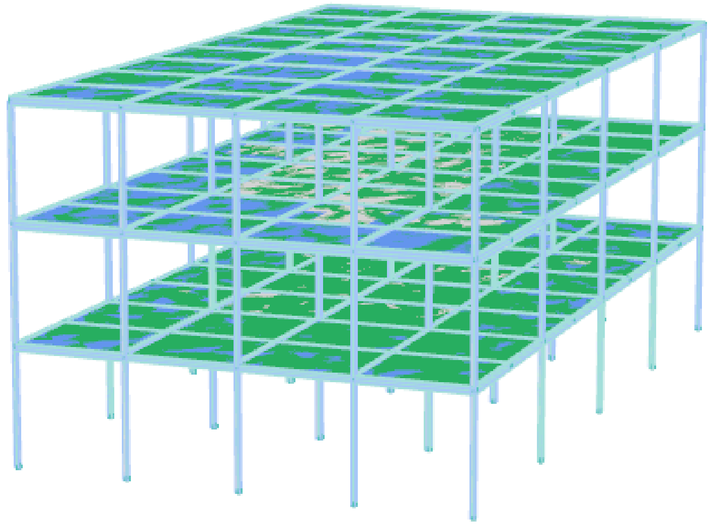
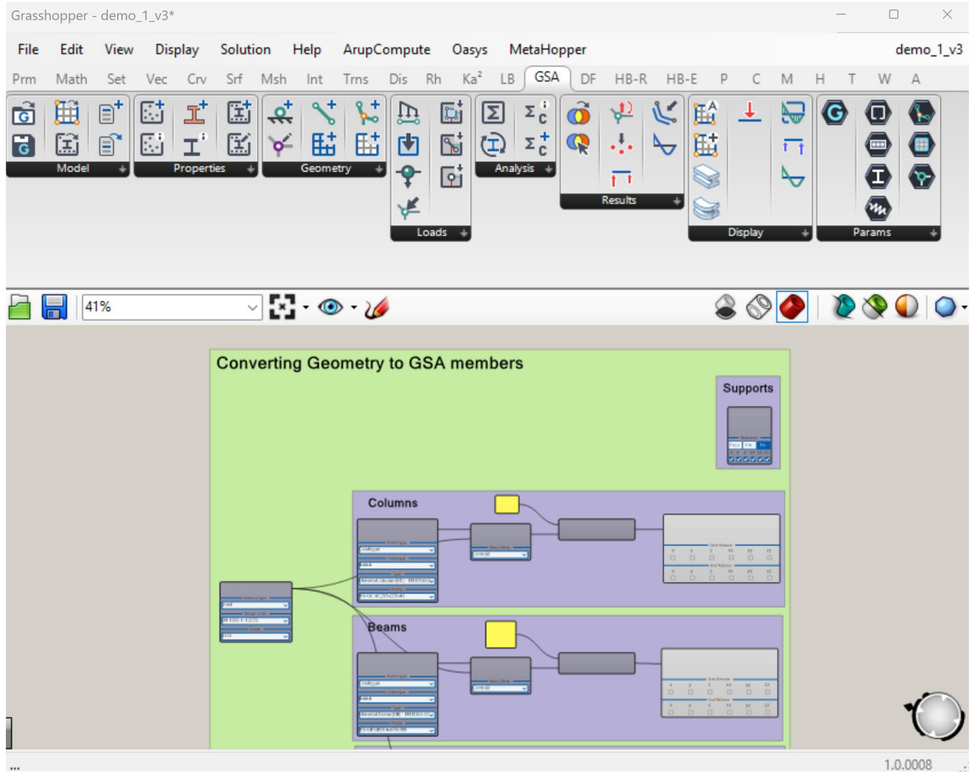
See how it works

Case study | Office building

Parametric workflow with GSA

Moment frame





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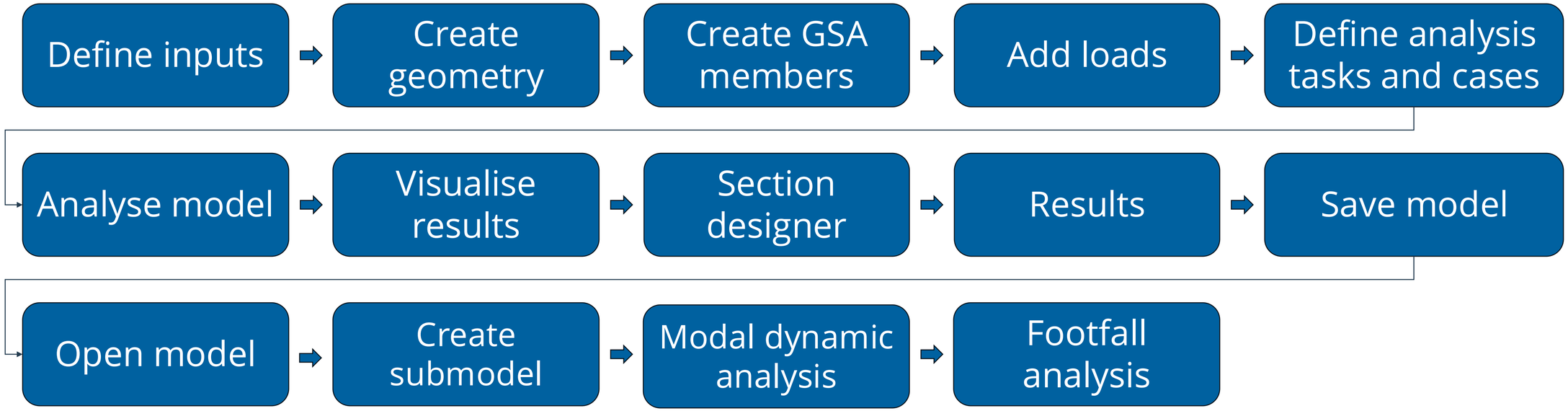
Parametric workflow with GSA



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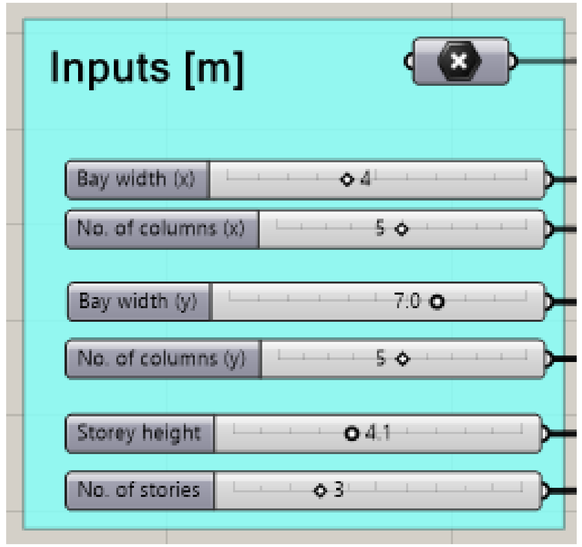
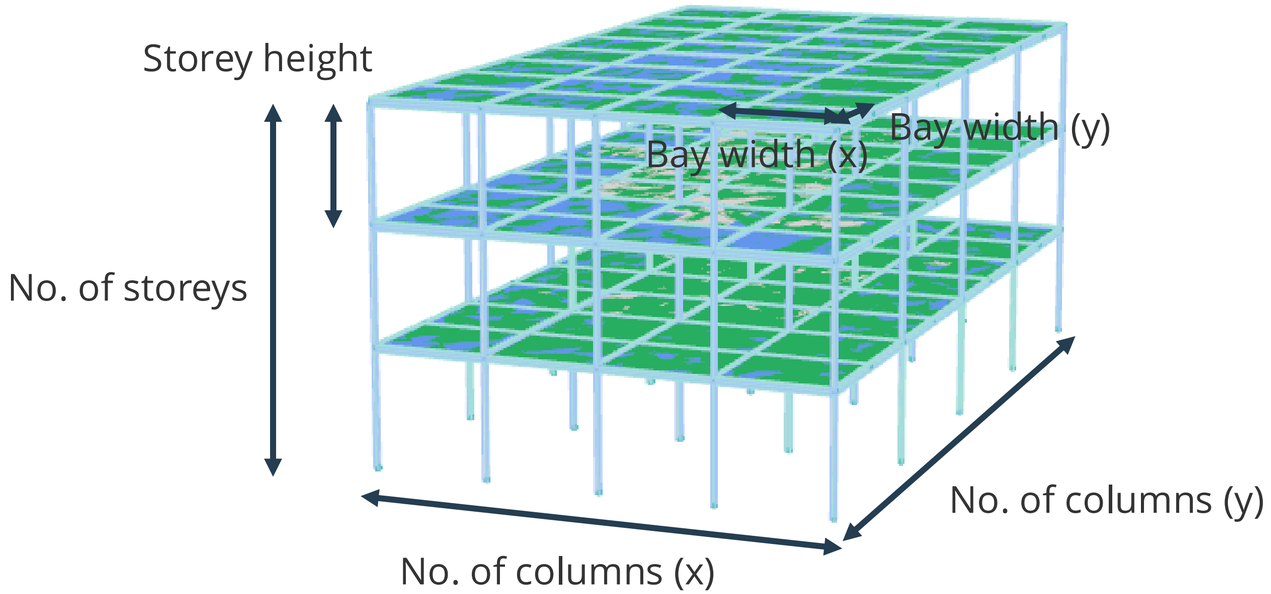
Define inputs



Moment frame



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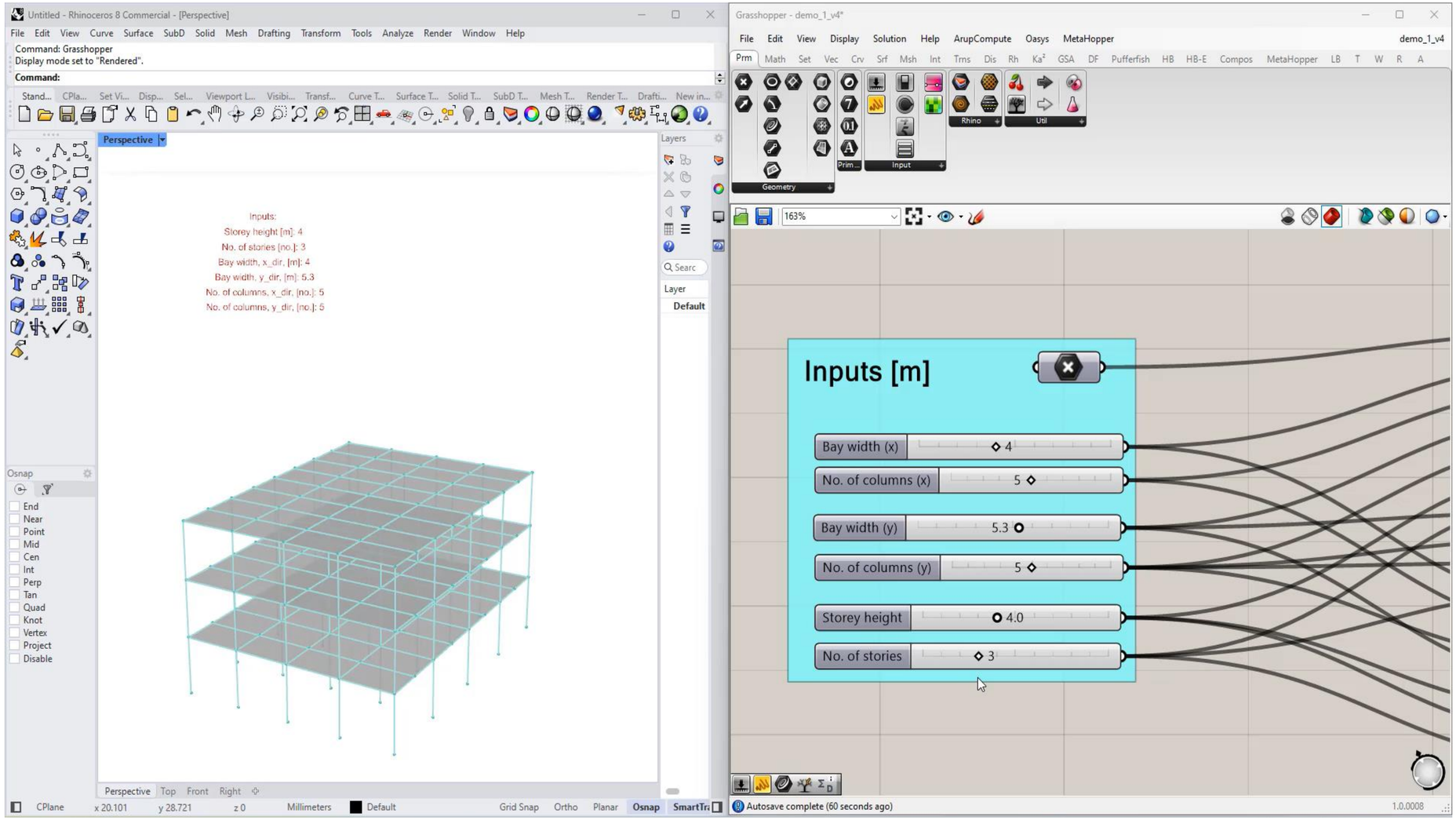
Define inputs



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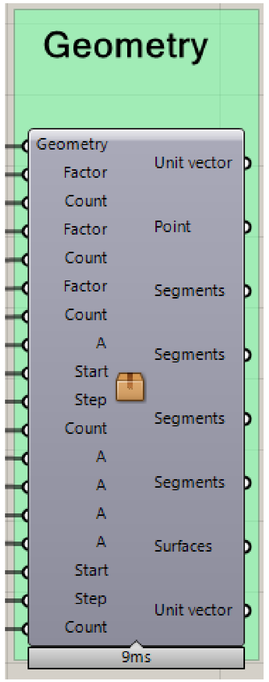
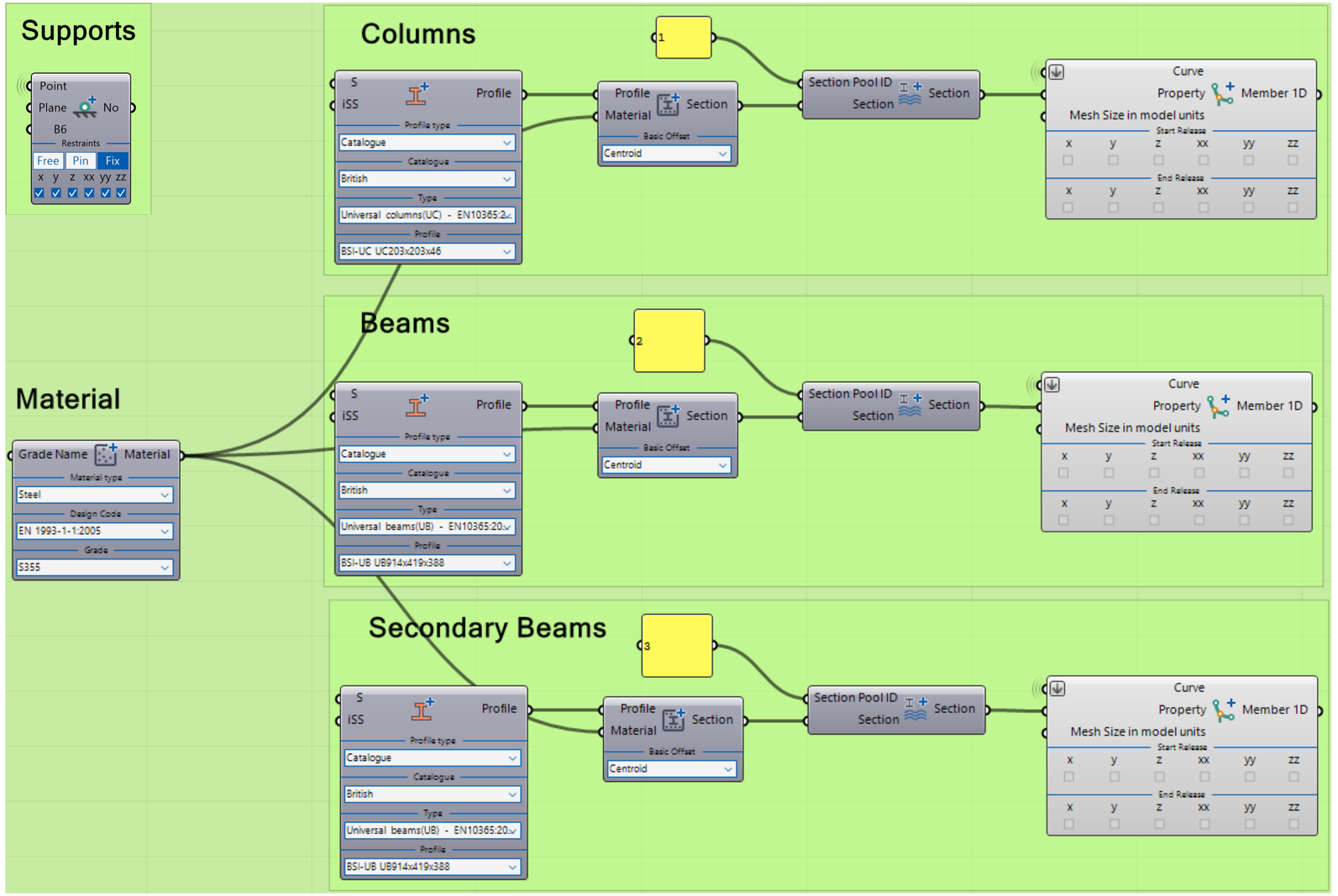
Creating GSA members and boundary conditions





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Creating GSA members and boundary conditions

Inputs:

Storey height [m]: 4.1

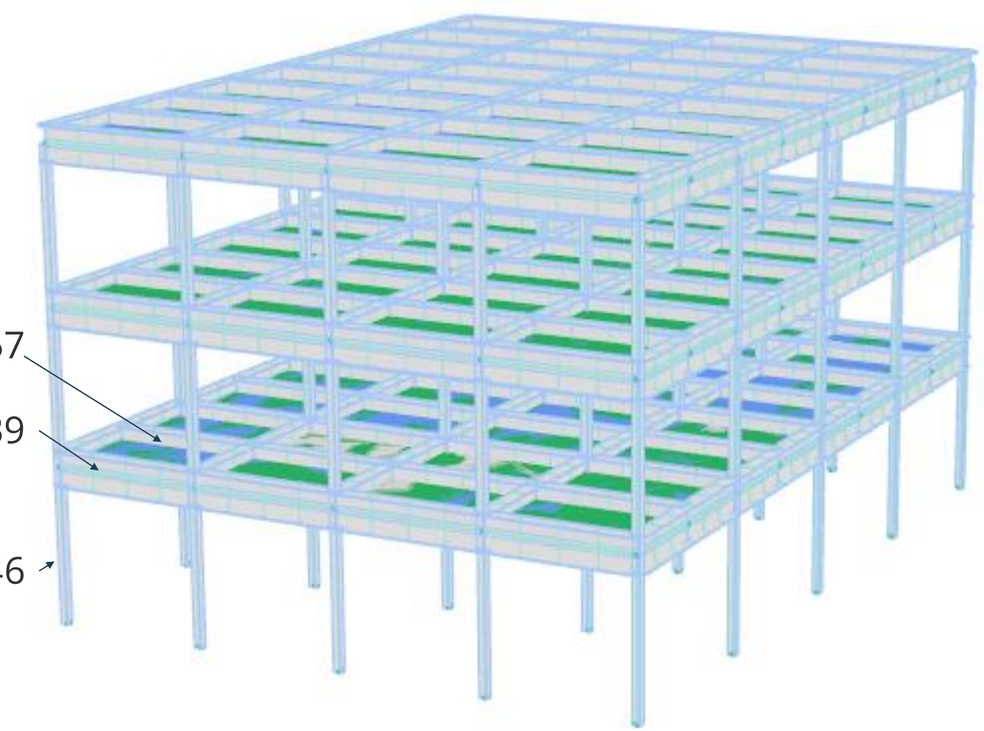
No. of stories [no.]: 3

Bay width, x_dir, [m]: 4

Bay width, y_dir, [m]: 5.3

No. of columns, x_dir, [no.]: 5

No. of columns, y_dir, [no.]: 5



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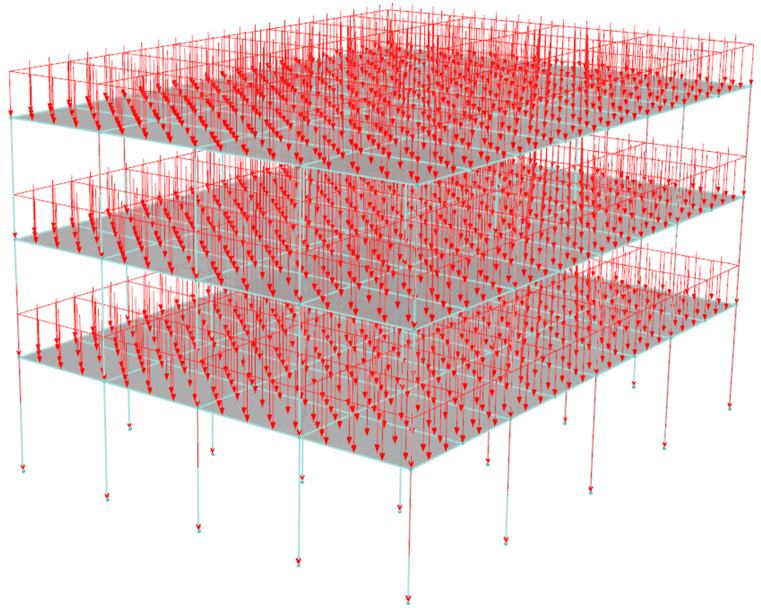
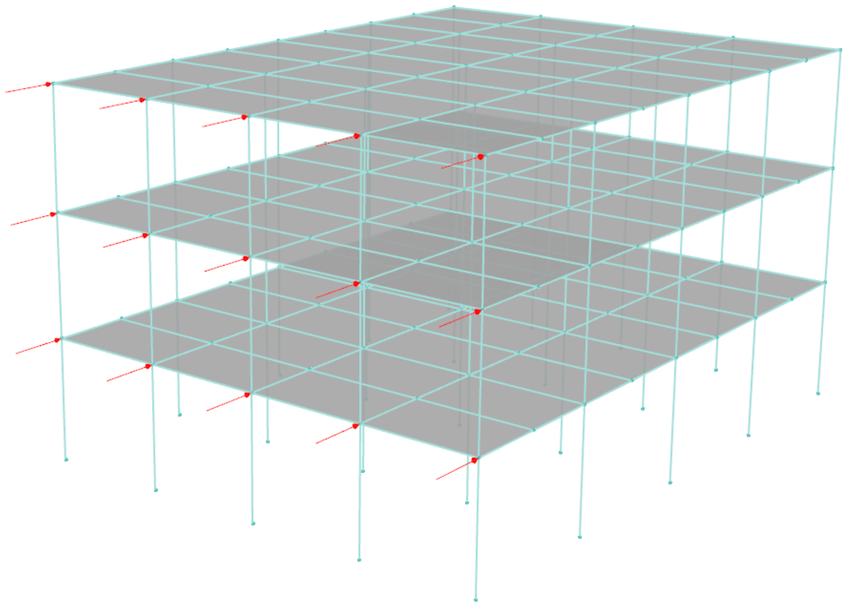
Adding loads

Self-weight



Wind load



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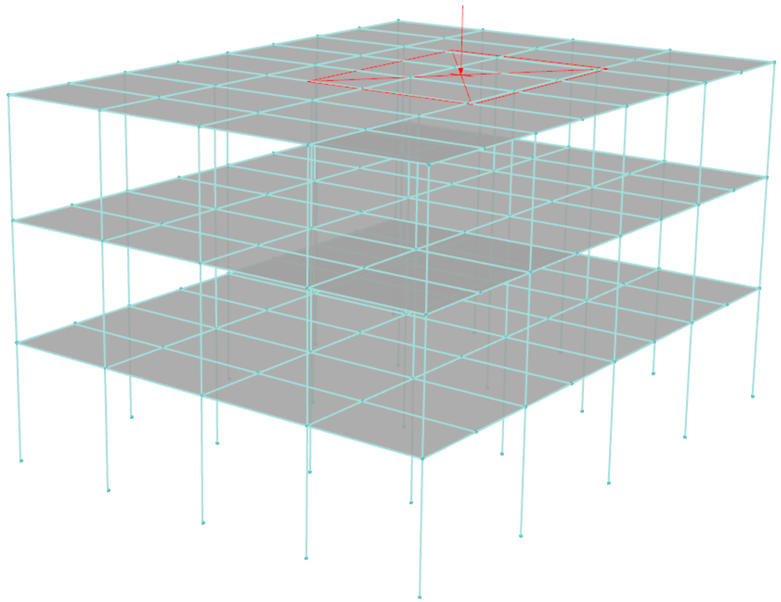
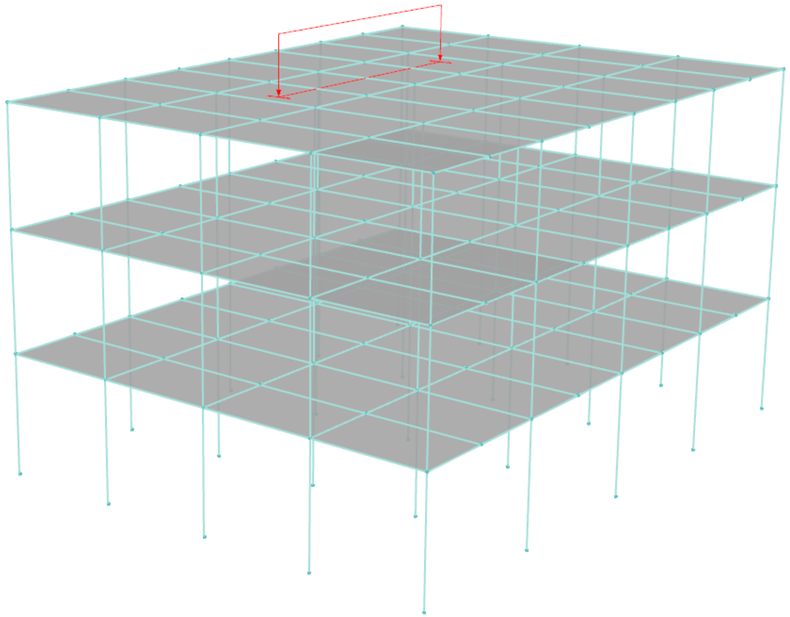
Add loads

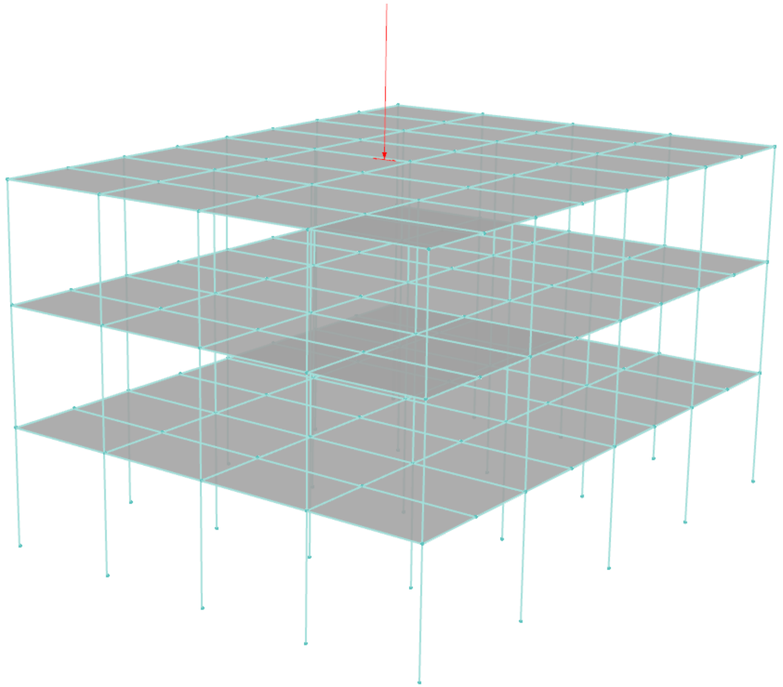
Grid area loads



Grid line load



Grid point load



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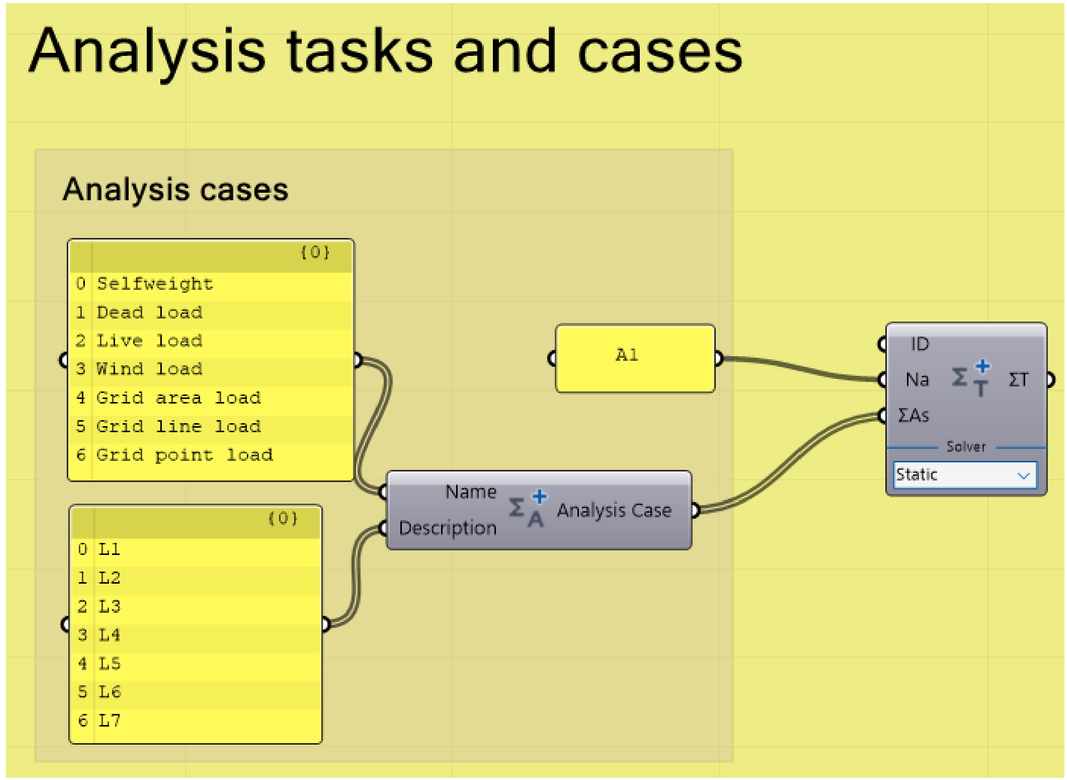
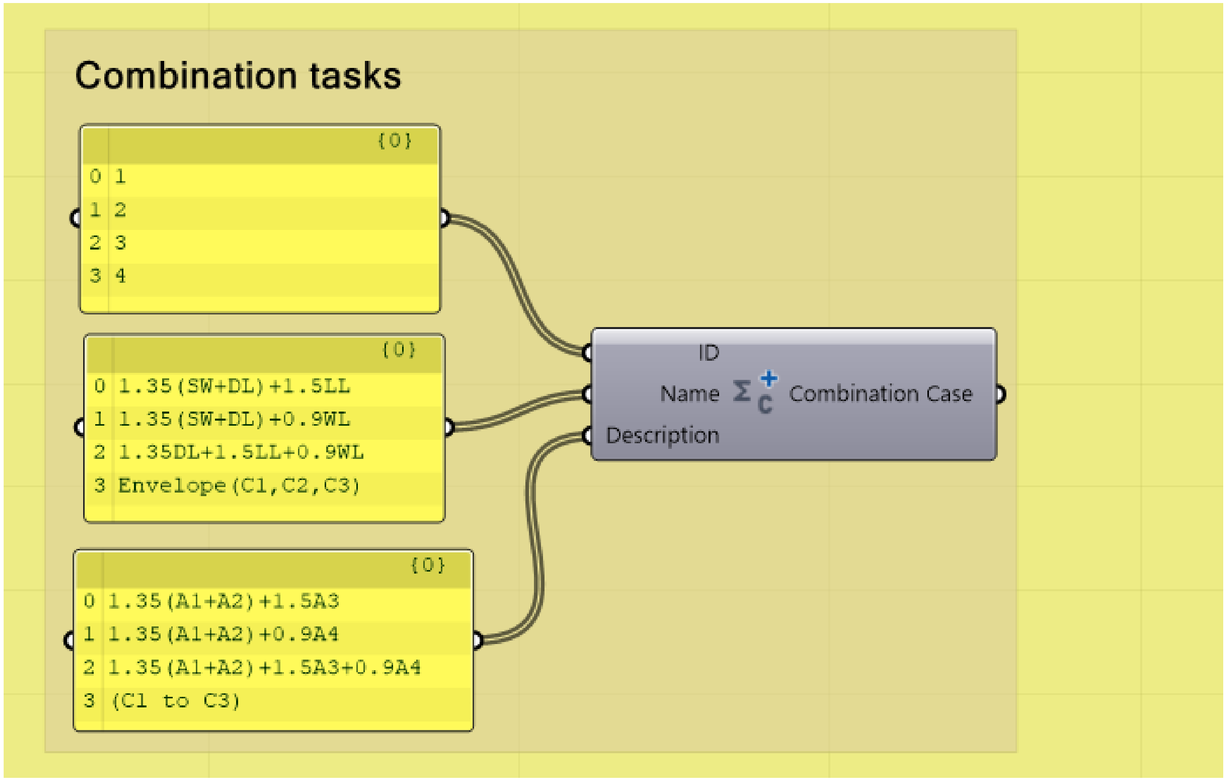
Analysis tasks and cases





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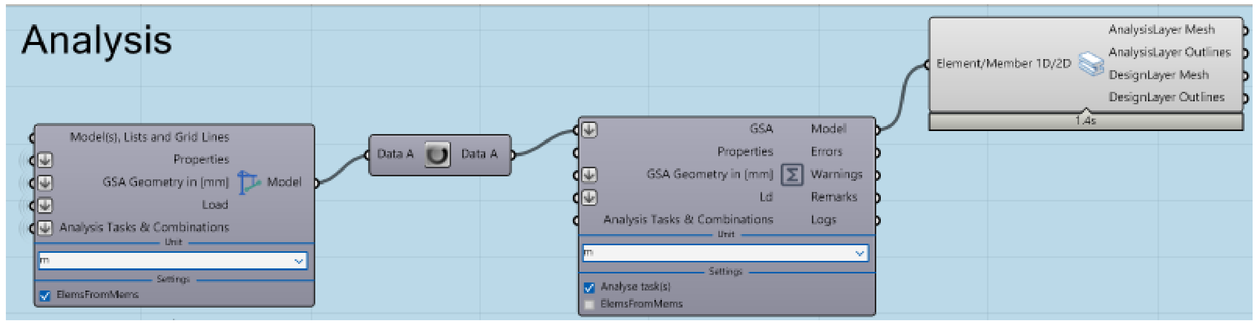
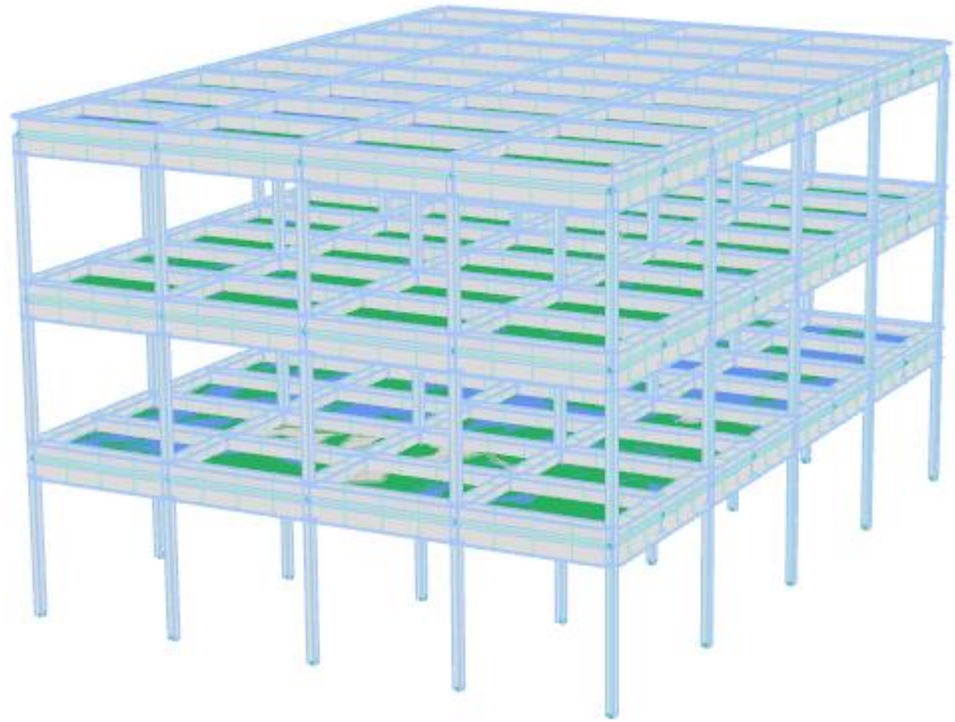
Create and analyse model



Create model

Analyse model



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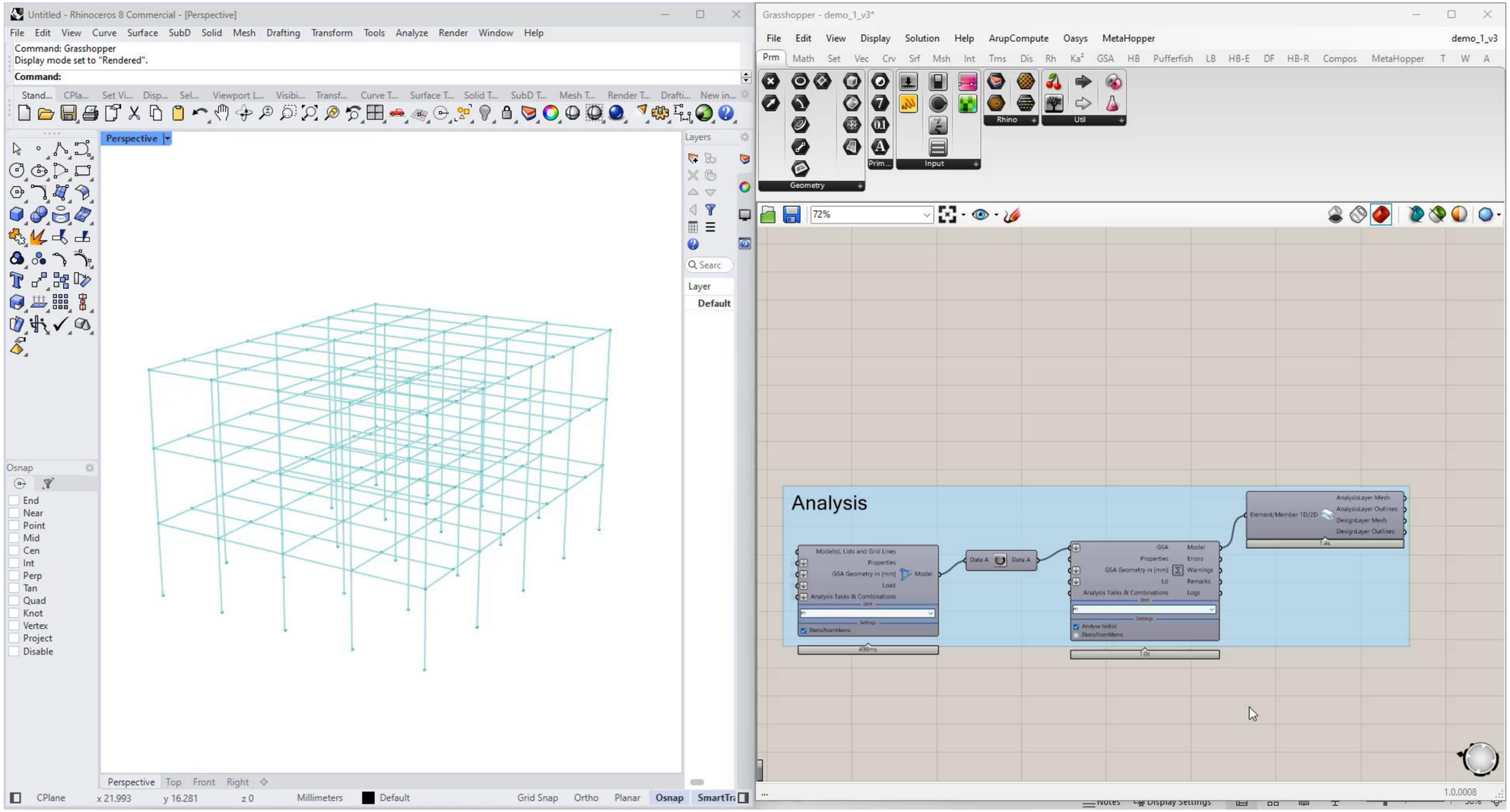
Visualise results



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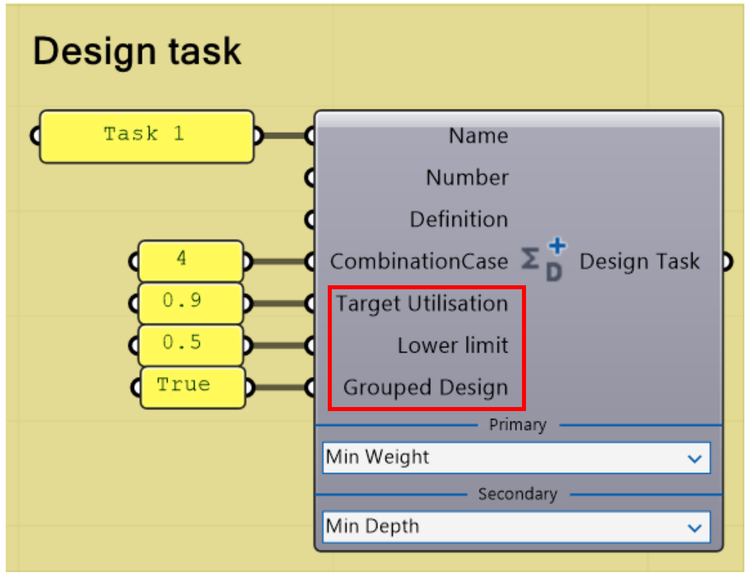
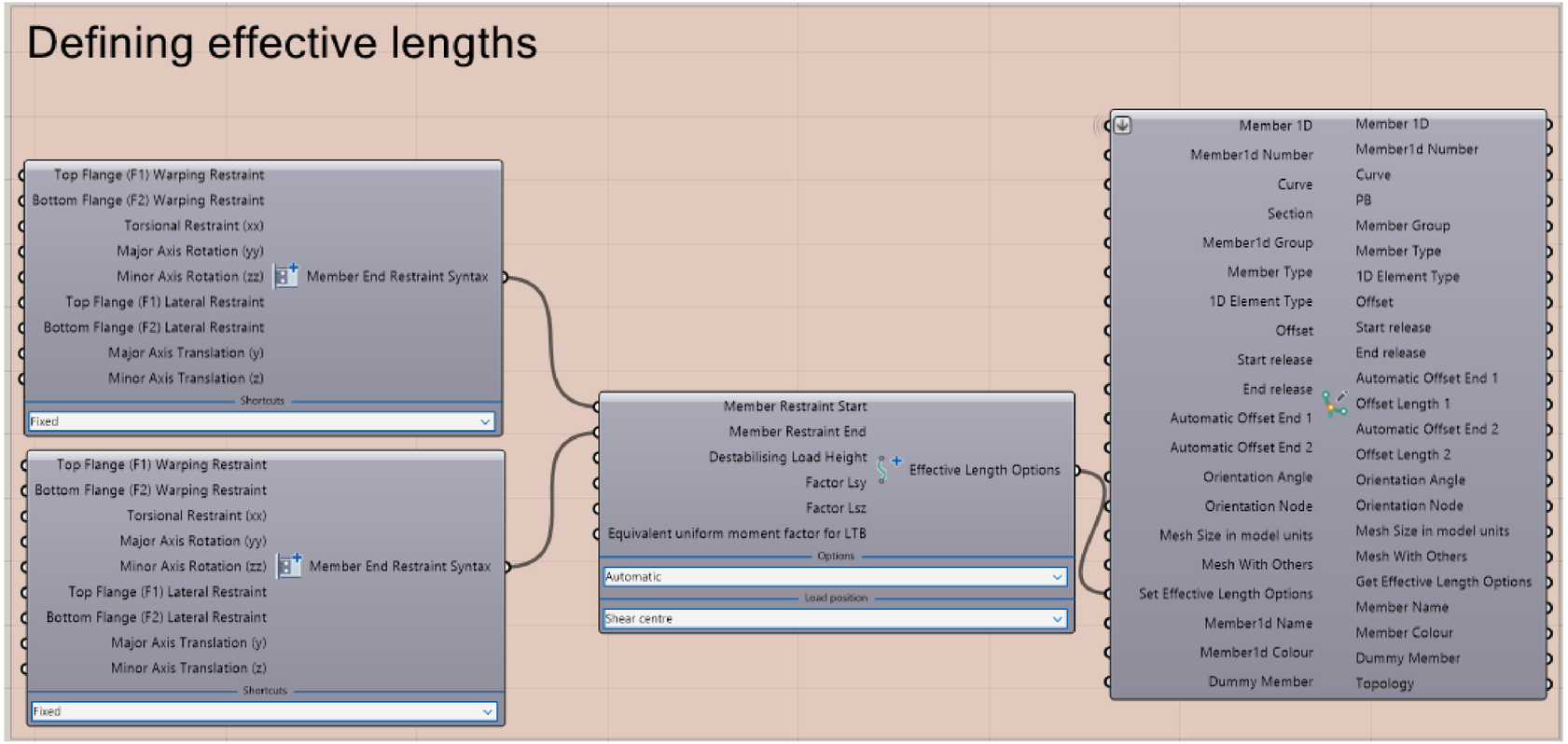
Steel designer





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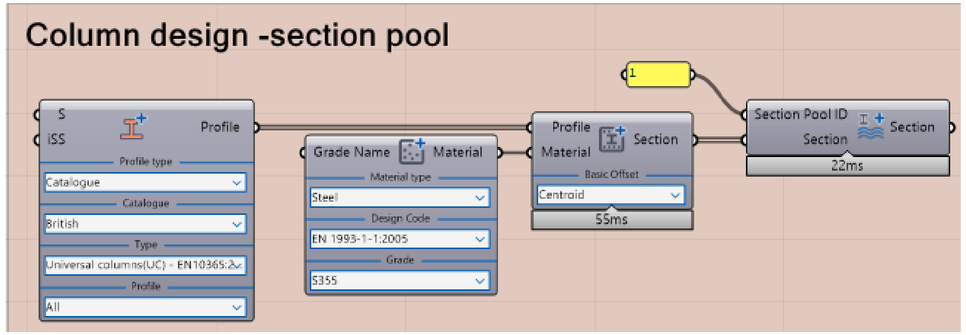
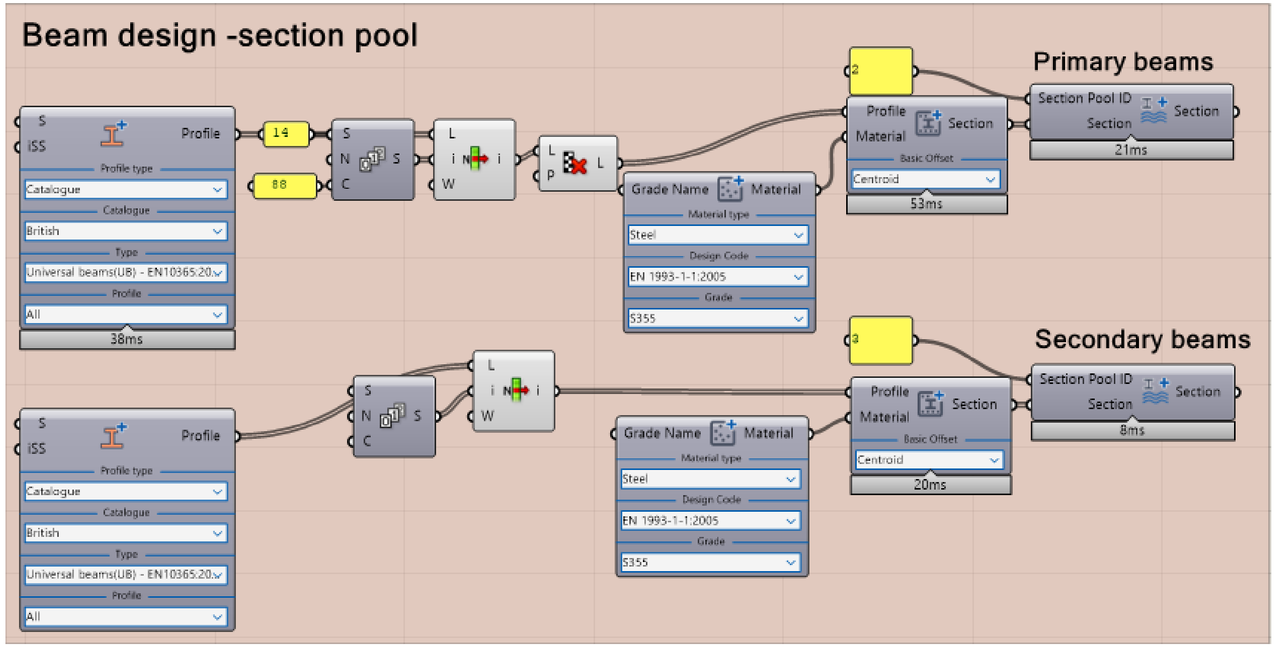
Steel designer





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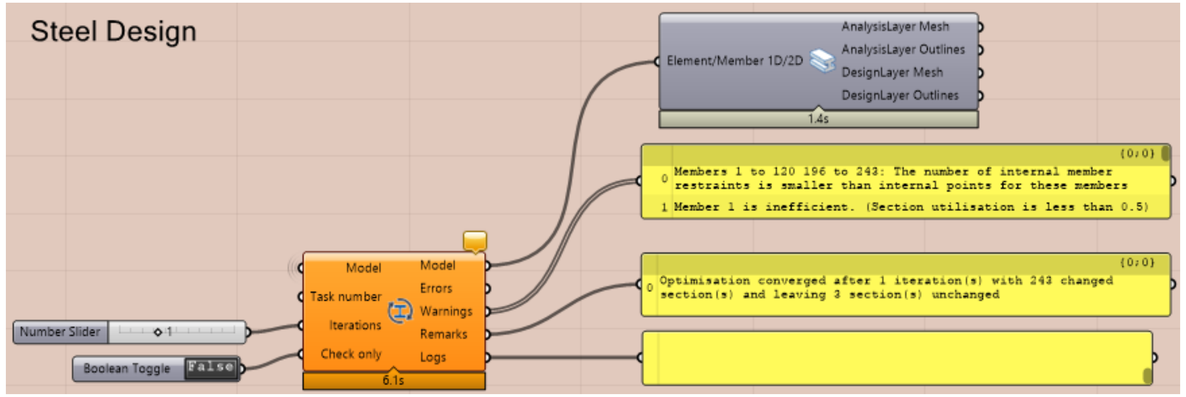
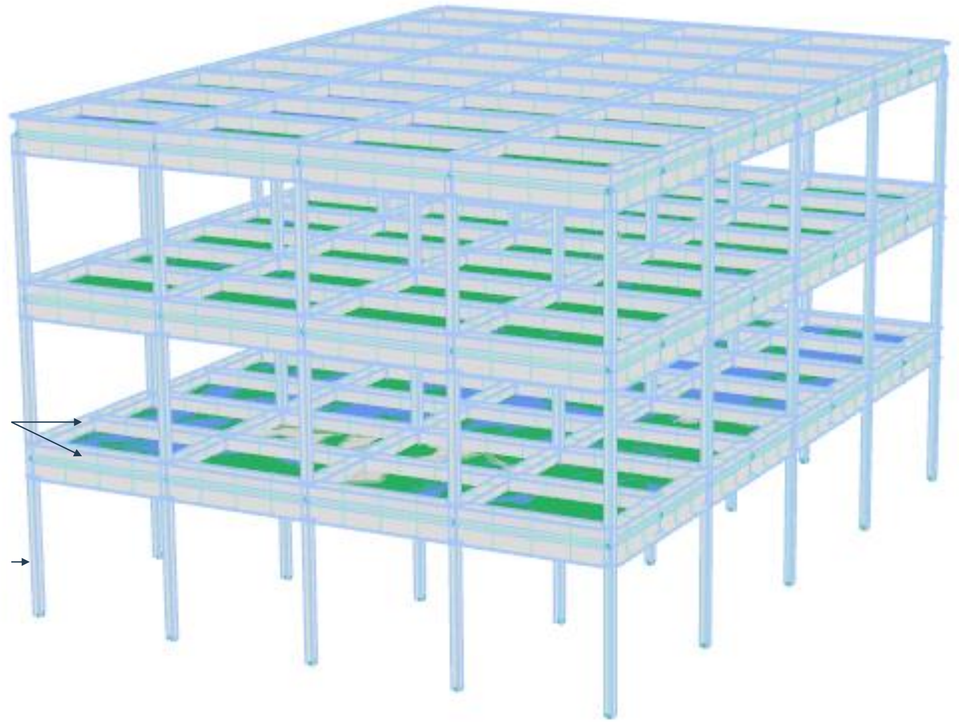
Steel designer



Before Steel design
Max Utilisation: 0.13
Max Deformation: -10.08mm

After Steel design
Max Utilisation: 0.59
Max Deformation: -11.11mm



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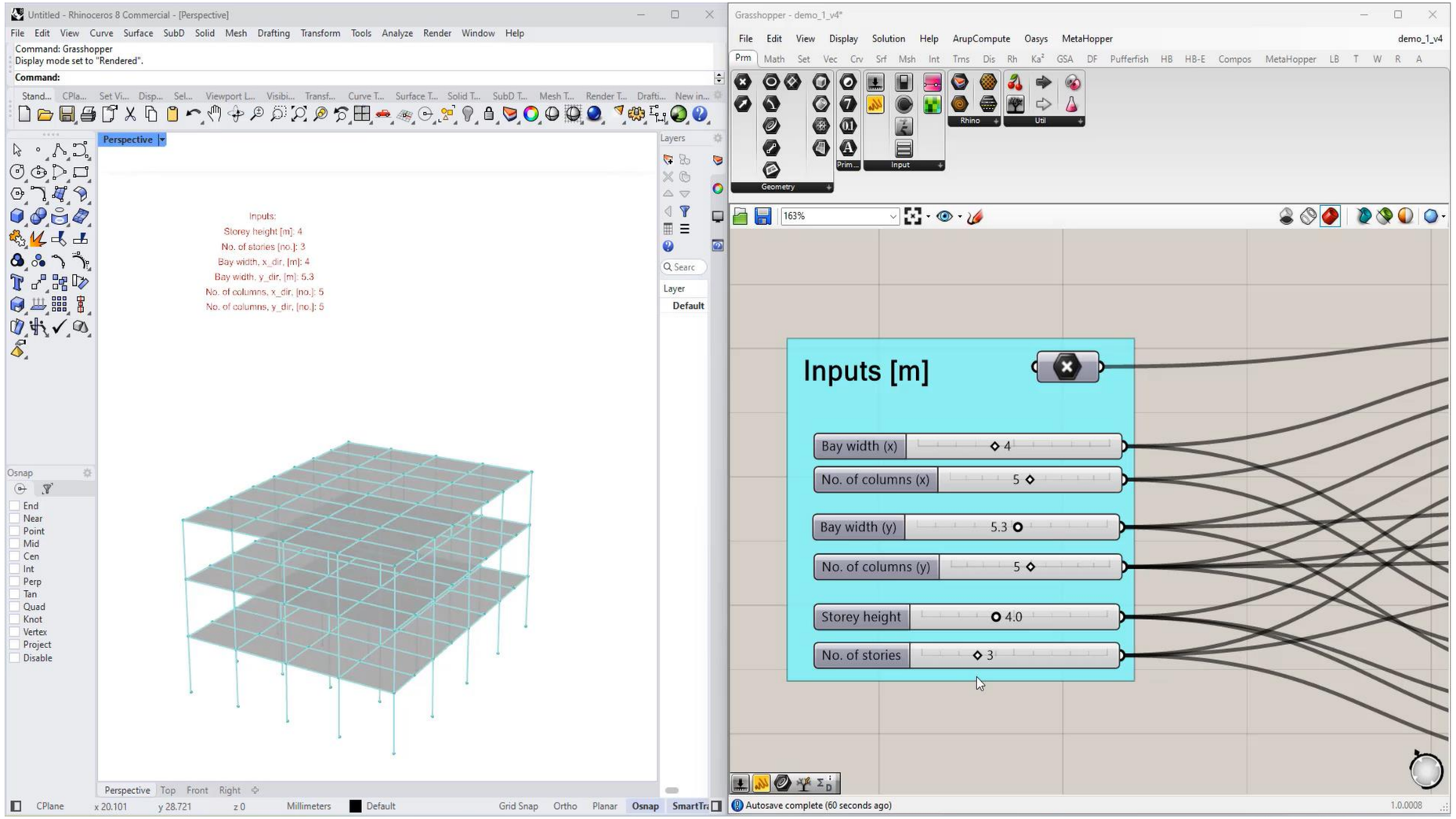
Explore options and get quick results



- Add loads
- Change section
- Add analysis cases
- Change the section pool

...and more

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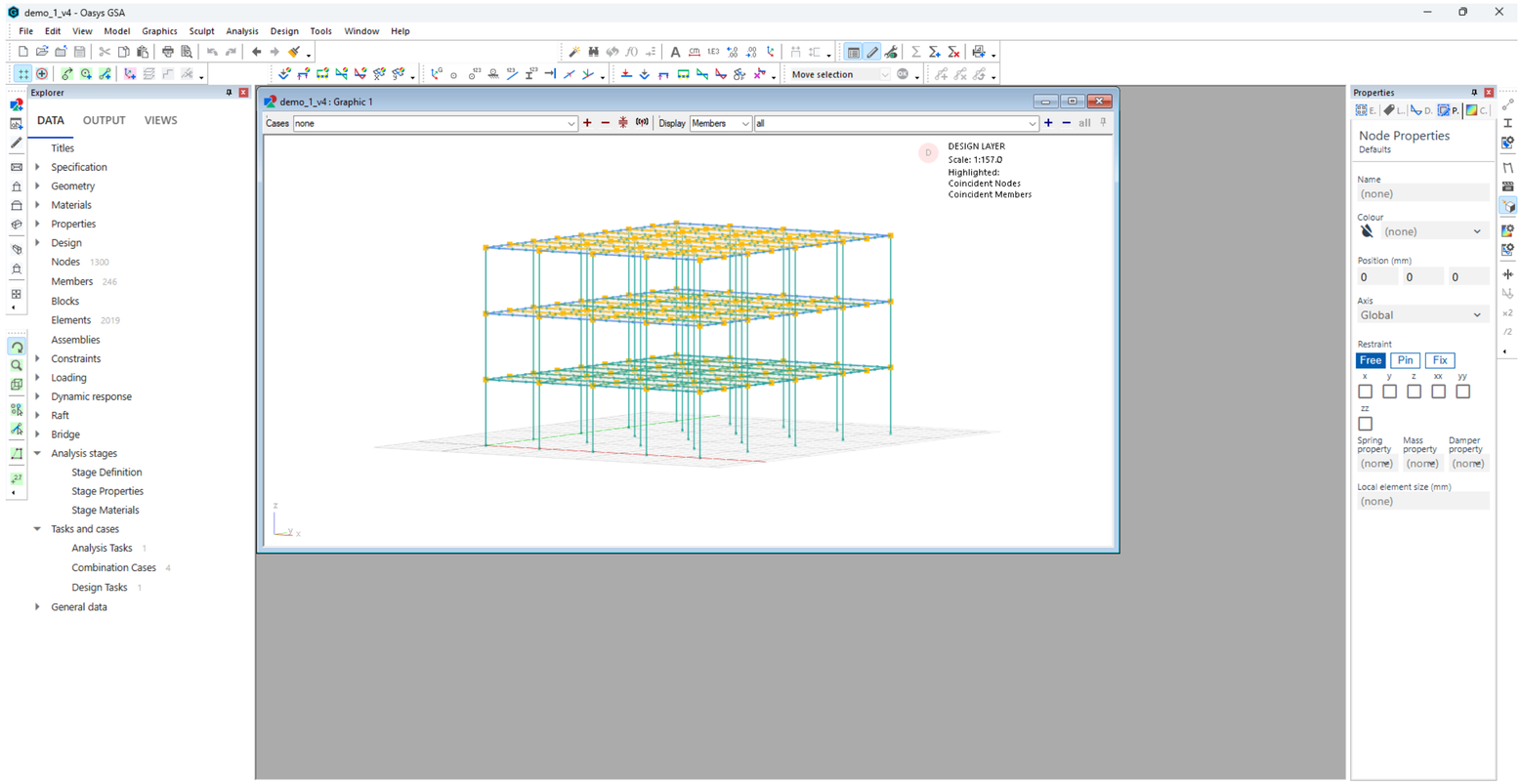
Further work in GSA



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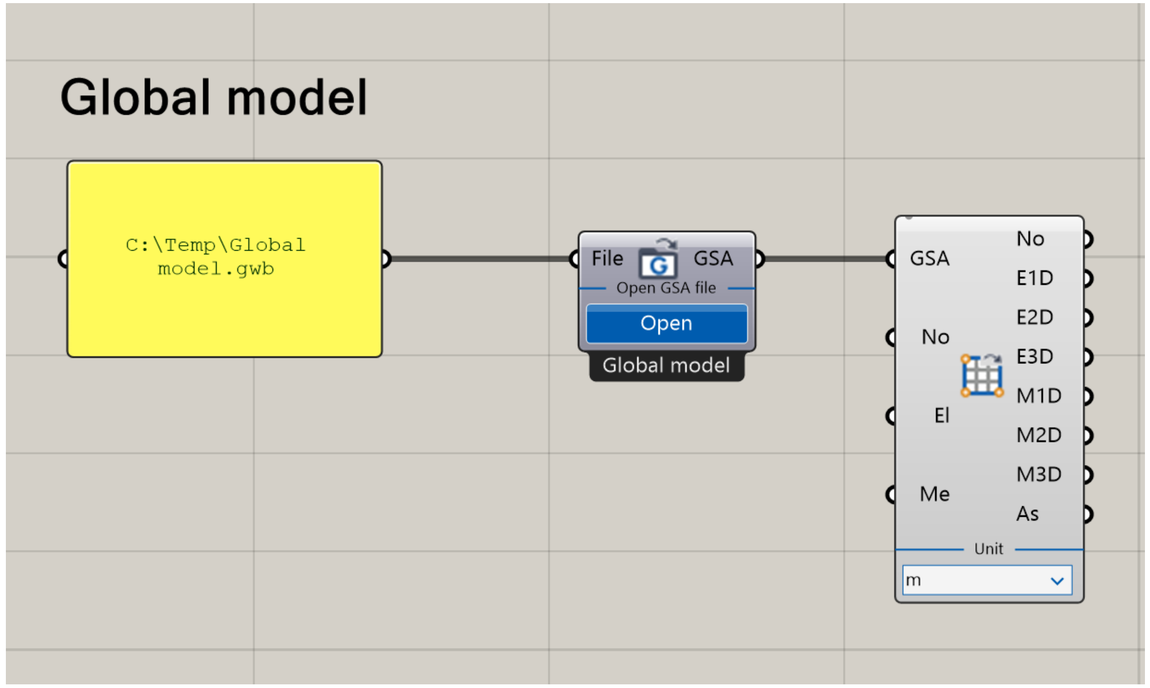
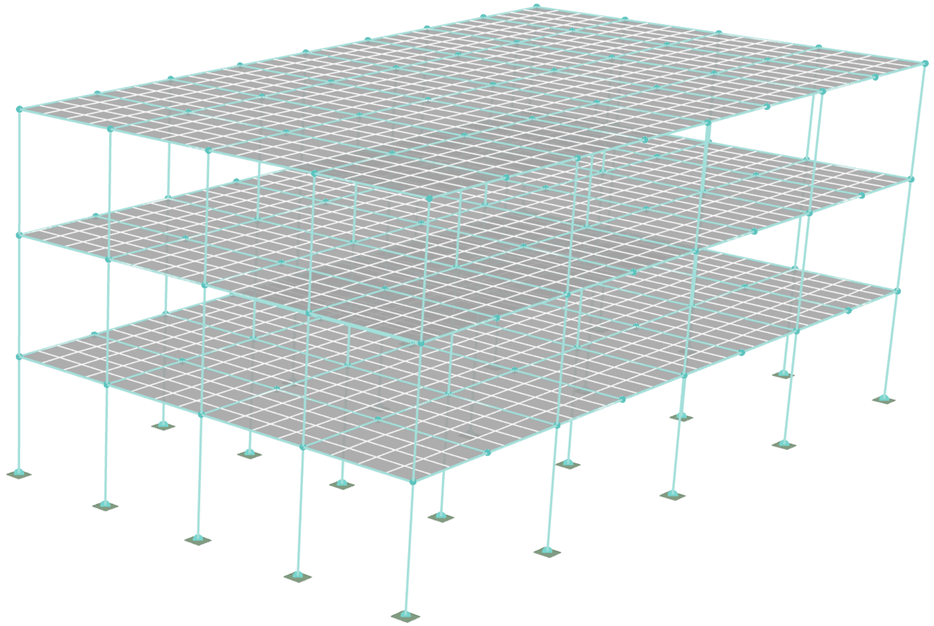
Opening GSA model





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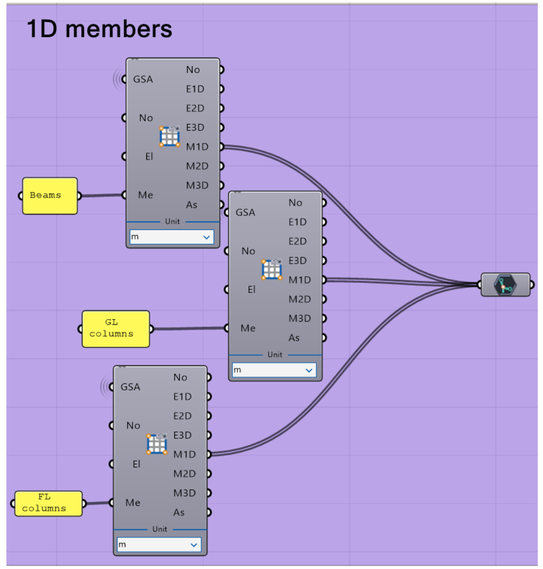
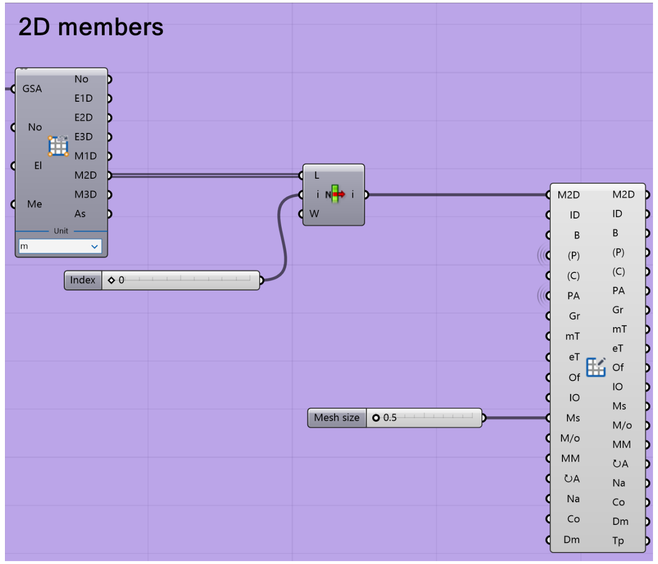
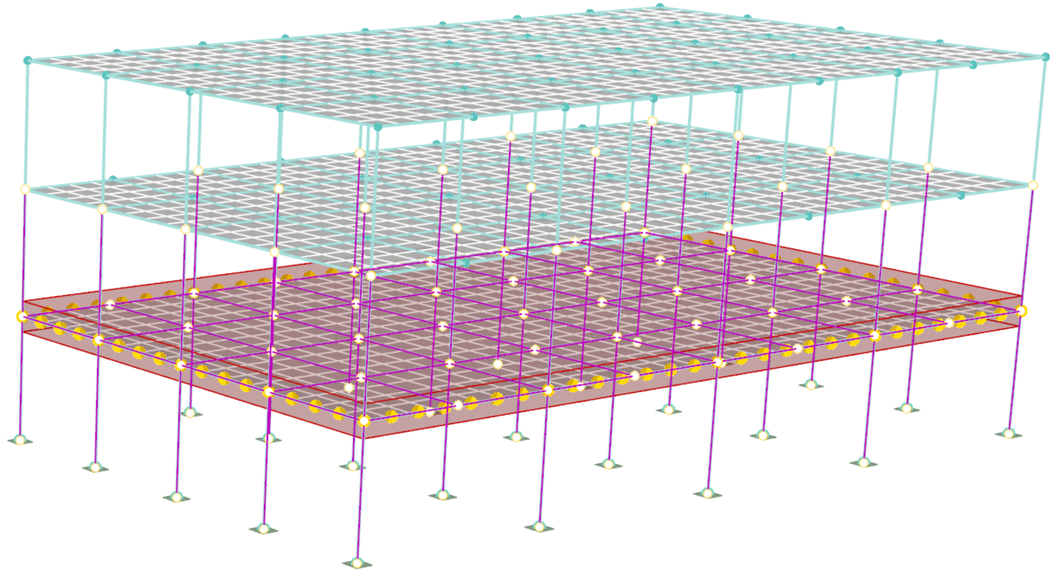
Sub-model for further analysis







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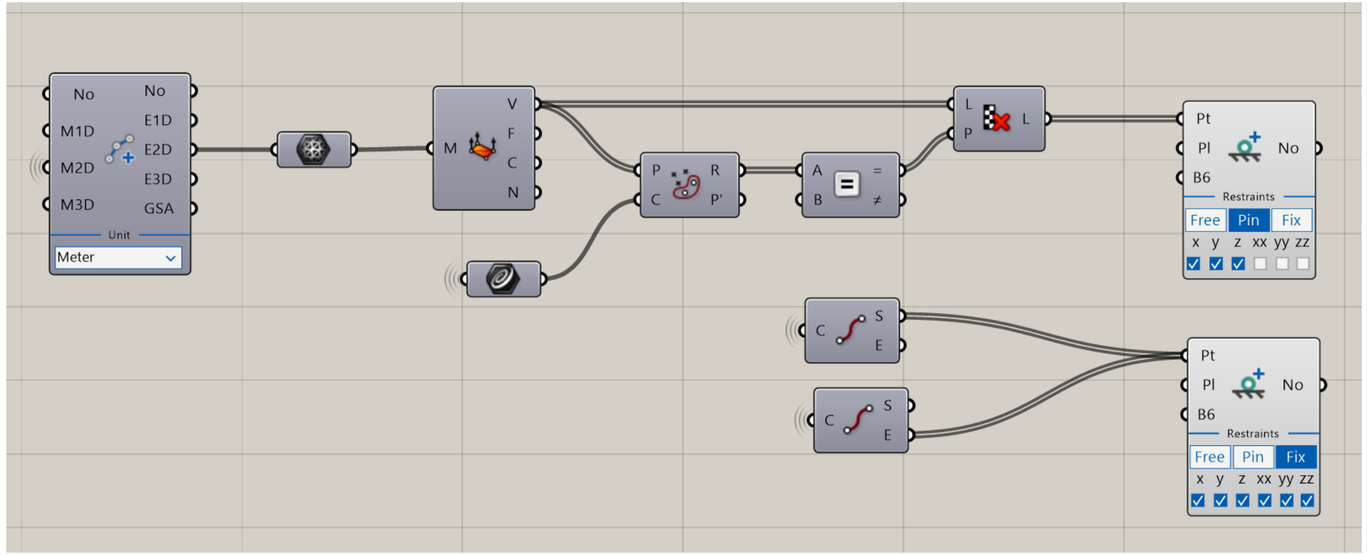
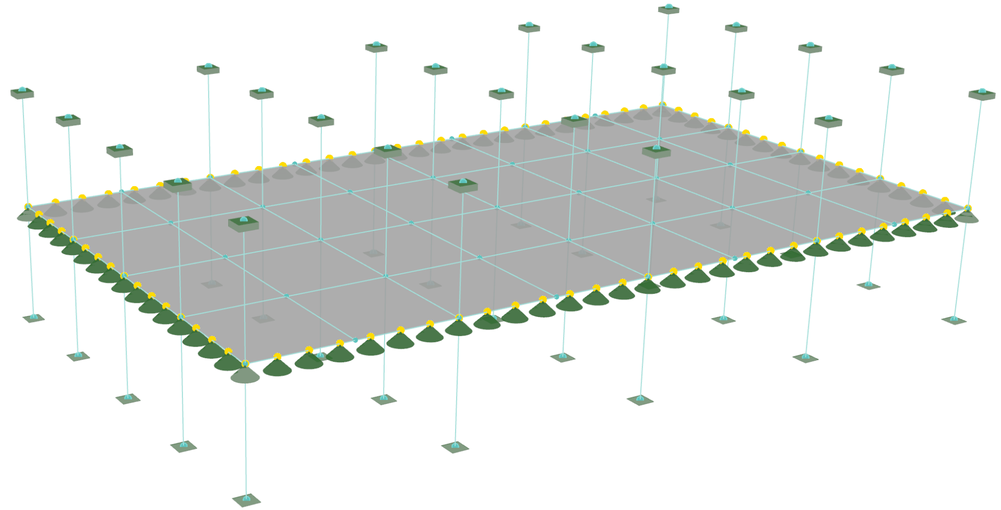
Supports





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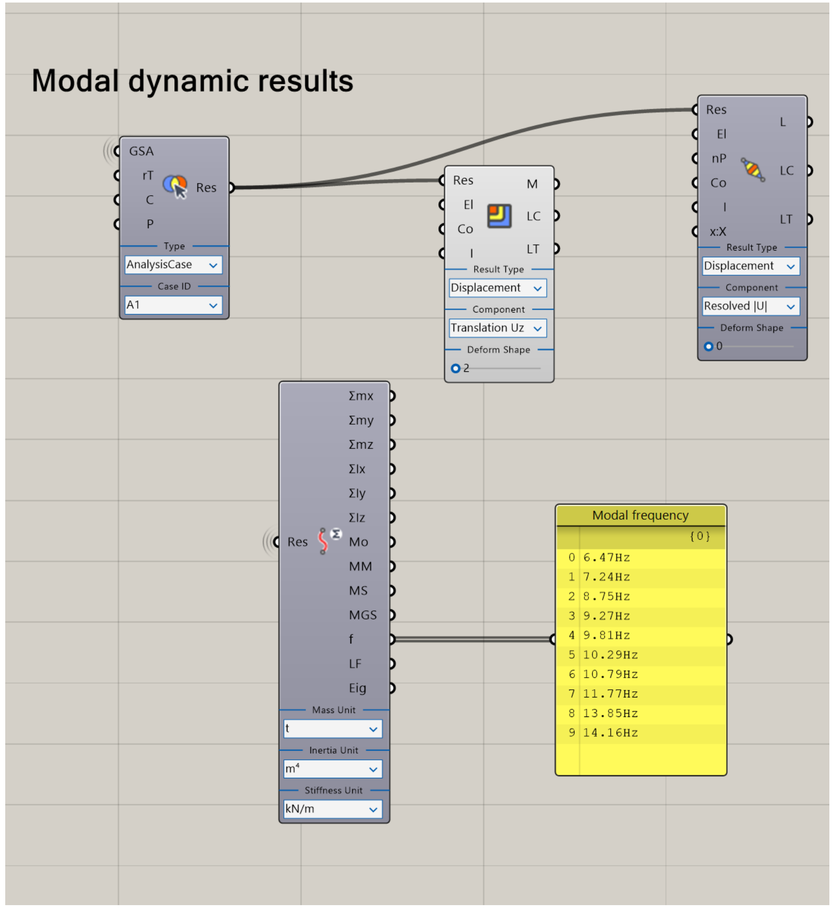
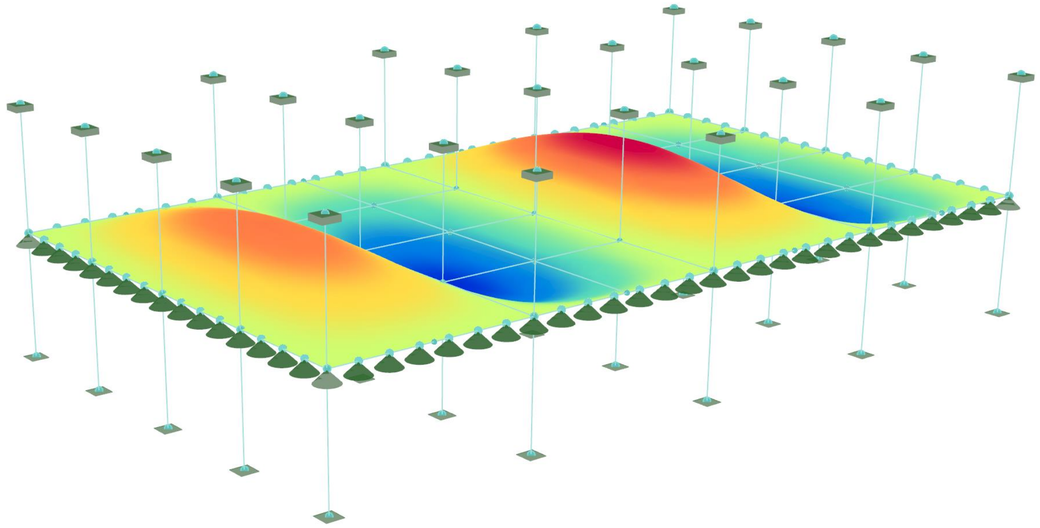
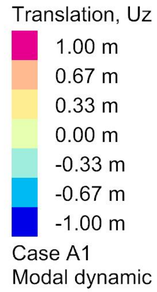
Modal dynamic analysis







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Footfall analysis

Frequency Weighting Curve (F)

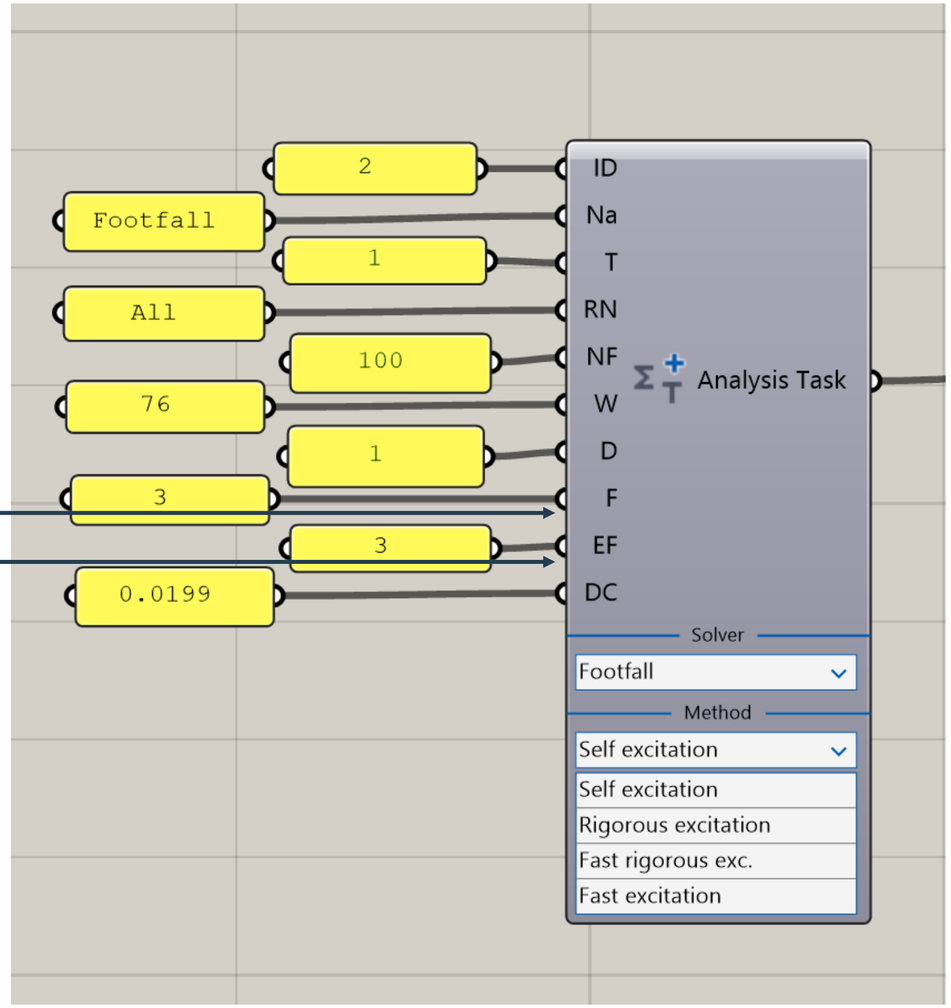
The Frequency Weighting Curve (FWC) is used in calculating the response factors.
Input the corresponding integer:
1 : (Freq. Weighting) Wb (BS6472-1:2008)
2 : (Freq. Weighting) Wd (BS6472-1:2008)
3 : (Freq. Weighting) Wg (BS6472:1992)

```
1 value inherited from 1 source…
3
```

Excitation forces (DLFs) (EF)

This defines the way of the structure to be excited (the dynamic Load Factor to be used)
Input the corresponding integer:
1 : Walking on floor (AISC SDGS11)
2 : Walking on floor (AISC SDGS11 2nd ed)
3 : Walking on floor (CCIP-016)
4 : Walking on floor (SCI P354)
5 : Walking on stair (AISC SDGS11 2nd ed)
6 : Walking on stair (Arup)
7 : Walking on stair (SCI P354)
8 : Running on floor (AISC SDGS11 2nd)

```
1 value inherited from 1 source…
3
```



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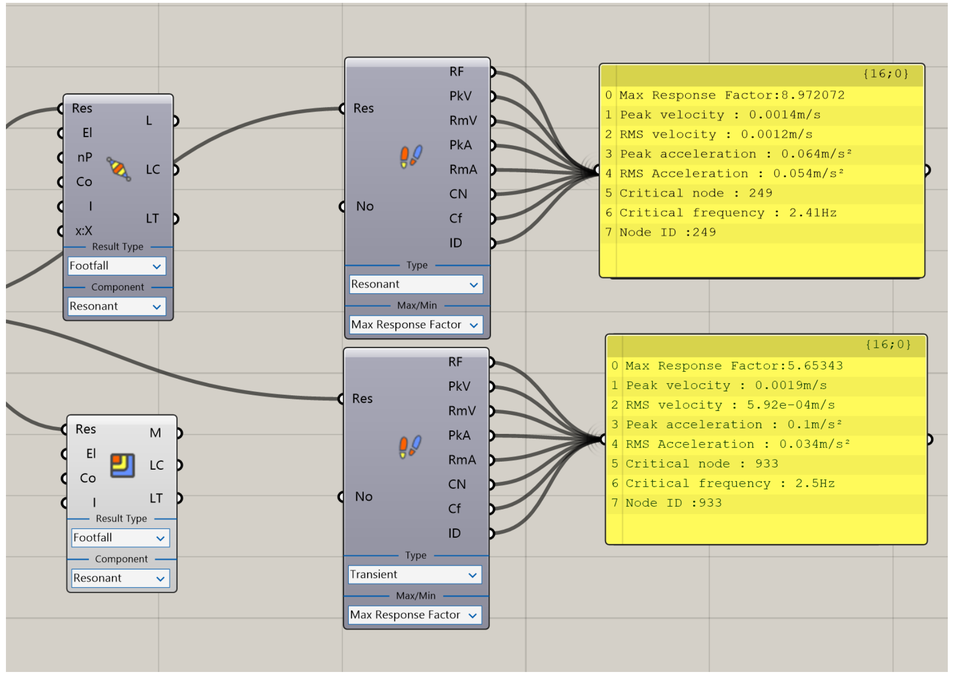
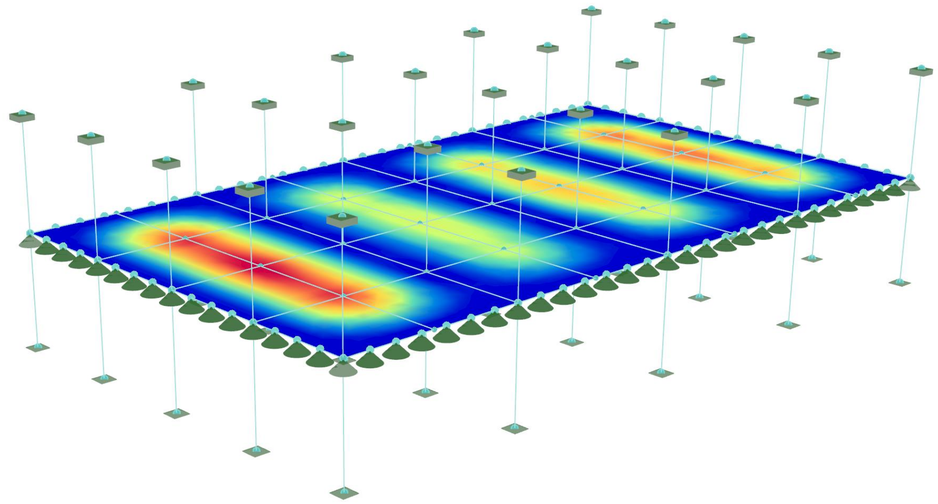
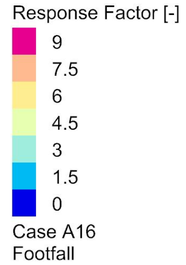
Footfall results







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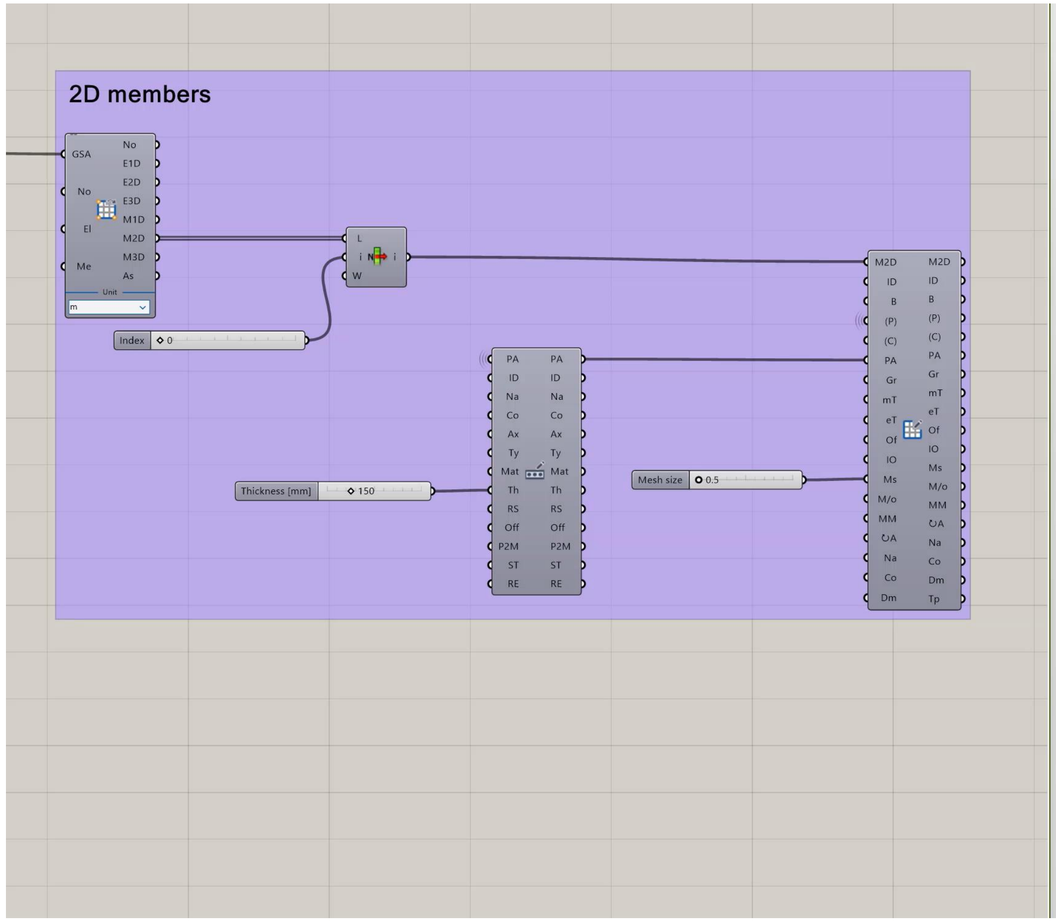

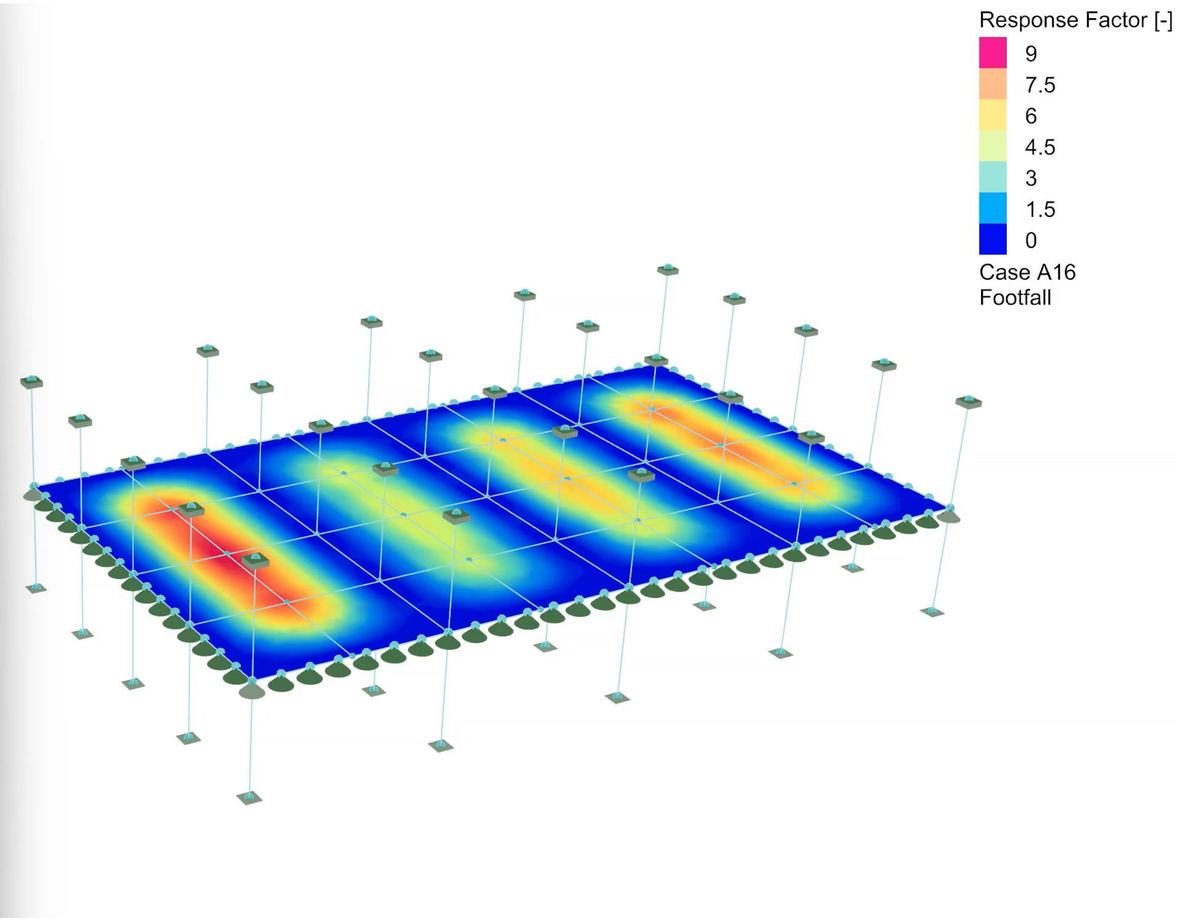

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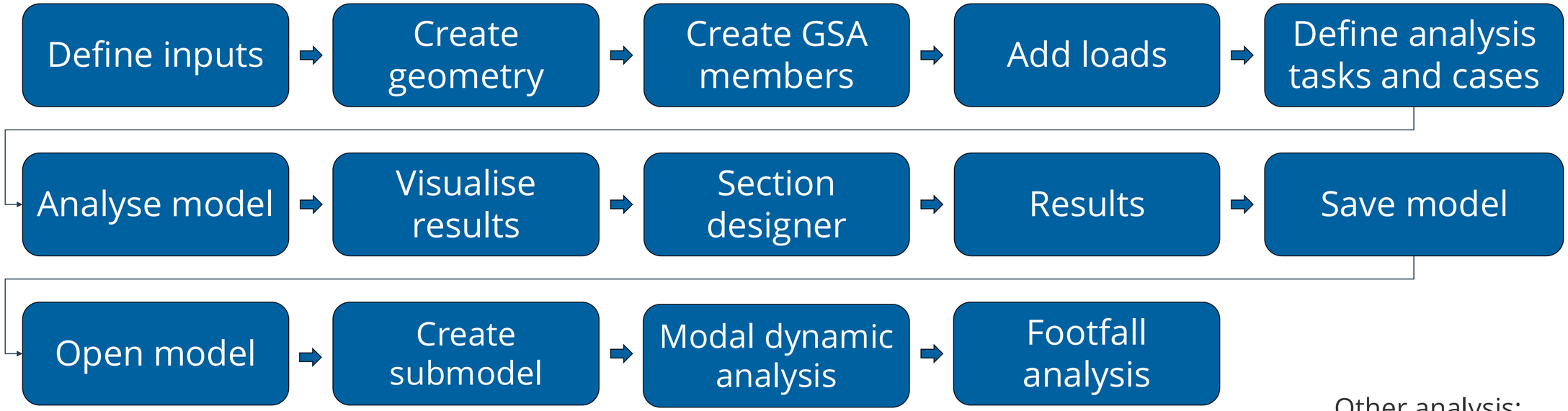
Oasys

Recap: Parametric workflow with GSA



Other analysis:
- Non-linear
- P-delta
- Buckling

...and more

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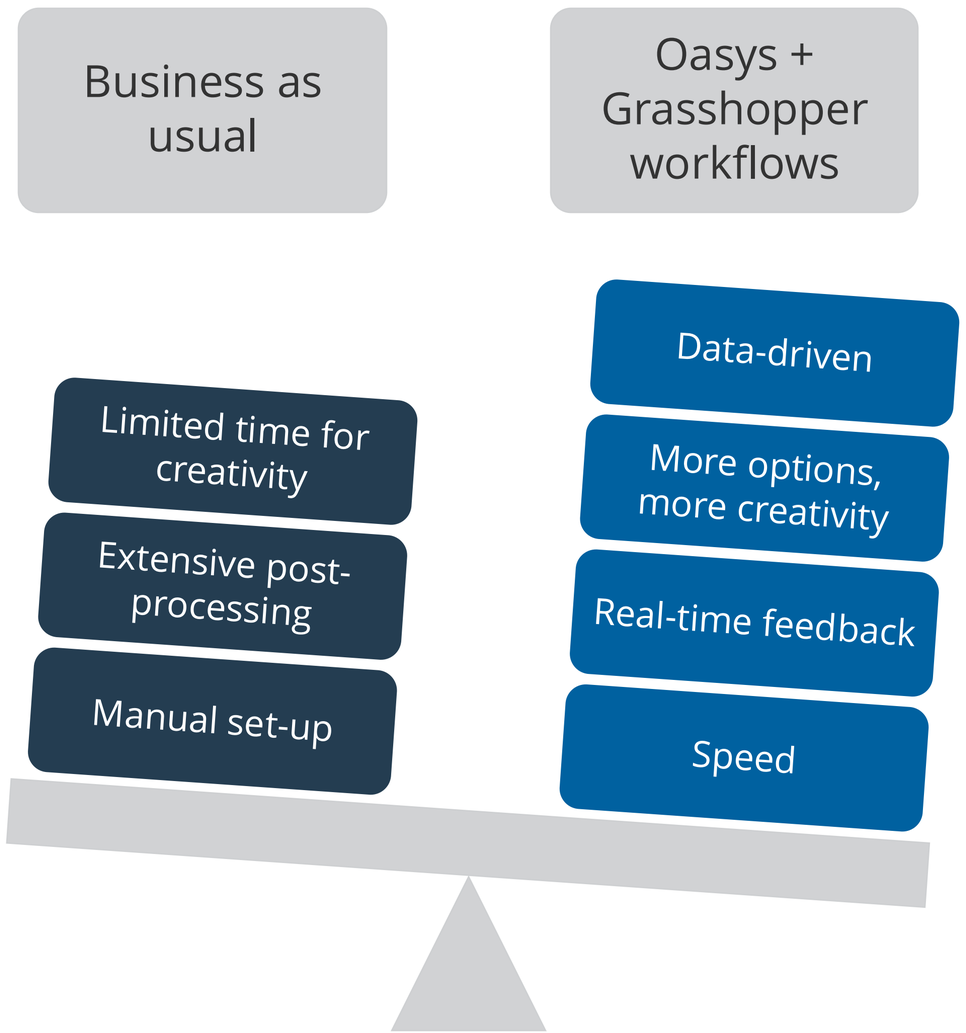
Recap

What we've covered today...

- The digital shift in structural engineering
- Challenges in repetitive structures
- How parametric workflows can help you make them interesting
- Enhancing structural analysis and design with Oasys and Grasshopper

Smarter, faster, more creative structural engineering starts here.



Enhance your structural journey

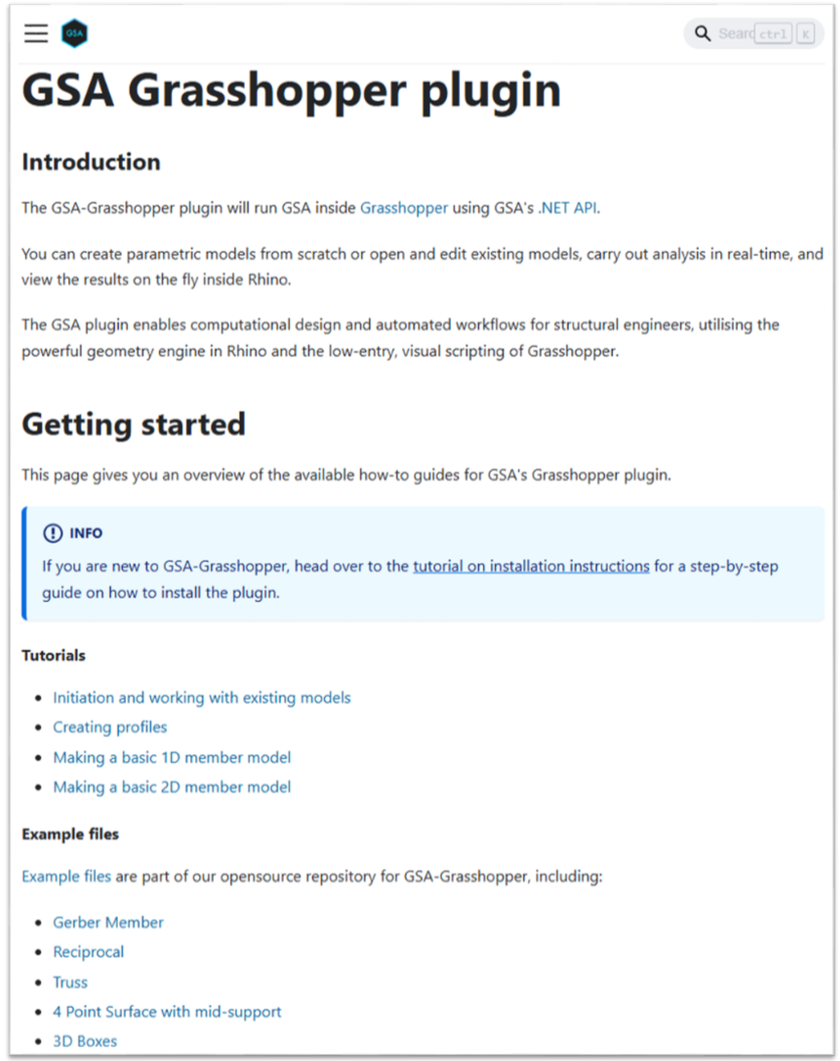
Oasys

It’s not about replacing engineering judgment: it’s about equipping yourself with tools that amplify it.

And getting started is easier than you think:

- Follow the tutorials
- Adapt Oasys sample files
- Build on what your colleagues have developed before

[GSA Grasshopper plugin
Oasys GSA Documentation]



GSA Grasshopper plugin

Introduction

The GSA-Grasshopper plugin will run GSA inside Grasshopper using GSA's .NET API.

You can create parametric models from scratch or open and edit existing models, carry out analysis in real-time, and view the results on the fly inside Rhino.

The GSA plugin enables computational design and automated workflows for structural engineers, utilising the powerful geometry engine in Rhino and the low-entry, visual scripting of Grasshopper.

Getting started

This page gives you an overview of the available how-to guides for GSA's Grasshopper plugin.

INFO

If you are new to GSA-Grasshopper, head over to the tutorial on installation instructions for a step-by-step guide on how to install the plugin.

Tutorials

- Initiation and working with existing models
- Creating profiles
- Making a basic 1D member model
- Making a basic 2D member model

Example files

Example files are part of our opensource repository for GSA-Grasshopper, including:

- Gerber Member
- Reciprocal
- Truss
- 4 Point Surface with mid-support
- 3D Boxes

Thank you for your time

Any questions?

Post your questions in the chat or Q&A tab.

Contact details

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Next steps:

Already a user?

Contact your account manager for more information or to request sample files.

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Scan the QR code below to register your interest and speak to a member of the team.

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