ColBot   
Rhino Grasshopper3d components

# Installation

Copy paste the AECforward grasshopper component into the grasshopper component folder

Background pattern

Description automatically generated with low confidence

The grasshopper component folder can be found at file/special folders

Graphical user interface, text, application

Description automatically generated

The component will use an external link to *api.AECforward.ai*

# Components

There are two components provided:

Graphical user interface

Description automatically generated

bots / ColBot:

Predict best steel column sections for different loads and objectives (e.g. low carbon or cost)

Diagram

Description automatically generated

utilities / SectionProperty

Provide different properties of the steel sections. (cost, weight, embodied carbon…)

Diagram

Description automatically generated

# Example files

### ColBot\_Grasshopper3d\_example\_01\_basic.gh

This example demonstrate basic use of the components:

A picture containing text, map, indoor

Description automatically generated

### ColBot\_Grasshopper3d\_example\_02\_truss\_iterative.gh

This example allows to predict a full truss design to reduce the embodied carbon or minimise costs.

A picture containing text, colorful, sport

Description automatically generated

Diagram

Description automatically generated

Karamba is required for the finite element model solver.

To generate the truss either BullAnt or Lunchbox components are required.

Diagram

Description automatically generated

This is an iterative design. The DataDam needs to be activated until the design has converged. Usually after a couple of iterations.

Graphical user interface, diagram

Description automatically generated

ColBot – Readme

## Questions? Comments? or want full detailed calculations?

Please email us at [bots@AECforward.ai](mailto:%20bots@AECforward.ai).

## What is this about

ColBot is predicting the best structural steel column (UK market). The column of height Ly is loaded by an axial force N and some bending moments.

The best selected columns have different grades S355, S460 and different steel making processes BOF (basic oxygene furnace) or EAF (Electric Arc Furnace).

The option weight\_S355 corresponds to a baseline basic design using S355.

The carbon option considers the embodied carbon for the production stages A1-A3.

## Disclaimer

AECforward.ai own all intellectual property rights to the apps, API, components associated with ColBot.

This design has been generated automatically using a machine learning process and hence is approximate.

Steel raw material varies and depends on market conditions. Cost estimates are provided for information only and are based on average user’s input or specific inputs.

The Information provided is for Informational/Educational purposes only and should not be treated as a substitute for or replacement of professional structural engineering advice.

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