

Gartner Facade automated in Rhino



The „crown“ of the new iconic building at 10 Fenchurch Avenue in downtown London, designed by Eric Parry Architects, will be realized as a (Closed-Cavity-Façade) CCF by Josef Gartner GmbH.

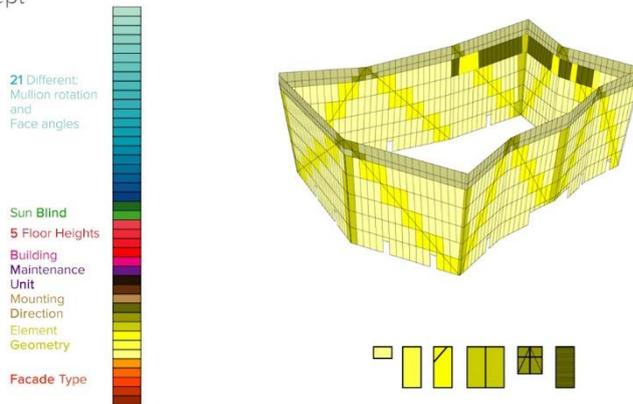
[Imagine Computation](#), as a sub-contractor of Gartner, was in charge of creating the highly detailed models and the complete manufacturing relevant information of all 1056 crown elements – all created with a custom Plug-In for Rhino.

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86% of the façade elements are unique

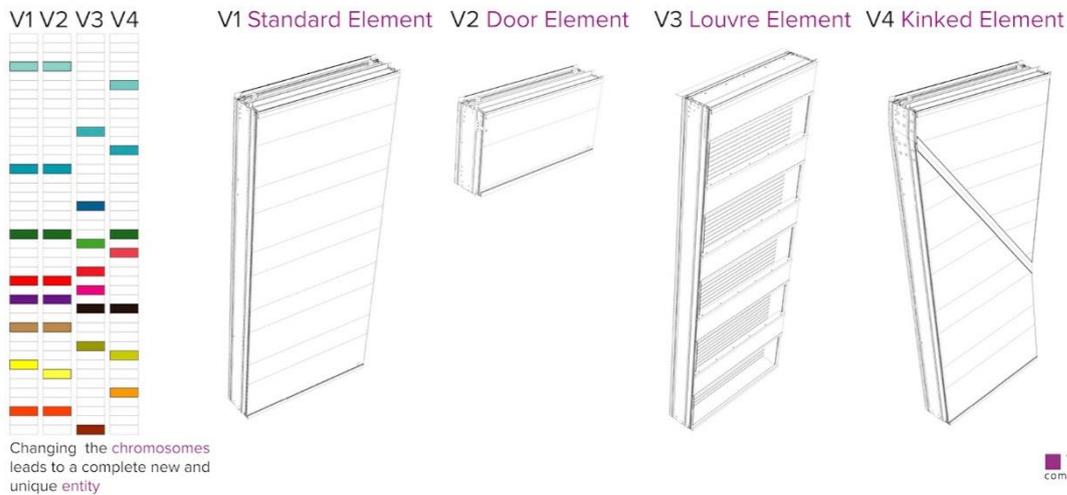
The challenge in this project was not its complex shape but rather the large variety of different types of facade elements in combination with the very high requirements of precision.

Genotype Concept
DNA Building Types



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All driving parameters of different functional, structural and geometrical requirements led to a set of approx. 31.500 possible configurations. Just like DNA defines the shape of the human body, the configuration sets define the final shape of the element. These sets were used as input to the custom developed Plug-In for Rhino.



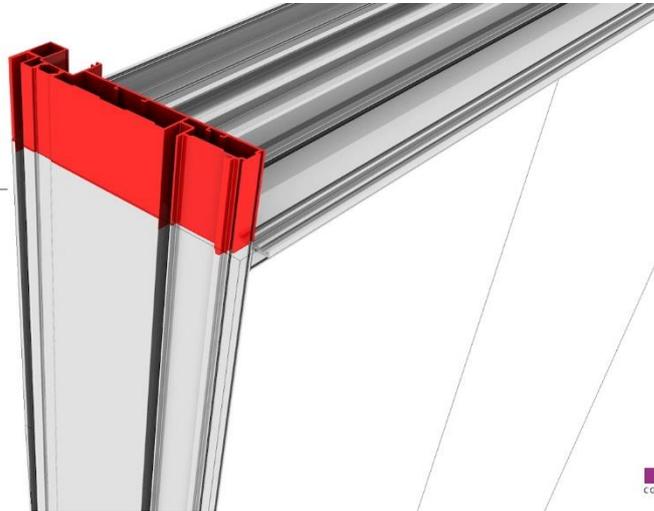
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Automation with Rhino using C# Programming language

In order to cope with the complexity, a custom Rhino Plug-In was developed. Not only does the Plug-In handle geometry, it also structures associated data to create a clean interface to the SAP ERP-System used by Gartner.

Fully automated process
based on specific DNA and 3D-grid

Mullion Face 5
Rotation +1.28°



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Fully automated process
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Final 3D model with:
20 Profiles
4 Glass elements
25 Sheets
36 Gaskets
350 Screws
47 Special fittings
Built in **attributes** for each geometrical element

100% Automation Processing Time
2 - 4 Minutes

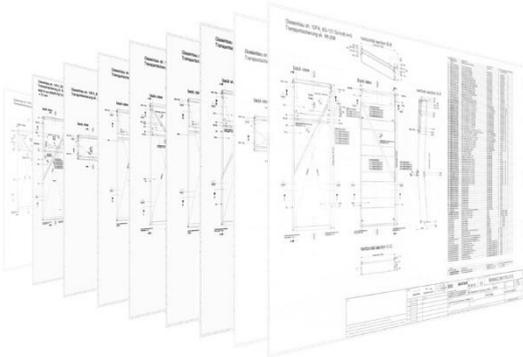
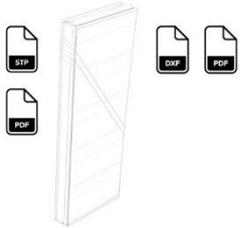


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Drawing Automation

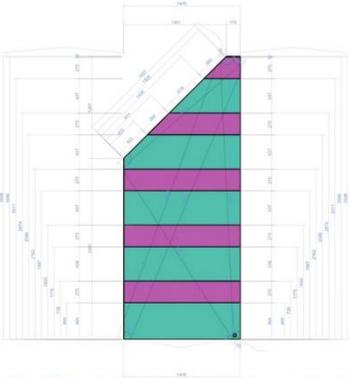
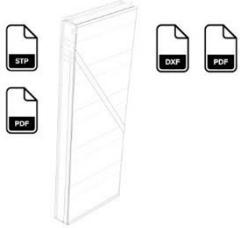
For assembly of all parts it was necessary to create assembly drawings for each of the window elements. With the exception of glass panes, part drawings for manufacturing were not required. The creation of all plans (with dimensioning) was also automated within Rhino.

3D model 2D drawings



Plan overviews with dimensions automatically created for 760 Window Elements

3D model 2D drawings



Glass Plans with dimensions automatically created for all glass panes

Optimization & Production Cost Reduction

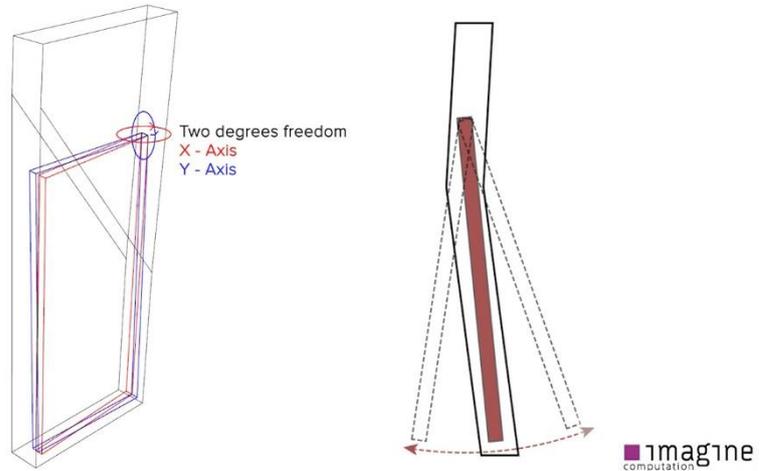
Creating an element by using Algorithms allows to automatically optimize a model during the construction process – something that is very hard to accomplish by “classic” parametric modeling.

Blind Placement

Fully automated process
based on specific DNA and 3D-grid

Blind Placement

Finds collision-free
position of blinds in
kinked Elements



Sun shading devices need to run in a plane – also in kinked elements. The collision free plane was automatically detected.

Changing to cheaper Production Processes based on Geometric Tolerance

Glass Panes

Perfectly rectangular glass panes are significantly cheaper to produce than non-rectangular shapes. The algorithm checked automatically if the glass was producible as perfect rectangle with a given tolerance.

Fully automated process
based on specific DNA and 3D-grid

Cost Optimisation

Optimising **tilted** glass panes to **rectangular** glass panes within
given tolerances



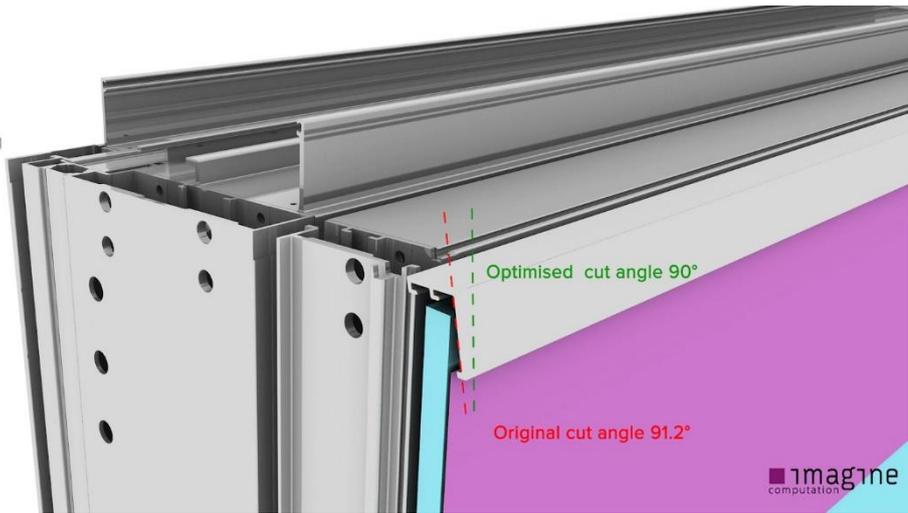
Profile Cuts

In order to increase the number of standard cut elements selected profiles were simplified within tolerance.

Fully automated process
based on specific DNA and 3D-grid

Cost Optimisation

Changing **miter cuts** /CNC-milling
to straight cuts for certain
elements within given tolerances



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