CUSTOMER STORY

5X FASTER STEEL CONNECTION ANALYSIS

RENOWNED ARCHITECTURAL FIRM USES ALTAIR SIMSOLID® TO SLASH PROJECT TIMELINES

About the Customer

Skidmore Owings and Merrill (SOM) is a renowned architectural and design firm known for its iconic and innovative buildings around the globe. Its reputation as a global leader in sustainable architecture and design, as shown by its many projects, leads the company to design and consult on some of the world's most challenging structural design projects.

> In our process, validation is an essential step in adopting a solution. There is always a balance between ease of use, time savings, and ensuring results make physical sense. In addition to producing results 5x faster, what was powerful was the correlation between Altair SimSolid's results and traditional analysis methods, which supported our decision to use Altair SimSolid.
>
> Abel Diaz Valdes, PE SE
> Associate Principal
> Skidmore, Owings & Merrill

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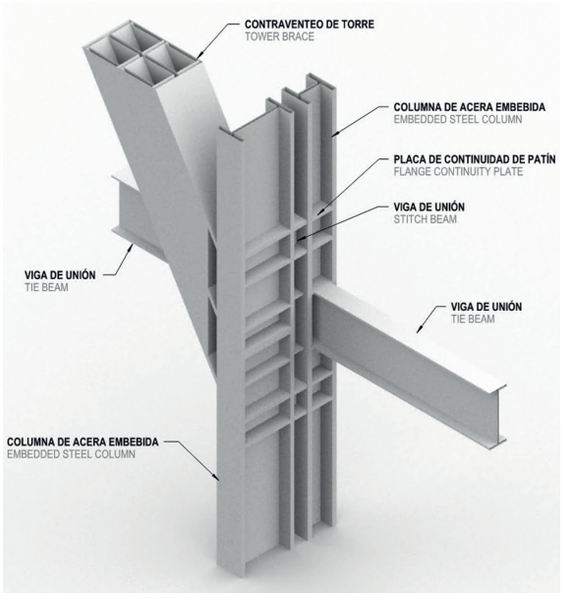

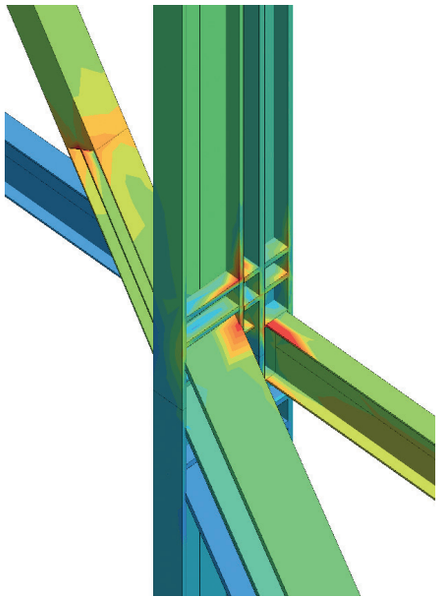

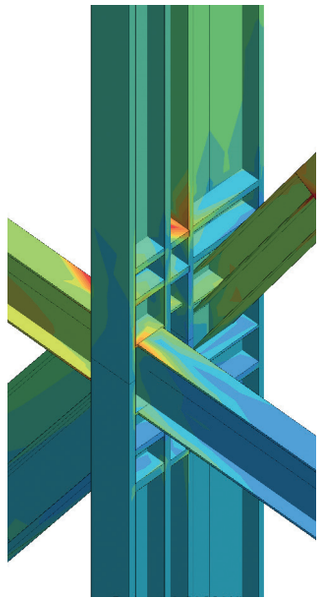

LEFT: braced frame node schematic **MIDDLE/RIGHT:** Altair SimSolid enabled SOM to generate analysis results five times faster than traditional FEA methods. (SOM)

Their Challenge

Tall building design in Mexico City requires architects and structural engineers to take a multi-hazard resilience approach to address problems that can result from earthquakes, winds, and floods. Innovative, unique buildings that go beyond standard practices require additional external peer reviews to evaluate and ensure designs meet strength and serviceability. These extra peer reviews can significantly lengthen a building project.

The Antara Fase II building* in Mexico City is an innovative high-rise tower designed by Sordo Madaleno Arquitectos with architecturally exposed brace-frames that contribute to the lateral load bearing structural system. As the structural engineer for the project, SOM developed the seismic resisting system including detailed evaluation of the steel braced frame connections, which underwent several design changes during the pre-construction phase. SOM engineers were experienced with traditional finite element method (FEM) analysis for non-standard connection design; their challenge arose from the time constraints placed on the project required to satisfy their client's deadlines.

Our Solution

Engineers at SOM opted to use Altair SimSolid®, a mesh-free analysis solver that acts directly on imported CAD 3D models without needing to simplify the geometry. By eliminating both the time-consuming task of CAD geometry simplification and complex mesh creation, the engineers could readily import their CAD models into Altair SimSolid and generate analysis results five times faster than traditional FEA methods. What would typically take two weeks was completed in two days. "While speed is important, validation is critical," said Abel Diaz, PE SE Associate Principal, SOM. It was essential for the SOM engineers to verify that Altair SimSolid's results were accurate and reliable. Through extensive validation examples, SOM was confident that using it would allow engineers to meet analysis requirements and project deadlines.

Results

Being able to quickly and reliably generate analysis results and visualize stress, strain and deformation with detailed contours accelerated SOM's workflow. Leveraging Altair SimSolid for the steel brace-framed connection analysis allowed SOM to complete a job that typically takes weeks in just a few days – generating a fivefold time savings increase.

To learn more, please visit **altair.com/simsolid**

SOM would like to acknowledge their partners in this project: Sordo Madaleno and SOMA