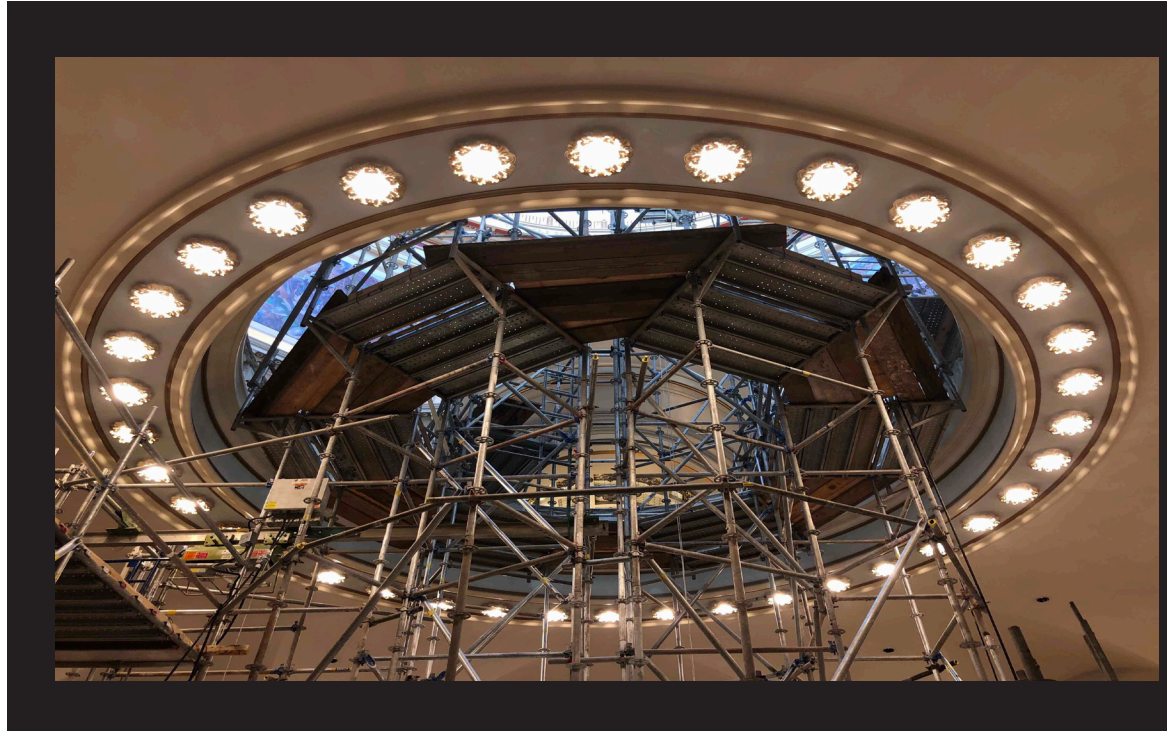# Lighting the Rotunda

The Restoration of the Oklahoma City Capitol Dome by FSB Architects with the use of LightStanza's electric lighting analysis software

5.26.20

FSB is an award winning firm of architects, interior designers, and engineers. Partnered with Manhattan Construction, they began their interior restoration of the Oklahoma City Capitol in 2016. The goal was to make repairs and updates to the historic building built in 1917. In 2002, FSB successfully added a dome to the top of the building. They created a rotunda from the top of the dome to the bottom, from the fourth to the first floor.

Nathan Terranova spearheaded the integrative lighting design effort of the dome. He chose LightStanza because it was the only tool that could model the detail of the historic dome and efficiently run large calculations of different lighting fixtures and arrangements. He was able to impressively implement multiple designs using LightStanza, even though he had little experience with lighting and had never used LightStanza's electric lighting product before.

The original lighting from 2002 did not light the dome as well as it could have. Nathan and his colleagues seamlessly imported the existing lighting condition of the dome into LightStanza from Revit and were able to orient new fixtures inside LightStanza to try different lighting concepts very easily.

Nathan and his colleagues worked on multiple design iterations and came up with three options. They were able to work quickly in LightStanza because they did not have to upload multiple models. LightStanza's 3D photometric web viewer made it easy to check the luminaire orientation in the design context.

While working on the lighting design, FSB realized that they were more comfortable managing the IES files in LightStanza than in Revit. Even though they were experts more familiar with Revit, they were able to learn and use LightStanza's user-interface more efficiently.
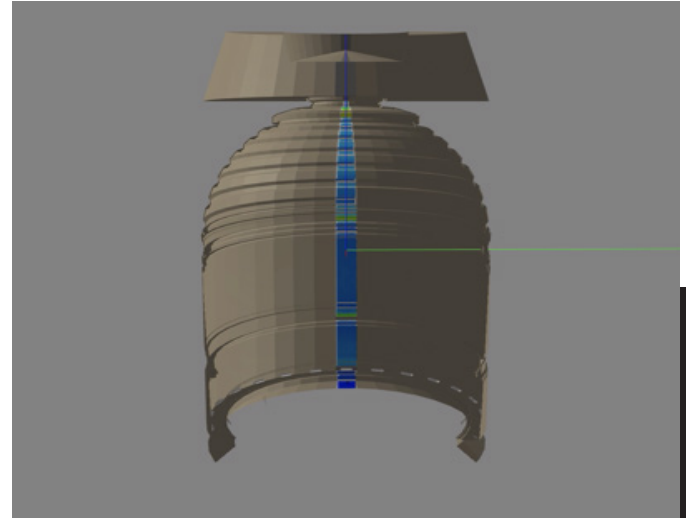
This image shows the original lighting of the dome, placed in 2002. The blue reflects the low amount of illumination levels that reached throughout the dome.

LightStanza's IES and luminaire editing tools made it easy to explore different light source orientations.
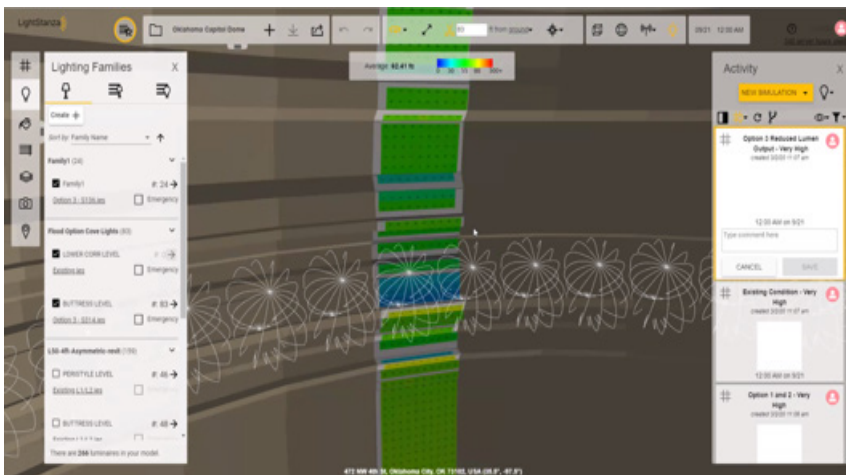

LightStanza
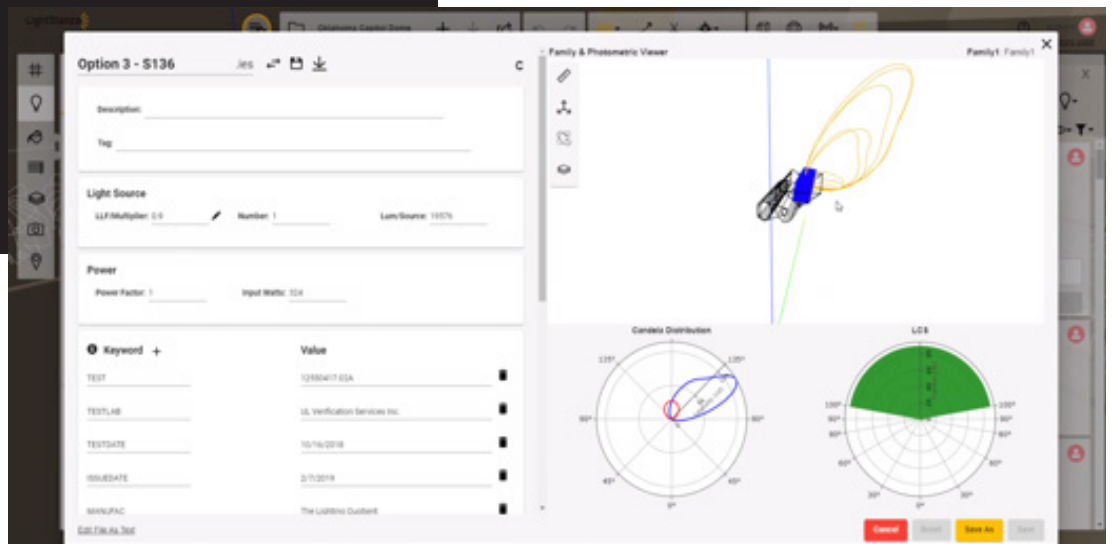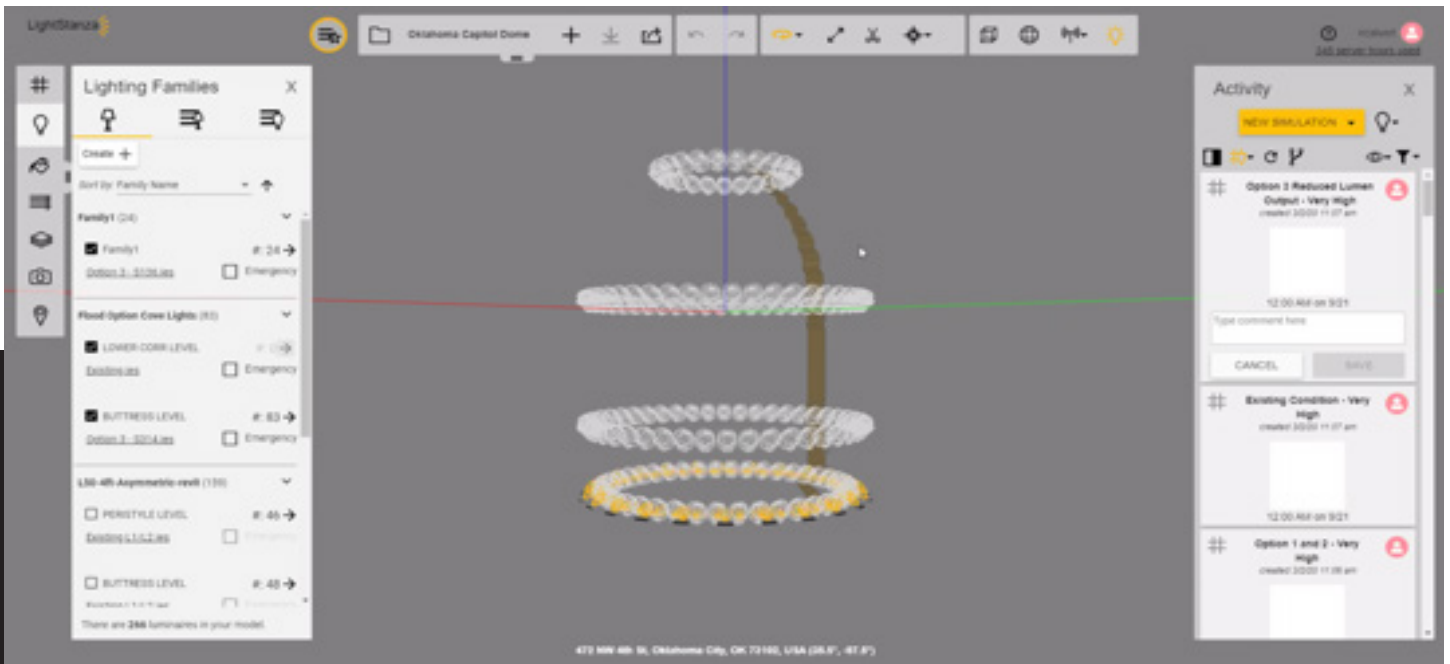
On the right sidebar, the three lighting options could easily be rotated between to view and see results. The left sidebar showed the lighting families that were easily checked and unchecked to use and rotate through.

In the end FSB chose their third design iteration because they liked the evenness of the light going up the rotunda. Based on their different analyses, they realized the original design option (existing condition) was not going to work.

While importing the Revit model, Nathan and his colleagues noticed the grid illuminance sensors were facing the wrong direction. Nathan and his team found LightStanza's intuitive interface essential in correcting this and verifying each analysis plane's orientation.
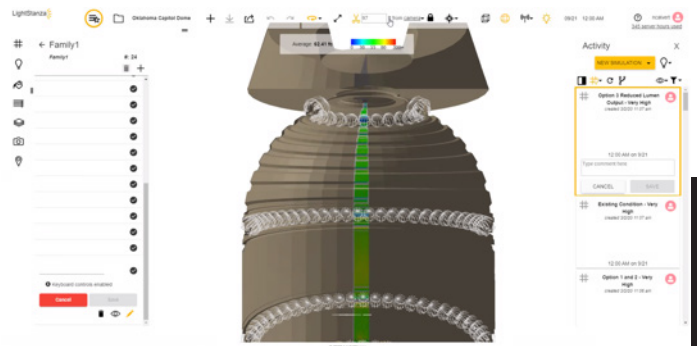

The green shows the bright luminance shining evenly from the top of the dome to the bottom.

The even spread of light was exactly what FSB wanted for the dome.

LightStanza

The green arrows represent the grid illuminance sensor directions indicating the orientation of each analysis plane. LightStanza made it easy for Nathan and his colleagues to catch and fix the mistake.

The electrical engineers at FSB were easily able to aim fixtures, adjust light loss factors, and compare lighting options . Originally the dome had 4 rows of light, but with simulation they confirmed they were able to get an optimal result with only a single row.
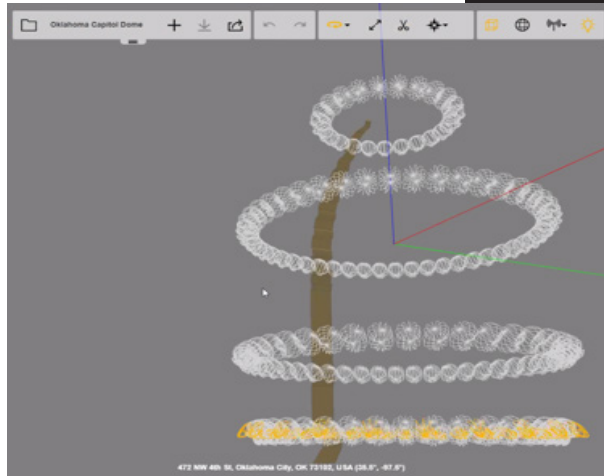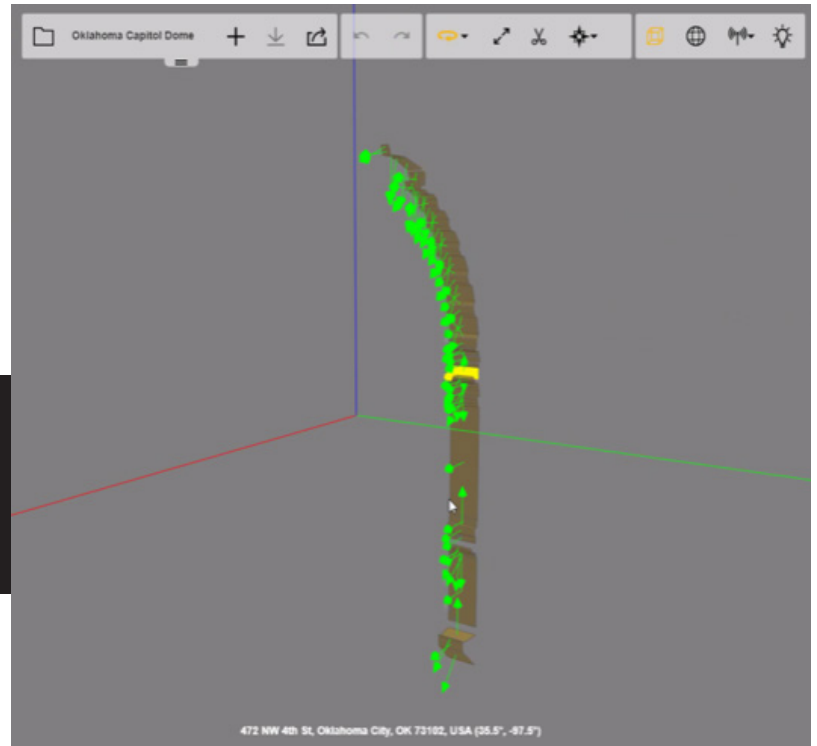
The third iteration showed that process working by keeping the bottom ring of lights and adding bigger ones going up the rotunda.

LightStanza's features that proved useful to their project were:

Able to learn and utilize Lightstanza and achieve their goals efficiently with no training
The accuracy of LightStanza - confidence in results
Easy-to-understand IES file viewer and in-context photometric webs
Straightforward workflow allowing quick exploration of different electric lighting strategies
After picking lighting option three, they did a mock-up of how the dome lighting would turn out, and it was successful.

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