

Challenge exercise

Run simulations for vertical, high-rise designs in Forma Site Design

This is a continuation of the Module 2 challenge, *Design a high-res project in Forma Site Design*. Leveraging the 335 Plymouth Ct., Chicago site and massing model, run a baseline set of simulations and resolve several questions to help start evaluating your form.

Complete the required activities:

1. Run a sun hours simulation, and resolve the following questions:
 - At what level do the sun hours become favorable (to contribute to daylighting interior spaces) considering shadows from adjacent buildings in the density of Chicago?
 - Is there an elevation that may not receive adequate sun hours to contribute to a successful daylighting strategy? Could a form-based change improve the condition? Could a decision about the interior space resolve less required daylight?

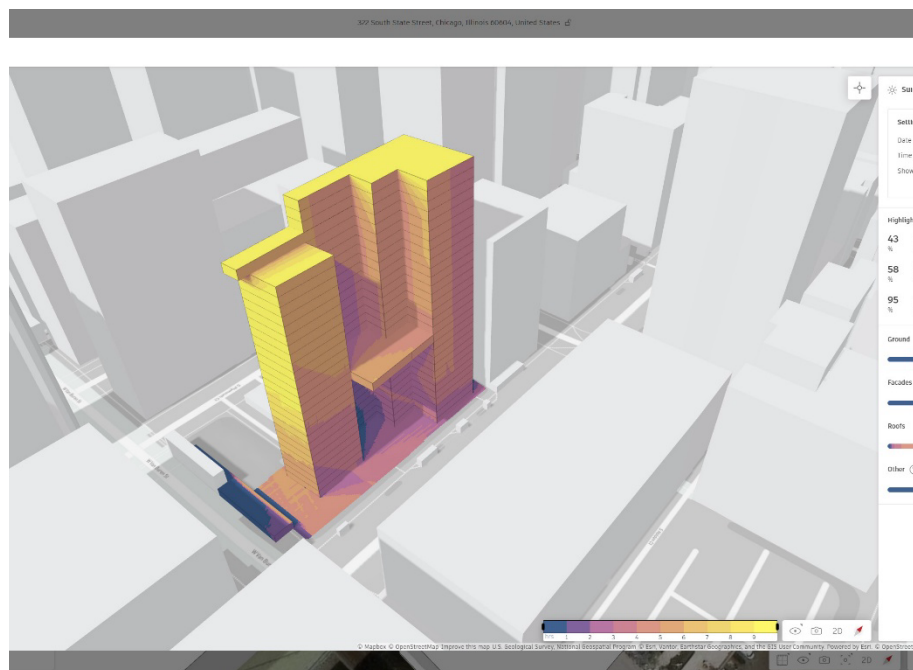


Figure 1. Chicago site at 335 S. Plymouth Ct – Sun hours.

2. Set up a series of wind simulations studying both the rapid wind simulation (comfort and direction), and the detailed wind simulation.
 - Create a visualization of wind moving through the canyon of buildings in the warmer summer months and a second visualization for the colder winter months. In the wind analysis tools, it might improve your wind visualizations to modify the streamlines by varying height rather than importance in the drop-down list directly under the streamline visibility settings.
 - Observe the wind condition at your proposed open level of the high rise. What is the wind direction and speed? If ranging into the “uncomfortable” levels, propose a massing change to mitigate wind.
 - Use the rapid wind simulation and explore the ground level. Are there areas on your site layout that are problematic (in the strolling color gradient), and are there ways to mitigate the wind by modifying the design?

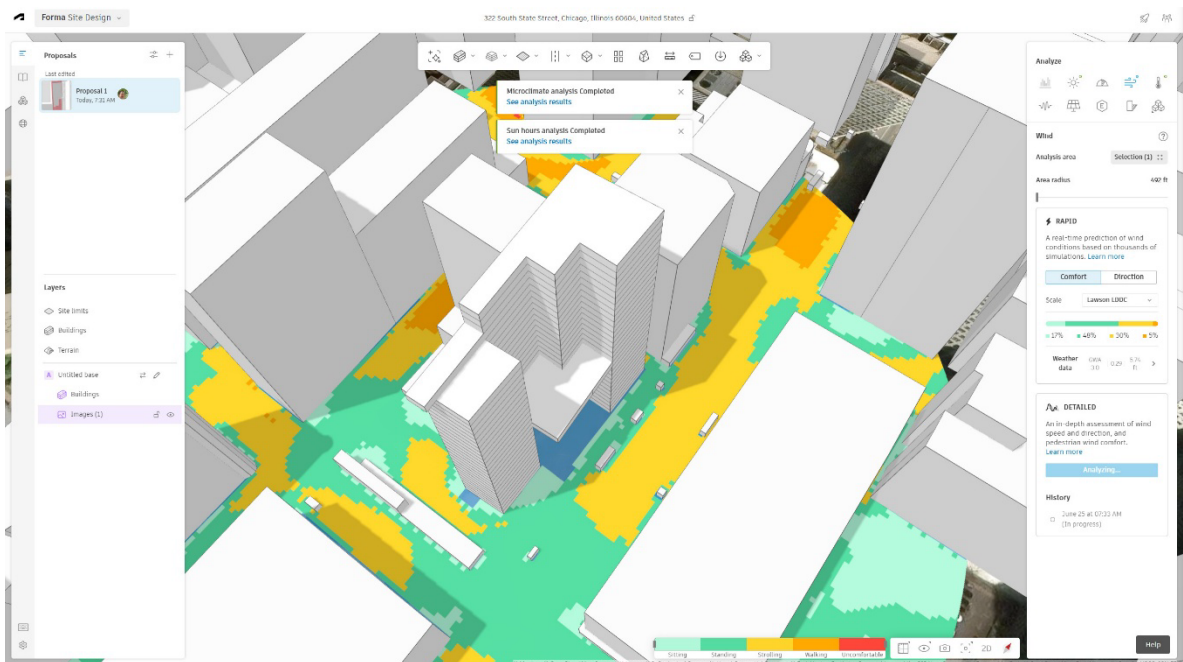


Figure 2. Chicago site at 335 S. Plymouth Ct – Wind simulations.

3. Run the microclimate simulation, and create a short-written document with associated visuals that address the following:

- Observe the microclimate temperatures at the plaza on the lower-level entry during the fall, summer, and winter extremes. Consider design modifications to block wind to help winter month temperatures, and create shade during the summer months at the plaza, and along the entry path.
- Observe the microclimate temperatures at the open level of your high rise during the fall, summer, and winter extremes. Consider massing modifications to block wind to help winter month temperatures, and create shade during the summer months at the plaza, and along the entry path.

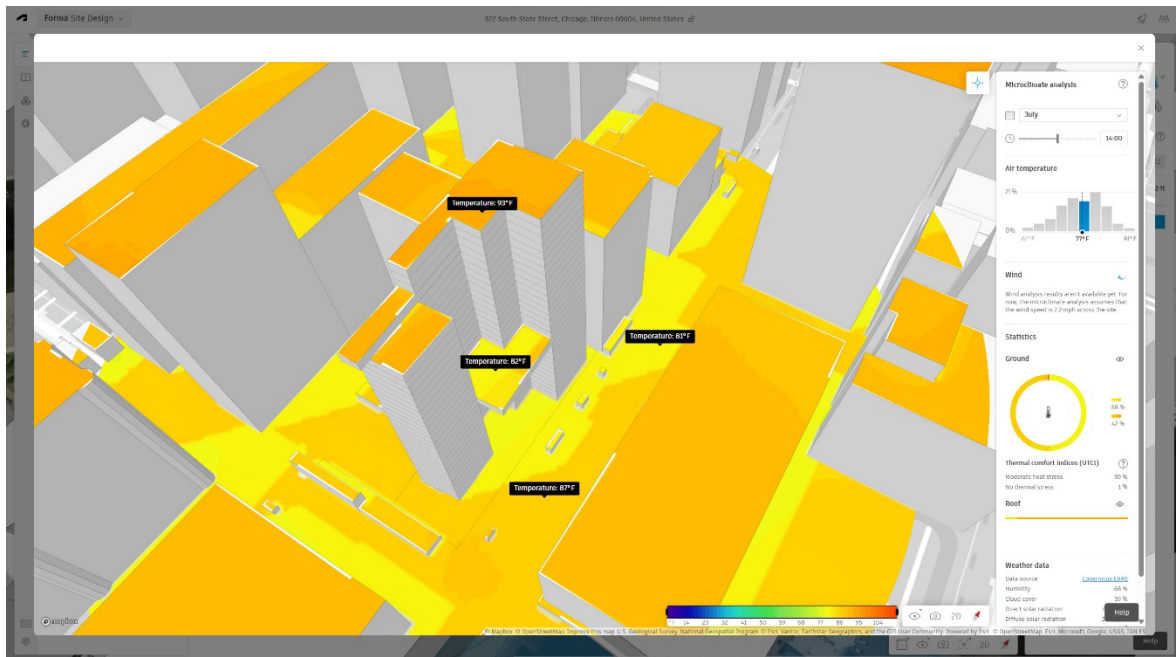


Figure 3. Chicago site at 335 S. Plymouth Ct – Microclimate.

Grading rubric:

	Advanced	Proficient	Basic	Emerging
Questions resolved	Well thought out response connecting design intent with data	Correct answers not implicitly tied to the design ideas.	Answers completed, but little to no application to the design	Answers are incomplete and/or incorrect
Is the data presented accurately	Accurate, applied, and presented with understanding	Completed, correct	Minor errors or missed interpretations	The data is either not completed, presented, nor available
Explanations provided with clarity (graphic and/or written)	Design ideas and design data are presented clearly and creatively	Clear responses and graphics	The information and graphics are presented, but not connected or composed	Incomplete or not legible
Creativity in the design solution	The site layout design is innovative, an appropriate response, and is informed by the data in Forma Site Design	The site layout is appropriate, but the connection to the simulation data is not clear	Quality design, but not connected to the simulation data created by Forma	The site layout design proposal does not meet the design criteria