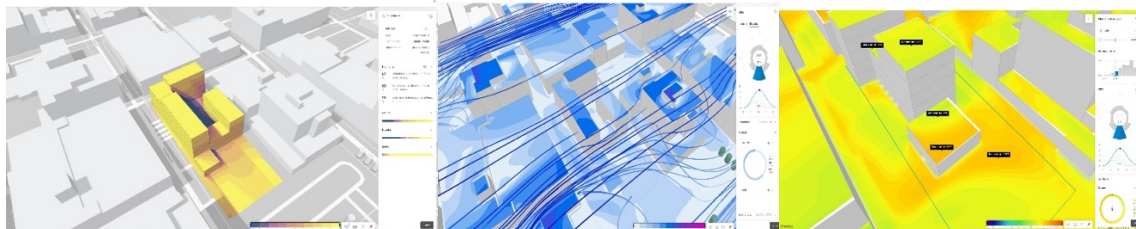


Practice exercise**Build depth on a design proposal through site simulations**

In this exercise you will work with the massing model and site layout on the 311 E. McDaniel site. To analyze your work, you will run a series of simulations to understand the performance potential of the site layout, identify problems, and establish paths to explore for the design to evolve:

Learning objectives:

- Apply the sun hours, wind, and microclimate simulation tools to a site design.
- Use the simulation data to evaluate your site layout.
- Establish design direction from the data created from Forma Site Design simulations.



The completed exercise

1. Leveraging either your massing proposal from the previous practice assignment, or one of the proposals currently developed on the 311 E. McDaniel site, run the sun hours simulation on your massing proposal and answer the following questions, with visuals from Forma:

- Which elevation gets the fewest solar hours during the winter solstice and how many hours?

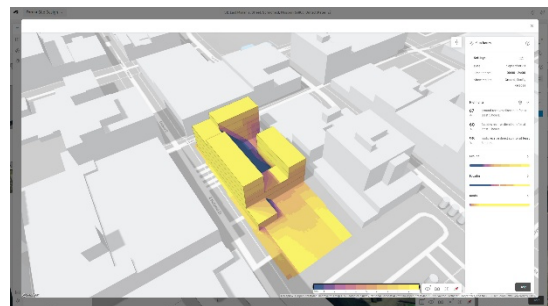


Figure 1. Sun hours.

- Which elevation gets the most solar hours during the summer solstice and how many hours?

2. Run a series of wind simulations on your massing proposal and create answers with associated visuals from Forma Site Design to answer the following prompts:
 - What is the predominant wind direction?
 - Are there times of year where wind is helpful for cooling? Are there times of year where wind is a menace to the site?
 - What areas on the site are accelerating the wind past the average speeds as noted on the wind rose, and why?
 - What areas on the site is the wind speed decreasing, and why?

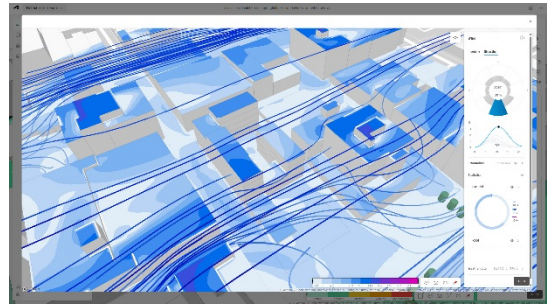


Figure 2. Wind.

3. Run the microclimate simulation on your site layout proposal and resolve the following questions by creating written statements with visuals from Forma:
 - What is the highest temperature you can find on the site design? What time of year and where on the site does this happen?
 - Same question, but for the most extreme cold? Why?

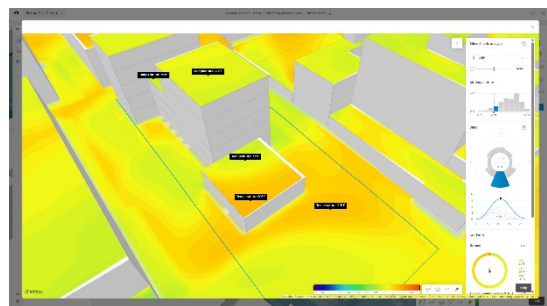


Figure 3. Microclimate.

4. Create a copy of the proposal and make adjustments to the design based on your analysis. Write a short description (3-4 sentences) covering the modifications you made in your proposal to account for initial analyses in Forma Site Design.

Grading Rubric:

	Advanced	Proficient	Basic	Emerging
Sun hours analysis	Well considered idea that meets the program criteria	Follows the program closely, but perhaps some odd decisions	Missing some or incomplete elements of the building program	The design lacks a connection to the building program
Wind analysis	The building massing has been given functions and is schematically clear	Completed, but not all of the functions clear or applied	Completed massing, not clear on functions within the design	The model is missing, incomplete, or not available
Microclimate analysis	The design engages the surrounding context in an appropriate and interesting way	The project responds to the site edges and streets	The design is missing opportunities and understanding of the context	Incomplete or not within the site parameters
Creativity in the overall building design form	The building form shows innovative thinking, and design the begins to respond to both environmental and local contexts	There is quality to the design and creativity	Quality in the design, but it does not yet consider the local or environmental contexts introduced	The design is either incomplete, or lacks any connection to the goals and contexts of the project

Voice-over for the answer key video:

Remember, we are not evaluating the design for this practice exercise – this evaluation is based on the design ideas generated by studying the performance

analysis. In short, the simulations are not design tools if they do not move our site layout forward.

The sun hours analysis should mention the areas that are working, and then focus on any areas that might be problematic. In the middle of the United States, the temperature swings are aggressive, so understanding the connection between solar exposure and time of year is really crucial here. Are we getting adequate hours in areas that we could use some warmth during the winter months, and are there areas that will need shading, or a reduction of sun hours during summer. Both of these should be clear in the student explanations.

Wind and microclimate are very much linked, and are double edged – wind is needed to help reduce temperatures, but too much and it makes the site uncomfortable. Less wind and you need more shade to keep temperatures lower, if you are using the building as your primary shading device (outside spaces on the north side of the building at this site), you may see negative consequences on the wind patterns. As such, like many things in environmental design thinking, this is about understanding how to walk the negotiation between elements –

Compromise is your friend, and good responses should address the balance between wind and perceived temperature.

The last part of the rubric is all about making sure the data that's observed begins to drive the design thinking forward. These are very powerful tools and deserve more than a shrug and saying – well, that is what happens. Reading the data and having the ability to articulate how to move the design forward is at the core of learning Forma Site Design.