

Activity 2.3.7 Residential Site Planning

Introduction

When a building is designed apart from a specific site, an opportunity is lost to match the design to the strengths and weaknesses of the site. To make a building meet the needs of the client, the site itself should be considered during the design process. Local codes, solar and wind orientation, adjacent properties, and land contours are just a few of the site-specific considerations that the designer should incorporate into the planning of a building.

Equipment

- Engineering notebook
- Tracing paper
- Affordable Home Site handout
- Affordable Home Site Plan Student Revit file
- Engineering Weather Data for Indianapolis, IN

Procedure

In this activity you will plan the site and complete the site plan for a home located in Indiana. You will be given specific weather data and a pre development site plan to help you as you plan.

Part 1: Research the Site

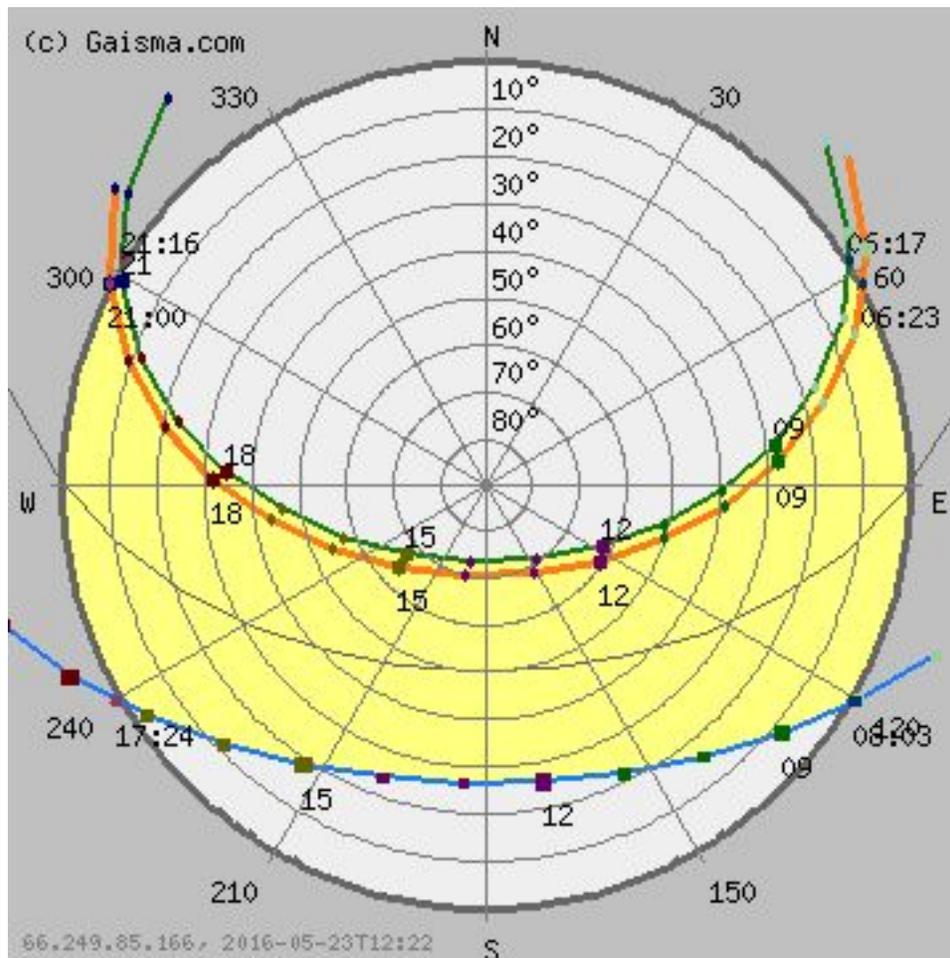
1. Study the Affordable Home Site.

Between Maple Street and 10th Street in Noblesville Indiana.

2. Study the Engineering Weather Data for nearby Indianapolis.

http://web.utk.edu/~archinfo/EcoDesign/escurriculum/weather_data/reports/indianapolis_in.pdf

3. What is the solar orientation?



4. What are the extreme temperatures for the site?

In winter temperature varies from 21 degrees to 36 degrees, in the summer temperature varies from 65 degrees to 87 degrees

5. From which direction do the prevailing winds come?

According to Indianapolis weather data reports the wind summary for December, January and February says that the highest knots of wind (25-34 knots) comes from the west. In March, April, and May the highest knots of wind (25-34 knots) comes from the west, southwest, and northwest but is generally spread throughout all directions. In June, July and August the highest knots of wind (15-24 knots) comes from the south. In September, October and November the highest knots of wind (25-34 knots) comes from the west.

6. What type of terrain is present for drainage?

There is a slight slope on the south side of our site which allows for rain to flow down it when it rains

7. Where will the water run in a heavy rainstorm?

It will flow down the southern slope into asphalt alley street

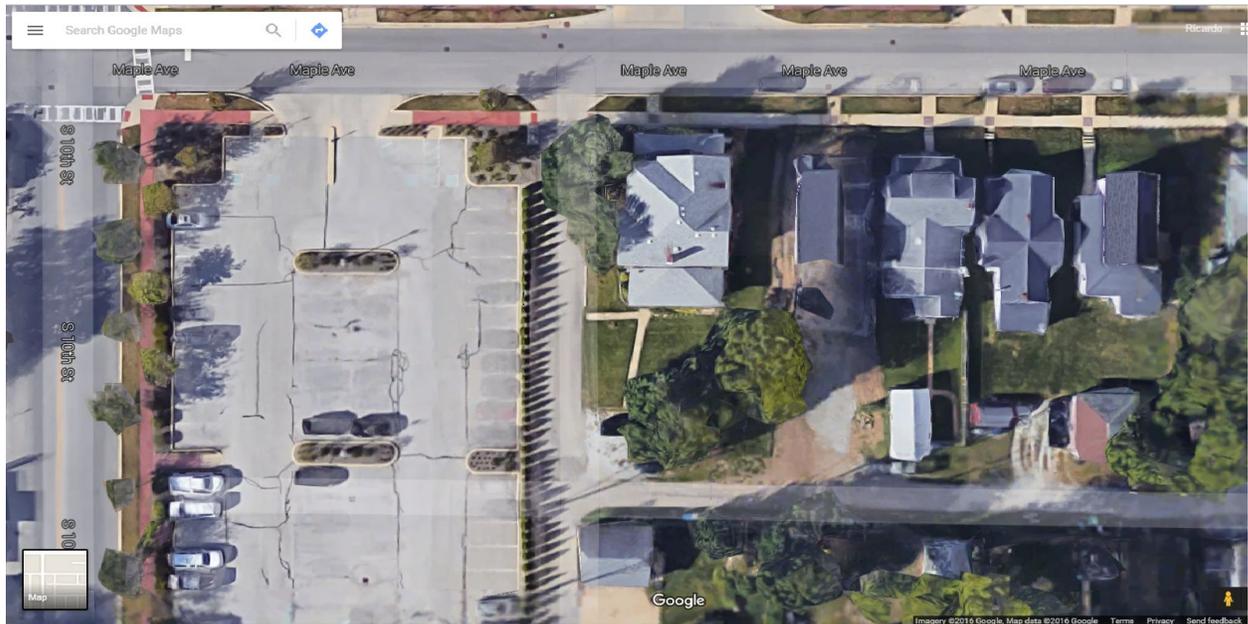
8. What are the adjacent properties?

There's is a gas station, town hall, Museum, clothing store and a bank

9. Is there a potential for noise or sound problems?

Cars driving on the nearby roads. There is a nearby gas station that could potentially be disturbing.

10. Review Internet satellite images to discover more about the property and its surroundings. Save an image for your project documentation.



Part 2: Make a Plan

1. Place a piece of tracing paper over the top of a printed site plan.
2. Create a Site Opportunities Map to reflect solar, wind, view, sound, and terrain orientation, and to document existing features that will affect the site layout.
3. Place a second piece of tracing paper over the top of the site plan and Site Opportunities Map. Sketch the building, approximately to scale, on the lot. Placement should be made after careful consideration of solar, wind, view, and sound orientation.

Remember the LEED® credit requirement related to passive solar orientation which requires that the east-west axis of the building is within 15 degrees of due east-west.

Take into consideration the potential location of utilities lines to be brought to the structure. Also consider the building line. Indicate approximate dimensions from the building to two perpendicular property lines.

4. Sketch a proposed driveway and sidewalk to the front door as well as proposed decks and porches.

5. Place landscaping to complement the design and improve energy efficiency.

Remember the LEED credit requirement related to passive solar orientation which requires that at least 90% of the south-facing glazing is completely shaded at solar noon on the summer solstice and unshaded at noon on the winter solstice.

Take into consideration the winter and summer extremes when placing trees and shrubs.

Remember that shading hardscape within 10 years of planting can lead to LEED Sustainable Sites credit.

Do some research to identify native vegetation that is hardy, requires less water than average (minimize turf grass), and is easy to maintain.

6. Document the advantages of your plan.
7. Present the sketches to your client. Highlight the advantages of your plan. Once they have approved the design, have the client sign the approved bubble diagrams and/or sketches.

Part 3: Document Your Design

1. Open the Affordable Site Plan Revit file and then open the HABITAT FOR HUMANITY SITE (under Floor Plans in the Project Browser).
2. Add the following site plan elements to the 3D model:
 - Use 1" = 30' scale
 - Legal description
 - North arrow
 - Property lines (by sketching over existing lines) and tags
 - Setbacks
 - Water (W) and Sanitary Sewer (SS) mains along the streets. Note that the SS lines should pass through the manholes.
 - House pad with appropriate dimensions and finished floor elevation
 - Driveway, walks, decks, and patios
 - Water service line (W) to the house
 - Sanitary sewer lateral line (SS) to the house
 - Landscaping
3. Revise the sheet title block as necessary and print a copy of your site plan.

Conclusion Questions

1. Detail the reasons for the orientation of your house.

The reasons for the orientation of our house is

2. How will the orientation of the building influence the energy costs during the life cycle of the house?

If the orientation is aligned towards the sun, the owner will use natural sunlight to illuminate his home instead of turning on the lights, saving energy. Additionally, the sun will