THE ARCHITECTURE HANDBOOK:
A Student Guide to Understanding Buildings

chicago ARCHITECTURE foundation
Jennifer Masengarb with Krisann Rehbein
# Table of Contents in brief

## Pre-Project
- **Chapter 1** The F10 House, Green Architecture, 10 Comparison Buildings

## Project 1: The Block Plan
- **Chapter 2** Reading Maps and Reading Drawings
- **Chapter 3** Scale
- **Chapter 4** Counting, Labeling, Documenting
- **Chapter 5** Comparing the F10 House Block with Your Street

## Project 2: The Site Plan
- **Chapter 6** Relationship to Nearby Buildings
- **Chapter 7** Orientation of the Building on the Site
- **Chapter 8** Topography and Landscape
- **Chapter 9** The Path to the Front Door

## Project 3: The Floor Plan
- **Chapter 10** Planning Spaces
- **Chapter 11** Circulation, Clients, and Guest Spaces vs. Family Spaces
- **Chapter 12** Furniture and Dimensions
- **Chapter 13** Window Placement, Views and Light
- **Chapter 14** Mechanical, Electrical, and Plumbing Systems

## Project 4: The Elevation
- **Chapter 15** Building Forms and Massing
- **Chapter 16** Buildings in Elevation
- **Chapter 17** Fenestration
- **Chapter 18** Building Proportions and People
- **Chapter 19** Materials and Colors

## Project 5: The Building Section
- **Chapter 20** Reading and Drawing a Building Section
- **Chapter 21** Forces and Structures
- **Chapter 22** Construction Materials
- **Chapter 23** Comparing Construction Techniques and Materials

## Project 6: The Design Project
- **Part 1** The Design Process
- **Part 2** Design a new home for a client
- An addition to the F10 House—the people and the construction process

## Resources
- **Index** From arches to zoning ordinances... you’ll find it here
- **Appendix A** Meet the F10 House and the 10 Comparison Buildings
- **Appendix B** How to ‘read’ a building
- **Appendix C** How to photograph a building
- **Appendix D** Careers in architecture and the built environment
- **Appendix E** How to prepare for the next step
- **Interview with architect Marc Ulian, designer of the F10 House**
- **Bibliography** Books and websites
- **Photo Credits**
THE BIG QUESTIONS

1. What different types of buildings can be identified on the block?

2. What maps or other tools are used to document the types of buildings on the block?

A land use map is an important tool used in counting, labeling, and documenting the things that make up a neighborhood. When this type of map is color-coded based on each building’s function or use, architects, urban planners, geographers, sociologists, and architectural historians can more easily see the patterns of how buildings are grouped together. Investigating these patterns helps people evaluate the overall character of a neighborhood, determine which buildings serve the residents, study how things may have changed over time, and evaluate what types of buildings may be missing from a community.
A land use map helps to illustrate and answer questions such as:
- What is the function or use of each building?
- What types of buildings are located along each street?
- How are these buildings grouped together?
- How much open space is around the buildings?
- Is the open space simply vacant land? Or, has it been set aside on purpose for recreation or for a natural area?

On most land use maps, the functions of buildings and land are grouped into five main categories: residential; commercial / business; institutional / public; industrial; and parks / open spaces / green spaces. Professional urban planners often use standard colors to color-code each building type:
- residential: yellow
- commercial / business: red
- institutional / public: blue
- industrial: grey
- open space: green

The land use map of the blocks around the F10 House shows that Tripp, Keeler, and Kedvale Avenues are narrower residential streets that tend to be quieter. Alleys run behind the homes and parallel to the streets, providing access to garages and garbage bins. Wider and busier Armitage Avenue contains most all of the area's commercial / business buildings, while some structures are mixed-use buildings with apartments located above the businesses.

The alley runs behind the homes and parallel to Keeler Avenue

### CHAPTER VOCABULARY

- **land use map**: a map that shows the use or function of each building, group of buildings, or open land area.
- **function / use**: a description of how a particular building is used.
- **residential building**: buildings used by people as their home.
- **commercial / business building**: buildings used for business or commerce and where people sell things.
- **mixed-use building**: buildings that have more than one use; typical mixed-use buildings in a city have commercial businesses on the first floor and residences in the floors above.
- **zoning ordinances**: a system of rules typically established by the local government to control the height, density, and use of buildings in various areas of a city.
- **institutional building**: (also called a public building or civic building) buildings used for providing a service to the public; examples include hospitals, schools, houses of worship, and government offices.
- **lot / site**: the geographic location of a building; it is often identified by its property lines.
- **industrial building**: buildings used to make a product.
- **park / open space / green space**: land set aside for recreation, as a natural landscape, or for agriculture; it typically has few or no buildings.
- **vacant**: empty land or buildings not set aside as open space; instead it currently lacks a use.

CONTINUED ON NEXT PAGE
**dwelling** another word for a home of any kind

**single-family** a home designed for one family

**multi-unit building** any type of residential building with more than one housing unit

**townhouse / rowhouse** a multi-unit residential building where each family occupies more than one floor; the residences are divided vertically

**condominium / condo** a multi-unit residential building where each family owns one unit within the building; there may be several units on each floor of the building

**United States Census** the count of the population every 10 years by the federal government

**housing unit** a house, apartment, mobile home, room, or other place that the census counts as a separate space where a single person or a family can live

**developer** the person that invests money in the land and starts a project by hiring the architect and finding someone who is expected to buy the completed building

Corner of Keeler and Cortland Avenues, looking northwest

East side of Keeler Avenue

Corner of Armitage and Keeler Avenues, looking northeast

Corner of Armitage and Keeler Avenues, looking west
Over time, cities have organized their residential and commercial streets in a variety of ways. A city government may establish zoning ordinances, which determine where different building types may be located. Some streets may be designated for only commercial buildings or only residential buildings, while other streets may contain a mixture of both. Throughout the mostly residential streets of Chicago, for example, a minor commercial street occurs every ¼ mile and a major commercial street occurs every ½ mile.

Around the F10 House, for example, institutional buildings, such as St. Philomena church and school, are located on corner lots/sites along Cortland Avenue. Other institutional buildings, such as the large neighborhood public elementary school and a public high school, are located a few blocks away. Industrial buildings in the neighborhood cannot be seen on the F10 House land use map, because they are separated from the homes and businesses. Two neighborhood parks with green space are within easy walking distance, but they also are located beyond this map. Vacant land exists at both the southeast and southwest corners of Armitage and Keeler Avenues.

**DID YOU KNOW?**

**Bird’s eye views**

Before the invention of airplanes or the construction of tall buildings or satellites in space, people had no way to see what the earth looked like from the air. However, beginning in the 1860s, hand-drawn colored bird’s eye views became very popular and were available for most American towns. Since it was physically impossible to see the earth from high above in the 19th century, the bird’s eye view was an imagined view. An artist would begin by making accurate sketches on the ground of each building in the town and then would create an overall imaginary view as seen from the air. For the first time, residents could fully see the entire town and their place in it. Bird’s eye views remained popular until aerial photographs became available in the 1930s.
in class

Your ideal block

Imagine that you are an urban planner and have been given the unique opportunity to design your ideal block plan. How many buildings will be on each block? What types of residential, commercial, and institutional buildings will you plan for? Will you include any green space? How much green space? Are the different types of buildings to be grouped together or mixed up? Will your ideal block include places that residents of all ages can use? Your teacher has the templates and instructions for this in-class activity.

There are two main types of residential dwellings: single-family residences, and multi-unit buildings (such as townhouses / rowhouses, or condominiums). Every ten years, the United States Census counts the overall population of the country as well as measuring the number and types of housing units. In 2000, 66.7% of homes in America were single-family residences. Multi-unit housing (which is defined as any building with more than 2 units) made up 26.2% of housing, while slightly more than 7% of housing units were mobile homes, RVs, or house boats.

The Hermosa neighborhood of Chicago, where the F10 House is located, has a much lower percentage of single-family buildings than the national average. In 2000, 29.4% of the housing units in Hermosa were single-family residences, while 70.6% of the housing units in Hermosa were in multi-unit buildings.

Of course the percentage of each type of residence differs widely from neighborhood to neighborhood and from city to city. Large and dense cities such as New York, Chicago, Philadelphia, and Boston have higher percentages of multi-unit housing and more mixed-use buildings. Cities with more space and smaller populations have more single-family buildings.

on your way home TODAY

Try to find a street that has a mix of uses that includes both commercial buildings and residential buildings. Notice the size of each of these buildings relative to each other. Are the buildings roughly the same size? Do they appear to have been built at the same time? Do you think it is intentional that these buildings co-exist on the same block?
If a neighborhood has an empty lot or site, city officials, urban planners, and residents may be eager for something new to be constructed there. But before they can recommend what type of building the community needs and encourage a developer to invest in the area, they need to understand what the community already has. Consulting a land use map and studying current census data will help in making decisions about issues such as:

- Are the other buildings on this street mostly residential or commercial / business or institutional?
- What types of buildings are allowed by the city’s zoning ordinances?
- If this building is not a residence, would people typically visit this place once a day, once a week, once a month, or once a year?
- Should the lot contain a building that benefits many people or only a few people?
- What age groups and income levels will benefit from this future building?
- How might the new building affect the community?

Consulting a land use map can help a developer make decisions about an empty lot.

- Will the new building provide jobs for the residents?
- Will it provide services (health care, job training) or sell things (repair, groceries, dry cleaning)?
- Will it provide a place for the residents to gather and meet each other?

Together, all this information helps explain how a neighborhood looks and functions. Urban planners study different types of data when developing a plan for the redesign or growth of an area. For an architect, an understanding of the block will help to determine the design and function of a building.

**CHAPTER RESOURCES**


*Taking Measures Across the American Landscape*, James Comer with Alex MacLean photographs. New Haven: Yale University Press, 1996. TR660.5.C67

---

**TALK about it**

- What types of buildings do you need to visit every day? Every month? Only once a year?
- Look at the blocks around the F10 House on the land use map. If you lived in the F10 House (shaded dark grey, in the center of the map), which buildings would you visit daily, weekly, monthly, or yearly?
- Imagine that you are 85 years old and live in the F10 House. What types of buildings would you want to visit? What places for seniors exist? What places for children exist? What places for senior citizens are missing?
- Imagine that you are 45 years old and the parent of a family living in the F10 House. What places for families exist? What places for families are missing?
Reading

A ‘BALLET’ ON THE SIDEWALK


Jane Jacobs’ neighborhood of Greenwich Village, New York City

BACKGROUND

Jane Jacobs is known around the world as someone who changed the way that people such as architects and urban planners look at cities. Specifically, she was a leader in the historic preservation movement. She argued that keeping old buildings added to the value of street life and that mixing of uses and both new and old buildings on a block created better, more livable, streets. She was writing in the 1960s at a time when it was common for cities to tear down historic neighborhoods and put large freeways and modern high-rise housing in their place. This reading is an excerpt from her most well-known and influential book. It records her observations about her own neighborhood of Greenwich Village in New York City.
The stretch of Hudson Street where I live is each day the scene of an intricate sidewalk ballet. I make my own first entrance into it a little after eight when I put out the garbage can, surely a prosaic occupation, but I enjoy my part, my little clang, as the droves of junior high school students walk by the center of the stage dropping candy wrappers. (How do they eat so much candy so early in the morning?)

While I sweep up the wrappers, I watch the other rituals of morning: Mr. Halpert unlocking the laundry’s handcart from its mooring to a cellar door, Joe Cornacchia’s son-in-law stacking out the empty crates from the delicatessen, the barber bringing out his sidewalk folding chair, Mr. Goldstein arranging the coils of wire which proclaim the hardware store is open, the wife of the tenement’s superintendent depositing her chunky three-year-old with a toy mandolin on the stoop, the vantage point from which he is learning the English his mother cannot speak.

Now the primary children, heading for St. Luke’s, dribble through to the south; the children for St. Veronica’s, cross, heading to the west, and the children for P.S. 41, heading toward the east. Two new entrances are being made from the wings; well-dressed and even elegant women and men with brief cases emerge from doorways and side streets. Most of these are heading for the bus and subways, but some hover on the curbs, stopping taxis which have miraculously appeared at the right moment. For the taxis are part of a wider morning ritual: having dropped passengers from midtown in the downtown financial district, they are now bringing downtowners up to midtown.

Simultaneously, numbers of women in housedresses have emerged and as they crisscross with another they pause for quick conversations that sound with either laughter or joint indignation, never it seems, anything between. It is time for me to hurry to work too, and I exchange my ritual farewell with Mr. Lofaro, the short, thick-bodied, white-aproned fruit man who stands outside his doorway looking solid as earth itself. We nod; we each glance quickly up and down the street, then look back to each other and smile. We have done this many a morning for more than ten years, and we both know what it means: All is well….

When I get home from work, the ballet is reaching its crescendo. This is the time of roller skates and stilts and tricycles, and games in the lee of the stoop with bottletops and plastic cowboys; this is the time of bundles and packages, zigzagging from the drug store to the fruit stand and back over to the butcher’s; this is the time when teenagers, all dressed up, are pausing to ask if their slips show or their collars look right…this is the time when the fire engines go through; this is the time when anybody you know around Hudson Street will go by….

I have made the daily ballet of Hudson Street sound more frenetic than it is, because writing it telescopes it. In real life, it is not that way. In real life, to be sure, something is always going on, the ballet is never at a halt, but the general effect is peaceful and the general tenor even leisurely. People who know well such animated city streets will know how it is....
1 Keeler Avenue, between Cortland Avenue and the alley to the north, is 470 feet long, and has 2 fire hydrants on each side of the street, near the center of the block. Keeler Avenue is a one-way street and cars can park on both sides. However, cars cannot park within 15 feet of a fire hydrant or within 15 feet of any intersection (of a street or an alley).

Given these conditions, how many feet are available for parking on one side of the street?

2 The total length of a typical car, plus the space required for maneuvering into a parking space, is 20 feet.

Approximately how many cars can be parked on both sides of Keeler Avenue, assuming the conditions are the same as in #1 and the same on each side of the street?
3 On this same block of Keeler Avenue, the following conditions exist:

<table>
<thead>
<tr>
<th>TYPE OF BUILDING</th>
<th># OF BUILDINGS</th>
<th># OF OFF-STREET PARKING SPACES (accessible from an alley)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-unit apartment building</td>
<td>9</td>
<td>1 space per building</td>
</tr>
<tr>
<td>3-unit apartment building</td>
<td>4</td>
<td>1 space per building</td>
</tr>
<tr>
<td>6-unit apartment building</td>
<td>2</td>
<td>4 spaces per building</td>
</tr>
<tr>
<td>single-family homes</td>
<td>16</td>
<td>1 space per building</td>
</tr>
</tbody>
</table>

A housing unit is defined as one house or one apartment counted as a separate unit. How many housing units can be found on this block of Keeler Avenue?

4 What is the total number of off-street parking spaces available for housing units on Keeler Avenue?

5 If the housing units on the block average 1.5 cars each, what is the total number of cars belonging to people living on Keeler Avenue?

6 How many cars must be parked on Keeler Avenue?

7 Based on your answers from #4, #5, and #6, will all these cars fit on this block of Keeler Avenue? Explain.

8 In some neighborhoods of Chicago, including this block of Keeler Avenue, cars that park on the street overnight must have a neighborhood street parking sticker that costs $25 a year. These special stickers prevent non-residents and visitors from occupying parking spaces. How much money will be generated by the City from the residents’ cars that must use street parking?

9 Suppose that you lived in a home that had an off-street parking space available, but you do not own a car. You’ve decided to rent this space to earn money to buy a used car. You estimate that you need $6,000 to buy this car. If you rented the space for $125 a month, for how long would you need to rent the parking space until you saved enough money to buy the car?