NEWHOUSE | ARCHITECTURE +DESIGN COMPETITION

The Accessible City

2024 Student/Educator Manual

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NEWHOUSE | ARCHITECTURE +DESIGN COMPETITION

Newhouse at a Glance

The annual Newhouse Architecture + Design Competition showcases the talents of Chicago-area students who create projects that solve real-world problems.

Named after late Illinois Senator Richard Newhouse, this competition gives students an opportunity to practice and refine design skills and create a project that could be part of their portfolio. It inspires teens to understand why design matters by researching, representing and redesigning the built environment to solve challenges that are personal, and place based.

The Chicago Architecture Center thanks the supporters of its education programs:

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A special thank you to our partners, **Human Scale**. Human Scale is a 501(c)(3) nonprofit organization founded in 2018 by a group of architecture students with the goal of using their skills to make a positive impact in their communities.

Their mission is to design and build functional, beautiful, and meaningful public spaces in historically disinvested neighborhoods across Chicago. As a result, our work seeks to improve mental and physical wellness, promote civic responsibility, highlight heritage and culture, and foster strong inter-generational relationships within the communities we work in.

2024 Newhouse Competition Theme

The theme for the 2024 Newhouse Competition is the Accessible City. To ensure the competition is accessible and equitable to all interested participants, this year's divisions will range from small, medium, and large scaled projects.

WHAT IS AN ACCESSIBLE CITY?

According to the United Cities and Local Governments (UCLG) World Congress and Summit of Local and Regional Leaders, an accessible city 'is a place where everyone, regardless of their economic means, gender, ethnicity, disability, age, sexual identity, migration status or religion, is enabled and empowered to fully participate in the social, economic, cultural and political opportunities that cities have to offer.'

As Chicago continues to be a laboratory for city development, it is our responsibility to move into our future with a full understanding of the needs of city residents and how to create spaces and neighborhoods we need, want, and deserve.

INTRODUCTORY RESOURCES:

- Inclusive + Accessible Cities

- The 15 Minute City

- How to Make Cities Accessible and Inclusive

- What is City Planning?

- Principles of Sustainable Architecture

- The Four Pillars of Sustainability

- American Planning Association

- Sustainability – What Is It? Definition, Principles and Examples

- Learn About Sustainability

TOPICS TO CONSIDER REGARDING ACCESSIBILITY:

- Urbanization

- Universal Design

- Circular economy

- Hostile Architecture

- Urban Planning

- Social responsibility

- Greening the City

- Needs for a Changing Downtown, post-COVID 19

- LEED (Leadership in Energy and Environmental Design)

- Education and investment

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TOPICS TO EXPLORE REGARDING ACCESSABILITY:

- Materials native to the Chicago/Mid-West

- Nature in a space

- Nature of a space

- Representational presence people and cultures

- ADA Compliance

- Food Deserts

- Civic Engagement

- Self-Efficacy and Agency

Timeline

January 19	April 12	April 15-19	May 18
REGISTRATION OPEN & COMPETITION LIVE	COMPETITION CLOSES	JURY REVIEW	SHOWCASE AT CAC

Developing + Submitting Your Project

All work must be submitted to the competition portal at architecture.slideroom.com by 11:59pm (midnight) CST on April 12, 2024 to qualify for jury review. The Newhouse Architecture + Design Competition is free to enter.

REGISTRATION

Participation requires online registration, using a portal called SlideRoom. This registration creates a unique account where you will later upload your photos, artwork, renderings, etc. Refer to each **Division Description** for specifics on what to upload.

SUBMISSION REQUIREMENTS

○ Complete the registration form

○ Complete all of the requirements for your selected Division

○ Complete all of the requirements for your selected Challenge

○ Be sure all images are uploaded

- NOTE: You may upload up to 10 files for your submission, including any combination of the following: image files (JPEG, TIF, PNG), PDF, video, audio

- Designs may be digital or hand-drawn images, 3D physical models or a combination of types. However, all work must be submitted digitally on the SlideRoom platform

○ Include design process artifacts (floor plans, elevations, sketches, photographs, notes, research you used, audio or video, etc.) that illustrate your project's development

○ Include a final draft (model, floor plan, graphic, etc.)

○ Include a completed Design Concept Statement and Essay

Design Concept Statement + Essay Requirements

The written component of your submission must include:

DESIGN CONCEPT STATEMENT

What challenge does your project address and for whom? What are the most important characteristics of the design, and how do they address an accessible city?

REFLECTION

What was it like to work on this project? How did you work through each step of the Design Process? What snags or roadblocks did you encounter along the way, and how did you overcome them? If you could do it all again, would you make changes to your process?

UPLOADING YOUR PROJECT

You can log in and out of your SlideRoom account at any time. You may upload up to 10 files for your submission, including any combination of the following: images (JPEG, TIF and/or PNG), documents (PDF, Microsoft Word docs), audio and video files. Maximum file sizes are 20MB for PDFs, 10MB for images, 500MB for videos and 60MB for audio files. Audio and video may be file uploads within those limits or shared via links to YouTube, Vimeo and/or SoundCloud. Please ensure any linked media files are made public or include passwords required for access by Newhouse jurors.

GUIDELINES FOR FILE NAMES

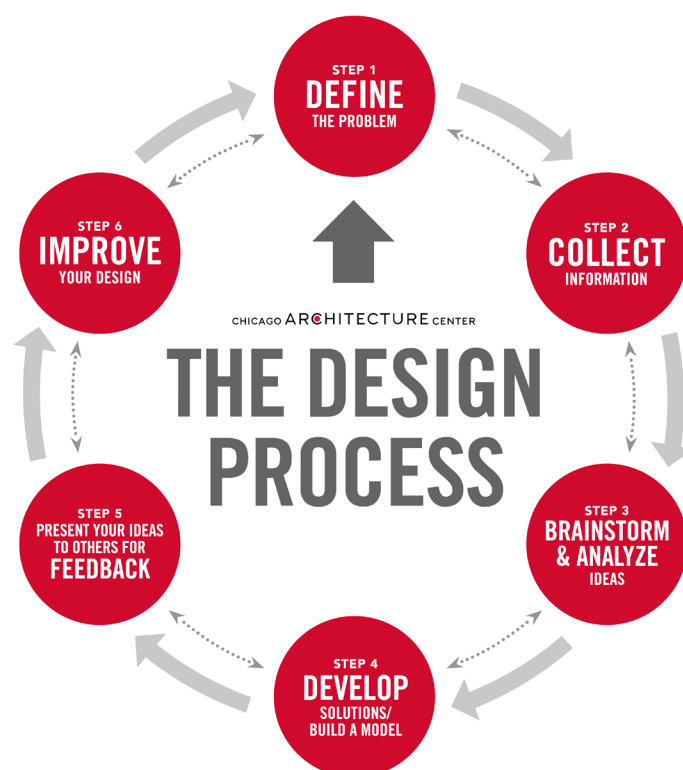Files must be labeled in the following format:

- Final project file(s): FINAL_FirstInitialLastName_#of#.filetype
    - > Example: FINAL_NSmith_1of2.jpg

- Essay file: ESSAY_FirstInitialLastName.filetype
    - > Example: ESSAY_NSmith.pdf

- Design artifact files: DESIGNARTIFACTS_ FirstInitialLastName_#of#.filetype
    - > Example: DESIGNARTIFACTS_NSmith1of4.jpg

PHOTOGRAPHING PHYSICAL MODELS, SKETCHES & ART PIECES

- If using a smartphone, set your camera to take photos at the maximum resolution available (HD, 4K, etc.)

- Consider your background. Minimize clutter/distractions by photographing your work against a blank surface/wall (preferred)

- Triple-check that your images are clear and the proportions are not stretched. Enable HDR (High Dynamic Range) if available

- Please review your images and file names carefully before submitting

Design Process Guidelines

The Design Process, much like the Science and Engineering Practices, can help you to work through solutions to real world challenges. Consider the following steps as you work on your project. Be sure to include how you worked through these steps in the essay portion of your submission, and save documents, notes, sketches and ideas you collect along the way. These "design artifacts" are an important part of your final submission.

THE DESIGN PROCESS

STEP 1 — DEFINE THE PROBLEM
STEP 2 — COLLECT INFORMATION
STEP 3 — BRAINSTORM & ANALYZE IDEAS
STEP 4 — DEVELOP SOLUTIONS/BUILD A MODEL
STEP 5 — PRESENT YOUR IDEAS TO OTHERS FOR FEEDBACK
STEP 6 — IMPROVE YOUR DESIGN

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THINGS TO THINK ABOUT

- Does the project address address accessibility?

- What problems are worth solving/understanding? What's worth knowing/experiencing? What constraints or criteria need to be considered?

- How could my project make someone feel? Do they understand the need for an accessible city?

- What do the locations like urban, suburban, and rural city planning affect the project?

- Are materials still sustainable regarding where they are sourced from?

- Using the data you collected, imagine ways you might solve the problem. Record your ideas as they evolve through things like sketches, photos, and notes. How are community voices represented in your design? Begin thinking about how you'll move to a final idea, and how you will share it with others.

- Continue to improve on your ideas, doing more research when necessary. Build a model, prototype or draft. Identify the materials/medium that will be a part of your final project/solution.

- Present your idea to others and improve your design. Do this multiple times!

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Newhouse 2024:
Architectural Division (SMALL)

SMALL: DESIGN A BRT BUS SHELTER: Due to the rapid increase in population and shifts towards urban migration, a rising trend across the world for mass transit. Bus Rapid Transit (BRT) is a cost-effective and efficient way to move people throughout their cities.

Unlike typical bus stops, BRT stops are meant to be less frequent along routes, making the commute faster and accommodating more people. It is up to you to design a new type of transit shelter, decide how it will function and protect passengers from the elements and provide information and other amenities while they are waiting. A shelter is a structure that we may take for granted, but BRT shelters also have the potential to make our daily lives easier while also significantly impacting the way our streets look.

DEFINE

Design a BRT shelter to accommodate minimum of 25 people

Take into consideration:

For the BRT shelter, be sure to include a ticket or Point-of-Pay facility so that riders can pay before the bus arrives. The BRT station should facilitate easy loading and unloading of passengers, some of whom may use wheelchairs or other assistive devices. The weather is not always pleasant, and your BRT station should protect people from rain, snow and extreme heat. Passengers should be safely removed from traffic but not hidden from view of the bus driver or public safety workers. Consider how to provide information to riders departing from and arriving at the BRT station. Finally, your BRT station should be energy efficient and not prone to flooding. Provide information about the intersection/stop selected, including drawings.

COLLECT INFO

In this step of the design process, you'll want to gather as much information as possible about different types of shelters, from regular bus shelters to train shelters. How are they different? How do people use them? Since BRT is new to Chicago, you'll also want to look at BRT stations that have been designed in other countries. Interview bus riders about how they use the current type of bus shelter and what is missing in their design.

Think About:

- Start off the project by analyzing what you already know about bus shelters.

- What are the basic functions and design elements of any bus shelter?

- What materials are these shelters made from?

- How could current bus shelters be scaled up to accommodate more people and longer wait times?

- What are some things that you really like or hate about Chicago's current bus shelters?

- How long will passengers typically wait at the bus stop? Check out this timetable to give you an idea.

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Try This:

- Make a list of all the different features on an existing Chicago bus shelter. Explain what you've learned and post information the information in this step.

- **Learn about the BRT system.** How does it work? How are the station locations determined? What makes a BRT system different than a regular bus route?

- Look at transit systems and stations from other countries. The **TransMilenio in Bogota, Colombia** had a lot of press when it opened in 2000.

- Use **Flickr** and **Google Images** to search "bus shelter." Research different types of bus stops and shelters in different cities around the world. How are these different than regular bus shelters?

- Use **Google Maps** to view and print out an aerial photograph of your intersection. How far away is the stop from the street corner? How far away should it be?

- Interview several of your friends and classmates about what they like or hate about the bus shelters you typically use.

- **This blog** about bus shelter designs have some very interesting ideas from all over the world.

BRAINSTORM IDEAS

How do you Brainstorm Ideas for this step of the design process?

- In this step of the design process, you'll want to put some early ideas down on paper that show what you've found in the **Collect Info** step. You also might take more photos to show specific new ideas you have.

- Make some early decisions about the location, size, features, and materials for your shelter. Draw a hand sketch to help you puzzle through new ideas.

Try This:

- Identify a location for your shelter on your site near your intersection. Mark this location on a map and think about its proximity to other bus stops, rail stations, or other points of interest near this intersection.

- Based on what you learned in the Collect Information, make a list of all the features you'd like to have in your design. Edit this list into 'necessities' and 'nice to have' categories.

- Using a tape measure and some masking tape, mark out some different footprint options for the shelter. How many people do you need to accommodate? How much space should each person get? How does this compare with the size of a regular bus shelter? Explain your thinking in the description of your project.

- Draw several quick sketches to get your early ideas down on paper. Either take a photo or scan and then upload your sketches to your project account. These don't need to be your final ideas.

- Consider what materials the shelter will be made from: what materials will be durable against the weather and the riders who wait there?

DEVELOP SOLUTIONS

How do you Develop Solutions for this step of the design process?

Now's the time to take what you've learned from the steps above to develop your solution for a bus shelter.

Draw a sketch or use software such as Google SketchUp, AutoCAD, or Revit to illustrate your ideas. You can upload photos (JPG files) from your SketchUp model, video fly throughs (FLV files) of your SketchUp model, or drawings (DWF files) from AutoCAD.

Try to include:

- One site plan

- One floor plan

- At least two elevation or perspective views

Try This:

You may use any method you'd like to show your design (pencil, colored pencil, collage, physical models, or digital rendering software). Here are a few suggestions for drawings and models of your BRT shelter:

- Use cardboard or cardstock to build a rough physical study model or prototype of your shelter. You can't really understand the shape of the shelter until you make a quick study model. Don't worry about making a fancy finished model at this time. Instead, use cardstock, scissors, and tape to quickly create the large 3D form. See how it looks. Break off different sections, add new pieces, and try new ideas. Take photos of your model and upload them to this step.

- Sketch or use software such as Google SketchUp, AutoCAD, or Revit to get the ideas out of your head to share with others.

FINAL DESIGN

Create more finished drawings that illustrate your ideas to others. Remember, your explanation text and the types of drawings, images, and models you share need to tell the whole story of your project.

Continue to collect feedback from your peers, teachers and the online community to help you improve on your final design. Be sure to review and add constructive comments on the work of your classmates and other students who are solving the same design problem. If your ideas change, be sure to explain your thinking and let others know about the new work you have posted to your account.

You might want to share floor plans, elevations, renderings of your digital model, photos of a physical model, or a video animation of your model.

- Review your design and test it against your original success statement that you wrote for the Overview. Does it meet this criterion?

- Make a list of your ideas, sketches, and study models. For your final design you will want to write and post a short but effective paragraph of your process and the unique solutions you found developed. Tell us about your ideas.

JUDGING CRITERIA

Your teacher and architectural mentors will be looking for these things:

1. Originality in your design

2. Your ability to creatively solve the design challenge

3. The quality of images, sketches, drawings, and models you have uploaded in each of the **five design process steps** (Overview, Collect Info, Brainstorm Ideas, Develop Solutions, and Final Design).

4. As your ideas change, be sure to explain your thinking and let others know about the new work you have posted to your account. Go back to the virtual drawing board and revise your project based on the feedback of others.

5. How well you have written about and explained your thinking in each of the design process steps.

Newhouse 2024:
Architectural Division (MEDIUM)

MEDIUM: ARCHITECTURAL PHOTO ESSAY: The Chicago streetscape is constantly under construction. In an already dense city, any redevelopment program, large or small, has the potential to subtly or dramatically transform the look and feel of a neighborhood. But just as a new building changes the character of a community, so too does the removal of an existing building. In 2022 alone, the City of Chicago issued more than 800 wrecking permits. While one demolition project might afford space for a much-needed neighborhood amenity, such as a new grocery store or affordable housing, another project might erase an architecturally, historically, or culturally significant resources. Photographs, along with our personal stories and memories, provide a powerful record of the buildings and places Chicago has lost over time.

DEFINE

Select a building in your neighborhood that is permitted for demolition but has not yet been torn down — you will generally find official signage displayed at the building site. You may also identify a vacant building that is still standing but is not currently occupied. You can use the City of Chicago Data Portal to locate demolition permits, or contact your local planning department if you reside outside the city.

Create a photographic essay documenting this building. Be sure to capture its sitting, context, massing, condition and any relevant architectural details. In photographing the building, be intentional about lighting, time of day, depth of field, the scale of the building and its local context to give your essay visual interest and support your narrative.

COLLECT INFO

Try This:

- Identify a property on the Demolition Permit list that you can visit in person, then schedule time to go see it in the daylight. As you walk around a property, look to see what angles are most visible from the street and what perspectives might make for an interesting photograph. Take notes on anything else you notice about the block or immediate area, including any other buildings, properties, people, etc.

- Using internet-based research, find out anything you can about how your selected building, including but not limited to when it was built, how it was used over time, and why it is now scheduled to be demolished.

- Ask an older member of your community (or more than one) about a Chicago building he/she remembers that is no longer there. Where was this building located, and what is there now? What did it mean to the person you are interviewing? Do any photographs exist?

Explore these resources:

- Chicago Data Portal, demolition permits
- Library of Congress, Historic American Buildings Survey database and highlights
- 8 Tips for Doing Stunning Urban Landscape Photography
- GNU Image Manipulation Program — Free photo editing software
- More resources, including chapters of The Architecture Handbook

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BRAINSTORM IDEAS

How do you Brainstorm Ideas for this step of the design process?

Try This:

- Make a table to organize different photographic methods to experiment with, including equipment and/or techniques to use, times of day you want to photograph, compositional ideas, color, etc.

- Consider where your site is located. What are its context and surroundings? How might the removal of your building and/or redevelopment of the site change the nature of the block or neighborhood?

DEVELOP SOLUTIONS

How do you Develop Solutions for this step of the design process?

Try This:

- Take LOTS of photos! In order to get one good photo, you might have to take 10. Don't be afraid to take more photos than you need now and edit them down later.

- Photograph the same site multiple times, in every possible angle.

- Go back and photograph on different days, and at different times. How does it change?

- As you select your final photos to submit, think about what unique perspective or story each photo tells. Why are you selecting that photo over another?

Get Feedback and Improve

- Ask your teacher, friends, family, neighbors, what they think of your design.

- Get professional feedback at CAC's Teen Saturday Studios.

FINAL DESIGN

Submission Requirements:

- Register for this division

- 1 zip folder of 9 photographs uploaded digitally | on Slideroom in order to qualify for jurying:
    - > Save your 9 photographs and compress the folder into a .zip file
    - > LASTNAME_FIRSTNAME_1.jpg, etc..
    - > Caption each of your photos to explain what is being shown

- Essay (150-200 words) uploaded digitally | on Slideroom in order to qualify for jurying
    - > In what ways will the demolition/repurpose of this property change the community?

- The 9 photographs (4" x 6") mounted on a single horizontal board | turned into your teacher or drop off location in order to qualify for jurying. Drop off: Chicago Architecture Center, 111 E Wacker Drive, 60601
    - > The 9 photographs must be mounted on a 30" x 20" board. Each image MUST have a title, date, time, and camera model/type
    - > The 4" x 6" photos can be either portrait or landscape
    - > Print on photo paper. They must be full bleed or with a border on each photograph

> This is NOT a photo editing contest. You may only use photo manipulating programs (in the whole image or specific parts) to accomplish the following tasks using any method: Convert to black and white or duotone, Sharpen, Remove noise, Adjust the exposure

> Do NOT apply filters that alter your photo to resemble other media types or styles

> The 4" x 6" images must be full bleed or with a border on each photograph

> Fill out and apply competition entry labels with your unique participant ID number (Slideroom ID). Do NOT include your name or school anywhere visible on the model

JUDGING CRITERIA

- Clear documentation of a building site set in context with its surroundings.

- Effective use of framing showcases the photos and makes a compelling image.

- Convey technical quality, composition, and originality in your work.

Newhouse 2024: Architectural Division (LARGE)

LARGE: DESIGN AN AFFORDABLE SHIPPING CONTAINER HOME: 'Shipping container architecture' is a growing form of design using steel intermodal shipping containers as the main structural element. The steel is not only strong but meant to withstand heavy loads and harsh weather conditions. Currently, the world has over 60 million shipping containers in use, making them widely available for alternative uses and a relatively inexpensive and sustainable building material.

DEFINE

What's the problem here? Getting started on your container house design project.

The challenge is to design a livable home out of standard industrial shipping containers. These intermodal freight containers have a standard size of 40 by 8 feet each, and are commonly 8 feet 6 inches or 9 feet 6 inches tall. They are typically made of corrugated weathering (commonly known as the trademarked COR-TEN) steel, and have simple 'twistlock' corners for easy stacking, locking, and craning. These containers are ideal for construction because they can be transported to a site in so many different ways (and can carry some of the other construction materials!). They can be shipped by rail, container ship, or semi-trailer truck. However, there are some drawbacks too. The containers are not insulated and do not provide protection against heat and cold on the inside. See the list of advantages and disadvantages:

Advantages:

- **Strength and durability:** Shipping containers are in many ways an ideal building material. They are designed to carry heavy loads and to be stacked in high columns. They are also designed to resist harsh environments, such as on ocean-going vessels or sprayed with road salt while transported on roads. Due to their high strength, containers are useful for secure storage.

- **Modular:** All shipping containers are made to standard measurements, and as such they provide modular elements that can be combined into larger structures. This simplifies design, planning and transport. As they are already designed to interlock for ease of mobility during transportation, structural construction is completed by simply emplacing them. Due to the containers' modular design, additional construction is as easy as stacking more containers. They can be stacked up to 12 high when empty.

- **Labor:** The welding and cutting of steel is considered to be specialized labor and can increase construction expenses, yet overall it is still lower than conventional construction. Unlike wood frame construction, attachments must be welded or drilled to the outer skin, which is more time consuming and requires different job site equipment.

- **Transport:** Pre-fabricated modules can also be easily transported by ship, truck or rail, because they already conform to standard shipping sizes.

- **Availability:** Used shipping containers are available across the globe.

- **Expense:** Many used containers are available at an amount that is low compared to a finished structure built by other labor-intensive means- such as bricks and mortar- which also require larger more expensive foundations. Construction involves very little labor and used shipping containers requiring only simple modification can be purchased from major transport companies for as little as US $1,200 each. Even when purchased brand new they are seldom more than US $6000.

Disadvantages:

- **Temperature:** Steel conducts heat very well; containers used for human occupancy in an environment with extreme temperature variations will normally have to be better insulated than most brick, block or wood structures.

- **Humidity:** As noted above, single wall steel conducts heat. In temperate climates, moist interior air condenses against the steel, becoming clammy. Rust will form unless the steel is well sealed and insulated.

- **Construction site:** The size and weight of the containers will, in most cases, require them to be placed by a crane or forklift. Traditional brick, block and lumber construction materials can often be moved by hand, even to upper stories.

- **Building permits:** The use of steel for construction, while prevalent in industrial construction, is not widely used for residential structures. Obtaining building permits may be troublesome in some regions due to municipalities not having seen this application before.

- **Treatment of timber floors:** To meet Australian government quarantine requirements most container floors when manufactured are treated with insecticides containing copper (23-25%), chromium (38-45%) and arsenic (30-37%). Before human habitation, floors should be removed and safely disposed. Units with steel floors would be preferable, if available.

- **Cargo spillages:** A container can carry a wide variety of cargo during its working life. Spillages or contamination may have occurred on the inside surfaces and will have to be cleaned before habitation. Ideally all internal surfaces should be abrasive blasted to bare metal, and re-painted with a nontoxic paint system.

- **Solvents:** Solvents released from paint and sealants used in manufacture might be harmful.

- **Damage:** While in service, containers are damaged by friction, handling collisions, and force of heavy loads overhead during ship transits. The companies will inspect containers and condemn them if cracked welds, twisted frames or pin holes are found, among other faults.

Tiny home living is not just about downsizing and minimalism, it can also have a big positive impact on the environment. Research on the topic is still emerging as the trend grows, yet studies have found that upon downsizing, tiny homes use significantly less energy to maintain, use less building materials, and residents have less waste-producing stuff. All of this contributing to a smaller ecological footprint. Check out Florida's "LEEDing Tiny" program.

- Find and upload designs that inspire you.

- Research LEED and other local sustainable policies in your area.

- As an example, the Chicago Sustainable Development Policy provides a menu of sustainable strategies which includes the following categories:

❍ Health	❍ Water
❍ Energy	❍ Transportation
❍ Stormwater	❍ Solid Waste
❍ Landscapes	❍ Workforce
❍ Green Roofs	❍ Wildlife

- Architects' designs should include solutions across these categories and are scored according to the point system specified in the Sustainable Strategies Menu. Each category is worth a set number of points. The combined category points should equal 100 to meet the requirements. Why 100? Planned Development Projects for New Construction require a combined total of 100 points from multiple categories to qualify for city approval. Will your design meet the required 100 points?

- Make a list of possible sustainable solutions you want to incorporate. Find images or sketch ideas.

DEFINE THE PROBLEM

- **Purpose:** Create an alternative home design by repurposing shipping containers.

- **Location:** Your choice. Select a site within your home's or school's neighborhood, which you can photograph and measure.

- **Target audience:** Individuals or families interested in alternative housing solutions.

- **Size limitations:** Up to four containers, 40 feet x 8 feet each

- **Materials to be used:** Containers and recycled materials.

- **Budget constraints:** $30,000.00 including the cost of the shipping containers, which cost about $6,000 each (see WikiHow for how to buy a shipping container)

COLLECT INFO

How do you Collect Info for this step of the design process?

In the **Collect Info** step of the design process, you try to gather as much information as possible about shipping containers and your site, along with the people who will use it. You can't propose solutions until you figure out and document the design problem.

Try This:

- Start off the project by analyzing what you already know about container architecture and container housing.

- Measure out a full-scale plan of a container using a measuring tape. This will help you visualize the full size of a shipping container.

- Make a list of the features you want this home to have. What is important? Remember, you only have up to 4 containers. Is living space most important, or the number and size of bedrooms?

- Consider the size of your site. There may only be a certain way the shipping containers can fit on the site, so try a few different combinations of the containers, including putting them in multiple levels.

- Research shipping container architecture to see how others have repurposed shipping containers into buildings.

Think About:

- How many people will be living in this home? What are their ages and genders? What do they do? How much space does each person need? What kinds of living spaces will this family need? How many bedrooms and bathrooms?

- Where is the site for this container house? What makes this site unique? Is it narrow? Square? This will dictate how you can configure multiple containers.

- What basic necessities will you need to add to make this space livable? For example, you will need to add plumbing, electricity, and insulation. What else is needed?

- How will the outdoor space be used?

BRAINSTORM IDEAS

How do you Brainstorm Ideas for this step of the design process?

In the **Brainstorm Ideas** step of the design process, you put some early ideas down on paper that show what you've found in the **Collect Info** step. You also might take more photos to show specific new ideas you have.

The simple diagrams you make here will help you understand how the site location and design compare with your new ideas.

Think About:

- Spend some time looking at the aerial photo of your site. What types of other buildings surround your site? Homes, businesses, parks, parking lots, or an empty field? How will these other buildings impact the design of your home?

- What types of streets surround your site? Are they busy or quiet?

- On a piece of tracing paper placed over the aerial photo of your site, sketch a diagram showing a large arc around the building to show the path of the sun throughout the day. This drawing is called a site analysis diagram and here's a video on how to create one. (Remember, the sun rises in the east and sets in the west).

- Draw other lines on this diagram to indicate the best views around the site.

- Based on the site analysis diagram you've sketched, where is the sun located throughout the day?

- How can the indoor and outdoor rooms be positioned to take advantage of the sunlight for good lighting?

DEVELOP SOLUTIONS

How do you Develop Solutions for this step of the design process?

In the **Develop Solutions** step, your rough ideas come together with drawings and models that can show others your solutions for a shipping container home.

Draw a sketch or use software such as Google SketchUp, AutoCAD, or Revit to illustrate your ideas. You can upload photos (JPG files) from your SketchUp model, video fly throughs (FLV files) of your SketchUp model, or drawings (DWF files) from AutoCAD.

FINAL DESIGN

How do you create a Final Design for this step of the design process?

The **final step** of the design process is to create more finished drawings that illustrate your ideas to others. Remember, your explanation text, and the types of drawings, images, and models you share need to tell the whole story of your project to someone who may or may not have ever visited your site or even your city.

Continue to collect feedback from your peers, teachers and the online community to help you improve on your final design. Be sure to review and add constructive comments on the work of other students who are solving the same design problem. If your ideas change, be sure to explain your thinking and let others know about the new work you have posted to your account.

You might want to share floor plans, elevations, renderings of your digital model, photos of a physical model, or a video animation of your model.

- Review your design and test it against your original problem statement that you wrote for the Overview. Does it meet this criteria?

- Make a list of your ideas, sketches, and study models. For your final design you will want to write and post a short but effective paragraph of your process and the unique solutions you found developed. Tell us about your ideas.

JUDGING CRITERIA

Your teacher and architectural mentors will be looking for these things:

1. Originality in your design

2. Your ability to creatively solve the design challenge

3. The quality of images, sketches, drawings, and models you have uploaded in each of the **five design process steps** (Overview, Collect Info, Brainstorm Ideas, Develop Solutions, and Final Design).

4. As your ideas change, be sure to explain your thinking and let others know about the new work you have posted to your account. Go back to the virtual drawing board and revise your project based on the feedback of others.

5. How well you have written about and explained your thinking in each of the design process steps.

General Resources

FREE (TRIAL) DESIGN SOFTWARE 3D

- SketchUp (Web)
- AutoCAD
- TinkerCAD
- Rhino

PHOTO + IMAGE CREATION + MANIPULATION

- Gimp
- PixlrX
- Krita

DRAWING + PAINTING

- Inkscape
- Gimp

PRINT LAYOUT + DESIGN

- Scribus
- Canva
- Viva Designer

FREE OR LOW-COST ACCESS TO PHYSICAL MATERIALS

- DollarTree
- The WasteShed, Chicago
- Creative Chicago Reuse Exchange

VIDEO EDITING

- Davinci Resolve
- Vimeo
- HitFilm Express
- LightWorks
- Shotcut

AUDIO EDITING

- Shotcut
- Audacity

HUMAN SCALE
Meaningful Public Spaces

Teacher and student support is available from our partners at **Human Scale**. If you are a teacher or student who is struggling with the technical aspects of this architecture competition, please contact **CACLearning@architecture.org** with the subject line: 'Human Scale Assistance.' We will connect you with a designer either in person or remote.

Learning Standards Alignment

ILLINOIS SOCIAL SCIENCE STANDARDS

Inquiry Skills
- SS.9-12.IS.1 Developing Questions and Planning Inquiries
- SS.9-12.IS.11 Taking Informed Action
- SS.9-12.IS.12 Taking Informed Action

History
- SS.9-12.H.4 Change, Continuity, and Context

Geography
- SS.9-12.G.6 Human/Environment Interaction
- SS.9-12.G.8 Human/Environment Interaction

Economics and Financial Literacy
- SS.9-12.EC.2 Economic Decision Making

ILLINOIS ARTS LEARNING STANDARDS

Creating: Organize and Develop Artistic Ideas and Work
- MA.Cr2.1.I
- MA.Cr2.1.II
- VA.Cr2.3.I

Revise, Refine, and Complete Artistic Work
- MA.Cr3.1.I

Presenting: Convey Meaning Through the Presentation of Artistic Work
- VA.Pr6.1.II

COMMON CORE ENGLISH LANGUAGE ARTS STANDARDS (IL)

Text Types and Purposes
- CC.K-12.W.R.2
- CC.K-12.W.R.3

Research to Build and Present Knowledge
- CC.K-12.W.R.9

Vocabulary Acquisition and Use
- CC.K-12.L.R.6

COMMON CORE MATH STANDARDS (IL)

Apply Geometric Concepts in Modeling Situations
- CC.9-12.G.MG.1
- CC.9-12.G.MG.3

NEXT GENERATION SCIENCE STANDARDS

Biological Evolution: Unity and Diversity
- HS-LS4-6

Engineering Design
- HS-ETS1-1
- HS-ETS1-2

ILLINOIS COMPUTER SCIENCE STANDARDS

Emerging and Future Technologies
- 9-10.ET.E
- 11-12.ET.E

CTE (CAREER AND TECHNICAL EDUCATION)

Media, Equipment, and Reproduction Methods
- DDA1-4 Use Drafting Media
- DDA3-1 Identify Freehand Sketching Techniques and Processes

Computer-Aided Drafting and Design
- DDB2-1 CADD Software Set-up

Orthographic and Multi-View Projection
- DDC2-3 Produce CADD Drawings Using Multiview Projection
- DDC3-7 Dimensioning Systems and Practices

Design Process
- DDF1-1 Use a Design Process
- DDF2-5 Construction Design Briefs

Creative Problem Solving
- DDG1-1 Use Critical Thinking for Design
- DDG1-3 Problem-Solving Techniques
- DDG2-3 Environmentally Responsible Designs

Communication Skills
- DDH1-3 Effective and Efficient Communication

Project Management
- DDI2-1 Project Management Strategies and Techniques
- DDI2-2 Organizational Skills

Graphic Agility
- DDJ4-2 Pictorial Drawings and Sketches Using CADD

Physical Model Building in Architectural Design
- DDK1-5 Produce a Presentation Mode

Teacher Resources

- 21ˢᵗ Century Knowledge & Skills in Educator Preparation by AACTE
- Green Infrastructure for CAC by John Perrecone
- Principles of Design by J. Paul Getty Museum
- CAC Arch Handbook - The F10 House, Green Architecture
- Visitor Bill of Rights by J.Rand
- 10 Model Making Tips by Jack Schroeder, Landon Bone & Baker Architects
- Paraline Explication by Bellevue Community College
- CAC Arch Handbook - Scale
- CAC Arch Handbook - Topography and Landscape
- CAC Arch Handbook - Window Placement, Views and Lights
- CAC Arch Handbook- Furniture and Dimension
- humanscale.org