

# Architecture Studio: 1<sup>st</sup> Year Spring

Spring 2012, CMU, Arch #48-105, M/W/F 1:30-4:20  
Class Website: [www.andrew.cmu.edu/course/48-105](http://www.andrew.cmu.edu/course/48-105)

Coordinator: Kai Gutschow  
Email: [gutschow@andrew.cmu.edu](mailto:gutschow@andrew.cmu.edu)  
Off. Hr: M/W/F 12:30-1:00pm & by appt. in MM302

(3/30/12)

## Project 4: COURTYARD HOUSE

**MINDSET:** The capstone project for freshman year studio is a modest courtyard house. It continues the year long investigation of small residences as a tool for understanding the core ideas of architecture, and the use of drawing as a tool to communicate ideas about the elements of architecture that create memorable space and experience. The primary goal of the project is to explore the transition from inside to outside, to understand and use effectively the many tools and architectural elements at the architect's disposal to craft a series of experiences that enriches the connection of architecture and its exterior context. In order to promote a rigorous design process, we begin the project by doing "research" exercises, readings, and precedents studies related to the fundamental design issues involved in a courtyard house.

### ASSIGNMENT 1a: IN-OUT TRANSITION - Due: Wed. Mar. 28 & 30, 1:30pm

- Create a series of sectional drawings/diagrams exploring a broad variety of effective transitions between inside & outside in a courtyard house.
- You are encouraged to explore the many "layers" of space and experience on either side of a precise line separating interior conditioned space and the exterior, from landscape features outside, to architectural elements inside, and their blending in between.
- Explore the transition from inside to outside at different scales: from a site section, to a wall section or window detail
- Explore different kinds of public and private spaces both indoors and outdoors, from the public street to the private courtyard, from entry foyer to bedroom.
- Each diagram must be drafted (hand or computer) to show real thickness of materials. You may also add shading or other texture/color to indicate the sensual and perceptual quality of the spaces and experiences.
- Each diagram should be 4"x6", landscape format. Place 4 diagrams each on two 11x17 landscape oriented pages.

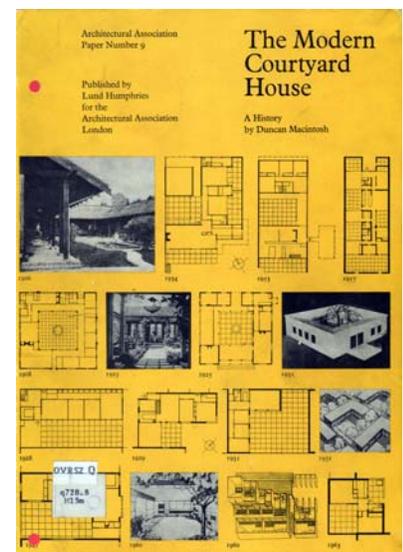
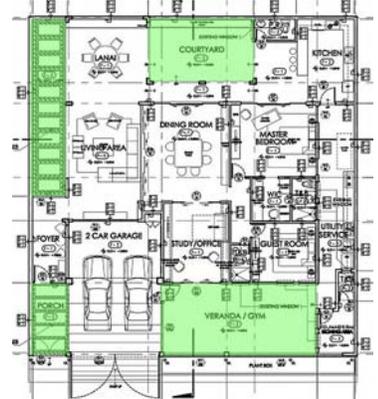
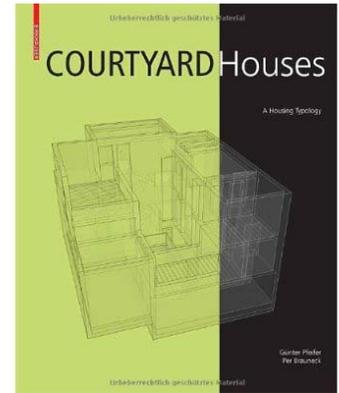
### ASSIGNMENT 1b: READINGS - Due Mon. Apr. 2, 1:30

- Read carefully the following articles about courtyard houses and the nature of the indoor-outdoor relationships in this building type. **1)** Alvar Aalto, "From Doorstep to Living Room," in *Alvar Aalto in his Own Words* (1998) pp.49-55; **2)** J.J.F. Forés, "Courtyard housing: Environmental Approach in Architectural Education," in *Conference On Technology & Sustainability in the Built Environment*; and **3)** review Reichel, et al, "Introduction," to *Open - Close: Windows, Doors, Gates, Loggias, Filters* (2010), pp.8-33. These and other articles and books on courtyard houses can be found on Blackboard, and on the 48-105 carrel in Hunt library.

### ASSIGNMENT 1c: PRECEDENT - Due. Mon. Apr. 2, 1:30

Each studio will collaborate as a group to study and report on the following eight (8) courtyard buildings (one of which was part of Proj.2):

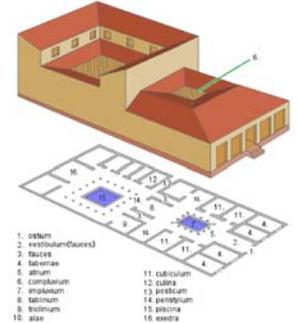
- Studio A**
- LC/JO**
1. Typical ancient Roman Atrium House, Italy (e.g. Pompeii)
  2. Giulio Romano, Palazzo del Te, Mantua, Italy, 1534
  3. Jorn Utzon, Bakkedraget Housing, Fredensborg, Denmark, 1962
  4. Breuer, Hooper House II, Bare Hills, MD, 1959
  5. Philip Johnson, Hodgson House, New Canaan, CT. 1950 (see Proj.2, C. Hayes)
  6. Tadao Ando, Azuma House (= Row House in Sumiyoshi), Tokyo, Japan, 1976
  7. Souto de Moura, Courtyard Houses, Porto, Portugal, 1999
  8. Ryue Nishizawa (SANAA), Moriyama House, 2006



- Studio B**
- FC/MG**
1. Typical Islamic Courtyard House (e.g. Fez, Morocco)
  2. Vasari & Vignola, Villa Giulia, Rome, Italy, 1555
  3. Jorn Utzon, Kingo Housing, Elsinore/Helsingfors, Denmark, 1958
  4. Philip Johnson, Rockefeller Guest House, NYC, 1942
  5. Jose Luis Sert, Own House, Cambridge, MA, 1957
  6. Alvar Aalto, Experimental Summer House at Muuratsalo, Finland, 1953 (see Proj.2, Y. Chan)
  7. Shigeru Ban, 2/5 House, Hyogo, Japan, 1995
  8. Alberto Campo Baeza, Casa Guerrero, Cadice Spain, 2006



- Studio C**
- KS/JK**
1. Typical Chinese Courtyard House (e.g. Beijing Siheyuan & Hutong)
  2. Pallazzo Medici-Riccardi, Florence, Italy, 1460
  3. Adalberto Libera, Housing at Tuscolano/Rome, Italy, 1952
  4. Ludwig Mies van der Rohe, Lemke House, Berlin, Germany, 1932
  5. Luis Barragan, Own House, Tacubaya, Mexico City, 1947
  6. Eliot Noyes, Noyes Residence II, courtyard, New Canaan, CT 1955 (see Proj2, N. Laguerre)
  7. Toyo Ito, U-House, Tokyo, 1976
  8. David Adjaye, Lost House, London, 2002-4.



Work together and with other studios to locate any resources you can access about your buildings, including books, articles (see Avery Index) and internet sources. Find multiple sources! Be sure to find a detailed plans and detailed sections of each building, especially relating to the courtyard (these will likely not be found in sufficient detail online; check out books and journals!).

Focus on the courtyard/terrace/garden. How do the exterior spaces relate to interior spaces? How do they relate to the street? How are they oriented to the sun? If there are multiple courtyards, how do they relate to each other? How do the courtyards in one house compare to others? Look at ground level changes, the ceiling, and especially the roof. Investigate your buildings at different scales, from construction details and materials, to major axes and site context, and how they all reinforce each other. Imagine yourself approaching the building, walking through it, and how all your senses would be stimulated by both the space and the material structure, especially in the courtyard.



Search for compositional "principles" in order to discover the architectural "language," and the arrangement of important spaces and architectural elements (entry, walls, thresholds, openings, courtyards, geometry of spaces, circulation, poche, gardens, etc). Then go beyond, by focusing on the materiality of the architecture that creates spaces and experiences through structure and mass. What is it made of? Is it a "load-bearing wall" made by piling up materials, or a "skeletal" system made of inter-connected vertical posts and horizontal beams? How does the geometric configuration of the structural system affect spatial experiences and movement through the building? Why?



Create two 11"x17" landscape format sheets for each building:

- 1) A sheet of hand-drafted floor plans, building sections, wall sections and details drawn to a scale that will fill the page (consider drawing bigger, and then reducing to fit on the page).
- 2) A sheet of photos, sketches and diagrams you create to reveal the unique composition and architect's intent, especially with regard to the courtyard(s) of each of your buildings.



Upload a 2pp. pdf of each building to the archpcserver using the file name to indicate which studio (A,B or C) and the name of the architect:

*StudioX\_Courtyard\_Architect.pdf*



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(4/2/12)

### Project 4: COURTYARD HOUSE

**CLIENT:** Your client owns the Tillie Speyer house and an extensive property on Wightman Street in Squirrel Hill. The house was designed by famous modernist architect James Speyer (1913-1986). Speyer was born in Pittsburgh, received an architecture degree from Carnegie Tech in 1934, went on to study in Europe, and from 1938-9 was Mies van der Rohe's first graduate student at the Armour Institute of Technology (later IIT). He later set up his office in Chicago, but built several houses in Pittsburgh, including this one for his widowed mother Tillie in 1963. The present owner is proud to own this landmark, and is eager to maintain the general ambience of the modernist house, and the quiet, traditional upscale neighborhood.

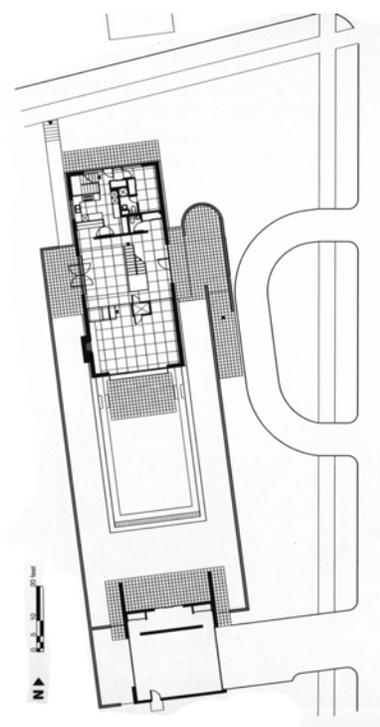
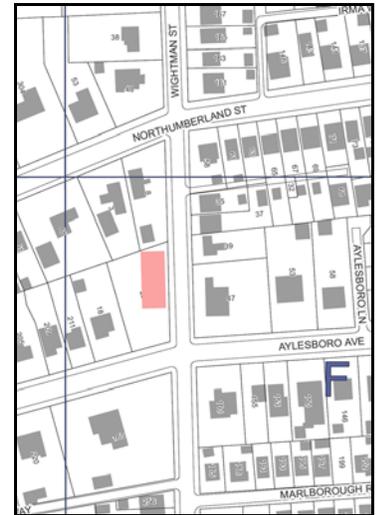
**SITE:** Your client has decided to re-develop her rarely used tennis court into two adjacent courtyard houses, each designed by a separate architect. She has mandated that a unified 8ft high garden wall in the same brown brick, using the same "stacked" (not bonded) brick pattern as her own house, be built around the existing tennis court. It will result in two identical lots, each 60ft wide x 50ft deep inside the walls, and set back slightly from the sidewalk. The garden walls are not allowed to be punctured, interrupted, or overhung in any way, except for a front entry or door (this may include side-lights) and a two-car garage door on Wightman, and a modest back door to access the communal gardens. All other windows or openings will need to face onto internal courtyards and gardens. The garden wall will:

- 1) preserve the integrity of the client's overall property;
- 2) insure privacy and quiet for the residents of these modest lots on this busy street;
- 3) allow the rest of the property, in back of the courts and along Ayelsboro, to serve as communal garden space, or be developed in the future.

**ASSIGNMENT 1d:** - Due. Fri. Apr. 6, 1:30 (bring drafts on Wed. Apr. 4)

Each studio should collaborate to study the site and begin to understand the issues, forces, and atmospheres related to the site and the context, and what impact it will have on designing adjacent courtyard houses here. Although you should divide up the work, every student should develop a firm understanding of:

- 1) **Site Plan:** The entire 1<sup>st</sup> year studio should collaborate to create a single, accurate Autocad site plan of the entire property using the maps and plans provided. It should include footprints of neighboring buildings. All students will use the same base plan, to help insure that all students work with the same base dimensions.
- 2) **Street Elevation:** The entire 1<sup>st</sup> year should also collaborate to create a single Wightman street elevation between Aylesboro and Northumberland street. It should include the Tillie Speyer House, both of the project lots, the gardens and a light outline of the trees on Wightman (estimate the height & span of the trees).
- 2) **Sun/Shade:** Each separate studio should study the day-lighting issues on this site, working to understand where the trees and other context will cast shadows during different times of the day, and different seasons throughout the year. Each studio should create an 11x17 sheet documenting these results.
- 3) **Topography & Views:** Although the construction site is perfectly flat, and only inches above the street level, the garden to the south of the tennis court includes a slight elevation change, and overall the site is on a hill, very much the top of Sq.Hill. Study this topography and begin to speculate on the implications for your design. What kinds of views are available? What opportunities would (slight) level changes in the garden or house, or the existence of a 2<sup>nd</sup> floor, afford?
- 4) **Neighborhood Context & Traffic:** Walk the neighborhood, begin to understand the rhythms and patterns of the other houses and traffic. What factors might you be able to tap into, so that your courtyard house works well within the context of both the traditional houses across the street, and the owner's modernist house and landscape? How will traffic (pedestrian & cars) affect your house design?



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(4/6/12)

### Project 4: COURTYARD HOUSE

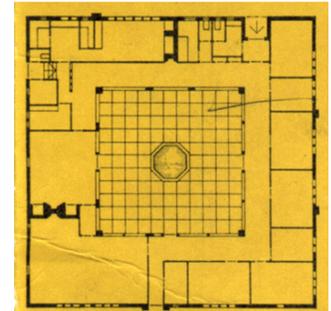
#### REQUIREMENTS / CONSTRAINTS:

Your client is seeking an urban courtyard house with plenty of indoor-outdoor living that maintains the general ambience her own modernist house, and the quiet, traditional upscale neighborhood. It must comply with the following constraints:

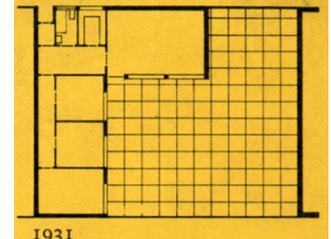
- Every student will be paired with a neighboring architect. You should coordinate with your neighbor regarding the overall composition of your houses, especially the front facade, and any massing or roof that sticks out over the 8ft wall.
- Each house must fit completely within the 50ft x 60ft brown-brick wall of your site.
- Since the houses will likely be rented or sold to affluent clients, who may well be older, the owner seeks to keep elevation changes within the house to a minimum. Avoid excessive steps, stairs, ramps or climbing, except access to a 2<sup>nd</sup> floor.
- The owner is discouraging all major excavation or soil removal from site.
- The absolute height limit is the Tillie Speyer house (approx. 22ft).
- There is a maximum "footprint" of 1500sf of enclosed living space, including raised, sunken, double-height, or overhanging indoor spaces (footprint = massing shadow).
- If you have a 2<sup>nd</sup> floor, it can be a maximum of 500sf of enclosed space on top of other occupiable space (indoor or outdoor). If it overhangs an outdoor area, it must be included in the max. 1500sf "footprint".
- You must include a 25'x25' covered 2-car garage off of Wightman. Use a minimum 16ft garage door. Consider how the garage links to house and any courtyards.
- You must include a rear door in the west wall, both for emergency exit reasons, and to access the shared communal garden behind the site.
- Site boundary walls are not allowed to be punctured, interrupted, or overhung in any way, except at garage and front and back entry (openings may include side-lights).
- Windows facing the neighboring courtyard house must be set back 4ft from the wall (i.e. no windows looking directly into the neighbor's house or garden).
- Work with the following rules of thumb for construction:
  - interior floor thickness of 12" minimum (from ceiling to floor above).
  - a maximum clear span of 20ft, except in the garage.
  - any space bigger than 20ftx20ft must include a column and beam, or wall, to support the ceiling/roof joists in at least one direction.
- Occupiable roofs must be flat/horizontal, and all flat roofs should be 18" thick.
- Your house should include at least "1½ baths"; one bath must be at least 6ftx8ft with toilet, sink and bathtub (use templates from Proj.3), include a "powder room" with toilet and sink (usually for more public use). Draw bathroom fixtures in all plans.
- You must include a place to store and make food (use kitchen templates from Proj.3). Draw primary kitchen appliances and built-in counters in all plans.
- You must include separate sleeping area(s). Draw the outlines of all beds.
- You must include a space for eating. Draw the outlines of a dining table.
- You must include a space for gathering/living. Draw the outlines of a couch or major sitting opportunities and built-in furniture.

#### ASSIGNMENT 1e: - Due. Mon. Apr. 9, 1:30pm

Create at least three separate proposals for a courtyard house design that focus on a rich sequence of transitions from inside to outside: 1) One "based on" ideas similar to those explored in your loft, but now for a new site, client, etc. 2) Another "based on" or referencing some aspect of any of the precedent studies (from your studio or others). Be specific about which precedent you build off. 3) At least one design that is of your choice, developed from some other source of inspiration. For each design create an 1/8" scale model using cardboard or thick chipboard. Discuss with your neighbor and classmates the benefits and down sides of each of the three plans. Draw a 1/4" sectional drawing through one of the designs, explaining a narrative sequence of carefully articulated experiences and transitions from inside to outside, through major spaces and courtyards of one design.



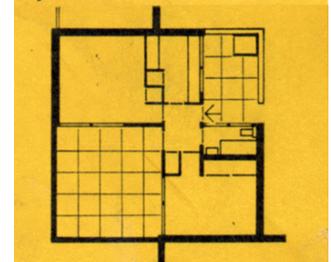
1908



1931



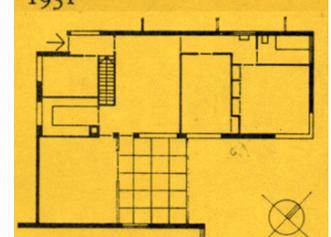
1960



1963



1931



1929

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(4/18/12)

## Project 4: COURTYARD HOUSE - FINAL REQUIREMENTS

### **FINAL DUE DATE: Sun. Apr. 29, 10:00pm**

- There will be **NO WORK ALLOWED** after the deadline. Out of fairness to your peers, anyone caught working later will risk **FAILURE**.
- Incomplete work (discretion of your instructor & coordinator) will **NOT** be allowed to pin-up, but may be reviewed later.
- In the final push, respect your peers & work environment, watch your fingers.

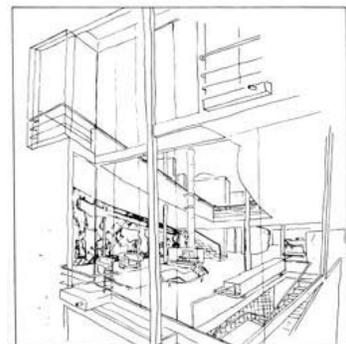
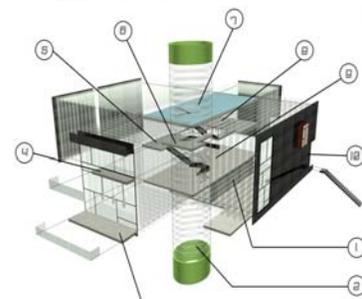
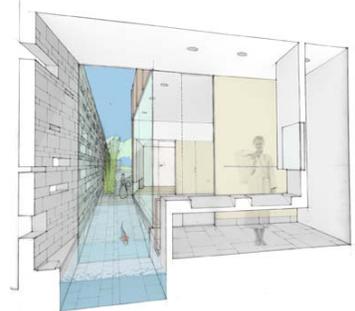
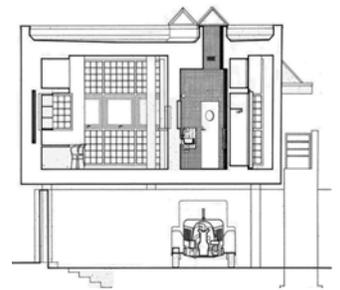
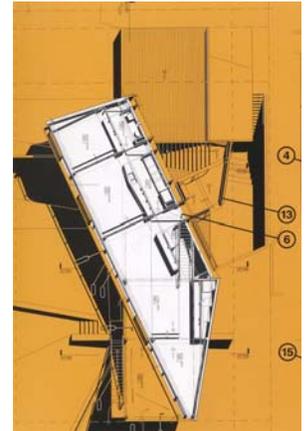
### **MODEL:**

- All students must create a well-crafted, accurately-scaled physical model at 1/4"=1'-0".
- Models should be displayed as a pair on your Proj.1 "Stand"; if not possible, collaborate with your partner so your projects work as a coherent pair at 20" high.
- Every student must build their model on an identical 18" x24" model base (thickness and material TBA). Your house should be built alongside one edge of the base so that it will link up to your partner's model to create a pair. You will each be left with approx. 2.5" of side yard, and should leave a 2.5" back yard.
- Be sure all elements are modeled to scale: accurate thickness for walls, roofs, etc.
- Your model should come apart to show all interior spaces and reveal experiences. Work with your instructor to explore the best methods based on your design.
- Your model should include context (trees, fences, etc.) and scale figures / cars.
- The existing 8ft high, 12" thick brown brick wall should be made out of chipboard. Any other parts of your house that are made out of this same brown brick should also be made out of the same chipboard.
- All other opaque materials should be modeled in white. It is recommended that you use white museum board and/or foam core for the walls, and white-painted dowels and dimensional basswood for "stick" elements such as columns, beams, mullions, etc.
- Use acrylic to model all windows and transparent or translucent elements.
- Your model should show a high degree of finish: there should be no glue showing, no foam visible, and minimum "end-grain" for cardboard or wood revealed.

### **DRAWINGS:** (Plot files or hand drawings **DUE Thu. Apr. 26, 10pm**)

Each student must create at a **MINIMUM** the following drawings:

- A complete set of floor plans of your entire house at 1/4" = 1'-0" scale. Your ground floor plan must contain the site between the street and the front wall, including all trees and landscape elements. Upper floor plans (if you have any) can be "partial plans," but it should be clear how they relate to the floor below.
- At least two sections at 1/4", sliced in opposing directions through your house, cutting the most important spaces, likely including the courtyards. The drawings should contain major architectural elements and built-in furnishings in the background, scale figures, and trees or other landscape features in the courtyard and background.
- At least three more drawings of your choice to reveal important experiential aspects of your project. These can be additional sections, unfolded sections, perspectives, vignettes, details, walls sections, paraline drawings, exploded drawings, reflected ceiling plans, diagrams, process work, relief models, etc. **YOU** must pick the type of drawings and visualizations that will best represent your ideas. The goal is for you to present **YOUR** Courtyard House design and the transitions from inside to outside in the best, and most powerful way through a minimum number of drawings.
- Plans and sections should be drafted in Autocad; all other drawings can be in any appropriate medium (check with instructor). Drawings must be **CLEAR, BOLD**, read well from 20ft, and distinguish between line weights!
- The precise dimensions and layout of the drawings will be determined later.
- All drawings must fit on a single vertically oriented panel.
- Collaborate with your partner to orchestrate a coherent presentation of your work!
- All work should be thought-fully crafted using effective techniques to reinforce the content and communicate the *meaning, materiality, and experience* of your house and transitions from inside to outside without needing much verbal introduction.



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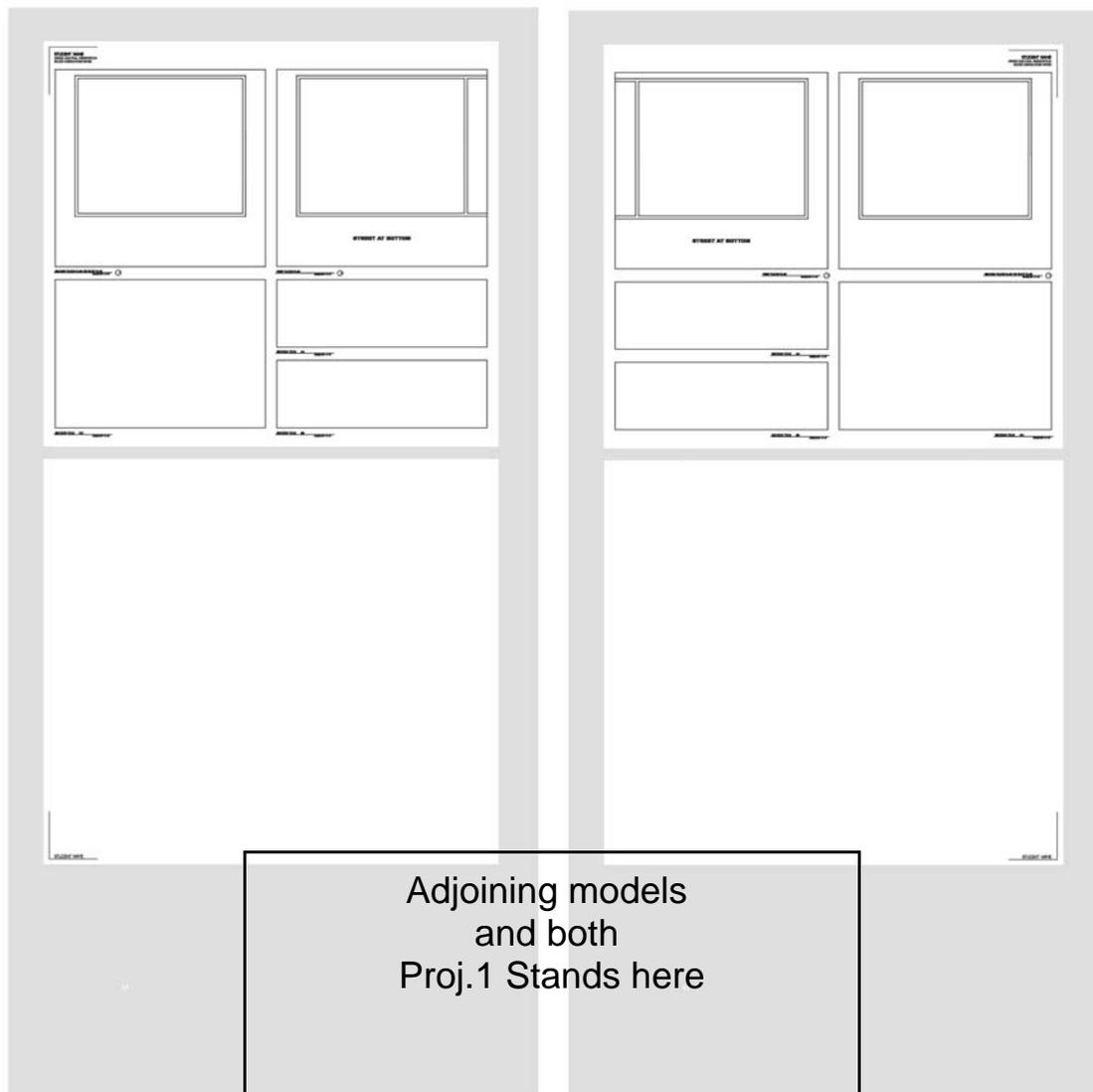
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(4/25/12)

## Project 4: COURTYARD HOUSE - FINAL REQUIREMENTS

### **DRAWINGS:** (Plot files or hand drawings **DUE Thu. Apr. 26, 10pm**)

- Join with your partner to create a unified, powerful presentation of your two neighboring projects.
- Use InDesign templates provided to collect your drawings on two pieces of paper. Adhere original hand work to the bottom panel to minimize the number of pins needed.
- The top panel must be 40"w x 36" high, and must include: 1) a 1/4" ground floor plan, with the street oriented down (North to the right), with street and landscaping shown (6.5 ft from outside of wall to sidewalk; 5ft sidewalk; 3.5ft from sidewalk to edge of street). Use the red box in the InDesign template to locate your courtyard, and insure that all courtyards are located identically on the sheet. 2) a 1/4" upper floor plan (if nec.); 3) a 1/4" section slicing E-W; 4) a 1/4" section slicing N-S; 5) any other drafted drawing, including extra sections, an important paraline, etc. See earlier handout for more details.
- The bottom panel may be freely composed and should include all other drawings. Minimum requirements called for plans and sections and three other drawings: if you put one on the upper sheet, it means this sheet will contain at least two drawings. Hopefully more. Consider adding early process drawings, including models of earlier models, IF they are helpful to understanding your final design ideas!
- Hints: do NOT just blow up small drawings to a huge scale; 2) if you have space left over, leave it all along the bottom edge, and move the bottom name block/graphic up so it sits under your drawings.



Left Panel / Project / Student

Right Panel / Project / Student

## **MODEL FORMAT REQUIREMENTS**

- Join with your partner to create a unified, powerful presentation of your two neighboring projects.
- All models must be built on the 20"x24" birchply base supplied by the SoArch
- Orient the model the same as the plans, so that the street is facing the audience (North to the right).
- Locate your outside courtyard wall on the edge of your base, so that it joins up with your neighbor.

You are encouraged to build 1/2 a wall each between your projects. The overall size of the combined model base will be 24" deep x 40" wide.

- Locate the outside of the rear wall exactly 3" from the rear edge of the base (be sure it aligns with your partner). Since your courtyard is 52ft from outside of wall to outside of wall, and the space from the outside of the front wall to the street is 17ft., this will leave approx. 3" (= 12ft) of street on your model.

- The model should be built up from the wood base. The street should be left in WOOD.

- The curb, sidewalk, and driveway level should be generated by gluing a layer of thin GREY chipboard to the wood base. This may also include many of your outdoor courtyards. We recommend you glue one large piece of chipboard to your entire model (except for the 3" of street)

- Anything in your project that is BELOW the sidewalk level (such as sunken courtyards or pools) should show the WOOD base, or be routed out of the base.

- Any areas higher than the sidewalk should be created by adding additional layers on top of the grey base. This will include most interior floors, planters, and grass areas.

- Consider ground-level grass areas to be taller than the sidewalk, and so they should be shown with an additional layer of GREY chipboard. This includes the area between the street and the sidewalk, and between the sidewalk and the house, and at the side of the house, and behind the house, and any grass areas in your courtyards. All these should have two layers of chipboard on top of the wood base.

- Any surface that you consider to be ground-level "garden" and "natural," should be shown in GREY chipboard.

- As instructed in the original requirements, the brown-brick garden wall, as well as any other walls in that same material, should be built in GREY chipboard.

- Any area that is "architectural" and constructed, including garden pavers, raised planters, raised front walkways, raised patios or porches, and roof gardens, etc., should be in WHITE board.

- All vertical architectural elements should be in white board or acrylic.

- If foam-core is used, there should be NO foam visible. See the earlier handout for model requirements.

- All trees should be simple basswood dowels, of appropriate thickness, drilled into the base. Do not show the canopies or major branches on your model.

**FINAL DUE DATE: Sun. Apr. 29, 10:00pm**