Urban Housing and Aggregation

ARC U510 Urban Housing Studio: Syllabus, Fall 2010, Tuesday/Friday 1:35 – 5:05 PM

Studio focus and framework

Unlike recent housing studios that have focused on medium-density wood frame housing, this studio will focus on high-density residential buildings that exceed 70’ and therefore trigger the high rise building code. Rather than start with a specific site and program, as in past typical design studios, we will begin design speculation by working prototypically with the design agenda driven mostly by the inside-out logics of the building type.

The first step will be to research and understand the range of issues that both set constraints on design possibilities but also suggest opportunities for innovation. Primary among these are a) the impact of the building code on the range of options for designing the circulation armature and elevators, b) the impact of the market on unit configurations and sizes, c) the efficiency of the typical floor plan in terms of net/gross and the “loss factor”, and d) the impact of efficient structural solutions on the overall configuration of the building.

At the same time, the class will look at other issues that can drive the design agenda. These will include a) sustainability approaches, b) branding and lifestyle engineering strategies, and c) the concept of the residential high-rise as a type – with specific cultural and social connotations within the context of the North American City.

Studio structure

The studio is organized into three phases: 1) Research and Synthesis, 2) Prototyping, and 3) Site-specific Design. Each phase will include studio discussions, suggested and assigned readings, and a final graphic deliverables.

Phase 1: Research and Synthesis

Students will be organized into groups of 2 or 3 to research each of the following themes in order to make a coherent presentation to the rest of the class:

A. Typology: collect precedent of high-rise residential buildings that can be categorized as “towers” or “slabs” and create a series of diagrams that clarify their internal organization, primary circulation strategy, the symbolic/iconographic strategy, and relationship to the larger urban context (tower on site-responsive podium, tower in the park, slabs in a park, etc.). The study should also address the history of the high-rise type, and uncover regional differences based on prevailing code, social expectations, and/or material cultures.

B. Code: through a series of diagrams, explore the range of options for solving for the elevators, fire stairs, and corridor of typical floor, as permitted by the most recent addition of the Massachusetts State Building Code. Pay special attention to the high-rise code. Issues to explore include a) the thresholds between tiers of high-rise code and the additional components that are triggered by each threshold, b) area of refuge requirements (for the lowest tier of high-rise), c) required separation of egress stairs, and d) requirements for elevator lobby enclosure. Once these options have been established, produce a complementary diagram for the ground level/lobby level that shows required egress paths, ADA accessible routes and other code-driven solutions. Also frame the accessibility issues for units within a multi-family building using the same code (which is more stringent than ADA).

C. Sustainability: Research and consider sustainable design strategies for a 15-story residential high-rise building located in Worcester, Massachusetts. Prioritize strategies that may have an impact on the configuration of the plan,
elevations (fenestration), building shape, and expression. Issues to explore include solar orientation, passive ventilation (as it relates to prevailing winds), façade strategies that leverage seasonal daylighting/shading strategies, etc. Students should use precedent and three-dimensional diagrams to explore and communicate the full range of options.

D. Marketing: Research two kinds of market issues. The first is understand the range of unit sizes and shared amenities for new high-rise construction in Cambridge, MA and Providence, RI. The source of information will primarily come from the marketing websites of new and recently built developments but also can come from newspaper articles, and face-to-face meetings with brokers, real-estate developers, and property management companies. Information graphics, maps and diagrams should be produced to make general observations about the findings. The group should also create a “how to” manual for putting together a marketing/branding strategy for a new residential building in terms of potential themes, marketing collateral (brochures, web-sites), target unit types/sizes, and shared buildings amenities.

E. Tectonics: Research and compare a steel versus a cast-in place concrete structural solution for a typical 15-story high-rise building. Issues to explore include bay sizes, sheer walls, typical floor-to-floor heights, accommodation of the building core, etc. In addition, understand and demonstrate the general dimensional and technical requirements for elevators, and MEP systems as they impact the need for vertical chases, mechanical penthouses, and basement mechanical spaces.

At the conclusion of Phase 1, a workshop will be held to share the findings with the entire class. Students groups will make ppt presentations and experts in each of the categories will be invited to the review.

Phase 2: Prototyping

Each student will develop a 15-story high-rise residential building prototype for Downtown Worcester considering categories A-E above. The project should be driven by a lifestyle script based on one of the following scenarios:

1. Graduate student housing: designed for “urban-oriented” graduate students from Worcester area schools.
2. Workforce housing: designed to attract young people who work at area medical centers and life science companies. 25% of the units are reserved for instructors and students at the nearby New England College of Pharmacy.
3. Live/work
4. Eco-Housing: designed to appeal to people who want to live an environmentally-conscious lifestyle.
5. Car-free Housing: designed for people who have eschewed the use of automobiles and plan to only use bicycles and mass transit alternatives.
6. Housing for Urban families: designed for people who are committed to raising their children in an urban environment

Prototypes will be designed during an intense two-week period but must result in a full proposal, including floor plans, typical unit plans, a digital model of the exterior and lobby (but not the interior of the typical/unit floor plans) and a sketch massing model showing materials.

Phase 3. Site-specific Design

Each student will develop a more detailed and site-specific proposal for one of two assigned sites in Downtown Worcester. The instructors will supply a site plan showing these sites within a larger master plan for the area. The sites are adjacent to each other; and as a result, each student will need to communicate and collaborate with one other (assigned) student developing a proposal on the adjacent site. While the projects will be conceived and designed as individual projects (and evaluated as such), a visual dialogue should be developed between the proposals and urban design connections and relationships should be established and reinforced.

Comprehensive proposals will be required in this phase of the studio, including but not limited to floor plans, detailed cross-sections, unit plans, perspectives of the building and typical units, and a physical model. Your emerging proposal will be reviewed on a weekly basis, at a mid-project review, and at the final review at the end of the semester.
The final requirements will be discussed and determined at the launch of this phase of work.

Prerequisites
This course requires that you have satisfactorily completed all courses in the studio sequence through Studio 3 before you take this course. If it is discovered that you have not completed these prerequisites, you may be dropped from the course at any time during the semester.

NAAB Student Performance Criteria
The work that students produce toward their degree granted by the Department of Architecture is the property of the Department of Architecture. The complete course work from three students shall be collected by the Department for each course taught for the National Architecture Accreditation Board [NAAB] documentation. Students are welcome to and encourage to document their work for their personal portfolio if it is requested by the Department for the NAAB, but the work must be submitted to the professor no later than one week after final exams week. This course meets the following NAAB Student Performance Criteria to the extent designated:

12.10 National and Regional Traditions Understanding
12.11 Use of Precedents Ability
12.13 Human Diversity Understanding
12.14 Accessibility Ability
12.20 Life Safety Understanding

Course Requirements
Pin-ups and reviews: Requirements for each review will be specified a few days before the pin-up. Work should stop at 12:00 midnight before each major review. No work can continue during a review unless it is designated a “working pin-up.” There are NO acceptable excuses for not presenting work due to digital media issues. Please produce and print your digital work far enough ahead of the deadline to allow for contingency plans. All deliverables for reviews will be presented in PowerPoint (and not as multipage PDFs or Keynote) and as 11 x 17” printouts.

Readings: Readings will be assigned from time to time (with a total of three readings during the semester). Each assigned reading will require a one-page written synopsis and commentary (typed and printed on one 8.5 x 11 sheet).

Assignments: You will be assigned a series of sub-projects that will be due at the next class period. No late work will be accepted toward your final grade, but you will, however, be responsible to complete each assignment so you can maintain the continuity of the process.

Attendance and Participation: Three unexcused absences will automatically drop your grade by one letter-grade, i.e., from an A to a B [28 meetings; 3 absences is 11% of the course]. All students are required to participate in class discussions; active dialogue is encouraged and required. You are also required to attend all the evening lectures offered during this term. The lectures are scheduled for Monday evenings.

Evaluation: Your final semester grade will be calculated as a composite of the following criteria:

On-going Effort* 5%
Phase 1 Deliverables: 15%
Phase 2 Deliverables: 20%
Phase 3 Mid-project: 15%
Phase 3 Elevation Review 15%
Phase 3 Final Review 30%

*Work product at pin-ups, participation in group discussions, quality of reading commentaries, etc.
Grading: The Architecture Department guidelines for studio course grading is as follows:

A - superb quality work.
The student:
* demonstrates one of the best performances on projects the instructor has seen at Northeastern or any other accredited school of Architecture
* demonstrates true intellectual passion, curiosity, initiative, and exploration
* consistently brings strong ideas to fruition with a high level of craft
* conveys a strong affinity for design culture

A - high quality work.
The student:
* demonstrates one of the best performances on projects within the studio
* demonstrates true intellectual curiosity, initiative, and exploration
* consistently brings ideas to fruition with a high level of craft
* conveys strong interest in design culture

B+ - good quality work.
The student:
* demonstrates a strong performance on projects within the studio
* consistently brings strong ideas to fruition with a good level of craft
* conveys broad interest in design culture

B - above average work.
The student:
* demonstrates good initiative and above average craft
* conveys interest in design culture

B - average work.
The student:
* demonstrates average effort and craft and initiative
* meets attendance requirements

C+ - below average work.
The student:
* demonstrates below average effort and craft and initiative
* meets attendance requirements

C - minimal work.
The student:
* demonstrates well below average effort and craft and initiative
* engages in excuse-making, tardiness, and absence

C - minimal work.
The student:
* demonstrates minimal effort and craft and initiative
* engages in chronic excuse-making, tardiness, and absence

D+, D, D- - marginally acceptable work.
The student:
* demonstrates unacceptable effort and craft and initiative
* engages in chronic excuse-making, tardiness, and absence

Academic Honesty
Northeastern University is committed to the principles of intellectual honesty and integrity. Members of the Northeastern community are expected to maintain complete honesty in all academic work, presenting only that which
is their own work in tests and assignments. If you have any questions regarding proper attribution of the work of others, contact your professor prior to submitting work for evaluation.

**Schedule**

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<th>Date</th>
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<th>Sub-Topic</th>
<th>Activity &amp; Requirements</th>
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<td>Fri 10 Sep</td>
<td>Introduction</td>
<td>Research topics</td>
<td>Set up studio, establish working groups</td>
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<td>wk 2</td>
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<tr>
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<td>Research</td>
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<td>Working group mini-pin-ups</td>
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<tr>
<td>Tues 21 Sep</td>
<td>Research</td>
<td>Content</td>
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<tr>
<td>Fri 24 Sep</td>
<td>Research</td>
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<tr>
<td>Tues 28 Sep</td>
<td>Research</td>
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<tr>
<td>Tues 5 Oct</td>
<td>Prototyping</td>
<td>Introduction</td>
<td>Assign scenario themes</td>
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<td>Fri 8 Oct</td>
<td>Prototyping</td>
<td>Parti proposals</td>
<td>Mini pin-ups</td>
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<td>wk 6</td>
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<tr>
<td>Tues 12 Oct</td>
<td>Prototyping</td>
<td>Development</td>
<td>Desk crits</td>
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<tr>
<td>Fri 15 Oct</td>
<td>Prototyping</td>
<td>Representation</td>
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<td>wk 7</td>
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<tr>
<td>Tues 19 Oct</td>
<td>Prototyping</td>
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<td>Fri 22 Oct</td>
<td>Project</td>
<td>Site Intro</td>
<td>Lecture, assign sites for projects</td>
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<td>Tues 26 Oct</td>
<td>Project</td>
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<td>Fri 29 Oct</td>
<td>Project</td>
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<tr>
<td>Tues 9 Nov</td>
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<td>Fri 12 Nov</td>
<td>Project</td>
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<td>Tues 16 Nov</td>
<td>Project</td>
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<td>Fri 26 Nov</td>
<td>Elevations</td>
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<td>Tues 30 Nov</td>
<td>Elevations</td>
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<td><strong>Elevation review</strong></td>
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<td>Fri 3 Dec</td>
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<td>Tues 7 Dec</td>
<td>Project</td>
<td>Representation</td>
<td>Lecture, mini pin-ups</td>
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<tr>
<td>Fri 10 Dec</td>
<td>Project</td>
<td>Last day of classes</td>
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<td>wk 15</td>
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<tr>
<td>Tues 14 Dec</td>
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<td><strong>Final Review</strong></td>
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</tbody>
</table>
Northeastern University School of Architecture

Urban Housing and Aggregation Bibliography and Precedents

On Housing:


On Sustainability:


On Marketing:
http://www.nytimes.com/2010/08/22/realestate/22cov.html?_r=1&emc=eta1

On Code:
http://www.mass.gov/?pagelD=epopssubtopic&L=4&L0=Home&L1=Consumer+Protection+%26+Business+Licensing&L2=License+Type+by+Business+Area&L3=Construction+Supervisor+License&sid=eeops

Precedents:
Hoogbouw Towers, Amsterdam
Duiker and Wiebenga, 1927-29

860/880 Lake Shore Drive, Chicago
Mies van der Rohe, 1951

Price Tower, Bartlesville, Oklahoma
Frank Lloyd Wright, 1953-56

Romeo Tower, Stuttgart
Hans Scharoun, 1954-59

Keeling House, London
Landsun & Partners, 1955-58

Neue Vahr Apartments, Bremen
Aalvar Aalto, 1958-62

Peabody Terrace, Cambridge
Sert, Jackson and Courley, 1962-64

Marina City, Chicago
Bertrand Goldberg Associates, 1963

Lake Point Tower, Chicago
Shipporeit and Heinrich, 1965-68
Nakagin Capsule Tower, Tokyo
Kurokawa Kisho, 1972

Tours Aillaud, Paris
Emile Aillaud, 1975

Kanchanjunga Apartments, Bombay
Charles Correa, 1983

Horizon Apartments, Sydney
Harry Seidler, 1997

Gifu Kitagata Apartment Building
Kazuyo Sejima, 1998

I-J Tower, Amsterdam
Neutelings Riedijk Architecten, 1998

Housing Tower, Munich
Steidle and Partner, 2001

Soft Metropolitanism, Aomori, Japan
Abalos and Herreros, 2001

165 Charles Street, New York
Richard Meier, 2004

Shinjyuku Vertical Campus, Tokyo
OMA, 2004

Mirador, Madrid
MVRDV, 2005

Rodovre Sky Village, Copenhagen
MVRDV, 2008

23 East 22nd Street, New York
OMA, 2009

56 Leonard Street, New York
Herzong and DeMeuron, 2009

100 11th Avenue, New York
Jean Nouvel, 2009

Aqua Tower, Chicago
Studio Gang, 2009

Little Tower, Copenhagen
BIG (Bjarke Ingles Group), 2009

HL23, New York
Neil Denari, 2010

Solstice on the Park, Chicago
Studio Gang, 2010
A Competition for an Iconic Building in Worcester
A Prototype for a Signature Apartment Building

Phase 2: Prototyping / Issued Friday, October 1, Final review Tuesday, October 19

Project Brief

Each student is required to develop a complete proposal for a prototypical residential building for Downtown Worcester, an urban context that, with only a few exceptions, is between four and eight stories in height. The proposal should be prominently visible from both Union Station and I-290, an elevated highway that passes just east of the Downtown. As a result, proposals should be conceived as memorable urban icons and not background buildings. Prototypes will be designed during an intense two-week period but must result in a full proposal, including floor plans, typical unit plans/sections, renderings, and a physical model (see the full requirements below). Proposals can be singular towers (for example, ‘the tallest building in Worcester’), sculptural slab-like buildings (potentially engaging a major urban thoroughfare), or more complex forms.

The design agendas should be driven by the research, synthesis, and discussions during the first phase of the studio and by a lifestyle script based on one of the following scenarios:

1. Graduate student housing: designed for ‘urban-oriented’ graduate students from Worcester area schools.
2. Workforce housing: designed to attract young people who work at area medical centers and life science companies. 25% of the units are reserved for instructors and students at the nearby New England College of Pharmacy.
3. Live/work: designed for professionals who use their home as a work and meeting space.
4. Eco-Housing: designed to appeal to people who want to live an environmentally-conscious lifestyle.
5. Car-free Housing: designed for people who have eschewed the use of automobiles and plan to only use bicycles and mass transit alternatives.
6. Housing for Urban families: designed for people who are committed to raising their children in an urban environment.

Topics will be selected in a lottery process to ensure an even distribution of programs in each studio section.

Two prototypical sites have been created to house your projects (see attached diagram). The street and sidewalk widths are given but the precise size and proportion of the site is up to each designer with a maximum dimension in either direction of 500 feet and a total parcel size of one acre (site boundaries must remain on an orthogonal grid). This is meant to allow for a wide variety of building proportions. Proposals must cover more than 80% of the total site area at the ground floor.
One of the two sites (Site A and Site B) will be selected in a lottery to ensure even distribution of sites in each studio section.

Given the nature of the exercise, the studio critics will offer general guidance but will not interject their own ideas or recommendations. It is also expected that designers will establish their own rigorous schedule to both allow for open-ended design exploration and adequate time to create a convincing final presentation of their proposals. The grade for this assignment is worth 15% of your overall grade.

**Final minimum requirements**

1. All typical floor plans
2. All typical unit plans
3. Sections of all typical units
4. Ground level plan that includes surrounding streets, sidewalks, and any proposed exterior spaces within the parcel boundaries
5. Eye-level perspective of building
6. Eye-level perspective of front entrance/building lobby
7. Building program presented on appropriate drawings and within a single comprehensive table:
   a. Unit mix (size and number of each unit type broken down by number of bedrooms)
   b. Program list and areas of lobby, service areas, and other common building functions
   c. Total GFA (Gross Floor Area) of building
   d. Total area of parcel (project site within boundaries of the back of sidewalks)
   e. GFA of a typical floor
   f. Net-gross ratio of a typical floor
   g. GFA of ground floor
   h. Lot coverage = GFA of ground floor/Total parcel area
   i. FAR (Floor Area Ratio) = Total GFA/Total parcel area
8. A 1"=40’ physical model per the requirements in the attached diagram (the choice of materials is up to the designer). An abstract context should be included to convey the intentions of your building as it is seen against the existing urban fabric.

**Final Review**

The final review is scheduled for Tuesday, October 19th. Each studio section will hold their own independent review with a 30 minute wrap-up discussion that includes all three sections at the end of the day.

The deliverables for the final presentation are limited to:

1. A PPT presentation of the proposal no longer than 7 minutes (the presentations will be timed with a strict cut-off)
2. A handout of the proposal (four copies) created from a single sheet of paper (that can be folded in any configuration)
3. A physical model

The exercise will be run as a competition with four awards in each studio section:

1. Best overall proposal (quality of presentation material, concept, and design)
2. Best programmatic/architectural concept
3. Best perspective view
4. Best physical model

More than one award can be given to a single project. The awards will be decided by the studio critic and the guest critics of each studio section. In addition, the winning projects will be discussed at the wrap-up session.
A physical model base is required.

Physical model will be built at 1:30. Model should include surrounding blocks and may include building context.

Net site area must be less than 1 Acre.

The corner of the physical model needs to be drawn in CAD for the project to be approved by the Planning Board.