MIT Architecture

Spring 2026

Core II / 4.152
1-5pm / Tuesdays and Thursdays with working sessions on Fridays

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thanks to Jeffrey Roberts (Zoning and Development), Gregory Brian (Urban Designer) and John Todd, WOJR and Northeastern University

Introduction

The normative context means a set of public laws and regulations that must be followed by any new building in an urban space. More than rules of game, it shapes a continent – or mass plan – inside which architecture operates. When the normative context changes, architecture tends to follow it, reshaping the cityscape according to its new criteria and limits.

City of Cambridge, 2025[1]

ORDINANCE that the Zoning Ordinance of the City of Cambridge be amended on a Zoning Petition by the City Council (Multifamily Housing Zoning Petition – Part One) to amend the Zoning Map and Articles with the intent of:

> *(1) removing zoning districts that are intended to permit single-family or two-family but not multifamily residences;*
>
> *(2) permitting multifamily and townhouse residences as-of-right in all zoning districts except Open Space and removing special requirements applicable to multifamily and townhouse residences;*
>
> *(3) removing dimensional requirements including minimum lot width and area and minimum lot area per dwelling unit, removing floor area ratio (FAR) limitations for residences, reducing minimum yard requirements for residences, and increasing height limitations for residences to permit four stories above grade in Residence C-1 Districts, with allowable increases up to six stories for inclusionary housing projects subject to certain limitations, and at least six stories above grade in all other districts except Open Space to allow for additional housing units beyond what is permitted under current zoning;*
>
> *(4) removing remaining references to minimum parking requirements; and*
>
> *(5) revising other parts of the Zoning Ordinance for internal consistency.*

The public policy that informs this new zoning code is clear: to face the deficit of housing, more importantly inclusinary and affordable housing, by increasing density and incentivizing its production. Specifically:

- allowing four-story high (45-foot) multi-family buildings throughout the city of Cambridge, without exception;

- the height of buildings or portions of buildings used as residences may exceed the base height limit, up to a maximum of six-story high (74-foot), if all of the following criteria are met: The building complies with the Inclusionary Housing (since 1998) requirements, regardless of whether it exceeds the size threshold requiring compliance; and the area of the lot on which the building is located is not less than 5,000 square feet. In this case 20% of units must be destinated to inclusionary houses

- to further the purpose of encouraging housing for persons of all income levels, and the specific objective of encouraging the construction of multifamily housing, including income-restricted affordable housing, in every neighborhood of Cambridge.

On the impact of these new rules on the existing Cambridge: 5,000 square feet properties will tend to rise up to six-story high. As two lots can be combined, 74-foot tends to be the new general height template for the entire city. Beyond

[1] https://www.cambridgema.gov/CDD/zoninganddevelopment/Zoning/Ordinance

four-story high elevator is required. Therefore, to provide elevator and egress staircase will be a prerequisite for existing buildings to be incremented with additional floors.

This new normative context poses a question to architects: How to achieve the intended positive social impact to increase the supply of affordable and inclusionary housing and, at same time, to mitigate the indiscriminate demolition of existing buildings or even existing urban neighborhoods?

Target and focus: existing buildings (combined or not) occupying a property not less than 5,000 square feet to be able to be incremented to a six-story high multifamily housing proposal. Minimizing demolition is a goal. Using light material and a constructions method that reduces carbon emission, besides energy efficiency, is a commitment.

Pre-existence as a starting point: as an assumption, we will be working on the transformation of existing buildings; for this reason, the documentation or the existing – by finding historical documents or by surveying existing building – is a requirement.

Where? As the idea is to offer a rich collection of scenes by testing the effect of this new normative context in the city of Cambridge, the project site will be picked up along of a 3.6 miles long east-west axis crossing Cambridge. It starts at the Charles River, at the MIT waterfront, then it follows Broadway and, after crossing Cambridge Common, it goes through Concord Avenue until the Fresh Pond area. This line covers different zoning codes, a few zoning overlay districts and nine of the thirteen neighborhoods [2]of the city. Potentially, it would offer a rich collection of architectural examples to illustrate the changes to come.

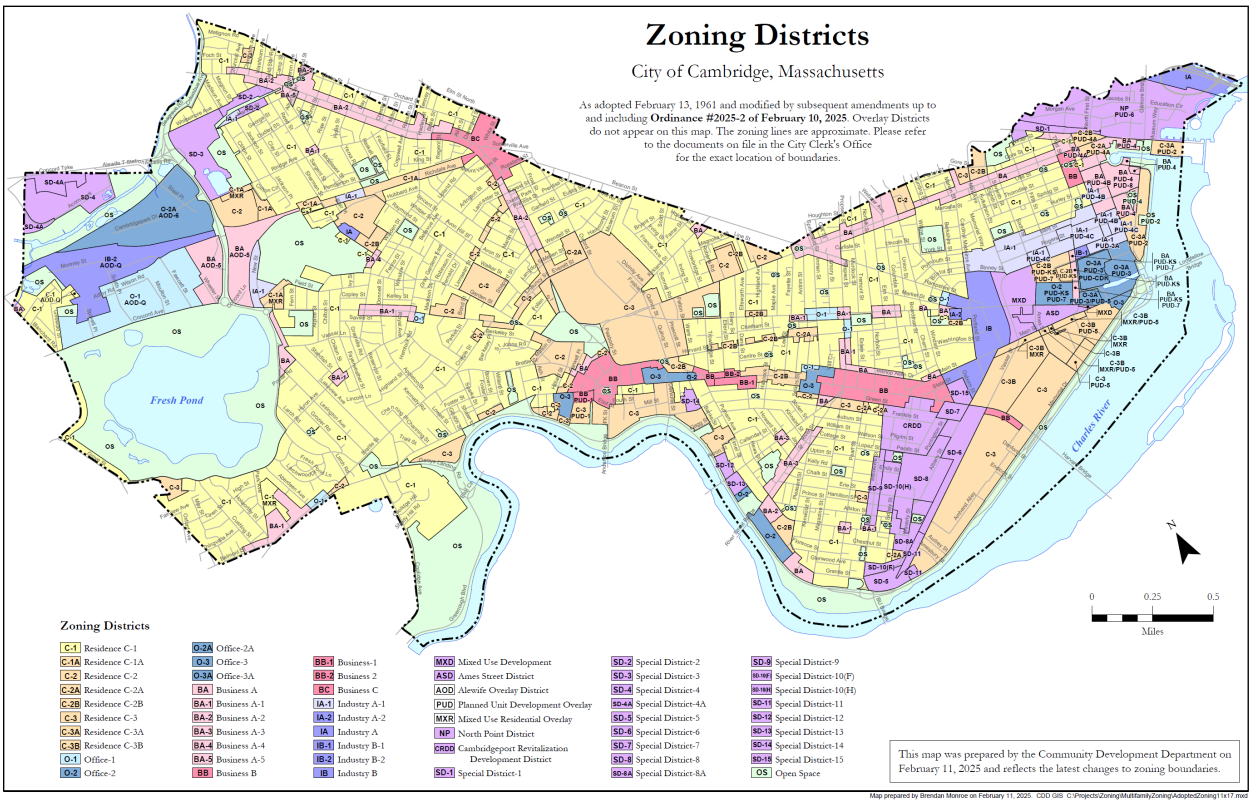
Structural challenge: how to add two or three new floors on the top of a low-rise existing building to be preserved? Reinforcing its existing structure, crossing through it with a new structure or surrounding outside of it with a new structure as a peristyle? The answer depends on each case, for sure, anyway structure tends to be the key to enable a solution for this interesting up-to-date circumstance. In this case, more than stability or a way to solve construction, structural thinking tends to be a strategy for design thinking.

Color standard for drawings:
yellow to demolition; red to indicate new construction, black for existing buildings and green to re-used materials.

Table 5-1: Table of District Dimensional Requirements

District	All Uses	Residential Uses (Section 4.31 a-j.)				Non-Residential Uses (Section 4.30 except 4.31 a-j.)				
	1. Min. Open Space Ratio (5.22)	2. Max. Stories Above Grade (5.23)	3. Max. Building Height in feet (5.23)	4. Min. Front Yard Setback in feet (5.24)	5. Min. Side or Rear Yard Setback in feet (5.24)	6. Max. Building Height in feet (5.23)	7. Min. Front Yard Setback in feet (5.24)	8. Min. Side Yard Setback in feet (5.24)	9. Min. Rear Yard Setback in feet (5.24)	10. Max. FAR (5.25)
5.31 Residence Districts										
Res. C-1	30%(1)	4(2)(37)	45(2)(37)	10(3)	5(4)	35	H+L(5) / 4	H+L(14)(15) / 5	H+L(7) / 4	0.75
Res. C-1A	15%	6	75	10(3)	5(4)	45	10	H+L(12) / 7	H+L(12) / 5	1.25
Res. C-2	15%	7	85	10(3)	5(4)	85	H+L(5) / 4	H+L(15) / 5	H+L(7) / 4	1.75
Res. C-2A	10%(10)	6	75	5(3)	5(4)	60	H+L(6)(9) / 5	H+L(9)(15) / 6	H+L(7) / 5	2.5
Res. C-2B	15%	6	75	10(3)	5(4)	45	H+L(5)(11) / 4	H+L(11)(15) / 5	H+L(7)(11) / 4	1.75
Res. C-3	10%	10	120	5(3)	5(4)	120	H+L(6) / 5	H+L(15) / 6	H+L(7) / 5	3.0
Res. C-3A	10%	10	120	5(3)	5(4)	120	H+L(6)(8) / 5	H+L(8)(15) / 6	H+L(8) / 5	3.0(8)
Res. C-3B	10%	10	120	10(3)	5(4)	120 (36)	10	none	none	3.0(13)(36)

[2] East Cambridge, MIT, Wellington Harrignton, The Port, Mid Cambridge, Baldwin, Neighborhood Nine, West Cambirdge, Cambridge Highlands



Methodology

As a design studio, activities are developed through dialog under two universal formats: desk crits, individually; and pinups, sharing ideas among the group. The dynamic of working is modulated in time throughout the semester, three reviews [concept, midterm, and final reviews] according to milestone events for three successive emphases of the design process: concept, development and closing. These emphases are enchained like three acts, phases, to make us realize how time inflects changing goals and atmospheres along the design process.

The first one, concept, is dedicated to opening our field of possibilities. Arriving at a worthy decision, besides clear criteria, requires selecting the best among several possibilities, which come up during the design process as sketches. Therefore, at this first act, we should be dedicated to open more than to focus, as in a productive drift. It is in this phase that architects renew themselves by formulating hypotheses that are unusual or unexpected. The question here is 'what?' The goal is a clear concept. Although it might seem simple, this concept produces a fundamental drawing, usually a diagram or a sketch: clear enough to guide us at the beginning of the process and, at the same time, open enough to allow several possible unfoldings. For this reason, a single concept remains in our mind, with the power for multiple proposals that we see as recurring along the life of an architect. The concept aims at the density of a synthesis. This phase could be related to arch (-arkhi): as starting point, foundation and cause of the process.

The second act, development, corresponds to a dive into the grammar of architectural language emphasizing its constructive and aesthetic aspects. This phase is dedicated to tectonic (-tekton). Here, the question that we must face is 'how?' Its resolution requires that the unity, from a clear concept, must be dismantled in parts. It is an analytical search for the possible essence of each part and the judgment of its constructive meaning in relation to the whole. It is a phase of accumulation, but at same time it is crucial to clean all that is not the case anymore to be kept. As if we were shaking the drawing paper strongly enough to make fall away what is all that is no longer relevant. It is accumulation under a clear criterion of validity.

The third act, closing, requires the most rigorous filter, at same time strategic and poetic, in order to frame a clear discursive sequence that can properly present a proposal. The essence of this phase is conciseness. The question here is 'why' which, at this point, must be properly supported by the architectural proposition.

Schedule

phase	week	date	activity
Phase 1: CONCEPT (group/shared research)	1	FEB 03 FEB 05 FEB 06	STUDIO LOTTERY; meet at 4pm, introduction Comunity Development Department, 344 Broadway Jeffrey Roberts (Zoning and Development) and Gregory Brian (Urban Designer) Working section
	2	FEB 10 FEB 11 FEB 12	Desk crits Desk crits / PINUP Working section
	3	FEB 17 FEB 19 FEB 20	*no class / Monday schedule / President's Day* desk crits **PINUP / closing Phase 1**
phase 2A: DEVELOPMENT 1	4	FEB 24 FEB 26 FEB 27	Introduction to phase 2A: development / Desk crits Desk crits Working section
	5	MAR 03 MAR 05 MAR 06	Desk crits PINUP Working section
	6	MAR 10 **MAR 12** MAR 13	Desk crits Desk crits Working section
	7	MAR 17 **MAR 19** MAR 20	Pinup **MIDTERM REVIEW** Working section
		MAR 23 – MAR 29	SPRING BREAK
phase 2B: DEVELOPMENT 2	8	MAR 31 APR 02 APR 03	Introduction to phase 2B: development 2 / Desk crits Desk crits Working section

	9	APR 07 APR 09 APR 10	Desk crits Desk crits Working section
	10	APR 14 APR 16 APR 17	PINUP *Campus Preview Weekend* *Campus Preview Weekend*
Phase 3: CLOSING	11	APR 21 APR 23 APR 24	*no class / Monday Schedule* Introduction to Phase 3: Closing / desk crits Working section
	12	APR 28 APR 30 MAY 01	Desk crits PINUP / Final ReviewPreview Working section
	13	MAY 05 MAY 07 MAY 08	Desk crits Desk crits Working section
	14	**MAY 12**	**FINAL REVIEW**

Studio Objectives:

- Strengthen the students' ability to research, conceptualize, and developing an understanding of complex urban environments
- Strengthen the students' ability work across urban, landscape, and architectural scales
- Learn and practice presentations skills in front of clients and user groups
- Ability to represent a design concept through accurate graphic representation

Evaluation Criteria:

Students will be graded according to the following criteria:

Studio Criteria:

- Quality and depth of analysis and design research.
- Engagement in communal discussions and contribution to the studio's shared learning.
- Ability to process criticism in a productive manner and to self-evaluate.
- Clarity and organization of oral presentations.
- Completion of assignments by their deadlines.
- Individual growth over the growth of the semester.

Attendance:

Attendance for the full duration of each class is mandatory. Greater than three absences for the semester without a medical excuse supported by a doctor's note or a family emergency confirmed by a school official may result in a failing grade. If you miss six or more classes, you will be asked to drop the subject or receive a failing grade.

Grading Definition

A: Exceptionally good performance demonstrating a superior understanding of the subject matter, a foundation of extensive knowledge, and a skillful use of concepts and/or materials.

B: Good performance demonstrating capacity to use the appropriate concepts, a good understanding of the subject matter, and an ability to handle the problems and materials encountered in the subject.

C: Adequate performance demonstrating an adequate understanding of the subject matter, an ability to handle relatively simple problems, and adequate preparation for moving on to more advanced work in the field.

D: Minimally acceptable performance demonstrating at least partial familiarity with the subject matter and some capacity to deal with relatively simple problems, but also demonstrating deficiencies serious enough to make it inadvisable to proceed further in the field without additional work.

F: Failed. This grade also signifies that the student must repeat the subject to receive credit.

Final Studio Deliverables

Grades will not be posted for students to view on their grade report until their work has been archived. The projects need to be properly prepared and formatted, and delivered to the Archiving TA. Studio TA's will collect project archives from each student immediately following the review. Detailed requirements and instructions for formatting will be posted to CRON, the Department website, and sent to students at the beginning of the semester.

Student Performance Criteria (Grading)

The final grade will be based on a combination of attendance, participation, timely completion of assignments, and the quality of the work produced.

Academic Integrity and Honesty

All work submitted will fall under the jurisdiction of the MIT Policy on Academic Integrity. MIT's expectations and policies regarding academic integrity should be read carefully and adhered to diligently: http://integrity.mit.edu.

Disabilities

A student who has a documented disability, or any concerns which he/she thinks may affect his/her ability to perform in class are invited to consult with the professors early in the semester so that suitable arrangements may be made. For MIT's policy on accommodations for disabilities, please follow this link: http://mit.edu/uaap/sds/students/.

Diversity Statement

Massachusetts Institute of Technology values an inclusive environment. A sense of community in the classroom shall be fostered, while the classroom should be considered to be a place where students will be treated with respect. This class welcomes individuals of all backgrounds, beliefs, ethnicities, national origins, gender identities, sexual orientations, religious and political affiliations – and other visible and non-visible differences. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class. If this standard is not being upheld, please feel free to speak with any instructors.

NAAB Student Performance Criteria

Required by NAAB and organized by "realms" to better understand the relationships between individual criteria. (The "NAAB Student Performance — Educational Realms & Student Performance Criteria" document is available on the Faculty Handbook website.) Include the criteria your subject addresses:

Realm A: Critical Thinking and Representation

- A1. Communication Skills: Ability to read, write, speak and listen effectively
- A2. Design Thinking Skills: Ability to raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards.
- A3. Visual Communication Skills: Ability to use appropriate representational media, such as traditional graphic and digital technology skills, to convey essential formal elements at each stage of the programming and design process.
- A4. Technical Documentation: Ability to make technically clear drawings, write outline specifications, and prepare models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.
- A5. Investigative Skills: Ability to gather, assess, record, apply, and comparatively evaluate relevant information within architectural coursework and design processes.
- A6. Fundamental Design Skills: Ability to effectively use basic architectural and environmental principles in design.
- A7. Use of Precedents: Ability to examine and comprehend the fundamental principles present in relevant precedents and to make choices regarding the incorporation of such principles into architecture and urban design projects.
- A8. Ordering Systems Skills: Understanding of the fundamentals of both natural and formal ordering systems and the capacity of each to inform two- and three dimensional design.
- A9. Historical Traditions and Global Culture: Understanding of parallel and divergent canons and traditions of architecture, landscape and urban design including examples of indigenous, vernacular, local, regional, national settings from the Eastern, Western, Northern, and Southern hemispheres in terms of their climatic, ecological, technological, socioeconomic, public health, and cultural factors.
- A10. Cultural Diversity: Understanding of the diverse needs, values, behavioral norms, physical abilities, and social and spatial patterns that characterize different cultures and individuals and the implication of this diversity on the societal roles and responsibilities of architects.
- A11. Applied Research: Understanding the role of applied research in determining function, form, and systems and their impact on human conditions and behavior.

Realm B: Integrated Building Practices, Technical Skills and Knowledge:

- B1. Pre-Design: Ability to prepare a comprehensive program for an architectural project, such as preparing an assessment of client and user needs, an inventory of space and equipment requirements, an analysis of site conditions (including existing buildings), a review of the relevant laws and standards and assessment of their implications for the project, and a definition of site selection and design assessment criteria.
- B2. Accessibility: Ability to design sites, facilities, and systems to provide independent and integrated use by individuals with physical (including mobility), sensory, and cognitive disabilities.
- B3. Sustainability: Ability to design projects that optimize, conserve, or reuse natural and built resources, provide healthful environments for occupants/users, and reduce the environmental impacts of building construction and operations on future generations through means such as carbon-neutral design, bioclimatic design, and energy efficiency.
- B4. Site Design: Ability to respond to site characteristics such as soil, topography, vegetation, and watershed in the development of a project design.
- B5. Life Safety: Ability to apply the basic principles of life-safety systems with an emphasis on egress.
- B6. Comprehensive Design: Ability to produce a comprehensive architectural project that demonstrates each student's capacity to make design decisions across scales while integrating the following SPC:

    - A.2. Design Thinking Skills
    - A.4. Technical Documentation
    - A.5. Investigative Skills
    - A.8. Ordering Systems
    - A.9. Historical Traditions and Global Culture
    - B.2. Accessibility
    - B.3. Sustainability
    - B.4. Site Design
    - B.5. Life Safety
    - B.8. Environmental Systems
    - B.9. Structural Systems
- B7. Financial Considerations: Understanding of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility, operational costs, and construction estimating with an emphasis on life-cycle cost accounting.
- B8. Environmental Systems: Understanding the principles of environmental systems' design such as embodied energy, active and passive heating and cooling, indoor air quality, solar orientation, day lighting and artificial illumination, and acoustics; including the use of appropriate performance assessment tools.
- B9. Structural Systems: Understanding of the basic principles of structural behavior in withstanding gravity and lateral forces and the evolution, range, and appropriate application of contemporary structural systems.
- B10. Building Envelope Systems: Understanding of the basic principles involved in the appropriate application of building envelope systems and associated assemblies relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.
- B11. Building Service Systems: Understanding of the basic principles and appropriate application and performance of building service systems such as plumbing, electrical, vertical transportation, security, and fire protection systems.
- B12. Building Materials and Assemblies: Understanding of the basic principles utilized in the appropriate selection of construction materials, products, components, and assemblies, based on their inherent characteristics and performance, including their environmental impact and reuse.
- **Realm C: Leadership and Practice**
- C1. Collaboration: Ability to work in collaboration with others and in multidisciplinary teams to successfully complete design projects.
- C2. Human Behavior: Understanding of the relationship between human behavior, the natural environment and the design of the built environment.
- C3. Client Role in Architecture: Understanding of the responsibility of the architect to elicit, understand, and reconcile the needs of the client, owner, user groups, and the public and community domains.
- C4. Project Management: Understanding of the methods for competing for commissions, selecting consultants and assembling teams, and recommending project delivery methods.
- C5. Practice Management: Understanding of the basic principles of architectural practice management such as financial management and business planning, time management, risk management, mediation and arbitration, and recognizing trends that affect practice.
- C6. Leadership: Understanding of the techniques and skills architects use to work collaboratively in the building design and construction process and on environmental, social, and aesthetic issues in their communities.
- C7. Legal Responsibilities: Understanding of the architect's responsibility to the public and the client as determined by registration law, building codes and regulations, professional service contracts, zoning and subdivision ordinances, environmental regulation, and historic preservation and accessibility laws.
- C8. Ethics and Professional Judgment: Understanding of the ethical issues involved in the formation of professional judgment regarding social, political and cultural issues in architectural design and practice.
- C9. Community and Social Responsibility: Understanding of the architect's responsibility to work in the public interest, to respect historic resources, and to improve the quality of life for local and global neighbors.