University of California, Berkeley

Interim Progress Report for Year Five

Instructions and Template

November 30, 2021

Contents

1. INSTRUCTIONS AND TEMPLATE GUIDELINES

Purpose

Continuing accreditation is subject to the submission of interim progress reports at defined intervals of 2 years and 5 years after an eight-year term of continuing accreditation is approved.

This narrative report, supported by documentation, covers three areas:
1. The program's progress in addressing not-met Conditions and Student Performance Criteria (SPC) from the Interim Progress Report Year 2 review.
2. Changes or Planned Changes in the Program.
3. Summary of Preparations for Adapting to 2020 NAAB Conditions.

Supporting Documentation

1. The narrative should describe in detail all changes in the program made in response to not-met Conditions and Student Performance Criteria, including detailed descriptions of changes to the curriculum that have been made in response to not-met SPC that were identified in the review of the Interim Progress Report Year 2. Identify any specific outcomes expected to student performance. Attach new or revised annotated syllabi identifying changes for required courses that address unmet SPC.
2. Evidence of student work is only required to address deficiencies in the following cases: (1) If there are any SPCs that have not been met for two consecutive visits; (2) If there are three not-met SPCs in the same realm in the last visit.

    - Provide three examples of minimum-pass work for each deficiency and submit student work evidence to the NAAB in electronic format. (Refer to the "Guidelines for Submitting Digital Content in IPRs" for the required format and file organization.)

    - All student work evidence must be labeled and clearly annotated so that each example cross-references the specific SPC being evaluated and shows compliance with that SPC.

3. Provide additional information that may be of interest to the NAAB team at the next accreditation visit.

Outcomes

IPRs are reviewed by a panel of three: one current NAAB director, one former NAAB director, and one experienced team chair.[1] The panel may make one of two recommendations to the Board regarding the interim report:
1. Accept the 5 yr. Interim Progress Report as having corrected deficiencies identified in the Interim Progress Report Year 2. The annual statistical report (see Section 9 of the 2015 Procedures) is still required.
2. Reject the interim report as having not corrected deficiencies or demonstrated substantial progress toward addressing deficiencies and advance the next accreditation sequence by at least one calendar year, thereby shortening the term of accreditation. In such cases, the chief academic officer of the institution will be notified and a copy of the decision sent to the program administrator. A schedule will be determined so that the program has at least six months to prepare an Architecture Program Report. The annual statistical report (see Section 9 of the 2015 Procedures) is still required.

Deadline and Contacts

IPRs are due on November 30. They shall be submitted through the NAAB's Annual Report System (ARS). As described in Section 10 of the 2015 NAAB Procedures for Accreditation "…the program will be assessed a fine of $100.00 per calendar day until the IPR is submitted." If the IPR is not received by

[1] The team chair will not have participated in the visiting team during the year in which the previous decision on a term of accreditation was made.

January 15 the program will automatically receive Outcome 2 described above. Email questions to accreditation@naab.org.

Instructions

1. **Reports shall be succinct and are limited to 40 pages/20 MBs, including supporting documentation.**
2. Type all responses in the designated text areas.
3. Reports must be submitted as a single PDF following the template format. Pages should be numbered.
4. Supporting documentation should be included in the body of the report.
5. Remove the #4 “Requirements for the Use of Digital Content in Interim Progress Reports” pages before submitting the interim progress report.

2. EXECUTIVE SUMMARY OF THE TWO MOST RECENT NAAB VISITS: 2016 and 2010

CONDITIONS NOT MET

2016 VTR	2010 VTR
I.2.1 Human Resources and Human Resource Development	3 Public Information

STUDENT PERFORMANCE CRITERIA NOT MET

2016 VTR	2010 VTR
B.9 Building Service Systems	13.16 Program Preparation
	13.22 Building Service Systems
	13.23 Building Systems Integration
	13.25 Construction Cost Control
	13.28 Comprehensive Design

3. TEMPLATE

Interim Progress Report Year 5

University of California, Berkeley
Department of Architecture
Master of Architecture
Track I (non-preprofessional degree + 72 credits)
Track II (advanced standing + preprofessional degree - 120 credits + 48 graduate credits)
Year of the previous visit: 2016

Please update contact information as necessary since the last APR was submitted.

Chief administrator for the academic unit in which the program is located:

Name: **Lisa Iwamoto**
Title: **Department Chair**
Email: **liwamoto@berkeley.edu**
Address: **232 Bauer Wurster Hall, Berkeley, CA 94720**

Any questions pertaining to this submission will be directed to the chief administrator for the academic unit in which the program is located.

Chief academic officer for the Institution:

Name: **Catherine Koshland**
Title: **Interim Executive Vice Chancellor and Provost**
Email: **evcp@berkeley.edu**
Address: **200 California Hall, Berkeley, CA 94720**

Text from the previous VTR and IPR Year 2 Review is in the gray text boxes. Type your response in the designated text boxes.

I. Progress in Addressing Not-Met Conditions and Student Performance Criteria

a. Progress in Addressing Not-Met Conditions

University of California, Berkeley, 2021 Response: Narrative Satisfied by 2-Year IPR.

b. Progress in Addressing Not-Met Student Performance Criteria

B.9 Building Service Systems

2016 Team Assessment: The team was unable to find evidence of student understanding of the basic principles and appropriate application and performance of plumbing, electrical, communication, vertical transportation, security, and fire protection systems.

University of California, Berkeley, 2018 Response: The courses that fulfill this requirement are ARCH 240-Advanced Study of Energy and Environment,ARCH 260-Introduction to Construction and ARCH 203-Integrated Design Studio. Currently, ARCH 260 covers fire protection as well as MEP; ARCH 203 introduces elevators, lighting, communication and security systems as well as structural and MEP integration;ARCH 240-Advanced Study of Energy and Environment also fulfillspart of this requirement through its teaching ofdaylighting and natural ventilation as building systems.This year we are undergoing our Academic Program Review (described in section 2). To better introduce and integrate Building Service Systems, weare planning to addstructural and MEP components earlier in the design studio sequence, moving the introduction from the fifth studio (ARCH 203) taken in the third year to the second studio (ARCH 200B) taken in the first year. This material will then be developed inARCH 150-Introduction to Structures and ARCH 260 that are taken in the second year. This will allow three additional modules in communications, vertical transportation, as well as security and fire protection to be added to ARCH 203, offered in the third year.We are also reviewing a graduate course in structure, ARCH 250. As these changes are part of our current self-study, implementation will be in the fall of 2019.

University of California, Berkeley, 2021 Response: *Since our last two-year IPR submission, we have revised the content of ARCH 207C- Professional Practice Colloquium to run parallel with ARCH 203- Integrated Design Studio. ARCH 203 uses consultants in the design studio and these consultants lecture in ARCH 207C to all ARCH 203 students. Lectures and readings cover structural design integration, daylighting, electrical lighting, mechanical systems and natural ventilation, and life safety systems including fire protection. In addition to lectures, the consultants serve as roving critics in the design studios to give small group desk crits on individual projects. In each ARCH 203 studio section, vertical transportation and plumbing are covered. In addition, ARCH 260- Introduction to Construction also covers some of the materials on building service systems. In the appendix, you will find the syllabus for ARCH 207C as well as ARCH 260. The B.9 items are highlighted in yellow. Pages not pertaining to B.9 have been deleted. In addition, three examples of student work from ARCH 203 and three examples from ARCH 260 are included in the appendix, with B.9 evidence also highlighted.*
With the revision of ARCH 207C, ARCH 240 no longer addresses building service systems. Since the last IPR, we have launched a graduate course in structures, ARCH 250- Introduction to Structures. It also does not cover any building service systems.

II. Changes or Planned Changes in the Program

Please report such changes as the following: faculty retirement/succession planning; administration changes (dean, department chair, provost); changes in enrollment (increases, decreases, new external pressures); new opportunities for collaboration; changes in financial resources (increases, decreases, external pressures); significant changes in educational approach or philosophy; changes in physical resources (e.g., deferred maintenance, new building planned, cancellation of plans for new building).

University of California, Berkeley, 2021 Response: *The last three year have seen significant changes for our department. Professors Gary Black, Jean Paul Bourdier, Tom Buresh, Nicholas deMonchaux, and Susan Ubbelohde have either separated or retired. Adjunct faculty Marco Cenzatti, Roddy Creedon, and Danelle Guthrie have retired. We have hired three new ladder faculty: Giovanni Betti as Assistant Professor, Marcel Sanchez Prieto as Associate Professor, and Vishaan Chakrabarti as Professor and Dean. We also appointed two new adjunct faculty as continuing lecturers: David Orkand and Dan Spiegel. At the time we submitted our two-year IPR, Renee Y. Chow just finished her first semester as department chair. In 2019-20, Chow moved to the role of acting dean as the college awaited the arrival of Chakrabarti and in the interim, Professors Ron Rael and Andrew Shanken served as acting chair and vice chair. In 2020-21, Chow returned to serve as chair of Architecture with the arrivial of the new Dean. Unfortunately, in August of 2021, Dean Chakrabarti took family medical leave and in September he resigned as dean, and Chow was again appointed as acting dean and then as dean in early November. On December 1, 2021, Professor Lisa Iwamoto will serve as chair of Architecture. Iwamoto is a much respected professional and educator, and we look forward to longer term leadership stability in the department and college. At the university level, EVCP Paul Alivisatos left for University of Chicago and Catherine Koshland now serves as interim EVCP. A search is in progress. Financially, COVID was challenging for the university and as a result it took back money from the academic units on campus; for Architecture much of this burden was taken on at the College level and not felt departmentally. Nonetheless, we are anticipating additional financial challenges based on University messaging about finance reform.*

III. Summary of Preparations for Adapting to 2020 NAAB Conditions

Please provide a brief description of actions taken or plans for adapting your curriculum/ classes to engage the 2020 Conditions.

University of California, Berkeley, 2021 Response: *The M Arch Committee has been charged with the transition to the 2020 NAAB conditions. During the summer of 2021, a rubric was developed to assess the our current courses in relation to 2020 Program Criteria and Student Criteria. All faculty were asked to assess their courses in relation to the 2021 PC and SC. The M.Arch Committee is now reviewing, drafting criteria narratives, establishing metrics of assessments, as well as establishing a baseline to then monitoring progress. The PC and SC narratives and benchmarking will be in place by the end of spring 2022.*

IV. Appendix (include revised curricula, syllabi, and one-page CVs or bios of new administrators and faculty members; syllabi should reference which NAAB SPC a course addresses. Provide three examples of low-pass student work for SPCs in the following cases--if there are any SPCs that have not been met for two consecutive visits, or If there are three not-met SPCs in the same realm in the last visit--as required in the Instructions.)

University of California, Berkeley, 2021 Update: Must include student work evidence for B.9: *Syllabi for B.9 Building Service Systems for ARCH 207C, ARCH 260, and ARCH 203 Handbook; CVs of new administrators (Iwamoto as Chair and Chow as Dean); and and CVs of new faculty (Betti, Chakrabarti and Sanchez Prieto.) In the base folder, please find student work for ARCH 203 (studio that parallels 207C) and ARCH 260, highlighting B.9 Building Service Systems.*

PROFESSIONAL PRACTICE COLLOQUIUM

Instructor: Dan Spiegel
Arch 207c
Fall 2021
Units: 1

// Remote Instruction
// Tuesday, 5:00pm- 6:30pm PST
// Zoom Meeting ID: 969 4317 3444
Passcode: 563619

** Image from San Rocco Magazine 6, Collaborations*

This class accompanies ARCH 203, the required integrated design studio in the three-year option of the Master of Architecture program. It is the third in a series of one-unit colloquia, scheduled in the fall for each year of the M.Arch program.

Using a 'consultant model' approximating common conditions of architectural practice, experts in the various disciplines of building design will give presentations on their fields of expertise, providing a framework for approaching specialized topics and technical systems, for deployment and integration within your studio design proposals. These lectures are coordinated to coincide with design development in the Integrated Design Studio, and the consultants will often join the individual studio sections in the class sessions after the presentation of their material in order to give feedback and guidance on the implementation of their subject matter within the students' studio projects.

Enrollment in course is on a P/NP basis. Attendance and participation are the basis for receiving a passing grade. Active engagement in question and answer sessions with the guest speakers is required. If you are not able to attend a presentation, you can watch a recorded version of the presentation separately and submit a written summary of the guest and the related conversation.

SCHEDULE: *[SUBJECT TO CHANGE]*

WEEK			*CONTENT*	*LECTURE*/GUEST
2				
	T	08.31	*A207 // Course Introduction, Climate Strategy*	*Dan Spiegel,* *Patrick Flynn [Salesforce]*
3				
	T	09.07	*A207 // Environmental Design I*	*Luisa Caldas*
4				
	T	09.14	*A207 // Structural Systems I*	*Ben Corotis*
5				
	T	09.21	*A207 // Work in the Public Realm*	*Maia Small* *[SF Planning]*
6				
	T	09.28	*A207 // Mechanical Systems I*	*Todd See* *[WSP]*
7				
	T	10.05	*A207 // Facade Systems I*	*Adrian Betanzos* *[Apple]*
8				
	T	10.12	*A207 // Environmental Design II*	*Luisa Caldas*
9				
	T	10.19	*Biodiverse & Bird Safe Urban Landscape Design*	*Dan Stephens & Scott Terrill* *[HT Harvey & Associates]*
10				
	T	10.26	*A207 // Structural Systems II*	*Ben Corotis*
11				
	T	11.02	*A207 // Mechanical Systems II*	*Stet Sanborn* *[SmithGroup]*
12				
	T	11.09	*A207 // Life Safety*	*Manuelita David* *[Jensen Hughes]*
13				
	T	11.16	*A207 // Facade Systems II*	*David Green* *[WJE]*

REFERENCE READINGS:

CODE:

Building Codes (2019 CA Building Code including 2020 Supplements) CBC (Upcodes)
CA Building Code (Vols 1&2)
CA Electrical Code
CA Mechanical Code
CA Plumbing Code
CA Energy Code
CA Fire Code
CA Green Building Standards Code (CALGreen)
CA Residential Code, Historical Code and Existing Building Code not used for ARCH 203

ARCH 203 Integrated Studio Handbook (2021 Update)

MECHANICAL SYSTEMS:

- Grondzik, Walter. Mechanical and Electrical Equipment for Buildings. Wiley 2010 (on line via lib. berkeley.edu) https://ebookcentral.proquest.com/lib/berkeley-ebooks/detail.action?docID=1791341
- Lechner, N. Heating, Cooling, Lighting: Sustainable Design Methods for Architects. John Wiley & Sons, 3rd Edition, 2009.

WATER SYSTEMS:

- Sedlak, David. Water 4.0: The Past, Present and Future of the World's Most Vital Resource. New Haven: Yale University Press, 2014.
- Shades of Grey. Architect Magazine. [Overview] http://www.architectmagazine.com/green-technology/shades-of-gray_1.aspx
- The Future of Designing (with) Water [Continuing Ed- Overview] http://www.ranacreekdesign.com/wp-content/uploads/2014/03/HWU_Water_ADV14_Full.pdf
- San Francisco Public Utilities Commission, 2012, San Francisco Graywater Design Manual for Outdoor Irrigation. http://sfwater.org/modules/showdocument.aspx?documentid=55

VERTICAL TRANSPORTATION SYSTEMS:

- Smith, Rory. "Key Innovations and Technologies in Vertical Transportation Systems since 1980. Journal of Physics: Conference Series 2018. https://iopscience.iop.org/article/10.1088/1742-6596/1048/1/012009/pdf
- Rethinking Vertical Accessibility- lifts. [AEC Daily] bCourses.
- Cheeseright, Robin. "Vertical Transportation: A Primer," CTBUH, 2021. bCourses

SECURITY SYSTEMS:

- Norman, Thomas. "Security System Design Elements." Integrated Security Systems Design, Elsevier 2014. https://www.sciencedirect.com/topics/computer-science/security-system-design
- Fennelly, Lawrence. Effective Physical Security, Elsevier 2017. https://www.sciencedirect.com/book/9780128044629/effective-physical-security#book-description

COMMUNICATION SYSTEMS:

- "Placing Electrical systems and Communications Systems in Buildings" U.S. General Service Administration. https://www.gsa.gov/node/82713
- Communication Systems- voice, data, video, lan, hvac, fire alarm, security and cctv. FOSCO (commercial site) https://www.fiberoptics4sale.com/blogs/archive-posts/95047110-communication-systems-voice-data-video-lan-hvac-fire-alarm-security-and-cctv

FIRE PROTECTION SYSTEMS:

- "Types of Fire Protection" Phoenix (commercial site) https://www.phoenixfirenc.com/types-fire-protection
- "Components of a Fire suppression System" MPW(commercial) https://www.mpwengineering.com/blog/components-of-fire-protection-systems/

STRUCTURAL SYSTEMS:

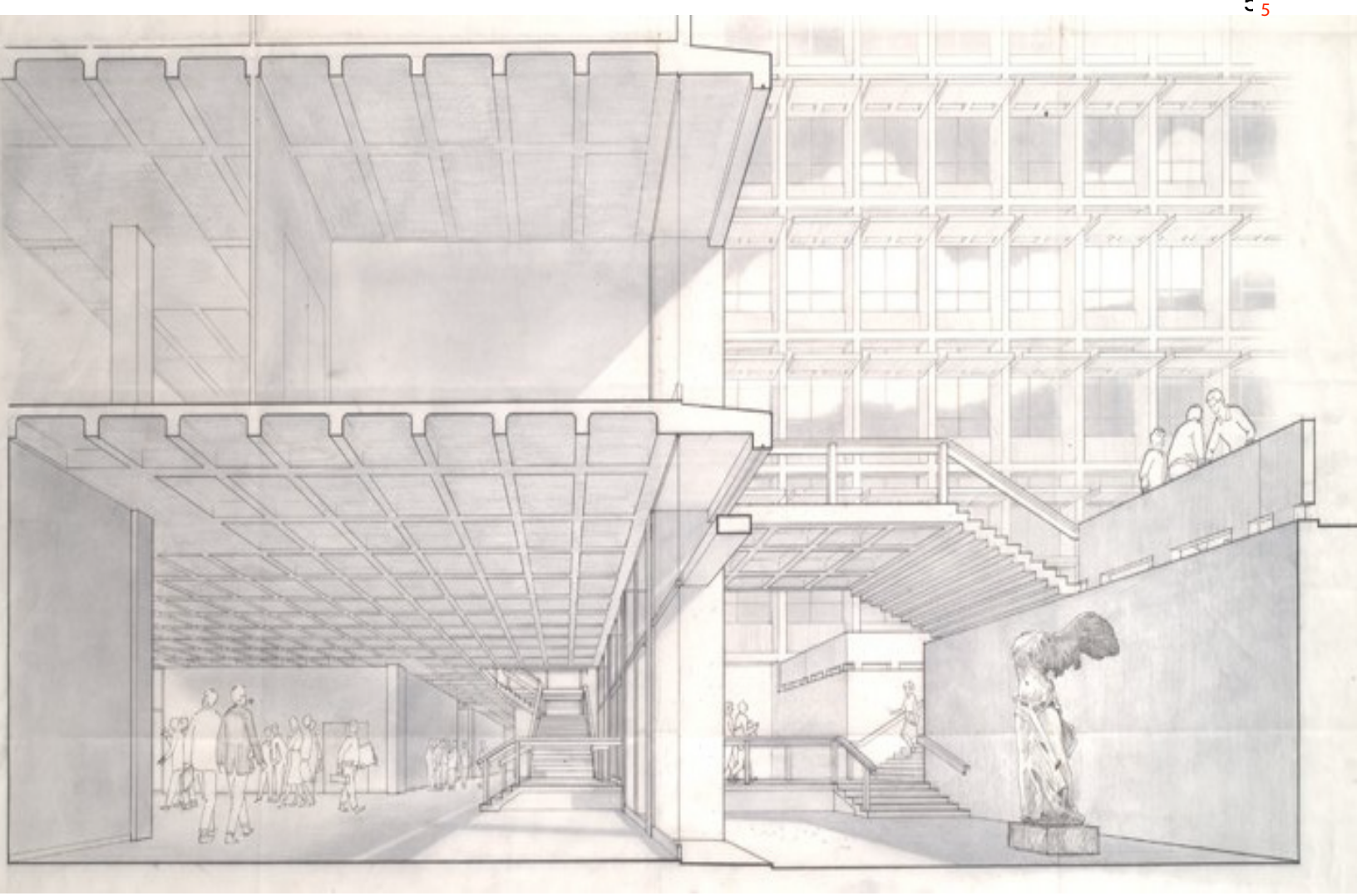
- Ambrose, J. Building Structures. John Wiley & Sons. (1993).
- Ching, F. D., Onouye, B. S., & Zuberbuhler, D. Building Structures Illustrated: Patterns, Systems, and Design. John Wiley & Sons. (2011)
- Herzog, T., Krippner, R., & Lang, W. Facade Construction Manual. Walter de Gruyter. (2004)
- Herzog, T., Natterer, J., Schweitzer, R., Volz, M., & Winter, W. Timber Construction Manual. Walter de Gruyter. (2004).
- Schierle, G. G. Structure in Architecture. University of Southern California Custom Pub. (2006).
- Schittich, C. Glass Construction Manual. Birkhauser Architecture. (2007). Schittich, C., Lang, W., &
- Krippner, R. Building Skins. Walter de Gruyter. (2006) Schueller, W. The Design of Building Structures. Prentice Hall. (1996).
- Wood Reference Handbook: A guide to the architectural use of wood in building construction. Canadian Wood Council (1991)

SUSTAINABILITY:

- Keeler, M. & Burke, B. Fundamentals of Integrated Design for Sustainable Building. US Green Building Council, 2009
- Kwok, A. & Grondzik, W. The Green Studio Handbook: Environmental Strategies for Schematic Design. Burlington, MA: Elsevier : Arch.Press
- Aksamija, A. Sustainable Facades: Design Methods for High-performance Building Envelopes. John Wiley & Sons, 2013.
- "Overcoming Carbon Form." Log 47, Fall 2019. Anyone Corporation.

GENERAL BUILDING:

- Allen, Edward & Iano, Joseph. Fundamentals of Building Construction: Materials & Methods. New Jersey: Wiley & Sons, 2014.
- Ching, F. D. Building Construction Illustrated. John Wiley & Sons. (2014).
- Deplazes, A. Constructing Architecture: Materials, Processes, Structures, a Handbook. Springer Science & Business Media. (2005).
- Ramsey/Sleeper. Architectural Graphic Standards. New York: AIA & Wiley & Sons.



INTEGRATED STUDIO
HANDBOOK

ARCH 203 - FALL 2021
CED - UC BERKELEY

Table of Contents

Fire and Smoke Protection (Chapter 7)

This chapter governs the materials, systems and assemblies used for fire resistance construction, and safeguards against the spread of fire within a building. The table included here define the maximum amount of exterior wall openings allowable based on distance from property lines or other buildings. Refer to Table 721.1 for detailed information with regard to how structural members are protected, and typical systems for walls and floors that have minimum rating requirements. A few examples of typical details are included.

TABLE 705.8 - Maximum Area of Exterior Wall Openings Based on Fire Separation Distance and Degree of Opening Protection

Fire Separation Distance (Feet)	Degree of Opening Protection	Allowable Area [a]
0 to less than 3[b,c,k]	Unprotected, Non-sprinklered (UP, NS)	Not Permitted[k]
	Unprotected, Sprinklered (UP, S)[i]	Not Permitted[k]
	Protected (P)	Not Permitted[k]
3 to less than 5[d,e]	Unprotected, Non-sprinklered (UP, NS)	Not Permitted
	Unprotected, Sprinklered (UP, S)[i]	15%
	Protected (P)	15%
5 to less than 10[e,f,j]	Unprotected, Non-sprinklered (UP, NS)	10%[h]
	Unprotected, Sprinklered (UP, S)[i]	25%
	Protected (P)	25%
10 to less than 15[e,f,g, j]	Unprotected, Non-sprinklered (UP, NS)	15%[h]
	Unprotected, Sprinklered (UP, S)[i]	45%
	Protected (P)	45%
15 to less than 20[f,g, j]	Unprotected, Non-sprinklered (UP, NS)	25%
	Unprotected, Sprinklered (UP, S)[i]	75%
	Protected (P)	75%
20 to less than 25[f,g, j]	Unprotected, Non-sprinklered (UP, NS)	45%
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit
25 to less than 30[f,g, j]	Unprotected, Non-sprinklered (UP, NS)	70%
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit
30 or greater	Unprotected, Non-sprinklered (UP, NS)	No Limit
	Unprotected, Sprinklered (UP, S)[i]	No Limit
	Protected (P)	No Limit

UP, NS = Unprotected openings in buildings not equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1. Footnote information continues on next page.

- 2019 California Building Code Chapter 7

UP, S = Unprotected openings in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.
P = Openings protected with an opening protective assembly in accordance with Section 705.8.2.

a. Values indicated are the percentage of the area of the exterior wall, per story.
b. For the requirements for fire walls of buildings with differing heights, see Section 706.6.1.
c. For openings in a fire wall for buildings on the same lot, see Section 706.8.
d. The maximum percentage of unprotected and protected openings shall be 25 percent for Group R-3 occupancies.
e. Unprotected openings shall not be permitted for openings with a fire separation distance of less than 15 feet for Group H-2 and H-3 occupancies.
f. The area of unprotected and protected openings shall not be limited for Group R-3 occupancies, with a fire separation distance of 5 feet or greater.
g. The area of openings in an open parking structure with a fire separation distance of 10 feet or greater shall not be limited.
h. Includes buildings accessory to Group R-3.
i. Not applicable to Group H-1, H-2 and H-3 occupancies
j. For special requirements for Group U occupancies, see Sec. 406.3.2
k. For openings between S-2 parking and Group R-2, see Sec. 705.3, Exception 2.

Typical Floor and Wall Rated Details

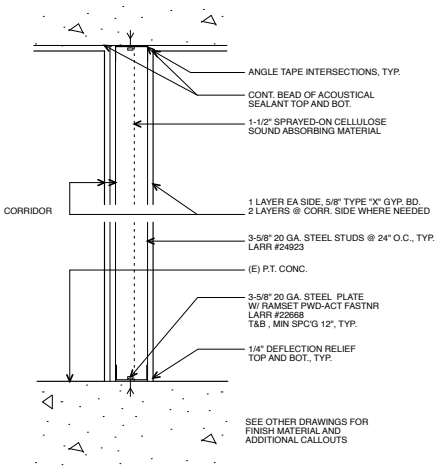


Fig. 11 Typical 1 Hr Wall at Corridor

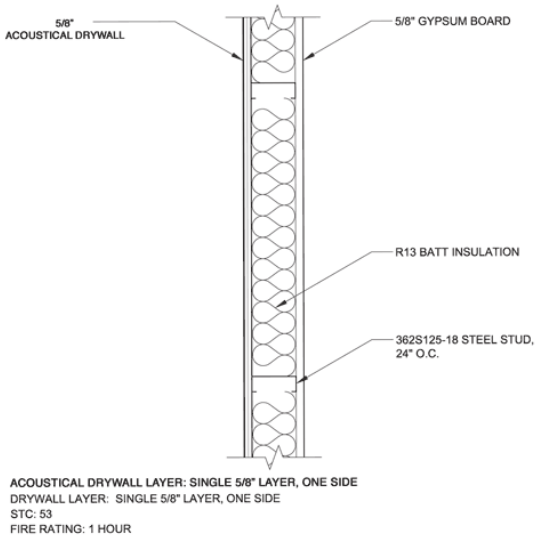


Fig. 12 Typical 1 Hr Wall Assembly

- Fire-rated assemblies, www.usgdesignstudio.com

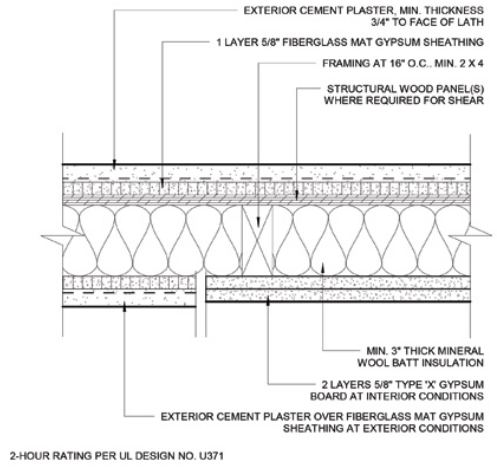


Fig. 13 Typical 2 Hr Exterior Wall

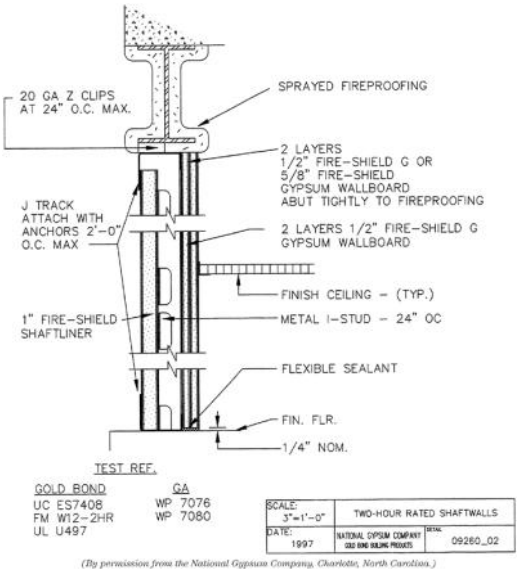


Fig. 14 Typical 2 Hr Wall Assembly

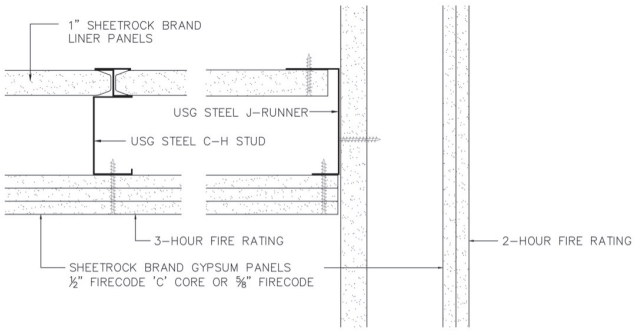


Fig. 15 Typical Ceiling Assembly

For further information on other fire-rated assemblies go to www.usgdesignstudio.com

- Fire-rated assemblies, www.usgdesignstudio.com

ARCH 260 – Introduction to Construction, graduate-level

Format:
Three hours of lecture/seminar per week (three credits)
Tuesday and Thursday 12:30 – 2:00pm, Wurster 112

Instructor:
David Jaehning, AIA; david_jaehning@berkeley.edu
Office: Wurster 378b, office hours: by appointment only

Graduate Student Instructor:
Megan McConnell; megan.mcconnell@berkeley.edu
Office: Wurster 332, office hours: Tuesday 9:00 am – 12:00 pm, Friday 12:30 – 3:30 pm

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Course Description:
This course introduces the materials, components, and processes of construction. Students will become familiar with each of these elements, understand the role of both labor and available skilled trades, the location of on- and off-site work, and the impact of codes and regulations on design professionals.

Lectures will be accompanied by construction site visits and group projects. By observing construction, you will see how architects' decisions affect the size of materials and connections, also where and how they are assembled. Team projects will explore tectonics through various precedents, and how projects are developed from concept to construct.

Learning Outcomes/Goals/Objectives:
This course is designed to give you the knowledge and skills to bridge between the discipline, profession, and practice of architecture as they relate to the construction of architecture. Students will be exposed to and learn to comprehend the technical aspects of design, systems, and materials. They will see how architects are able to apply that comprehension to architectural solutions. In addition, the impact of such decisions on the environment and labor must be well considered.

Student learning outcomes/goals/objectives for this course include:

- Understanding of relevant codes and regulations that include the principles of life-safety and accessibility standards.

- Ability to make technically clear drawings, and construct models illustrating and identifying the assembly of materials, systems, and components appropriate for a building design.
- Ability to demonstrate the basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces.
- Understanding of the basic principles used in the appropriate selection of interior and exterior construction materials, finishes, products, components, and assemblies based on their inherent performance, including environmental impact and reuse.
- Understanding of the basic principles, integration, and performance of building service systems, including lighting, mechanical, plumbing, electrical, vertical transportation, and fire protection systems.
- Understanding of the fundamentals of building costs, and how they relate to maintenance.
- Understanding of how architects demonstrate the skills associated with making integrated decisions across multiple systems and variables in the completion of a design project.
- Understanding of the relationships among key stakeholders in the design process—client, contractor, architect—and the architect's role to reconcile stakeholder needs.
- Understanding of the architect's responsibility to the public and the client as determined by regulations and legal considerations involving the practice of architecture and various delivery methods.

Materials:

There is one textbook for this course:

- *Allen, Edward and Joseph Iano, Fundamentals of Building Construction: Materials and Methods: Seventh Edition (New Jersey: John Wiley, 2019).*

There is no need to purchase the accompanying workbook.

Additional recommended reading materials:

- *Deplazes, Andrea, Constructing Architecture: Materials, Processes, Structures: Second Edition (Basel: Birkhäuser, 2012).*
- *Detail manuals and magazines, (Basel: Birkhäuser, various).*
- *McMorrough, Julia, Materials, Structures, Standards: all the details architects need to know but can never find, (Massachusetts: Rockport, 2006).*
- *Takaki, Ronald, A Different Mirror: A History of Multicultural America, (New York: Hachette Book Group, 2008).*

As part of the class, you will be modeling and drawing elements of a precedent project. This will require the use of software such as Rhinoceros, Illustrator, Photoshop, InDesign, and access and knowledge of the printing system at Wurster. Your GSI will be available to assist with any specific software questions, however, will not be administering lab tutorials.

Course Schedule:

Week 01	8/26, Thursday – Course introduction
Week 02	8/31, Tuesday – A.E.C. industry and project delivery *Reading: 4-8, 12-18, 20-29* 9/2, Thursday – Wood: material basics *Reading: 80–83, 84-92*
Week 03	9/7, Tuesday – Dimensioned lumber *Reading: 93-95, 152-156, 164-167, 169, 171-187, 202-204* 9/9, Thursday – Engineered wood *Reading: 96-106, 117 (image)*
Week 04	9/14, Tuesday – Trusses: floor and roof/prefabrication and **Quiz 1** *Reading: 115-118, 202-202* 9/15, Thursday – CLG and roof framing/rafters *Reading: 190-198*
Week 05	9/21, Tuesday – Connections, heavy timber and CLT *Reading: 126-142* 9/23, Thursday – Construction fires in wood structures (Lorenzo Llanillo) *Reading: no assigned reading*
Week 06	9/28, Tuesday – **Tectonic Precedent: Part 1** 9/30, Thursday – Roof finishes and **Quiz 2** *Reading: 212-220, 651-684*
Week 07	10/5, Tuesday – Design/build (David Dowell, KSU Design+Make) *Reading: no assigned reading* 10/7, Thursday – Stairs, egress and exiting *Reading: 275-278, 280-281, 567 (image), 694 (image)* *Due: **Construction Site Report 1**, 11:59pm*
Week 08	10/12, Tuesday – Exterior finishes *Reading: 228-237* 10/14, Thursday – MEP: veiling complexity *Reading: 246-253, 808-810, 868-870* plumbing, electrical, electrical+data
Week 09	10/19, Tuesday – Properties of steel and stud framing, and **Quiz 3** *Reading: 396, 398-408, 410-414, 459 (Fig. 11.86), 468-483* 10/21, Thursday – Conventional steel framing *Reading: 426-440*
Week 10	10/26, Tuesday – Tie rods, HSS and lattices *Reading: no assigned reading* 10/28, Thursday – **Tectonic Precedent: Part 2**

Week 11	11/2, Tuesday – Galvanic corrosion, movement, failure, and fires *Reading: 442-447, 459, 484-487, 686-687* 11/4, Thursday – Building envelope *Reading: 220-223, 253-264, 652-655*
Week 12	11/9, Tuesday – Concrete basics and **Quiz 4** *Reading: 596, 156-164, 575-579* 11/11, Thursday – Veteran's Day (no class) *Reading: no assigned reading*
Week 13	11/16, Tuesday – In-situ concrete, forms & shotcrete / Parts of concrete *Reading: 534-545, 555-566, 497-551* 11/18, Thursday – Parts of concrete (con't) Precast, tilt-up & PT concrete *Reading: 522-526, 554-562, 584-619*
Week 14	11/23, Tuesday – Glass, windows, and doors (Megan McConnell) *Reading: 696, 698-723, 732-738, 745-755* 11/25, Thursday – Thanksgiving holiday (no class)
Week 15	11/30, Tuesday – Post-rock (Thom Moran, T+E+A+M) *Reading: no assigned reading* 12/2, Thursday – Curtain walls and **Quiz 5** *Reading: 784-793, 800-805*
Week 16	12/7, Tuesday – Final studio reviews (no class) 12/9, Thursday – Final studio reviews (no class)
Week 17	12/14, Tuesday – *Due:* ***Construction Site Report 2****, 11:59pm*

Academic Integrity:
You are a member of an academic community at one of the world's leading research universities. Universities like Berkeley create knowledge that has a lasting impact in the world of ideas and on the lives of others; such knowledge can come from an undergraduate paper as well as the lab of an internationally known professor. One of the most important values of an academic community is the balance between the free flow of ideas and the respect for the intellectual property of others. Researchers don't use one another's research without permission; scholars and students always use proper citations in papers; professors may not circulate or publish student papers without the writer's permission; and students may not circulate or post materials (handouts, exams, syllabi–any class materials) from their classes without the written permission of the instructor.

Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course

RENEE Y. CHOW is Professor of Architecture and Urban Design in the College of Environmental Design at UC Berkeley as well as Principal of Studio URBIS, founded with her partner, Thomas Chastain. She currently serves as the William W. Wurster Dean of the College of Environmental Design.

Her design and research address the metropolitan challenges of the 21st century — water scarcities, resource reductions, and sustainable places. To encode local conditions, Renee developed analytic and generative tools for integrating urban and architectural systems across sites and individual buildings. These practices can be found in her books: *Suburban Space: The Fabric of Dwelling* (2005) and *Changing Chinese Cities: The Potentials of Field Urbanism* (2015).

Renee has been honored as a ACSA Distinguished Professor, the Eva Li Chair in Design Ethics, "Ten Top Architectural Educators" by *Architecture* magazine, as well as received research and project awards from the American Institute of Architects. She received her B.S.AD and M.Arch from the Massachusetts Institute of Technology where she also taught before joining the faculty at Berkeley.

LISA IWAMOTO is Professor and Chair of Architecture in the College of Environmental Design at UC Berkeley. She has taught at all levels in the school including coordinating undergraduate design studios, graduate integrated design, and architectural thesis. Her teaching and research focus on design synthesis and the innovativecoherence of material, technological, spatial, geometric, and contextual constraints of building.

Iwamoto is founding partner of IwamotoScott Architecture which she leads together with her partner, Craig Scott. IwamotoScott has received numerous awards including the 2020 Cooper Hewitt/Smithsonian National Design Award, Interior Design Hall of Fame, the Architectural League's Emerging Voices and Young Architects, Architectural Record's Design Vanguard, Architect's Newspaper Top 50 interior design firms, Architizer A+ awards, P/A Award, over twenty AIA Design Awards including a National Award, among other architecture and interior awards. Iwamoto was awarded Next Generation Leader by Architectural Record's Women in Architecture awards in 2018 and IwamotoScott received the 2017 ACADIA Digital Practice award of Excellence. She is author of Digital Fabrications: Architectural and Material Techniques published in 2009 by Princeton Architectural Press. She has delivered numerous lectures at institutions both nationally and internationally.

IwamotoScott's work has been published in hundreds of journals and exhibited in numerous museums and galleries. Their commissioned museum work includes theoretical projects for Vitra Design Museum, the Guggenheim Museum, and MOMA/PS1 where IwamotoScott was finalist in the PS1 program. Recent building commissions include Ivy Tech Community College in Columbus, Indiana, winner of the invited proposal competition by Cummins Design Excellence Program. 1450 Owens Street, a seven-story lab/office tower in Mission Bay, and 770Woolsey -- a design for a new special use district of 64 "small homes" in the Portola District, San Francisco. Both projects recently received entitlement from their respective planning authorities. Their exhibition pavilion for the Chengdu Science and Technology city master-planned by OMA is currently under construction. IwamotoScott's previous projects include the winning design for UCSF's Third Street Garage Façade, HQ's for Pinterest and Bloomberg both of which received numerous design awards, and recently

completed large-scale offices for Twitch/Amazon and Google.

Lisa received her Master of Architecture degree with Distinction from Harvard University, and a Bachelor of Science degree in Structural Engineering from the University of Colorado. She began her teaching career as Muschenheim Fellow at the University of Michigan and has taught studios at Harvard Graduate School of Design, Southern California Institute of Architecture, and Cornell University where she was the Gensler Visiting Critic. She is a registered architect in California and Michigan.

GIOVANNI BETTI is Assistant Professor of Architecture in the College of Environmental Design at UC Berkeley. He holds a Master of Architecture Summa Cum Laude at the *Università La Sapienza di Roma*, Italy, (2005) and a Master of Science in Built Ecology at the Rensselaer Polytechnic Institute (RPI), NY (2007), USA. He is a registered Architect in Italy since 2006. In 2007 he joined Foster+Partners in London as Environmental Design Analyst in the Specialist Modeling Group (SMG) until he left in 2015 as Associate Partner.

The on-site investigations conducted in Masdar City (Abu Dhabi, UAE) meant exploring the recently built public spaces by means of infrared cameras, globe thermometers, temperature sensors and radiation meters. This revealed alternative views of the city, as perceived by our skin rather than our eyes. His work has been crucial to the implementation of passive and natural ventilation strategies in large commercial buildings, such as the Apple Campus in Cupertino and the Bloomberg European Headquarter in London. For the latter project -winner of the 2018 RIBA Stirling Prize-, Giovanni developed the concept for the naturally ventilation facade and an innovative multifunctional ceiling system. He is mentioned as first inventor in the related international patent. A prototype of the ceiling system is now part of the permanent Architecture Wall at the Royal Academy of Arts in London.

In 2015, he joined HENN Architects as founder and head of the Performance Based Design team, leading a practice-based interdisciplinary research unit. In this role he was involved in projects such as the Zalando Headquarters in Berlin, has been responsible for the architectural design of Emmanuel Merck Platz in Darmstadt, the innovative exhaust cavity facade for the Continental Headquarter in Hannover and the architectural concept for the Carbon CUBE in Dresden, the world's first building built with carbon fiber reinforced concrete. For HENN, he also created installations exploring the use of robots and mixed reality in architecture for the Architecture Biennale in Seoul (2018) and the Make. City Festival in Berlin (2019). He was also responsible for HENN's participation in the European research and training network InnoChain.

In July 2020 he started his academic career as Assistant Professor in Architectural Design for Building Performance at the College of Environmental Design, University of California-Berkeley and as a faculty member of the Center for the Built Environment. During this time, he has continued his research by developing an on-line, open-source web application for the analysis of climatic data. The CBE Clima Tool creates high quality, interactive visualizations of over 25,000 weather files worldwide, specially designed to support climate adaptive building design.

VISHAAN CHAKRABARTI is Professor of Architecture and former dean of the College of Environmental Design at UC Berkeley. He is the founder of Practice for Architecture and Urbanism (PAU), an architecture firm based in New York.

Chakrabarti began his career at Skidmore, Owings & Merrill LP in New York where he worked as an Associate Partner and Director of Urban Design. In 2003 Chakrabarti was named Director of the Manhattan Office of the New York Department of City Planning under Mayor Michael Bloomberg. He then served as the President of Moynihan Station Venture at the Related Companies. From 2012 until 2015, Chakrabarti was a partner at SHoP Architects. After leaving SHoP in 2015, Chakrabarti founded PAU (Practice for Architecture and Urbanism), through which he has been involved in projects such as the master plan for the site occupied by the rail yards in Sunnyside, Queens; the design for the adaptive reuse of the Domino Sugar Refinery in Brooklyn; and Penn Palimpsest, a proposal for reimagining New York's Penn Station.

Prior to joining the architecture faculty in Berkeley, Chakrabarti was Associate Professor of Practice at the Graduate School of Architecture, Planning and Preservation (GSAPP) at Columbia University where he held the Marc Holliday Professorship and served as the Director of the Master of Science in Real Estate Development and the founding director of the Center for Urban Real Estate (CURE).

Chakrabarti assumed the deanship of the UC Berkeley's College of Environmental Design in 2020 stepping down in 2021, citing family health issues. Chakrabarti is an alumnus of CED's M.Arch program and has his M.CP from Massachusetts Institute of Technology. In 2018 he was named a fellow of the American Institute of Architects.

Publications

- 2013: *A Country of Cities: A Manifesto for an Urban America*
- 2013: *NYC 2040: Housing the Next One Million New Yorkers*

MARCEL SANCHEZ-PRIETO is Associate Professor of Architecture in the College of Environmental Design at UC Berkeley and co-founder with Adriana Cuellar of CRO Studio, a collaborative practice that originated in the border region of Tijuana – San Diego. Research and the range of projects speak to urban renewal through architecture, addressing sustainable revitalization of city neighborhoods, emergent growth on urban peripheries, the resurgence of civic space, migrant populations, and the impact of industry and material technology.

Born in Tijuana, Mexico, he received his Bachelor of Architecture from Universidad Iberoamericana in Tijuana and Master in Architecture from the University of California, Los Angeles, where he was awarded the Director's Scholarship Award. He is the recipient of the 2018-19 Rome Prize in Architecture from the American Academy in Rome, Best Project 2020 ACSA College of Distinguished Professors Award, in 2017 selected among 32 social housing prototypes built in Apan Hidalgo, Mexico as part of the Social housing laboratory for INFONAVIT Institute of the National Housing Fund for Workers, 2013 P/A Progressive Architecture Award, two XXII CEMEX awards, selected in Arquine's "Best of XXI century Vol. 5 2011-12 and Vol.6 2013-14", and recognized among the 2014 IX BIAU Ibero-American Biennial of Architecture and Urbanism in Rosario Argentina.

Marcel was previously professor at Woodbury University, UC Berkeley Spring 2020 Howard A. Friedman Visiting Professor of Practice, and has taught at The University of Pennsylvania, Philadelphia University, RMIT, ITESO Mexico, South Eastern University in China, Universidad Iberoamericana, and The New School of Architecture and Design, where he co-directed the Rome study abroad program. For several years he participated in a wide range of urban studies along the México-US border with San Diego State University, University of California San Diego, COLEF-College of the Northern Border, the Municipal Planning Institute of Tijuana, and the San Diego Association of Governments. He worked for Kieran Timberlake and Frank Gehry on technology-driven projects, research on digital design methodologies, fabrication, and material explorations.