Why Teach Masonry Construction to Architects?

Incorporating Masonry into the Curriculum

AIA Course: TMSMEW2202

June 21, 2022

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THE MASONRY SOCIETY

The Masonry Society

AIA Provider: 505119857

CONTINUING EDUCATION AIA

The Masonry Society is a registered Provider with the American Institute of Architects Continuing Education Systems. Credit earned on completion of this program will be reported to CES Records for AIA members. Certificates of completion for non-AIA members are available upon request.

This program is registered with AIA/CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

Course Description

This course summarizes alternative means through which masonry design and construction systems can be incorporated into an architecture curriculum.

It explains accreditation and licensure expectations regarding masonry design and construction systems.

It also reviews key content regarding masonry construction systems, and presents the challenges faced by an architect in practice regarding masonry design and construction.

Learning Objectives

At the end of this course, participants will be able to:

1 Understand how courses containing masonry content help meet NAAB requirements
2 Understand how masonry is addressed in the Architectural Registration Exam
3 Examine how architects in practice apply knowledge about masonry design and detailing
4 Understand recent innovations regarding masonry products and accessories

There are basically two motives for learning about **any** construction system, including masonry.

One is to **avoid failure**.
Failure includes everything from an embarrassing design flaw to catastrophic collapse of a built work.

The second motive is to **achieve success**.
That is, to produce excellent architecture. This is the motive worthy of our attention. If we direct our efforts toward this objective, the other will not be an issue.

Excellent masonry buildings are produced by designers and craftspeople who have accepted the unusual discipline of masonry construction, have revealed insights about how it is best used, and have executed the work in a craftsmanlike manner.

Following is an outline of factors that designers and craftspeople needs to be aware of when making a building containing masonry.

Masonry buildings are difficult to design and build well.

•Many possible solutions exist.
No 2 masonry buildings have the same formal, technical or aesthetic features.

•Lots of new, difficult challenges to face.
Clay masonry construction is 6,000 years old, but today's masonry walls are complex 20th and 21st century inventions, that are still evolving.

•Design, detailing, and construction administration are more challenging.
When fees for services are reduced fewer detail drawings are prepared.
This often means more RFI's during construction.

•Marketplace demands greater certainty.
regarding quality, cost and time.

•Quality control is difficult to achieve.
•variations in mason's training
•lack of ability to inspect built work
•absence of designer from construction site where critical details are made

•Initial costs are volatile.
especially due to significant labor component, but life-cycle costs are very low.

Construction professionals need to be competent in the design and construction of masonry buildings.

•**NCARB licensing criteria require some level of competency.**

•**Masonry is often used today as a veneer, as part of the enclosure system**.
the designer (often not an engineer) is responsible.

•**Masonry construction is composed of many materials and elements**.
each of which must be carefully combined into effective details.

•**Masons are responsible for the proper installation of many accessories.**
which are critical to performance.

•**Masonry can be an economical, durable, sustainable, and versatile.**
if properly executed.

•Presentations will include examples of

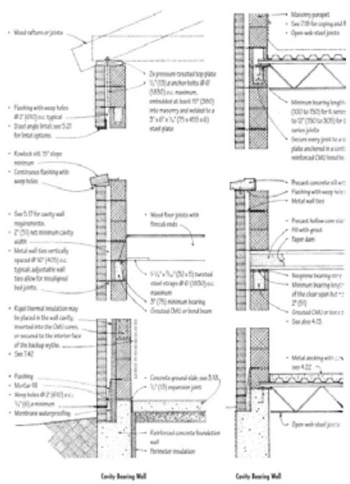
- •**very good** building designs and details
  showing that skilled designers and builders can do wonderful things

- •**very poor** building designs and details
  showing that unskilled designers and builders can do harm

The competent construction of masonry buildings involves an ongoing commitment to education and training.

• Being a competent construction professional requires some level of ***understanding*** and ***ability*** *regarding masonry*.

> ***Understanding****:* the assimilation and comprehension of information.
>
> ***Ability:*** the skill in using information to accomplish a task, in correctly selecting the appropriate information, and in applying it to the task.

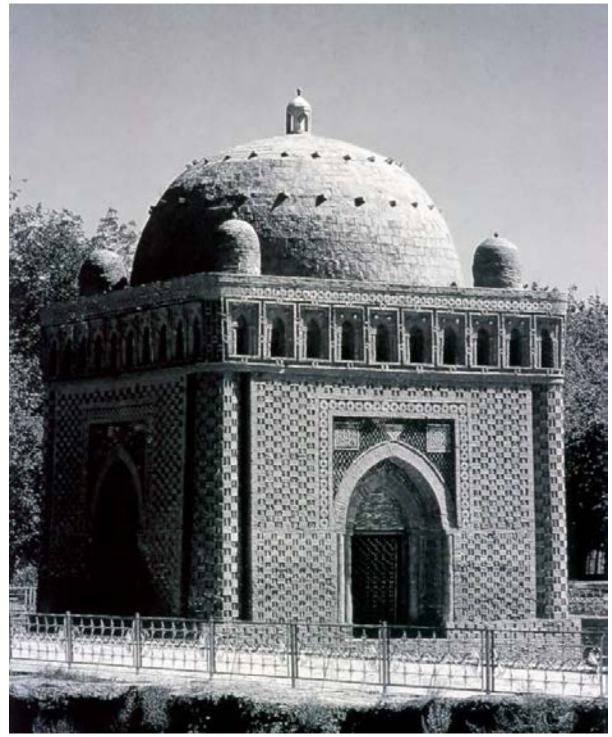


• Students are eager to learn about this ancient yet ever-changing construction medium. **It offers immediate, tangible gratification.**

• **Physical modeling is complementary** to digital media.

• **Where should masonry be taught** in the curriculum?
  - Survey of architecture faculty in North America
  - Curricular innovations in courses, laboratories and studios
  - Active learning enhances student performance quickly and permanently
  - Informal discussions at this workshop may yield new ideas

• **A well-organized masonry industry is available** to offer assistance to academia.



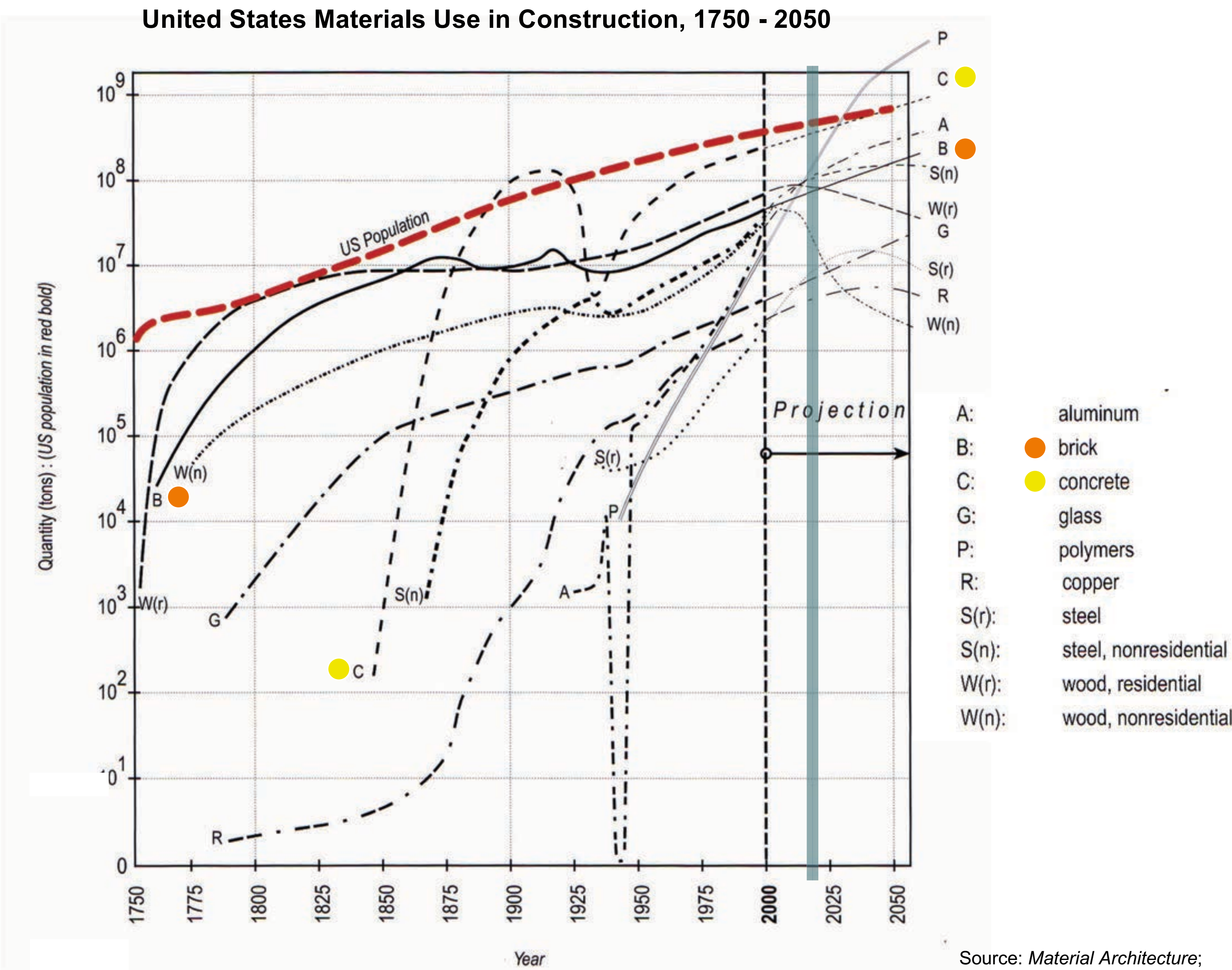
Mausoleum
Uzbekistan
13th century

National Parliament House
Louis Kahn
Dakha, Bangladesh
1961 - 1982

Brandhorst Museum
Sauerbruch Hutton
Munich, Germany
2002 - 2009

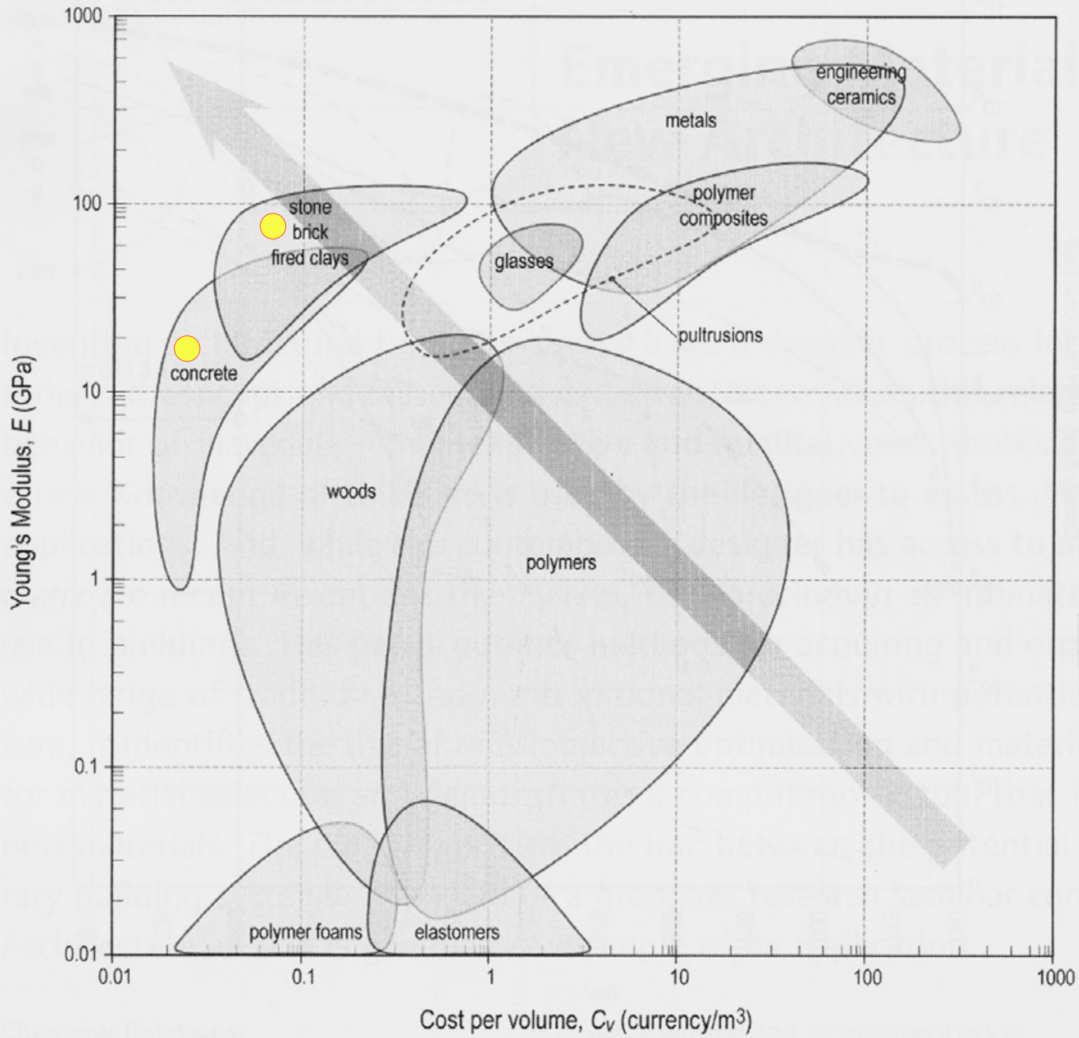
Year	Major Events in the History of Masonry Construction
prehistoric	Numerous primitive structures made by stacking stone on stone
-10,000	Sun-dried brick first made, reinf. w/ straw or dung, Middle East
-3,500	First kiln-fired brick, Middle East (Babylonia and Assyria)
-2,500	Mortar made using sand and gypsum, Egypt
-1,400	Arches first used, Babylonia
-1,300	Barrel vaults@ Tombs, Mycenae, Eastern Mediterranean
-490	Mortar made using sand and lime, Rome and Greece
-300	Pozzolan (volcanic ash) added to mortar to make it more gluelike, Rome
-10	Vitruvius established the 1:3 ratio of lime:sand for mortar
37-41	First concrete masonry units made; solid units, present day Naples
50-100	First true domes, stone, Rome; Vitruvius' 10 Books of Architecture
124	Pantheon; clay masonry faced with stone 142' d. dome, 4' thick at top, 12' thick walls at base, empirical design, Rome
1824	Portland Cement invented, used in concrete, later used in mortar; Leeds, England
1830's	Cement-based cast stone units made to mimic ashlar
1889	Monadnock Building, Chicago; Burnham and Root, world's tallest building (16-stories) unreinforced loadbearing brick building, 6' thick walls at base, empirically designed,
1900	How has masonry craft changed over the years? Use of trowel, spirit level and stretched string all thousands of years old.
	The steam barrel invented to mix mortar
1929	Autoclaved aerated concrete invented in Sweden.
1940's	The paddle mixer invented for mortar making
	Automated production of concrete masonry

Fort Macon
Bogue Banks, NC
1834

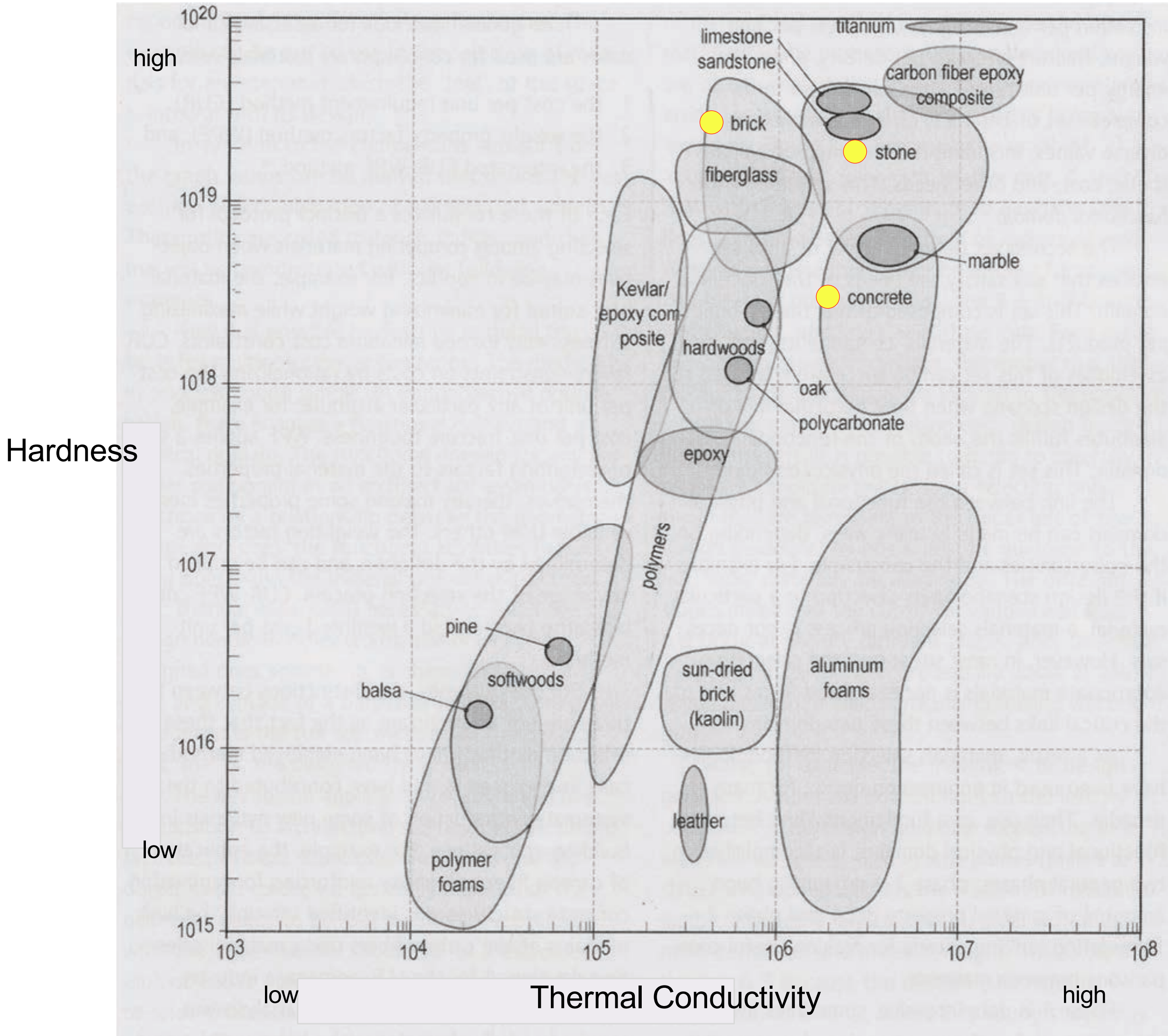


Source: *Material Architecture*;
John Fernandez, 2006

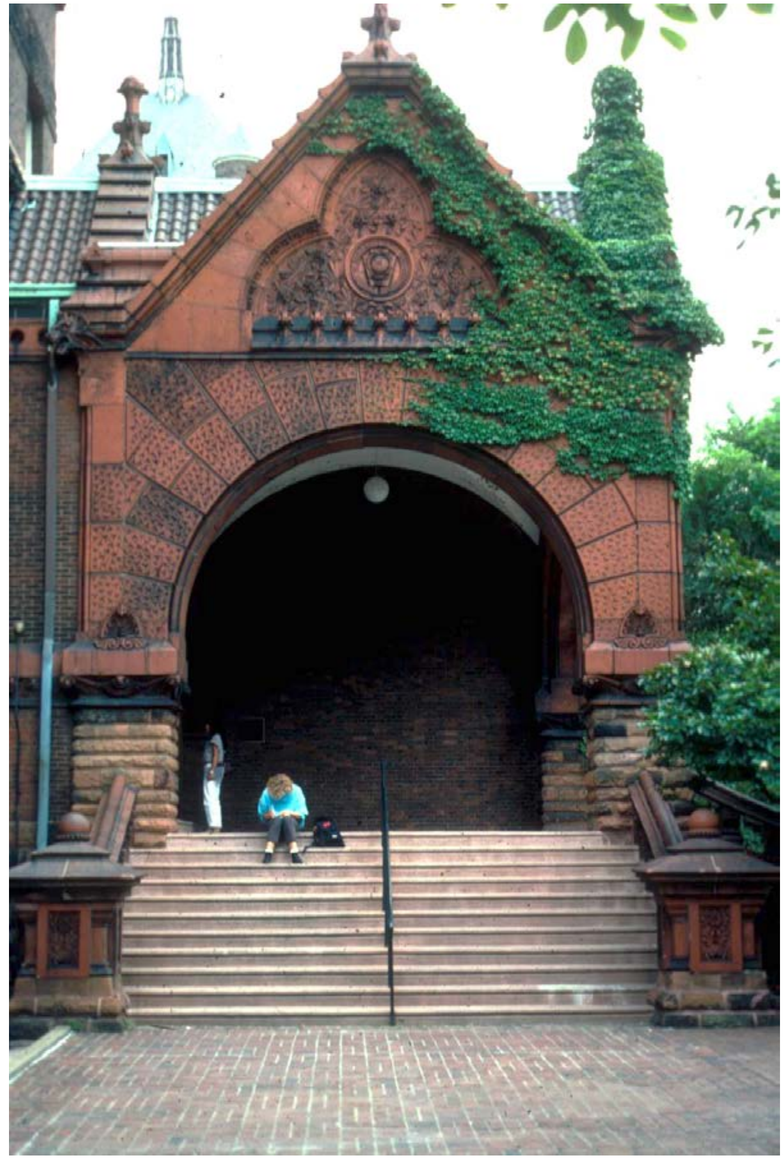
2. Young's modulus against cost per volume. (The author, produced using CES 4.1.)



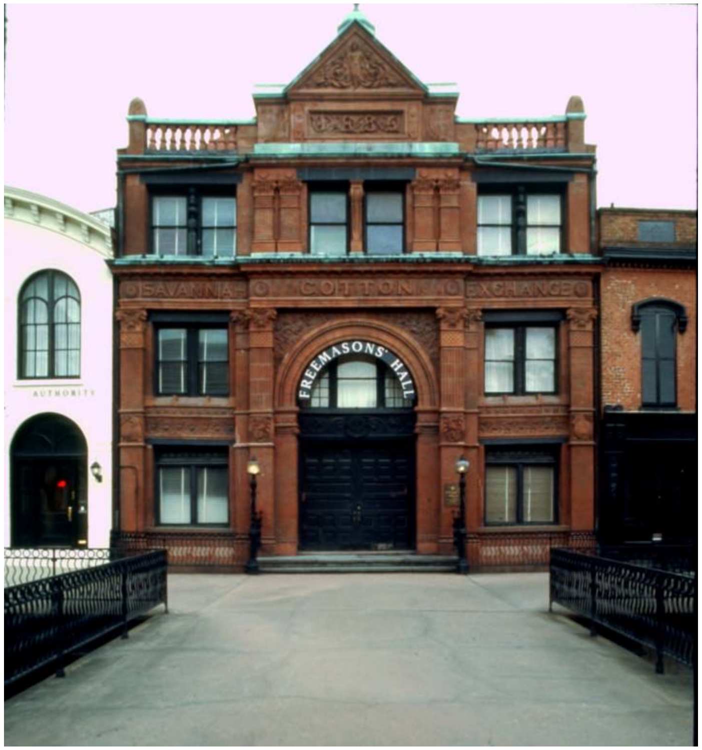
Source: John Fernandez, "From Kaolin to Kevlar"; *Journal of Architectural Education*. September 2004



Source: John Fernandez,
"From Kaolin to Kevlar";
Journal of Architectural Education.
September 2004



Fisher Library
Frank Furness
University of Penn
1891



Cotton Exchange
Savannah
1886

MIT Hockey Rink
Davis Brody
Cambridge
1981

From the nature of the material the design comes…
Louis Kahn

soft mud manufacturing process
periodic kiln

stiff mud manufacturing process
tunnel kiln

Adobe, with parging

Large format

Interstate
Super Atlas

Cast
stone

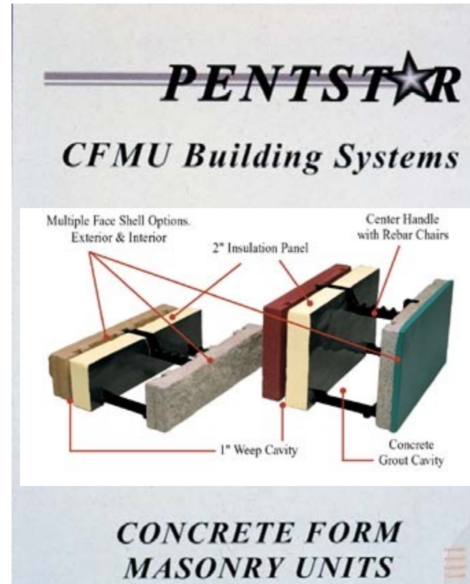
FormBlock

AAC

LitraCon

The Integra Wall System has been designed into more than 7,000 structures, and has been thoroughly tested, to be sure that it is the very best product that construction has to offer. The masonry units used for Integra are available in a variety of types and textures to suit the designer's needs.

Quality control is an important feature of The Integra Wall System. Not only are the individual components provided by Oldcastle companies, but the way each project is engineered, constructed, and post-tensioned, is monitored by Oldcastle personnel. The Integra Wall System can be easily erected by a masonry



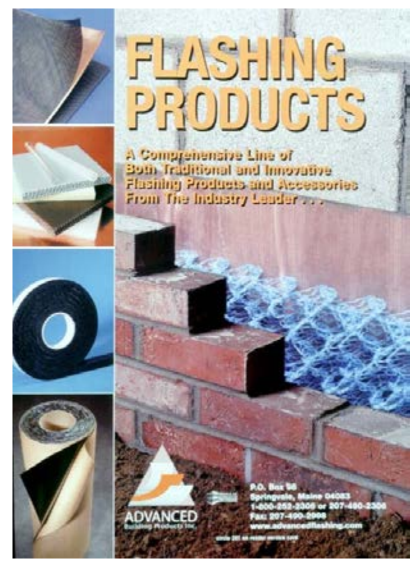
Future of Concrete

New and even more exciting concrete hybrids and technologies are now on the horizon. For example, one of the givens of concrete construction for the past century has been the need for steel reinforcement, but ultra-high-performance concrete is now available that obviates the need for rebar in even long-span structures. The material is, in effect, self-reinforcing, thanks to the advanced fibers added to the concrete formula. Even more amazing is the prospect of translucent concrete, of which several prototypes are currently in development. The near future holds the promise of architecture unlike anything one might have conceived even a few years ago. Concrete, in its myriad forms, will remain a key determinant and facilitator of changes to the way we design and build.

Prototype wall of LiTraCon, a translucent concrete product. Courtesy of LiTraCon, © GmbH

BETTER BLOCKS

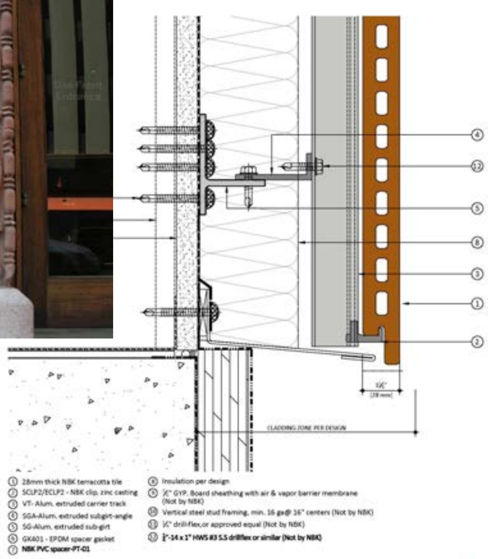
Alternatives to building materials that contain Portland cement are few. But the modular **Watershed Block** from Watershed Materials in Napa, Calif., aims to fill the gap. Made of fused soil and rock fragments including quartz and other minerals, it contains half the cement of typical concrete units but weighs up to 30 percent more. Backed by a National Science Foundation grant, the manufacturer is working on a structural block that contains no cement. Offered in standard CMU dimensions. *watershedmaterials.com* Circle 103



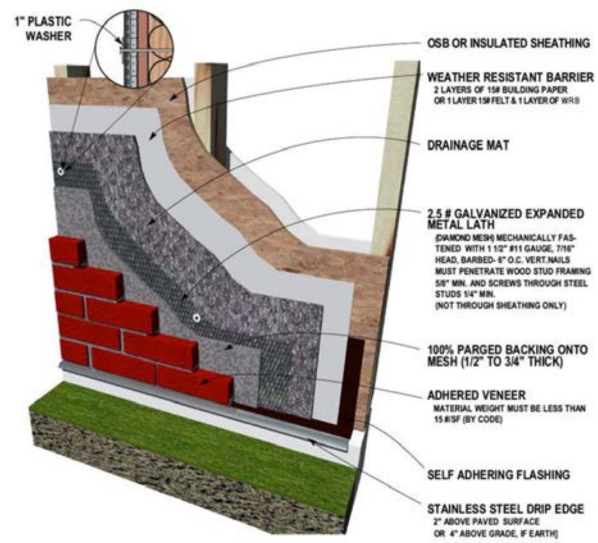
BIOMASON

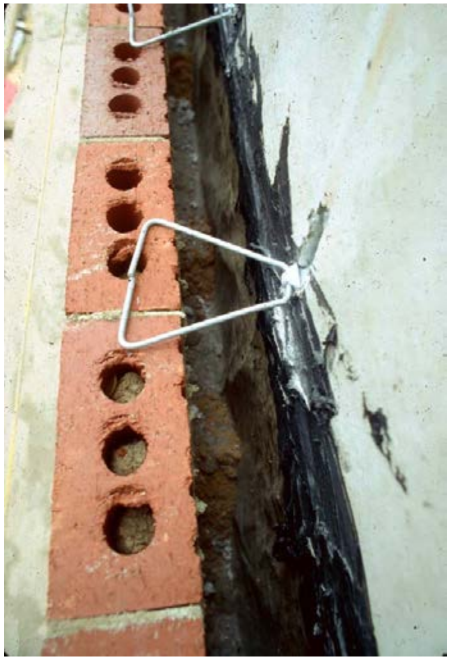
The fabrication of Portland cement–based masonry units is notorious for its CO_2 emissions, spurring the development of products and processes that emit fewer air pollutants and VOCs. One of these, BioMason, uses bacteria grown from yeast extract to do the binding work of cement when mixed with an aggregate. The result is a durable masonry unit that hardens in fewer than five days. The product won the inaugural Cradle to Cradle Product Innovation Challenge in 2013. *biomason.com* Circle 103

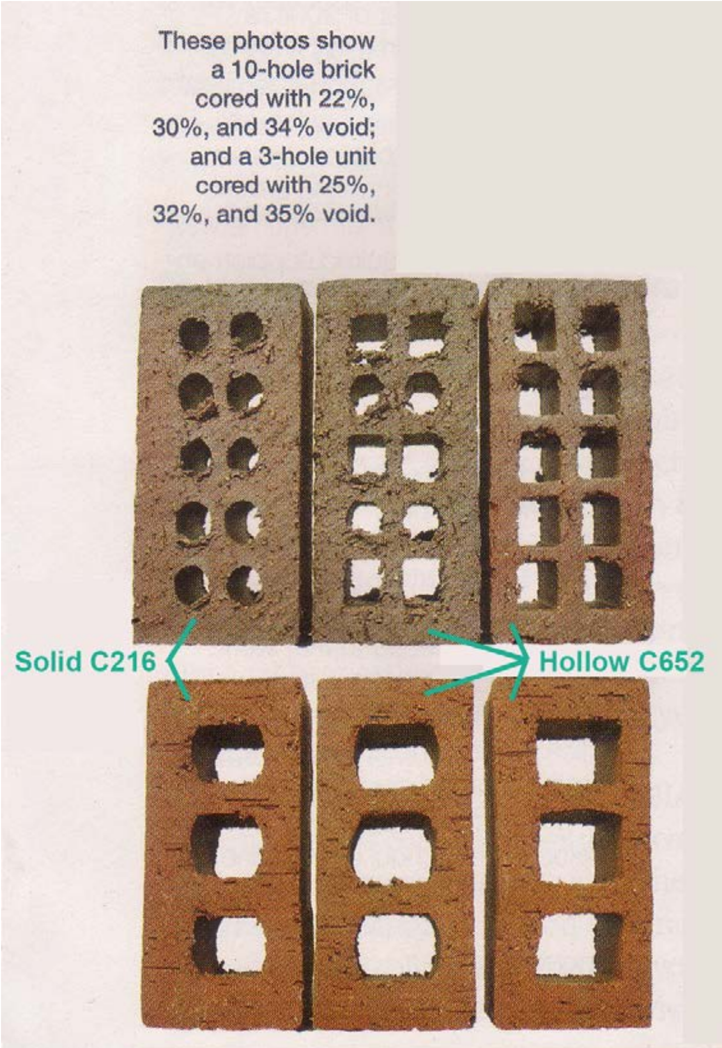
adhered masonry



terra cotta







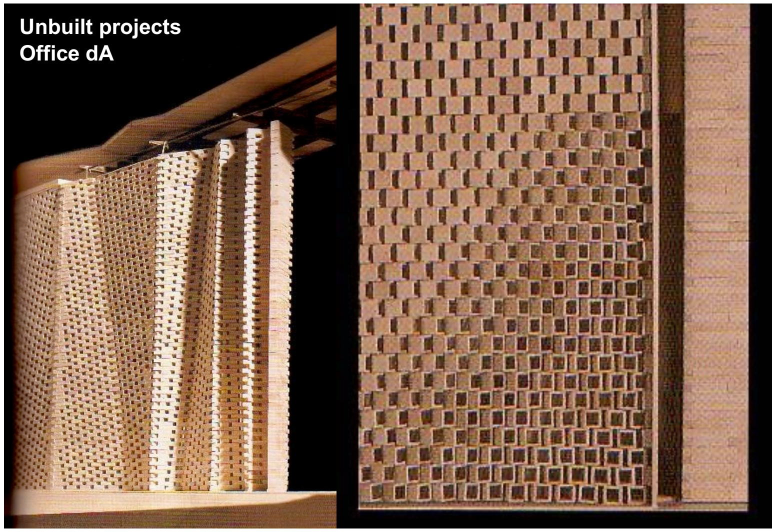
Holes in face brick are good:

- reduces manufacturing time for drying and firing
- reduces weight
- reduces cost; more sustainable; less clay or shale
- increases bond with mortar
- not large enough to receive vertical rebar

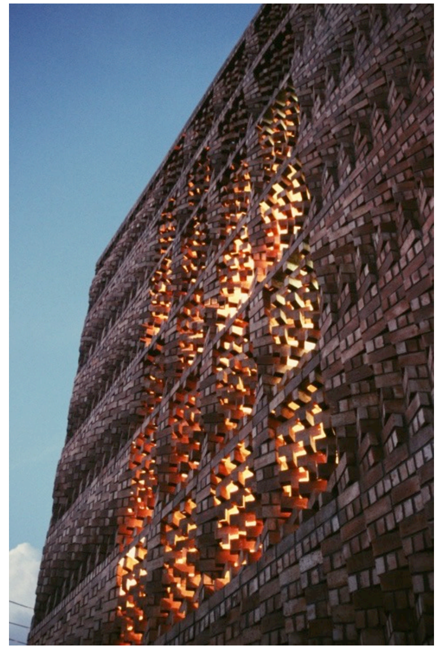
"**solid**" face brick can have up to 25% cores in section (C216)

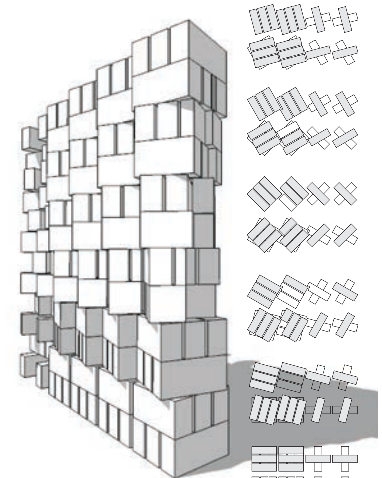
"**hollow**" face brick can have between 25% and 60% cores in section (C652)

Unbuilt projects
Office dA



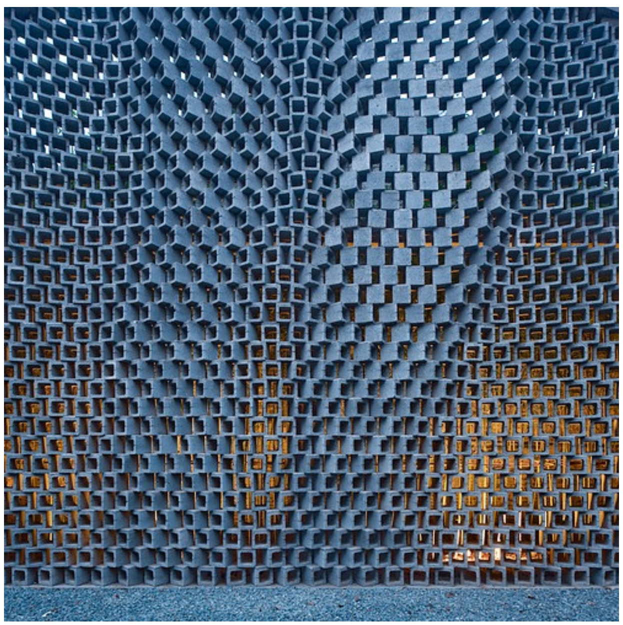
South Asian Human Rights Documentation Center
Anagram Architects
New Delhi
2008





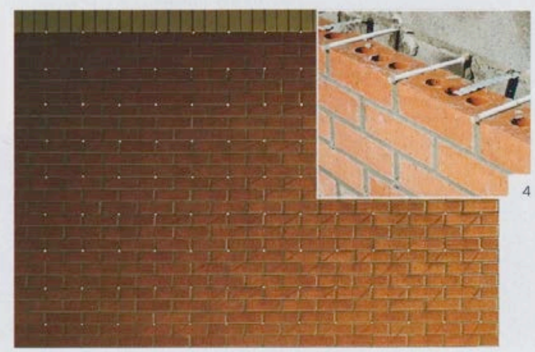
BRICK COURSE DETAIL

AU Offices and Gallery
Archi-Union Architects
Shanghai
2010



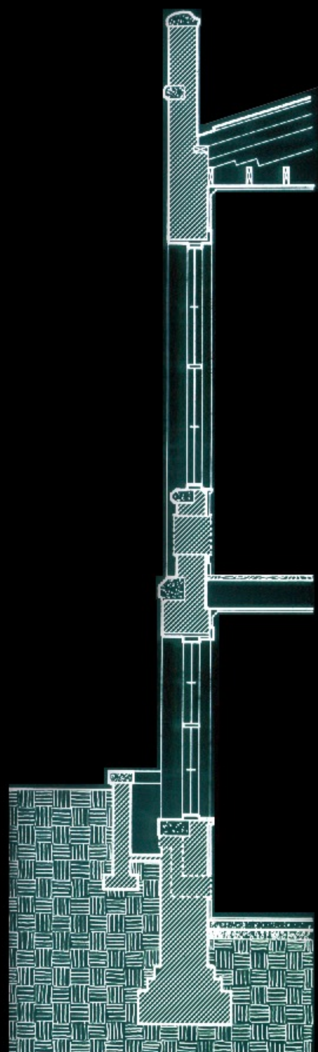
Masonry Light Wall
designer **Hanney & Associates Architects**
haarchitects.com

Martin Hanney, AIA, of Wichita-based Hanney & Associates Architects, designed an innovative way to bring light through a solid masonry wall for an elementary school project. Acrylic dowels spaced at 8" centers, both vertically and horizontally, are laid in the mortar bed of an exterior masonry wall. As people walk past the wall, they create a pixilated light display for those inside. **CIRCLE 203**

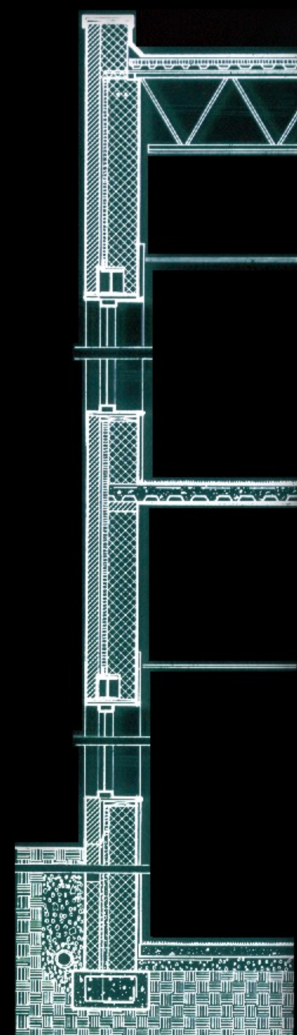


4

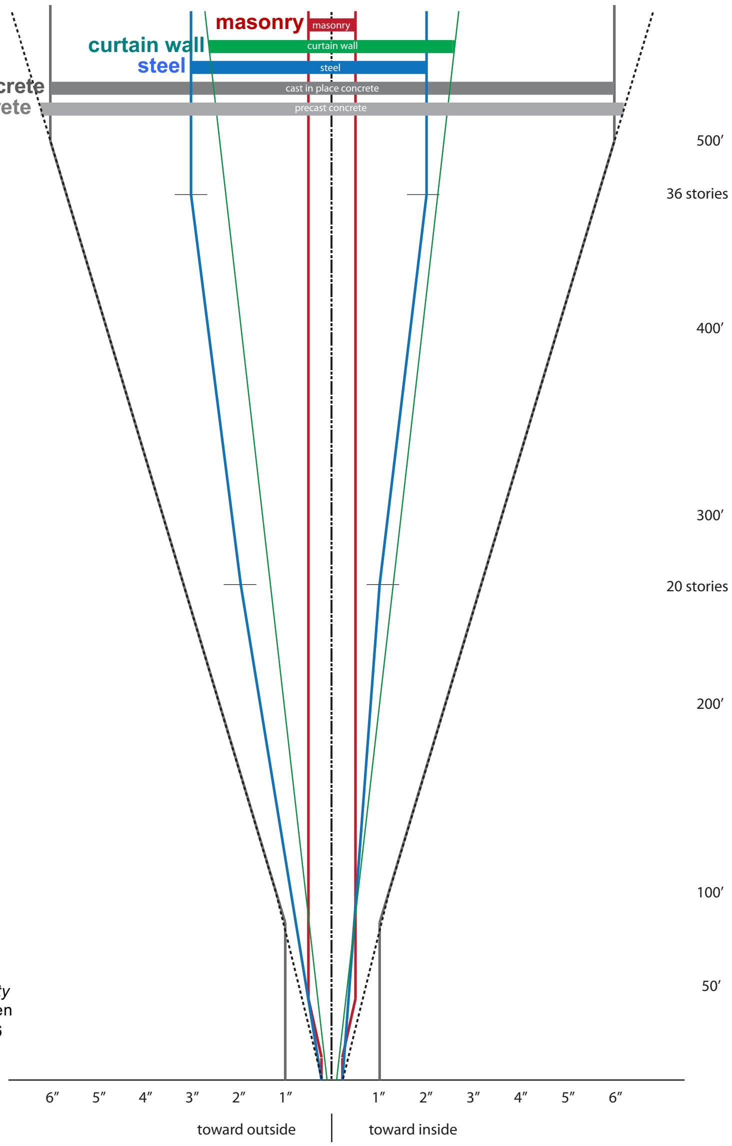
Gantenbein Vineyard Facade
Bearth & Deplazes Architekten
ETH Collaborators: Bonwetsch and Knauss
Fläsch, Switzerland
2006



Holladay Hall / NCSU / 1889

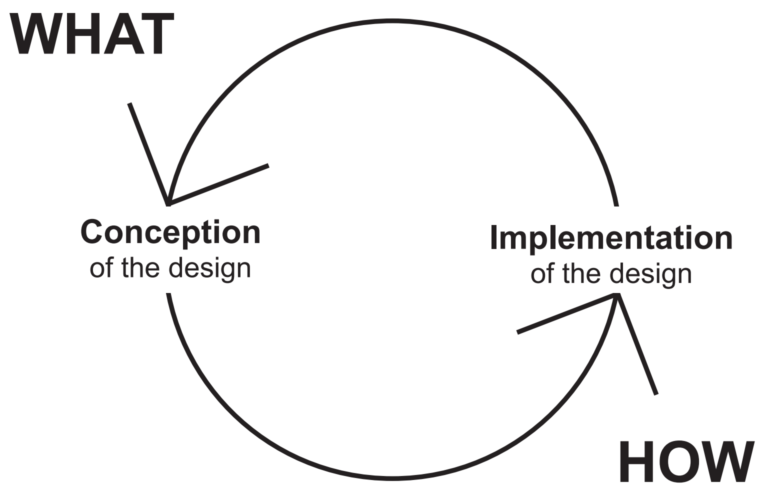


Dining Hall / NCSU / 1985



Source:
Architectural Detailing; Function, Constructibility Aesthetics; Edward Allen and Patrick Rand, 2016

Knowing **What** one would like
to build inspires one
to find out **How** to build well.



Knowing **How** to build well
inspires new ideas about
What one can build.

NAAB National Architectural Accrediting Board, Inc.

Conditions for Accreditation

2020 Edition

3.2 Student Criteria (SC): Student Learning Objectives and Outcomes

A program must demonstrate how it addresses the following criteria through program curricula and other experiences, with an emphasis on the articulation of learning objectives and assessment.

SC.1 Health, Safety, and Welfare in the Built Environment—How the program ensures that students **understand** the impact of the built environment on human health, safety, and welfare at multiple scales, from buildings to cities.

SC.2 Professional Practice—How the program ensures that students **understand** professional ethics, the regulatory requirements, the fundamental business processes relevant to architecture practice in the United States, and the forces influencing change in these subjects.

SC.3 Regulatory Context—How the program ensures that students **understand** the fundamental principles of life safety, land use, and current laws and regulations that apply to buildings and sites in the United States, and the evaluative process architects use to comply with those laws and regulations as part of a project.

SC.4 Technical Knowledge—How the program ensures that students **understand** the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects.

The following (from the *2020 Procedures*, section 3.5.2) describes the types of evidence required for the assessment of SC.1 through SC.4:

Primary Evidence for Student Criteria (SC) SC.1 through SC.4. *These criteria will be evaluated at the understanding level. The program will submit the primary exhibits as evidence for SC.1-4 to the visiting team in an electronic format 45 days before the visit. Programs must provide the following:*

Narrative*: A narrative description of how the program achieves and evaluates each criterion.*

Self-Assessment*: Evidence that each student learning outcome associated with these criteria is developed and assessed by the program on a recurring basis, with a summary of the modifications the program has made to its curricula and/or individual courses based on findings from its assessments since the previous review.*

Supporting Materials*: Supporting materials demonstrating how the program accomplishes its objectives related to each criterion. Organize the supporting exhibits in the format specified by the NAAB and include the following for each course associated with the student learning outcome:*

a) ***Course Syllabus****. The syllabus must clearly articulate student learning outcome objectives for the course, the methods of assessment (e.g., tests, project assignments), and the relative weight of each assessment tool used by the instructor(s) to determine student performance.*

b) ***Course Schedule****. The schedule must clearly articulate the topics covered in the class and the amount of time devoted to each course subtopic.*

c) ***Instructional Materials****. The supporting materials must clearly illustrate the instructional materials used in the course. These may include a summary of required readings, lecture materials, field trips, workshop descriptions, and other materials used in the course to achieve the intended learning outcomes.*

- ***Understanding***—The capacity to classify, compare, summarize, explain and/or interpret information.

- ***Ability***—Proficiency in using specific information to accomplish a task, correctly selecting the appropriate information, and accurately applying it to the solution of a specific problem, while also distinguishing the effects of its implementation.

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2020 Edition

3.2 Student Criteria (SC): Student Learning Objectives and Outcomes

A program must demonstrate how it addresses the following criteria through program curricula and other experiences, with an emphasis on the articulation of learning objectives and assessment.

SC.5 Design Synthesis—How the program ensures that students develop the **ability** to make design decisions within architectural projects while demonstrating synthesis of user requirements, regulatory requirements, site conditions, and accessible design, and consideration of the measurable environmental impacts of their design decisions.

SC.6 Building Integration—How the program ensures that students develop the **ability** to make design decisions within architectural projects while **demonstrating integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems**, and the measurable outcomes of building performance.

The following (from the *2020 Procedures*, section 3.5.3) describes the types of evidence required for the assessment of SC.5 and SC.6:

Primary Evidence for SC.5 and SC.6. *These criteria will be evaluated at the ability level. Programs may design their curricula to satisfy these criteria via a single course or a combination of courses. Evidence supplied for these required courses is provided in the team room and include fully labeled exhibits of student work from each course section. Programs must provide the following:*

Narrative*: A narrative description of how the program achieves and evaluates each criterion.*

Self-Assessment*: Evidence that each student learning outcome associated with these criteria is developed and assessed by the program on a recurring basis, with a summary of the modifications the program has made to its curricula and/or individual courses based on findings from its assessments since the previous review. If the program accomplishes these criteria in more than one course, it must demonstrate that it coordinates the assessment of these criteria across those courses.*

Supporting Materials*: Supporting materials demonstrating how the program accomplishes its objectives related to each criterion. Organize the supporting exhibits in the format specified by the NAAB and include the following for each course associated with the student learning outcome:*

a) ***Course Syllabus****. The syllabus must clearly articulate student learning outcome objectives for the course, the methods of assessment (e.g., tests, project assignments), and the relative weight of each assessment tool used by the instructor(s) to determine student performance.*

b) ***Course Schedule****. The schedule must clearly articulate the topics covered in the class and the amount of time devoted to each course subtopic.*

c) ***Instructional Materials****. The exhibits must clearly illustrate the instructional materials used in the course. These may include a summary of required readings, lecture materials, field trips, workshop descriptions, and other materials used in the course to achieve the intended learning outcomes.*

Student Work Examples*: The program must collect all passing student work produced for the course(s) in which the learning outcomes associated with this criterion are achieved within one year before the visit, or the full academic cycle in which the courses are offered. The visiting team will evaluate approximately 20 percent (no less than three, no more than thirty examples) of the student work collected in this time frame, selected by the NAAB at random before the visit. The program may self-select additional student work, up to 10 percent, for the visiting team to review.*

If several courses are used to satisfy the SC, the class lists from each course must be aligned so that a random selection process will collect the work of each student selected in all classes that are used to meet the SC. The student lists provided must comply with FERPA rules.

NCSU **Bachelor of Architecture**

Courses and Studios cross-referenced with the 2014 NAAB Student Performance Criteria

Student Performance Criteria (SPC)

SPC expected to have been met in preparatory or pre-professional education, if applicable:

SPC met in NAAB-accredited program, as follows:

Group	Course Number	Course Title	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	C1	C2	C3	D1	D2	D3	D4	D5
			Professional Communication Skills	Design Thinking Skills	Investigative Skills	Architecture Design Skills	Ordering Systems	Use of Precedents	History and Global Culture	Cultural Diversity and Social Equity	Pre-Design	Site Design	Codes and Regulations	Technical Documentation	Structural Systems	Environmental Systems	Building Envelope Systems and Assemblies	Building Materials and Assemblies	Building Service Systems	Financial Considerations	Research	Integrated Evaluations and Decision-Making	Integrative Design	Stakeholder Roles in Architecture	Project Management	Business Practices	Legal Responsibilities	Professional Conduct
			Critical Thinking and Representation								Building Practices, Technical Skills, and Knowledge										Integrated Arch Solutions			Professional Practice				
			Ab	Ab	Ab	Ab	Ab	Ab	Un	Un	Ab	Ab	Ab	Ab	Ab	Ab	Un	Un	Un	Un	Un	Ab	Ab	Un	Un	Un	Un	Un
	Required Architecture Courses - BArch Curriculum																											
BEDA Courses	ARC 162	An Introduction to Architecture						X																				
BEDA Courses	ARC 211	Natural Systems and Architecture			X							X				X											X	
BEDA Courses	ARC 232	Structures and Materials													D			X										
BEDA Courses	ARC 241	Introduction to World Architecture	X				D		X	X																		
BEDA Courses	ARC 242	History of Western Architecture	X				D		X																			
BEDA Courses	ARC 251	Digital Representation	A					D																				
BEDA Courses	ARC 331	Architectural Structures I					X								X		X	D										
BEDA Courses	ARC 332	Architectural Structures II					X								X		X	D										
BEDA Courses	ARC 414	Environmental Control Systems														X	X		X									
BEDA Courses	ARC 432	Architectural Construction Systems												X			X	X										
BEDA Courses	ARC 441	History of Contemporary Architecture	X		X				X																			
Barch	ARC 561	The Practice of Architecture	X		X															X				X	X	X	X	X
Barch	ARC 581	Project Preparation Seminar			X			X			X										A			X			?	
	Required Architecture Studios - BArch Curriculum																											
BEDA Studio	ARC 201	Architectural Design: Form	X	X		X	X	X																				
BEDA Studio	ARC 202	Architectural Design: Environment	X	X	X	X	X					X		D														
BEDA Studio	ARC 301	Architectural Design: Tectonics	X	X		X	A					A	D		A			A						D				
BEDA Studio	ARC 302	Architectural Design: Technology	X	X	X	X	X						X	X	X	X	X	X	A									
BEDA Studio	ARC 401/490	Architectural Design: Urban	X	X	X					X				D														
BEDA Studio	ARC 402	(1) Architectural Design: Advanced	D	D			D																					
Barch	ARC 501	Professional Architecture Studio I	X	X	X		X	X	D		X	X	X	X	X	X	X	X	X			?	X					
Barch	ARC 502	Professional Architecture Studio II	X	X			X				A	X	X	X								A	X				X	

A = ADDITION
D = DELETION

NCARB

ARE® 5.0

Understanding ARE 5.0

NCARB used the results of the *NCARB 2012 Practice Analysis of Architecture* when developing ARE 5.0 to determine the critical knowledge and skills an architect must perform competently. These knowledge and skills were organized into **six practice-based divisions:**

ARE 5.0 DIVISIONS

Use these columns to determine which ARE 4.0 division(s) you will need to pass to earn an ARE 5.0 credit.

ARE 4.0 DIVISIONS	Practice Management	Project Management	Programming & Analysis	Project Planning & Design	Project Development & Documentation	Construction & Evaluation
Construction Documents & Services	●	●			●	●
Programming Planning & Practice	●	●	●			
Site Planning & Design			●	●		
Building Design & Construction Systems				●	●	
Structural Systems				●	●	
Building Systems				●	●	
Schematic Design				●		

ARE5.0 HANDBOOK

INTRODUCTION

1 PRACTICE MANAGEMENT

2 PROJECT MANAGEMENT

3 PROGRAMMING & ANALYSIS

4 PROJECT PLANNING & DESIGN

5 PROJECT DEVELOPMENT & DOCUMENTATION

6 CONSTRUCTION & EVALUATION

CASE STUDIES

ARE5.0 REFERENCES

DIVISION DESCRIPTION

Project Planning & Design

DIVISION DETAILS

ITEMS	TEST DURATION	APPOINTMENT DURATION*
100	4 hr **5 min**	5 hr

*Appointments allow for introductory screens, a break if you choose, and closing screens.

This division will test a candidate's ability to protect the public's health, safety, and welfare by:

- Evaluating project design alternatives
- Determining if a design meets project parameters, including those defined by the client, the environment, and society
- Selecting the appropriate building systems and material to meet project goals and regulatory requirements
- Integrating technical knowledge and information to develop a design

The 120 items will assess you on five sections related to Project Planning & Design. The number of items from each section will vary based on the targeted percentage of items within each section.

SECTION DETAILS

SECTIONS	EXPECTED NUMBER OF ITEMS	TARGET PERCENTAGE*
SECTION 1: Environmental Conditions & Context	10-16	10-16%
SECTION 2: Codes & Regulations	16-22	16-22%
SECTION 3: Building Systems, Materials, & Assemblies	19-25	19-25%
SECTION 4: Project Integration of Program & Systems	32-38	32-38%
SECTION 5: Project Costs & Budgeting	8-14	8-14%

DIVISION DESCRIPTION

Project Development & Documentation

DIVISION DETAILS

ITEMS	TEST DURATION	APPOINTMENT DURATION*
100	4 hr 5 min	5 hr

*Appointments allow for introductory screens, a break if you choose, and closing screens.

This division will test a candidate's ability to protect the public's health, safety, and welfare by:

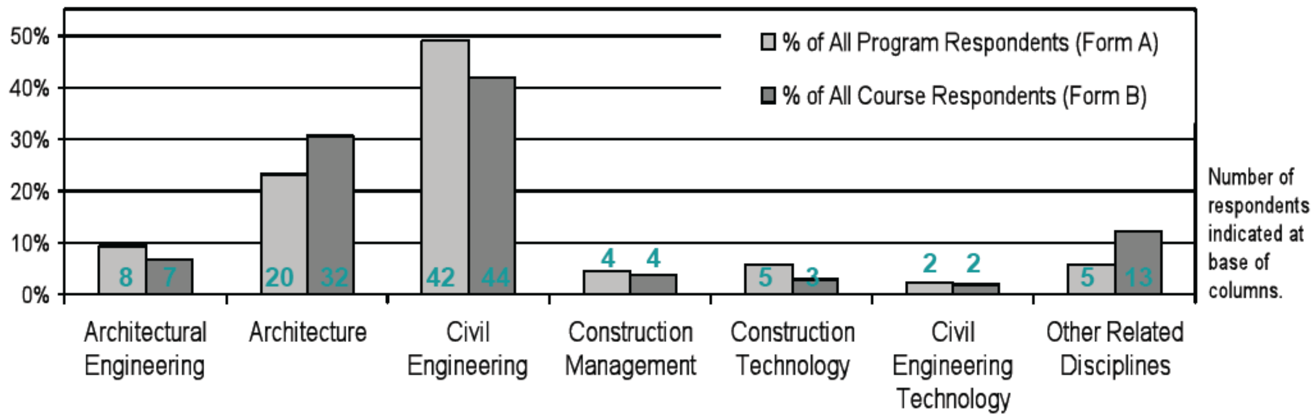
- Evaluating project documentation for the constructability of a building and site
- Integrating technical knowledge and information to refine a design
- Integrating materials and building systems to meet the project design requirements
- Translating design decisions into appropriate construction documentation

The 120 items will assess you on five sections related to Project Development & Documentation.
The number of items from each section will vary based on the targeted percentage of items within each section.

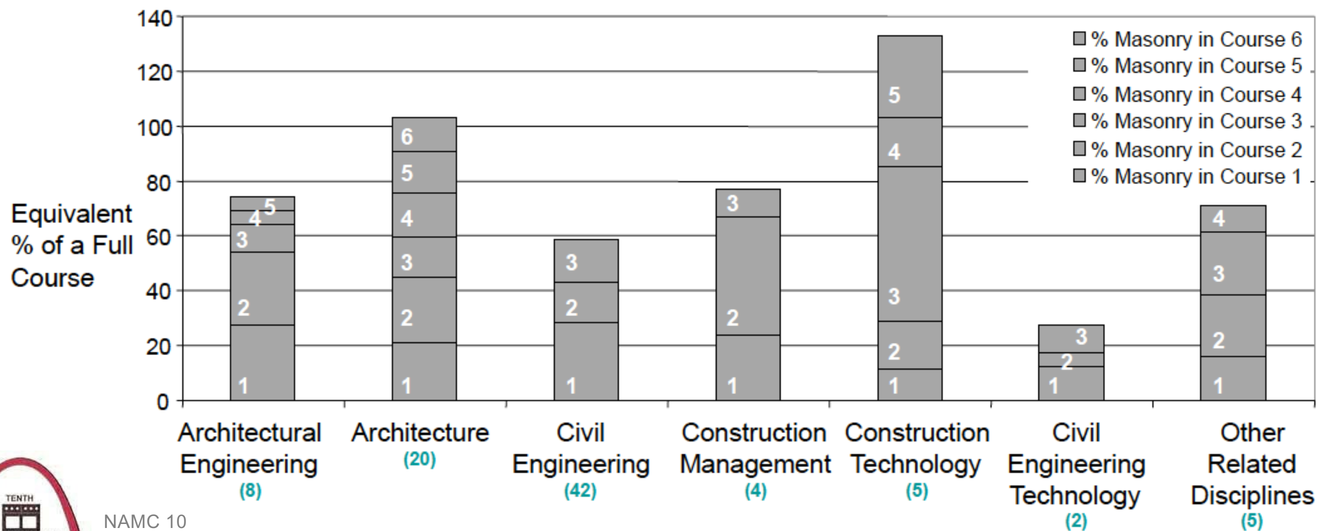
SECTION DETAILS

SECTIONS	EXPECTED NUMBER OF ITEMS	TARGET PERCENTAGE
SECTION 1: Integration of Building Materials & Systems	31-37	31-37%
SECTION 2: Construction Documentation	32-38	32-38%
SECTION 3: Project Manual & Specifications	12-18	12-18%
SECTION 4: Codes & Regulations	8-14	8-14%
SECTION 5: Construction Cost Estimates	2-8	2-8%

Percentage and Number of Respondents to Surveys, by Discipline



Average Cumulative Exposure to Masonry through Masonry-related Courses, by Discipline

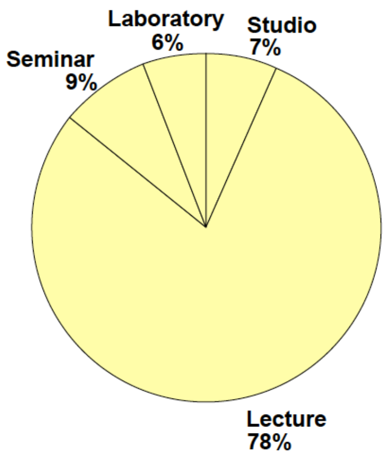


Constraints on Masonry Instruction in Curricula

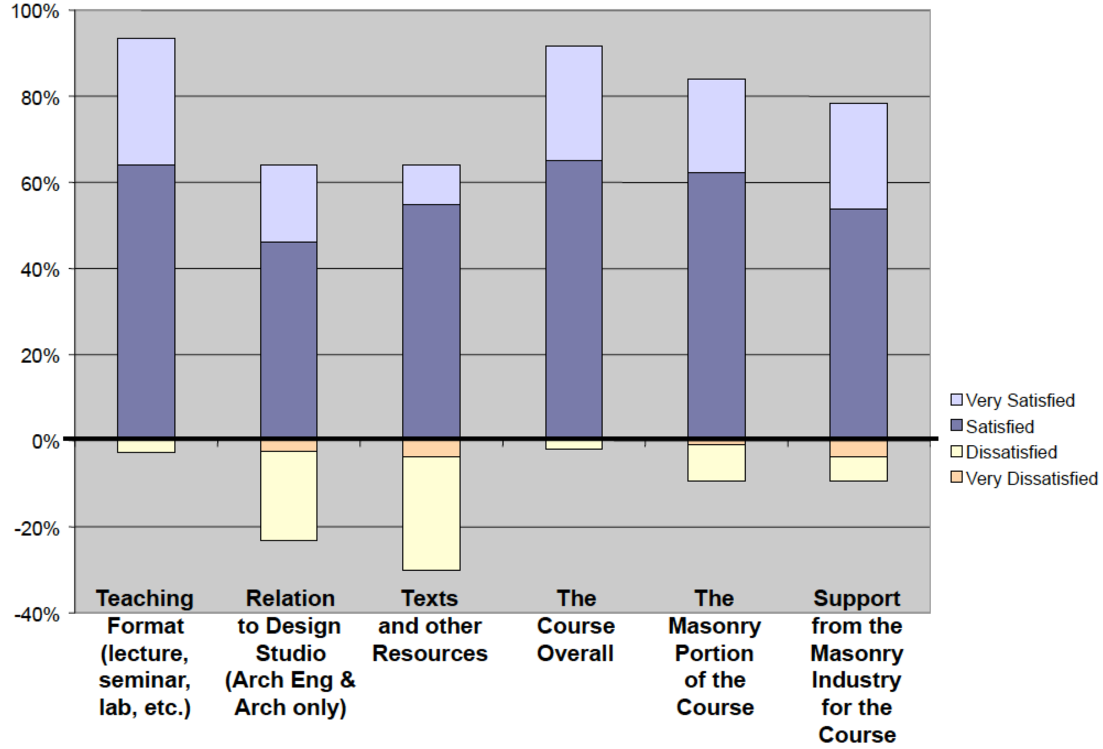
What factors constrain masonry instruction? (Please check all that apply)		
	Number	% of all Respondents **(24)**
Curriculum restriction	17	**71%**
Lack of faculty to teach such a course	10	**42%**
Lack of student demand / interest	5	**21%**
Other	5	**21%**
Lack of faculty interest	3	**13%**
Lack of industry support	3	**13%**

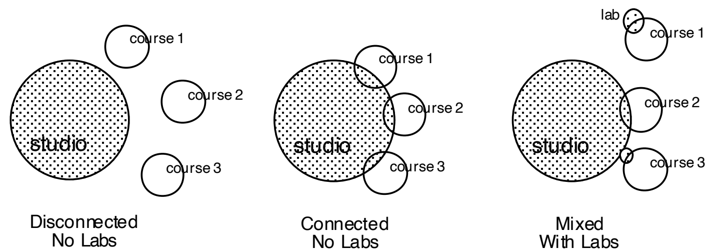
- Curriculum restrictions were noted by 71% of all respondents as the primary constraint on masonry in the curriculum. Such curricular limits are typically governed by accreditation criteria or departmental policy, and are not easily altered.
- Accreditation requirements vary by discipline. Masonry instruction is required in all accredited Architecture programs; in other disciplines masonry instruction is optional.
- Enhancements to masonry instruction will likely need to be achieved within existing courses.
- Only 13% of respondents cited a lack of interest by faculty or in support from industry.

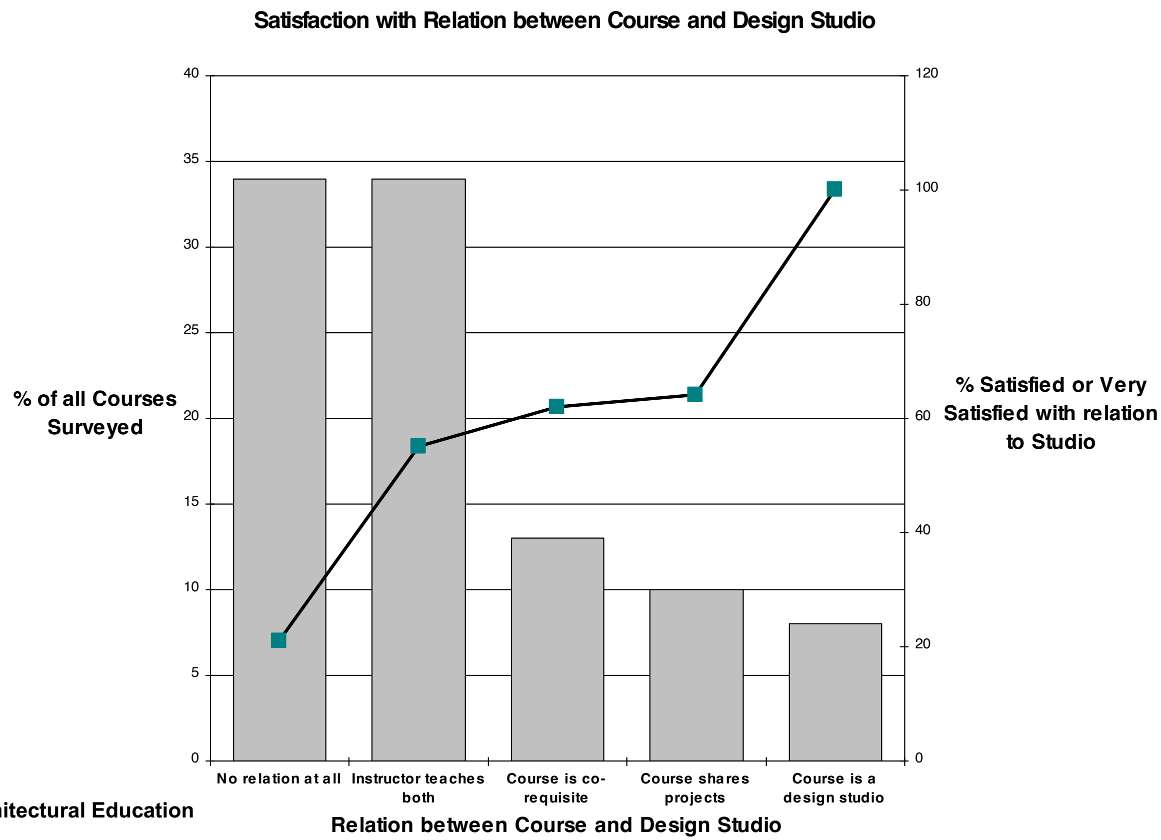
Course Teaching Format

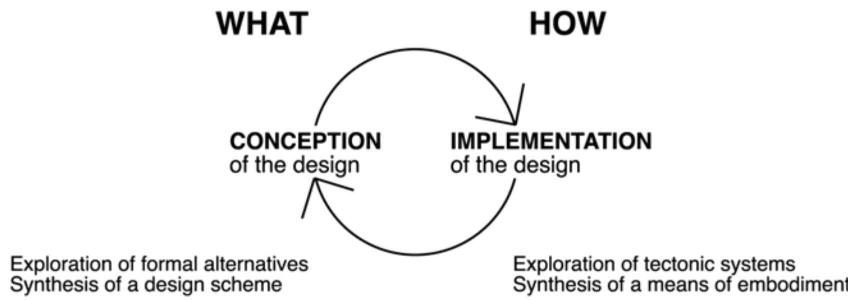


Faculty Satisfaction with Various Aspects of Courses

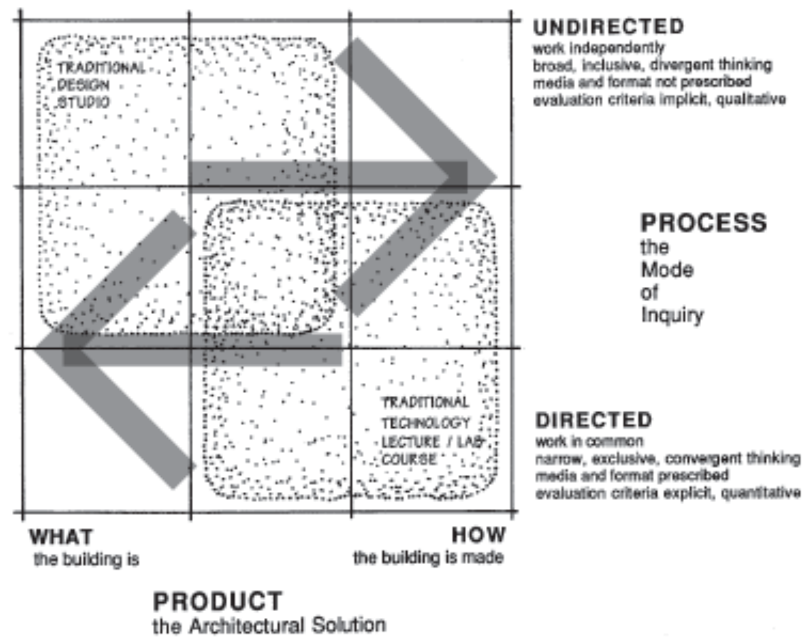



lab
course 1
course 2
course 3
studio
Disconnected
No Labs
Connected
No Labs
Mixed
With Labs


Satisfaction with Relation between Course and Design Studio
% of all Courses Surveyed
% Satisfied or Very Satisfied with relation to Studio
0
5
10
15
20
25
30
35
40
0
20
40
60
80
100
120
No relation at all
Instructor teaches both
Course is co-requisite
Course shares projects
Course is a design studio
Relation between Course and Design Studio

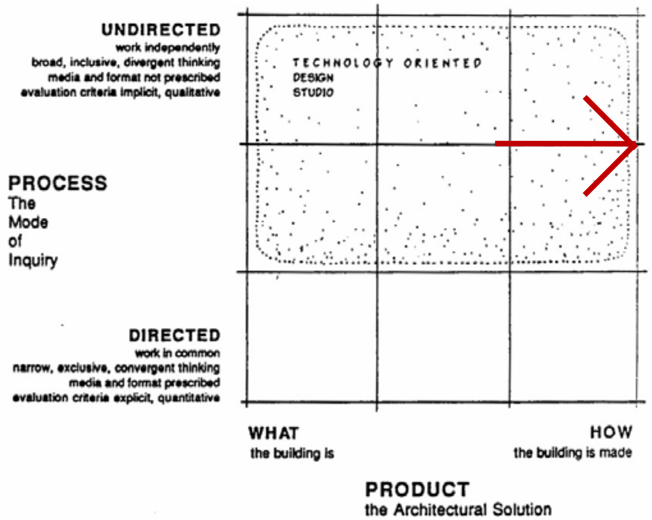


WHAT
HOW
CONCEPTION
of the design
IMPLEMENTATION
of the design
Exploration of formal alternatives
Synthesis of a design scheme
Exploration of tectonic systems
Synthesis of a means of embodiment



TRADITIONAL DESIGN STUDIO
TRADITIONAL TECHNOLOGY LECTURE / LAB COURSE
UNDIRECTED
work independently
broad, inclusive, divergent thinking
media and format not prescribed
evaluation criteria implicit, qualitative
PROCESS
the Mode of Inquiry
DIRECTED
work in common
narrow, exclusive, convergent thinking
media and format prescribed
evaluation criteria explicit, quantitative
WHAT
the building is
HOW
the building is made
PRODUCT
the Architectural Solution

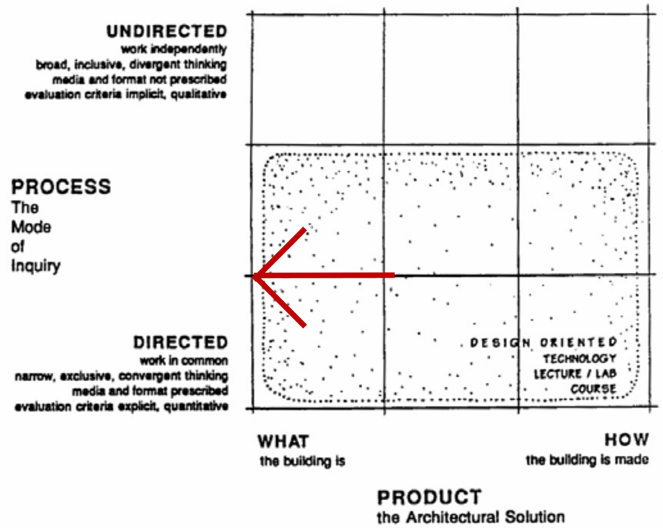
Incorporate Technology into the Design studios.



Guiding principles for **design studio projects** include:

1. Students primarily work individually, but small groups are also possible.
2. The point of departure for project is outlined in general; scope is relatively broad and inclusive.
3. Insights and knowledge about technology provoke design innovation.
4. There are a plurality of correct solutions; emphasis placed on understanding the implications of any proposal.
5. Varied learning / designing styles are accommodated; whole-brain activity is involved.
6. The presentation format is not tightly defined.
7. Evaluation criteria are implicit involving qualitative comparison or analysis.

Incorporate the act of Design into the Technology courses.



Guiding principles for **technology course projects and laboratory assignments** include:

1. Students may work individually, but small groups may be better.
2. The point of departure for project is clearly defined; scope is relatively narrow and exclusive.
3. The act of making, even if only hypothetical, provokes inquiry to new knowledge and innovation.
4. There are a plurality of correct solutions; emphasis placed on understanding the implications of a proposal.
5. Varied learning / designing styles are accommodated; whole-brain activity is involved.
6. Presentation format is relatively narrowly defined.
7. Evaluation criteria are explicit and may involve quantitative comparison or analysis.

Teaching Masonry through Design
Masonry Educator's Workshop

Patrick Rand, FAIA, Distinguished Professor Emeritus
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The making of buildings forms the intersection between architectural concept and implementation.
Concept is dependent upon detail. Detail is dependent upon concept.
In architecture, the general concept and the specific detail are simply two aspects of the same thing.

Elements of construction are not only of technical concern, but have potential compositional and symbolic content that make them integral to, and inspiration for, the making of form.
Construction materials and details give voice to the architectural concept.

Optimal learning in building technology courses takes place when technology and design are engaged together.

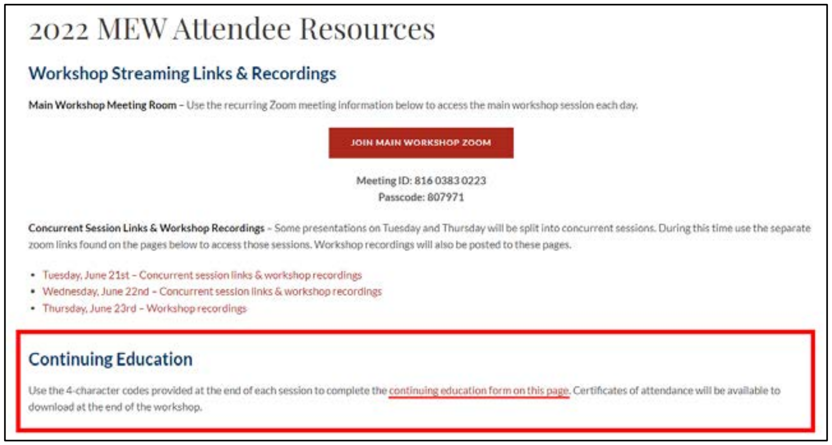
To integrate technology with design, faculty may have to overcome a tendency to think of **knowledge** and **imagination** as two separate and even antagonistic domains.
They are not.

Certificates of Attendance

Session: Why Teach Masonry to Architects?

Code: DH37

- Submit this code through the continuing education link on the workshop resources page
- Select this session from the menu and enter the code shown above (not case-sensitive)


2022 MEW Attendee Resources

Workshop Streaming Links & Recordings

Main Workshop Meeting Room – Use the recurring Zoom meeting information below to access the main workshop session each day.

JOIN MAIN WORKSHOP ZOOM

Meeting ID: 816 0383 0223
Passcode: 807971

Concurrent Session Links & Workshop Recordings – Some presentations on Tuesday and Thursday will be split into concurrent sessions. During this time use the separate zoom links found on the pages below to access those sessions. Workshop recordings will also be posted to these pages.

- Tuesday, June 21st – Concurrent session links & workshop recordings
- Wednesday, June 22nd – Concurrent session links & workshop recordings
- Thursday, June 23rd – Workshop recordings

Continuing Education

Use the 4-character codes provided at the end of each session to complete the continuing education form on this page. Certificates of attendance will be available to download at the end of the workshop.

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