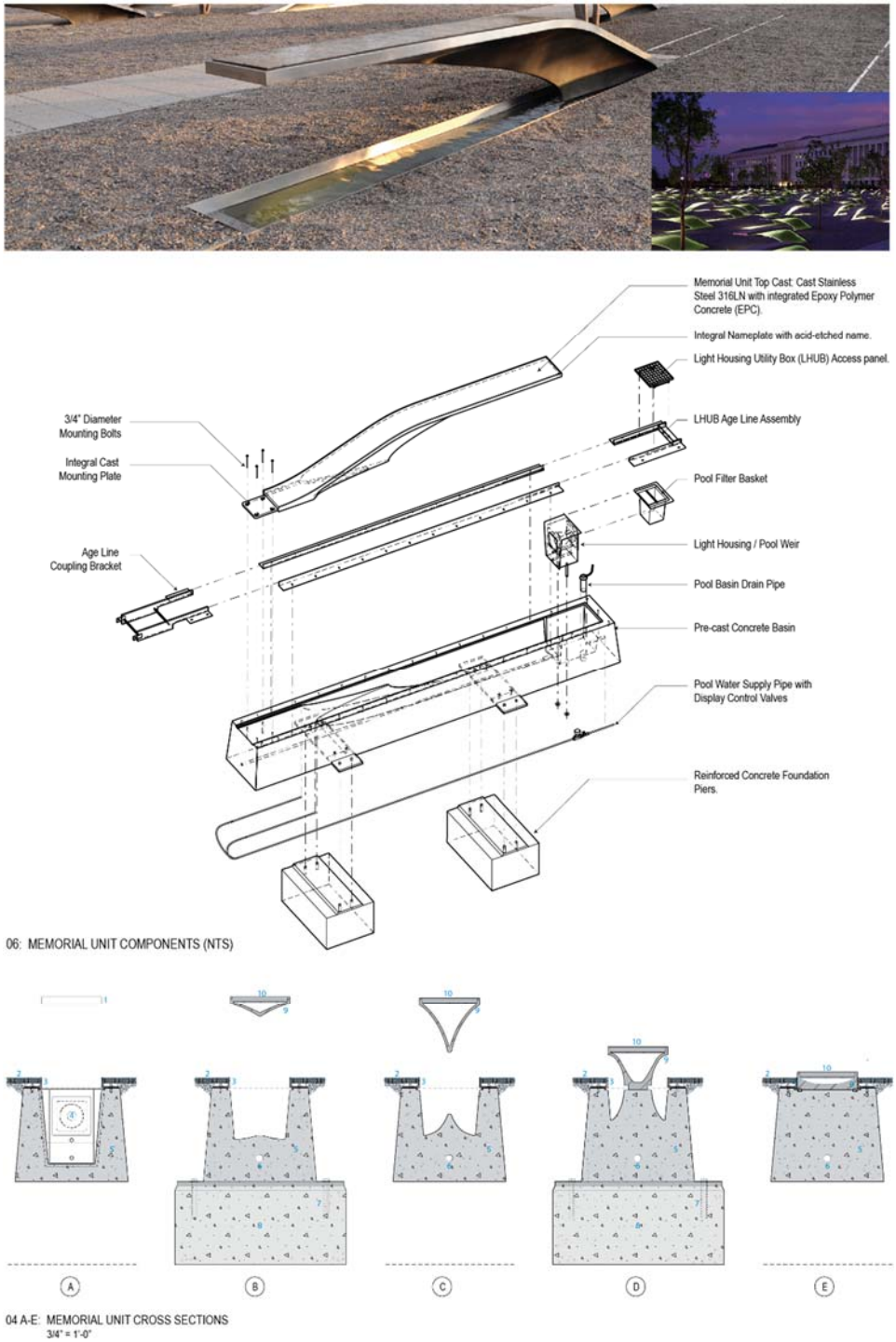

Pentagon Memorial: Axonometric Bench Assembly and Section Details, KBAS: Keith Kaseman and Julie Beckman

LARC 230: Site Systems I – Materiality in Landscape Architecture
Class: Tu / Th, 12:30 – 2:20, Architecture Hall 305, 3 Credits
Instructor: Catherine De Almeida, Assistant Professor
Contact: cdealmeida2@unl.edu; 2-4900
Semester: Fall 2017

Catalogue Description: Relationship between design and implementation through construction processes; technical representation; detailing as an extension of design; landscape architectural materials; material assemblies as performative systems; basic structural theory; detailing and structures; conventional and innovative materials and construction methods; and technical specifications as a means of ensuring design intent.

Course Prerequisites: Admission to the College of Architecture
This course is a prerequisite for:
LARC 231: Site Systems II – Site Engineering

Course Introduction: Landscape architects must have the ability to understand, design, assess, and oversee the implementation of material assemblies that compose landscapes. These assemblies include, but are not limited to, sidewalks, stairs, retaining walls and plantings, overhead structures, and seating. Each assembly requires the designer to combine a range of heterogeneous materials within a specific context for particular performative criteria, and communicate their design intent to other professionals through drawings and specifications.

This first course in the Site Systems sequence is an introduction to the range of materials landscape architects use (concrete, masonry, metals, wood, soil, and plantings), their performative capabilities, and their applications in the built environment. It serves as an introduction to an extensive body of knowledge and techniques related to the performance of landscape materials and assemblies, and their detailing.

The focus of the course is three-fold: material characteristics (lifecycle and performance assessment including sourcing materials, structural behavior, textural and phenomenological qualities); material assemblies (agglomerations of different materials operate and perform as systems); and technical and qualitative representation (investigating and communicating design intent and landscape performance metrics through drawing). Conventional and innovative materials and assemblies are examined in the context of sustainability using landscape performance metrics to evaluate their environmental, economic, and social benefits.

The course's sequence reflects the process oriented, interconnected qualities of landscape design. Rather than specifically focusing on material class or type of assembly, this course takes an integrative approach by using material types as an organizational structure for understanding their qualities, heterogeneous assemblies, and applications in design.

"Realization is Realization in Form, which means a nature. You realize something has a certain nature...In such consultation you can discover the Order of water, the Order of wind, the Order of light, and the Order of certain materials...The beauty of what you create comes if you honor the material for what it really is. Never use it in a subsidiary way so as to make the material wait for the next person to come along and honor its character."

Louis I. Kahn, *Between Silence and Light*

Learning Goals and Outcomes: The primary goal of this course is to provide students with a foundation to landscape materials and assemblies, and their performative benefits through detailing, research, and technical and qualitative representation.

Learning Goal One:
Knowledge of Materials and their Assemblies -
Students gain a broad understanding of materials, material applications in designed landscapes, how individual materials are assembled into heterogeneous material systems, and the landscape performance of material systems by using metrics to convey the environmental, economic, and social/cultural benefits of contemporary and innovative details.

Learning Outcomes:
1. Describe the characteristics (rot resistance, water resistance, etc.) and qualities (texture, color, strength, behavior, etc.) relevant to the performance of landscape materials and assemblies.
2. Understand the significance of material lifecycles by synthesizing issues related to social, cultural, and environmental dimensions in their selection, assembly, and detailing. Some considerations include, but are not limited to, material extraction, material processing, construction, assembly, activation and use, and decomposition, disposal, or reuse.
3. Identify the material components above and below the surface within an assembly system.
4. Investigate material assemblies for their performative effects in relation to structure, function, and aesthetics.

Learning Goal Two:
Research Methods + Applications of Materials and Detailing to Design -
Students develop research methods and skills for understanding, documenting, and analyzing material applications, material and assembly performance, technical detailing, and construction as part of an iterative design process.

Learning Outcomes:
1. Develop a vocabulary and proficiency in conventional, sustainable, and innovative landscape materials and construction techniques through the lens of landscape performance, and apply this knowledge to design proposals.
2. Ensure design intent with an accumulated knowledge of material innovation and selection, construction detailing and assembly performance, and basic structural theory.

Learning Goal Three:
Skills + Methods in Technical and Qualitative Representation -
Students build a literacy of technical detailing as a visual language for investigating design ideas and communicating design intent.

Learning Outcomes:

1. Demonstrate an understanding of the conventional visual language of technical detailing in material assemblies, consisting of drawing types, line weights / line types, textures and poche, labeling and annotation, dimensioning, and scaling.
    - Draw plans and sections with explanatory notes to adequately convey design intent and ensure its proper fabrication and installation by a professional.
    - Become familiar with construction nomenclature and utilize standard dimensions systems, symbols, layout, and description of materials and processes.
2. Utilize drawing as a communicative tool to convey design intent, and as an investigative method exploring assembly performance.
3. Build a library with a wide range of material palettes and assemblies that reflect their implementation and performance in the landscape.
4. Apply AutoCAD as a tool for drafting and technical detailing, and InDesign as a tool for integrating qualitative and quantitative information to produce professional quality technical drawings.

Course Format and Structure:

To accomplish the above learning goals and outcomes, this course uses illustrated lectures, readings, class discussions, experimental model-making, cumulative assignments, field trips, independent research, analysis, drawing and computer drafting, design development, experimentation and evaluation.

Illustrated Lectures / Readings / Discussions

Lectures consist of illustrated and visual examples accompanied by verbal explanations. They are largely organized by materials, their lifecycles, their structural, visual, and sensorial characteristics, and their applications in constructing landscapes. Lectures include discussions of the physical attributes of materials, tectonics (the art of material connections), and the function of common landscape assemblies and their relationships to site systems.

Course readings relate to landscape materials and detailing, and accompany each Phase of the class. Readings are assigned before each lecture (see Course Schedule and Course Readings for details). Students are required to read for each class with the expectation they may be tested on their knowledge and asked to participate in class discussions. Supplemental readings are provided as reference material to the course, lectures, and for completing assignments.

Students are encouraged to ask questions during lectures. Topics in the readings and covered in lectures are designed to stimulate discussion and build a literacy and knowledge in construction materials and technical detailing. Students will also present their assignments and projects in a pin-up format in order to receive continual feedback from fellow peers and contribute to the overall discussion of projects.

Field Trips

Field trips will occur within Lincoln. They will consist of constructed landscapes, landscapes under construction, and material production facilities. Trips will introduce students to material production / disposal and material assemblies in constructed landscapes.

Course Structure – Phases

This course is structured into 3 Phases with Subphases. The Phases are structured as a cumulative sequence, in which each assignment builds on the previous one(s). Detailed project briefs are provided at the beginning of each Phase. Below is an outline of the course structure:

Phase 1: Intro to Landscape Performance through Material Assemblies; Technical Representation + Detailing [3 weeks]

This Phase is divided into 2 Subphases:

A – Material Assemblies as Performative Systems [8/22-9/7]

B – AutoCAD [8/29-9/5]

In this first phase, students will analyze innovative details that perform as green infrastructure. Students will select an assembly on or around UNL campus, such as Love Library Learning Commons Plaza or P Street. On-site observations will guide students to select a performative landscape strategy (i.e. stormwater filtration, native plantings, placemaking, etc.) that will be explored throughout the exercise. Detailed material assemblages will be drawn using scaled plans and sections, with diagrams that convey and evaluate the quantitative and qualitative benefits of the material assembly, combining ecological and technological performance.

Phase 2: Materials, Lifecycles, and Assemblies – Performance + Applications [9 weeks]

This Phase is divided into 4 Subphases:

A – Aggregate + Asphalt + Cast-in-Place Concrete [9/7-9/21]

B – Pre-Cast Concrete + Brick + Stone [9/21-10/10]

C – Metal + Wood [10/10-10/31]

D – Soil + Plantings + Earthworks [10/31-11/9]

Phase 2 will expose students to materials used in constructed landscapes, and how assembled materials perform as systems. This phase will emphasize material lifecycles and their landscape impacts in the context of designing sustainable landscapes. This ranges from extraction/sourcing and manufacture, to their performance and landscape applications, to their end-of-life fates. Students will develop an understanding of the range of conventional materials and techniques used to construct landscapes, paired with innovations and technologies associated with those materials and assemblies. Emphasis will continue to be placed on

highlighting the material components that make up detailed assemblages, and their ecologically performative conditions. In each Subphase, students will select and draw details of conventional assemblies paired with an innovative counterpart selected from a case study in LAF's Landscape Performance Series. Students will use landscape performance metrics to evaluate and compare the innovative detail's benefits to those of its conventional counterpart.

Phase 3: Synthesis of Landscape Materiality – Designing a Performative Material Assembly [~4 weeks]

This Phase is divided into 3 Subphases:
A – Designing Details [11/9-11/16]
B – Constructing Assemblies [11/16-11/28]
C – Landscape Performance Evaluation of Material Assembly [11/28-12/7]

Phase 3 will test students' understanding of landscape materiality, material assemblies, and their performative capacities in constructed landscapes through designing a construction detail for their design studio projects. Students will draw and model a design detail referencing conventional and innovative materials and assemblies that were covered throughout this course. The details will emphasize material components, tectonic relationships, and how the assembly performs as a system. After drawing and modeling their details, students will use landscape performance metrics to evaluate their benefits in the context of their studio design proposals (LARC 210).

Projects and Evaluation

Course projects are mostly individual work, with a group project mid-semester. Project briefs provided at the start of each Phase contain a project description, requirements, and expectations for submission and presentation. See "Grading" and "Definitions" for more information.

<u>Projects</u>

Phase 1A: Material Assemblies as Performative Systems -	-10%
Phase 1B: Integration of AutoCAD -	-05%
Phase 2: Material Palette, Assembly, and Landscape Performance Catalogue -	-40%
Phase 2C: Spanning and Loading (Bridge Project) -	-05%
Phase 3: Designing, Constructing, and Evaluating Performative Assemblies -	-30%
Participation -	-10%

Criteria + Rubric

A rubric will be used to evaluate projects, with each project worth 100 points. Work will be evaluated according to the following criteria [Note: not all criteria apply to all projects]:

- Craft + Representation [30 pts.] (technical quality, legibility, precision, annotation) –
  Drawings will be evaluated for technical quality and legibility. This includes precision, composition, craft, and systematic presentation of information. Line weights, line types, appropriate notation system, accuracy in dimensioning, scale, and the overall organization of technical information are critical to achieving professional drawing quality. Sufficient level of information in drawing, annotation, and description must be presented to address a given scenario in order for design intent to be realized in a constructed landscape.
- Rigorous Investigation [30 pts.] (quality and depth of analysis; exploration and use of metrics in landscape performance evaluations) –
  Demonstrate the ability to analyze the landscape performance of a material assembly. Additionally, demonstrate the ability to investigate and communicate design intent for fit, capacity, and performance relative to site and technical considerations.
- Evolution [15 pts.] (growth of technical ability; response to feedback; iteration of work)–
  Design and learning are iterative processes that allow students to evolve their work. The course is structured for students to learn by doing and making. This criterion will evaluate the ability for students to use feedback to evolve their work, techniques, and design approaches throughout the course.
- Critical Thinking [15 pts.] (critically evaluate design ideas; question conventional modes of working; develop ethical considerations of materials, their assemblies, and performative capacities) –
  Self-critically evaluate a design idea, including responding to the evaluation and criticism of peers by improving the work. This includes thinking critically about conventional modes of representation, materials and assemblies, material sourcing, and methods of construction, and the ways in which they may be rethought.
- Timely Submission [10 pts.] all work is submitted and completed on time.

Required Material:

The following are required materials for this course:

- A notebook or sketchbook for notes and drawings in the classroom and in the field, and for keeping course handouts.
- Architectural and Engineering Scales
- Appropriate clothing and footwear for field trips (rain or shine)
- For Phase 2C and 3: Physical modelling materials will be required; students are expected to procure their own supplies for these projects. Sharing of materials + buying in bulk are highly encouraged, as well as finding and reusing scrap materials throughout Arch Hall.

Computer Requirements:

A computer or laptop with AutoCAD 3D and plotting capabilities.
External hard drive – Students are required to back up their work every week.

Grading:

The following schedule of grades applies to all:

A+ 100-96.67	A 96.66-93.34	A- 93.33-90
B+ 89.99-86.67	B 86.66-83.34	B- 83.33-80
C+ 79.99-76.67	C 76.66-73.34	C- 73.33-70
D + 69.99-66.67	D 66.66-63.34	D - 63.33-60
F 59.99 or below		

Definitions:

A+, A, A-
An outstanding performance in which the student demonstrates superior grasp of the subject matter, and an ability to go beyond the given material in a critical and constructive manner. The student demonstrates a high degree of creative and/or logical thinking; a superior ability to organize, to analyze, and to integrate ideas; and a thorough familiarity with the relevant literature and techniques.

B+, B, B-
A good to very good performance in which the student demonstrates a thorough grasp of the subject matter, and an ability to organize and examine the material in a critical and constructive manner. The student demonstrates a good understanding of the relevant issues and a solid familiarity with the relevant literature and techniques.

C+, C, C-
A fair performance in which the student demonstrates a general grasp of the subject matter and a moderate ability to examine the material in a critical and constructive manner. The student displays an adequate understanding of the relevant issues, and a general familiarity with the relevant literature and techniques.

D+, D, D-
A poor performance in which the student demonstrates a minimal familiarity with the subject matter, but whose attempts to examine the material in a critical and constructive manner are inadequate. The student displays minimal understanding of the relevant literature and techniques.

F
An inadequate performance. Failure

Special Accommodation:

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) Office, 132 Canfield Administration, 472-3787 voice or TTY.

Attendance and Due Date Policy:

Your punctual arrival to class is required. Furthermore, attendance (both physical and mental) for the full class period is required. It is your responsibility to be on time and attentive each day. Partial attendance for only a portion of class and not for the full duration will result in an absence. If you arrive after attendance is taken, it will count as a late. Two (2) late attendances will equal one (1) absence.

If you are absent for three (3) or more class periods, you will automatically receive a failing grade for this course, regardless of your course performance. Accidents happen, so please plan accordingly. (Should you have exceptional circumstances, you are personally responsible for explaining the reasons for your absence to your instructor and the Department Chair).

Projects are due on the date, time, and location specified by your instructor. Late work will not be accepted at all without instructor's prior approval and written agreement, to be signed by both student and instructor, as to revised due dates. Absences from any scheduled review will also result in no credit given for that particular project.

Retention of Work:

The College of Architecture has the right to retain any student work, either in part or in its entirety, for display, accreditation, documentation, recruitment, or any other educational or legal purpose.

Academic Integrity:

Any issues which arise relative to academic honesty or integrity will be handled in accordance with UNL Student Code of Conduct (http://stuafs.unl.edu/ja/code/). You are to do your own work on projects, exams, reports, etc. except where a group has been assigned. Any work copied from current or previous student projects or professional work examples will receive a "zero" (0) evaluation for that submittal.

Studio Etiquette:

This course will abide by the College of Architecture studio culture document. This document can be downloaded from the syllabus section of Blackboard. We will maintain a professional atmosphere in the course at all times this semester. This not only refers to the attitude and seriousness of each of us in the course, but also to the physical environment. Students are highly encouraged to work in the studio in addition course hours, rather than at home. Students are permitted to work in studio at all hours but sleeping overnight in studio is not allowed.

Employment Policy:

The study of architecture and landscape architecture is a demanding discipline requiring a significant commitment to succeed. For this reason, the department has adopted a policy recommending that students, who are employed, not exceed the following registration guidelines.

Credit Hours Recommended/ Work Load / Week:

Up to 18 credit hours	0 hours
13-16 credit hours	8-16 hours
10-12 credit hours	17-20 hours
Up to 6 credit hours	Full time

Course Schedule:

LARC 230: Materiality in Landscape Architecture - Tentative Weekly Schedule					
Week	Day	Date	Description	Deliverables	Required Readings (see syllabus for more details)
1	Tu	22-Aug	Introductions, Course Description and Briefing, Schedule, & Format Phase 1 Description and Presentation Technical Detailing + Drawing Lecture	Kick - Off	X
	Th	24-Aug	LAF Landscape Performance Webinar #1 Emily Casper Lecture + Site Visit	Required Reading + Discussion Review LAF Performance; select strategy	Loidl-Reisch, "Constructing Landscape," p. 9-11. Kirkwood, "Introduction," p.1-9. Yglesias, "Preface," "Conclusion," and "Afterword," p. 1-4; 179-184.
2	Tu	29-Aug	Group Pin-up Phase 1B Description and Presentation Intro to AutoCAD 3D Tutorial and Handout	Material / Detail selections; photos with technical plans and sections on 11x17 Download AutoCAD 3D onto computers Required Reading + Discussion	Kirkwood, "Fundamentals: Landscape and Detail," p. 11-44.
	Th	31-Aug	Group Pin-up	Technical sketches translated into AutoCAD Selected benefits for evaluation Precedent images for diagramming	X
3	Tu	5-Sep	Group Pin-up	Final draft board with plan + section details; diagrams; landscape performance evaluation	X
	Th	7-Sep	*Phase 1: Pin-up - CAD Details Phase 2 Description and Presentation Phase 2A: Materials Lecture - Compressive forces; Foundations	Final Drawings and Presentations Required Readings + Discussion	Sovinski, "Ch. 1, 2, and 4," p. 5-12; 13-24; 57-76. Zimmerman, "Foundations," p. 159-169.
4	Tu	12-Sep	*Cathy away for conference* Phase 2A: Lecture by Eric Casper on P Street Project - Street Assemblies	Required Reading	Zimmerman, "Paths and Squares," p. 215-240.
	Th	14-Sep	LAF Landscape Performance Webinar #2 Field Trip - Concrete Plant	Camera + Notebook	Hutton, "Reciprocal Landscapes," p. 40-47. Yglesias, "Concrete," p. 5-21.
5	Tu	19-Sep	Phase 2A: General Discussion Desk Crits / Meetings Working Session	Detail Selections Drawing Development + Preliminary Layout	X
	Th	21-Sep	*Phase 2A: Pin-up - CAD Details + Materials Palette [Streets] Phase 2B Begins	Final Drawings and Presentations	X
6	Tu	26-Sep	Phase 2B: Materials Lecture - Pathways + Paving Patterns Nebraska Masonry Alliance Lecture	Required Readings + Discussion	Zimmerman, "Cut Stone; Brick and Clinker; and Concrete," p. 67-102.
	Th	28-Sep	Field Trip - Brick Plant	Camera + Notebook	X
7	Tu	3-Oct	Phase 2B: Lecture - Walls + Stairs	Required Readings + Discussion Detail Selection Drawing Development + Preliminary Layout	Zimmerman, "Steps; and Walls," p. 243-263; 295-323.
	Th	5-Oct	Phase 2B: General Discussion Desk Crits / Meetings Working Session	Detail Selection Final Draft of Board	X
8	Tu	10-Oct	*Phase 2B: Pin-up - CAD Details + Materials Palette [Paving + Pathways; Walls + Stairs] Phase 2C Begins; Group Selection	Final Drawings and Presentations	X
	Th	12-Oct	Phase 2C: Materials Lecture - Tensile Forces; Spans; Structures	Required Readings + Discussion Sketches / Study Models of Spans	Zimmerman, "Wood; and Metals," p. 53-63; 105-119. Zimmerman, "Load-bearing Structures," p. 137-157; (173-195).
9	Tu	17-Oct	*Fall Break*		
	Th	19-Oct	*Span Project - Testing Working Session	Final Models	X
10	Tu	24-Oct	Phase 2C: Materials Lecture - Seating + Fences + Rails Desk Crits / Meetings Working Session	Required Readings + Discussion Detail Selections	Zimmerman, "Railings and Fences," p. 267-291.
	Th	26-Oct	Phase 2C: General Discussion Desk Crits / Meetings Working Session	Drawing Development + Preliminary Layout	X

11	Tu	31-Oct	*Phase 2C: Pin-up - CAD Details + Materials Palette [Seating + Fences + Rails]	Final Drawings and Presentations	X
	Th	2-Nov	Phase 2D: Materials Lecture - Soil + Plantings + Erosion Control	Required Readings + Discussion	Zimmerman, "Planting Technique and Care of Vegetation Surface; Lawns and Meadows," p. 369-396.
12	Tu	7-Nov	Phase 2D: General Discussion Desk Crits / Meetings Working Session	Detail Selection Drawing Development + Preliminary Layout	X
	Th	9-Nov	*Phase 2D: Pin-up - CAD Details + Materials Palette [Soil + Plantings + Erosion Control] Phase 3 Description and Presentation	Final Drawings and Presentations	X
13	Tu	14-Nov	Phase 3A: Designing Detail Desk Crits / Meetings Working Session	Required Readings + Discussion Detail Selection + Sketches Drawing Development + Preliminary Layout	Kirkwood, "Practices: Constructing Detail," p. 109-155.
	Th	16-Nov	*Phase 3A: Pin-up - CAD Details + Materials Palette - Design Project Phase 3B Discussion	Final Drawings and Presentations	X
14	Tu	21-Nov	Phase 3B: Constructing Tectonic Details Desk Crits / Meetings Working Session	Sketches of Assembly; In progress Model Construction	X
	Th	23-Nov	*Thanksgiving*		
15	Tu	28-Nov	*Phase 3B: Pin-up - 3A Sheet with Tectonic Model Phase 3C Discussion	Final Drawings, Model, and Presentations	X
	Th	30-Nov	Phase 3C: Landscape Performance Evaluation Group Pin-ups / Working Session	Selection of Landscape Performance Evaluations; Sketches of Diagrams	X
16	Tu	5-Dec	Phase 3C: Landscape Performance Evaluation Group Pin-ups / Working Session	Final Drafts of Phase 3 Deliverables	X
	Th	7-Dec	*Phase 3: Full Design Project Pin-up	Final Drawings, Models, and Presentations	X

Note: The final presentation of Phase 3 will coincide with your Final Studio Presentation.

Your Phase 3 Project must be submitted to Canvas no later than:
Tuesday, December 12 by 8AM [no exceptions]

Readings and Bibliography:

Required readings are to be completed before the specified class date (see schedule for more details of dates). A short discussion of the readings will take place at the beginning of class. For select readings, students are to submit at least 2 quotes in Canvas by 10am the day of class. These help fuel discussion and allow students to keep a collective body of important ideas that develop throughout the semester. Readings are intended to compliment the Phases of the course and provide a theoretical and technical basis of knowledge. Skipped weeks indicate no required readings for those weeks. Supplemental readings and bibliography are provided as additional resources to course material.

Students are expected to obtain copies of required texts (provided on Canvas), and read the portions noted in the schedule. Additional reference texts are available in my office or in Architecture Hall library.

Required Text:
Zimmermann, Astrid (ed.), *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015).

Course Readings:

Week	References
1	Required (Phase 1A) Loidl-Reisch, Cordula, "Constructing Landscape" in *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 9-11. Kirkwood, Niall, "Introduction" in *The Art of Landscape Detail: Fundamentals, Practices, and Case Studies*, (New York: John Wiley & Sons, 1999): 1-9. Yglesias, Caren, "Preface," "Conclusion," and "Afterword," in *The Innovative Use of Materials in Architecture and Landscape Architecture: History, Theory, and Performance* (McFarland & Company, 2015): 1-4, 179-184. Supplemental Zimmermann, Astrid (ed.), *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015). Hopper, Leonard J., *Landscape Architectural Graphic Standards*, Student Edition, (Hoboken: John Wiley & Sons, 2007). Harris, Charles W. and Dines, Nicholas T., *Time-Saver Standards for Landscape Architecture: Design and Construction Data*, (New York: McGraw-Hill, 1988).
2	Required (Phase 1B) Kirkwood, Niall, "Fundamentals: Landscape and Detail" in *The Art of Landscape Detail: Fundamentals, Practices, and Case Studies*, (New York: John Wiley & Sons, 1999): 11-44. Supplemental Zimmermann, Astrid (ed.), *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015). Hopper, Leonard J., *Landscape Architectural Graphic Standards*, Student Edition, (Hoboken: John Wiley & Sons, 2007).

3-4

Required (Phase 2A)

Hutton, Jane, “Reciprocal Landscapes: Material Portraits in New York City and Elsewhere,” *Journal of Landscape Architecture* 8(1), 2013: 40-7.

Sovinski, Rob W., “Chapters 1, 2, and 4” in *Materials and their Applications in Landscape Design* (Hoboken: John Wiley & Sons, 2009): 5-12; 13-24; 57-76.

Yglesias, Caren, “Concrete,” in *The Innovative Use of Materials in Architecture and Landscape Architecture: History, Theory, and Performance* (McFarland & Company, 2015): 5-21.

Zimmermann, Astrid (ed.), “Foundations”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 159-169.

Zimmermann, Astrid (ed.), “Paths and Squares”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 215-240.

Supplemental

Margolis, Liat and Robinson, Alexander, *Living Systems: Innovative Materials and Technologies for Landscape Architecture*, (Basel: Birkhauser, 2007): 58-61; 70-71; 114-117; 160; 171.

Harris, Charles W. and Dines, Nicholas T., "Asphalt; Concrete; and Paving, Paving Joints, Edges, Dividers, and Curbs Details and Devices" *Time-Saver Standards for Landscape Architecture: Design and Construction Data*, (New York: McGraw-Hill, 1988): 820-1 - 820-23; 830-1 - 830-21; Sections 910-914.

Hopper, Leonard J., *Landscape Architectural Graphic Standards*, Student Edition, (Hoboken: John Wiley & Sons, 2007).

6-7

Required (Phase 2B)

Zimmermann, Astrid (ed.), “Cut Stone; Brick and Clinker; and Concrete”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 67-102.

Zimmermann, Astrid (ed.), “Steps; and Walls”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 243-263; 295-323.

Supplemental

Yglesias, Caren, “Brick,” “Ceramics,” and “Stone,” in *The Innovative Use of Materials in Architecture and Landscape Architecture: History, Theory, and Performance* (McFarland & Company, 2015): 49-73; 101-114.

Sovinski, Rob W., “Chapters 3, 5, and 7” in *Materials and their Applications in Landscape Design* (Hoboken: John Wiley & Sons, 2009): 25-55; 79-89; 111-133.

Zimmermann, Astrid (ed.), “Paths and Squares”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 215-240.

Harris, Charles W. and Dines, Nicholas T., "Retaining Walls and Devices; Surfacing and Paving; Masonry; and Steps", *Time-Saver Standards for Landscape Architecture: Design and Construction Data*, (New York: McGraw-Hill, 1988): 410-1 - 410-10; 440-1 -440-7; 840-1 - 840-34; Section 920.

Margolis, Liat and Robinson, Alexander, *Living Systems: Innovative Materials and Technologies for Landscape Architecture*, (Basel: Birkhauser, 2007): 58-61; 70-71; 114-117; 160; 171.

McLeod, Virginia, *Detail in Contemporary Landscape Architecture*, (London: Laurence King, 2008): 62-65; 76-79; 96-99; 156-159; 172-175.

8; 10

Required (Phase 2C)

Zimmermann, Astrid (ed.), “Wood; and Metals”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 53-63; 105-119.

Zimmermann, Astrid (ed.), “Load-bearing Structures”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 137-157 (173-195).

Zimmermann, Astrid (ed.), “Railings and Fences”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 267-291.

Supplemental

Yglesias, Caren, “Metals,” and “Wood,” in *The Innovative Use of Materials in Architecture and Landscape Architecture: History, Theory, and Performance* (McFarland & Company, 2015): 34-48; 115-129.

Sovinski, Rob W., “Chapters 6, and 8” in *Materials and their Applications in Landscape Design* (Hoboken: John Wiley & Sons, 2009): 91-109; 135-150.

Zimmermann, Astrid (ed.), “Small Bridges; and Seating Elements”, *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 347-354; 490-500.

Harris, Charles W. and Dines, Nicholas T., "Fences, Screens, and Walls; Wood; Metals; and Seatwalls", *Time-Saver Standards for Landscape*

Architecture: Design and Construction Data, (New York: McGraw-Hill, 1988): 450-1 - 450-14; 850-1 - 850-32; 860-1 - 860-32 Section 931.

McLeod, Virginia, *Detail in Contemporary Landscape Architecture*, (London: Laurence King, 2008): 38-41; 54-57; 68-71; 72-75; 130-133; 140-143; 160-163.

11

Required (Phase 2D)

Zimmermann, Astrid (ed.), "Planting Technique and Care of Vegetation Surface; Lawns and Meadows", *Constructing Landscape: Materials, Techniques, Structural Components*, 3rd Edition (Basel: Birkhauser, 2015): 369-396.

Supplemental

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Online Resources

Landscape Architecture Foundation: Landscape Performance Series
https://landscapeperformance.org/

Landscape Architecture Foundation: Benefits Toolkit
https://landscapeperformance.org/benefits-toolkit

Landscape Architecture Foundation: Case Study Briefs
https://landscapeperformance.org/case-study-briefs