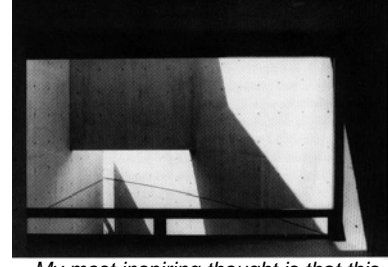
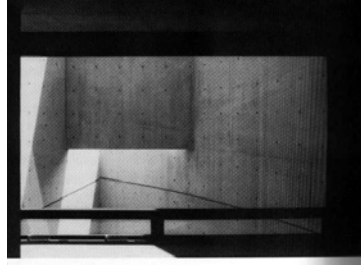


ARCH 5516 • LUMINOUS AND THERMAL DESIGN ECOLOGICAL DESIGN FOR THE 21ST C



My most inspiring thought is that this place, if I am to live well in it, requires and deserves a lifetime of the most careful attention. -- Wendell Berry

During the four perilous days of solar transition, each household in San Juan Pueblo shares in a period of rest and spiritual retreat within their home as an expression of collective awe and respect for the Sun. --The Tewa, Southwest U.S., Days of the Sun Ritual

PROJECT ONE – Phase 2

LIGHTSCAPES: Light in Place and Time

Final Project One Due: Wednesday, February 6, pin-up by 8:45 on the courtyard (reviews at 9:00)

(Phase 2 total: suggested time limit: minimum 24 hours)

- **Friday, February 1: In-Process Pin-up-Phase 2.1 Due:** pin-up on mezzanine at 9:45
- **Monday, February 4: In-Process Pin-up for Phase 2.2 Due:** sign-up for team critique (between 10-12:00)
- **Wednesday, February 6: Final Presentation for Phase 1 and Phases 2 Due:** reviews at 9:00 in courtyard

Phase 2.1: Design Proposals: 1/16” site/massing physical models

Due: Friday, February 1: In-Process Pin-up for Phase 2.1: pin-up on mezzanine at 9:45 (in-process reviews start at 10:00); *(Phase 2 Feb 1 studies: suggested time limit: 1/2 day)*

Objective: To investigate the relationship between the quality and character of the luminous experience and the massing, section, envelope, and window form.

Daylight is a dynamic and constantly changing force. It is always in a process of transition, varying from hour to hour and season to season. Each moment offers new colors, positions, and qualities of light which are particular to a given place and geographic location. In *The Poetics of Light*, Henry Plummer states: “...living structures can *be* only if they *become*, they can *exist* only if they *change*. Change and growth are inherent qualities of the life process.” Daylight provides an opportunity to explore the changing and evolving qualities of architectural experience. In Project One you will explore the ecological, experiential, and aesthetic opportunities of light, place, and time in the mnZED Lab addition. Each team member is asked to develop at least ONE 1/16” site/massing model to communicate your daylighting proposals for the mnZED Lab. The model should reveal “an experience of place and time”.

1. **Define What Aspect of “Place and Time” to Express:** Reflect on the site and bioclimatic lessons from the charette. Take time to reconsider your project in a way that reveals some character or quality of the “light in place and time”. You are asked to focus on the **building massing and envelope**. Consider what characteristics or qualities of place/site you want to capture and express in Phase 1:
 - Seasonal phenomena
 - Geographic location
 - A particular view(s) (near or far)
 - A particular time of day (morning, mid-day, afternoon...)
 - Site materials or features (snowfall, water, topo, etc.)
 - Sky conditions (clear, overcast, etc.)
 - A mood or feeling of the site
 - Colors of light (morning, mid-day, evening)
 - Luminous phenomena on the site
 - Connection to earth or sky? Others...
2. **Develop New Exploratory Studies (1-2 hours suggested):** Use sketches, computer models, or physical models to reconsider the overall site/massing of your design from the Bioclimatic Charette (including the old part of Rapson). Develop new site/massing proposals to consider how “place and time” can be revealed in architecture. Generate as many ideas as you can before selecting proposals to further develop using 1/16” scale physical models (see step 3 below). Document your explorations to include in your *Final Project One Presentation*. Select an exploratory study to develop in a 1/16” physical model.

3. Develop at Least One 1/16" Physical Site/Massing Model (3-4 hours minimum): Each team member is asked to develop at least ONE 1/16" design proposal for the mnZED Lab. Use materials of your choice to construct a 1/16" physical site/massing model to express your chosen aspect(s) or qualities of "light in time and place" (balsa wood, wire, mesh, screen, translucent materials, metal, etc. Use a sunpeg for 44°NL and a digital camera to document the daylighting on the inside of your model. You will need to include a "peep hole" to see inside your model at select locations to photograph the inside. Also consider if there are any reflective surfaces outside the windows or objects that block or influence the daylight that should be modeled (e.g. is there a ground plane adjacent to a window? Do you need to consider seasonal light changes with snow or vegetation? Document your explorations to include in your *Final Project One Presentation*.
4. Annotated 1/16" Sections and Daylighting Concept Diagrams (1 hour minimum): Each team member is asked to develop annotated plans and sections (at 1/16" scale) and daylighting concept diagrams to communicate your 1/16" design proposals. Document your explorations to include in your *Final Project One Presentation*.
5. Friday, February 1: In-Process Pin-up-Phase 2.1 Due: pin-up on mezzanine at 9:45 (in-process reviews start at 10:00). Please include: exploratory studies, 1/16" physical models, and annotated sections.

Phase 2.2: Integration into a Team Proposal: Daylight Program: Qualitative and Quantitative Analysis

Due: Monday, February 4: In-Process Pin-up for Phase 2.2: sign-up for a review on Monday between 10-12 (Daylight Program and 1/16" models are due on Monday, February 4).

1. Weekend Design Integration: Develop ONE Team Proposal: Physical Model at 1/16" (4 hours minimum): Over the weekend you are asked to integrate the best of your design thinking into ONE TEAM PROPOSAL using a 1/16" physical site/massing model. Based on the design critique on Friday, revise your proposal to further develop, clarify, and refine your daylighting design. Leave time to conduct a quantitative Ecotect analysis and Photo-documentation of the new 1/16" team proposal.
2. Define the Team's Daylighting Program and Goals (1-2 hours estimated): As a team, use the "*Program Narrative Handout*" (who, what, when, where, how, etc.) and the *IESNA Lighting Handbook* (on reserve in the library) to define your team's daylighting program goals (qualitatively and quantitatively). Prepare a brief written description of your "Daylighting Program Goals" (including answers to the "Program Narrative: who, what, when, where, how" and the target illuminance levels in different spaces). Develop an Ecotect study model of the team proposal to assess the illumination levels and distribution of light. Use qualitative photo-documentation of the team proposal to assess the character of the light and whether you have issues for solar control and heat gain.
3. Develop a Quantitative Analysis of the Team's Proposal Using Ecotect (4 hours estimated): On Monday, February 4, the team is asked to present a quantitative analysis of their combined "team proposal" using Ecotect (mnZED Lab addition only). You should evaluate the illuminance level in lux (1 footcandle = 10 lux) for 3 times of the year: Noon for June 21, March/September 21, and December 21 (this is the maximum, average, and minimum illumination seasonally). Include plans, sections, and 3-D Axonometric for each of the specified times and seasons (e.g. this is a total of 3 times of the year with 3 drawings for each time). Take time to critique your Ecotect study: what is it telling you about the amount of light, distribution, and program needs? Do you have sufficient light? Experiment with the Ecotect model to see how design modification impact the quantity and distribution of light. *If you run into problems move back to design explorations and troubleshoot with Mary and the TAs on Monday. You will be asked to develop a written critique of your Ecotect Analysis for the final presentation on Wednesday, February 6.*
4. Develop a Qualitative Analysis of the Team's Proposal Using Photo-Documentation of 1/16" Model (1-2 hours estimated): After constructing the team model, use a sunpeg to photograph the model on the actual (yes – real) site. *Leave plenty of time to get a sunny day!* Please use a digital camera to document the following nine times of day for each of the 1/16" models (a sunpeg for 44° NL is in the climate data handout).
 - MARCH/SEPT. at 9:00, noon, and 3:00 (or 3 other times for the same day).
 - JUNE at 9:00, noon, and 3:00 (or 3 other times for the same day).
 - DECEMBER at 9:00, noon, and 3:00 (or 3 other times for the same day).
2. Monday, February 4: In-Process Pin-up for Phase 2.2 Due: sign-up for team critique (between 10-12:00 and in the afternoon); Please include: Daylight Program and Goals, Ecotect Study, and Qualitative Photos of the Team's Proposal.

FINAL PRESENTATION REQUIREMENTS FOR PROJECT TWO:

Final Submissions for Phase 2.1 and Phase 2.2

- **Due: Wednesday, February 6: Final Phase 2.1 and Phase 2.2:** pin-up by 8:45 on the courtyard (reviews at 9:00); All final materials are due on February 6.

Written Submission & Graphic Presentation Checklist for Project Two: Phase 1, Phase 2.1, and 2.2

Work as a team to prepare a graphic presentation using a vertical 24x36" format. *Please identify the name of the team member who developed the 1/32" and 1/16" design proposals. Label all plans, elevations, sections and other diagrams. Include graphical scale and indicate "north" direction on all plans.*

1. **Phase 1: Nature of Light:** Please include a graphic summary with all the investigations from Phase 1: The Nature of Light, include the following for each team member:
 - images and words from nature
 - 1/16" physical section models
 - photos of the models in the presentation
 - annotated 1/16" sections
2. **Phase 2.1: Light in Place and Time:** Please include a graphic summary with all the investigations from individual team members (identify team member's projects):
 - Exploratory studies (sketches, computer studies, photos, etc.)
 - 1/16" site/massing model (one per team member)
 - Annotated 1/16" Sections and Daylighting Concept Diagrams (one per team member)
3. **Phase 2.2: Light in Place and Time:** include the following for the team model:
 - Daylighting Program and Goals (written summary – team only for all work listed below)
 - Team Model: 1/16" Physical Site/Massing Model
 - Ecotect Study of the Team Model (noon for 3 designated seasons; 9 images: plan, section, axon)
 - Qualitative Photo-Documentation of 1/16" Model (9 times of the year)
 - Annotated 1/16" Sections and Daylighting Concept Diagrams
 - Written Critique: assess the Ecotect analysis and the photo-documentation to evaluate the strengths and weaknesses of the team proposal: 1) Ecotect: do you have enough light based on your program and goals? Critique the distribution of light pros and cons? 2) Photo-documentation of Model: evaluate the seasonal images from the 1/16" Photo-Documentation: what did you observe in the photographs? Evaluate whether the quality of light and patterns of light meet your daylighting goals and objectives. 3) Discuss whether there are any problems with solar control, comfort, glare, and heat gain? Discuss the strengths and weaknesses and identify any changes you would make to the team design.

PIN-UP: Bioclimatic Charette Boards: Please also pin up your Site and Bioclimatic Charette presentation

Grading Criteria: Project Two: 25% total grade

1. **Bioclimatic Charette: 15% (150 points – team grade only)**
 - 50 points: Clarity and craft of "Site & Bioclimatic Analysis" (team grade)
 - 50 points: Clarity, craft, and execution of design intentions demonstrated in the models and drawings (individual grade)
 - 50 points: Overall craft of presentation boards and drawings (team grade)
2. **Phase 1: Nature of Light: 10% (100 points – team and individual grade)**
 - 70 points: Clarity, craft, and execution of design intentions demonstrated in the models and drawings (individual grade)
 - 30 points: Overall craft of presentation boards and drawings (team grade)
3. **Phase 2: Light in Place and Time: 25% (250 points – team grade only)**
 - 125 points: Clarity, craft, and execution of design intentions demonstrated in the models and drawings (team grade)
 - 50 points: Clarity and accuracy of quantitative and qualitative analysis (team grade)
 - 75 points: Overall craft of presentation boards and drawings (team grade)



Goldsworthy, Schoorl, Provincie Noord-Holland, March 1999.

Movement, change, light, growth and decay are the lifeblood of nature, the energies that I try to tap through my work. I need the shock of touch, the resistance of place, materials and weather, the earth as my source. Nature is in a state of change and that change is the key to understanding. I want my art to be sensitive and alert to changes in material, season and weather. Each work grows, stays, decays. Process and decay are implicit. Transience in my work reflects what I find in nature. - Andy Goldsworthy