Title
The Zero+ Campus Design Project: Integrating Landscape and Architecture

Each building is a unique ecosystem within the larger ecosystems of landscape and region...
Ecologically designed buildings and institutions afford a chance to make such relationships explicit, thereby becoming part of the educational process and research agenda organized around the study of local resource flows, energy use, and environmental opportunities.


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Zero+ Background
The Zero+ Campus Design Project (Zero+ Project) has brought together the University of Minnesota’s Department of Landscape Architecture, School of Architecture, Institute on the Environment, Capital Planning and Project Management (CPPM) staff, and faculty and students to explore the integration of landscape and architectural design to reduce energy, carbon, water, and waste on the Twin Cities campus. The project has been supported by the Office of the Provost to develop a series of new courses to explore design methods and tools to integrate zero and low-emission, energy, water, and waste strategies and metrics in the early predesign and programming phases of planning for new campus buildings and landscapes. This paper will discuss the related Zero+ curriculum models and goals, assessment methods and tools, project outcomes, and lessons.

Zero+ Curriculum Models and Goals
During the past two years four courses have been offered using distinct formats to investigate the integration of landscape and architectural design strategies to reduce campus emissions, energy, water, and waste. The paper will provide a comparative analysis of four Zero+ curricular models, including: 1) a 7-week design studio, 2) a 1-week workshop 3) a 3-week summer studio, and 4) a 15-week seminar. The teaching and learning opportunities and constraints of each course will be discussed in relation to the course organization, learning goals, project requirements, design and assessment outcomes, and CPPM staff and stakeholder participation.

Zero+ Assessment Methods and Tools
The Zero+ curricula is based not only on teaching fundamentals of energy and environmental performance design strategies, metrics, and assessment tools, but also exploring the challenge of integrating tools across scales and disciplines. The paper will provide an overview of the working definitions and aspirations for “Zero+ design” and design tools and assessment methods that have been most effective in evaluating related performance metrics and design decisions at the building, landscape, and integrated design scales. Design tools and metrics will be discussed from three perspectives: 1) An “At-A-Glance Tool Overview” of the attributes and outcomes of assessment tools across topics and scales, 2) the “Top Ten” Zero+ Tools that have been most effectively integrated into the Zero+ curricula, and 3) custom “Zero+ Design Tools” developed to integrate design outcomes across topics and scales.

Zero+ Project Outcomes and Lessons
Students, faculty, and CPPM staff have identified a range of Zero+ best practices, design strategies, assessment tools, and environmental performance metrics that can be implemented over the short and long term on the UMN campus. The outcomes and lessons for the Zero+ Project will include:

- Challenges and opportunities of teaching interdisciplinary and performance-based Zero+ curricula.
- Overview of integrated Zero+ design strategies and metrics based on the UMN campus climate, site conditions, programs, and scale.
- Advantages and disadvantages of off-the-shelf modeling and assessment tools.
- Suggestions and lessons for integrating Zero+ design strategies, systems, and assessment tools in the early stages of programming and predesign.