FUNDAMENTAL SUSTAINABILITY AT CORNELL LAW SCHOOL'S NEW ACADEMIC CENTER

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INTRODUCTION

The New Academic Center achieved a LEED Platinum rating, the first for Cornell's core campus. While the obligation to meet the University's green building criteria was a given, the design was largely influenced by historic preservation and an interest in maintaining views of an historic quadrangle and valuable campus green space. These drivers led to a comprehensive design process in alignment with the University's long term goals for overall campus redevelopment. The first phase initiative, a below-grade classroom addition, provides new space for Law School programs in an exceptionally energy efficient building with concurrent environmental benefits, including preservation of open space and enhanced storm-water management. In addition, as a thoughtful addition to a landmark building, the project emphasized the use of both existing and local building materials.

KEYWORDS

Historic Preservation, Adaptation, Below-Grade Construction, Earth-Sheltered Construction, Green Roof, Thermal Mass, Energy Efficiency, Renewed Landscape, Campus Planning

BACKGROUND

Cornell University Green Building Requirements

Cornell University is committed to pursuing a reduction in Greenhouse Gas (GHG) emissions with the ultimate goal of "carbon neutrality" for the entire Ithaca campus by the year 2035. Simultaneously, Cornell continues to develop and modernize both programs and infrastructure. The first critical strategy in pursuing this ambitious goal is to prevent unnecessary growth in utility needs while building new facilities or undertaking significant renovations to existing facilities. Since 2000, the total square footage of the Cornell campus has grown by 20%, while simultaneously the campus energy use has remained flat. As a tool to formalize and enforce this commitment, Cornell requires the use of the United States Green Building

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Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) program as a process for evaluating, planning, and implementing sustainable practices, with a focus on reduced energy use.

1. All building projects shall utilize the LEED process with the goal of incorporating LEED strategies sufficient to achieve a LEED Silver rating.
2. All building projects with a total budget of $5 million or more shall be designed and constructed to attain formal certification with a LEED Silver rating as a minimum.
3. All building projects shall be designed to utilize as low an energy level as practical and be consistent with other building and program requirements. Total energy use shall be modeled to meet the following:

    - Total building energy use as modeled under the requirements of LEED Energy and Atmosphere strategy EA-1 shall be at least 30% below the baseline building as determined by the ASHRAE 90.1 standards applicable to the project LEED version. This energy reduction must be achieved at the building level prior to the incorporation of the University distinct energy system efficiencies modeled separately under ASHRAE 90.1 appendix G.
    - The design team and Cornell staff will conduct a workshop prior to energy modeling to define methodology, establish base case parameters, and to establish inputs such as schedules, energy costs, and climate data.
    - The project team shall target further energy reductions with a target of achieving energy usage at least 50% below baseline building energy use, while simultaneously targeting the following total building energy use, as predicted by an energy model: no more than 50,000 BTUs per gross square foot per year.

FIGURE 1: Arial View of Cornell Law School Campus, 2010.

Comprehensive Master Planning

In 2010, Cornell University engaged Ann Beha Architects (ABA) to develop an updated Master Plan and Conceptual Design Study for the renovation and expansion of the Cornell Law School (CLS) based on a target program and long-term strategic approach to address the deficiencies of the existing facility. Space for all CLS programs was limited, but classrooms, student services, and community gathering spaces were particularly inadequate. Even with student enrollment anticipated to remain near the current level, the registrar and the faculty agreed that a substantial increase in classrooms and a re-organization of sizes and room configurations were urgently needed. ABA brought a commitment to research early in the process and this led to an appreciation for and fundamental understanding of the unique context of CLS and the University's long term goals for the campus. The design team reviewed the University's extensive archive of construction drawings and technical reports and built upon previous programming and master plan efforts including:

1932 Jackson, Robertson & Adams Architect Design and Construction Documents
2005 Cornell Law School Update Master Facility Plan
2008 Cornell Master Plan for the Ithaca Campus
2009 Cornell Climate Action Plan
2010 Cornell Law School Site Development Guidelines

Architectural and Historical Context

The Law School quadrangle is situated at the western edge of the campus marking a boundary between the City of Ithaca and the main academic center. An important example of Collegiate Gothic architecture, the principal building, Myron Taylor Hall, was designed in 1930 by Jackson, Robertson & Adams. The iconic Peace Tower marks the entry between the library and classroom wings which are perpendicular to each other. With a retaining wall along the street, the two wings form the Purcell Courtyard, a ceremonial space used for alumni receptions and graduation. Preservation of the landmark building and site inspired a vision for a sustainable future as the siting and design of Myron Taylor Hall represents a true integration of building with topography, in which architecture and landscape work together to form a powerful sense of place. Archival renderings reveal the original architects' design aspirations. The first establishes the Peace Tower as an emblem of the Law School at the high point of a ridge. The axis under the tower to the inner courtyard beyond marks the primary entry to the school as well as a monumental passage to the upper campus from the town and open landscape below. The second view, of an open, terraced courtyard, shows how the architects integrated the natural topography and bucolic landscape of the upper campus into the core of the Law School quadrangle.

CONCEPTUAL DESIGN – TEAMWORK AND PLANNING

Alignment with the University Campus Plan

ABA's Master Plan drew inspiration from the original building and site but was also informed by, and aligned with, the University's long term plans for the campus. The project was required to follow site development guidelines developed by the Campus Planning Office to ensure both sustainable site design as well as a good fit as a major gateway and an edge to the Cascadilla Gorge. The 2008 University Master Plan recognized decades of encroachment on open

FIGURE 2: Rendering of the Peace Tower from the City of Ithaca, Jackson, Robertson & Adams, 1930.

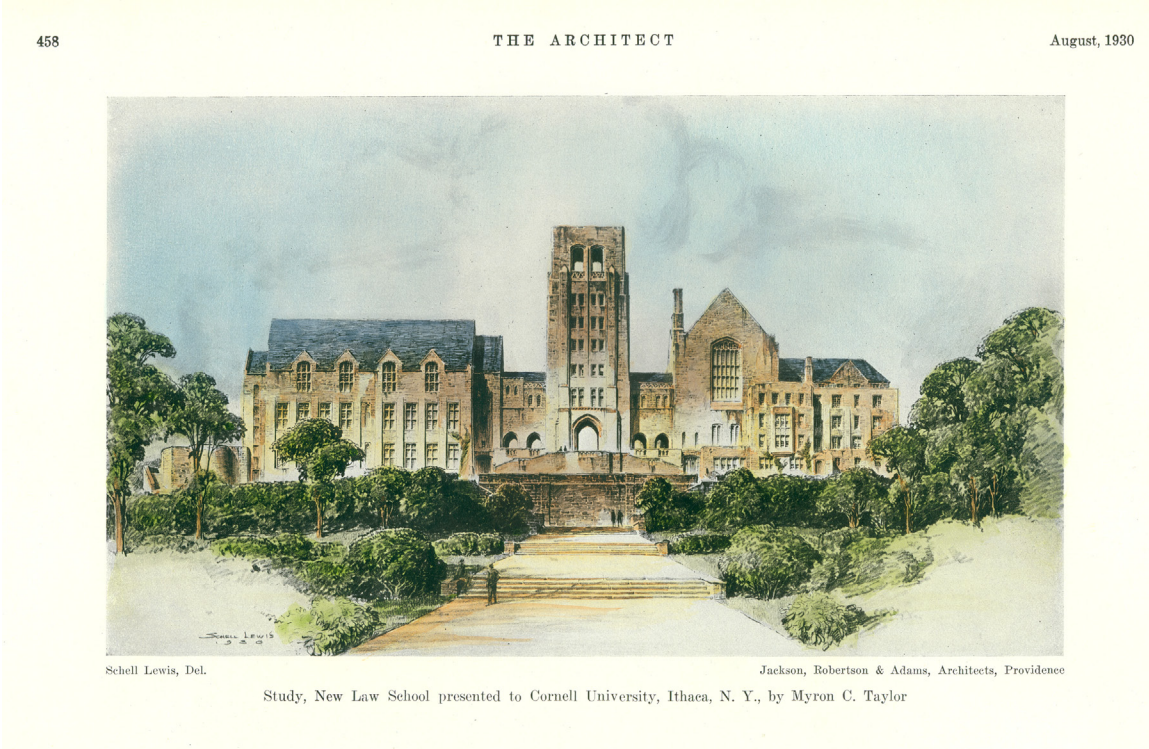
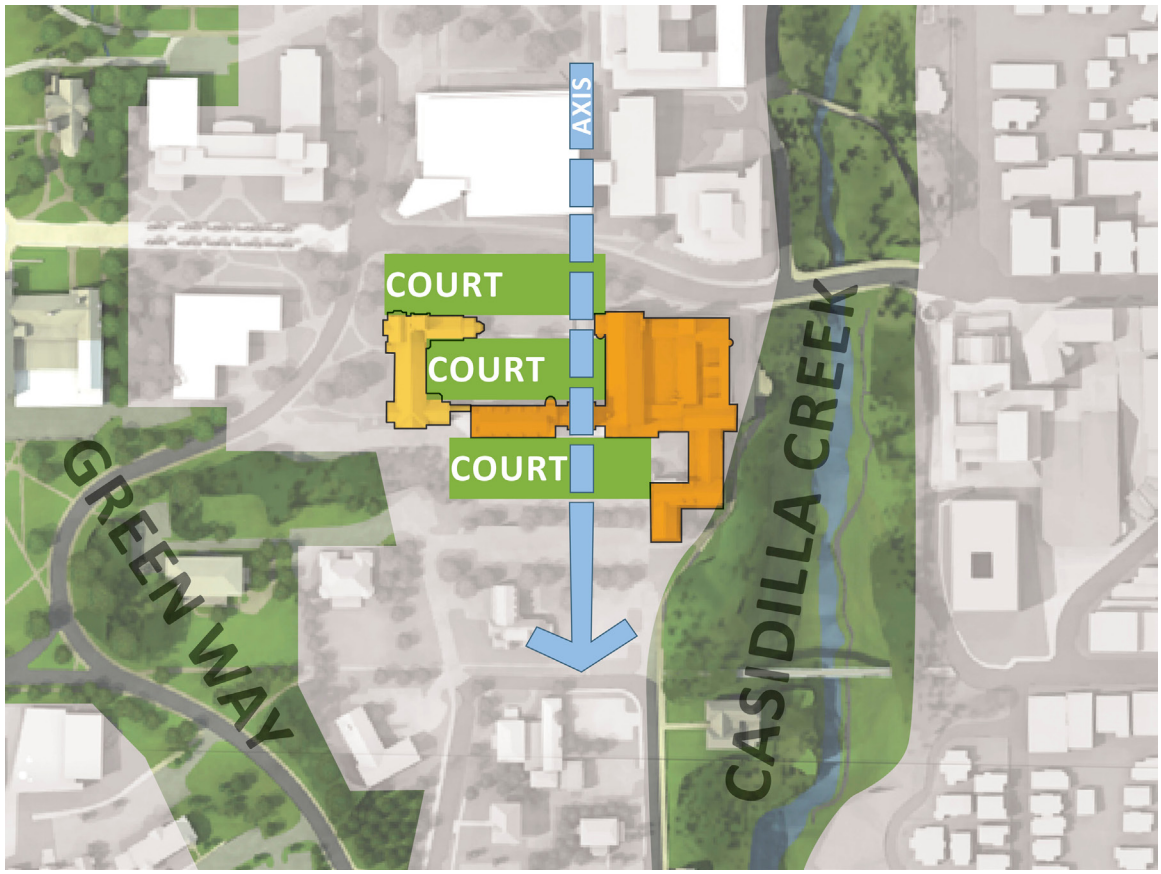


FIGURE 3: Rendering of Purcell Courtyard from the Cornell Campus, Jackson, Robertson & Adams, 1930.

space and the diminution of the original relationship of the campus to surrounding natural topography. The 2008 plan outlined goals for re-establishing a more natural landscape and critical view corridors across the campus, particularly along the sloping lawns between the core academic quad and the town to which the Law School forms a gateway.

FIGURE 4: The 2008 Campus Plan outlined goals for a more natural landscape and critical views corridors at CLS.



Site Development Guidelines

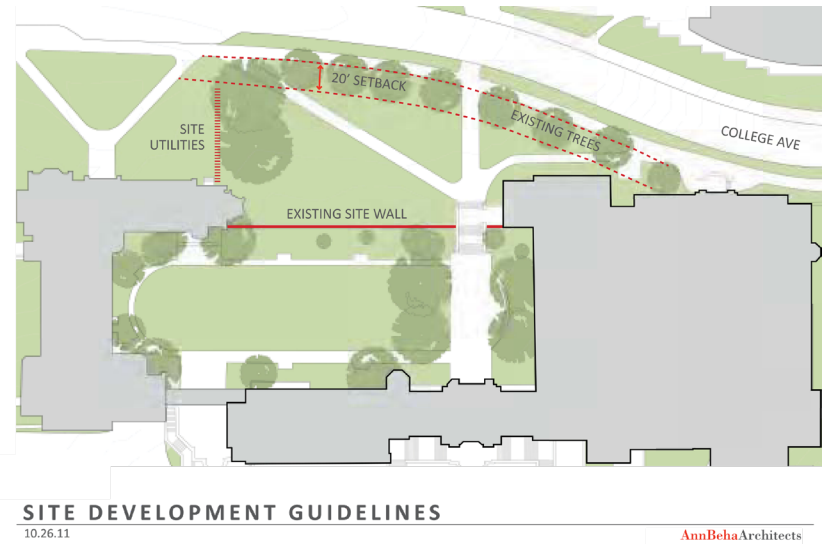
ABA Architects led several workshops with CLS leaders, University Planner, Mina Amundsen, University Architect, Gilbert Delgado, and the Associate University Architect, Andrew Magre, as well as staff from the campus landscape and accessibility committees to review goals and objectives from the 2008 Campus Master Plan and its specific implications for development on the CLS site. The dialogue and collaboration across multiple disciplines lent focus to the 2010 Cornell Law School Site Development Guidelines. University planners stressed the need for the preservation and enhancement of open space in an urbanized context and the reinstatement of trees, particularly street trees to strengthen the site's green infrastructure at the gateway to the campus. In addition, as a primary corridor into the campus, hardscape design and accessibility were serious issues for consideration where terraced courtyards, steep stairways and sloped walkways limited ADA access. Development of a bike lane and safer

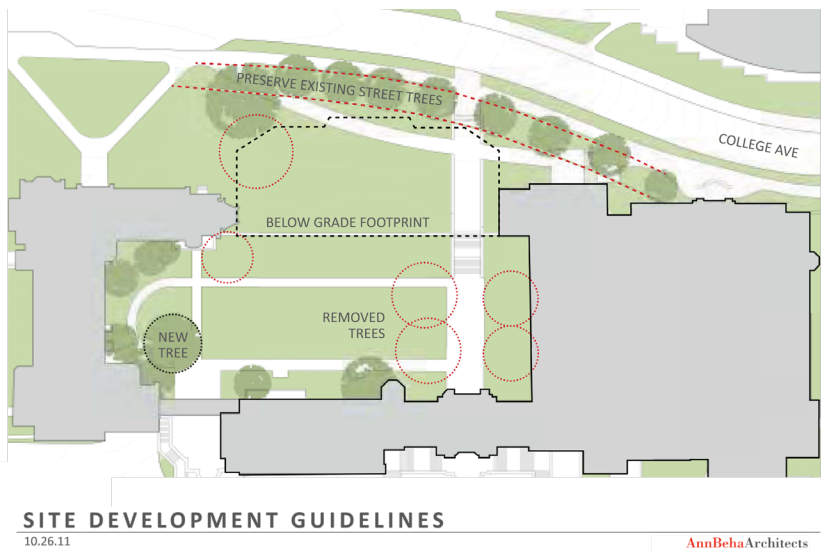
pedestrian circulation to and from the adjacent commercial neighborhood were articulated as essential goals. With input from diverse campus stakeholders, ABA established a series of guiding principles for future design and created diagrams to communicate and record the main priorities. These visual tools and detailed written principles became a benchmark for further discussion in Schematic Design.

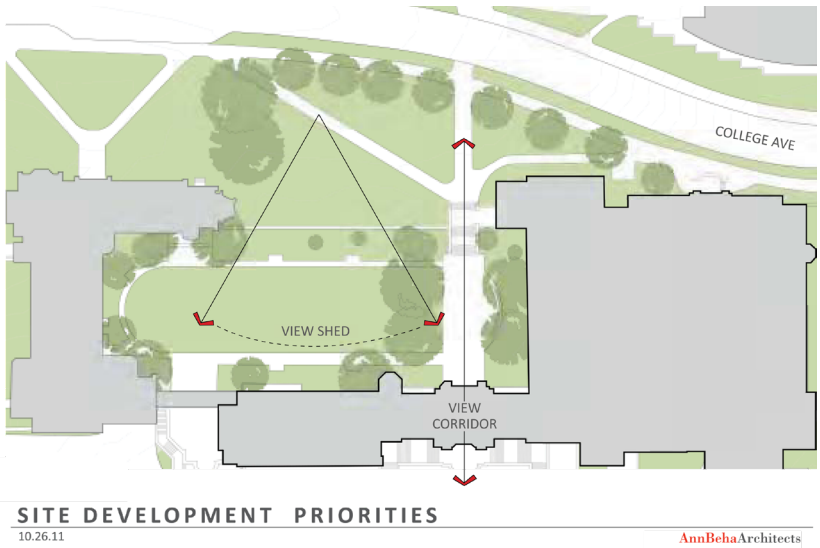
The Project Team confirmed these specific project goals with University campus planners:

- Enhanced accessibility to the Law School, specifically to Purcell Court
- Maintenance of street trees along College Avenue
- Preservation of open space and views to Purcell Court and to the Peace Tower
- Strategic removal of trees to promote views and daylighting
- A 35' setback from College Avenue for new construction to allow a future bike lane.

FIGURE 5: Site design guidelines included preservation of key views and clearances for street trees and a future bike lane.







SUSTAINABLE VISION FOR THE FUTURE

With the assistance of the Campus Planning Office, ABA's Master Plan realized a unique opportunity to provide for CLS's most pressing space needs and resolve deficiencies in accessibility while preserving historic campus views and landscape. Prior to engaging Ann Beha Architects, the Law School, faced with the inevitable need for change and growth, had planned a new four story building. This was to occupy the parking court immediately behind Myron Taylor Hall and would have blocked daylight and views from classrooms and offices and concealed the iconic gateway façade. ABA worked with leaders from CLS, including faculty and students, to understand not only program needs but the limitations within the existing building and courtyard. ABA led the school to a new and more sustainable approach in support of its long term needs. The team developed a plan for optimizing the use of the existing facility that focused on a three-phase strategy for renovation and strategically placed additions.

Phased Expansion

ABA's 2011 CLS Master Plan identified a phased construction and renovation approach, indicating that the existing architectural context should be respected. Design options concentrated on repurposing underutilized areas of Myron Taylor Hall and identifying strategies for new construction around Purcell Court, specifically:

- A new below-grade Academic Center providing three new classrooms and a reconceived Purcell Court.
- Reconstruction of an outdated library within the core of Myron Taylor Hall to provide a modern and technologically rich Learning Commons with newfound space for community gathering, conferences and events
- Renovation of an under-utilized dormitory for expansion of administrative offices and student service.

The Phase 1 Project, begun in June 2012, focused on limited renovations in Myron Taylor Hall to provide a new accessible entry along College Avenue and the construction of a new Academic Center below the lawn with direct access to an upgraded Purcell Court.

FIGURE 6: Diagram of Building and Renovation Projects identified in the 2011 Master Plan.

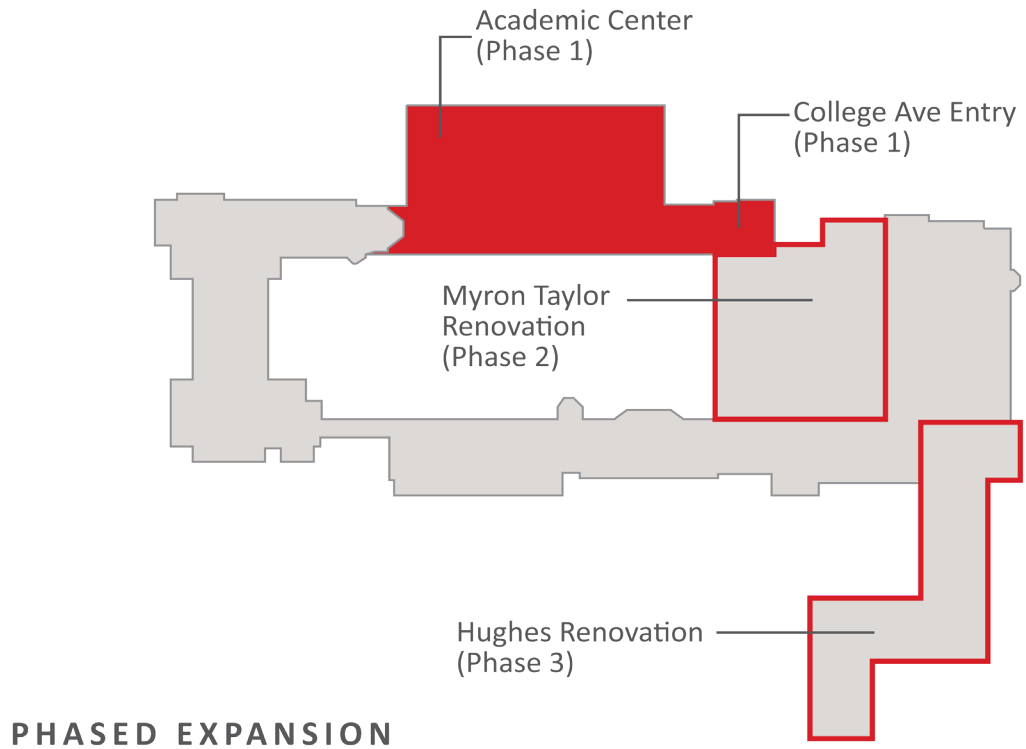
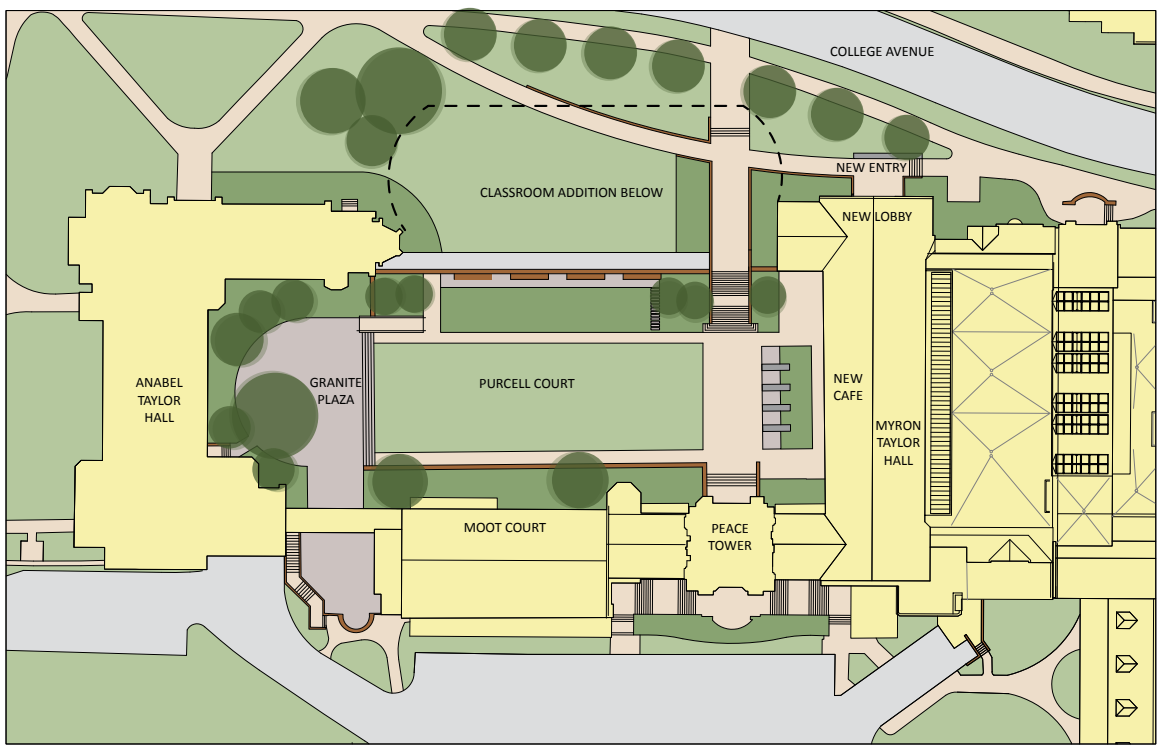


FIGURE 7: Phase I Site Plan.



New College Avenue Entry

The new entry was a key component in fulfilling Cornell's site development goals. With a strategic modification to an existing masonry façade, and by establishing an accessible route from the existing bus stop and ADA drop off, the new entry enhances the identity of the CLS at its most public face and addresses deficiencies in wayfinding and accessibility to the Law School. A new lobby provides direct elevator and stair access to the new Academic Center, to existing classrooms, gathering space, library, and to the Purcell Court. Key design features include:

- Modification of an existing masonry façade
- New accessible entry plaza with connection to bike racks and public transportation
- New lobby with elevator access to internal program spaces and the Purcell Court

FIGURE 8: A new accessible entry, carefully integrated into an existing masonry façade, preserves views to the open quadrangle and Peace Tower from the street and upper campus. Photo credit: 2014 David Lamb Photography

New Academic Center

Constructed below-grade along College Avenue, the Academic Center realized a unique opportunity to provide for the School's most pressing needs while preserving and enhancing open space and campus views, key priorities confirmed during the master planning process. The roof of the addition re-instates the existing lawn, trees and stone balustrade along College Avenue. With a 170-seat auditorium and two 78-seat classrooms, the new 16,500 sf facility enables the school to schedule large classes and host special events with access to a flexible breakout space and direct connection to the outdoors. New mechanical systems are located in a basement below the lobby. The facade is a contemporary composition of four bays projecting from a fieldstone wall, detailed and positioned to recall the former retaining wall of the court. The steel framed window system recalls the proportions and craftsmanship of the steel casement windows of the surrounding Collegiate Gothic buildings. Key design features include:

- Use of locally quarried fieldstone for the new facade
- Direct access to a revitalized outdoor space
- Extensive green roof deep enough to support both lawn and trees

FIGURE 9: A featureless retaining wall was replaced with a contemporary masonry and glass façade with views and access to the courtyard. Photo credit: 2014 David Lamb Photography

Photo credit: 2014 David Lamb Photography

FIGURE 10: The use of local fieldstone unites the interior gathering space with the outdoor court. Photo credit: 2014 David Lamb Photography

A Revitalized Purcell Court

The scope of the new landscape design evolved through the design process and the revitalization of Purcell Court became an integral component of the project. In order to maximize access to new and future gathering spaces and classrooms, the southern two-thirds of the court was lowered 28 inches. The northern end of the court and a deep planting bed along the west wing of Myron Taylor Hall maintain the existing grade. The monumental stair into the court was re-built, and new paved areas enhance outdoor programming for everyday as well as for special events. The traditional lawn was preserved and is large enough to accommodate a tent for Convocation and Graduation receptions, and for alumni events. Plantings maintain open views and access to sunlight. Paving materials, such as granite and concrete, complement existing bluestone terraces and provide the long term durability required by Ithaca's heroic winters. Key design features include:

- Lowering level of court to allow access to indoor program space
- Low plantings to increase daylight both inside and out
- Use of the open lawn as a storm water retention filter

ACHIEVING LEED PLATINUM – INTEGRATING THE VISION

The commitment to below grade construction grew out of a desire preserve views and open space and to align CLS expansion with long term campus master plan goals. By building

underground, we were able to provide 16,500 sq. ft. of additional program space with no new footprint. The final result looks simple and perhaps inevitable, which is certainly part of the project's success. But the technological coordination and construction management required were no small undertaking.

FIGURE 11: Construction of the below grade roof deck, November 2013.

Sustainable Site Design

In Schematic Design, the Project Team led by ABA and the Landscape Architect TWMLA, advanced the 2010 site development principles as the revitalization plan for Purcell Court and the design of the New Academic Center under the College Avenue lawn became more detailed. Excavation for the new wing was carried to the edge of the street. Existing trees had to be carefully removed and preserved during construction for later re-installation. The plaza deck was designed to maximize the height of interior spaces while also sloped for drainage and had to provide a loading capacity to support access for emergency vehicles. The deck accommodates 12-48 inches of soil and provides a sustainable foundation for the green roof plantings. While the project was able to protect or transplant and reuse several of the site trees and shrubs, newly selected and installed plantings are 100% native or adapted to thrive in the Ithaca, NY, Zone 5 climate. The Ithaca climate, while cold during the winter months, provides ample precipitation for plants to thrive. With careful plant selection, the entire project site, including the green roof, does not require or include permanently installed site irrigation. Plants have been hand watered for the first year in order to establish, but have since thrived.

While abundant rainfall provides an invaluable resource, site designers addressed the realities of stormwater runoff control and treatment before sending the water offsite towards its natural destination of Cayuga Lake via the picturesque Cascadilla Creek gorge. At the surface level, the inclusion of a green roof and extensive amounts of vegetated open space

served to slow and infiltrate precipitation. Soils at the site have been classified into Group B by the National Resource Conservation Service, meaning that they have a moderate infiltration rate. Infiltration of the site stormwater was the first strategy used to control excessive runoff and as an added benefit serves to recharge the underlying aquifer. The Civil Engineer, T.G. Miller, and University Landscape Architect took a lead role at these meetings in developing a storm water retention plan for the court.

At the subsurface level, a sand filtration and storm chamber system slows the rate of discharge to protect waterways and treats runoff by removing the entrained particulates. Pre-treatment for the filter is provided by 6-10 foot wide grass filter strips with cross slopes of about 2.0% along the entire perimeter. The holding capacity for the system is approximately 2,800 c.f. which significantly exceeds the calculated channel protection value of 920 c.f. for the receiving body (Cascadilla Creek). Runoff reduction in the form of infiltration and evaporation/evapotranspiration resulting from the installation of the green roof and sand filter exceeds the runoff reduction volume required by the State of New York which compares the developed site condition to the existing site as a baseline. Thus, the post-developed condition of the site has resulted in an improved hydrological condition. This treatment and storage system is located within the building central courtyard. Once completed, the system became part of the formal landscape, providing a flat grassy assembly space and a connection to the outdoors for building occupants. In part, due to the enclosed courtyard location, this system was selected for its low maintenance requirements since heavy equipment access is limited.

LEED credit calculation for roof and non-roof heat island effect impacts were complicated by the accessibility of the green roof structure. Green roof and pedestrian hardscape surfaces located over the occupied addition were considered rooftops while vegetated space and hardscape located adjacent to these spaces were assessed using differing criteria. Fortunately, the green roof areas represented sufficient square footage to qualify for the LEED credit despite the non-compliant SRI value that the concrete pedestrian hardscape represented on the building roof. During the project construction, the project landscape architect expressed concern regarding the stress that might be placed on rooftop vegetation and brought these concerns to the group. As a team, the designers and owner considered the overall impacts and agreed to lessen the thickness of roof deck insulation to allow for additional soil cover. The team consensus determined that this alteration gave the rooftop vegetation needed thickness for soil retention and root growth without significantly impacting the rooftop thermal performance.

Building Envelope

The below grade design led directly to dramatic benefits in enhanced thermal performance due to the extra-ordinary thermal performance provided by the extensive green roof and subgrade walls on three sides. The thermal gradient between the conditioned internal environment and the exterior is greatly reduced when comparing earth sheltered construction versus a traditional slab-on-grade structure. Extruded polystyrene insulation panels installed between the roof and walls further limited heat loss, while a massive 12 inch slab provides thermal mass. In addition, air infiltration into the space is minimized with only one side of the structure exposed to the exterior environment. The single exterior wall is well insulated with an assembled wall U value of 0.039 and steel storefront glazing and entry doors with argon filled low-e tinted double pane glass.

FIGURE 12: Re-instatement of street trees and lawn, November 2014.

Daylight Access and Control

Despite being a largely underground structure, the addition provides occupants with abundant natural daylight and access to exterior views. While the southwest facing glazing receives direct daylight for the much of the day, the light is diffused by the taller existing building directly across the courtyard. The softened natural light is allowed to filter into the interior teaching spaces through louvered wooden wall panels. Supplemental LED lighting along the exterior of the lobby is daylight sensitive, dimming to save energy and allows the natural daylight to achieve its greatest effect.

Mechanical Systems

The project Mechanical Consultant, Altieri Sebor Wiebor, executed their design according to the University Design and Construction Standards (http://cds.fs.cornell.edu/) in coordination with University engineers, utilities, and energy management staff. Several interdisciplinary sessions were held in which designers and campus staff discussed how Cornell's Green Building and Energy Use and Modeling Guidelines could best be achieved given the specific climate control needs and variable occupancy of the three new classrooms and flexible breakout space and how best to tie the new systems into campus steam and chilled water and other systems. The guidelines are generally non-prescriptive on how designers should achieve LEED and energy use requirements, but require coordination with the owner and mandate a LEED based charrette where specific sustainability project goals can be discussed, developed, and returned to project designers to be used as design criteria. In addition to the sustainability focused

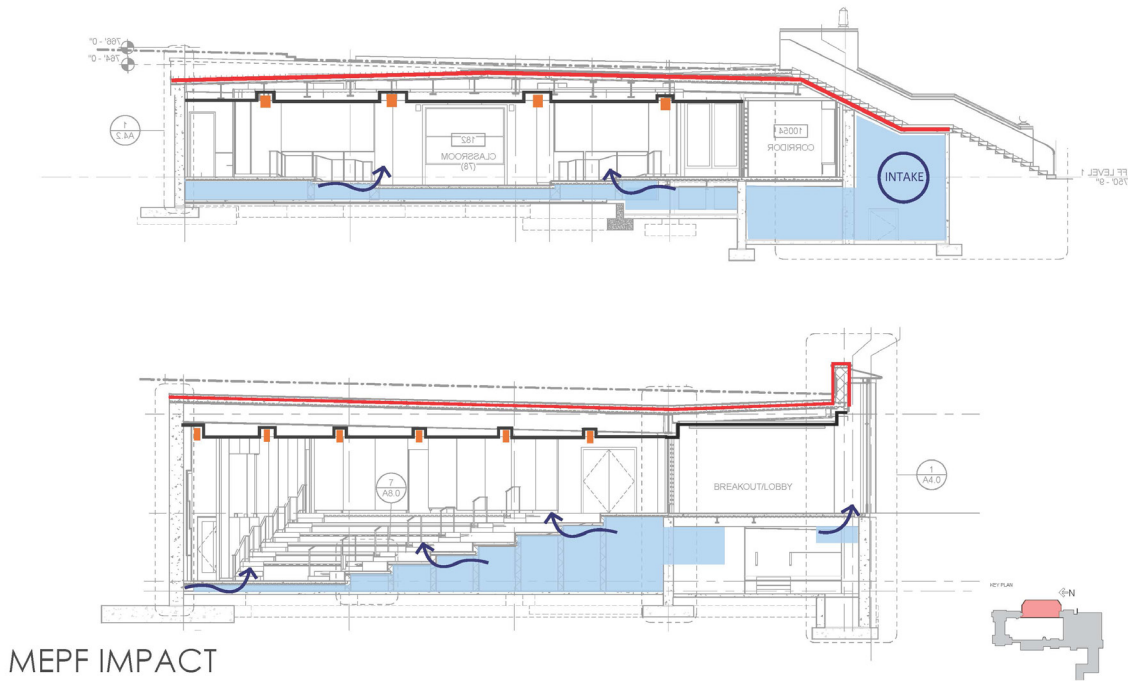
FIGURE 13: A louvered window wall introduces controlled daylight into the classrooms from the sun-filled Breakout Lobby. Photo credit: 2014 David Lamb Photography

LEED charrette that was held during the Design Development phase, the Project Team met for full day document review sessions at the ends of Schematic Design, Design Development and at the 50% Construction Document milestones to refine the plans and to confirm conformance with campus goals. The final result was a building conditioned with hydronic heating with demand controlled displacement ventilation providing fresh air and cooling using CO2 sensors installed in teaching areas with highly variable levels of occupancy. When classrooms are occupied and CO2 levels rise, they receive fresh air via low velocity air distribution through the floor. Fans slow or shut down when rooms are unoccupied. The lighting in these spaces is likewise occupancy based and deactivate when unoccupied. The mechanical design delivers comfort directly to occupants in a traditional and efficient manner.

Energy Management

As an addition to an existing building complex, the project faced one complication in pursuing LEED certification. The LEED Minimum Program Requirements require separate metering be installed for all facility utilities. In this case as is the case in many campus projects, the project is served by water, steam, and chilled water that are mechanically interwoven with the existing adjacent buildings. While the project installed separate meters for electrical use, it would be impractical and prohibitively expensive to attempt to separately meter the remaining utilities. The project successfully requested an exemption that this minimum program requirement be waived by the certification reviewers.

FIGURE 14: Diagrams of classroom air distribution system.



Energy Performance

Since 2008, Cornell has completed energy models for all new buildings pursuing LEED certification. Modeling for the law school project has shown the most dramatic savings over the baseline ASHRAE 90.1 model design energy use.

The building as designed delivers a modeled energy savings of almost 47%. The University central utility infrastructure delivers additional modeled savings using exceptional calculation methodologies (ASHRAE 90.1-2007, G2.5). Space heating is supplied via the central steam distribution system that is generated at the campus co-generation heating plant which along with the campus run-of-river hydroelectric facility provides approximately 80% of the campus electrical needs. Space cooling is provided using the campus chilled water that is generated at the Cornell Lake Source Cooling facility. This exceptionally efficient chilled water generation plant uses the deep cold waters of Cayuga Lake in a non-contact heat exchange facility on the lakeshore to provide cooling for the entire campus while at the same time reducing energy used on cooling by 86% and requiring no chemical refrigerants to operate. Chilled water loads on campus must all follow strict design and construction standards that ensure each gallon of water has the highest temperature rise possible to minimize pumping energy usage. Those standards include a mixing loop at each building to ensure a constant supply temperature to the loads, all two way valves, and variable speed pumping controlled by both valve position and differential pressure, and cooling coils selected with a 15 degree F temperature rise. The combination of these features results in a nearly 18 degree F temperature rise at peak loads, and nearly constant temperature rise as the flow varies with the cooling load.

Energy performance was further optimized with carefully considered HVAC systems designed to align with specific programmatic needs and automated building control systems. Although the current trend on the Cornell Campus is towards decoupling space conditioning and ventilation, the majority of the Law School building space is composed of auditorium seating creating a largely ventilation driven space. Supply air is preconditioned using energy recovery ventilation and the system utilizes recirculated air to conserve energy.

After incorporating these central plant and district efficiencies, the modeled efficiency at the Law School building shoots up to 64%, thereby capturing all of the 19 available energy efficiency LEED credits. Although not pursued within the project LEED application, additional opportunities for documenting district energy renewable supply exist. As a campus project with a district energy system, the project could have pursued EA-2 renewable energy credits from the run-of-river hydroelectric plant generation as well as a newly installed 2 MW remote net metered solar photovoltaic array which is dedicated to the operation of the Lake Source Cooling facility. This new PV array supplies approximately 40% of the required electrical pumping energy for Lake Source Cooling.

Building Construction – Execution and Realization

The process of creating a sustainable structure certainly did not end in the design phase. Sustainability Consultants Altelier 10, Cornell facilities engineers, and ABA collaborated to create bid specifications that not only outlined the overall project LEED requirements and integrated sustainable product requirements into individual specification groups, but also provided a contractor LEED reporting structure.

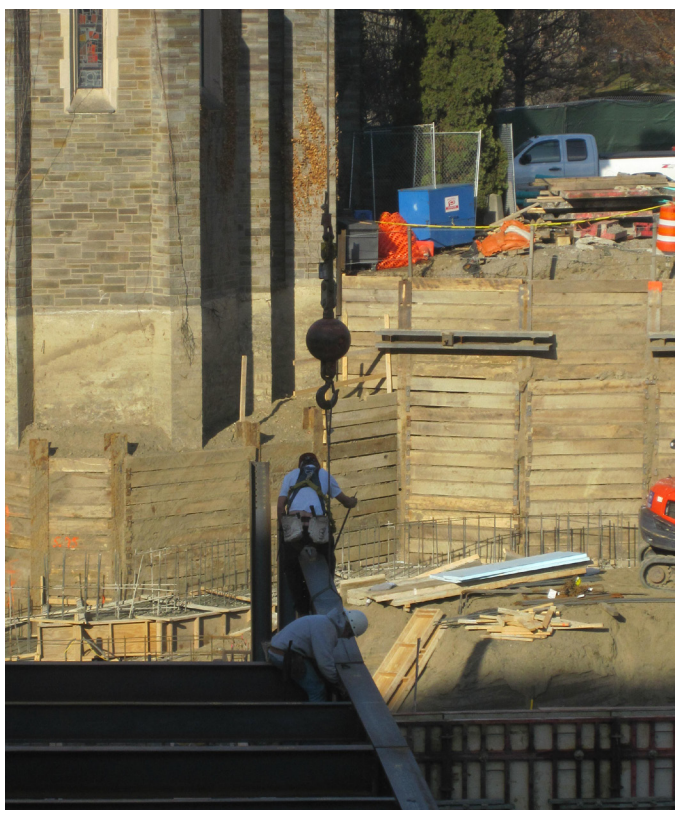


FIGURE 15: Sheet piles set for tall foundation walls.

Often on construction projects of this magnitude, LEED material submittal tracking is sporadic, and submittal quality varies depending on subcontractor familiarity with the LEED process. At the CLS project, a designated Cornell Facilities LEED project manager was responsible for reviewing and reporting on progress towards specific LEED credit categories. This data was collected and reported as the materials were approved by ABA which ensured compliance with the individual material sustainability requirements. When a deficiency in LEED documentation was identified, the Construction Manager responded by following up with the appropriate subcontractor while allowing the material to remain approved and usable at the job site. The deficiency list was maintained independent of the normal material submittal process, but was updated and discussed at each project meeting. In this manner, the three parties worked together to fully capture and document all of the product material sustainable attributes, without slowing the approval and construction process.

During the project constrution, special attention had to be paid to operating in an active educational setting. Noisy work and deliveries were typically scheduled during non-class times and all disruptive activities had to cease during exam periods. Strict indoor air quality hygiene was observed to protect the building occupants and prior to the project turnover, IAQ sampling was conducted to ensure fresh, clean air was present.

In December 2014, ABA led an initial post occupancy evaluation of the New Academic Center with users from the Law School twelve months following substantial completion. Reports indicated a high degree of satisfaction with the new program spaces, fitout, and overall environmental conditions. The School is currently pursuing the renovation of Hughes Hall (former dormitory) to expand admininstrative space and student services. This 2016 project is seen as an enabling project for future completion of the Master Plan.

CONCLUSION

The CLS Phase 1 project achieved LEED Platinum certification through a multi-disciplinary design approach, thoughtful integration of appropriate technologies, and a carefully managed construction process. As proud as the team is of this recognition, the greater achievement lies in the long term benefits derived from ABA's initial research, comprehensive design exploration, and commitment to the opportunities inherent to the site itself. Preservation of the existing historical buildings and landscape was the starting point for an open and inclusive design process which succeeded to formulate a plan for phased adaptations to meet the mission and program needs of the Law School well into the future. The Cornell Law School Master Plan and the Phase 1 Project exemplifies a fundamental approach to sustainability based on a careful balance and integration of technology and strategic design initiatives in support of campus wide goals for the use of natural and built resources.

PROJECT FACTS

Project: New Academic Center
Location: Cornell University, Ithaca, NY
Client/Owner: Cornell Law School
Design Team
- Architect: Ann Beha Architects, Boston, MA
- Landscape Architect: Trowbridge and Wolf, Ithaca, NY
- Civil Engineer: T.G. Miller, P.C., Ithaca, NY

MEP Engineer: Altieri Sebor Wieber, Norwalk, CT
Lighting Consultant: Horton Lees Brogden Lighting Design, Boston, MA
LEED Consultant: Atelier Ten, New York, NY
LEED Certification Coordinator: Matthew Kozlowski, LEED AP, Cornell Facilities Engineering

General Contractor: Welliver Mcguire, Inc., Montour Falls, NY

Project Size:

Renovation:	9,000 gsf
New Construction:	16,500 gsf
Site Area:	32,000 gsf

Project Schedule:

Design:	July 2011-July 2012
Construction:	June 2012-April 2014

LEED Certification:
LEED Platinum Certification Awarded November 2014, 83 Points Achieved Out of A Possible 110.

LEED AP: Jason Bowers AIA, LEED AP

USGBC CERTIFICATION SUMMARY

83 points achieved out of 110 possible points

21 Sustainable Sites (SS) Possible Points 26

The law school addition lies below-grade. By tucking the building underground, the team preserved open space and the historic character of the existing Myron Taylor Hall. A vegetated green roof improves both storm-water management and energy efficiency. The project is an infill project that increases the density of the central campus which is located conveniently nearby housing and is served by extensive public transit options.

8 Water Efficiency (WE)/Possible Points 10

All fixtures within the project are low-flow. Fixtures in adjacent buildings that would be utilized by project occupants were also upgraded. The building is projected to be 41.6% more efficient than similar baseline buildings. Landscape selections included only native and adaptive plants that required no irrigation to thrive in the local environment.

25 Energy/Possible Points 35

Because it is built below-grade, the building envelope's thermal performance is extraordinary. Coupled with modern HVAC and building automated control systems, energy performance is modeled at a 63.77% savings by cost.

6 Materials (ME)/Possible Points 14

Ann Beha Architects incorporated recycled content and regionally manufactured materials in the building and furnishings.

Over 20% of the material value was regionally manufactured and extracted including Finger Lakes Stone, a locally quarried used for patterned and irregular fieldstone wall construction and Woodbury Granite, a regionally quarried and manufactured product used for

landscape treads, custom curbing, and benches. Over 90% of the site construction waste generated at the site was either recycled, repurposed, or reused elsewhere and were diverted from offsite landfills.

13 Indoor Environmental Quality (IEQ)/Possible Points 15

All paints, adhesives, sealants, furnishings, flooring and wood products meet strict volatile organic compound limits. IEQ was protected during the project construction and the building air was flushed out and tested prior to building occupancy to ensure cleanliness.

Building ventilation responds to occupancy based on CO2 concentrations in the spaces thereby ensuring ample fresh air and energy use reduction

6 Innovation and Design (ID)/Possible Points 6

The project received exemplary performance credit for energy use reduction and open space created/preserved.

4 Regional Priority Credits/Possible Points 4

Photo credit: 2014 David Lamb Photography

BIOGRAPHY OF AUTHORS

Scott Aquilina, the ABA project manager for the Master Plan and New Academic Center at Cornell Law School, is an award-winning architect known for his leadership in preservation and in design for academic institutions, museums and the performing arts. He has a proven expertise in the integration of new program and systems within historic buildings, has provided sustainable design leadership, and has delivered projects which successfully meet program needs while maintaining budget targets. Scott Aquilina holds a Master of

Architecture Degree and Bachelor of Arts Degree from Princeton University. He has been an Instructor at the Boston Architectural College and a Teaching Assistant at Princeton University's School of Architecture and is an active member of the Society for College and University Planning. Scott recently accepted a position as a principal at Bruner/Cott & Associates in Cambridge, Massachusetts.

Matthew Kozlowski graduated from the Rochester Institute of Technology with a BS Degree in Environmental Management and Technology and is currently pursuing his Masters in the Baker program in Real Estate at Cornell University. Matthew came to Cornell University with a background in environmental consulting and brownfield remediation and currently works within the Cornell University Facilities Engineering Department. Initially hired to assist with environmental remediation and nuclear test reactor decommissioning projects, he helped develop the University green building program requirements, and now specializes in administering LEED green building design and construction for new construction and significant renovation projects at both the Ithaca NY and NYC Tech campuses.

Dr. Ying Hua's research and teaching activities demonstrate her passion in addressing the challenges for transforming the built environment toward more sustainable. Coming from architecture background, her work contributes to the development of strategies for the design, operation, and management of buildings to mitigate the risks and consequences of a changing climate. Two main topics of her research are human behavior and experience in the built environment, and building sector stakeholder engagement and impact on delivered building performance. Since 2010, Dr. Hua has been serving as the Co-Chair of the Working Group I: Buildings and their sustainable performance of the International Sustainable Campus Network (ISCN), and have been an active contributor to the Climate Action Plan and the collective effort toward campus carbon neutrality at Cornell University.