

Practical Experiences in Conservation: The Preservation Praxis Course

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Preservation Praxis is an *Advanced Technology Elective* offered jointly to undergraduates in The New School of Architecture of the Polytechnic University of Puerto Rico and students in the Graduate Program in Historic Preservation from the University of Pennsylvania. Representatives from two disciplines embrace the documentation, analysis and treatment of historic structures and sites through extensive archival, laboratory, and on-site experiences.

Focusing on conservation issues pertaining to specific architectural icons, students learn and apply the knowledge and skills required for interpretation and intervention of high-profile historic structures. Faculty and students target architecture of cultural relevance, engaging other institutions, decision-makers, and the community at large in understanding both their value and preservation possibilities. Hands-on workshops facilitate student training on traditional building techniques and methods.

The highly technical studies produced are made understandable to the public through presentations to children, youngsters, government officers, and professionals from the construction industry. Projects cover the full spectrum of conservation: historical research, building documentation, sampling of materials, scientific analysis, and the production of technical drawings and specifications. Students learn and apply theoretical knowledge and the practical skills required for the preservation of historic monuments and sites.

At the New School of Architecture of the Polytechnic University of Puerto Rico, the undergraduate Technology Component requires students to fulfill an advanced elective, after a sequence including *Introduction to Technology: Materials and Methods; Site Planning; Electrical, Acoustical and Telecommunications*, and *Environmental Systems*.

Profiting from its region's extended architectural heritage and centuries-old building stock, the school's curriculum incorporates *Architectural Conservation* as a pedagogical tool for training future architects, whether or not they become preservationists. Early drawing courses record historic buildings and a full Third-year studio is dedicated to theoretical and design issues related to Conservation. Historiography and Archival Research courses feed an interest that culminates in the opportunities granted by Preservation Praxis, where many skills are integrated. Graduate students in Conservation, on the other hand, have the opportunity to work in an integrated team effort with architectural students thereby enriching the perspective of each group. Conservation graduate students are provided a hands-on opportunity in which they assume the role of professional consultant. By focusing on the unique issues and problems associated with a specific case study, these advanced students have the opportunity to learn and apply the knowledge and skills required for their intervention and interpretation.

This is an elective course for upper-level (advanced fourth and fifth year) students in a five-year professional Bachelor's Degree in Architecture, and is offered jointly for graduate students pursuing a Masters' Degree in Historic Preservation. In support of this elective, which is integral to the New School of Architecture's purpose and program, an Architectural Conservation Laboratory has been fully equipped and is the only of its kind in the entire Caribbean region.

The school's curriculum endorses strong links with professional practice. As such, this course in particular, connects students with representatives from key institutions in the area of conservation: the State Historic Preservation Office, the National Park Service, other state and municipal agencies, the local chapter of the AIA and private industry. The work produced by this course won an AIA Puerto Rico Student Honor Award in 2003.

The course was offered during the Winter trimester 2002/03; Spring trimester 2002/03; and Fall trimester 2003/04. These dates correspond to a year-long course divided into three academic trimesters which was initially developed under an Architectural Conservation Planning Grant awarded by the John Paul Getty Trust to create and monitor these courses. Different sites have already been selected for the next course installment, beginning in the Fall of 2004.

The first part of the course included Documentation and Recording of the selected historic building and/or site. With a strong theoretical, historical and technological background, this segment aimed at teaching students technical aspects of historic preservation to become familiar with basic concepts and problems in the conservation of traditional building materials and methods. The availability, properties, and decay of diverse traditional construction materials were addressed: wood, stone, rubble-masonry, brick, adobe, earth. More recent materials were also considered: reinforced concrete and cement fabrics. Examples from different parts of the world, including the Caribbean region, were discussed. Historic building and site documentation and investigation were carried out extensively.

Students understood that contemporary intervention procedures may not be applied at random or in a general and indiscriminate manner without a prior and thorough understanding of the specific construction technology and the present state of a historic structure. *Historic Structure Report* contents and formats were discussed and real project documents were used as reference for class work. Digital technologies of photomontage, AutoCad overlays, and 3-D modeling were taught and used for graphic representations and final work.

Through a series of field exercises, students expanded their knowledge of traditional building materials. The course included class lectures, site visits, documentation of a historic building, the creation of a condition survey specifically produced for the building in question and the production of a set of As-Built digital drawings which included the building's realities and its particular conditions.

Students were endowed with technical vocabulary, knowledge and proficiency regarding traditional construction technologies, and contemporary building preservation/conservation techniques, thus promoting a higher level of technical responsibility.

Students were exposed to diagnostic techniques and possible architectural conservation philosophical alternatives.

The second part of the course was dedicated to Building Fabric Analysis and Performance. This segment of the course, which took place between field work and the Architectural Conservation Laboratory, provided students with one of the few, if not only, opportunities to experience first hand tactile relationships with primary raw building materials and their subsequent construction products. Laboratory experiments and exercises were designed to afford students the basic skills to understand and better manipulate the fundamental building materials of traditional architecture. The entire gamut of materials from inorganic to organic were studied and utilized in the laboratory to better arm the students with the skills necessary to evaluate how, where, why and when to intervene successfully into a historic structure with traditional materials as well as when to implement substitute contemporary building materials. These analytical laboratory skills provided the needed complement to the theoretical subjective design parameters which were covered in the student's curriculum and early parts of this course. Technical texts regarding different raw construction materials techniques and classification methods were discussed. Traditional mixes found in historic building specifications (mortars, plasters and lime washes) were discussed and prepared in class. Comparisons were made between prepared samples with varying aggregates and additives. Based on the conditions documented during the first part of the course, a sampling plan was prepared identifying the answers pursued through the building materials sample extraction plan. Samples extracted from the building were scientifically analyzed in the Architectural Conservation Laboratory and results were placed in computer digital formats which include high magnification photography through the microscope. The results were then discussed in order to propose intervention strategies and techniques compatible to the historic building fabric.

An Architectural Conservation Laboratory was designed and equipped to safely handle ten students and a small research group at any one time. Comparative collections and reference inventories of basic raw materials are maintained within these research facilities. Students were versed in scientific analytical procedures relevant to interventions into the built environment. They were also trained in the proper and safe use of scientific analytical equipment and materials. Participating students were provided with the opportunities to carry out the evaluation of a historic building from sampling to the development of compatible repair mixes. The students were trained in microscopic examination and reading of qualitative characteristics of raw building materials and the ability to discern changes through time.

The third and last part of this course was practical in nature and included Intervention Strategies for Architectural Conservation. Theoretical background which includes principles of

intervention, historical development and contemporary practice set the base for this hands-on course. Local conservation approaches to historic buildings and structures were studied through site visits and presentations by architects or designers of these projects. Intervention techniques such as masonry repair, grouting and cleaning were addressed, as well as the preparation of Construction Documents for Conservation Projects (drawings and specialized technical specifications which conform with the CSI format). Practical hands-on workshops prepared the students in traditional building methods and techniques. They learned the importance of understanding these processes in order to be able to specify them in construction documents as well as supervise the procedures themselves during project supervision. Compatible traditional mortar mixes were prepared and plastering and re-pointing of a simulated historic surface was practiced in order to train the students for an actual Site Conservation Program. A "mock up" was prepared on one of the walls of a historic building in order to test compatibility issues and check appropriateness and the effects of proposed intervention procedures.

Even though there was individual grading, based on class and field-work participation, most of the course work was carried out by groups of two to three students which contributed to the

overall project. The digital, layered drawings of the first segment of the course were evaluated through traditional architectural jury methods. The drawings were put up on the walls and evaluated as a set of architectural drawings. The Sampling Plans, Site Sample Log Books and Site Documentation Procedures of the second part of the course were evaluated by reviews of each groups' field and lab notebooks. The scientific lab analysis of the samples were graded according to accuracy of specific tests and conformity as a set. The complete class, interpreted the lab results. A final public audio-visual presentation of the project results was a course requirement which was also evaluated for clarity and conformity to the whole project. The practical third course segment required that the students kept individual photographic and written diaries of the training workshops, as well as the specific intervention techniques proposed on the selected historic building itself. These were individually graded for veracity of the material gathered as well as for systematic documentation of the work carried out in the field. Participation in all field work was required and graded for collaboration and level of participation. As a final course requirement, the students were individually graded on written technical conservation specifications for individual topics, which had to conform with the CSI format and the construction standards for Conservation Projects.





