

## **A6418 Building Diagnostics and Condition Survey**

Spring 2017, Mondays 10:00am-1:00pm, 655 Schermerhorn Extension (Conservation Lab)

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by appointment

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### **Background**

St. Bartholomew's Episcopal Church hosts a thriving congregation at 325 Park Avenue. The St. Bartholomew's Conservancy supports ongoing conservation work at the church, and they are currently preparing for the conservation of the triple French Romanesque Revival portal designed by Stanford White.

This portal was originally installed at the previous location occupied by the congregation, a church designed by James Renwick located on the southwest corner of Madison and East 44<sup>th</sup> Street. The congregation then moved to its present location when a new church, designed by Bertrand Goodhue, was consecrated in 1918. Goodhue modified his design to accommodate the beloved triple portal, which was dismantled at the Madison Ave. site and reinstalled on Park Ave. in 1916-17.

As part of a larger cooperative agreement with the Historic Preservation department at GSAPP facilitated by Dr. George Wheeler, the St. Bartholomew's Conservancy seeks assistance in preparing the baseline documentation and testing necessary to prepare for a conservation campaign on the triple portal.

### **Course Description**

This is a project-based course centered around ongoing restoration work at St. Bartholomew's Episcopal Church. Through lectures and field study, students will gain exposure to techniques of condition survey and diagnosing typical problems that occur on ornamental facades. The assessment of the portal will include a summary of its history and previous interventions, identification of materials of construction and description of current conditions, analysis of materials and their deterioration products, analysis of structural stability, and recommendations for future interventions.

Students will gain exposure to contemporary techniques in documentation including: using poles, lifts and a drone to capture visual information not available from the ground; creating 3D representations and orthophotographs of the portal using photogrammetry; using an AutoCAD workflow to generate measured drawings from photogrammetric results. Students will also gain familiarity with diagnostic and analytical techniques including: vibration monitoring, ground-penetrating radar, and XRD/XRF.

Information about previous interventions will rely on field analyses and significant extant archival material held by the church. Laboratory analysis will be performed using facilities at Columbia University, the Metropolitan Museum of Art, the Conservation Center at the Institute of Fine Arts of New York University, and field instrumentation provided by advising experts. The collective results will be compiled into a report that models an Historic Structures Report typically provided for a project such as this. Students will also communicate these processes clearly to the St. Bartholomew's Conservancy in a final presentation.

## **Deliverables**

- Background research using Church archives and other archival material in Avery and NY Historical Society
- Preliminary study in the form of drawing/annotated photographs
- Photogrammetric models of the portal in its entirety as well as models of specific regions of interest
- Measured line drawings of the portal and specific regions of interest
- Identification of key issues as well as appropriate analytical and diagnostic tools to assist in the resolution or more precise description of these issues
- Deployment of analytical and diagnostic tools
- Compilation of findings and development of recommendations
- Final report writing and illustration
- Final presentation

## **Course Requirements and Evaluation**

**Performance in the course will be evaluated on the following:**

- **Class participation**
- Individual and collective research, documentation, drawings and text
- **Final Presentation**
- **Final Report**

## Equipment and Software

During this course, students will use personal equipment, university equipment and equipment provided by instructors and outside partners. Students should treat all such equipment with equal care.

Students should plan to use their own DSLR cameras when available. Alternatively, the AV office at GSAPP has a number of DSLR cameras equipped with wide angle lenses available for 48-hour checkout (excepting weekends).

Two computers in the Conservation Lab are equipped with Agisoft PhotoScan Pro, and are available for use during this course. Students are also encouraged to download a free trial version of the software during the photogrammetry module, available through [www.agisoft.com](http://www.agisoft.com). Photogrammetric rendering is computationally intensive and is less time consuming on machines with 16GB of RAM or more.

Students who do not already have their own copy of AutoCad and ReCap should download and install student licenses for AutoCad (2015 or later) and ReCap. Those students who do not yet have a basic familiarity with Autodesk software should pursue the free introductory tutorials offered to all GSAPP students through Lynda.

Visit <http://old.arch.columbia.edu/resources/gsap-resources/lynda> and connect with your UNI. Focus on completing the tutorials for AutoCAD Essential Training.

## Schedule

Monday Jan. 23: Introduction (classroom session)

Jan. 30: Preliminary meeting with St. Bartholomew's Conservancy and initial description of portal (field session)

Feb. 6: Introduction to photogrammetry, documentation and conditions assessment, archival research (field session)

Feb. 13: Description of Agisoft to AutoCAD workflow, ongoing documentation and conditions assessment, archival research (field session)

Feb. 20: Group review of initial findings and results, ongoing documentation and conditions assessment, elevated photography (field session)

Feb. 27: ongoing documentation and conditions assessment, elevated photography (field session or classroom session as needed)

Mar. 6: Group presentation of baseline documentation and conditions assessment, identification of key issues to be resolved or described in greater detail (classroom session)

Mar. 13: SPRING BREAK

Mar. 20: Description of key diagnostic techniques to further explore issues identified in the first portion of the course (classroom session)

Mar. 27: Guest lecture by Andrew Smyth: vibration monitoring for the built environment, sample collection for lab analysis (field session)

April 3: Guest lecture by Gina Crevello: non-destructive evaluation for the built environment, deploying NDE techniques to answer questions raised in the first portion of the course, sample collection for lab analysis (field session)

April 10: Additional diagnostic tools, lab analysis (field session)

April 17: Additional diagnostic tools, lab analysis (field session), discussion of recommendations

April 24: Additional diagnostic tools, lab analysis (field session), DRAFT of final report due

May 1: Rehearsal of final presentation (classroom session)

FINAL PRESENTATION: May 8

FINAL REPORT DUE: May 12