

St. Andrew's Chapel

Preservation Plan

Preservation Studio, Fall 2010

Graduate Program of Historic Preservation,
University of Pennsylvania

ADVISORS & STUDENT PARTICIPANTS

ADVISORS

Randall F. Mason

Associate Professor and Chair

Graduate Program in Historic Preservation

Suzanna Barucco

Director of Historic Preservation

KSK Architects Planners Historians, Inc.

STUDENTS

Emily Aloiz

Henry Bernberg

Janelle Sahutski

Kim Broadbent

Samantha Driscoll

Rebekah Krieger

Olivia Mitchell

Betty Prime

Nathaniel Rogers

Sara Rogers

Tiffin Thompson

Rie Yamakawa

CONTENTS

ACKNOWLEDGEMENTS•V

EXECUTIVE SUMMARY•1

PRESERVATION PHILOSOPHY•3

PHYSICAL DESCRIPTION•5

METHODOLOGY•7

COMPARABLES STUDY•10

PHYSICAL IMPACT MATRIX•13

SITE EVOLUTION & HISTORY OF THE CHAPEL•15

GUSTAV KETTERER•25

SAMUEL YELLIN•29

NICOLA D'ASCENZO•39

DESIGNATION HISTORY•47

CHARACTER DEFINING ELEMENTS•55

PREVIOUS WORK•59

CONDITIONS•62

CONTENTS CONTINUED

CASEMENT WINDOWS•75

SCHIST•85

SLATE ROOF•91

CONDITIONS RECOMMENDATIONS•95

MOTHBALLING•103

DEMOGRAPHICS•107

STAKEHOLDERS•110

SWOT ANALYSIS•114

DESIGN PROPOSALS•115

PROPOSALS FOR THE DEANERY•135

FINANCIALS•141

MANAGEMENT SCHEMES AND FUNDING
OPTIONS•143

CONCLUSION•150

APPENDIX•152

ACKNOWLEDGEMENTS

Thank you to Suzanna Barucco and Randall Mason, our dedicated professors, for their guidance, patience, and confidence in us.

Thank you to the following community members and stakeholders for their time and interviews. For their candid responses and sincere interest in the success of our work, without which our project could not have been successful:

David Hollenberg – University Architect, *University of Pennsylvania*

Ed Datz – Executive Director, *Facilities & Real Estate Services, University of Pennsylvania*

Tuomi Forrest – Associate Director, *Partners for Sacred Places*

Cindy Roberts – Executive Director, *Parent Infant Center (PIC)*

Robert Lundgren – Landscape Architect, *University of Pennsylvania*

Rich Kirk – *The Calvary Center for Culture and Community*

Chadd Stevens – Database Manager, *Facilities & Real Estate Services, University of Pennsylvania*

Barry Grossbach – Board of Directors, *Spruce Hill Community Association*

Ann Kreidle – Manager of K-12 Partnerships, *Penn Partnerships Planning Office*

Andy Meloney, Community Planner for West Philadelphia, *Philadelphia City Planning Commission*

Rob Rogers – Canon for Finance, *DIOPA of the Bishop's Office of the Episcopal Diocese of Pennsylvania*

Julie Althoff Bush – *Lager Raabe Skafte Landscape Architects, Inc.*

Noreen Shanfelter – Executive Director, *University City Arts League*

Thank you to the numerous research institutions and archives in Philadelphia which were a wealth of information for historic research, design documentation, and models:

The Athenaeum of Philadelphia

The Architectural Archives at the University of Pennsylvania

Facilities & Real Estate Services at the University of Pennsylvania

The Philadelphia Historical Commission

EXECUTIVE SUMMARY

This report seeks to present a preservation plan for St. Andrew's Chapel, a former divinity school chapel located in West Philadelphia, Pennsylvania. The chapel, designed in the Collegiate Gothic style by local Philadelphia architecture firm Zantzinger, Borie, and Medary, is located on the

northwest corner of the 4200 Block of Spruce Street. A monumental entranceway leads up to a soaring, vertical jewel of a building that seemingly comes from another time and place. Sadly, it has been without a use for several decades. St. Andrew's Chapel proper, along with its attached deanery, was the focus of this year's Historic Preservation Studio. The goal of the project was to consider the structure holistically with the aim of creating a feasible strategy that would enable it to return to its former glory through revitalization and renewed use. This report is the culmination of the studio's findings.

The report opens with some insight into the studio's working process. The sections on the Methodology, Comparable Sites, and Physical Impact Matrices illuminate the means in which the studio began to focus its initial ideas.

A critical tenet of the preservation discipline is the recognition that tracing the history and evolution

of sites, structures and buildings offers particular insight into their particular character and value as heritage, while also providing an ethic for future decisions. Following the sections on process is an overview of the history of the Chapel and Deanery up to the present moment, from the sociocultural currents relevant to their building to their fall into disuse. Special Reports on the nationally recognized artisans who were commissioned to execute the chapel's spectacular decorative program provide compelling evidence for the building as an exceptional *Gesamtkunstwerk*. These works of the 'allied arts'—along with other elements that the group deemed essential to the chapel's identity as heritage—are discussed in the Character Defining Elements section of the report.

A history of the various conservation campaigns opens the chapters documenting the current conditions of both the chapel and deanery, which have been surveyed and are described in detail.

Additional Special Reports on particular issues include the following: the casement windows of the deanery, the mechanisms of deterioration within the schist, and the current state of the slate roof. Recommendations for future work to address these conditions and active mechanisms have been prioritized and hierarchically organized in terms of their urgency and cost.

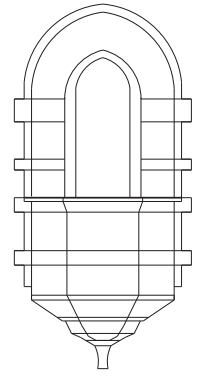
An analysis of the neighborhood's demographics—along with an analysis of the current strengths, weaknesses, opportunities, and threats facing the chapel—introduces a range of proposals that the group determined would mitigate harmful impacts and reinvigorate the vacant structures. Three schematic proposals are structured around a principle re-use of the chapel's open nave. Ordered on the basis of impact, these are: re-use as a performance

space, recreation center, or envelope for sensitive commercial infill. Additionally, two smaller interventions for hospitality or retail conversion could be used in multiple scenarios, and are considered in this section. A brief look at the financial implications and management schemes that would play a critical role in these reuse schemes follows these proposals. Finally, the report concludes with a recap of the final presentation and the discussion that followed.

We present our interpretation in this report with the hope that it will be a catalyst for the University of Pennsylvania to reconsider this building and its rich potential, while also recognizing the particular challenges of responsible stewardship for this exceptional asset, so that it may be sustained for generations to come.



Hammerbeam Truss



PRESERVATION PHILOSOPHY

Our team's approach was to find a feasible reuse for St. Andrew's Divinity School Chapel and deanery that stabilizes the structure; maintains the integrity of the spaces in order of their relative importance; and is sensitive to these character defining elements: interior massing, local materials, local craftsmen, landscape of the site, the spruce street entrance, choir stalls, windows, and doors. In addition, the reuse should enhance the overall quality of the Spruce Hill neighborhood whilst filling a need identified by

interviewing the stakeholders and conducting a neighborhood survey. The chosen reuse of St. Andrew's Chapel should complement the current block use by the Parent Infant Center and the Penn Alexander School, and consider the role of the University of Pennsylvania as property owner. In order to be successful, the team considered a range of different reuse possibilities using the above-mentioned framework, in an effort to determine a reuse that is both realistic and creative.



Flèche



PHYSICAL DESCRIPTION

St. Andrew's Chapel and its attached deanery residence are collegiate gothic structures built by the Divinity School of the Protestant Episcopal Church of Philadelphia in 1925. They were designed as part of a complex campus

masterplan that was never realized in its entirety. The attached structures are roofed with slate and have exterior walls of Wissahickon schist accented by cast stone belt courses, coping and window trim. The chapel is crowned with a metal flèche that once rose approximately 50 feet above the 75-foot peak of the gable roof.¹ The chapel and deanery are designed in the spirit of a simplified English Perpendicular that evokes the streamlined Art Deco sensibility that reigned during the era in which they were built.

The main entrance to the chapel is from the south via an elaborate double staircase rising from the sidewalk of Spruce Street. The three-story chapel contains a central nave surrounded by auxiliary spaces in the place of traditional gothic aisles. The basement consists of a vaulted crypt accessible from Spruce Street and in the rear

are unfinished support spaces with reinforced concrete piers. An interior wooden stair leads to an entrance vestibule on the eastern side of the chapel. These stairs continue to a second story room containing a decorative wrought iron gate and railing, possibly by Samuel Yellin. This stair hall, part of the transept, accesses the sacristy, choir vestry rooms and a hallway leading to the ambulatory on the north end of the chapel. On the west side of the chapel are bathrooms, a classroom, and a winder staircase accessing the organ loft and pulpit. A small room beyond the staircase accesses yet a third staircase that leads downward to the library of the deanery, (*See Appendix: Architectural Drawings*).

The auxiliary spaces surround the tall central volume of the sanctuary space, 74 feet in height, 28 feet wide and 124 feet in length

from the altar on the north end to the double entrance doors at the south end. The chapel's original function as a divinity school is reflected in the arrangement of the space in the traditional collegiate chapel form, essentially one great choir and altar space without traditional forward-facing pews for a congregation. The gray stucco walls of the sanctuary soar straight up to the hammerbeam ceiling without interruption. The ceiling of the entire sanctuary space is formed of hundreds of painted panels depicting biblical themes punctuated by the polychrome hammerbeams. Each hammerbeam ends in the head and torso of an angel, whose clasped hands provide the anchor for the space's only artificial light sources, simple circular iron luminaires. Clerestory windows of pastel colored cathedral glass fill the space with light, while the second story room on the east and organ loft to the west open onto the space through tripartite colonnades.

Entrance doors from the front vestibule lead into the south end of space, which contains commemorative wall plaques, a narrow winding stair to the deanery library on the west and double doors leading to an entrance hall and barrel vaulted hall on the east. Tiered pews, now in storage, originally faced one another across a central aisle. Still remaining in place are oak choir stalls along the outer walls to the transept. The stepped floor that held the tiers of pews has been covered with plywood flush to the level on which the choir stalls sit. The stalls are crowned with an elaborate gilded canopy of carved wood and composite. The canopy is a confection of gothic flamboyant spires accented with polychrome checker patterns.

The marble altar at the north side of the chapel is surmounted by a reredo containing paintings of the eleven disciples, a tall painted panel with the ghost of a cross (now removed), with elaborate gilded wood and composite canopies above. The whole composition is crowned by three lancet stained glass windows by Nicola D'Ascenzo. On either side of the altar are two gothic profile arches, the east arch filled by a wrought iron gate by Samuel Yellin. The second gate has been removed and is now stored behind the eastern gate.

The attached four-story deanery residence consists of a windowed finished basement, a main floor and two upper stories. The most ornate space in the deanery is the double-height library adjacent to the chapel. The space contains wood paneling, two-story leaded glass bay window and a large stone fireplace. There are leaded glass casement windows throughout the building. The floors of the deanery have been transformed from a residence by subsequent occupants and partitioned into many small rooms.

¹ Gary W. Gredell, P.E. of Gredell & Associates Structural Engineers, "Structural Review of St. Andrew's Chapel" (February 15, 1993). The upper third of the flèche has been removed and is stored in the chapel's ambulatory.



METHODOLOGY

Each of our twelve person team elected to take on the site specific studio project of finding a use for a vacant church. We split ourselves into smaller groups to address the context of the building: history, mapping, social/economic data,

existing conditions, policy and comparables, (*See Appendix: Methodology, 1*). The finalization of our site as St. Andrew's Collegiate Chapel and deanery took place a week later. Because of this late start, we only had nine weeks to complete this project, (*See Appendix: Methodology, 2*).

We felt it was important for all of us to go to the site as soon as possible. We were awe struck by the interior of the chapel; its immense long, thin nave with intricate polychrome details in the artistic works. The deanery was much less attractive with peeling paint, obvious vandalism and collapsing plaster. The allure of the historic chapel drove us to concentrate on its unique needs for our studio. In hindsight more consideration of the auxiliary spaces may have been warranted.

We pursued our individual group projects while meeting occasionally as a group with key stake holders such as Ed Datz of the University of Pennsylvania and Tuomi Forest from Partners for Sacred Places. Techniques we used throughout the project to analyze and document the church included archival research, interviews, visual observation, GIS mapping, plan drawings, axiomatic drawings, site evolution mapping, photography, digital 3D modeling, digital renderings and construction of a physical model and chapel interventions.

We synthesized our small group research with a class presentation on October 25th. During our next group meeting, we listed building and site fabric we considered important by small group, then narrowed the list down to the characteristics we all agreed upon—those became our character defining elements. At this point we also began to consider reuse.

With the help of comparable religious projects to use as typologies, we began to eliminate incompatible types. In hindsight this may have been too early in the process to eliminate use ideas.

With our possible reuses we created matrixes to rate the impact—high, medium or low—each use would have on the character defining elements and on the surrounding community defined as the Penn Alexander Catchment area. Another project began at this meeting was to divide into separate small groups to survey the catchment area for other examples of our top typologies—office/nonprofit space, restaurants, and performing arts center.

After looking at the typologies of the comparables, the considerable deterioration conditions and the lack of pressing community needs, we decided that it was not feasible for one tenant to take over the entire chapel and deanery. We decided to divide the space into multiple smaller uses which we presented during the midterm review. The approach of one proposed reuse package with many parts evolved into three different reuse schemes. This change came primarily through the influence of the design charrette in Johnstown, PA the weekend of November 19th that two group members took part in. Their presentation of a variety of potential uses for a set of vacant churches without a specific tenant in mind stimulated discussion and new ways of thinking about and visualizing the sacred spaces. This approach seemed like a better deliverable to give to our client in order to showcase the many possibilities that exist for adaptation and broaden their approach to the

site. At this point we re-examined potential site uses including a library, a church, and installing a climbing wall in the chapel. The library and the church were both eliminated due to the high cost of fixing the building envelope and the challenges of floor space in the long, thin nave.

On November 25th, we created a reuse matrix of three schemes: office, performing arts center and recreational facility. These are named for the use that would fill the sanctuary; each scheme is still mixed use with elements such as a café or restaurant filling auxiliary spaces. Many of the elements such as a café could be used in multiple schemes. At this point we also weighted the historical elements according to their tolerance for change from low to high. The deanery is much more flexible to adapt than the chapel due to its modest interior and traditional residential plan, whereas the massing of the interior of the chapel has a very low tolerance for change and hindering it would compromise the historic character of the structure.

At this point in the semester we had already chosen our individual projects and deciding how to elaborate the three schemes for the report and presentation was a challenge. Some of our projects dealt with aspects of reuse design such as the insertion of floor plates into the chapel, but addressing the feasibility and design of all of the space uses was not manageable in the time we had before our final presentation.

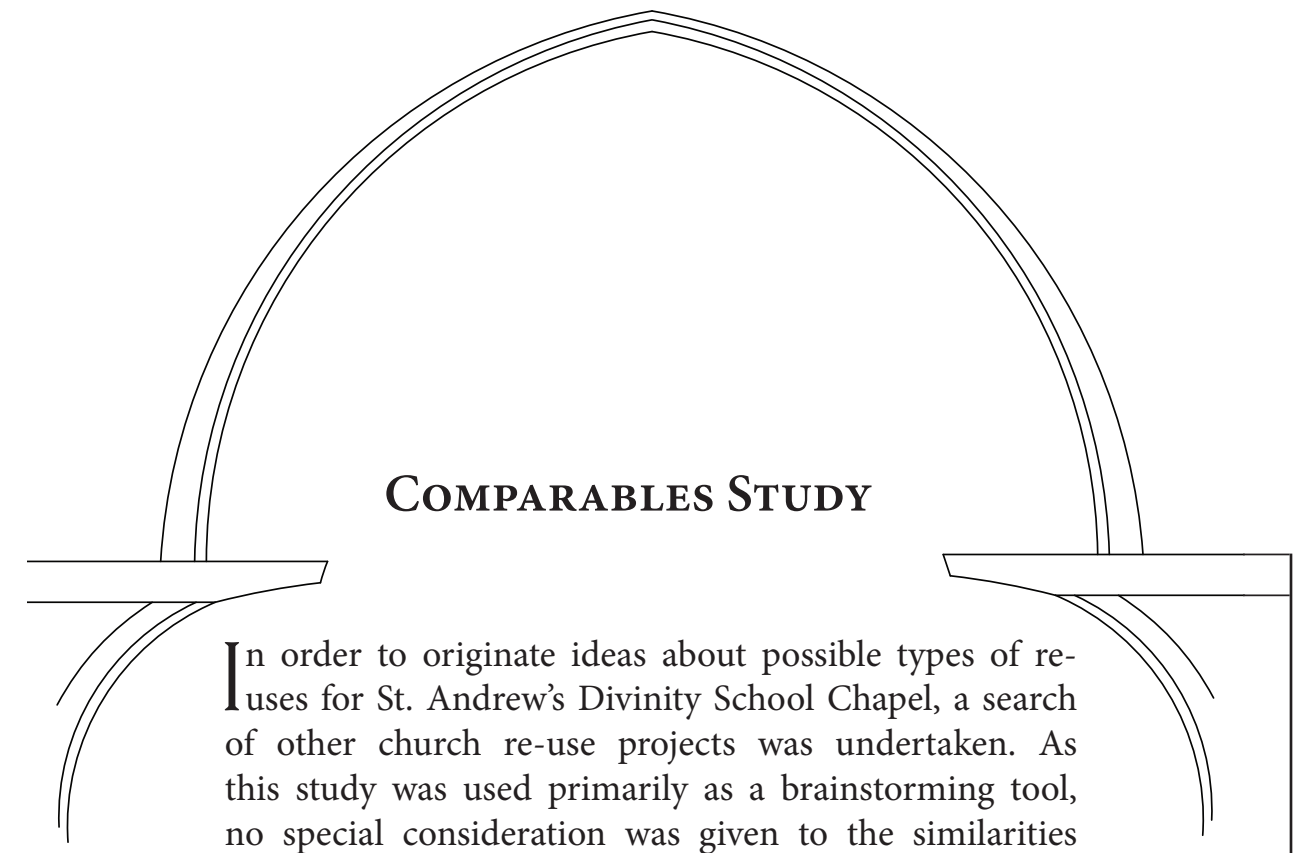
For the final presentation we wanted to integrate the research we had done in the past with

our individual projects to make the presentation a cohesive whole. As a group we created an outline for the presentation. We grouped the outline by topic, assigned a time limit for each and designated a person to speak. Our goal was to minimize extraneous information, cut the number of speakers and make the presentation more cohesive than the mid-term review. A significant challenge to our presentation was the fact that our primary stakeholders and the owners of the property could not attend the presentation at 2pm on December 13. We felt it was necessary to

present what we found to our "client" in hopes that our research shed usable information on how to best maintain the physical fabric as well as stimulate creative thought into a long-term tenant for the site. We presented an abbreviated version of the presentation to Ed Datz and David Hollenberg two hours before our class presentation. Through both of our presentations we hoped to draw attention to the incredible opportunities afforded by St. Andrew's Collegiate Chapel and deanery.

INDIVIDUAL PROJECTS:

- Conservation Recommendations for the Slate Roof
- Conservation Recommendations for the Deanery Casement Windows
- Conservation Recommendations for the Wissahickon Schist Masonry
- Creation of a 20 year Plan to Prioritize Interventions
- Cost Analysis
- Multi-Level Floor Insertion Proposal
- Chapel Floor Interpretive Installation
- Interpretive Panels
- Library Cafe Intervention
- Deanery Ground Level Restaurant Intervention
- Landscape Design
- Light Study
- Recommendations for Mothballing



COMPARABLES STUDY

In order to originate ideas about possible types of re-uses for St. Andrew's Divinity School Chapel, a search of other church re-use projects was undertaken. As this study was used primarily as a brainstorming tool, no special consideration was given to the similarities

of the examples' architectural style or massing to the chapel at St. Andrew's. Instead, this study was approached from the perspective of programmatic typology, and the feasibility of these different typologies for our site. These typologies were discussed primarily within the context of the chapel's stakeholders, prospective users, and availability of funding sources. It is important to note that because St. Andrew's Chapel is owned by the University of Pennsylvania, there is more flexibility in the choice of reuse—if it was owned by an archdiocese, things would be different, as explained by The Boston Globe in a 2008 article, "When selling a church, the archdiocese issues a request for proposals. The goal is to select a buyer whose plan is consistent with the church teachings and social mission."¹

Residential

In the initial search, residential church reuses were the most common. Sanctuaries and

adjacent buildings have been repurposed for condominiums as well as rental apartments. The largest concentration of residential examples found was in Boston, where the problem of vacant church reuse has been most prevalent. According to an article in the Boston Globe, "The Roman Catholic Archdiocese of Boston shuttered 65 parishes instituting a sweeping parish consolidation in 2004. At least 30 properties have since been sold, many to developers eager to turn an old church into trendy housing."² The team identified several residential re-uses in Boston: St. Theresa of the Child Roman Catholic Church in Watertown, MA became the Bell Tower Place condos in the hands of a developer, as did Sacred Heart Catholic Church in Ipswich, becoming Bell Manor. Residential church conversion was not limited to Boston, however, and the team was able to find two examples within Philadelphia—832 Lombard Street, which was converted into a private residence, and Cloisters, a garden apartment

complex of which St. Agatha's Roman Catholic Church and annex are the central buildings.

Office

Office space is another church reuse that was common in our initial searches. However, the majority of the office examples did not include the office within the sanctuary space. The Righteous Babe Record offices at the Hallwalls Contemporary Art Center in Buffalo, NY has office space located in the ancillary spaces on the site, comparable to the deanery on the St. Andrew's Chapel site. In this specific reuse, the sanctuary space is utilized as a flexible performance space. The Church of New Jerusalem located at 22nd and Chestnut Streets here in Philadelphia is currently used as office space for a few different companies. In this case, three office floors were inserted into the main sanctuary space with a glass curtain wall facing the altar. This particular reuse allowed our team to think more broadly about the ways to interpret the office reuse for St. Andrew's Chapel.

Restaurant

Surprisingly, the reuse of vacant churches as restaurants was something that was particularly prevalent in our study. In most cases, the decorative architectural elements within the church sanctuary serve as a striking interior design element and add cache to the given restaurant interior. David Dworsky, general manager of Mark's American Cuisine in Houston, Texas had this to say about the restaurant interior, "Eating here is definitely

a religious experience. Everyone who walks into the restaurant, their jaws drop."² In the case of Mark's American Cuisine, as well as Mad River Bar & Grille in Charleston, SC; the Church Brew Works in Pittsburgh, PA; and the Terrapin Restaurant in Rhinebeck, NY—the church interior enhances the visitor experience, and even has the affect of drawing people to the restaurant.

Art Center/Community Center

Because of the nature of the sanctuary spaces of vacant churches, the art center or community center is a popular reuse for churches. In addition to fitting within the architectural constraints of the building, a use such as this continues to serve a function in the community as the church once did. According to the Institute of Sacred Architecture in the article entitled "A House Rebuilt," "The preferred use is to find another religious organization in need of space... When an ideal tenant cannot be found, the most likely reuse is to find a function that continues to serve the community in a public way."³ The McColl's Art Center in Charlotte, North Carolina, houses gallery/exhibition space as well as classroom/teaching space and studio spaces that are available to artists through the artist in residence program. In this case, a structure was inserted into the sanctuary to create a multi-level gallery space. In New Orleans, St. Alphonsus Church is used as an Irish Cultural Center, and St. Cecilia Church is used as a day center for the elderly. Neither of these uses required any redesigning of the sanctuary space. Also, the Cohoes Public Library in Cohoes, NY is located in the former St. John's Episcopal Church building, and the

sanctuary space is used for the book stacks.

Performance Space

As mentioned earlier, in the Hallwalls Community Art Center in Buffalo, NY, they have office space as well as a flexible performance space. This reuse is common for many churches that either don't have a lot of money, or are hesitant to do any extensive renovation in the sanctuary space that would do away with some of the decorative architectural elements. According to Nola.com, "... developers say (churches) are most easily adapted into concert venues, reception halls or visual art centers, all of which require a large amount of open space."⁴ The Calvary Center in West Philadelphia has a theatre troupe, which utilizes the sanctuary space for its productions, but they have not physically altered the space in any way. In Philadelphia, the Iron Gate Theatre at Penn and the Temple Performing Arts Center are both former churches, and in the case of both of these projects, significant alteration has been made within the spaces in order to accommodate more people for performances on a larger scale, as well as the technical facilities required for performances of a given size.

Conclusion

As stated by the Institute of Sacred Architecture, the team believed, "These buildings represent the heart of their neighborhoods and communities. They act as beacons, landmarks, and community centers. To abandon them functionally is sometimes a

necessity, but to lose them architecturally is simply wrong."⁵ After examining these different typologies and some of the specific reuse projects that represent them, it was determined that residential would not be a use to pursue for the St. Andrew's site. The team knew that its location on the same block as the Parent Infant Center and the Penn Alexander School would present a problem for residential reuse not only from the perspective of the stakeholders, but also the end user. Each of the other use typologies was seen as having some benefit to the surrounding Spruce Hill neighborhood, as well as being physically feasible within the constraints of the structure. As a result, the remaining use typologies served as a framework through which to continue our analyses.

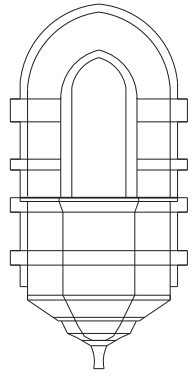
¹Kathy McCabe, "Repurposed Under Heaven," *The Boston Globe*, July 27, 2008, http://www.boston.com/realestate/news/articles/2008/07/27/repurposed_under_heaven/.

²Kate Moran, "Closed Churches Take on Many New Roles," Nola.com, April 12, 2008, http://www.nola.com/news/index.ssf/2008/04/closed_churches_can_take_on_ma.html.

³Kimberly A. Kloch, "A House Rebuilt," *Sacred Architecture Journal*, 13 (2007) http://www.sacredarchitecture.org/articles/a_house_rebuilt/.

⁴Kate Moran, "Closed Churches Take on Many New Roles," Nola.com, April 12, 2008, http://www.nola.com/news/index.ssf/2008/04/closed_churches_can_take_on_ma.html.

⁵Kimberly A. Kloch, "A House Rebuilt," *Sacred Architecture Journal*, 13 (2007) http://www.sacredarchitecture.org/articles/a_house_rebuilt/.



PHYSICAL IMPACT MATRIX

The physical impact matrix and the neighborhood impact matrix were tools used by the team to better understand the affects of the different reuse typologies on the building (*Physical Impact Matrix*) and the Spruce Hill neighborhood (neighborhood impact matrix). The physical features chosen for the physical impact matrix were derived from the character defining

elements, as well as from conversations amongst the team about materials concerns. The reuse typologies were then applied to these factors, and under each typology the physical feature was given a rating of impact—low, medium or high. The same methodology was used for the neighborhood impact matrix; however, the factors utilized were ones pertaining to the greater

Physical Impact Matrix

Degree of Physical Impact Matrix	Arts Center			Performance Space			Office		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
Interior Massing	x			x	x				x
Wissahickon Shist	x			x			x		
Slate Roof	x			x			x		
Landscape	x			x			x		
Spruce Street Entrance	x				x			x	
Choir Stalls		x				x			x
Windows	x			x			x		
Doors	x				x			x	
Stained Glass	x			x			x		
Ironwork	x				x		x		
Interior Finishes		x				x			x

neighborhood and not just the site. Early on in our brainstorming process, these matrices helped us to visualize the areas where we were deviating from our preservation approach/philosophy, and refocus our attention on the optimal reuse possibilities. It is important to note, however, that the rating system was not clearly defined prior to the matrices completion,

and it is possible that there were discrepancies in different team members' interpretation of the rating system. In addition, the recreation center is not one of the typologies considered in our matrix. This reuse opportunity was brought to our attention later in the process when two teammates attended a charrette where a recreation center reuse was proposed.

Degree of Physical Impact Matrix	Restaurant			Church			Maintain			Mothball		
	Low	Medium	High	Low	Medium	High	Low	Medium	High	Low	Medium	High
Interior Massing		x		x			x			x		
Wissahickon Shist	x			x					x			x
Slate Roof	x			x				x			x	
Landscape	x			x			x			x		
Spruce Street Entrance		x		x			x			x		
Choir Stalls		x			x		x			x		
Windows	x			x				x		x		
Doors			x		x		x			x		
Stained Glass	x			x			x			x		
Ironwork		x		x			x			x		
Interior Finishes			x	x	x			x		x		

SITE EVOLUTION & HISTORY OF THE CHAPEL

In order to best facilitate a preservation plan for the St. Andrew's Chapel, it is necessary to understand its previous history and context. The following report will cover topics pertinent to the history and contextual understanding of the chapel.

Starting with a description of the site, this section will also cover information about the property exchange, the Philadelphia Divinity School, the design competition, the architects, and architectural merits of the Chapel.

Site:

The area to the west of the Schuylkill River had remained largely undeveloped even as late as 1850. Before that time, most of the establishments on the far side of the river were charity houses or institutions catering to the disabled and poor. However, the expansion of the railroad encouraged the growth of small villages, which were incorporated into the city limits in 1854. At the same time, a bridge of the Schuylkill allowed for the extension of the horse drawn railcar into West Philadelphia and thus beginning the push west. A historic map by R.L.

Barns that dates to 1855 indicates that westerly construction does not exceed past 38th Street.

The following decades brought West Philadelphia into the spotlight. First, in 1870, the University of Pennsylvania purchased a large plot of land just across the river and relocated their campus from old city to the new plot. The Presbyterian Hospital also moved across the river. Wealthy Philadelphians, wanting to escape the congested downtown, began purchasing plots of land in what then seemed to be a healthy distance away from the city. According to a note written by someone visiting the city, the most prestigious addresses were located between Market and Pine streets, west of the Schuylkill River.¹ Additionally, the 1876 Centennial Exposition attracted 10 million visitors to the city. Many of the attractions were located on the west bank of the Schuylkill, which promoted traffic through the growing suburb. A visitor



Figure 1 View of Chestnutwold Estate described the area as:

One of the most attractive sections of the city, blending as it does, the beauties of both country and town. It is a location much sought after for private residences and consequently is filled with handsome edifices and delightful villas.

These combined factors helped to instigate a second major growth spurt. By 1895, development had crept to 45th street. A map dating to 1910 shows considerable growth in the western part of the city.²

The block on which St. Andrew's Chapel sits remained a small oasis, untouched by the rapid development that took place around it in the late 19th century. Clarence H. Clark, President of the Centennial National Bank, was a wealthy

businessman who saw opportunity to the west of the University of Pennsylvania and purchased a considerable amount of land early on. He chose the 4200 block between Locust and Spruce as land on which he would build his own residence and sold off the other parcels of land over the years.

According to an article written about Clark, his estate—known as Chestnutwold—reflected his particular appreciation for horticulture. Oaks, chestnuts, and azaleas surrounded a conservatory, and many of his close acquaintances assumed that he would leave his property to the city as a public park.³ In 1909, however, he bequeathed a large area of land to the city now called Clark Park and Chestnutwold was eventually demolished and the property sold.

The 4200 block between Locust and Spruce



Figure 2 View of the landscape of Chestnutwold

must have looked much the same when the Divinity School purchased the property in 1917 as it did when the Clark family lived there. A report about the Chapel published in 1823 noted the importance of the landscape to the overall design, (Figure 3):

It was determined to maintain the natural configuration of the ground and adjust the plan of the buildings to it because the whole site was covered with an exceptional growth of old trees, so fine that both architects and trustees regarded their preservation not only as a priceless accessory of natural setting but also as a sort of public trust for the benefit of the surrounding neighborhood.⁴

All of the numerous old trees were marked on the architectural plans and historic photographs from the time of the property's purchase show proof of their abundance. The sensitivity of the design was such that, despite drawing over 20 buildings across the property, only three trees had to be sacrificed. Unfortunately, a number of trees were cut during construction of the Penn Alexander School in 2004.



Figure 3 The property—from the corner of Lucust and 42nd Street—before the design competition.

A description of the site of the Divinity School was published in an article written in a 1923 edition of *Architectural Record*. It draws attention to the importance of the topography and natural landscape, and refers to it as a place, “of highly diversified undulating surface, retaining all of its original contours unchanged from the time when it was an urban estate.”⁵ Indeed, the variance of the elevation across the site is significant: a total of 41 feet. The architects clearly considered this fact as they laid out their plans. The chapel was located on the a very high point adjacent to the most severe change in elevation. The effect is impressive—the Chapel reaches effortless up through the trees into the sky.

The Philadelphia Divinity School and Design Competition:

The history of St. Andrew's Chapel dates back to nearly a century before any thoughts about it specifically had even been conceived. At the beginning of the 19th century, the Episcopal community in Pennsylvania was considering the idea of establishing an Episcopal Seminary

within the state. Efforts taken by the first bishop of the Diocese, William White, between the years 1817 and 1820, brought the idea very close to reality. Unfortunately, the establishment of the General Seminary in New York City around the same time forced White to give up his project. Nevertheless, in 1857 the Bishop of Pennsylvania, The Right Reverend Alonzo Potter, founded The Divinity School—a smaller and less well-funded concession, yet a place for residents of Pennsylvania to educate themselves on the topic of religion.

Lacking facilities, the students at the newly established school began taking classes at the Episcopal Academy. However, within a few years, the Divinity School had garnered enough support to purchase a building at 3901 Walnut Street in West Philadelphia. The school expanded rapidly, and within a decade more land was needed in order to accommodate the growing number of students and teachers. As a result, a plot on Darby Road (now Woodland Avenue) was purchased between 50th and 51st streets. This soon also became too small and by 1915, the Board of Trustees recommended that the Divinity School purchase the Clark Estate. The large property with its natural retreat-like qualities appealed to the School and they purchased it in 1917 for \$200,000. The other sites were sold the following year to help finance the new endeavor, which was to be an “institution of self-contained life,” meaning all activities and ceremonies were to take place within the property's confines.

Setting up a competition, whereby several architecture firms were asked to submit proposals, in order to select a design had been common practice for many years. Early on, these competitions

had been open to the public and architects submitted drawings for free. Success in the prestigious competitions could launch those lucky enough into stardom, while others would gain no rewards. This system did not appeal to many architects and certain members of the AIA thought it promoted shortsightedness. In 1910, the members of the AIA passed a measure that banned these open competitions in favor of competitions open to a small handful of firms.

The AIA code promoted the concept of the competition as a contract between the client and a select group of architects. To this end it required the client to hire a ‘competent advisor [who] . . . should be an architect of highest standing and to let a jury of architects make the decision.’ Most important, it endorsed the ‘limited’ rather than the open competition, that is, a competition limited to a small number of invited entrants all of whom would receive payment for their drawings.⁶

As this type of competition took hold, it became less and less ethical for AIA members to participate in the larger, open competitions.

By the time of the competition for the Divinity School design the small competitions had become standard. Five architecture firms, from Philadelphia to Boston, were contacted to submit proposals to a completion for the design of the campus. The firms included:

- Zantzinger, Borie, and Medary of Philadelphia
- Cram and Ferguson of Boston
- Tilton and Githens of New York
- Rankin, Kellogg, and Crane of Philadelphia
- Allen and Collins of Boston and New York

The president of the University of Pennsylvania's Architecture School, Warren P. Lair was the advisor for the competition.

A program for the competition, a copy of which exists in the Architectural Archives at the University of Pennsylvania, in the Laird Collection, stipulates the requirements for the submission, (*Figure 3*). Of utmost importance was the "scholastic and religious character," which the program says, "should be brought frankly to public view." It cites the positive relationship that the University of Pennsylvania maintains with the public as a goal for the new religious campus, "Therefore the architectural expression of the institution, on this side of its activities, should be the reverse of a sheltered and monastic seclusion."⁷ The academic buildings, library, and Chapel are all mentioned as buildings that will serve both the school and the community, and it was stated that these buildings should, "constitute the two foci of equal interest or significance," and should be given, "positions of chief distinction."⁸

Collegiate Gothic

The Collegiate Gothic style seems to have been on the minds of the committee as the program for the competition was laid out. The language of the requirements, as well as a few instances where it is said outright, suggests that the school did not want to be associated with old ideas of religious life. Rather, by starting afresh and by building their own identity, both figuratively and metaphorically, they could establish themselves within the neighborhood as both an intellectual and spiritual escape.

Gothic architecture had flourished in the

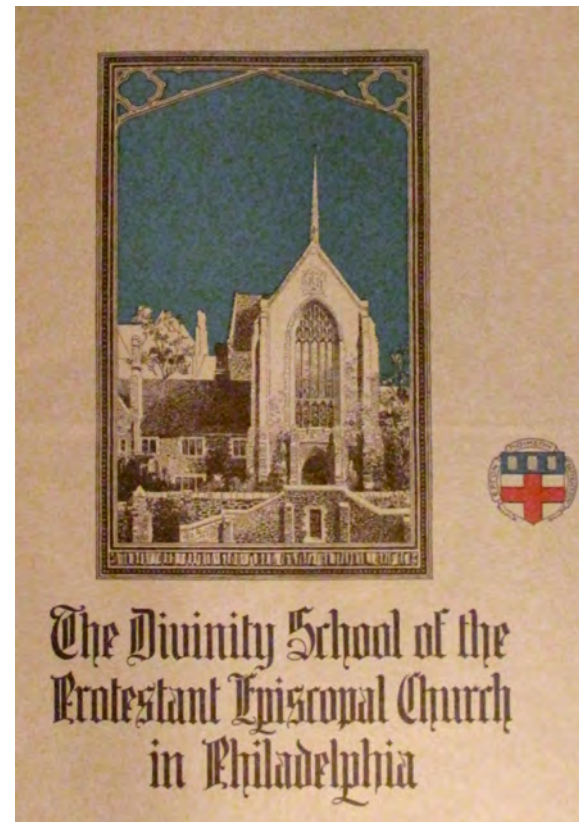


Figure 3 Title page for the report on the school

15th and 16th centuries in Europe. This period was followed by the Renaissance and as that style took hold, Gothic was reduced to nothing more than pointed arches and tracery windows. Despite this decline, however, certain buildings from that era persisted and were even restored. The revival of Gothic architecture began in the mid 18th century when, "buildings were erected inspired by Gothic for its own sake, rather than being modeled on Gothic to conform to earlier examples."⁹

The acceptance of this style rose out of a nostalgia for what people considered a romantic past, enhanced by the growing number of ruined cathedrals and other religiously affiliated

structures. Additionally, the writings of theorists from the time greatly influenced people and were widely read. John Ruskin reflected on the moral superiority of the medieval world and the need for those ideals to be reconsidered in contemporary life. Architecture was built that paired these ideas together: the renewed interest in religion and morality with the growing interest in archaeology.

The theory of architecture was widely discussed during this period, in particular because many of the theorists were politicians. These topics included: national identity, industrialization, demography, religious controversy and the preservation of national monuments. By the 19th century the Gothic Revival had become a typical style and was used for many different building types.

Many people attribute the robust, early twentieth-century phase of the American Gothic Revival to the leadership of architect Ralph Adam Cram (1863-1942). Until the mid-nineteenth century, Gothic architecture was viewed in a dim light and generally associated with the idea of 'the past.' In the second half of the nineteenth century, the gothic idiom as a system of design was rehabilitated both across Europe and in America, achieving a broad variety of results and phases from the picturesque ruin to archeological derivation and Victorian eclecticism.

Cram's interest in Gothic architecture stemmed from his travels to Europe, but was also encouraged by his acquaintance with Henry Adams; Cram wrote the introduction to Adams' *Mont-St.-Michel and Chartres*, published in 1904. The book praised the cohesiveness of medieval

society and the position of the church during that time. Cram picked up on the themes of this work, and began to design buildings in the Gothic style to, "convey spiritual values as a corrective to technological civilization."⁸ Cram, who theorized that the late Gothic – the Perpendicular – was yet an open project unfortunately derailed by the Renaissance, situated Gothic firmly within contemporary artistic production. His work, and the larger movement that surrounded it, was characterized by a modernist approach to dramatic massivity and the organic integration of structure and ornament, much as was occurring in other sensibilities more often associated with the rise of the Modern movement.

The American Gothic Revival followed the trends coming from England more than those from France. Other major American Architects included Richard Upjohn who designed Trinity Church in New York City and the firm Cope and Stewardson, based out of Philadelphia who designed a number of collegiate style buildings for many campuses around the country. The designs of other universities around the country, "had far-reaching effects. An historical atmosphere became inextricably associated with education, and accordingly, gothic came to be applied in nearly every sort of school building."⁹

This was largely because of the freedom of expression afforded to the architects. While following plans and proportions outlined in previous eras, Architects could take more liberty with the detailings. The idiom was framed as carrying forward new artistic production where the English Perpendicular Gothic left off (with the arrival of the renaissance). Also, the Arts and Crafts Movement on both sides of the

Atlantic wedded the Revival, for many architects and craftsmen, to an agenda for labor and social and reforms. As far as campuses, stylistically, education could recall the scholastic traditions of the Oxbridge quadrangles and instill a seriousness of learning, while the picturesque qualities of the idiom meant it could be adapted to uneven terrains. The major gothic additions to Boston College, Princeton, and Yale are all within this decade.

Architects

The winning design was the small trio of architects, all who had at one point or another attended the University of Pennsylvania for school in design: Zantzinger, Borie, and Medary. Their plan was solid and cohesive and encompassed all of the requirements that had been laid out in the competitions' requirements. Unfortunately, all of the proposals submitted by the other firms were returned at the end of the competition. As a result, it is unclear exactly how

all the designs differed. Two firms, Tilton & Githens and Rankin, Kellogg, & Crane were best known for their work in the Classical Revival and Beaux-Arts styles. While the other two firms, Cram & Ferguson and Allen & Collins, were best known for work done in the Gothic Styles.

All three architects of Zantzinger, Borie, and Medary all were familiar with both architectural languages. Clarence C. Zantzinger, who had graduated from the École des Beaux-Arts in Paris in 1901, established the firm in 1902 and in 1905 joined forces with C. Louis Borie, Jr. This pair's work was concerned mainly with the style from the École, and might have been the reason for their introduction to and subsequent work with the well-known architect, Paul Cret.

It wasn't until 1910 that Milton B. Medary, Jr. signed with them. Of the three, Medary was best known for his understanding of Gothic revival architecture, which was often

considered, "appropriate for both collegiate and ecclesiastic projects." His addition balanced the firm's previously Beaux-Arts center style. For his design of the Bok Carillin Tower in Mountain Lake, Florida, he was honored with the Gold medal of the AIA.

All three architects were members of the AIA. Zantzinger served as president of the Philadelphia Chapter while Medary served as president of the national organization until his death in 1929. Though the firm was nationally known, the work of these architects has largely been overshadowed by the tremendous names of the people with whom they have collaborated. Paul Cret, who participated in many architectural competitions, worked often with them and several of their projects received high praise. Those included: the Indianapolis Public Library (1916) and Detroit Institute of Art, (1923-1927). Another large firm they worked with was Horace Trumbauer & Associates, the Philadelphia Museum of Art being one of the buildings to emerge from their combined efforts.

Perhaps the most significant building, from their work prior to the Divinity School's competition, was on the Washington Memorial Chapel at Valley Forge, 1917. There are many parallels between the two gothic chapels. Perhaps the most important was the fact that all of the artisans who contributed to the Chapel in Philadelphia also worked on the one at Valley Forge, particularly: Samuel Yellin and Nicola D'Acenzo.

It has been suggested that the reason for this firm's inclusion in the competition was their connection to both Warren P.

Lair, from their time at Penn, and Paul Cret, who was on the jury. The original drawings are located in the Architectural Archives at the University of Pennsylvania. Additionally, the plaster model of the entire campus is also housed there, (*Figure 4*).

Construction of the Campus Plan

Construction of the first building followed shortly after the selection of the Zantzinger, Borie, and Medary design. The first building to be constructed was the library, located in the northeast corner of the site. The chapel and a faculty house followed in 1924. The Chapel received much praise and many considered it one of the finest examples of Gothic architecture in America. The architectural historian, James D. Van Turmp said this of its design:

This aspiring building is an architectural statement, both profoundly religious and irreducibly poetic, produced by an earlier day that is yet a time very near to us. We can only be grateful that announcement was so beautifully made and so firmly established because it still speaks in unmistakable accents to our own troubled and questioning age.

Sadly, the following construction diverged from the initial plan following the construction of these buildings, though two additional buildings were built in 1951 and 1955 by the same architects, though in a more mellow gothic style. A modern addition was added to the library in 1960, and though sympathetic in terms of its materials, indicated the abandonment of the initial architectural design.

In the 1970s the Divinity School was forced to close its doors and relocate to Boston, where



Figure 4 The plaster model for the winning design, from the University of Pennsylvania Architectural Archives

it joined with its sister institute the Episcopal Divinity School.

The property changed hands to its current owner in 1977, when an adverse buyer was considering the property. Tension between the University and the surrounding neighborhood had been high in the years preceding, and so Penn—in an effort to reach out to the community—agreed to buy the lot. Since that purchase, several organizations moved into some of the existing buildings. The most notable was the Parent Infant Center (PIC). They occupied the library starting in 1986 and continue to use that property and the adjacent playground, for their classes.

Additional efforts by Penn to support the neighborhood took place in 2004 with the opening of the Penn Alexander School. This school is a public school, partially funded by the University, that has received high praise for its excellence in teaching. To accommodate the students and teachers, a large, new building was built on the property to the west of the library. As a result, many of the large trees that had been such an integral part of the initial campus plan were cut down.

Today, the chapel still sits proud on its hill in West Philadelphia. These days, only a few people ever enter it. However, the chapel's integrity still remains high thanks to the care and maintenance the University invests in it each year.

¹ Skaler, Robert Morris. 2002. West Philadelphia, University City to 52nd Street. Charleston, SC: Arcadia.

² A large tract of land, between Market and Larchwood and 47th and 50th, remained undeveloped. This was due to the fact that it was owned by Eli K. Price, a Philadelphia lawyer who focused on real estate. A map dating to 1934 indicates the land had been developed.

³ Clark's will did not leave the property to the city, which allowed the Divinity School to purchase it in 1917. (Buildings of West Philadelphia: Who's Who. <http://www.archives.upenn.edu/histy/features/wphila/exhbts/grubel/who.html>, accessed October 22, 2010)

⁴ Fitz-Gibbon, Costen. 1923. *The Architectural Record*. Volume 54, number 2, August, 1923. New York: F.W. Dodge.

⁵ Ibid.

⁶ Grossman, Elizabeth G. 1986. "Two Postwar Competitions: The Nebraska State Capitol and the Kansas City Liberty Memorial". *The Journal of the Society of Architectural Historians*. 45 (3).

⁷ *The Divinity School of the Protestant Episcopal Church in Philadelphia*, Competition Program, University of Pennsylvania Architectural Archives.

⁸ Ibid.

⁹ Georg Germann and Pippa Shirley. "Gothic Revival." In *Grove Art Online*. Oxford Art Online, <http://www.oxfordartonline.com/subscriber/article/grove/art/T033731> (accessed November 11, 2010).

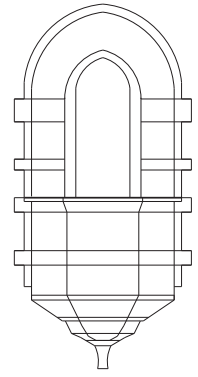
¹⁰ "Ralph Adams Cram." *Encyclopedia Britannica*. 2010. *Encyclopedia Britannica Online*. 07 Nov. 2010 <<http://www.britannica.com/EBchecked/topic/141688/Ralph-Adams-Cram>>.

¹¹ Loth, Calder, and Julius Trousdale Sadler. 1975. *The only proper style: Gothic architecture in America*. Boston: New York Graphic Society.

¹² Nietzsche, George E. 1918. *University of Pennsylvania: Its history, traditions, buildings and memorials: Also a brief guide to Philadelphia*.

Timeline of the Chapel:

- 1857: Episcopal Divinity School was founded; students attend classes at Episcopal Academy.
- 1862: The Divinity School purchases a building of its own, 3901 Walnut Street.
- 1872: The school purchases more land on Darby Road (now Woodland Avenue) between 50th and 51st street.
- 1915: Board of trustees recommends the purchase of the Clark Estate, which is located between 42nd and 43rd and Locust and Spruce Streets.
- 1917: The Divinity School purchases the Clark Estate for \$200,000.
- 1919: Warren P. Laird, Dean of U. Penn's School of Fine Arts, is chosen to advise a competition for the design of the Divinity School's new Campus. The Philadelphia firm Zantzinger, Borie, and Medary is chosen.
- 1920: The Board of Trustees decides to proceed with construction of the first building, based on the architectural plans.
- 1921: The first building is constructed—the William Bacon Stevens Library, designed in the Tudor Gothic style.
- 1924: The Chapel is completed and is considered one of the finest examples of Neo-Gothic Architecture in Philadelphia.
- 1974: The Divinity School closes to combine with its sister institute in Cambridge, Massachusetts.
- 1977: The University of Pennsylvania purchases the property for \$608,000.
- 1986: The Parent Infant Center (PIC) moves into one of the buildings on the property.
- 1993: The Chemical Heritage Foundation proposes using the chapel for the Donald F. and Mildred Topp Othmer Library of Chemical History.
- 1998: U. Penn President, Judith Rodin, announces the start of a Penn funded public school that will be called the Sadie Tanner Mossell Alexander University of Pennsylvania Partnership School.
- 1998: The West Philadelphia Streetcar Suburb Historic District is nominated as a National Register for Historic Places District.
- 2002: The Spruce Hill Local Historic District is nominated as a Philadelphia Historic District and includes 1930 properties, including St. Andrew's Chapel.
- 2004: The Penn Alexander School opens its doors to the first class of students.



GUSTAV KETTERER

Gustav Ketterer worked in various forms of art media in his career. He was foremost a decorator and painter collaborating with architects such as Paul Cret and designing interiors for some of Philadelphia's most prominent families. He was trained by the Pennsylvania Academy of Fine Arts and went on to work in the interiors department of Chapman Decorative Co. He was an active member of the Philadelphia trade community and a firm believer in the guild mentality. Later in his career he became an honorary curator at the Philadelphia Museum of Art.

Gustav Ketterer's work is characterized by its specificity, developing custom woodwork and architectural finish palettes for each project. His work is highly varied in style and appears to be tailored to each space and client. The quality and variability in his work is evident in the ceiling and decorative gilding in St. Andrew's Divinity School Chapel. The chapel is a masterpiece of late French and English Gothic architecture.¹ The hammerbeam ceiling of the chapel is adorned with hundreds of biblical figures, each figure is unique, (*Figure 2*). At the base

of each polychrome beam sits an angel with features highlighted by gilding, (*Figure 3*). He was responsible for constructing the carved choir stalls surrounding the perimeter of the collegiate chapel, (*Figure 1*). The tops of the stalls are highly ornate polychrome and gilded composite. The architects Borie, Zantzinger, Medary did the initial drawings for the choir stalls, screen, and ceiling. There are clear variations in the pieces completed by Ketterer, which may be evidence that he had some degree of artistic license when executing the woodwork and finishes.

Little has been documented of Ketterer's artistic process. As evident by his portfolio and the men he worked with, Ketterer was obviously a man held in high regard by prominent architects and craftsman around the county. He is referenced in the following works denoting important American Artists: *Dictionary of American Painters, Sculptors & Engravers*, *Who Was Who in American Art, 1564-1975*, *Who Was Who in American Art: Artists Active Between 1898-1947*, and the *Glenn Dictionary of American Artists*.



Figure 1 Choir stalls gold gilding and polychrome



Figure 2 Panel and hammerbeam ceiling depicting biblical figures

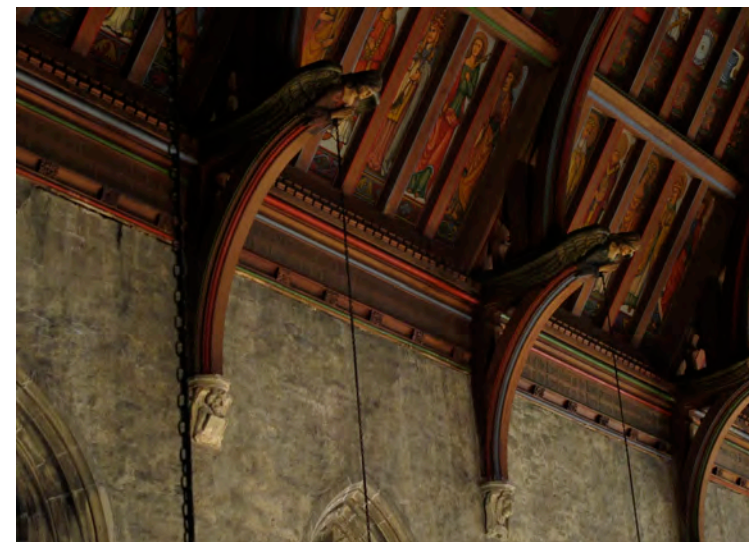


Figure 3 Angels at the base of hammerbeam ceiling

Other notable Works:

- In 1932 Gustav Ketterer gifted Lou Henry Hoover (Mrs. Henry Hoover) a 28 inch x 21 inch watercolor of the Liberty Bell.² The work is entitled “The Liberty Bell, Independence Hall,” (*Figure 4*). Today the painting is displayed in the White House.
- York Water Company – In 1929 Gustav Ketterer was commissioned to decorate the ceiling of a new office building for the York Water Company located in York, Pennsylvania. On the north and south entrances Ketterer designed a vaulted space with 12 signs of the zodiac integrated with symbols of the county. The ceiling is adorned with imagery depicting water delivery from biblical, Greek, and roman traditions. The ceiling is executed with soft blue, yellow, and green paint with gilded highlights.³
- Nationality Rooms in the Cathedral of Learning – Gustav Ketterer executed the interior decorations for three of the Nationality Rooms at the Cathedral of Learning; they include the French Room (1943), German Room (1938), and Scottish Room (1938). Ketterer collaborated with Samuel Yellin on the Scottish Room, Paul Cret on the French Room, and Frank Lindler on the German Room, (*Figure 5*).⁴ Each Room has dramatically different styles based on the styles of the country they were commissioned by. The color palettes and finish techniques also vary in each room.
- Independence Hall – It is unclear his exact role, but several sources noted that Ketterer was involved in the restoration of Independence Hall.



Figure 4 The Liberty Bell, 1932

- First National Bank – Ceilings adorned with panels depicting Roman coins. Ketterer also completed a wall mural in the lobby, (*Figures 6, 7*).

¹ At the Former Philadelphia Divinity School Site: Discovering Inspiration from the Past and Creating Spaces to Learn and Grow. 01 Nov. 2010, <http://www.upenn.edu/almanac/volumes/v56/n27/divinity.html>.

² “Gustav Ketterer Works.” The White House Historical Association. Washington, D.C.: 11 Dec. 2010, <http://www.whitehousehistory.org/whha/default.asp>.

³ History of The York Water Company. 15 Nov. 2010, http://www.yorkwater.com/home_files/history.html.

⁴ “Nationality Room Scholarships Home,” University of Pittsburgh: University Center for International Studies, 15 Dec. 2010. <<http://www.ucis.pitt.edu/natrooms/>>.



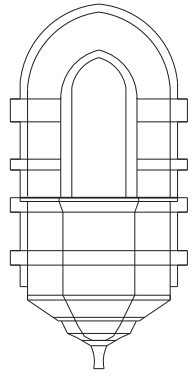
Figure 5 Cathedral of Learning – German Room



Figure 6 Detailed view of First National Bank lobby ceiling



Figure 7 First National Bank lobby



SAMUEL YELLIN

By the early nineteenth century, cheaper, less labor intensive cast iron for architectural fittings had replaced that of wrought iron which had been popular in the previous century. Viollet-le-Duc is credited with reviving the art in France with his 1840 commission of wrought iron hinges forged by Pierre Boulanger for L'Eglise de la Madeleine.¹ Because of innovations in the production of iron, in the second half of the nineteenth century ironwork was used both architecturally and decoratively and was thus a significant design factor until the early twentieth century. The material was expressed in conjunction with many revival architectural styles and also new ones such as Art Nouveau and Art Deco. However, with the rise of the Bauhaus school in the 1930s, use of the ornamental art was once again in decline, signaling the end of an era. "Thus, in less than a century the optimistic outlook for a renaissance of ornamental ironwork had come full cycle."² When it seemed that the art had been lost to innovation, Yellin perpetuated the art of wrought ironwork and served as the father of the American rebirth of the trade.

Samuel Yellin was born "with a hammer in his hand" in March 1885 in an area of Poland noted for its crafts and for fine workmanship of wood, fabrics, and metals.³ At age seven he attended an arts school where he studied and excelled in drawing and crafts. He was then apprenticed with a local blacksmith at age twelve, after his father's death. Because Yellin had a passion for the craft, he learned quickly and received his mastersmith certification at the young age of seventeen. He then travelled to all the great European art centers to expand his knowledge of the craft and in the process became especially interested in Medieval and Renaissance styles.

Upon arriving in Philadelphia in 1906, he enrolled in night classes at the Pennsylvania Museum of Industrial Arts (later the Philadelphia College of Art and today the University of the Arts). Because of his vast knowledge and exuberant attitude, he became a professor a year later in the metals department while also working at small metal fabrication shops, performing simple production far from ornate, custom work. At the school

he developed the "wrought iron class," which he taught until 1919, for which a forge was built in the school's carriage house; the first workshop that Yellin organized was that in his classroom.⁴ He would later write of himself that he was "instrumental in bringing important patrons of art to the Pennsylvania Museum. These have contributed to the Museum's fine craftsmanship in metal, wood, etc."⁵ He credited his students with assimilating him into the American culture and language and also in the development of his critical abilities and of his artistry. Many of his students eventually worked in his shop or set up one of their own. Throughout his career he lectured to architectural societies, museums, universities, and civic organizations, wrote extensively, and filmed his process at the anvil in order to disseminate his knowledge of the craft.⁶ His teaching later extended to the University of Pennsylvania School of Fine Arts and Architecture where he lectured on design and craftsmanship.

He opened two small shops, the first in 1907 on 5th St. and the second, larger, in 1911 at 217 Jefferson St. At the fourth floor, 5th St. shop he employed one helper and each phase of the work was completed in the same small room. However, his business grew as local clients, architect friends, and those associated with the museum, through introductions, began winning Yellin commissions with top clients and architects across the country. His first major commission came from LaFarge and Morris in New York, at which point he needed to greatly expand.⁷ This swayed the move to

217 Jefferson St. where Yellin increased his staff to 29 and had at least three forges as well as separate drafting, forge, assembly, and finishing areas; in New York City he opened a small office for pitching ideas and visits to local clients.⁸

From 1915 until 1940 "Samuel Yellin, Metalworker" operated out of a Spanish style, Mellor and Meigs designed metalworking studio, showroom, and later museum at 5520 Arch Street in West Philadelphia.⁹ As a businessman, he was highly organized and chronicled his business's labors through the collection and maintenance of wrought ironwork, presentation drawings, shop drawings, photographs, journals, quotes, shipping records, and business correspondence.¹⁰ Every work (with few exceptions) was inspected, photographed, and chronicled by Yellin before leaving the shop for its final destination; there are 1,048 catalogued project cards, one-third of which have multiple works.¹¹ His ornamental ironwork designs were executed by Yellin himself, which was highly uncommon, or one of over two hundred and fifty blacksmiths that forged under his supervision.¹² While some of his work was monumental other works were small and delicate. His work graces churches, residences, banks, libraries, universities, and museums in 45 states in the form of gates, grilles, lanterns, hardware, railings, and much more.¹³

Yellin collaborated with the most prominent revival architects of the day and he was respected and admired by those in the architectural and

building professions. This collaboration with architects was stressed by his belief that the architect “should be the great coordinator... presiding over all the crafts and bringing all the various craftsmen into an alliance with himself.”¹⁴ In his education endeavors he encouraged knowledge of architectural styles and the fundamentals of craftsmanship borne from masters of the past. “I am a staunch advocate of tradition in the matter of design. I think that we should follow the lead of the past masters and seek our inspiration from their wonderful work. They saw the poetry and rhythm of iron. Out of it they made masterpieces...for the ages. We should go back to them for our ideas in craftsmanship, to their simplicity and truthfulness.”¹⁵

Though an inventive and versatile artist-craftsman, Yellin’s work was deeply rooted in European traditions. He often travelled abroad to the places where he was taught to collect antique books and iron and gain design inspiration which he then translated into detailed measurements, full-scale drawings, and models of segments he termed “sketches in iron.”¹⁶ His favorite decorative motif, which was used most extensively, was the dot and chevron. He thoroughly describes his artistic process in his “Iron in Art” entry in the 1927 edition of the *Encyclopedia Britannica*. “First draw a sketch to a small scale, so as to obtain the general composition, proportion, silhouette and harmony with design of surrounding materials or conditions. The sketch should then be developed into full size to obtain details or ornament, various sections and sizes of material, and a general

idea of the method of making...Workers in iron should always attempt to make everything direct from a drawing, rather than from models. When working from a model, the object becomes more or less a reproduction, whereas the drawings allow a greater opportunity to express the craftsman’s individuality. Studies or experiments in the actual material are now made, for here many things are revealed which could not possibly be shown on paper...For this reason the true craftsman should often make a fragment or portion of the ornament in the actual material first, and make the drawings later.”¹⁷

Yellin ran his shop in the same manner as he was trained, based on a medieval guild. Each smith contributed to and celebrated the success of the others, always with a synergistic attitude. Francis Whitaker, a smith who had “the good fortune to work at Yellin’s for a year,” said of his experience: “He would work with one man until the results were perfect in every phase; design, forging, assembling, and finishing. Perfection was our goal; we were inspired by this great man. Work that was not up to standard was not let out of the shop. It was reworked or done over. Nothing escaped his eagle eye,” (*Figure 1*).¹⁸ In 1932 Yellin laid off a number of workers due to decline in business and degrading health after a heart attack, a second of which took his life at age 55 (1940). “It is doubtful if America has ever had an artist whose name more completely identifies itself with a particular type of creative work than the name of Samuel Yellin... No man in America came near him in scale of



Figure 1 Yellin working at the anvil with a striker, 1920s. work and robustness of design.”¹⁹ Today Clare Yellin, Samuel Yellin’s granddaughter runs the shop. As the designer and business person, she oversees the company’s two ironworkers who operate out of a forge in Chester County. With access to such extensive records, Clare has been able to restore thousands of works originally created by her grandfather. The family also donated over 2,343 original drawings by Yellin to the University of Pennsylvania Architectural Archives in remembrance of the greatest ironworker, Samuel Yellin.²⁰

Projects:

The Federal Reserve Bank of New York

commissioned Yellin in 1920, at a price of \$300,000, to complete interior and exterior wrought iron decorative work.²¹ At the time it was the largest decorative wrought iron project in the U.S. with over two hundred tons of material being installed.²² As a testament to the massive amount of work, when the project began in 1921, 74 men were employed by Yellin and at the project’s completion three years later, 178 men. Additionally, approximately sixty special power hammers and forges were installed.²³ York and Sawyer’s Central Savings Bank in New York commissioned Yellin in 1927 to design wrought grilles, gates, lanterns, brackets, doors, windows, bank screens, signs (job 2750), and even a revision to the lock for the safe deposit grille (job 2909).²⁴

Yellin’s largest single assembly was the McKinlock Memorial gate for Northwestern University (job 2864) in 1930.

Yellin worked with Zantzinger, Borie, and Medary and D’Ascenzo again on a nationally and locally registered Philadelphia ecclesiastical landmark. St. Mark’s Church at 16th and Locust Streets saw additions and alterations by the companies from 1922 to 1923, Yellin’s contributions were wrought iron hardware for doors (job 2088) and three halos (job 2227).²⁴ The three Philadelphia companies further collaborated on the Washington Memorial Chapel and Bell Tower in Valley Forge National Historical Park. Field and Medary were chosen by Laird as the winners of the design competition in 1903, the

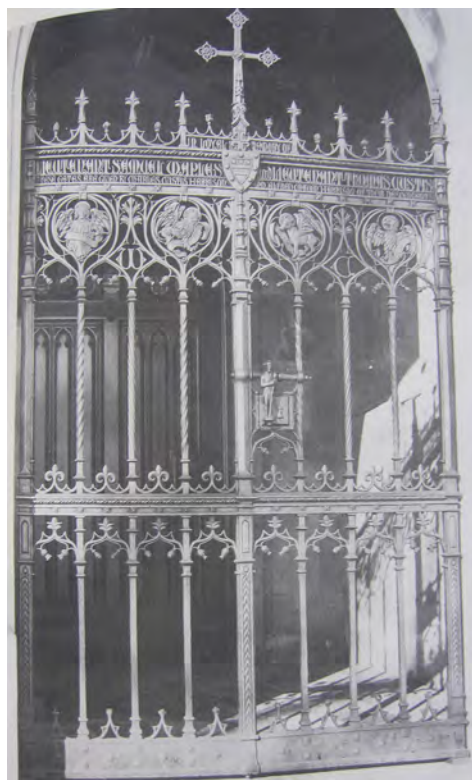


Figure 2 Washington Memorial Chapel, entrance gate.

same year construction began. Additions by Zantzinger, Borie, and Medary were completed between 1911 and 1930 (though Borie and Smith worked at this location until the late 1950s) as were Yellin's wrought iron gates (now obscured by glass doors), hardware and locks. Lamps were also designed for the complex but never installed.

He also worked with D'Ascenzo on the sixth largest cathedral in the world, the National Cathedral in Washington, the cornerstone of which was laid in 1907 according to the design of G.F. Bodley and completed 83 years later by

P.H. Frohman, a proponent of Yellin. Frohman said of Yellin: "He is one of the few living artists of whom it may be said that, in beauty and logic of design and in perfection of craftsmanship, his work is fully equal to the finest achievements of the Middle Age. Among the various arts and crafts which have been employed in the building and adornment of Washington Cathedral, we believe that the highest degree of artistic merit thus attained will be found in the wrought work of Samuel Yellin."²⁶ It was designated a National Historic Landmark in 1974 on the criteria of "cultural heritage and visual beauty."²⁷

"Notes of Interest Regarding Samuel Yellin, Esq." dated January 27th, 1937 and authored by Yellin served to interest prospective clients and to help generate business. After a list of his most noted works he states: "For the past 12 years: all the memorial work for the National Cathedral in Washington, this work being called 'Yellin Gothic.'" The work completed for the cathedral was extensive: job 2593—lighting fixtures, altar fittings, hardware, stair railing, flower vases, weather vane; job 2862—screens, Janney Memorial gate; job 2964—crypt lighting; job 3044—ironwork for stained glass windows; job 3171—candelabra, lights, and brackets; job 3264—decorative door, and the list goes on, (Figure 2). The range of works was highly varied and Yellin exhausted enormous amounts time and energy on the project which helped his shop to remain viable as business declined.

Exhibition and Awards

Yellin exhibited his work in the Detroit Institute of Arts as early as 1914. The small exhibition of wrought metal work including locks, hinges, and door knobs was "the best craftsman's exhibit that has been shown in the Museum along these lines [and] [a]s a designer of medieval styles, Mr. Yellin probably has no superior in this country."²⁸ In the 1920s in Michigan alone he completed works for the Detroit Public Library, The Detroit Institute of Arts, St. Mary's Church, the Edsel Ford residence, and in Ann Arbor Hutchins Hall and Legal Research Building. In 1933, the Pennsylvania Museum School of Industrial Arts exhibited Yellin's work. The exhibition, "Samuel Yellin: Metalworker," organized by the aforementioned school's Art Alumnae Association, showed from January 21 to March 26, 1932 and was also circulated by the Gallery Association of New York State.²⁹ Yellin received numerous awards from his alma mater as well as more renowned recognition with the AIA Craftsmanship Medal and Boston Architectural Medal in 1920 and the Architectural League of New York Gold Medal in 1922.

St. Andrew's Chapel

There is little mention of the work completed for St. Andrew's Chapel in the accounts of Yellin. In his own accounts, the entry reads simply: "St. Andrew's Chapel (2609) 1926."³⁰ The artistic works comprising the north wall were dedicated to Milton Bennett Medary on account of his untimely death prior to completion of the

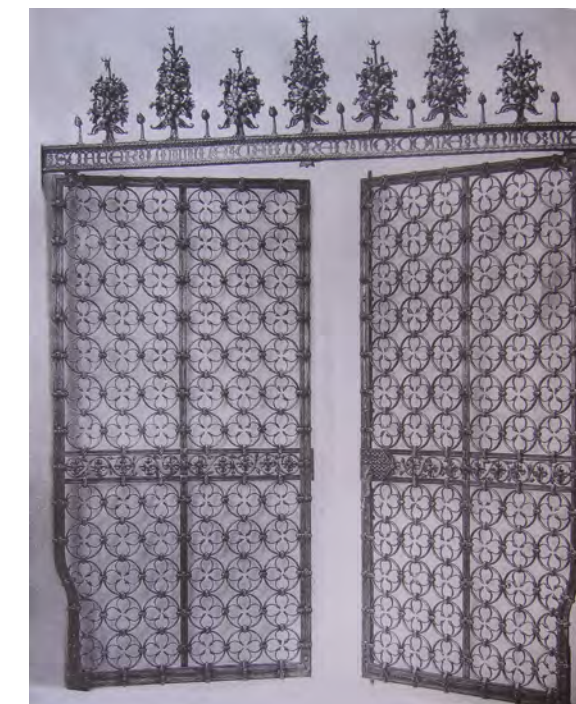


Figure 3 National Cathedral Children's Memorial Gate, Washington, D.C.

project. An inscription, barely perceptible, is carved into the frame of each gate flanking the altar and serves as a memorial to the architect, their friend (job 2981 "wrought iron memorial grilles"). "The enrichment of all this wall, the three-fold window, mural paintings, gilded and colored wood carving, great dossal... was in 1930 made and invented to the glory of God in affectionate remembrance of Milton Bennett Medary by his fellow craftsmen Joseph H. Dulles Allen, Charles L. Borie, Jr., John A. Cornelius, Jr., Nicola D'Ascenzo, Gustav Ketterer, Samuel Yellin, C.C. Zantzinger," (Figure 3).³¹

The gates flanking the altar are highly decorative, scripted wrought iron. Currently

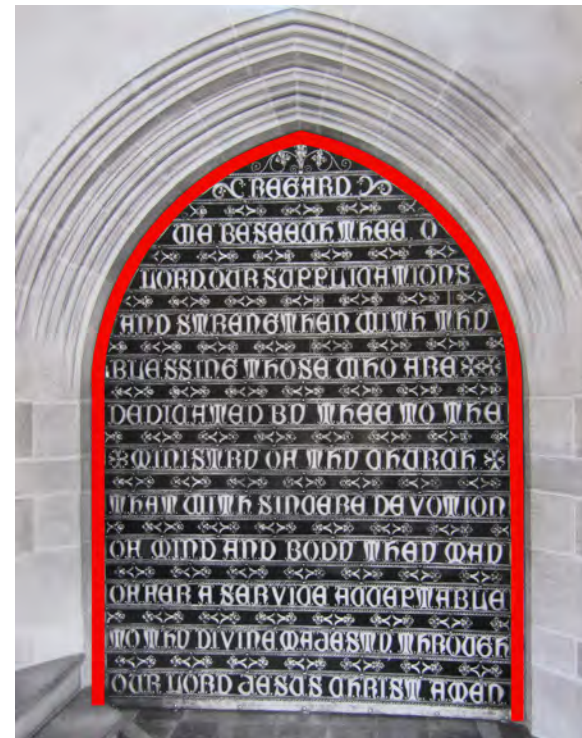


Figure 4 East gate. Location of the memorial inscription on the alter-flanking gates is indicated in red.

the east gate is extant in its original location but the west gate has been removed and placed in the ambulatory area north of the alter, wired to the east gate making the inscription read backwards. The west gate is extant in a 1980 photograph by Carl Doebley, taken while he was preparing a Pennsylvania Historic Resource Survey form, of the nave looking north but it is unclear as to when the gate was removed. However, it is likely that the gate was moved in 1989 when a short-term tenant was allowed to make changes to the interior of the chapel. A historic photograph of the west gate reveals the following scripture, (Figure 4):

*God who
receivest unto
thyself the souls of the
faithful grant we be-
seech thee that thy servant
Milton Bennett Medary
may rest in perpetual light
and that the desire of his
heart for this place may
be fulfilled through
our Lord and Saviour
Jesus Christ Amen*

The east gate reads (Figure 5):

*Regard
we beseech thee O
Lord our supplications
and strengthen with thy
blessing those who are
dedicated by thee to the
ministry of thy church
that with sincere devotion
of mind and body they may
offer a service acceptable
to thy divine majesty through
our Lord Jesus Christ Amen*

The Gothic style letters, a mix of both capital and lowercase, are the same height and a floral motif is sometimes used as a spacer or place



Figure 5 West gate

filler while a decorative hollow diamond and floral motif separate the scripted lines from each other.

Yellin's work in the chapel includes vent grilles (jobs 2437 and 2447) found in the wall of the north ambulatory, the floor of the nave, and elsewhere, (Figure 6). They are assumed to be the original Yellin installations for they all have the same decorative pattern: crisscrossed lattice with four-leaf floral motif at the intersections. The work is precise and intricate, looking more like cast iron than wrought iron. Hardware on wooden



Figure 6 Vent grilles, nave floor, 2010.

doors throughout the chapel is intricate yet substantial. Even the auxiliary entrance doors on the east façade are highly decorative, (Figure 7). Elaborate scrolls sprout from the oversized, visible hinges and eight glass cross inlays allow a small amount of light inside. Unaccounted for work of Yellin's includes a gate with no job number photographed in the Yellin studio and presented in Jack Andrew's Samuel Yellin, Metalworker, (Figure 8). The only other representation of the gate is in the original scaled section drawn by the architect. The gate is depicted occupying the space of the current memorial gates flanking the alter. It is uncertain if the gates were installed and later replaced or never installed. Additionally, unaccounted for are the wrought iron candlesticks (job 2609) which are not extant and not present in historic photographs. However, it has been assumed that they were of the ornate standing candelabra style and placed on the

floor in the nave, similar in design to other candelabras by Yellin. Though no specific mention is made of them, it has been speculated that the iron window hardware and hanging chandeliers, intricate and of high quality workmanship, could potentially be the work of Samuel Yellin, Metalworkers.

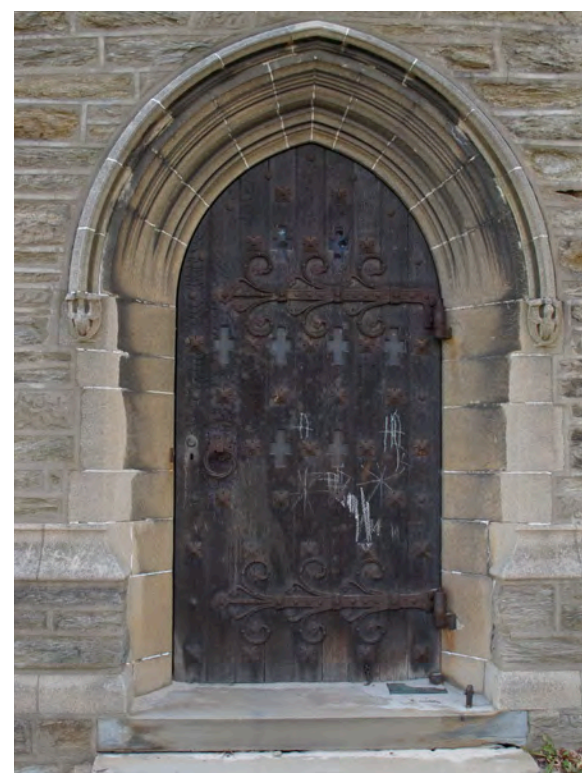


Figure 7 East façade exterior door with hardware by Samuel Yellin, 2010.

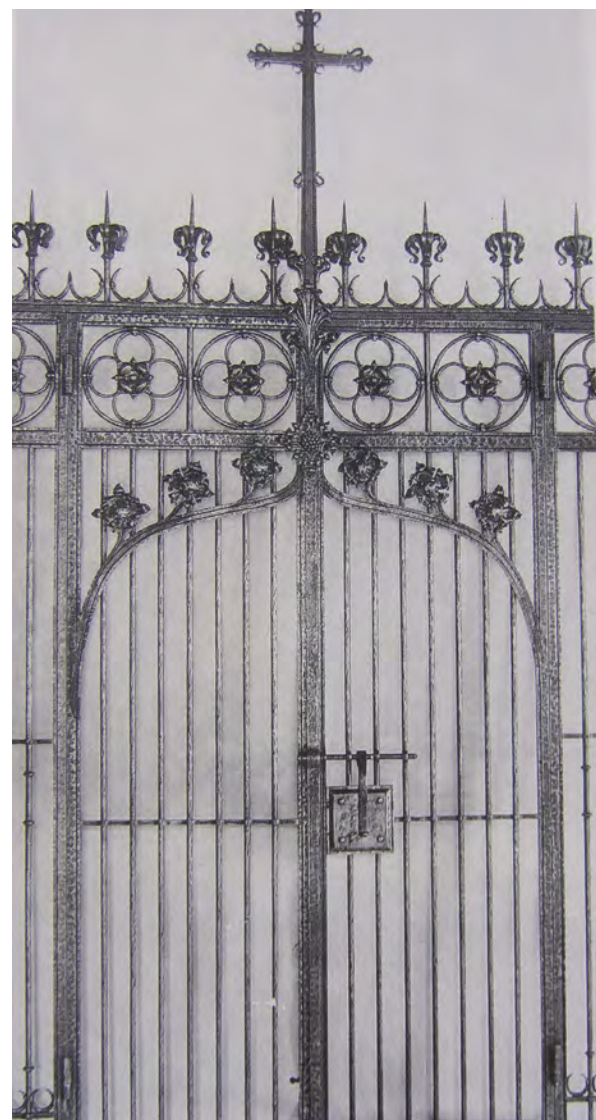


Figure 8 Originally designed alter gate.

¹Wattenmaker, Richard J. 1985. Samuel Yellin in context. [Flint, Mich.]: Flint Institute of Arts.

² Ibid.

³ Andrews, Jack, and Samuel Yellin. 2010. *Samuel Yellin: Metalworker*. Huntingdon, Pa: Blue Moon Press.

⁴ Ibid.

⁵ Yellin, Samuel. "Notes of Interest Regarding Samuel Yellin, Esq." January 27, 1937.

⁶ Wattenmaker, Richard J. 1985. Samuel Yellin in context. [Flint, Mich.]: Flint Institute of Arts.

⁷ Andrews, Jack, and Samuel Yellin. 2010. *Samuel Yellin: Metalworker*. Huntingdon, Pa: Blue Moon Press.

⁸ Ibid.

⁹ Tatman, Sandra. "Samuel Yellin." Philadelphia Architects and Buildings Project. 2000. Philadelphia architects and buildings. Philadelphia, PA: Philadelphia Architects and Buildings Project. <http://www.philadelphiabuildings.org/pab/index.cfm>.

¹⁰ Andrew's, Jack. Samuel Yellin, Metalworker. 1st ed. 1992. p. ix.

¹¹ Ibid.

¹² In 1928 Yellin employed his largest workforce: 268

¹³ Andrews, Jack, and Samuel Yellin. 2010. *Samuel Yellin: Metalworker*. Huntingdon, Pa: Blue Moon Press.

¹⁴ Unidentified article. Yellin Archives, Philadelphia.

¹⁵ Lecture for Architectural Club of Chicago: 1925. Yellin Archives, Philadelphia.

¹⁶ Andrews, Jack, and Jack Andrews. 1994. New edge of the anvil: a resource book for the blacksmith. Drexel Hill, PA: SkipJack Press.

¹⁷ Yellin, Samuel. "Iron in Art." *Encyclopedia Britannica*. 5th ed. Vol 14. 1927. p. 679-681.

¹⁸ Whitaker, Francis. Conversation in 1983 at the first Yellin Workshop, held at the Arch Street Studio.

¹⁹ Klimchek, Albert. *Samuel Yellin 1885-1940*. A quote by Philip C. Elliott. University of Pittsburgh Alumni Magazine. 1940. p. 22.

²⁰ Binzen, Peter. "Upholding a legacy of artistry in iron; The late, great Samuel Yellin is trio's inspiration." *The Philadelphia Inquirer*. September 29, 2003.

²¹ "Federal Reserve Bank of New York." New York City Architecture Images. <http://www.nyc-architecture.com>

²² Andrew's, Jack. Samuel Yellin, Metalworker. 1st ed. 1992. p. 35.

²³ Ibid.

²⁴ "Central Savings Bank of New York." New York City Architecture Images. <http://www.nyc-architecture.com>

²⁵ There is a discrepancy in job numbers. Andrews, Jack, and Samuel Yellin. 2010. *Samuel Yellin: Metalworker*. Huntingdon, Pa: Blue Moon Press.

²⁶ Frohman, Phillip H. "A Tribute to Samuel Yellin and his Work." *The Cathedral Age*. vol. ix. Washington, D.C: 1984.

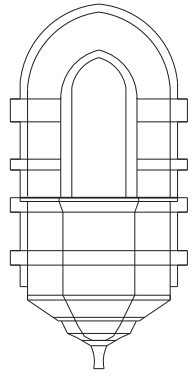
²⁷ Brown, T. Robins. 1973. *The National Cathedral: National Register of Historic Places registration form*. Washington, DC: National Capital Planning Commission.

²⁸ "Metal Work by Samuel Yellin," *Bulletin of The Detroit Museum of Art*, Detroit: The Museum. July 1914.

²⁹ *Selected Program History*, Rosenwald-Wolf Gallery Archive: The University of the Arts.

³⁰ Andrews, Jack, and Samuel Yellin. 2010. *Samuel Yellin: Metalworker*. Huntingdon, Pa: Blue Moon Press.

³¹ The inscription on the west gate has not been confirmed, as it has been removed and is inaccessible. The east gate inscription begins with "to the glory of God..." The above stated inscription was taken from p. 16 of James D. van Trump's "The Chapel on the Hill: The Philadelphia Divinity School" in *Charette: Pennsylvania Journal of Architecture* September 1967.



NICOLA D'ASCENZO

Stained Glass as an art form became popular in the eleventh and twelfth centuries and was used primarily as a decorative addition to Romanesque and Gothic ecclesiastical constructions. The windows often depicted biblical scenes for the overwhelmingly illiterate public. By the sixteenth century demand diminished and did not become popular again until the Arts and Crafts movement and Revival styles of the nineteenth century, namely Gothic, Picturesque, and Italianate, promoted by John Ruskin and Augustus Pugin.¹ Many arts beyond stained-glass experienced a renaissance including metalwork, furniture, and other textiles. Early pattern books by A.J. Davis and A.J. Downing promoted the use of decorative, colored glass and “helped to popularize a new taste in architecture...[that] influence[d] other architects.”² The impact of the artistic ideas that England natives Daniel Cottier and Charles Booth had on the craft in America promoted a greater recognition of stained glass as an art form and contributing decorative architectural element.³ However, following World War II, American and

European architectural styles moved towards the modern styles devoid of ornamentation.

Born in central Italy in September 1871, Nicola D’Ascenzo immigrated with his family to the United States when he was 11.⁴ Though apprenticed to a stone cutter and wood carver in his early years as a means of making money, he preferred drawing and enrolled at the Pennsylvania Museum School of Industrial Arts (later the Philadelphia College of Art and today the University of the Arts) at age 18.⁵ For ten years he irregularly attended art history and fine arts classes at the Pennsylvania Academy of Fine Arts and the New York School of Design.⁶ In 1893, he became a professor himself, teaching mural decoration at the Philadelphia College of Art for a year, after which he married a watercolorist, Myrtle Goodwin, and the two travelled Italy for two years studying art and architecture.⁷

Upon returning to Philadelphia, D’Ascenzo established an interior decorating firm at 1020 Chestnut Street.⁸ His commissions



Figure 1 Inspiration and rough design for the Milton Bennett Medary Memorial window, north wall of St. Andrew’s Chapel.

were primarily designed interiors, mosaics, portraits, and mural paintings though he had a tendency towards stained glass, the craftsmanship of which he described as “an industry producing abominable works.”⁹ To him, the only American craftsmen worth mentioning were the most famous—John La Farge and Louis Comfort Tiffany. However, their masterpieces were expensive and inaccessible to most. Thus, D’Ascenzo set out to produce affordable, quality stained glass windows based on traditional medieval methods for the wider public. His first recorded stained glass commission came in 1904.¹⁰ Eight years later his profession changed to “stained glass artist” and his offices were moved to 1608 Ludlow Street, and a move to a larger space at 1602–04 Summer Street in 1926.¹¹ The studio at Summer Street was a highly refined self-sufficient guild of artists and craftsmen.

D’Ascenzo admired La Farge and Tiffany as evidenced in his extensive library, and even praised La Farge as, “one of our greatest geniuses” in *The Ornamental Glass Bulletin* in 1924.¹² He also admired the work of the original twelfth century craftsmen whose work adorns the cathedrals of Europe; he made many trips to Europe to study the examples, the products of which became the basis for many of his art exhibitions.

Process

The following description of D’Ascenzo’s process was presented in conjunction with the “Technical Exhibit of Leaded Glass” shown at the Pennsylvania Museum in 1914.¹³ First, D’Ascenzo would create a rough drawing to be perfected by the design department, (*Figure 1*). Detailed drawings were then created and one rendered in water colors for the client, (*Figure 2*). These water colors were completed in order to assure harmony with the existing art and finishes of the space as well as that of the existing interior tones and character of architecture. Such drawings were based on actual measurements of the opening and a template was created. The template traced onto paper, it was hung on the wall and the drawing of the full size design begun. This “cartoon” was made in charcoal with the glass arrangement and lead came indicated, (*Figure 3*). The completed drawing was then taken to the cutting room where tracings were made of it on paper and each segment,



Figure 2 Detailed drawing for the Milton Bennett Medary Memorial window.

those outlined by lead lines, was given a number; the numbered pieces became individual pieces of glass. One trace was cut along the drawn lead lines with special double-edge scissors that cut the width of the heart of the lead came.

The individual glass pieces, usually antique flash glass that is white on one side and colored



Figure 3 Charcoal "cartoon" of the Milton Bennett Medary Memorial window.

on the other, were chosen using the watercolor as a guide, then cut using a diamond point wheel. D'Ascenzo preferred to use traditionally made glass as opposed to modern opalescent glass because the irregularities made the color more expressive.¹⁴ Some of the color was then etched from the glass using hydrofluoric acid, replacing the fourteenth century use of wheel and pumice, that etches

the color in the pattern desired. The glass was then painted to give detail and fired; up to as many as five times might be necessary to achieve the desired shading and tone which made the piece more susceptible to distortion. The pieces were then glazed together with pliable lead comes. The pieces were fit together over one of the numbered, full size tracings so as to expedite assembly time, (Figure 4). The various sections were kept together on boards, according to pattern, before the final stages of soldering and cementing. After assembly, solder was applied at each joint before being taken to the cementing room where on both sides, between the flanges of lead and the glass, cement was applied. Once dry, the cement serves as a waterproof barrier. Half-inch steel bars (previously iron and bronze) were soldered across the width of the light panel to prevent bulging and counteract wind pressure.

Education and Exhibition

D'Ascenzo went beyond the studio and clients of commissioned works to educate the public on the art of stained glass. As a member of the Pennsylvania Board of Education in the 1930s, he was an advocate for education and lectured often on education, religion, and appreciation of art to groups both local and foreign.¹⁵ He was a lecturer in a Wednesday afternoon series where he was especially expressive about the survival of quality craftsmanship in the shadow of mass production.¹⁶ He even invited groups to the studio to witness the process first hand.

Between 1911 and 1950 D'Ascenzo exhibited his work over 450 times and with over 150 organizations.¹⁷ In 1914, D'Ascenzo compiled an exhibit covering an area of fifteen square feet for the Pennsylvania Museum depicting the process of making leaded glass. The exhibit goes step by step through the same process which was followed in D'Ascenzo's studio. "One misses, of course, the welcome of Mr. D'Ascenzo, the making of the full size cartoons by his assistant designers, the snip of the scissors in the pattern room, the screech of the wheel as the glass is cut, the painting of the glass on the easels, the burning of the glass in the kilns and the hiss of the soldering iron."¹⁸ The *Exhibition of American Handicrafts*, showcasing the aforementioned



Figure 4 Nicola D'Ascenzo assembling individual pieces of glass.



Figure 5 Individual medallion for a window in the Washington Memorial Chapel. The window shown is composed of 36 such medallions.

exhibit, ran at the Pennsylvania Museum for three weeks in 1922 and then was circulated by the American Federation of Arts. The stained glass “from Nicola D’Ascenzo is representative of the successful revival of an ancient art, which should be gratifying to Philadelphians.”¹⁹ He was recognized for his work with the following awards: Pennsylvania Museum School of Industrial Arts Alumni Gold Prize (1927), T-Square Gold Medal (1927), New York Architectural League Gold Medal. He also honorably served as the

President of the Stained Glass Association of America from 1929 to 1930.

Projects

While a student, D’Ascenzo was asked to aid a professor in outlining for the chancel mural of St. John the Evangelist in Philadelphia. A disagreement between the professor and Reverend allowed D’Ascenzo to complete the mural and as such it became one of his first public art pieces.²⁰ From 1904 to 1954 D’Ascenzo Studios completed over 3,900 commissions and designed just shy of 8,000 windows.²¹ Works often stayed in the shop, propped on an easel, for weeks after completion so that D’Ascenzo could “live with” the design and ensure that every detail was perfected. A typical window took approximately three months to complete and larger ecclesiastical medallion windows, like the Washington Memorial Chapel window at Valley Forge, could take three years.²² Each work was a product of the most synergistic collaboration of trades from each level of the guild hierarchy: apprentice, journeyman, and master. D’Ascenzo ran his shop much in the same way as Samuel Yellin with the medieval guild the root of production and management. Each artist collaborated for the benefit of the artwork, profits were shared, and each man celebrated the successes of the others.

Projects completed with fellow artists Samuel Yellin, metalworker, and Zantzinger, Borie, and Medary, architects, include St. Mark’s Church in Philadelphia (the Census

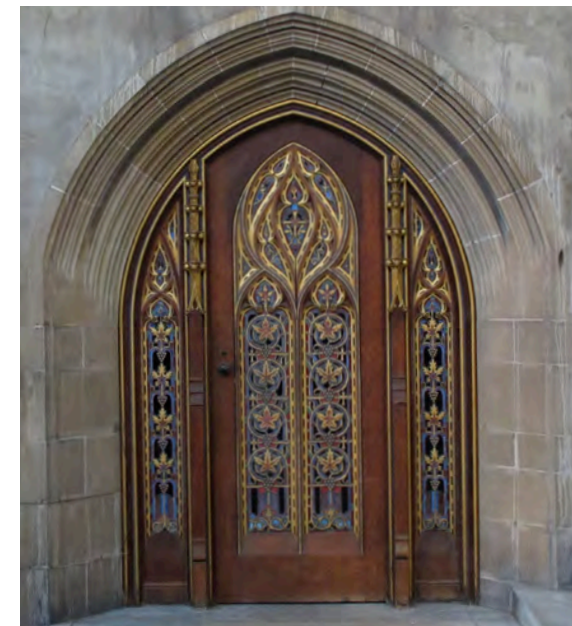


Figure 6 Gilded and mosaic glass doors leading to ancillary spaces.

of Stained Glass Windows in America credits D’Ascenzo Studios with the work of windows T1 (“Floral Ornamental”) and T3 (“Flying Angels”) and the Washington Memorial Chapel and Bell Tower in Valley Forge National Historical Park, (Figure 5).²³ D’Ascenzo Studios executed over 230 windows such as the north rose window which is 26 feet in diameter and the west rose window which has more than 10,500 individual glass pieces.²⁴ D’Ascenzo’s inspiration for the design of the chapel windows was the “Labelle Verriere” medallion window of the Chartres Cathedral in France which he first studied in 1911.²⁵ In 1921 he was given the honor of erecting scaffolding within the church to perform an in-depth study of the glass, comes, and techniques used



Figure 7 Intended temporary glass panel windows, south and east wall.

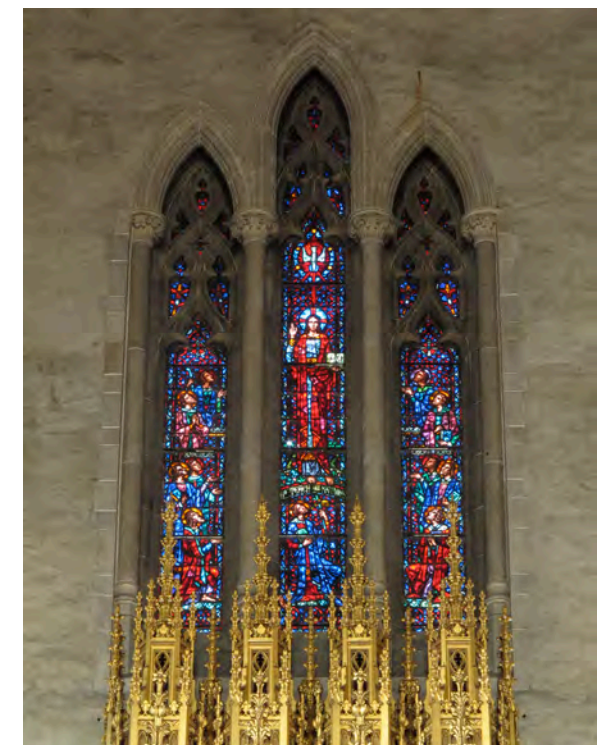


Figure 8 Milton Bennett Medary Memorial stained glass window, north wall.

in the creation of the windows. He spent time in other cathedrals experiencing the effects of weather on conveyance of colors. D'Ascenzo was internationally renowned for his work on numerous projects abroad. Under his skillful guidance, a rose window in the almoner's chapel from the hospital of the Knights of Saint Anthony at Aumoniere in Burgandy, France was restored to its fifteenth century glory.²⁶

St. Andrew's Chapel

The D'Ascenzo Studio Collection at The Athenaeum of Philadelphia has no written record of the work completed at St. Andrew's Chapel. Process drawings of the Medary Memorial stained glass window and a number of detailed historic photographs of the work accessible from the nave floor exist including the doors leading to the ancillary spaces that are gilded and polychromed repousse lead with background of surface color mosaic glass, (*Figure 6*). These doors are likely a collaboration between D'Ascenzo and Ketterer and exhibit the highest quality and most intricate design. In fairly good condition, they could benefit from a delicate cleaning, as could the numerous stained glass windows.

It was once common practice to fill church windows with temporary panels of leaded glass. These were composed mostly of clear or tinted glass in a simple, rectangular shape that was easily cut and assembled, (*Figure 7*). It was assumed that these temporary panels would be replaced with figural stained glass.

However, in St. Andrew's Chapel the rolled cathedral, textured, and seedy glass have remained as permanent fixtures. Similar replacement would cost approximately \$50 per square foot, whereas replacements of the quality originally intended, similar to that of the Medary Memorial window, could cost more than \$700 per square foot.²⁷ The current condition, as observed from the nave floor, is similar to that described in at 1993 Glass Survey. The good condition is attributed to high quality construction, simplicity of design, stout lead comes, and horizontal lead lines which have prevented bulging. D'Ascenzo's jewel in St. Andrew's Chapel is the Milton Bennett Medary Memorial window of the north wall, the crown above the alter, (*Figure 8*). The tripartite narrative window has the central figure of Christ with eleven cloaked men below, looking up. "Go Teach All Nations," at the foot of Christ, reflect the original use of the chapel as a collegiate seminary school. Red, blue, green, and gold-rod glass dominate the piece and it appears to be in good condition. Similar quality, yet smaller, windows found in the ambulatory space behind the alter are adorned with a simple floral motif.

¹ Weilbacker, Lisa. 1990. A study of residential stained glass: the work of Nicola D'Ascenzo Studios from 1896 to 1954. Thesis (M.S.)—University of Pennsylvania, 1990.

² Ibid.

³ Bolger, Doreen. 1986. In pursuit of beauty: Americans and the Aesthetic movement. New York: Metropolitan Museum of Art.

⁴ "Nicola D'Ascenzo." <http://www.ilsitodi.it/gessopalena/GessaniMondo/NicolaDascenzo/NicolaDascenzo.htm>. October 28, 2010.

⁵ "Industrial Art Medal Won by Nicola D'Ascenzo." The Bulletin of the Stained Glass Association of America. January 1928.

⁶ Nicola Goodwin D'Ascenzo. "Nicola D'Ascenzo- Master Craftsman." T-Square Club Journal. February 1931.

⁷ Weilbacker, Lisa. "A Study of Residential Stained Glass: The Work of Nicola D'Ascenzo Studios from 1896 to 1954." University of Pennsylvania Library. 1990.

⁸ Philadelphia City Directory. 1897. Historical Society of Pennsylvania.

⁹ "Nicola D'Ascenzo-Craftsman." Interior Architecture and Decoration. April 1931. p. 55.

¹⁰ Account Book, D'Ascenzo Studios Collection. The Athenaeum of Philadelphia.

¹¹ Philadelphia City Directory. 1912-1926. Historical Society of Pennsylvania.

¹² D'Ascenzo, Nicola. "Principles and Tendencies in the Making of Stained Glass Windows." The Ornamental Glass Bulletin. April 1924.

¹³ Kretschman, F.M. "Technical Exhibit of Leaded Glass." Bulletin of the Pennsylvania Museum. vol. 25. no. 47. July 1914. p. 36-38.

¹⁴ Weilbacker, Lisa. 1990. A study of residential stained glass: the work of Nicola D'Ascenzo Studios from 1896 to 1954. Thesis (M.S.)—University of Pennsylvania, 1990.

¹⁵ Ibid.

¹⁶ Copeland, Frank J. "The Elements of Architecture for Interior Decorators." Bulletin of the Pennsylvania Museum. vol. 18. no. 78. September 1923.

¹⁷ Weilbacker, Lisa. 1990. A study of residential stained glass: the work of Nicola D'Ascenzo Studios from 1896 to 1954. Thesis (M.S.)—University of Pennsylvania, 1990.

¹⁸ Kretschman, F.M. "Technical Exhibit of Leaded Glass." Bulletin of the Pennsylvania Museum. vol. 25. no. 47. July 1914.

¹⁹ Elliott, Huger. "American Handicrafts Exhibition." Bulletin of the Pennsylvania Museum. vol. 18. no. 73. January 1923.

²⁰ Weilbacker, Lisa. 1990. A study of residential stained glass: the work of Nicola D'Ascenzo Studios from 1896 to 1954. Thesis (M.S.)—University of Pennsylvania, 1990.

²¹ Ibid.

²² Ibid.

²³ Census of Stained Glass Windows in America, St. Mark's Episcopal Church, Philadelphia.

²⁴ D'Ascenzo The Art of Stained Glass from the collection of Stanley Switlik . Rider College Trenton, NJ Student Center Gallery 9/20-10/24 1973

²⁵ Weilbacker, Lisa. 1990. A study of residential stained glass: the work of Nicola D'Ascenzo Studios from 1896 to 1954. Thesis (M.S.)—University of Pennsylvania, 1990.

²⁶ Taylor, Francis Henry. 1930. "A Gothic Chapel". The Pennsylvania Museum Bulletin. 25 (135): 11-17.

²⁷ Divinity School Glass Survey. Mark S. Talaba. February, 1993.

DESIGNATION HISTORY

The designations associated with the Episcopal Divinity School complex are outlined below based on the type of nomination, whether national or local and the complex or a larger district. Unless otherwise noted,

the correspondence, nomination forms, and additional information used to compile this section came from research at the Philadelphia Historical Commission in the folders "Spruce Hill" and "4200 Block Spruce Street: Philadelphia Divinity School." Extensive amounts of correspondence regarding the former, particularly the unsuccessful designation of the Municipal West Philadelphia Suburb Historic District, are not represented in this synopsis.

In advocating for the preservation of the building, St. Andrew's Chapel would benefit most from an interiors designation based on the original quality and current integrity of the artistic finishes by renowned Philadelphia artisans. This decision, however, neglects particular social and reuse issues which would likely limit the potential future use of the space. The owner is not currently advocating

for a designation of any kind, though there are no plans to make interior fabric alterations and the current informal preservation plan appears to maintain the building in fairly stable condition.

West Philadelphia Streetcar Suburb Historic District, National Register Historic District

February 2, 1998

"The West Philadelphia Streetcar Suburb Historic District gains its significance in the areas of Architecture and Community Development, and represents the transformation of Philadelphia's rural farmland into urban residential development, made possible by the streetcar which provided easy access to Center City. From 1850-1930, the period of significance, the area evolved from a fashionable, upper class, country retreat

to a middle class streetcar suburb, largely commissioned by speculative developers, designed by some of the city's most prolific architects, and occupied by a rising class of industrial managers and other professionals." Later, in specific reference to the Divinity School: "Open space in the district remains limited to two parcels of land [Clark Park and the Divinity School Campus], the existence of which can be credited to the foresight of one individual, Clarence H. Clark... [The Episcopal Divinity School complex was] regarded as one of the most significant college plans during its construction."¹ The Divinity School was determined to be a contributing, versus non-contributing, property to the historic district.

November 2, 1998

A letter from the Philadelphia Historical Commission (PHC) to the Office of the Mayor concerning the Divinity School property. It is stated that the commission does not have jurisdiction over the property for it is not on the Philadelphia Register of Historic Places. "The Divinity School does however stand within the West Philadelphia Streetcar Suburb National Register Historic District. This entry requires consultation by the federal lead agency with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation in the event of a federal undertaking that may have an effect on the property pursuant of Section 106 of the National Historic Preservation Act of 1966" and its amendments. Federal involvement includes funding, licenses and approvals; listing per se does not constitute a federal involvement. The property may qualify for

the 20% federal investment tax credit for restoration and rehabilitation, but the costs must be substantial (greater than \$5,000 dollars). "In the event of Commonwealth involvement, including ownership or conveyance by a State instrumentality, the State agency must consult with the Pennsylvania Historical and Museum Commission as prescribed by the State History Code." A copy of a State Supreme Court hearing was included as well as the comment, "this may have bearing on activity by the School District at the site." There is no letter preceding or following this one and it can only be assumed that it is in reference to the addition of the Sadie Tanner Mossell Alexander (Penn Alexander) school to the complex.

2001

The Sadie Tanner Mossell Alexander University of Pennsylvania Partnership School opened in 2001 to kindergarten and first graders in a Divinity School building. By 2004 the school was located in a brand new \$19 million building, with funding from Penn, that served pre-K through 8th grade.²

Municipal West Philadelphia Suburb Historic District, Philadelphia Register of Historic Places

June 26, 2002

Domenic Vitiello, MCP of George E. Thomas Associates, Inc. prepared the third draft of the "Municipal West Philadelphia Suburb Historic District" for the Philadelphia Register of Historic Places, also known as the Spruce Hill Historic District. The district is roughly

bounded by 39th Street, Woodland Avenue, 46th Street, and Market Street. The description and significance of this nomination emphasize development as a function of transportation and are similar in content to the nomination of the similarly bounded National Register West Philadelphia Streetcar Suburb District. Within the significance section, the district is said to, per Section 14-2007 of the Philadelphia City Code, meet Criterion A, significant character in the development of a city, based on works of important regional architects and as a record of the evolution of one of the nation's first suburbs; C, reflecting the environment in an era characterized by a distinctive architectural style; E, works of designers who influenced historical development; and H, representing established visual features of neighborhoods in the city.³ Included with the expected nomination is a photographic and written survey of all of the properties (over 1,900) in the proposed district to be used to establish a base line for evaluating future proposed changes of street front facades. A sample entry for 503 Woodland Terrace shows the level of detail of the survey:

500 block Woodland Terrace
Street: asphalt; Sidewalks: concrete except for brick in front of 509-511, 517-519, and 520; Curbs: granite

501-519 Woodland Terrace
Charles M.S. Leslie, developer; Joseph Thatcher, house carpenter; Samuel Sloan, architect

These ten, three-story, three-register, brownstone, Italianate, semi-detached houses have ironwork fences with granite bases and posts around terraced front and side yards; granite steps from the sidewalk, slate and brick front walkways; wood steps to wrap-around bracketed millwork porches; three-story side entrance bays; paired,

glazed, paneled, wood doors with rectangular transom windows; floor length 4/4 first floor windows with paneled wood shutters; 2/2 wood sash second floor windows with bracketed projecting hoods; 1/1 paired arched third floor windows; third floor walls covered with wood shingles; paired bracketed window cornices; and hipped roofs with shallow cross gables and bracketed hipped cupolas with triple arched 1/1 wood sash windows.

503: concrete steps to porch; replacement door; paneled wood entrance foyer added onto porch; first floor shutters removed; wood shingles replaced on third floor with scalloped wood shingles; rear cinderblock shed addition.⁴

November 2, 2002

From *On The West Side* by the University City Historical Society in a letter to Councilwoman Blackwell:

For the past fifteen years, UCHS has been working toward local designation for an area of our neighborhood that roughly coincides with the boundaries of West Philadelphia's Spruce Hill section. Many enthusiastic and supportive neighbors have donated their time and over \$20,000 to make this project happen. Finally, after a long wait for consideration, we are now next in line...to have our proposed district reviewed by the Philadelphia Historical Commission. However, just recently, a very small but very vocal group of individuals emerged in opposition to this designation.

This group was headed by Alan Krigman and Michael Karp who live and own numerous properties in the area. Bill 020462 was introduced in response to their outrage. The bill transfers the authority to create historic districts from the Philadelphia Historical Commission, the expert panel which adheres

to a strict process and is by law required to have a democratic process that includes extensive community input, to each district councilperson, who is easily swayed by politics.

July 28, 2004

In a letter from Nancy Roth, President of the Spruce Hill Community Association, and Gregory Montanaro, President of UCHS, to Michael Sklaroff, Chairman PHC:

Since the submission of the updated nomination form for the Municipal West Philadelphia Suburb Historic District in 2002 there has been no word on the status of the designation process. The original nomination, developed over fifteen years ago, 'languished with the commission as a series of court challenges to the commission's jurisdiction prevented its consideration.' Over \$40,000 was raised in the community to pay for a professional to update the pending nomination which, "had become outdated owing to its delayed consideration over the years.

August 20, 2004

In an email from Richard Tyler of the PHC to Annette Babich of the University City Historical Society (UCHS):

The post-designation administrative tasks associated with the creation of the Old City Historic District are now all but completed with but some record photographing and some slight editing of the inventory remaining. We can then turn to Spruce Hill. This will include the field verification of the inventory, a step that, depending upon the care of the consultant who prepared it, can be very time consuming.

September 1, 2004

In a letter from John Gallery, Executive Director of the Preservation Alliance for Greater Philadelphia, to Michael Sklaroff, Chairman of the PHC:

The Spruce Hill Community Association and University City Historical Society sent me a copy of their July 28, 2004 letter to you inquiring about the status of the nomination of Spruce Hill for a local historic district. As indicated in their letter, an application has been submitted consistent with the requirements for nominating historic districts and its status is unknown. The Alliance is also concerned with this matter...In view of the fact that work has now been completed on the Old City District, it would seem appropriate for the Historical Commission staff to begin their review of the Spruce Hill nomination materials.

The Municipal West Philadelphia Suburb Historic District is not one of the nine historic districts on the Philadelphia Register of Historic Places. The status of the verification process is unknown to all PHC employees. The employee handling these concerns is currently on maternity leave.

Philadelphia Divinity School, National Register of Historic Places

April 29, 1980

The National Parks Service National Register of Historic Places nomination form for the complex was compiled by Ann Leopold and Robin Rosenfeld of the Clio Group under the title "The Philadelphia Divinity School." The property is described as private, occupied, educational buildings with limited access

owned by the University of Pennsylvania. The condition is excellent and unaltered, unmoved from its original site. The "Description" section describes the original campus plan followed by materials and architectural style. Then the buildings are described in order of construction: The William Bacon Stevens Library exterior then interior; St. Paul's House (administration building); St. Peter's House (the deanery); and St. Andrew's Collegiate Chapel (style, exterior, interior, details). Post World War II alterations and additions include Memorial Hall (dormitories and classrooms), Hart Hall (refectory and dormitory), and the later modern library addition by Carroll, Grisdale, and Van Allen in 1961. The areas of significance indicated are: religion, education, architecture, community planning, and landscape architecture. The "Statement of Significance" is subdivided: history of the school, landscape significance, architectural significance, and the neighborhood.

According to Carol Lee, National Register and Survey Coordinator for the Pennsylvania Historical and Museum Commission (PHMC), "the property was evaluated by our office for eligibility, but the owners never prepared a nomination for submission to the state Historic Preservation Board."⁵

Philadelphia Register of Historic Places

June 27, 1977

University City Associates, Incorporated, a University of Pennsylvania subsidiary, acquired the Episcopal Divinity School property with a land area of 224,200 square feet. [2010 market value \$15,995,000].⁶

March 24, 1981

C. Doebley of the Clio Group, Inc. prepared a Pennsylvania Historic Resource Survey form stating the owner as University City Associates.⁷ The building (not site) surveyed was the modern gothic Protestant Episcopal Seminary described as vacant with average condition and excellent integrity. Originally used as a college, the schist with limestone and brick building was designed by Zantzinger, Borie, and Medary in 1924. The "Brief Description" section talks about the seminary's move to University City in the 20th century after the acquisition of the Clark estate bounded by 42nd and 43rd and Spruce and Locust Street. "Over the next four decades the church erected its campus including St. Andrew's Collegiate Chapel, a parsonage, the deanery, the library and in the 1960s a new library." The last is the only building not designed by the original architect. The "History and Significance" section states the chapel as the most impressive building of the complex which was designed in the Collegiate Gothic style. There is a brief (3 sentence) architectural description of the chapel. The section closes with "A National Register nomination is pending for the Protestant Episcopal Divinity School." Final evaluation: "Would appear to be eligible for the National Register."

March 31, 1981

The PHMC wrote to Maurice Hertzfeld of University City Associates, Inc. stating that "A nomination for your property to be evaluated for placement on the Pennsylvania Inventory of

Historic Places and possible placement on the National Register of Historic Places has been received...The property has been evaluated and approved for listing...In the opinion of the staff your property appears to meet the National Register criteria. Before your property can be submitted for placement on the National Register, the nomination must be reviewed...Bureau for Historic Preservation staff will be shortly preparing a National Register nomination for your property...Prior to the Review Committee meeting at which your nomination is to be reviewed, you will receive notice of date of the meeting." A copy of Doebley's survey form and the National Register nomination form prepared by Leopold and Rosenfeld were attached.

May 8, 1981

The chairman of the PHC sent a letter to the owners of 4201-4299 Spruce Street (The Philadelphia Divinity School property and all buildings) stating that the property possesses the historical and/or architectural qualities that make it worthy of certification and preservation. This is the prerequisite letter of recognition after which the owner is allowed to protest designation.

May 14, 1981

Maurice Hertzfeld of University City Associates, Inc. sent Otto Haas, Chairman of PHC, a letter acknowledging the May 8th letter. He was angered that the PHC had "decided without our approval or authorization to place the property on the list of Historically Certified buildings." He was disappointed that he wasn't given the opportunity to oppose the

designation and asked what procedure must be followed to reverse the decision. "...we have no desire at this time to have our property certified historical on any registry of whatsoever kind...the properties in our view are not historical and do not qualify for placement on any Registry."

May 28, 1981

This a response to the previous letter in which Richard Tyler, historian at the PHC, stated: "Our procedures do contain a provision for an owner to object to the designation of a property by this Commission. Indeed, the concluding two paragraphs of our letter of notification explicitly solicit comment from the owner, and we do not formally enter a building on the local register until after the 30 day period cited in the last paragraph." He ensures that before any further determination is made the Commission will review the nomination and owner concerns.

August 22, 1989

To Dr. Sheldon Hackney, President of Penn, a letter from Vice President of the Philadelphia Historic Preservation Corporation (PHPC), President of Spruce Hill Community Association (SHCA), and President of the University City Historical Society (UCHS) regarding the leasing of the Divinity School chapel to a church group. There was much publicity and the authors were concerned about the preservation and use of the chapel. "We are aware that the present tenant of the chapel requested and received permission by the University's Department of Real Estate to

make changes to the interior of the chapel.” Some changes were made that destroyed original fabric and compromised the integrity of the space, namely the removal of the pews from chapel floor. The University apparently dissuaded the tenant, planning to stay only a year, from making drastic alterations like removing the choir stalls. The authors were encouraging the University to formulate a policy for protecting the architectural fabric of the complex. They alluded to the fact that the buildings will be protected legally once they become part of the Spruce Hill Historic District and admit that the nomination process for the district has been proceeding slowly.

We have contacted a consultant to individually nominate the complex to the city's list of Historically Certified Buildings. We are willing to pay the costs of this process but [as each of our organizations is a non-profit organization] we prefer a simpler, but equally certain, approach to our objective. If the University can publicly offer some assurances that it will, on its own, protect the historic and architectural integrity of the complex, it will not be necessary to initiate its nomination to the register...

¹ “West Philadelphia Streetcar Suburb Historic District” nomination form. <http://uchc.net/HistoricDistricts/wpsshd.html>

² Saffron, Inga. “Model School in West Philadelphia is built for Learning.” *The Philadelphia Inquirer*. 3 Jan 2003: E1

³ Philadelphia Historical Commission Rules and Regulations

⁴ “Municipal West Philadelphia Suburb Historic District.” “Spruce Hill” folder. Philadelphia Historical Commission.

⁵ Per email correspondence, November 5, 2010.

⁶ Philadelphia Office of Property Assessment. <http://opa.phila.gov/opa.apps/Search/SearchResults.aspx?id=7396004201>

⁷ Clio Group, Inc. Philadelphia Historic Resources Survey. More than 500 survey cards have been filled out, documenting over 2,000 buildings throughout West Philadelphia. A good resource to consult for precise information about individual buildings. Available in Harrisburg. Copies of some fiches at the Philadelphia Historical Commission.



Through the ambulatory

CHARACTER DEFINING ELEMENTS

The significance of St. Andrew's Chapel is both architectural and decorative. We identified the most important facets of the building, site, and details and created this list of character defining elements. This

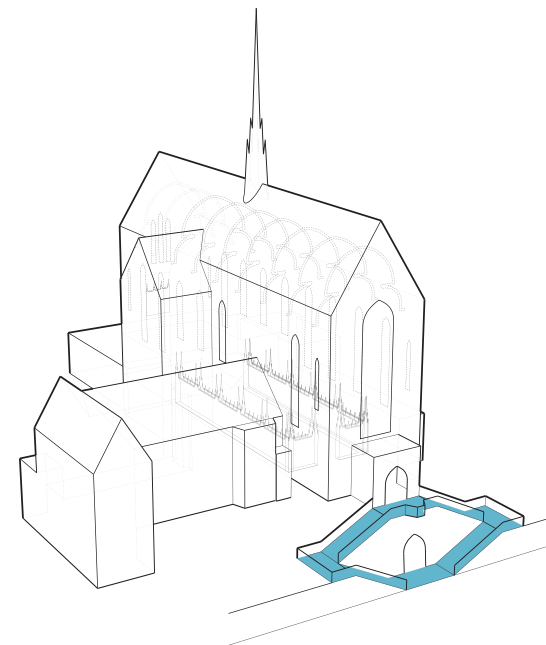
classification calls for increased consideration in the design process and an effort to maintain these elements in any sort of intervention.

Experience of Massing

The massing refers to the proportion of the sanctuary of St. Andrew's. The space is long, narrow and tall, creating an ethereal feeling upon entry, intended to evoke spirituality. We feel this intangible feeling must be considered in an intervention in order to maintain the inherent value of the sanctuary.

Spruce Street Entrance

The Spruce Street Entrance is the main entry to the sanctuary space. This entry is located fifteen feet above the sidewalk, resulting in the design of a massive stone staircase. The set of mirror image switchback staircases



Spruce Street Entrance

create a processional entry meant to highlight the journey to the sanctuary. This journey succeeds in emphasizing the hierarchy of the space, preparing the visitor for the experience of the massing within.

Ceiling Paintings

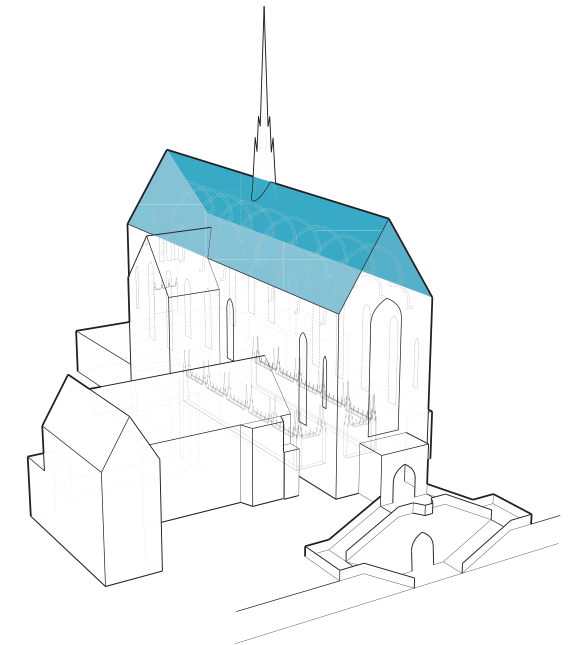
The ornately painted ceiling is the work of Gustav Ketterer, an internationally renowned mural artist. The wood panel ceiling extends for the entire length of the sanctuary space, sectioned by the hammerbeam trusses. Each panel of the wood is individually painted by Gustav Ketterer with religious iconography.

Hammerbeam Trusses

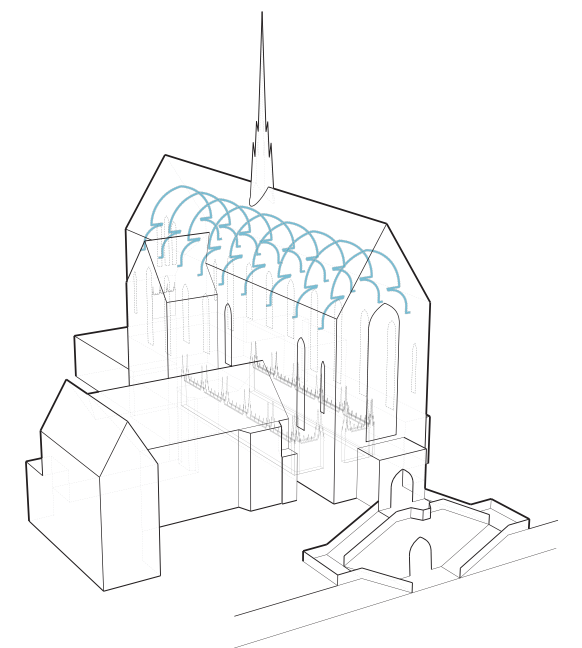
The hammerbeam trusses cross the painted ceiling intermittently through the entire length of the sanctuary space. They are made of wood, and also contain painted details. The hammerbeam trusses also contribute to the overall experience of the massing.

Ironwork

The ironwork of the sanctuary of St. Andrew's is the work of Samuel Yellin, an internationally renowned metalworker. The most apparent work is the memorial screens on either side of the altar, but more details are located throughout the space.



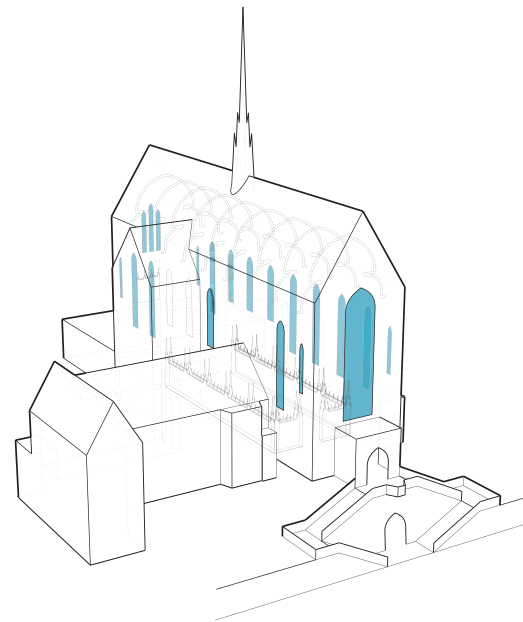
Ceiling Paintings



Hammerbeam Trusses

Clerestory Windows

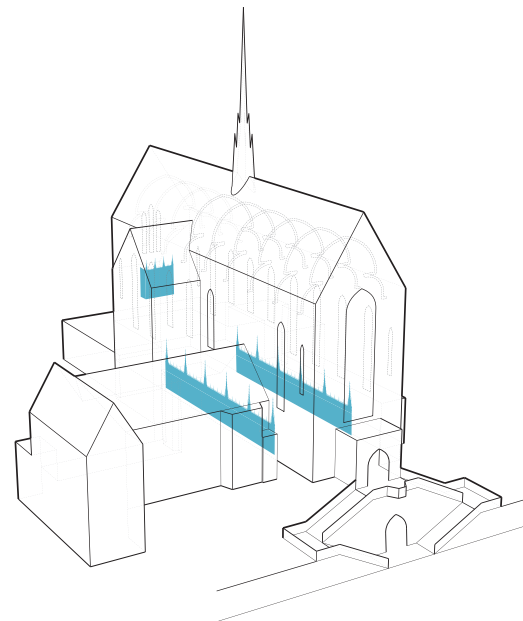
The windows of the sanctuary are instrumental in creating the light, airy feeling meant to be experienced from the overall massing. The east and west walls contain geometric, colored leaded glass windows which are tall and narrow in proportion. The south wall contains a large leaded glass window, of the same pattern and colors of the others. On the north wall, there is the one instance of figural stained glass in the sanctuary, a triptych masterfully completed by internationally renowned artist Nicola D'Ascenzo.



Clerestory Windows

Gilt Canopy and Choir Stalls

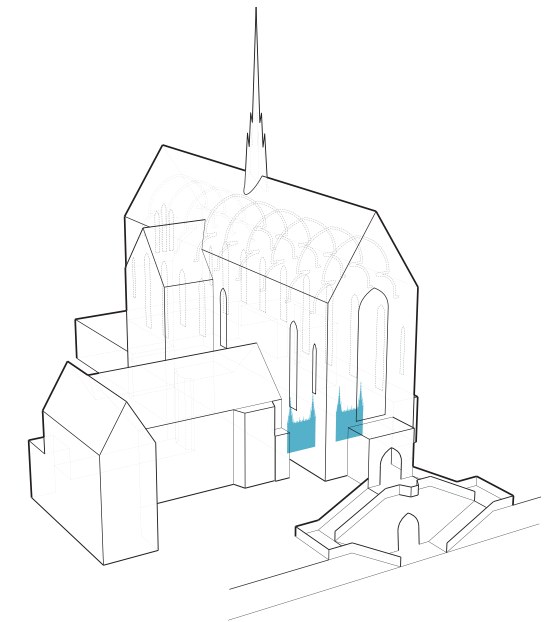
Lining the east and west walls of the sanctuary space are intricately carved wooden choir stalls. Since St. Andrew's was a Divinity School, and not a traditional church, they face inward. These wooden seats are even more detailed with the addition of a gilded canopy running above them. The canopy is extravagant, made of carved wood and plaster then entirely gilded and painted. The gilded canopy is also repeated on the altarpiece of the north wall, just below the stained glass window.



Gilt Canopy and Choir Stalls

Entrance Screen

The choir stalls and gilded canopy run up both the east and west walls of the sanctuary before turning inwards near the south entry. The turns on each side create a screen condition, partially interrupting the view shed and thus creating a division of space. The screens are very important in how one reads the massing upon entry from the Spruce Street entrance.



Entrance Screen



PREVIOUS WORK

In 1993, the Chemical Heritage Foundation of Philadelphia considered the reuse of the chapel and deanery and proposed inserting a research library into the chapel and associated offices of the foundation into the deanery.

Although the reuse was never realized, several engineering and materials studies were commissioned to determine the feasibility of this use. These studies resulted in preliminary reports examining the structural integrity, masonry, roof, decorative finishes and gilding, and windows and glass in the chapel and deanery. These reports informed the current work regarding materials and conservation. They are summarized below:

Engineering Report

In February 1993, Gredell and Associates, Structural Engineers, examined the structural integrity of the chapel and deanery. Their report identified a significant structural issue affecting the east and west walls and roof of the chapel. The collared rafters of the steel truss roof system are anchored onto the

masonry walls at a base plate that bears adjacent to the interior face of the wall. The rafters were found to deflect slightly under the dead load of the slate roof, causing an outward thrust of the walls. This was aggravated by differential thermal expansion of the steel roof structure and masonry walls. This condition has caused cracking in the walls of the chapel, but the cracks were not reported to be a structural threat. The report recommended installing a longitudinal slide plate at the bearings of the trusses closest to each end wall to combat the outward thrust of the walls. On the exterior walls of the chapel, cracking in the voussoirs of the buttresses was noted as a result of tensile stresses from the outward drift of the east and west walls. Additionally, the report found the flèche to be in poor condition, noting buckling on the top third of the structure.

The deanery was found to be in good structural condition with the exception of some misalignment of the masonry walls at the third floor dormers.

Masonry Survey

The Masonry Preservation Group, Inc. of Merchantville, New Jersey examined the condition of the masonry on the chapel and deanery exteriors in March 1993. The report found the overall condition of the buildings to be "poor to fair," with the chapel exterior exhibiting more deterioration than the deanery. Both structures, however, displayed similar conditions, including inappropriate pointing, deterioration of the Wissahickon schist stone, failed caulking and minor instances of displaced masonry units. The report identified moisture vapor transmission within the walls to be the cause of the accelerated deterioration of the schist. Roof drains and downspouts allowed water to soak portions of the exterior walls. The hard inappropriate mortar used to point the wall was found to prevent water vapor transmission, i.e. to evaporate out of the wall, and causes the moisture to enter the stone where it causes deterioration. The report also noted that a small portion of the schist had been laid with its bedding planes in a vertical orientation that contributed to the accelerated deterioration. The report recommended that the roof drainage system and downspouts be repaired immediately to halt water entry into the wall and that the entire façade be repointed using a soft mortar with a high lime content that allows moisture to evaporate through the

mortar joints rather than the stone. Finally, the report suggested a stone-by-stone survey of the façade to find defective stones so that they could be replaced.

Roof Survey

In 1993 an analysis of the roofing materials and structure of the chapel and deanery was conducted. The report details the extent of work required on the slate, built-up felt membrane, and copper roofs. It also included preliminary analysis of building materials, especially regarding the specific type of felt used on the flat roof sections. Structural analysis of the roof's support and subsurface were included. Suggested work consisted of replacing damaged slates, areas of built-up felt, and the areas of no longer functioning copper gutters.

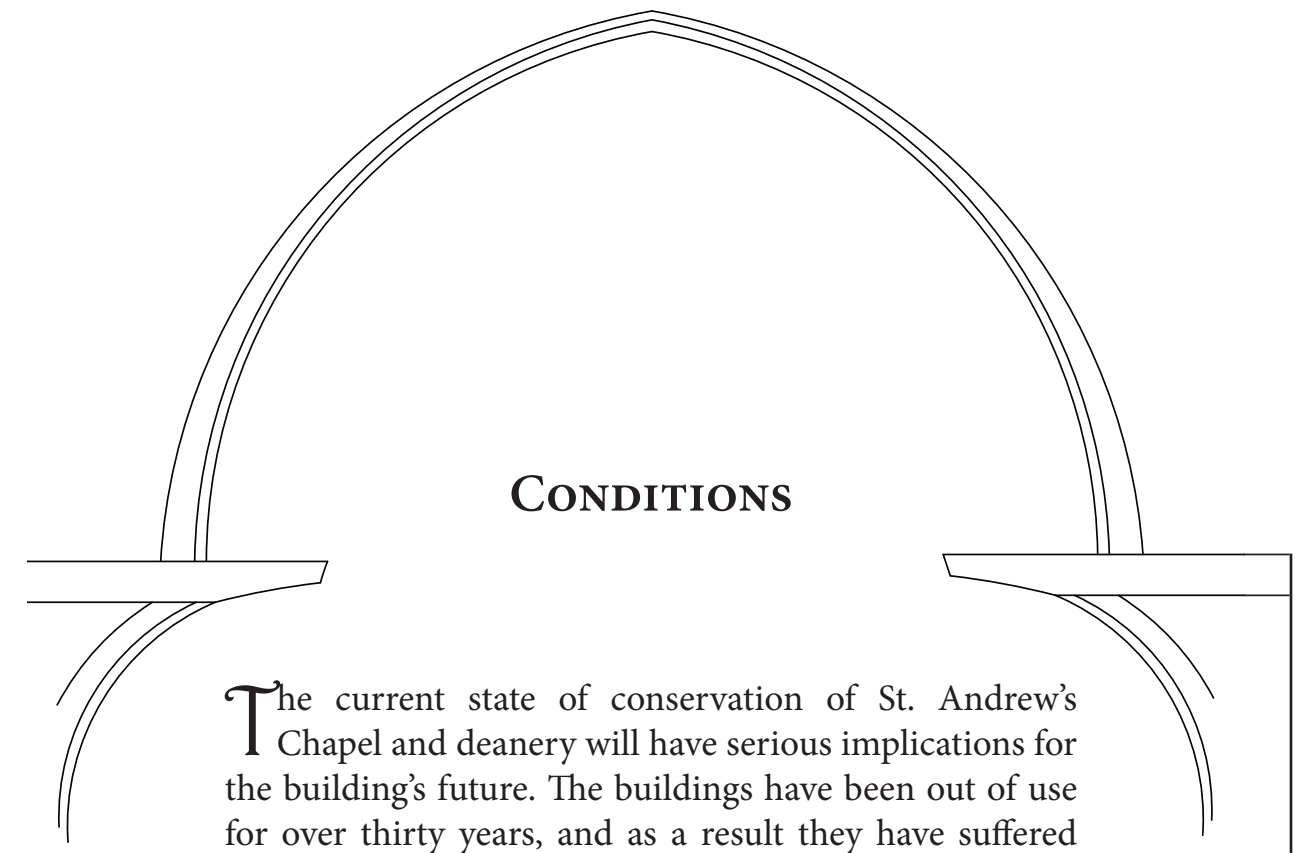
Ceiling and Gilding Survey

In February, 1993, Philadelphia's Overtuf Studios completed an inspection of the ceiling and decorative gilded elements on the interior of the chapel. The report noted an accumulation layer of grime on the painted ceiling and the carved angel hammerbeams, obscuring some of the detail and giving a dingy appearance to the decorative work. The study examined the gilded choir stalls and noted the following conditions: grime layers, abraded oil gilding, loss of composition elements, and deterioration of oil gilding due to water leaks. Loss of paint and gilding was also noted on some of the leaded glass chapel doors. On the altar, a layer of grime, flaking paint, and losses

of gesso were noted. The report offered three proposals, varying in cost and extent of work, to clean and conserve the ceiling and other decorative elements.

Glass Survey

Also in February, 1993, a glass survey was conducted by Mark S. Talaba. Talaba examined the stained glass in the chapel as well as the clear leaded glass windows in the ambulatory of the chapel and the deanery. Talaba found the chapel windows to be generally in very good condition due to the high quality of construction and the stout dimensions of the lead comes. The principle concern was the lack of proper puttying of replacement panes resulting in loose glass. Also, the ground level stained glass windows were found to be badly bowed and in need of restoration. The deanery windows were found to be less stoutly constructed and in greater need of attention due to weathering. Recommendations included reputtying and reconstruction of leaded panels where needed. Most repairs for chapel and deanery windows fell into the category of conservation rather than restoration. Talaba also recommended protecting chapel windows from vandalism with the installation protection glazing.



The current state of conservation of St. Andrew's Chapel and deanery will have serious implications for the building's future. The buildings have been out of use for over thirty years, and as a result they have suffered

from deferred maintenance and various acts of vandalism. The current state of conservation of St. Andrew's Chapel and the deanery will have serious implications for the building's future. The main mechanism of deterioration effecting the buildings is moisture infiltration. An insufficient drainage system and a failing roof have been responsible for numerous problems, from deterioration of the masonry on the exterior to staining of cement finishes and plaster deterioration on the interior. Despite a significant amount of surface deterioration, the chapel and deanery remain in fairly good condition, owing to a robust structure and an owner that continues to monitor the building and see to immediate maintenance needs. The University of Pennsylvania has undertaken various

maintenance campaigns over the years to keep the building's envelope in sound condition and prevent the building's complete decline.

As a component of this study, a condition survey of the chapel and deanery was undertaken to determine the nature and extent of deterioration. Conditions affecting the exterior and interior of the chapel were mapped on existing elevations and plans (*See Appendix: Conditions*). Recommendations for phased conservation of materials were formulated based on a budget plan. Several elements of the building were examined in more depth because of their relative importance. Studies and recommendations for schist, slate roof, and window conservation are included.

Exterior:**Walls**

The exterior walls of the chapel and deanery are generally in fair condition. The walls are plagued by such conditions as stone delamination, failure of mortar joints, water saturation and staining, and biological growth. The most threatening condition is the deterioration of schist observable on all elevations of both the deanery and chapel. Delamination is the decay process in which the face of the stone peels away layer by layer. Areas of delamination are particularly concentrated in areas of high moisture content adjacent to gutters and downspouts, but individually delaminating stones can also be observed in a random pattern on all facades. This is attributable to the highly variable nature of the schist wherein the degree of hardness varies greatly among individual stones, resulting in different rates of decay. Another contributing factor is the



Figure 1 Delaminating schist

bedding of the stones. The proper bedding orientation for stone units in a masonry wall is with the grain parallel to the ground and perpendicular to the direction of loading. Stones laid in a wall with vertical bedding planes, a practice known as “face bedding,” deteriorate at a much faster rate, as water is more likely to infiltrate between vertical sedimentation layers causing accelerated erosion and damage due to freeze-thaw cycles.¹ In some locations, particularly at corners, stones are bedded in a “checkerboard” pattern, meaning that they alternate between vertical bedding plane orientation and horizontal bedding plane orientation. Stones experiencing severe deterioration are, in some cases, decayed to a state in which their structural integrity is compromised, (Figure 1). Previous repair campaigns have patched failing stones with Portland cement as an alternative to replacing them with similar stones.

Another factor contributing to the deterioration of stone is the failure of mortar joints to perform adequately on all elevations of the chapel and deanery. In some areas, particularly along the wall facing onto Spruce Street at street level, the mortar is severely deteriorated leaving open joints susceptible to the weather. The mortar throughout most of the buildings is incompatible with the Wissahickon schist because it is too hard



Figure 2 Deteriorated mortar and inappropriate repointing with hard Portland cement mortar

for the soft stone and has a different water vapor permeability. This causes damage to the stone as water becomes trapped inside and causes erosion and freeze-thaw damage, (Figure 2). Not only is the mortar damaging to the stone because of these material incompatibilities, but in some areas is completely mismatched to surrounding mortar in terms of aesthetics (color and pointing technique), leading to discontinuities in the appearance of the wall. In addition to inappropriate Portland cement mortar used in the pointing of schist masonry units, caulk has been used for the pointing of cast stone units that form the trim and decorative stonework of the exterior. Caulk is used where units join one another and also where they abut the schist wall. Caulk has very negative

impacts on stone and cast stone, as it is highly impermeable and traps water inside of the masonry. Its bright white color also negatively affects the aesthetics of the building's exterior.

Other conditions affecting the exterior walls of the chapel and deanery include water saturation and staining and biological growth. Water has saturated the stones, particularly in areas around gutters and downspouts, because of poor drainage. This has created areas of constant dampness, a factor contributing to deterioration of stone and mortar joints. Water saturation also encourages biological growth, which needs moisture as a condition for growth. The presence of mosses, algae, and mold is noted on all elevations of the chapel in areas that



Figure 3 Biological growth, moisture staining, and inappropriate repointing on north elevation

are constantly damp. Most biological growth occurrences were noted on the surfaces of schist units, and also on cast concrete trim surfaces, although to a lesser extent. Biological growth can negatively impact stone and cast concrete surfaces by restricting moisture evaporation, (Figure 3).

Concrete Stairs

Because of the extreme grade of the site, the main entrance on Spruce Street is accessed by a set of concrete double stairs. The stairs continue down the slope of the lawn on the west side of the chapel entrance. The stairs are in poor condition; the concrete is spalling and cracking badly in several locations. On some of the steps, the concrete has spalled to reveal

the rebar in the riser of the step. This spalling and cracking probably results from freeze thaw cycles and expansion of the rebar.

Windows

There are several variations of window types throughout the chapel and deanery complex. The chapel contains both figured stained glass and rectangular pane leaded windows. The deanery windows as well as the windows of the ambulatory are leaded, mostly casement windows with steel frames. The windows throughout the chapel and deanery are in varying condition. Vandalism and frequent replacement of glass have damaged several windows. Missing or broken panes of glass are particularly prevalent on the west elevation in

the ground level windows of the ambulatory. Despite a few missing panes, the rectangular pane stained glass windows of the chapel appear to be in good condition. The ground level, figured stained glass windows on the north façade, however, are in poor condition. The glass is bowing badly and the lead comes are weakened. All figured stained glass windows, as well as some of the rectangular pane stained glass on the west elevation, are sheltered with protective glazing on the exterior. The ground level windows on the west side ambulatory have protective glazing as well, (Figure 4).

The deanery windows are more weathered than the windows of the chapel. Generally, the windows are still operable and salvageable, although there are exceptions. The leaded glass panels in many of the windows are bowed or misshapen and the lead comes are weakened, bent, or broken. Steel frames and subframes are rusted and exterior glazing is in very poor condition.

Doors

In general, the exterior doors are in good condition. Several of the doors, however, are damaged due to vandalism or lack of maintenance. The wooden ground level door at the Spruce Street entrance is a batten, arched door. It has suffered from wood deterioration at the bottom, probably due to contact with ground moisture. Failure of the paint film has sped the decay of wood. Several of the wooden elements in the arched jamb are loose or detached. The door is no longer secured; it will not close completely and is, as a result, secured with a padlock instead. The

doors on the west elevation contain decorative iron details that are experiencing severe rusting. The door that opens into the courtyard on the north façade of the deanery is very badly damaged due to vandalism. The glazed door contains leaded glass panels, one of which has been badly damaged and is temporarily protected with plywood, (Figure 5).

Roof and Flashings

The roof over the chapel and deanery is in poor to fair condition and its failure is a threat to the watertightness of the building. Three types of roof systems exist over the structure. Over the steeply-pitched gable roofs of the chapel and deanery is a graduated slate roof. Over the low-sloped roofs that cover areas of the ambulatory of the chapel, the roof consists of a built-up felt membrane system. On two flat roofs over the library and front entry of the chapel, both on the south elevation facing onto Spruce Street, the roof covering consists of copper sheets. The current slate roof, original to the 1926 construction, is in poor condition. The slates are experiencing varying degrees of weathering. While some appear to be in sound condition, others have weathered significantly. In general, the most weathered slates are near the bottom of the slope where slates are thinner due to the graduated system. Also, there are a number of broken or missing slates. Slate nails are missing or backing out of the substrate where they are exposed along the ridge. The copper and built-up roofs could not be inspected but are likely in need of repairs as well. The roof flashing is made of lead and copper sheet metal and is in very poor condition.



Figure 4 Broken glass, east ambulatory window



Figure 5 Vandalized deanery door



Figure 6 Flèche, top third removed due to structural problems



Figure 7 Failing downspout, southwest corner of chapel

Flèche

The flèche, or spire, rises above the ridge of the chapel's sanctuary. The steel frame structure is covered in lead sheathing. Following the recommendations of a 1993 engineering report, the top $\frac{1}{3}$ of the flèche was removed because of buckling of the lead sheathing. It has not been repaired but is stored in the north end of the ambulatory, (Figure 6).

Drainage System

The drainage system consists of built-in gutters with copper linings on steeply-pitched roofs and a scupper collection system for low-sloped roofs. The water runs off of the roof into a built-in gutter system, which discharges into scuppers and exterior downspouts. Galvanized lead and copper downspouts feed water into an underground

system. The failure of the drainage system is apparent on the surfaces of exterior masonry walls surrounding downspouts. These areas exhibit constant dampness, even on dry days, and can be correlated with water damage on the interior as well. The connection between scupper/gutters and downspouts is not secure, causing water to run down the wall rather than being directed into the downspouts. Also, built-in gutter liners are in poor condition and have not been properly maintained, (Figure 7).

CHAPEL INTERIOR:

Walls

The walls of the interior of the nave are covered in grey cement stucco. The greatest risk to the integrity of the chapel's interior is water damage, due to the building not being water



Figure 8 Water staining on cement stucco wall.

tight. A water leak was found on the south west wall where the ceiling meets the wall, (at the cornice). Efflorescence and water staining were found on both the cement stucco on the walls and on the cast stone framing the windows; the east, south, and west walls being the most affected. Efflorescence is caused by soluble salts that migrate through the wall under moist conditions. It is an aesthetic concern, as well as an indication of the presence of moisture, but has no structural implications. Efflorescence was primarily found around windows and in higher sections of the walls where the wall meets the ceiling, which suggests a failing roof system.

The presence of moisture staining on the cement stucco and cast stone has left vertical wash patterns on areas under the windows

and under the ceiling, which points to water infiltration from these two elements, (*Figure 8*). The moisture stains left on the cement stucco walls are dark while the stains on the cast stone are very light in color.

Another condition present on the cement stucco walls are cracks. These are located in different areas on the east and west walls. The report of 1993 stated that movement due to differential thermal expansion of steel and masonry, and downward deflection of trusses due to the weight of the slate are pushing the east and west walls outward resulting in cracking of the wall cement. It was found, however, that they did not adversely effect the performance of the building structure. The cracks are mostly vertically oriented and most prevalent in areas where different materials



Figure 9 Crack on top of wall



Figure 10 Interior door showing rusted hardware and loss of wood finish

meet, such as cement and cast stone, (*Figure 9*). Some detachment is found on the west wall exposing the substrate beneath. Furthermore, another possible cause of cracking and detachment on the cement could be water damage, since material is usually susceptible to disaggregation when exposed to acid rain.

There are also signs of mold on the walls. Biological growth is due to the high moisture content that enables organisms to develop and further deteriorate surfaces of the wall.

Doors

The interior doors are in very good condition. Some of the doors on the auxiliary spaces show some signs of weathering. Sanding, priming and repainting, glazing replacement, and hardware replacement are needed. The surfaces of these doors have lost their finishes in some areas, and the hardware is rusting, (*Figure 10*). The four repoussé doors on the north side, which lead to the auxiliary spaces are in excellent condition.

Ceiling

The ceiling is composed of painted and carved hammerbeams, arches, rafters, purlins, decorative panels, and angel figurines. Even though close examination was not possible, all elements seemed to be in good condition and color on painted surfaces is still very vibrant. Water damage is presumed by the leakage that was observed in several spots during a rainy day.

Systems

The chapel's heating system is original to the construction. A single centrifugal fan circulated air through supply and return ducts through a brick furnace, heated by a gas-fired burner. Heat was forced through cast iron grilles. The forced-air furnace is located in the basement beneath the chapel. The deanery was heated by a gas-fired cast iron boiler in the basement of the chapel. The boiler provided steam to the radiators throughout the deanery. This system is about 20–25 years old. The buildings lack an air conditioning system or sprinkler system, and the electrical system is antiquated.²

Deanery

The deanery's interior was assessed independently from the chapel because of the inherent differences in scale, materials, and structure. The deanery was built as a residential wing connected to the chapel on the southwest end. It was designed in conjunction with the chapel and the two were erected simultaneously. The exterior walls are stone masonry in the character of the chapel and interior framing and floors are timber. Interior surfaces are plastered and the floors throughout are carpeted. Suspended ceilings have been installed in some of the rooms.

Original Materials

The deanery was built to be a functional,

residential building, so it lacks the architectural detail that is seen in the adjacent chapel. It has also been subject to more alterations than the chapel, including some minor reconfiguration of spaces and replacement or removal of original interior doors. The deanery does, however, retain some original interior elements that are significant in their simple, Gothic expression that serve to architecturally unify the deanery with the chapel. Some of these elements include the leaded glass casement windows, Gothic style woodwork and arched door openings, and carved wooden mantelpieces in the Gothic style, (*Figure 11*).

General Condition Observations

The deanery has received less maintenance than the chapel, probably due to its complete



Figure 11 Carved wooden mantle in deanery



Figure 12 Plaster and finish deterioration due to water damage

lack of use in recent years and perceived lesser importance. The deanery seems to be structurally sound, but has a high degree of surface deterioration. The plaster and paint finishes are in very poor condition throughout most of the building, (*Figure 12*). The windows have also suffered from neglect and vandalism, and are in worse condition than those of the chapel. The exterior envelope is of the same materials and construction as the

chapel, and exhibits similar conditions including stone deterioration, slate roof and flashing deterioration, and failure of the drainage system.

Plaster

The most severe condition affecting the deanery's interior is the widespread failure of plaster on walls and ceilings. The plaster system consists of two or three layers of plaster over a diamond mesh metal lath that is affixed to the expanded wooden framing members. Plaster failure is noted in many locations throughout the building on all three floors. While it is most severe in the western end of the deanery, it is present in isolated locations throughout the building as well. At some locations, failure can be directly correlated to water intrusion. For example, plaster deterioration on the walls and ceiling of the southern staircase can be correlated to water saturation of the exterior masonry wall due to its proximity to a damaged downspout that has failed to keep water away from the wall. On the third floor, there are several locations where plaster failure can likely be linked to moisture intrusion from the roof. In these areas,

the plaster skim coat has detached to expose the scratch coat beneath. In some instances, all layers of plaster have detached to expose corroded and warped metal lath. Moisture has caused corrosion of lath, which has caused the plaster to lose its key and become detached.

In other locations, however, it appears that plaster failure cannot be attributed to water

damage but rather a structural failure of the plaster/lath system. On the second floor in the southwest room, the plaster ceiling, including both lath and plaster, has completely collapsed onto the floor, (*Figure 13*). It is likely that it was demolished in its entirety for safety reasons after it became apparent that it was in danger of collapse. This cannot be correlated to any obvious water damage; it is not directly below the roof and cannot be attributed to plumbing leaks because it is not beneath a source of water. This failure is probably due to excessive weight of the plaster combined with weakening of the lath over time. In the adjacent northwest room, the ceiling is intact but is exhibiting a definite sag towards the middle of the room as well as some cracking. Presumably, the

plaster has lost its key with the metal lath and has started to sag and crack as a result. Nails holding the lath may also have come loose. Considering the failure of the adjacent ceiling, this is a very urgent concern, as falling plaster could present serious safety threats.

Paint Finishes

The paint finishes throughout the deanery are in very poor condition. The finishes exhibit damage from moisture and also widespread peeling and blistering, as paint peels from the walls and ceilings in large sheets. This is likely a result of incompatibility between paint layers resulting in loss of adhesion between layers. This is not of great concern, as the building's interior has likely been painted



Figure 13 Collapsed plaster ceiling in southwest room, second floor

multiple times and the most recent finishes do not contain any great significance. It is, however, very likely that lead paint is present in the paint history, (*Figure 14*).

Vandalism

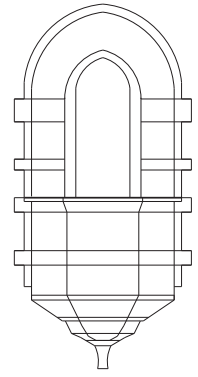
Vandalism is a problem that is most pronounced in the deanery part of the complex where numerous windows and doors have been damaged by vandals breaking into the building. Several windows have been destroyed and are currently covered with plywood because the leaded panels are partially or totally compromised. The courtyard door, previously mentioned, has been badly damaged as well and is also currently protected with plywood. Limited measures have been taken to prevent vandals from breaking into the building including interior metal bars on some first floor windows in the most vulnerable locations.



Figure 14 Peeling paint in third floor hall of deanery

¹ Weaver, Martin E., and F. G. Matero. 1993. *Conserving buildings: guide to techniques and materials*. New York: Wiley.

² William J. Trefz Consulting Engineers, "Mechanical Systems Report for St. Andrew's Chapel," April, 1993.



CASEMENT WINDOWS

Condition Assessment and Recommendations for Deanery Windows

The leaded casement windows in the deanery are an important character-defining feature of the early 20th century residential building. The deanery was designed in a restrained version of the Tudor Gothic style, employing subtle details to add architectural interest and unify it with the adjacent Gothic chapel. Leaded glass casement windows were derived from the English tradition of employing wrought iron casements with leaded comes in residential architecture. Leaded comes have been used to hold glass since the twelfth century. With the success of rolled steel, this tradition was adapted in the United States. Steel casements with lead comes became popular in residential architecture and in Gothic style campus buildings in the early 1920s. Although the windows in the deanery were designed to be primarily functional rather than decorative, the choice of materials and style illustrate an historical architectural tradition and contributes to the harmony between the deanery and the chapel. They are certainly



Figure 1 Leaded casement window in deanery

a character-defining element, retain a high degree of integrity, and should be conserved if possible in any reuse scenario, (Figure 1).

Window Construction

The casement windows of the deanery fall into four configurations: 9 panes, 12 panes, 15 panes and 18 panes. All windows, excluding two in the basement that have been filled in with replacement glazing, are in the casement style, opening outward with a hinge system. The hardware is iron, and the particularly decorative latches serve to lock the window closed. The subframe is the non-moveable component that is set into the masonry wall. The frame is the moveable sash element that holds the leaded panel of glass and is attached

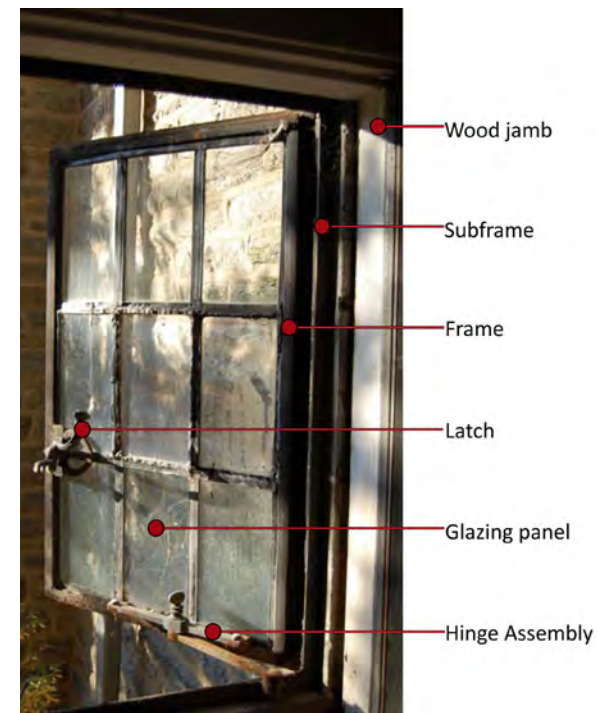


Figure 2 Components of deanery casement window

to the subframe with hinges. Both the subframe and frame are made of steel. The glazing panel consists of rectangular quarries of glass held together with lead comes. The comes are strips of lead that form an “H” shape in cross section and hold the individual pieces of glass with the assistance of a lead cementing compound. They are very malleable and can be easily bent or stretched to accommodate the glass. Where the lead comes intersect, they are soldered together at the joints. The glazing panel is set into the steel frame and secured with glazing putty around the perimeter (and possibly also clips), (Figure 2).

Conditions

A field survey was conducted to inventory existing window types and assess the material condition and operability of the windows (*t Condition Assessment of Deanery Windows*). The following elements were examined: glass, lead comes, steel frame, subframe, hardware, and exterior glazing putty. It was determined that the casement windows are generally in fair condition. Sixty percent of the windows are operable with no defects in operation and an additional eighteen percent are basically operable but need minor reconditioning to open and close without sticking. About seven percent of windows are damaged beyond repair, mostly due to vandalism, and will require complete replacement.

Glass

The glass has, undoubtedly, been broken and replaced in many of the windows, but it

is likely that a large percent of it is original. The glazing is rectangular, clear quarries one single pane thick. Fifty-seven percent of windows retain all glazing with no cracked or missing panes. Many of the basement and first floor windows have a lot of damage to the glass. The number of defective panes is noted on the window survey for each window, (See *Appendix*). In several windows, broken glass panes have been replaced with frosted glass.

Lead Comes

The lead comes are nearing the end of their

service life in the majority of the windows. Lead is an extremely soft and malleable material that, after years of weathering combined with wear from opening and closing, begins to deteriorate and lose its capacity to effectively support the weight of glass panes. It has little tensile or compressive strength and is also subject to cycles of thermal expansion and contraction that cause fatigue of the metal. Lead's coefficient of thermal expansion is three times that of steel, so the lead came's expansion within the steel frames have caused buckling and bowing, resulting in glazing panels that do not properly fit into the frames.



Figure 3 Deterioration of lead comes

The condition of the lead comes in the majority of the deanery windows is poor to fair, with a few that are in good condition (probably because they have received repairs). Deterioration and warping of lead is common, as well as breaks at the soldered joints, (Figure 3). In some of the most deteriorated windows, the lead comes have detached completely and are missing from the glazed panel.



Figure 4 Rusting of frame and subframe

Steel Frames and Subframes

Generally, the steel frames and subframes are in very good condition. Some of the frames exhibit minor bending or warping. Some degree of corrosion is noted on most of the frames and subframes, particularly on the bottom rail of frames where water tends to collect, (Figure 4). Corrosion, however, is a condition that is superficial in most cases and easily treated so it did not detract from the score of frames and subframes in the window survey except for in extreme cases where it has affected the performance of the window. The frames and subframes that are painted are in excellent condition.

Hardware

The decorative hardware of the windows is one of the most important elements, functionally and aesthetically. Fortunately, most

of the hardware is intact and in very good condition allowing the continued operability of the windows. A few windows are missing pieces of hardware, (Figure 5).

Glazing Putty

The putty applied to the exterior of the sash serves to protect it from the weather and to secure the glazed panel into the frame. Glazing putty is a sacrificial element that needs to be repaired and replaced frequently, and without maintenance will deteriorate and fall out. Because of lack of maintenance, the glazing putty is generally in very poor condition. It is deteriorated, brittle, and completely absent in some windows.



Figure 5 Characteristic iron window latch

Conservation Plan

Because of the advanced age and deteriorated condition of the deanery windows, a thorough reconditioning program is necessary to allow the windows to continue to function. The condition of each individual window will dictate the level of intervention necessary. Three levels of intervention are possible: maintenance, repair, and replacement.

1. Maintenance

According to the data obtained from the window survey, approximately 10-15% of the deanery windows are in very good condition and fall into the maintenance class of repair. These windows exhibit no major defects in the lead comes, frames, or subframes. The maintenance class involves routine maintenance that can be performed in situ without the removal of the sash or glazed panel. The following measures should be taken to ensure the continued longevity of these windows:

- Any rust or excess paint on the subframe or frame should be removed through mechanical means, such as brushing with a wire brush.
- Any small holes or uneven sections in the steel frame and subframe should be patched with a steel fiber/epoxy material and sanded smooth.

- Bare steel should be painted with a zinc-rich anticorrosive primer.
- Missing or cracked glass should be replaced by cutting out the broken pane at the solder joint, replacing with a

CASEMENT WINDOWS

new pane, and resoldering the joint. A cementing, waterproofing compound should be pressed under the comes to ensure a watertight bond between the lead coming and replacement glass. This can be performed in situ only when the lead comes are strong enough to withstand cutting and resoldering. If a large number of panes need replacement, these repairs should not be done in situ.

Deteriorated glazing putty should be removed from the exterior and the sash should be reputtied to secure the glazed panel into the frame.

- Steel elements should be painted to prevent corrosion.
- Clean and lubricate hardware and replace missing components to match existing.

2. Repair

The vast majority of the windows in the deanery will fall into the class of repair. These windows are salvageable but require a fair amount of reconditioning to allow them to continue function. Where there is damage to the glazing panel, including warping or bowing and deterioration of lead comes, it is recommended that panels are releaded. Because lead coming is considered a sacrificial element and it is at the end of its service life, its replacement is prudent. The recommended repairs must be performed in a workshop or studio rather than in situ.

- Glazing panels should be removed from steel frames and releaded. All glass that is not damaged should be saved and reused in the new panels. Broken glass should be repaired in kind. A restoration lead (ASTM B29-84) should be used in recreating the leaded panel.
- A waterproofing compound should be pressed under the comes to ensure a watertight bond between the lead coming and glass.
- The steel frame and subframe should be cleaned of rust, patched where necessary, and primed with anticorrosive primer. The releaded panel should be inserted into the frame and secured using a glazing putty compound around the perimeter of the frame.
- Primed steel components should be painted to prevent corrosion.
- Clean and lubricate hardware and replace missing components to match existing.

3. Replacement

Only about 5-8 windows are damaged badly enough to warrant complete replacement. In these windows, the frames are missing or badly warped and therefore incapable of holding the glazing panel. Replacement is necessary and justified in these cases. The selection of replacement windows should strive to match



Figure 6 Center window has received additional glazing for protection from vandalism

the originals in order to retain uniformity. The configuration, materials, number and size of panes, proportions, and profiles should duplicate originals as closely as possible. According to the National Park Service preservation brief on historic steel windows, many metal window manufacturers will reproduce historic configurations if requested. Because of the prevalence of historic leaded casement windows in England, there are several companies in the UK that offer services for replacement and custom recreation of leaded glass windows. “Tec Glass” is a British company that specializes in leaded glass windows and offers custom replacement windows.

Energy Efficiency

In a window reconditioning program, it is important to consider ways to improve

energy efficiency to decrease energy costs in maintaining interior temperatures. The casement is one of the least efficient window forms because of its tendency not to close tightly, especially after years of wear. Metal, particularly steel, is a very inefficient material in window construction because it conducts cold. These factors often lead to replacement of historic steel casement windows in building rehabilitations. There are, however, measures that can be taken to improve energy efficiency of historic metal casement windows.

Caulking

Caulking is a simple measure that should be undertaken as a part of a routine maintenance schedule. Caulk is applied to fill cracks and seal joints on the exterior where the metal subframe meets the masonry wall. A flexible



Figure 7 Interior screen set into wood jamb, possible location for interior casement storm window

elastomeric caulking compound with a minimum durability of ten years and compatibility with both metal and masonry should be used. This measure will reduce the amount of air that can penetrate the window opening.

Weatherstripping

After caulking, weatherstripping is the most basic measure that can be taken to improve energy efficiency. There are numerous methods and materials used for weatherstripping, but the casement form limits the options. The best weatherstripping material for metal casement windows is the sealant bead. A neat strip of firm silicone caulk is applied to the perimeter of the steel subframe at the point where it meets the sash. Polyethylene bond breaker tape is then applied around the perimeter of the sash frame at the contact point.

The window is then closed until the sealant has cured. When the window is opened again, the sealant will have formed the shape of the gap between the sash and subframe for a tight fit between the two. The bond breaker tape can then be removed.

Insulation Glazing

Another option for increasing energy efficiency is insulation glazing; adding an extra layer of glazing to insulate the window. Generally, adding one layer of glazing will double the insulating value of the window. This can be accomplished by adding a layer of glazing over the existing glass, replacing existing glass with thermal glass, or installing a storm window.

The cheapest method of adding additional glazing is to install a single sheet of acrylic or

glass over the existing window sash. Another option is to install additional glass over each individual pane in order to retain operability. The latter option is not possible for leaded windows because of the cames' inability to support two pieces of glazing. The former option would be possible but would have several disadvantages. The negative visual impact and destruction of operability outweigh the advantages of this option. Additional exterior glazing has already been installed in several deanery windows, presumably as a response to vandalism, (Figure 6). Installing thermal glass is not an option because thermal glass is heavy and thick, and could not be supported by lead cames.

The best option to improve energy efficiency of the deanery windows is to install an interior storm window for added insulation. This option, combined with weatherstripping and caulking, would effectively double the window's insulating value and have minimal visual impacts on the building's exterior. Because the casements open out, storm windows would be best located on the interior to maintain operability and exterior appearance. The steel subframe offers no support for such a window, but there does exist a rebate in the wood jamb in which the storm windows could be inserted. In some windows, this rebate is currently being used to support an inward-opening screen, (Figure 7).

The preservation brief on metal windows suggests two options for weatherizing casement windows with storm windows: a specially-fabricated interior casement storm window that opens inward or a sliding interior storm

window with a design that is sympathetic to the casement sash. Sliding interior storm windows are better suited for paired casement windows that meet at a vertical mullion bar that can provide a location for the meeting of the two sliding sash, whereas the deanery windows are either in single configuration or paired with a central jamb divider that would preclude the option of sliding. A special casement storm window will require custom fabrication of a subframe and casement unit that will fit into the profile of the jamb. Caulking should be performed once the storm subframe is installed into the jamb on the exterior face to prevent further air infiltration. The casement storm windows should have a dark frame and one sheet of clear glass for an inconspicuous appearance.

Conclusion

Reconditioning and thermal upgrading is the appropriate treatment program for the historic leaded glass casement windows in the deanery. While replacement with new, more energy-efficient windows may be a less expensive option, the loss of historic fabric and negative visual impacts of this type of work outweigh any benefits of cost saving, as can be seen in the single example where this has been performed in the deanery's basement. (Figure 8) It is important to preserve the windows in order to retain the historic architectural character of the deanery building. Through repairs and thermal upgrading, the service life of the windows can be greatly extended and energy efficiency achieved.'



Figure 8 Casement replaced with insulated sash and glass in deanery basement

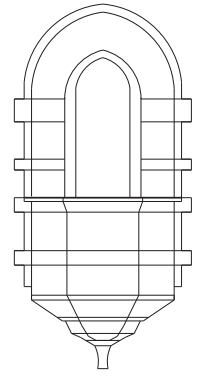
Charles E. Fisher and Christina Henry, Interior Storms for Steel Casement Windows, Drake Hotel, Philadelphia Case Study, National Park Service Preservation Tech Notes: Windows No. 15, 1986.

Margot Gayle and David W. Look, AIA, Metals in America's Historic Buildings: Uses and Preservation Treatments, Technical Preservation Services, U.S. Department of the Interior. Washington, D.C.: U.S. Government Printing Office, 1980.

Sharon C. Park, AIA, The Repair and Thermal Upgrading of Historic Steel Windows, National Park Service Preservation Brief 13, <http://www.nps.gov/history/hps/tps/briefs/brief13.htm>, December 14, 2010.

Tec Glass Leaded Glass website: <http://www.leadedlights.net/>, December 14, 2010.

Neal A. Vogel and Rolf Achilles, The Preservation and Repair of Historic Stained and Leaded Glass, National Park Service Preservation Brief 33, <http://www.nps.gov/history/hps/tps/briefs/brief33.htm>, December 14, 2010.



SCHIST

The exterior of St. Andrew's Chapel is composed of Wissahickon schist, a local material used throughout the Philadelphia region. The stone ranges in color from gray to beige with silver streaks of mica. A portion of the stone has a light, highly reflective appearance due to high proportions of quartz and mica, and may indeed be better characterized as a quartzite stone. These stones may be replacement for deteriorated schist. The more intensely colored stones contain higher proportions of minerals such as feldspar, (Figure 1).

Schist is a type of metamorphic stone "characterized by the presence of visible flaky or tabular minerals aligned in a cleavage...Micaceous schist (muscovite, containing silvery white mica, or biotite, a dark or black mica) contains a high proportion of mica, along with quartz and feldspar; mica is aligned on planes of wavy foliation."¹



Figure 1 The variegated stone exterior of St. Andrew's Chapel.

The schist predominant in southeastern Pennsylvania was first identified in the Wissahickon Creek gorge in Philadelphia and named after this geographic feature. According to the *Online Virtual Tour of Wissahickon Creek*:

The garnet and mica schist of the Wissahickon is a metamorphic rock that was once a shale, or a sedimentary rock composed primarily of clay—fine grained sediments that will only fall to the bottom if the water carrying them becomes still. Heating during burial and the additional pressure created by burial causes the minerals in the shale to undergo chemical changes. One of the dominant changes is the release of water from the clay and growth of minerals in the mica family. All micas are platy minerals that grow so that the plates are oriented in the rock to minimize differences in pressure.²

The chapel's façade of Wissahickon schist creates a distinctive presence along Spruce Street and marks the building as distinctly Philadelphian. However, marked deterioration of individual stones is noticeable by the casual observer. Upon close inspection, patterns emerge of deterioration that coincides with downspouts and other areas of exposure to water. The stone has multiple deterioration forces acting on it, such as bio-growth,



Figure 2 Decomposing schist on the southern elevation at the entrance to the crypt, exhibiting loss of material and brownish coloration.

gypsum encrustations and delamination along the bedding planes of vertically bedded stones. The most serious condition by far, however, is the disaggregation of individual stones, identifiable by a masonry unit's lowered profile (below the surrounding pointing and stones) and an orange-brown coloring, (Figures 2, 3).

Large sections of decomposing stone have developed within the chapel's interior, most notable in the northeast corner of the southeast entrance vestibule. In this location, the stones have turned a brownish-orange tint and have developed a brittle, powdery texture. Physical inspection of the stones confirms that their surface gives way under slight pressure, having suffered a complete loss of strength and cohesion, (Figure 4).

A March 10, 1993 report by The Masonry Preservation Group, Inc. of Merchantville, New



Figure 3 Salt deposits, likely gypsum, have formed a crust over stones on the southern elevation.



Figure 4 The texture and color of the schist changes as the feldspars decompose.

allow water vapor transmission, in effect trapping moisture within a wall or forcing it to find other means of egress than the masonry joints. In an ideal masonry and mortar configuration, the mortar acts as a sacrificial material by drawing water out of the wall, consequently deteriorating and requiring occasional replacement. The Wissahickon schist at St. Andrew's Chapel is more porous than the cement mortar, and has become the preferential route for water vapor transmission. The stone, rather than the mortar, has become the sacrificial material.

Jersey cites a lack of water vapor transmission through the masonry walls as the cause of the deterioration of the schist. It is true that water infiltration from failing roof membranes and inadequate roof drainage systems is causing deterioration in the stone. However, the full explanation of why the schist is so badly deteriorated is much more nuanced.

Based on the year it was built and the extensive use of concrete throughout the interior, the masonry of St. Andrew's chapel was probably bedded and pointed with cement-based mortars. Cementitious mortars do not

Moisture can initiate mechanical damage and chemical damage. Mechanical damage occurs when soluble salts from surrounding materials (they can leach out of mortars or stone) or formed from pollutants in the air dissolved in water vapor. Salts are carried throughout the masonry by moisture and remain as deposits when the moisture evaporates. As the salts crystallize they exert pressure on the surrounding stone that mechanically breaks down its structure.

While some efflorescence and encrustations of salts on the stone point toward the above type of deterioration mechanism, these occur only in select places. The majority of the stone needing replacement on the exterior and interior of St. Andrew's chapel appears to have undergone the chemical change of kaolinization. With prolonged exposure to water in combination with carbon dioxide and other atmospheric pollutants, the feldspar in schist decomposes into kaolin. This chemical transformation creates a reduction in volume as well as a dramatic reduction in strength. The schist loses its structure as a stone and become a soft, sandy, smaller version of its former self. There is no consolidation treatment available to return the kaolinized feldspar back to its previous state, a process that would require the immense heat and pressure that formed the metamorphic rock before it became building stone.

Wissahickon schist is naturally predisposed to kaolinization, but this chemical transformation can be prevented by completion of the following steps. First, the current roof drainage system must be repaired or augmented so that rainwater can be effectively directed away from the building walls and foundations. In addition, the entire façade should be repointed with a soft lime-based mortar to create a preferential path for water to evaporate through mortar joints rather than through stone.

At the time of this report, masonry repair was being performed on the western exterior wall of the deanery. The masonry contractor on site reported that they had found approximately 20% of the stone on this façade to be in need of replacement, and had replaced 187 stones. The mason also reported using a 6:1:1 mortar, a ratio of six parts aggregate to

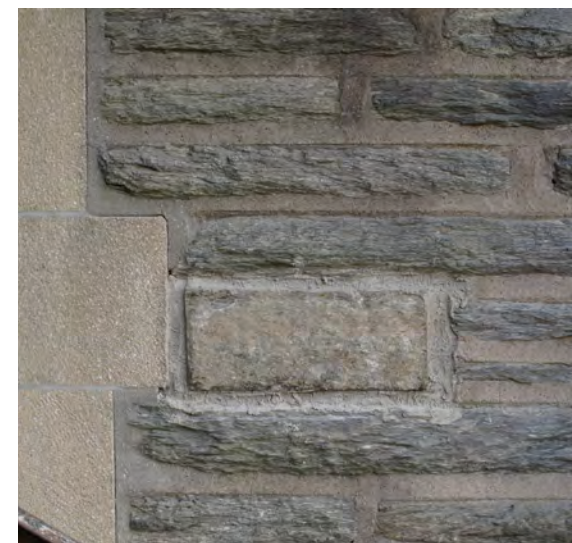


Figure 5 A December 2010 replacement on the western elevation of the Deanery that does not replicate the color, texture or size of surrounding masonry.



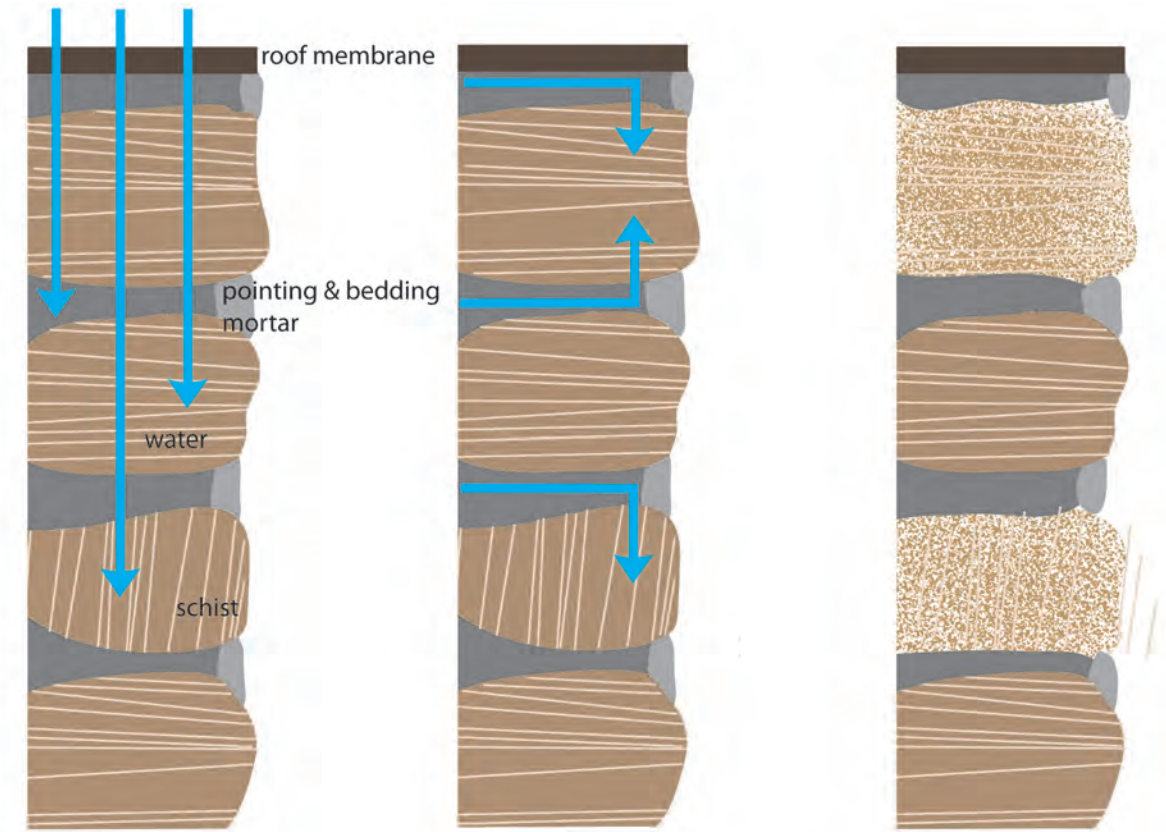
Figure 6 A second inappropriate replacement on the western elevation of the Deanery.

KAOLINIZATION AND DELAMINATION OF SCHIST

one part lime and one part portland cement. Water vapor transmission tests should be conducted to determine the necessary lime content such that the mortar becomes the preferential path for evaporation of moisture from the walls.

It also appears that the current masonry contractors are using a gneiss or granitic stone that does not match the original schist's color or texture. Furthermore, the size and shape of replacement stone is inconsistent with the existing coursing of the walls. Wissahickon schist is still available and replacement should be made in kind and bedded using the existing masonry patterns, (Figure 5, 6).

By ending the excessive water infiltration into the facades and repointing the entire building with a soft mortar, St. Andrew's schist façade will survive for generations to come.



Moisture enters the wall through faulty roof membranes and drainage systems

Moisture cannot exit the wall through the mortar joints and enters schist

Feldspar decomposes chemically and salt crystallization causes mechanical damage

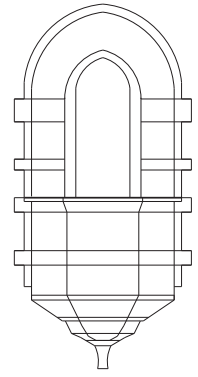
Recommendations:

Stop water infiltration

Repoint entire facade with lime-based mortar

¹ Pellant, Chris. 1990. Rocks & minerals. New York: Crescent Books.

² <http://www.personal.psu.edu/faculty/j/e/jea4/VWiss/Wiss2.html> "The Virtual Geologic Tour of Wissahickon Creek, Philadelphia, Pennsylvania." Accessed: Nov. 2010.



SLATE ROOF

The existing roof on St. Andrew's chapel is the original and has not undergone any replacement or repair since installation. The roof's construction consists of a metal truss system supporting a wooden roof deck covered by felt membrane and slate shingles. The roof is currently leaking where it contacts the walls due in combination to damage to the roof fabric and the copper gutters and flashings. In order to make the interiors occupiable these issues must be addressed.



Figure 1 Section of St. Andrew's roof showing, chipped, cracked, broken, and delaminating slates.

Roof tiles show signs of past damage and deterioration in progress. Tiles are chipped at corners, fractured, or completely broken due to physical impacts or mechanical deterioration over the period since original construction. Others slates show signs of delamination, leading to thinning of the slates and a weakening of the material, (Figure 1). A visual inspection from the ground shows approximately 20-30% of the slates to be damaged or in some stage of deterioration.

Damage to the supporting roof structure has been diagnosed and can be inferred due to other conditions present. The water infiltration that is evident on the interior of the chapel and deanery has likely damaged the wooden roof decking and the felt membrane above it. A lack of thermal

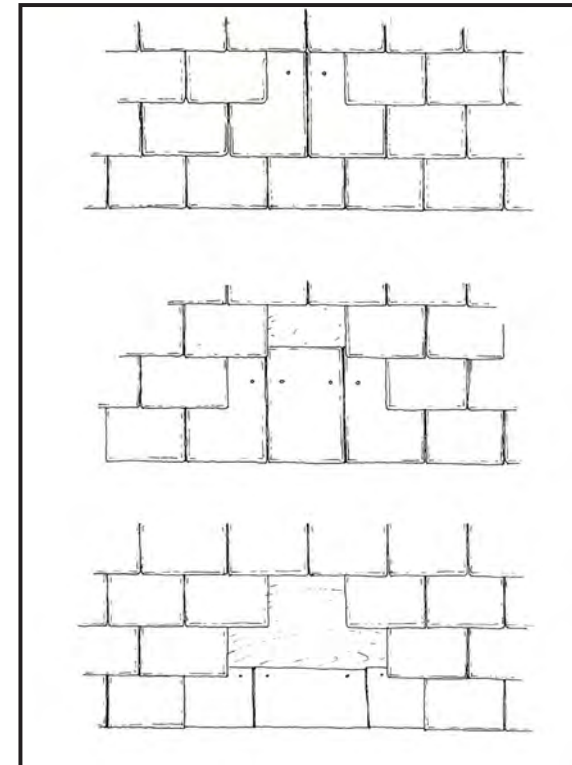


Figure 2 Diagram of slate roof removal for replacement.

expansion joints on the copper gutters can lead to damage and in some cases their failure. Finally, a lack of thermal expansion space and overloading of the steel roof trusses has caused internal pressure and cracking in the chapel walls.

The most immediate of these issues to address is the waterproofing of the roof. In 1993 a roof survey conducted by ARCON concluded that relatively few slates needed to be replaced to repair the roof. The number of slates requiring replacement was limited enough that individual slate replacement would have

been cost effective. The current condition of the roof leads to a full reroofing as the best solution. When 20% of a slate roof requires replacement it becomes more cost effective to reroof due to the number of additional slates that need to be removed in order to access the damaged slates for replacement and the additional cost of preserving the other slates without damaging them, (Figure 2).^{1,2}

Removing the roof tiles will allow access to the roof decking and membrane for evaluation and repair as necessary. This will also provide an opportunity to correct the lack of expansion room for the roof trusses as well as install new copper gutters and flashing.

The decision to reroof does not necessarily mean a full replacement of materials. A sample of the intact slate can be sent to a quarry where the remaining lifespan can be estimated. If the lifespan is deemed long enough, the remaining slate in good condition can be reused to save money on new materials. If this is not the case the material can be sold to a salvage company to help recuperate the costs of replacement. In both these situations the cost of removal and storage will be higher than if the material were simply disposed of due to the greater amount of care involved in the process.³

A complete cost estimate will not be possible without first conducting an analysis of the remaining slate. Therefore a matrix comparing the cost and attributes of possible new materials for reroofing was prepared, (Figure

3). This matrix uses the cost of full replacement of the roof material and assumes that the underlying structure is sound. Given the 1½”-¾” thickness of the existing slate roof it is reasonable to assume that the structure would be capable of supporting any of the new materials chosen without the need for additional reinforcement of existing fabric.

The existing slate roof is one of the defining aesthetic elements for St. Andrew’s Chapel. Any new roof that is installed should respect these aesthetics. Materials included in the matrix are the three grades of slate S-1 through S-3, graded based on their durability and, therefore, lifespan. These would be the material of choice due to its compatibility with the original, though it is the most expensive. S-1 and S-2 slates compensate for this through their long life spans.

Alternative materials are also considered. Synthetic slate mimics the appearance of the original material, but can be found lacking in durability and may prove to be more expensive over the lifetime of the roof due to the need to replace it sooner. A standing seam metal roof was considered but is not recommended due to a lack of visual compatibility with the building. Finally, an asphalt shingle roof is a plausible option. It can be designed to mimic the appearance of slate, while this may not stand up to close scrutiny, it would be indistinguishable to the casual observer and from the distance of the height of the chapel roof. Asphalt shingle roofs can also be found with warranties up to 50 years, matching the durability of S-2 slate.

Flashing, gutters, membrane, and roof deck replacement should be included as needed. The choice of materials is dependent on the reroofing material selected and should be compatible in appearance, behavior, and lifespan.

The installation of a new roof is a necessary expenditure for the continued maintenance of St. Andrew’s Chapel. While the expense of a new slate roof can be great, it is an isolated cost and it will help preserve the aesthetics of the chapel. Barring the possibility of replacement in kind we stress that a visually compatible material be chosen and properly maintained and a slate roof be reinstalled at a later date if possible.

¹ Stearns, B., Stearns, A., & Meyer, J. (1998). The Slate Book: How to design, specify, install, and repair a slate roof. Stowe, Vt, Vermont Slate & Copper Services].

² Levine, J. S. (1993). The repair, replacement, and maintenance of historic slate roofs. [Washington, D.C.?], U.S. Dept. of the Interior, National Park Service, Cultural Resources, Preservation Assistance.<<http://www.nps.gov/history/hps/tps/briefs/brief29.htm>>.

³ Conversation with Jeffrey Levine, 9 December, 2010.

	S-1 Slate	S-2 Slate	S-3 Slate	Synthetic Slate	Standing Seam Metal	Asphalt
Cost (sq ft)	\$40	\$30	\$20	\$15	\$15	\$20
Total Cost	\$440,000	\$330,000	\$220,000	\$165,000	\$165,000	\$220,000
Service Life	75+	45-75	45	50	50	50
Cost per Year	\$5,800 or less	\$4,400-\$7,300	\$4,900 or more	\$3,300 or less	\$3,300	\$4,400
Dead Load	Equivalent or less than original weight. Individual Slates may need replacement over time.	Equivalent or less than original weight. Individual Slates may need replacement over time.	Equivalent or less than original weight. Individual Slates may need replacement over time.	One half of original roof weight.		Less than original roof.
Durability	Individual Slates may need replacement over time.	Individual Slates may need replacement over time.	Individual Slates may need replacement over time.			Requires regular replacement.
Weathering	Stone will take on weathered appearance.	Stone will take on weathered appearance.	Stone will take on weathered appearance.			Roof tiles will fade.
Appearance	Can be matched to original, new slate will not have weathered appearance.	Can be matched to original, new slate will not have weathered appearance.	Can be matched to original, new slate will not have weathered appearance.		Significantly different from original.	Can be styled to emulate slate
Additional Requirements					Need to compensate for thermal expansion of materials	

Figure 3 Matrix comparison of reroofing materials considered.

CONDITIONS RECOMMENDATIONS

The St. Andrew's Chapel and Deanery have not had a permanent tenant or preservation plan for over 30 years, so prioritized recommendations for St. Andrew's Chapel and Deanery are being given for a 15 year span, and are based on a budget plan. The recommendations focus

on the conservation of the building without taking into account specific future uses. The recommendations are phased considering immediate needs and budget. Large areas such as roof and masonry walls cannot be done all at once, so work was split into manageable sections. If a major investment is placed in the conservation and maintenance of St. Andrew's Chapel and Deanery, the time it would take the buildings to be occupiable could be considerably reduced from 15 years to approximately 5 to 10 years.

A ground level assessment of the Chapel and Deanery was conducted in order to determine the areas that needed repairs or replacements. The costs were calculated according to prices per square unit in the Cost Estimate section (See: *Financials*).

The slate roof of St. Andrew's Chapel and Deanery is original to the building and has reached the end of its service life. The performance of the roof has been compromised and leaks are present throughout the building. The Roof Survey Report of 1993, states that at that time the slate roofs on both the Chapel and Deanery were in need of repair, and approximately 30 slates had either broken or are worn beyond what is acceptable. Also, gutters, scuppers and downspouts are not working properly. Scuppers and downspouts are not connected causing the rainwater to fall onto the walls saturating the masonry. These should be removed, restored, and reinstalled at the same time that reroofing is taking place. The copper flashings have outlived their useful life and have no provision for thermal movement.

Reroofing on the Chapel and Deanery must be addressed. A complete assessment on the condition of the slate, roof decking, felt membrane, copper gutters and flashings must be performed. Although costs might be great, the installation of a new roof is necessary to avoid further deterioration of the building.

The windows on the east, south and west walls have leaded panels of rectangular shape with a combination of clear and colored glass. Five panes of glass have broken and are in need of replacement. Three of these have

been covered with a temporary black material. The windows on the auxiliary spaces on the ground level of the Chapel have clear glass, and approximately 25 panes need to be replaced. These last ones have probably been vandalized and currently have a protective layer on the exterior.

The project scope is divided into five categories of work: stabilization, roofing repairs and replacement, masonry repairs, window and door repairs and replacement, and miscellaneous such as decorative elements.

Priority I: Within 1 year

Cost Estimate: \$148,220

The first phase of preservation work will focus on immediate maintenance needs, structural stability, and weather tightness.

1. Failing gutters and downspouts should be cleared of debris throughout the Chapel and Deanery (Gutters: 560 linear feet at \$2/lin.ft.).
2. Connections between scuppers and downspouts should be properly secured throughout the Chapel and Deanery.
3. Clean interior of the Deanery and get rid of debris that holds moisture to help prevent biological growth.

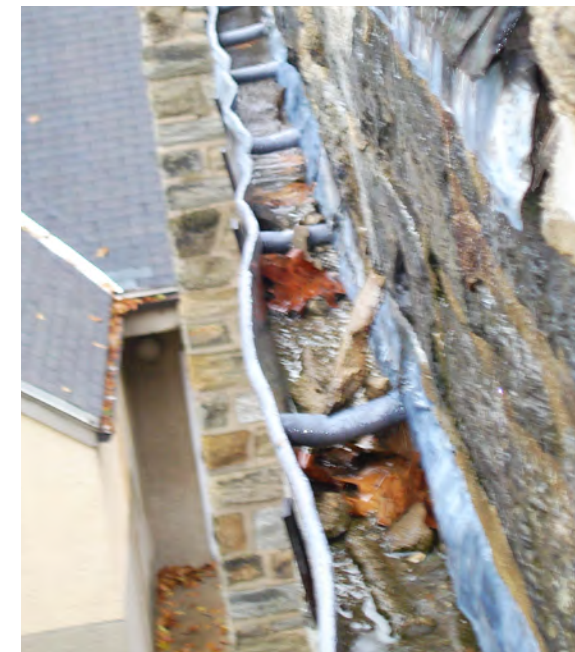


Figure 1 Debris on gutters



Figure 2 Door in very poor condition on the Deanery leading to courtyard

4. Replace severely damaged door on the north wall of the Deanery by recreating Gothic design as to not change the character of the building.
5. Interior missing doors in the Deanery should be replaced with doors that are similar in aesthetics to the existing doors. Assume six doors.
6. Replace severely damaged windows in the Deanery using the same design and technique as in the original casement windows to preserve the aesthetics of the building. Assume five windows.
7. Replace broken glazing on windows in the Chapel. Assume 30 panes.
8. Exterior doors throughout the Chapel and Deanery should be repaired.
9. Monitor cracks on cement walls and inspect roof of the Chapel to ensure performance of the building structure has not being compromised, (Figure 1, 2).

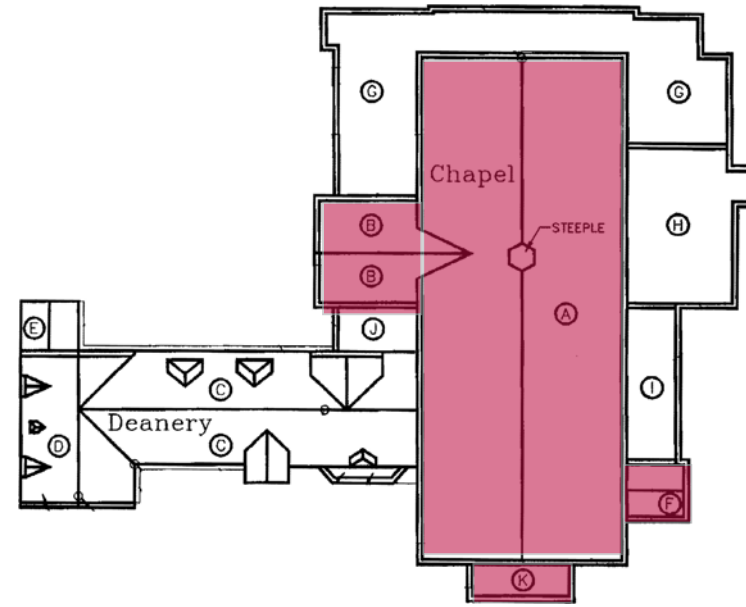


Figure 3 Roof plan showing areas needing reroofing

Priority II: Within 2 years

Cost Estimate: \$340,200

1. Reroof the Chapel.
2. Restore copper flashing, gutters, scuppers and downspouts.
3. Restore decorative leaded elements in gutters.
4. Restore spire.
5. Figure 3



Figure 4 Severely deteriorated schist on the exterior

Priority III: Within 4 years

Cost Estimate: \$300,000

1. Perform an assessment of the condition of the exterior stones on the east elevation of the Chapel. Severely deteriorated stone should be replaced with a stone having similar appearance or, depending on depth of deterioration, patched with an appropriate repair mortar. Replacement stones should be laid with bedding planes horizontally oriented. Assume 1200 sq.ft. need replacement.
2. All caulk from the east elevation of the Chapel should be removed from the joints of the cast stone trim and replaced with a mortar that is appropriate in terms of aesthetics and strength. Missing joints and failing Portland cement mortar throughout the building's exterior should be repointed with an appropriate mortar with high lime content.
3. Reset coping stones on east elevation of the Chapel.
4. Biological growth and staining should be cleaned from the surfaces of schist and cast stone on the east elevation of the chapel using water and gentle brushing possibly combined with a mild biological solution such as D2 by Cathedral Stone (Use natural bristle brushes or soft brushes. Have several brushes starting with a soft brush and proceed with stiffer brushes if needed. Do not use metal or wire brushes since they will damage the stone), (Figure 4).

Priority IV: Within 5 years

Cost Estimate: \$225,000

1. Perform an assessment of the condition of the exterior stones on the south elevation of the Chapel and south elevation of the Deanery. Severely deteriorated stone should be replaced with a stone having similar appearance or, depending on depth of deterioration, patched with an appropriate repair mortar. Replacement stones should be laid with bedding planes horizontally oriented. Assume 900 sq.ft. need replacement.
2. All caulk from the south elevation of the chapel and south elevation of the Deanery should be removed from the joints of the cast stone trim and replaced with a mortar that is appropriate in terms of aesthetics and strength. Missing joints and failing Portland cement mortar throughout the building's exterior should be repointed with an appropriate mortar with high lime content.
3. Reset coping stones on south elevation of the Chapel.
4. Biological growth and staining should be cleaned from the surfaces of schist and cast stone on the south elevation of the chapel using water and gentle brushing possibly combined with a mild biological solution such as D2 by Cathedral Stone (Use natural bristle brushes or soft brushes. Have several brushes starting with a soft brush and proceed with stiffer brushes if needed. Do not use metal or wire brushes since they will damage the stone).

Priority V: within 6 years

Cost Estimate: \$300,000

1. Perform an assessment of the condition of the exterior stones on the west and north elevations of the Chapel. Severely deteriorated stone should be replaced with a stone having similar appearance or, depending on depth of deterioration, patched with an appropriate repair mortar. Replacement stones should be laid with bedding planes horizontally oriented. Assume 1200 sq.ft. need replacement.

2. All caulk from the west and north elevations of the Chapel should be removed from the joints of the cast stone trim and replaced with a mortar that is appropriate in terms of aesthetics and strength. Missing joints and failing Portland cement mortar throughout the building's exterior should be repointed with an appropriate mortar with high lime content.
3. Reset coping stones on west and north elevations of the Chapel.
4. Biological growth and staining should be cleaned from the surfaces of schist and cast stone on the west and north elevation of the chapel using water and gentle brushing possibly combined with a mild biological solution such as D2 by Cathedral Stone, (Use natural bristle brushes or soft car brushes. Have several brushes starting with a soft brush and proceed with stiffer brushes if needed. Do not use metal or wire brushes since they will damage the stone).

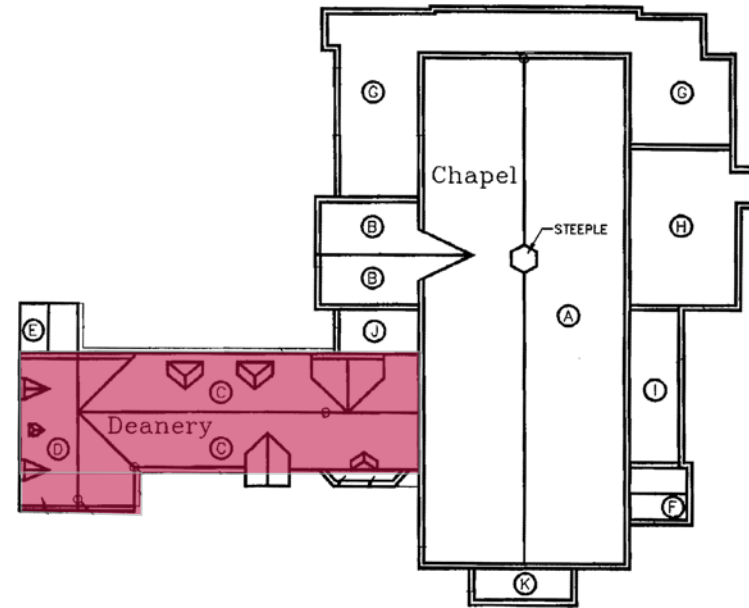


Figure 5 Roof plan showing area needed reroofing

Priority VI: Within 7 years

Cost Estimate:\$332,500

1. Reroof the Deanery.
2. Restore copper flashings, gutters, scuppers and downspouts.
3. Restore decorated leaded elements in gutters.
4. Perform an assessment of the condition of the stones on the west and north elevations of the Deanery. Severely deteriorated stone should be replaced with a stone having similar appearance or, depending on depth of deterioration, patched with an appropriate repair mortar. Replacement stones should be laid with bedding planes horizontally oriented. Assume 1,000 sq.ft. need replacement.
5. All caulk from the west and north elevations of the Deanery should be removed from the joints of the cast stone trim and replaced with a mortar that is appropriate in terms of aesthetics and strength. Missing joints and failing Portland cement mortar throughout the building's exterior should be repointed with an appropriate mortar with high lime content.
6. Reset coping stones on west and north elevations of the Deanery.
7. Biological growth and staining should be cleaned from the surfaces of schist and cast stone on the east elevation of the chapel using water and gentle brushing possibly combined with a mild biological solution such as D2 by Cathedral Stone (Use natural bristle brushes or soft brushes. Have several brushes starting with a soft brush and proceed with stiffer brushes if needed. Do not use metal or wire brushes since they will damage the stone), (Figure 5).



Figure 6 Severely deteriorated schist in the interior of the Chapel

Priority VII: within 9 years

Cost Estimate: \$351,000

1. Perform an assessment of the condition of the interior stones on the Chapel. Severely deteriorated stone should be replaced with a stone having similar appearance or, depending on depth of deterioration, patched with an appropriate repair mortar. Replacement stones should be laid with bedding planes horizontally oriented.
2. Replace felt membrane on roof of Chapel.
3. Restore copper flashings, gutters, scuppers and downspouts.
4. Restore decorative leaded elements in gutters
5. Severely deteriorated schist in the interior of the Chapel, (Figure 6).

Priority VIII: within 11 years

Cost Estimate: \$382,000

1. Restore windows in the Chapel. Assume 650 sq.ft.
2. Restore leaded glass windows in the Deanery. Assume 80%, (Figure 7).

Priority IX: Within 13 years (2026)

Cost Estimate: \$412,716

1. Metal lath and plaster ceiling on the east side of second floor of the Deanery has collapsed and should be replaced.
2. Metal lath and plaster systems exhibiting signs of eminent failure should be inspected and replaced where needed. Replacement cost would vary depending on materials chosen. This estimate was calculated replacing with similar metal lath, but other less expensive materials are available.
3. Restore interior doors in the Deanery. The level of repair varies according to the condition of each door. These include sanding, priming and repainting, glazing replacement, and hardware replacement. Assume 28 doors.
4. Clean and restore architecturally significant elements on the Deanery such as staircases and brick fireplaces and woodwork.
5. Failing metal lath and plaster system, (Figure 8).



Figure 7 Missing glazing on south end of the Chapel



Figure 8 Failing metal lath and plaster system

Priority VIII: within 15 years

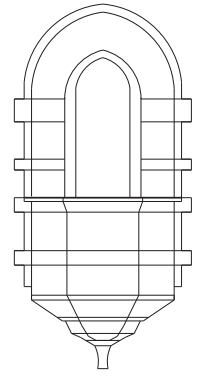
Cost Estimate: \$301,756

The D'Ascenzo's stained glass windows and Yellin's iron gate are in good condition. However, as part of the Chapel's character defining elements, these should be addressed.

1. D'Ascenzo's stained glass windows at floor level on the north end of the chapel have bowed and are bulging. These should be re-lead.
2. Close examination of the D'Ascenzo's stained glass windows on the center of the north end of the Chapel was not possible, so it should be inspected to determine condition and addressed if necessary.
3. Remove, conserve and reinstall Yellin's iron gate in the interior of Chapel.
4. Restore interior doors of the Chapel. Sanding, priming and repainting, glazing replacement, and hardware replacement are needed.
5. Cleaning of interior surfaces of the chapel. Interior surfaces should be cleaned to remove staining and efflorescence on concrete and cast stone surfaces.
6. Perform analysis on the composition of interior cement of the Chapel. Swelling and cement wall render bulging due to water infiltration should be corrected. Fill interior cracks and patch areas detached with compatible cement with respect to mechanical as well as aesthetic properties according to analysis. New cement must be weaker and more permeable than surrounding original fabric, (Figure 9).



Figure 9 Cracks and cement detachment on walls



MOTHBALLING

Mothballing is the process of sealing up a building that no longer supports a function so as to try and preserve it for a possible use in the future. However, buildings that are not in use cannot remain boarded up for ever and planning must occur so as to prevent rapid deterioration that can take hold as maintenance and use decrease. St. Andrew's Chapel and the adjoining deanery have been in the mothball stage for a number of years. After Penn's acquisition of the property, different parts of the buildings had been used by the PIC and other organizations. Despite its very infrequent use, the Chapel remains in good condition. However, the deanery, the most versatile space, is virtually unusable because of the present amount of deterioration.

Preservation Brief 31, put out by the National Park Service stipulates plans for proper mothballing. This brief stresses the fact that mothballing should only be considered as a temporary solution and that a new plan should be devised quickly so as to get the building up and running as soon as possible. Despite

the considerable amount of time it has been out of use, the integrity of the chapel and the beautiful architectural elements located there remain high. The current state of the deanery prevents instant reuse.

The chapel appears to be in better condition for several reasons. First, Penn issues occasional Certificates of Temporary Occupancy (CTO) that allow the chapel space to be used. While perhaps they are infrequent, these require that a certain level of maintenance be kept so that the space is usable for the next group. Even this minimal amount of maintenance is important to postpone deterioration. Second, the massing of the chapel is an advantage for the survival of the wooden elements. The chapel's tremendous height and the ancillary spaces around the nave allow for the circulation of air. As a building located in a warm-humid climate zone, the lack of services is of concern, especially during the summer months. The integrity of the building so far suggests that immediately updating the services in the chapel space not necessary.

Of concern is the very poor state of the Deanery. Explanations for this include some of the following possibilities. First, the windows in the Deanery have not been maintained and the building envelope is open directly to the external environment. This results in more than just the deterioration of the windows and the adjacent walls, (*Figure 1*).

Second, the building was constructed of less robust material, such as plaster and metal lath, that are much more susceptible to moisture damage than the stucco walls of the chapel. As moisture enters the building and saturates the plaster, it affects the metal, (*Figure 2*). As the metal rusts, plaster will begin to fall off, but there are larger issues that must be

addressed, such as the integrity of that wall. There are areas where the ceilings have fallen down because of this. The service lives of these materials is significantly less than those of the very durable materials in the chapel. Interior paints fail much more rapidly in the prolonged presence of moisture. This type of deterioration is clearly visible throughout the Deanery. The carpets that are located in many of the rooms hold moisture and encourage humidity. Additionally, because the building is not entirely sealed, it appears that people have been staying in it. Trash, in varying amounts, is located throughout the deanery and can cause deterioration on a number of levels. If it is food related trash it can attract pests and animals. Several rooms have large



Figure 1 General deterioration surrounding a window in the Deanery



Figure 2 Deterioration surrounding plaster and metal lath in the deanery

amounts of paper thrown all around; if it gets wet this can lead to mold growth, (*Figure 3*).

Considering these points mentioned above, there are several steps that can be taken now to help improve the buildings while they are not in use. Many of these recommendations are suggested in the Conditions Recommendations part of this report.

Stabilize the Building's Envelope:

- The roof in the chapel should be replaced to prevent the infiltration of water and moisture vapor.
- The windows throughout the building should be fixed or closed to prevent moisture infiltration or animal entrance.
- A small-scale monitoring plan should be set up to track both the temperature and relative humidity in the chapel to determine how the building is performing and how the wooden elements are reacting

Properly Secure the Building

- The rear door of the chapel is very difficult to lock, and has been found unlocked on several occasions. This lock should be replaced, with one that functions appropriately, to prevent people from simply walking in the building.

- Clean up the trash throughout the building, in particular in the deanery so as to promote the importance of both the chapel and the deanery, and give the impression to people who might be staying there that it is or will soon be in use
- The glass windows should be covered to prevent more breakage. This can either be done with wood or with a hard plastic. It should be done carefully so as not to suggest that either building is abandoned.
- Motion sensor lights should be put up around the deanery in dark areas to prevent break-ins.

Park, S.C. (1993). *Mothballing Historic Buildings*. [Washington, D.C.?], U.S. Dept. of the Interior, National Park Service, Cultural Resources, Preservation Assistance.



Figure 3 View of the condition of one of the rooms on the second floor of the Deanery

DEMOGRAPHICS

For the purpose of this report, the Spruce Hill neighborhood profile area was defined by the boundaries of the Penn Alexander School catchment area, (See Appendix for map: Demographics).

Community Profile Report for Spruce Hill

Population Trends and Racial Characteristics

This area is home to an estimated 12,650 people in 2010, and population is expected to drop by about 2% by 2015. This is a larger loss of population than is expected in Philadelphia County, which is expected to lose only about .5% population by 2015. Currently, about 40% of the Spruce Hill neighborhood population is white, 37% is African American, and about 15% is Asian. In the next five years, the white population is expected to decline by about 11%, whereas the African American and Asian populations are expected to grow only modestly. The Hispanic population, currently only at 5%, is expected to grow by about 12% in the next five years,¹ (See Appendix: Demographics, 1).

Age Distribution

Currently the largest age group in Spruce Hill is “working age” (18-64) at 82% of the population. This is significantly higher than Pennsylvania as a whole, which has a “working age” percentage of 62%. Spruce Hill’s next largest age group is “under 18” at about 14%. Those residents under age 5 and over age 65 each make up about 4% of the neighborhood population.

Incomes

Spruce Hill is a relatively low to moderate income neighborhood based solely on statistical data. However, these statistics can be misleading because there is a large student population living in Spruce Hill, which significantly lowers the reported median income of the neighborhood. When speaking with those familiar with the neighborhood, it was said that the residents who own homes in the area tend to be middle

and even high income households, as many are employed at the universities. Statistically speaking, however, the median household income for Spruce Hill currently ranges from about \$15,000 to \$69,000, compared to a state median of about \$50,000. In 2010, about 75% of households in Spruce Hill had an annual income of less than \$50,000, compared to about 63% of people in Philadelphia County and 50% of people in the state. Even more notable is that about 47% of households in Spruce Hill currently have an income of less than \$25,000, (See Appendix: Demographics, 2),

Household Composition

The Spruce Hill neighborhood is currently made up of about 6,000 households, and consists of both families and university students living with roommates. About 15% of households in Spruce Hill have children, which is significantly fewer than Philadelphia County or the state as a whole.

Employment by Industry

About 27% of Spruce Hill workers are employed in the Educational Service industry, making up the largest percentage of workers by industry. This is followed by about 18% of workers who are employed in the Health Care and Social Assistance industry. Both of these figures are to be expected, with the University of Pennsylvania and its associated hospital just to the east, (See Appendix: Demographics, 3).

Household Movement

The Spruce Hill neighborhood has attracted many new residents over the last ten years. The map below shows the estimated number of households who moved into their home since 2000, as

of 2010. It is clear by this map that the Spruce Hill neighborhood has seen many new residents move in recently, and it can be assumed that part of this attraction is the highly successful Penn Alexander School, as the highest movement areas on the map roughly follow the borders of the school’s catchment area, (See Appendix: Demographics, 4).

Housing Type

The largest percentage of housing type in Spruce Hill currently is units in small apartment buildings, which accounts for about 66% of the housing type in the neighborhood. This is followed by single family attached homes at about 18%. Compared to Philadelphia County, the Spruce Hill neighborhood has a substantially higher percentage of apartments and has substantially fewer single family homes. An estimated 12.5% of households own their homes in Spruce Hill at the present time. This figure is expected to drop slightly by 2015, (See Appendix: Demographics, 5).

Property Values

In 2010, property values in the Spruce Hill neighborhood ranged from the low \$100,000s to upwards of \$350,000. Surrounding the neighborhood to the north and south are lower-valued properties, (See Appendix: Demographics, 6).

Market Value Analysis

In 2008, The Redevelopment Fund developed a market value analysis for Philadelphia. The Spruce Hill neighborhood generally falls into either the “Regional Choice B” or “High Value C” categories. “Regional Choice B” is characterized by low foreclosures, low percent owner occupied houses, and a relatively high percent commercial mix. “High Value C” is characterized by a high

number of residential properties with tax abatements, relatively high home prices, and high residential density. Both categories are indicators of a healthy housing market,² (*See Appendix: Demographics, 7*).

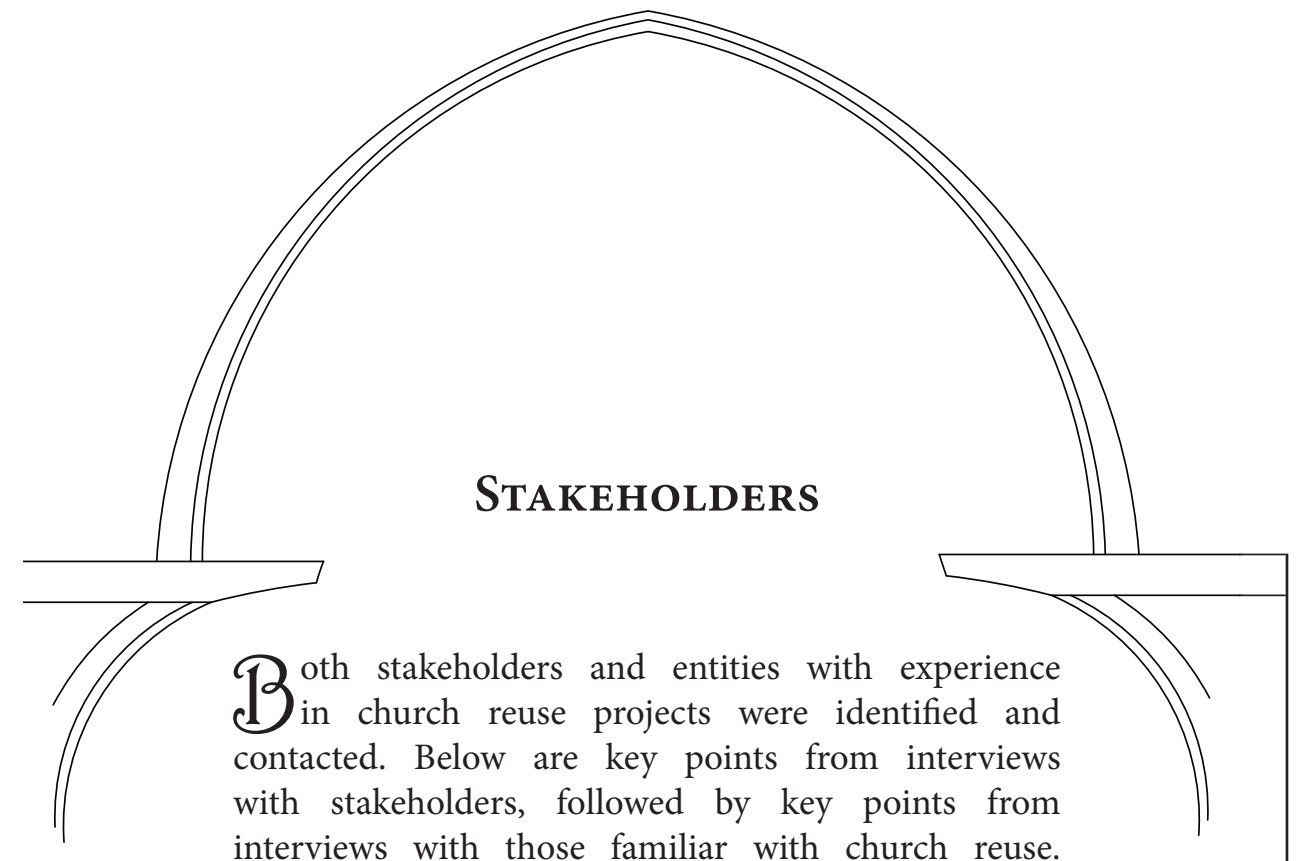
Building Vacancies

Vacancy rates in Spruce Hill have been increasing over the past several years. Two years ago, there were 81 documented vacancies, and there are currently 102 documented vacancies. These counts exclude units that are vacant because they are either for sale or rent. Compared to Philadelphia County, however, the Spruce Hill neighborhood has a slightly lower percentage of vacant buildings. The vacancy map below shows that the Spruce Hill neighborhood is faring better than communities to the north, south and west in terms of vacancies in 2010,³ (*See Appendix: Demographics, 8*).

¹ Population trends, racial characteristics, age distribution, incomes, household composition, employment, household movement, housing type and property values: Source: 2000 US Census, Summary File 3; The Nielsen Company

² The Redevelopment Fund

³ HUD USPS address vacancies



Both stakeholders and entities with experience in church reuse projects were identified and contacted. Below are key points from interviews with stakeholders, followed by key points from interviews with those familiar with church reuse.

STAKEHOLDERS

University of Pennsylvania

We met with Ed Datz, Executive Director of Real Estate, and David Hollenberg, University Architect, to discuss the University's history and interest in St. Andrew's. The University was urged to buy the property back in the 1970s in order to avoid it being purchased by an adverse buyer. Both stressed to our group that "sometimes, a church wants to remain a church" and that we should not rule out another congregation moving into the space. This scenario came close to happening several years ago, but fell through in the end. Currently, the University has no plans for the reuse of the building. The building would require a significant amount of investment to be brought up to building code for a new tenant. It was stated that the University would

like to obtain a tenant that would be beneficial for the community, although the University is not actively seeking a tenant. Additionally, Robert Lundgren, the University's Landscape Architect was contacted to discuss the maintenance of the site around the chapel.

Penn Alexander School officials

We spoke with Ann Kreidle, Manager of K-12 Partnerships in the Penn Partnerships Planning Office. She is the liaison between the University of Pennsylvania and the Penn Alexander School. Ann's primary message to us was that a new use of the chapel and deanery would need to be compatible with the surrounding uses, all of which are for children. She stated that the Penn Alexander School principal has mentioned in the past that she would like to use the chapel space for student music performances and rehearsals.

The Penn Alexander School does not have an auditorium and the music students have to practice and perform in the building's atrium. This is apparently nice to listen to but makes it difficult to hold meetings nearby. Utilizing the chapel space would give the music students a dedicated performance area. She was concerned about the circulation in this scenario, however, as the students would need to exit the school building and go outside in order to get to the chapel. Ann also suggested the addition of a restaurant (with no liquor license) in the lower level under the deanery.

Ann also felt that a recreation center could be a good use of the space, as the current recreation program at the Penn Alexander School is minimal and includes a standard gym class with little opportunity for extra-curricular activities. Her hesitations with a recreation center that included a climbing wall were focused on whether the School District would give permission for students to use the climbing wall, and whether a climbing wall was appropriate for a sacred space. Overall, however, she felt there was a need for such a space in the community.

Parent Infant Center

Cindy Roberts, Executive Director of the Parent Infant Center (PIC), spoke about the relationship that PIC has with the community, the University of Pennsylvania, and the block on which their buildings stand. The PIC moved into their second Divinity School campus building at 42nd and Locust in summer 2010 with substantial financial assistance from the University and currently does not have the want and/or resources to

further expand. Previously, when PIC was searching for additional space, the deanery was considered. However, code and improvement requirements, namely the construction of a firewall between the deanery and chapel, yielded the project financially impractical. The PIC currently uses the chapel biannually to fundraise for a scholarship fund. Cindy is concerned that reuse of the space will render it inaccessible for PIC use, though she advocates for a reuse that will be compatible with and benefit the PIC, neighborhood, and historic building fabric. She believes that the neighborhood will accept many uses and suggests using the chapel as art gallery, performance, or event space as well as a coffee shop or breakfast place.

Spruce Hill Community Association

As a director of the Spruce Hill Community Association (SHCA), longtime resident and community advocate, zoning official, liaison to the University of Pennsylvania, and member of the Penn Alexander planning committee, Barry Grossbach provided us with the perspective of the community that surrounds St. Andrew's Chapel. He considers the architecture and the massing of the interior space to be an asset and focal point in the community. Residents felt blindsided when no notice was given before the Divinity school left. Mr. Grossbach believes the Penn Alexander School's contract with Penn is vital to the health and stability of the community and that it must be maintained indefinitely. The current administration of the University is not as involved with Spruce Hill as past administrations have been. Mr. Grossbach also commented on the needs of

the community, mentioning that even though new restaurants have moved into the neighborhood, there is still a need for more. But the Chapel location is "off the beaten track" due to its elevation and no organizations that he knows of are looking to expand. He doesn't believe that the community would be against a BYOB after hours or the University occupying the space.

University City Arts League

We spoke to Noreen Shanfelter, the Executive director of the University City Arts League (UCAL). The organization has been in University City for over 40 years, though a recent contract agreement with the Penn Alexander School to provide art classes to the students has greatly increased the community they serve. In addition to the school related classes, the UCAL offers numerous after-school and weekend programs for a fee which is their major source of income. Through grants and other fundraising activities the group hopes to expand its staff by four people, but there is no extra office space at their present location. If the deanery or the chapel were converted to offices it would be a good location for them to expand into, though their limited finances preclude them from undertaking the needed renovations themselves.

CHURCH REUSE EXPERTS

Partners for Sacred Spaces

We met with Tuomi Forrest, Associate Director of Partners for Sacred Places, on several occasions. Tuomi noted that the most

common reuse of a vacant religious building is by another religious congregation, and that this is the type of reuse that Partners for Sacred Places strives for. However, due to reduced congregation sizes, the new congregation may have good intentions but not enough money to properly care for the historic building. However, the option for several congregations to use the one building at different times was mentioned and Tuomi felt this might be a feasible way to keep a religious use in the building while not placing the financial burden of the building on one congregation. Tuomi felt that an arts center reuse was appropriate for our building and the neighborhood, and noted that the University City Arts League operating across the street was likely in need of additional space.

Calvary Center for Culture and Community

We met with Rich Kirk from the Calvary Center for Culture and Community at 48th and Baltimore Avenue. Rich has been instrumental since the beginning in getting the church building reopened as a multi-use community center. The Calvary Center has approximately 16 organizations operating out of it at the present time, all of which pay a small amount to cover utilities. Before beginning rehabilitation, Rich and others interviewed community members regarding what they would like to see happen with the church building, which was only being used by a very small congregation at that time. Interestingly, every community member stated that they wanted to keep the congregation in the church, and allow for multiple community-based uses in the other spaces in the building. A 501(c)(3) was formed to manage

the Center and an all-volunteer Board of Directors was created. Restoration began and tenants were found soon after. The Calvary Center relies heavily on grant money to pay for restoration projects. Most grants received are matching grants and come from either the state of Pennsylvania or the William Penn Foundation. The Calvary Center is currently in the process of applying for a substantial grant that would allow them to restore the impressive sanctuary.

Lager Raabe Skafte Landscape Architects, Inc.

We met with Julie Althoff Bush, a principle landscape architect involved with re-designing the play area for the PIC as well as a community member and parent of a child attending PIC. She provided an interesting perspective on the landscape surrounding the building. The water flow along the east of the chapel is a problem due to the deep erosion caused by the compacting of the soil. Changing pedestrian access and re-grading the site is necessary. She was in favor of an orchard that could be maintained by the PIC as well as outdoor seating for a café and terraced ramps for ADA access.

The Bishop's Office of the Episcopal Diocese of Pennsylvania

We contacted Rob Rogers, Canon for Finance, DIOPA of the Bishop's Office of the Episcopal Diocese of Pennsylvania. Even though the Divinity School and the dioceses are two separate entities, this contact provided valuable information on the legal and religious policies in the Protestant Episcopal Church in the United States of America. Some of these include the ceremony of deconsecration and

financial incentives offered by the diocese to reuse church buildings.

Philadelphia City Planning Commission

We spoke with Andy Meloney, the Community Planner for West Philadelphia. He felt that if an art-centered community use could work anywhere, it could be at St. Andrew's. When asked about the neighborhood, he characterized it as having all of the resources that a community needs, so there was no immediate need that the space at St. Andrew's could necessarily fill. He felt that a recreation center with a climbing wall could be an interesting use of the space. Andy did note that the one thing that the Spruce Hill community wants more of is community gardens, however, the interior space at St. Andrew's would not be suited for such a use.

SWOT ANALYSIS

<p>STRENGTHS</p> <ul style="list-style-type: none"> Landscape Maintained by an owner Proximity to kids/school University City Arts League Beautiful/significant building National Register District Artisans/craftsmen Flexibility of the deanery 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> Rehabilitation Expense Proximity to kids/school Adaptability Site access Ongoing deterioration U Penn lack of W. Phila focus Materials No individual designation No local district designation Growing # of vacant churches
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> Pedestrian thruway (Locust/Pine) Active residential community Buildable open space Potential for multiple uses Potential for central community spaces Growing # of vacant churches Liquor license law not applicable 	<p>THREATS</p> <ul style="list-style-type: none"> Vandalism Vacancy Deterioration Ongoing events/functions

In order to properly assess the St. Andrew's chapel for preservation and reuse a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis was prepared. This examined the local communities, site stakeholders, history, and other context related items.

The main strengths of the building focus on the flexibility of the site and building as a whole. The site is zoned as an Institutional Development District (IDD) so there are few restrictions on its use and the internal spaces in the chapel and deanery are largely adaptable to a variety of uses, complimenting this. The large amount of original historic interior and exterior fabric is arguably the largest strength of the building.

These strengths are opposed by the amount of resources required to rehabilitate the chapel and deanery and the fact that it has remained unoccupied for so long.

The chapel's location and flexibility of potential uses provide it with the opportunity to find new uses. It is situated in a densely populated area of West Philadelphia where both students and settled families reside, providing a wide range of potential users for the space.

The most drastic threats to the building are its lack of occupation and the continued deterioration of the building materials rather than the regular maintenance that occupied buildings receive. This in turn leads to the threat of vandalism and sporadic usage without proper cleaning or repair. To partially counter the threat from vacancy, the University of Pennsylvania does employ a property manager that monitors the site and conducts basic maintenance.

These factors were analyzed to determine possible uses and treatment plans for the chapel and deanery to capitalize on strengths and opportunities while mitigating weaknesses and threats.

DESIGN PROPOSALS

The proposals for new uses at St. Andrew's Chapel take into consideration the range and volume of information we have found in analyzing the neighborhood, demographics, history and condition surveys. After a thorough examination

of our results, we found there was no pressing need for one particular use of the building. This allowed us to think more broadly about what uses could be appropriate to the scale of the building, maintain its significance, and benefit the community.

We did consider that a new church as the reuse is a feasible option. This option is not explored in our proposal section, as it is an assumption that a proposal for reinstating a religious use would be given high consideration by the owner. However, St. Andrew's would still need to be adapted to accommodate this use. Built as a Divinity School, and not a traditional church, the layout and proportions would need some intervention to facilitate needs of the congregation. We chose to develop our reuse proposals on more income producing uses.

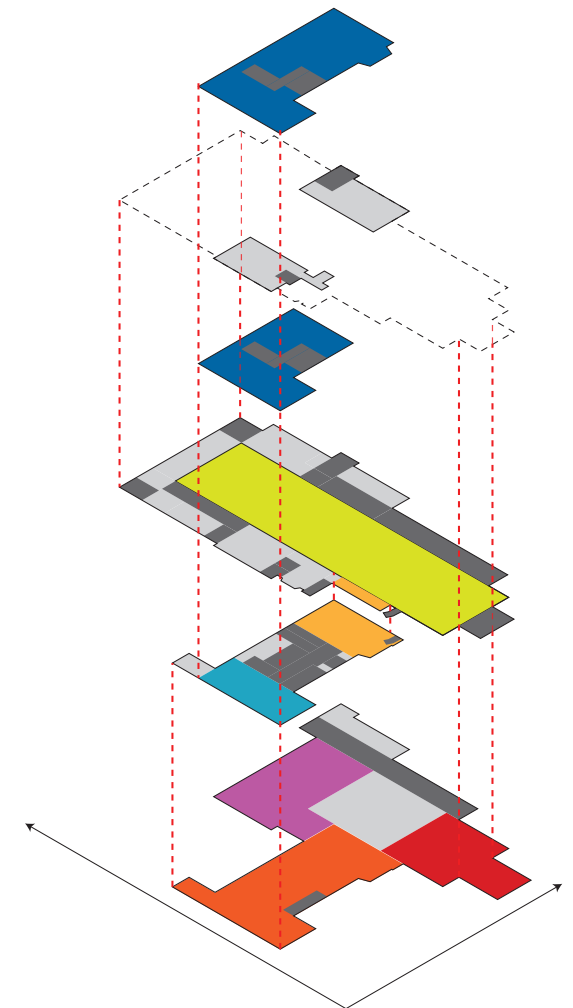
The speculative reuse matrix contains our three reuse proposal schemes: a performing arts center, a recreation center, and an office, (Figure 1). These titles are concentrated on what would be developed in the sanctuary space, but we propose each use as part of a larger mixed use plan with proposed uses for the secondary spaces as well. These spaces are listed on the matrix in the order which we felt held the most opportunity for intervention. The spaces with the most opportunity are the sanctuary, library and deanery basement. These areas will be explored further as specific programmatic elements.

Floor

The original plan of St. Andrew's Chapel was designed in the Collegiate Gothic style. The

specificity of the floor plan, tri-level pews facing inward, is a challenge for making the space workable for new activities, (Figure 2). As a group, we concluded that our proposed new uses for the Chapel would not function with the uneven floor. In order to make the building function today, floor infill is necessary. In 1989 the pews from the original floor was removed and the multi-level floor was covered with a temporary plywood deck, (Figure 5). The current temporary floor of plywood is not adequate for permanent use. In moving forward with the design of the floor we feel it is important to interpret those elements that were so integral to the use and volume of the space. Though the pews and original floor layout cannot remain we want to celebrate and mark their presence.

The first step to interpret the floor is to understand the original configuration. Using historic photographs, archival drawings, and field measurements of the original pews



Space	Sanctuary	Library	Deanery Basement	Crypt	Chapel Basement	Deanery I	Deanery 2/3
Base SF	3500 SF	540 SF	1760 SF	1000 SF	1650 SF	588 SF	2060 SF
Scheme	A Performing Arts	Café	Bistro	Gallery	Arts Center	Classroom	Office Suites
	B Rec. Center Climbing Wall, Dance Classes	Café	Study Center	Arts Center or Locker Rooms	Arts Center or Locker Rooms	Office	Office Suites
	C Office/Stacks	Conference Room	Bistro	Office, Formal Entrance	Gym, Locker Room	Office	Office Suites

Figure 1 Speculative Reuse Matrix

(currently located in the basement) we were able to generate a 3-D model of the church and floor plan. The process of documentation and recreation was integral to developing the interpretive design.

The proposed interpretive floor allows the space to have an even surface while referencing the past seating formation. The new concrete floor infill will be constructed of material similar to that of the original floor. Inlaid within the floor will be a bird's eye view of the pew layout—flattened—in wood. The original elevation levels will be etched into the surface, as well as the checkered paving pattern of the main aisle. Glass blocks placed in the original floor pattern of the aisle will enable the viewer to see through the new proposed level, down to the original tiered floor plan, (Figures 4, 9).



Figure 2 Model view looking NW as-built

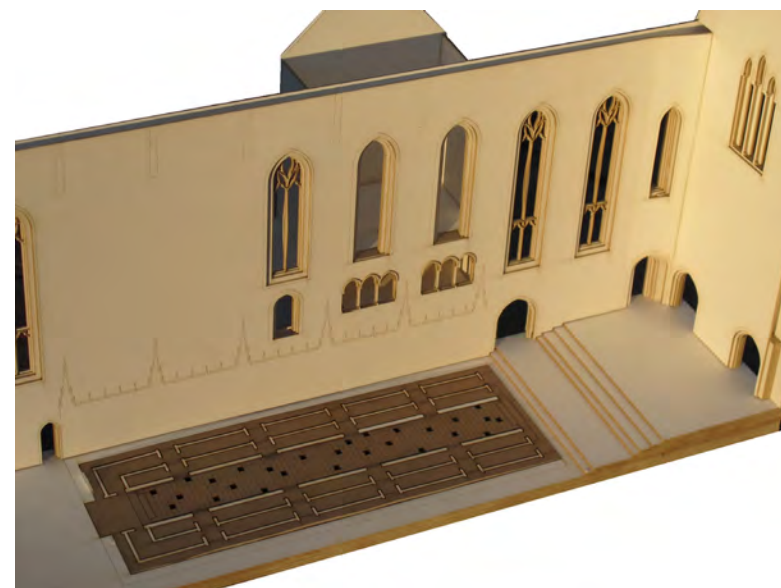


Figure 3 Model view looking NW with floor addition/interpretation

Performing Arts

In speaking with the major stakeholders of the site we have identified a performing arts center as a viable option for the reuse of the chapel and the secondary spaces surrounding and below it. The performing arts venue is the least invasive to the structure and is most sensitive to the elements of the building we feel are integral to the architectural expression of the interior space. While having limited physical ramifications for the structure, the new program will provide space for children and community arts organizations in need of more room, (Figures 5, 6).

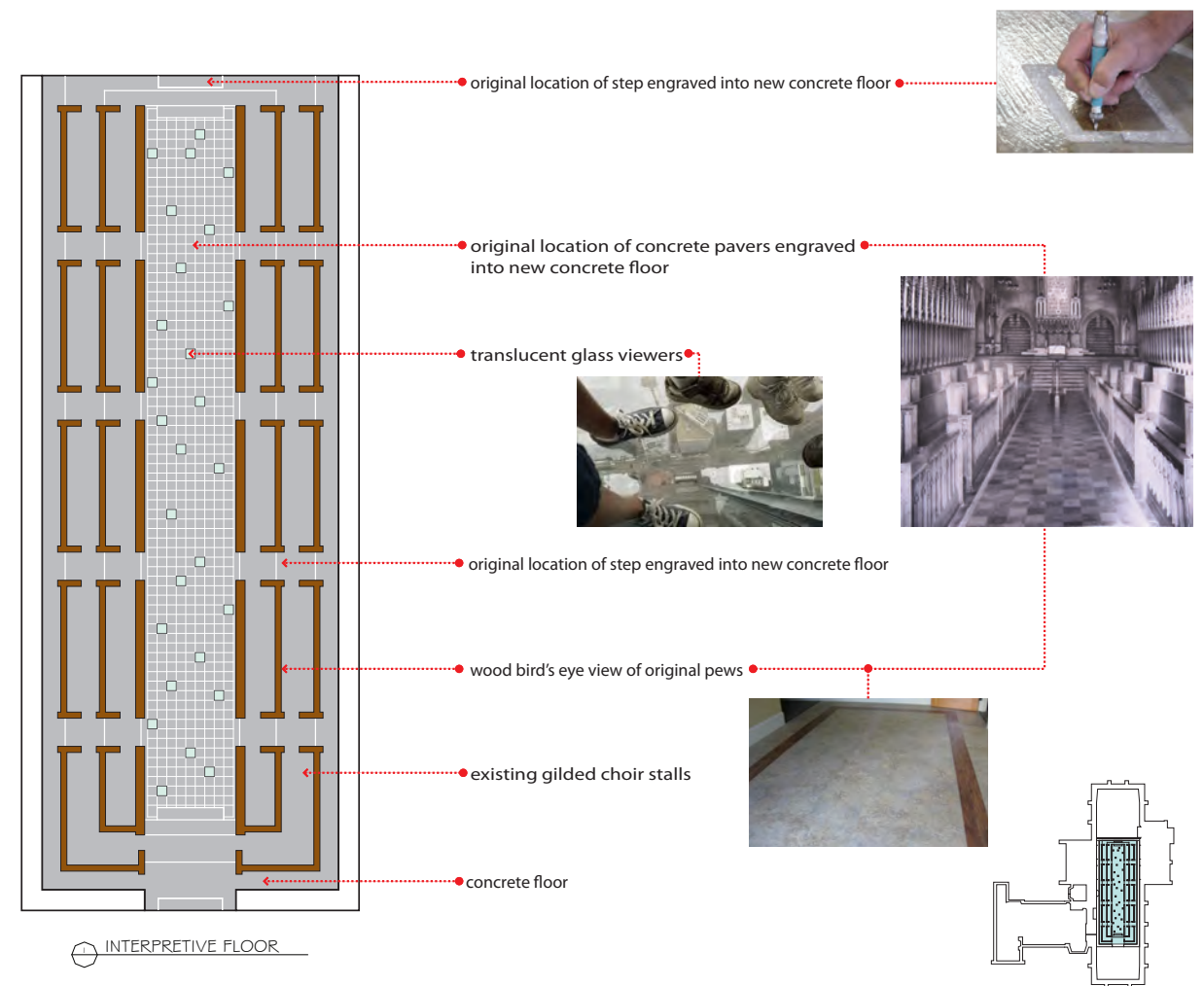


Figure 4 Diagram of the materials for the interpretive floor.

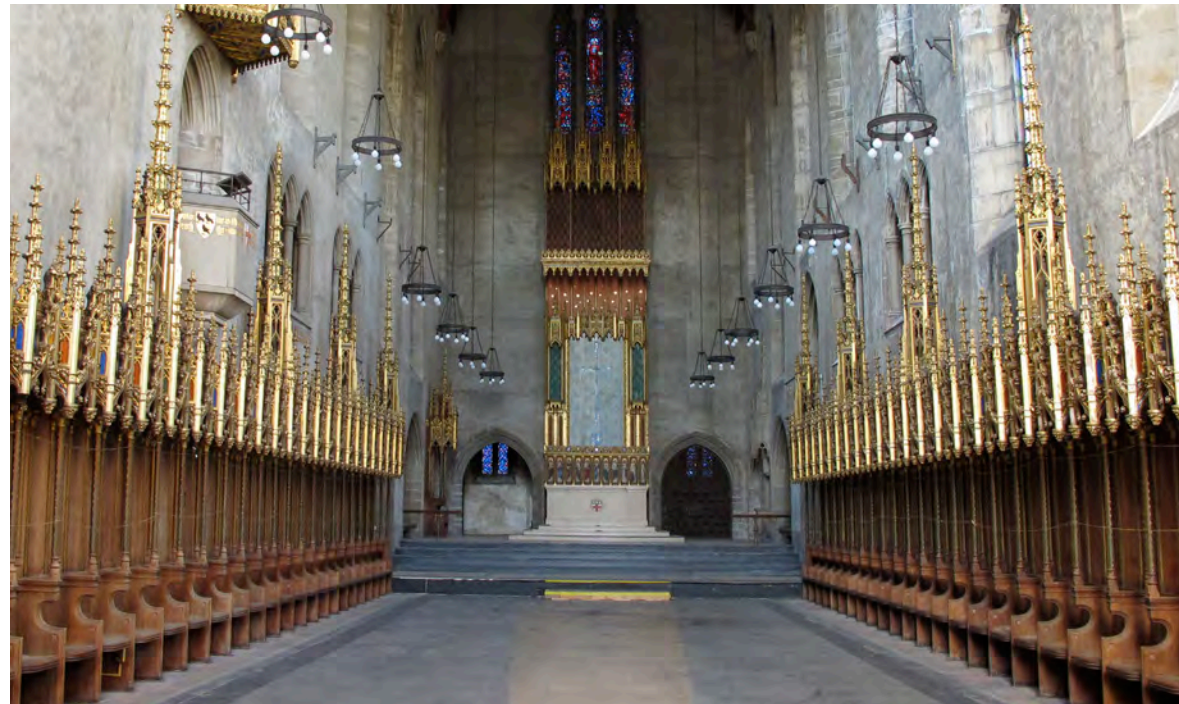


Figure 5 View of sanctuary present-day

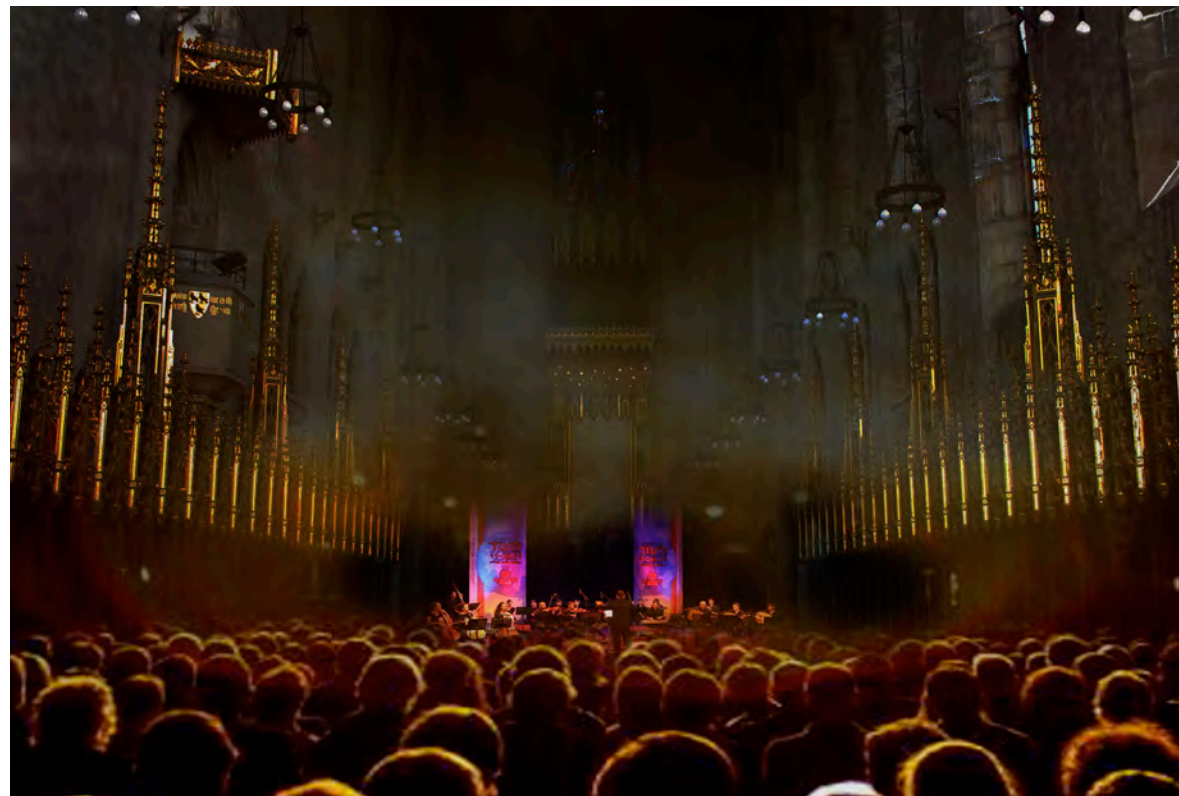


Figure 6 View of sanctuary as a proposed performing arts venue for concerts and orchestra performances



Figure 7 View of sanctuary as a proposed performing arts venue for community dance groups

The Penn Alexander School, located on the block to the west of the Chapel, has recently reduced their arts program due to funding cuts. In the past the school had hoped to incorporate the chapel space into their complex, making it an auditorium for student productions and orchestra recitals. Unfortunately the funding was not there to realize these plans. The St. Andrew's Chapel shares the 4200 block between Spruce and Locust Street with the school. Because of the new center's close proximity, the proposed performing arts venue at

St. Andrew's has the potential to benefit the school's art program and after-school groups.

The University City Arts League located across the street from the chapel provides after school art, dance, and language classes. Over the last few years their program has grown and is now close to capacity. In our proposed plan there would be opportunities for the University City Arts League to expand into secondary spaces located around the perimeter of the main sanctuary and the basement.

Physical changes to the space will be limited. As indicated in the conditions recommendations, the walls and roof of the structure must be repaired and restored for the new programmatic uses. The existing plywood floor will need to be replaced with a durable, permanent material. Stage lighting and window shading will be added to the sanctuary to accommodate performances during the day. Secondary spaces functioning as classrooms and art studios will need minimum cosmetic alterations.

The performing arts venue will be an asset to the community but its income potential is limited. Under this plan it will be vital to identify income-producing tenants for the deanery spaces to offset costs of maintaining the volume of the chapel.

Recreation Center

When looking into the proposal of a recreation center in St. Andrew's chapel, we considered several factors. First, climbing walls are becoming an increasingly popular reuse



Figure 8 View of sanctuary from above showing the existing plywood floor

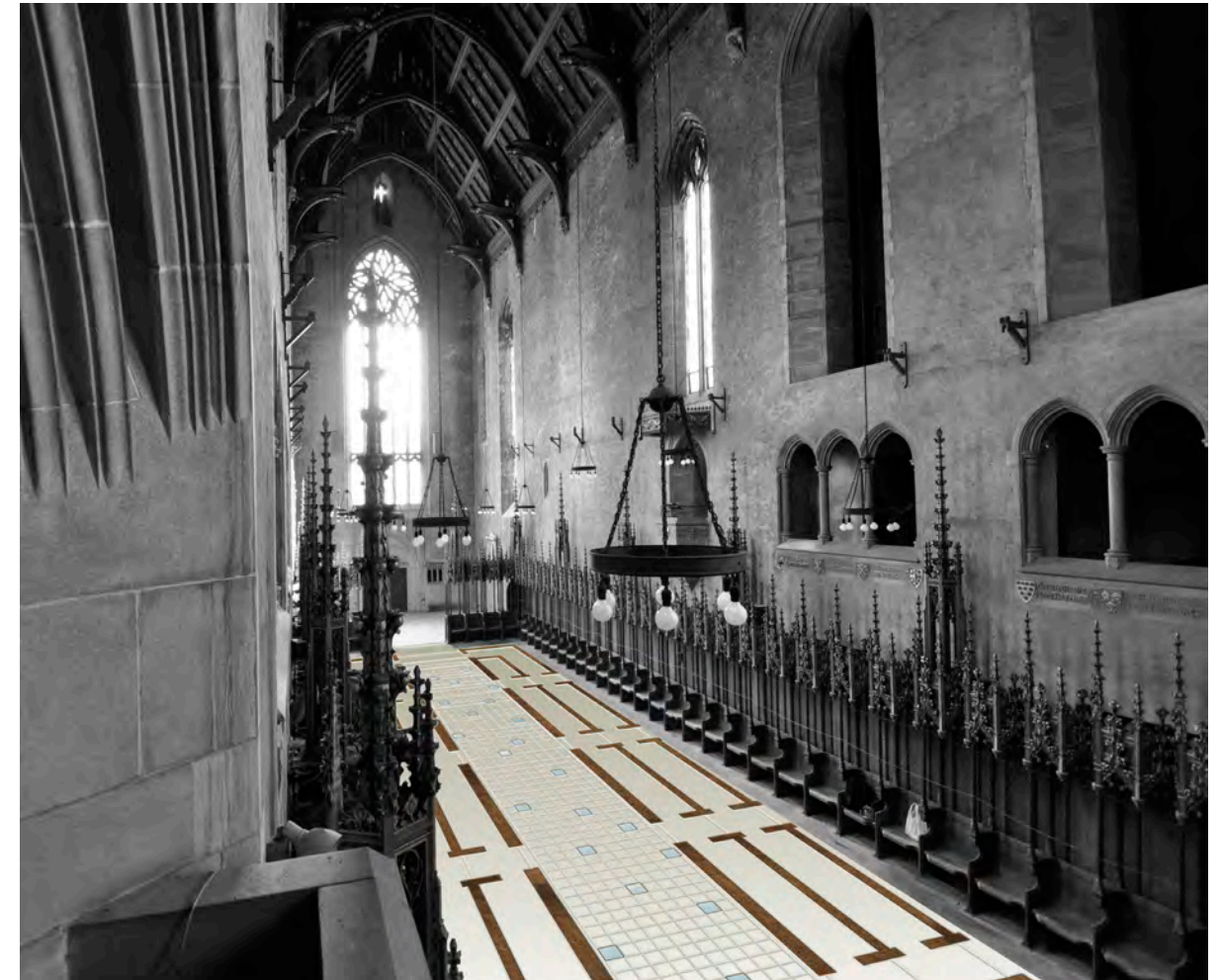


Figure 9 View of sanctuary with the proposed interpretive floor intervention

option for former church buildings, due in part to the height offering of most churches.¹ Additionally, the 4200 block of Spruce Street is occupied by only children-centered uses and a recreation center with a climbing wall would be well-located for these children. Lastly, the Penn Alexander School does not have a substantial gym and after-school sports program, and the recreation center could fill this void and provide a place for families to go and exercise together.

Initial research into recreation centers included mapping existing recreation center

locations to note proximity to St. Andrew's chapel, (*Figure 10*). As shown on the map, there are three recreation centers that fall within a wide survey area of the neighborhood. Of these three centers, Kingsessing (49th and Kingsessing Ave.) offers the most activities, including after school programs, art, basketball, boxing, dance, computers, fitness, baseball, softball and camps. The Lee Cultural Center (43rd and Haverford) offers a very limited supply of activities, including an after-school program, camps, and mentoring. The need for a recreation center in the neighborhood was noted by Ann Kreidle,

Manager of K-12 Partnerships in the Penn Partnerships Planning Office, who said that “there is definitely need for more rec space in the community and high ceilings would lend themselves to a rock wall.”²

Design of the climbing wall is crucial to maintaining some level of building integrity. It was decided that the west wall of the chapel was a good location for the climbing wall because a substantial section of the wall is without features (except for the choir stalls) and therefore would have a minimal impact on the remaining character-defining elements. This proposal would require the removal of the entrance screen and a portion of the choir stalls on the west side of the chapel. These mirrored features would remain intact on the east side of the chapel. Other

character-defining features such as doors, windows and the overall massing and ceiling would remain intact.

The actual climbing wall would rise approximately 40 feet in height, which is standard for indoor climbing walls, and is pictured at 30 feet in width, (Figures 11, 12). There are several options for attaching a climbing wall to the supporting wall, (Figure 13). Our preferred choice for attachment is fiberglass reinforced concrete panels. These involve the installation of a steel frame that is back filled with concrete to secure the panels to the frame. A second option is a polyurethane surface, in which panels are anchored directly to a subwall or framing. A third and more costly option is steel frame reinforced

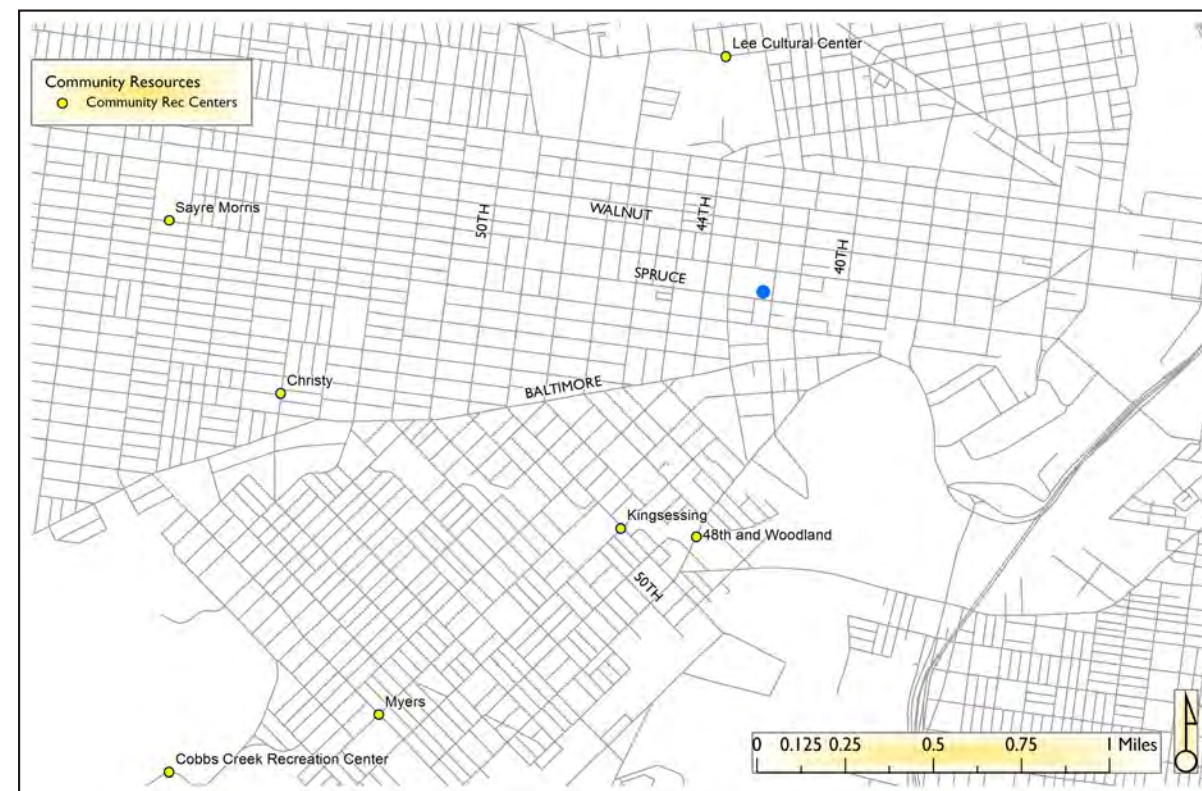


Figure 10 Map of existing recreation centers in West Philadelphia and in relation to St. Andrew's Chapel.



Figure 11 View of the climbing wall looking north toward the altar of St. Andrew's chapel. The choir stalls on the east side of the chapel remain in this proposal.

concrete, which incorporate a steel sub frame with concrete shot over it. This option allows for the most natural rock appearance.³

Other programming for the recreation center is flexible, and could include dance classes in the chapel space to the north of the climbing wall area. In addition, there is a substantial amount of usable space in both the basement of the chapel and the entire deanery building.

The basement of the chapel is well suited for art instruction space and also could include locker rooms for the recreation center programming. The current library space leading from the chapel into the deanery could be a café, and the ground level of the deanery would make an appropriate study area for students. The second and third floors of the deanery are well suited for office uses.



Figure 12 Proposed recreation center view looking southwest. Note that the entrance screen and a portion of the choir stalls on this west wall had to be removed, yet the proposal calls for keeping the remaining choir stalls.



Figure 13 Attachment options for a climbing wall. From left: fiberglass reinforced concrete panels (www.copecourse.com/climbingwalls.htm); polyurethane surface panels that are anchored directly to a subwall or framing (www.copecourse.com/climbingwalls.htm); steel frame reinforced concrete (www.athletiquet.com/indoor-rock-climbing.php).

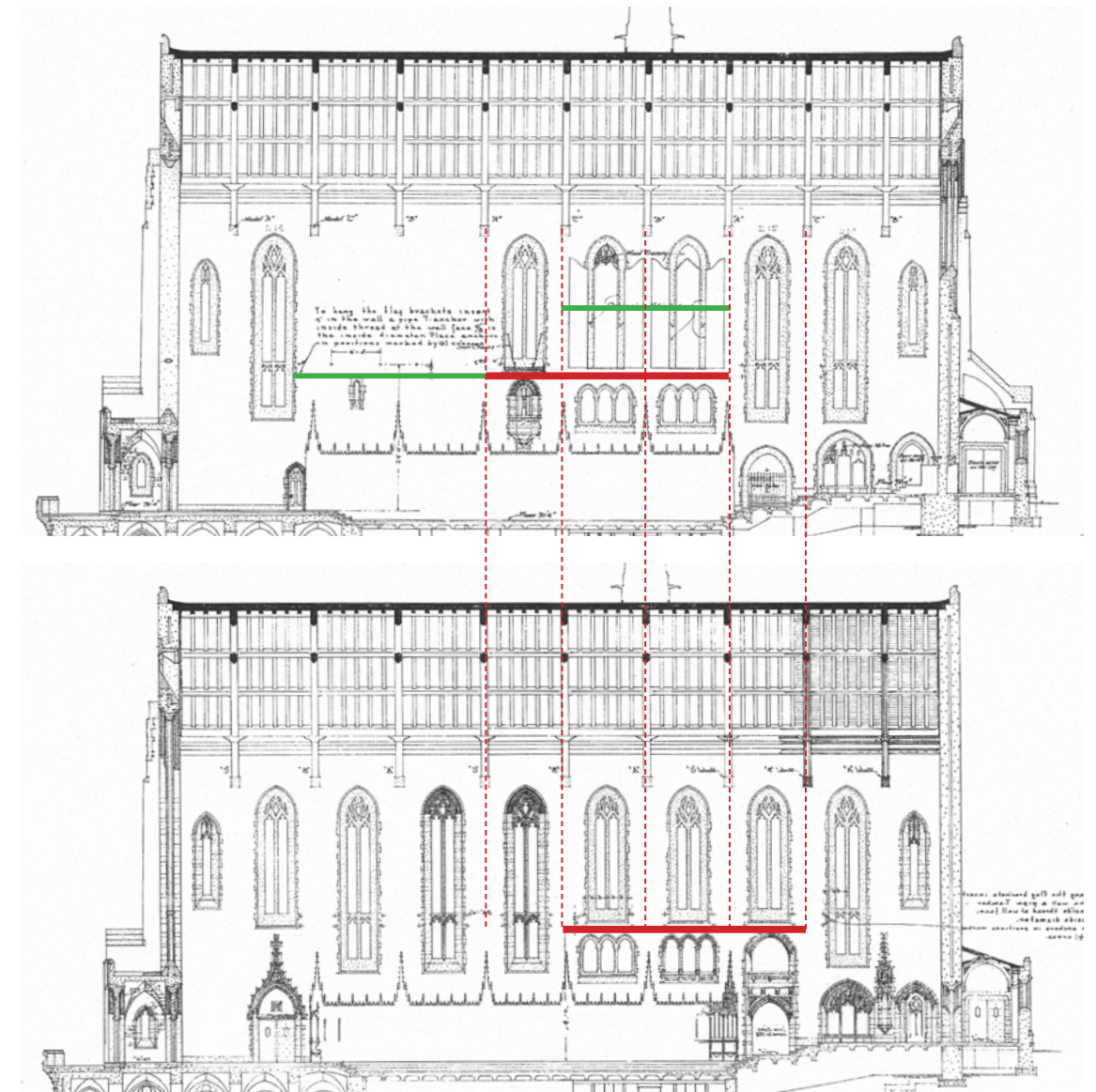


Figure 14 North-South Section facing West and Reflected Section facing East, showing syncopation in clerestory window bays (red), as well as the deanery and organ loft sections (NB: Lower drawing reflected.) (Zantlinger, Borie and Medary)

Office

This scheme for floorplate insertion is meant as a speculative exercise that can be generalized to a sympathetic approach. The proposal took as a point of departure a careful study of the highest-ranked items of significance, so that the impact on original fabric or a threshold experience would be mitigated. Critical to the

Chapel's distinction as a piece of architecture with a highly unified decorative program are the overall experience of exceptional massing, a view and understanding of the roof structure

and ceiling paintings, the sense of light that abounds through the simple tinted glass of the lofty clerestory windows, and the gilt work of the entrance screen and choir stall canopy.

The proposal was initiated by looking at the differences between clerestory sill heights where the second-floor galleries were asymmetrically articulated on the east and west interior elevations: bays 3, 4, 5 on the east (counting from the north) and 4, 5, 6 on the west. These abridged openings, with their

higher sills, created a datum line for the main first floor. Additionally, the west wall offers the third-floor organ loft in clerestory windows 4 and 5, and a blank wall for bays 7-8 where the deanery adjoins the chapel. This can all be understood in the comparison of one longitudinal section to its reflected opposite, (Figure 14).

These moments create boundary edges, with the floor plates being circumscribed by the view cones at two critical locations: 10' inside

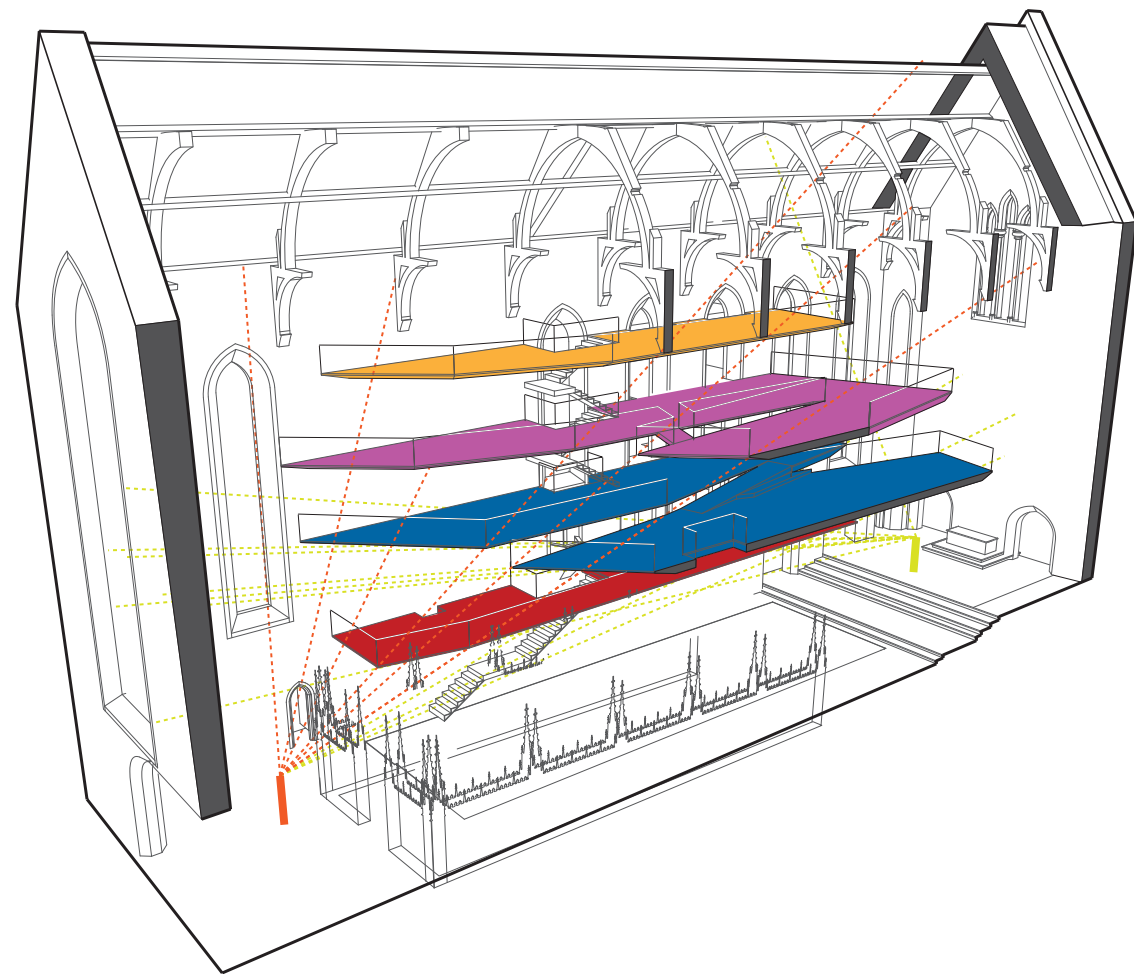


Figure 15 Perspectival diagram showing the four floorplates and threshold view lines in yellow and orange



Figure 16.1 Model view looking NW



Figure 16.2 Model view showing vertical arrangement under hammer beams



Figure 16.3 Model view showing vertical arrangement under hammer beams



Figure 16.4 Model view looking NW



Figure 17 Rendered view looking north

the front door, and 10 feet south of the altar on the north dais, (Figure 15). These two zones themselves—altar and entry—were also left open as being a critical part of the overall experience as the gilt altar canopy and south window are key character-defining features. The organ chamber (in which an organ is no longer extant) offers the prospect of a vertical core with elevator, services, and egress stair: a servant space to the served space of the chapel. An exposed stair knits two principle floors of 1700 sf each, while a mezzanine level (800 sf) and smaller fourth floor (1000 sf) offer additional space. The structure is primarily self-supporting, with additional lateral connections made to the chapel walls for stiffness. Vertical forces are channeled into a single row

of columns at the mezzanine level on the west side to mitigate impact on the choir stalls, which are left extant. This addition will add 5300 sf to the chapel's existing 4800 sf in the sanctuary and openly adjoining spaces (galleries and organ chamber). More importantly, it offers an approach for geometry derived from threshold conditions of experience that we believe should be preserved, (Figure 16).

Upon entering the south door, the visitor is met with light streaming down from the south windows and a preserved overall legibility of the original space. An extraordinary amount of ceiling, with its painted panels, is made visible as is a glimpse of the north altar window, (Figures 17, 18, 19).



Figure 18 Rendered view looking southwest, showing mezzanine (red in diagram) beneath plate 2 (blue). Columns come to a Y to protect the west choir stalls.

Landscape

The soils, trees, paths and topography of the land around the chapel provided context to the architecture and should also be considered in any new use design. The salient issues to be addressed include ADA accessibility, controlling erosion and enhancing the community's engagement with the site. As a historic feature, our approach to landscape design was minimal. We identified the landscape as a character defining element for its integral part of the campus plan laid out by Zantzing, Borie and Medary. Irregular, undulating topography is a characteristic of Gothic campus planning and informed the choice of building style. But even as a historic element, the landscape can tolerate change. The campus plan was never completed and

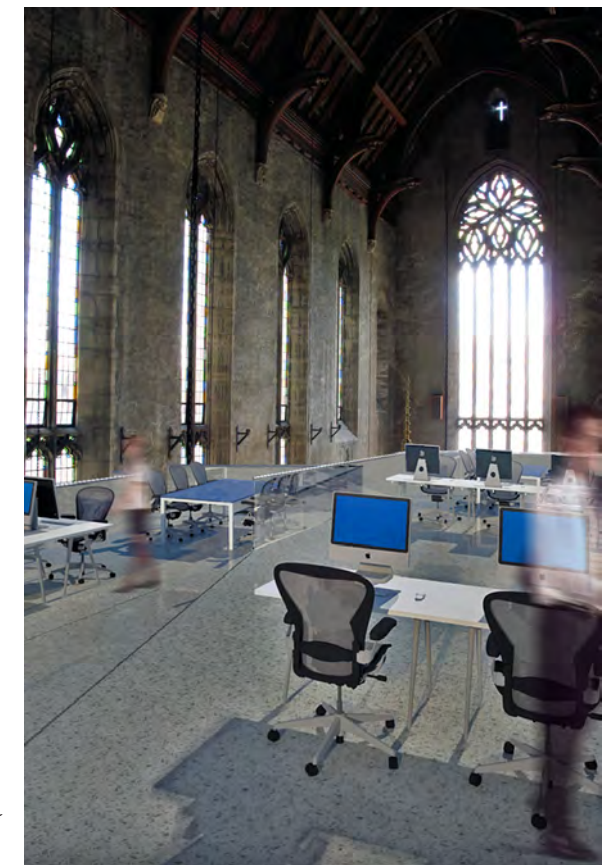


Figure 19 Rendered view looking southeast on an upper floorplate.



Figure 20 Bird's eye image of the landscape around the chapel. Image from, Bing Maps (2010).

much of the western landscape has been compromised by the creation of the Penn Alexander School. The highest areas of integrity exist around the chapel and deanery, (Figures 20, 22).

We broke the site into sections in order to analyze how it functions, (Figure 21). After



Figure 21 This is the 4200 block between Locust and Spruce streets. The shaded areas indicate zones of analysis. Google Earth (2010).

discussing the landscape with the people who use it the most—students and families associated with the Penn Alexander School and the Parent-Infant Center—it became clear that the landscape is actively used and serves their needs very well, (Figure 23). Though the University of Pennsylvania owns and maintains the land, it is used by the schools when they are in session and opened to the public afterwards. Walking past the buildings on a daily basis it can be seen that there are people using the spaces, from picnicking families to Drexel students creating a skate-

boarding video. This arrangement is part of the community engagement and revitalization initiative spearheaded by former University President Judith Rodin and John Anderson Fry.

The partnership between the Penn Alexander School and the University has created an influx

of families moving into the catchment area to send their children to one of the best public schools in the city. A characteristic that distinguishes Penn Alexander from others is the amount of green space to which students have access. A parking lot in area #2 on the map was even removed so that the school children could have more access to the natural outdoors.

CHAPEL LANDSCAPE

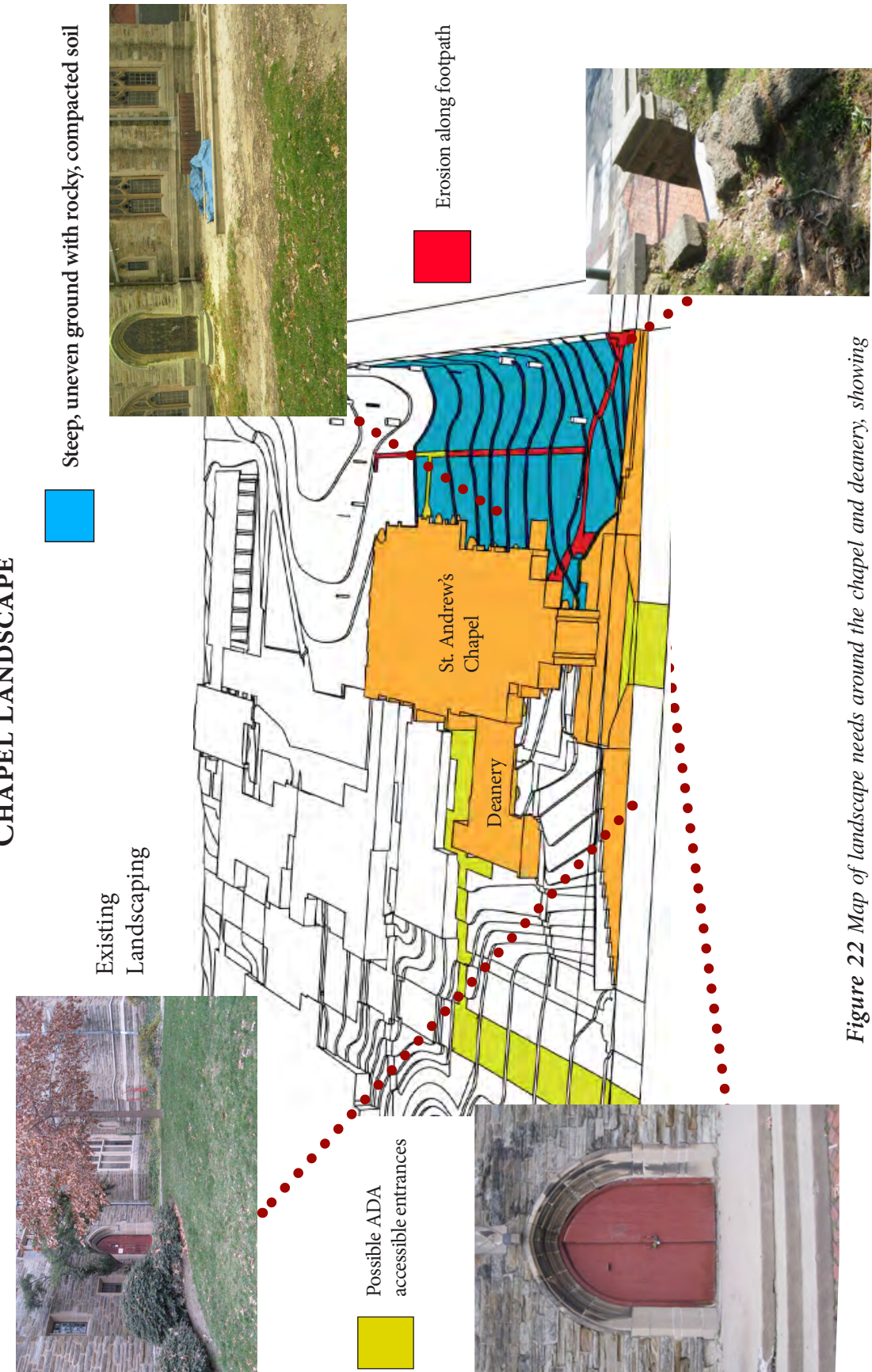


Figure 22 Map of landscape needs around the chapel and deanery, showing areas that need to be addressed in the repurposing of the chapel.

Altering these areas by building for-profit housing or office suites would be extremely detrimental to the community relationships the University has striven to foster. Therefore, we recommended no inventions on behalf of the chapel in areas #1, 2 and 3.

The pedestrian walk-way between Spruce St. and Locust St. (#5) is an opportunity to increase access to the chapel and deanery. For safety, the gate along Spruce is closed after the students leave the schools, (Figure 24). If a use were to go into the deanery there is no reason this entrance should not be opened. The path is well lit and is landscaped with a butterfly garden and flowers maintained by the PIC. The paved entrance from Spruce could be adapted to bring ADA accessibility to the deanery basement and first floor through ramps, (Figure 25).

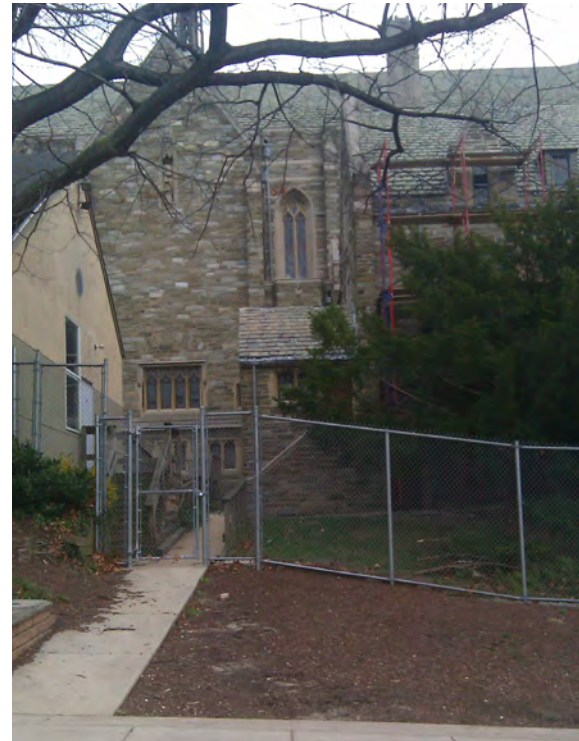


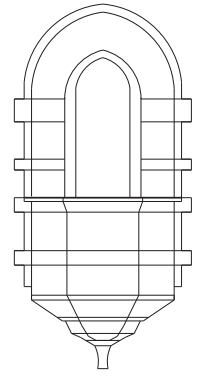
Figure 24 A gate currently separates the pedestrian walkway from the deanery entrances. Image is facing east.



Figure 23 Plan for the creation of the Parent-Infant Center's Nature Explore Classroom, October 2010 (Lager Rabbe Skafte Landscape Architects, Inc.)



Figure 25 Landscape to the east of the chapel as it appears today (top) as an orchard after regrading and seeding (bottom).



PROPOSALS FOR THE DEANERY

Café – Library

As a group we have identified several secondary programmatic spaces that are compatible with the community, income-generating, and interchangeable with the three proposed uses of the sanctuary. The original library has been designated as an area of high integrity, (Figures 1, 2). The two-story space located to the east of the deanery has been chosen to house a café. The proposed café will serve the neighborhood, parents from Penn Alexander

School, students from the University of Pennsylvania, and those people working and using other areas of the deanery and chapel. The café could also be dual functional, doubling as a lounge and concession area during performances in the chapel, (Figure 3).

The café design utilizes the two-story space of the library to house a counter and small exposed kitchen. Seating will be available in the library space as well as outside on the terrace, and in



Figure 1 View from above of library located adjacent to the sanctuary



Figure 2 View of library located adjacent to the sanctuary



Figure 3 View of library as a proposed cafe

the previous classroom space located below the organ loft, (Figure 4). All elements of the original casework will remain in situ and be repurposed as shelving and merchandise display. The window to the west of the café counter will be converted to a door to allow access to the terrace from the library space (Figure 5). Pews previously used in the chapel will be repaired and reused for seating in the old classroom space. The remaining spaces on the first floor of the deanery will be used for café support spaces including: a kitchen, office space, bathrooms, and storage.

Figure 4 View of terrace at the rear of the deanery.

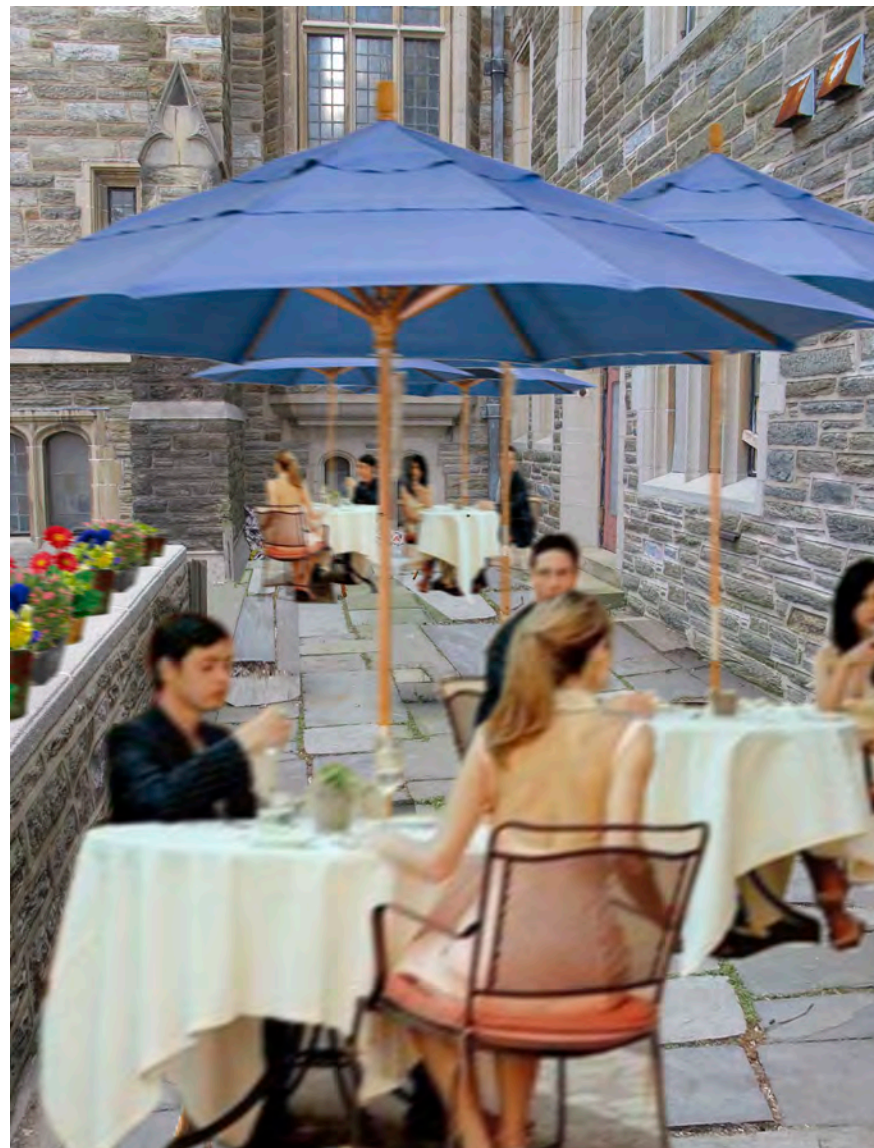


Figure 5 View of terrace as an extension of a proposed cafe.

PROPOSALS FOR THE DEANERY

BYOB Proposal – Ground Level

The ground level of the deanery, most recently used by Bike Works, is a very flexible space that is without any character defining elements, and therefore could be used for many different types of tenants. We feel that a restaurant use would be appropriate for this space. More specifically, the space lends itself well to a BYOB, which tend to be located in smaller spaces and would be appropriate for this building, as it would be difficult to have a restaurant with a liquor license next door to an elementary school and the Parent Infant Center.

Our initial research into the market for a BYOB restaurant began with mapping existing BYOB restaurants, (Figure 6). The majority of the existing BYOBs are small, ethnic restaurants that offer the option to bring your own wine or beer, yet most

patrons are unaware of this option at these types of restaurants. There are two existing BYOB restaurants that are located in the neighborhood and are similar to how we envision the St. Andrew's restaurant: Marigold Kitchen and Rx. Both restaurants are popular with the community, have been in existence for at least four years, and additionally are seen as destination restaurants for residents from Center City and the Philadelphia suburbs. We feel that this indicates that the market is strong enough to support an additional BYOB restaurant of this caliber. Barry Grossbach, from the Spruce Hill Community Association, confirmed our beliefs by saying that even though restaurants have moved into the community, there is still a need for more, and he did not believe that the community would be against a BYOB restaurant operating in the evening hours at St. Andrew's. To that point, it was our hope that this type of restaurant would add activity to the 4200 block of Spruce Street in

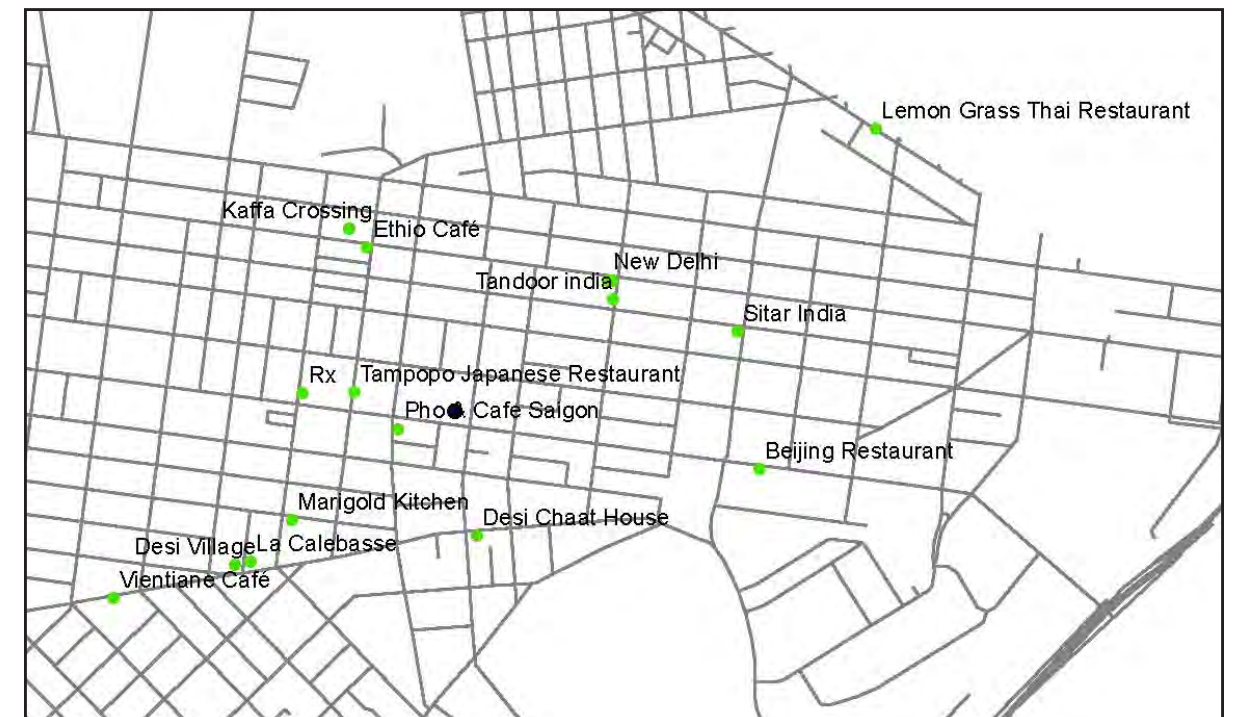


Figure 6 Map of existing BYOB restaurants in the Spruce Hill neighborhood, as of 2010.



Figure 7 Existing conditions of the ground level of the deanery, 2010.

the evening, as the current uses on the block are limited to the daytime.

The design of the proposed restaurant calls for the removal of most partition walls that are currently separating the ground level space into separate rooms. We feel that opening this space up will allow light from the west windows to filter through the room and provide needed natural light in the early evening hours, (Figure 7). Once the space is opened to be one room, we propose moving the current restrooms to the east corner. Where the restrooms once stood can now be occupied by an open kitchen. The entrance to the restaurant is conveniently located just off of the pedestrian thoroughfare separating the Penn Alexander school and St. Andrew’s, and can be made handicapped accessible through the landscaping proposal found earlier in this report.

Our current layout of the restaurant allows for the seating of 48 patrons, although the tables can be rearranged for slightly more or less seating as needed, (Figures 8, 9). Storage areas can be found immediately to the left as you enter the restaurant, and also as you walk into the hallway that leads to the crypt. Outdoor seating could also be available if the outdoor terrace were to be utilized.

¹ Partners for Sacred Places, “Workbook: Cambria City Church Reuse Charrette.” (November 2010).

² Email correspondence between Ann Kreidle and Kim Broadbent, 11/23/2010.

³ <http://www.copecourse.com/climbingwalls.htm>.

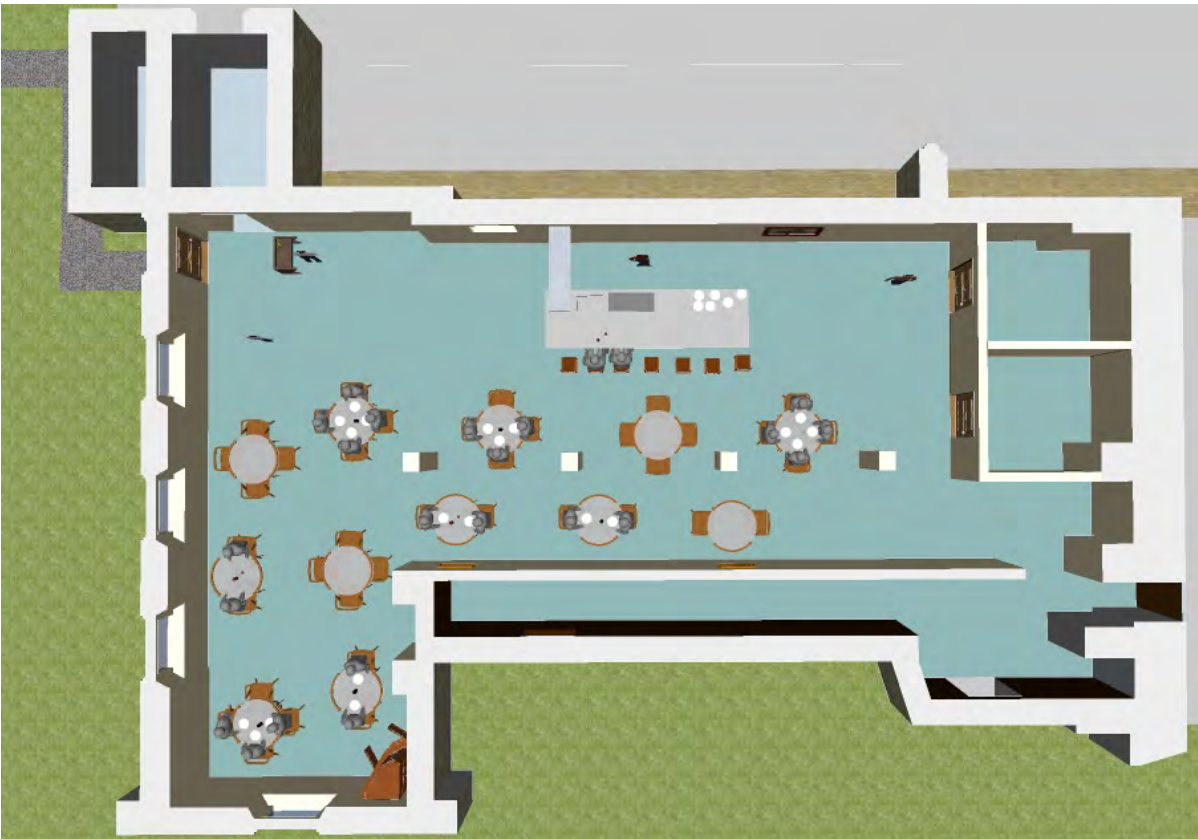


Figure 8 Aerial view of proposed BYOB restaurant.



Figure 9 View of how the proposed restaurant could appear to patrons.



FINANCIALS

This construction budget is meant to serve as an indication of the possibilities of many of the costs associated with an adaptive reuse project of this magnitude. An extremely accurate construction budget for a project of this type requires years of experience with similar

restoration/rehabilitation projects, as well as construction drawings which would include things like a lighting plan and an HVAC plan. The majority of the inputs into the spreadsheet were derived from in-depth conversations with Michael Funk of International Consultants Inc., a local Philadelphia cost estimator with years of experience doing rehabilitation projects. In addition to our conversations, Michael provided the team with three cost estimations that he had done for comparable projects to use as a jumping off point to make some assumptions of our own. Other number inputs were estimated from conversations with other industry professionals, and RSMeans. Again, this estimate is not meant to be comprehensive, and there are some factors, such as soft costs, that are noticeably missing from this spreadsheet.

Most of the inputs within the spreadsheet are on a per-square-foot basis, and the square

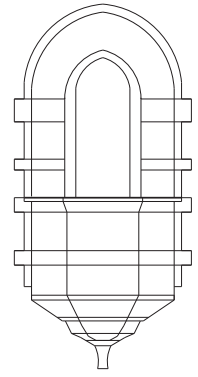
footages of the different building elements were taken from the architectural drawings. The majority of the overall square footages are extremely accurate, however, there are some inputs where the team applied a formula to derive square footages for certain building elements; for example, windows that are not perfect squares, and the running feet of the walls taking the door openings into account. The information within this sheet regarding renovation/restoration is based on visual survey that was done by the conservation group. The team was supplied with an itemized list of spreadsheet inputs, and asked to give estimates on a percentage basis. For example, on the exterior walls, Rebekah estimated that 60% needed heavy cleaning, so the exterior square footage of the building was multiplied by .6, to derive a number of square feet by which a cost estimate could be made. It is important to emphasize that the survey done was simply a

visual survey, and does not take into account any structural issues, which might not be visible. Information regarding demolition within the deanery was based on an architectural plan for the deanery, which was used for all three mixed-use proposals. The inputs that are located in the systems section of the spreadsheet, are not complete, as mentioned previously, this would be impossible to do without construction drawings. The items chosen to display within this section were items believed to be within our ability to make estimates on. These costs are based heavily in the comparable sheets given to us by Michael Funk. It is also important to note that the square footage totals for the HVAC and the sprinklers are the total square footage of the building.

Because of the malleable nature of the team's mixed-use proposals, the three uses did not

require much additional cost estimating. The per square foot cost for the kitchen and café spaces were found on a website called restaurantowner.com, and the rock climbing wall estimate is from Climb On!, a rock climbing gym in Wilmington, North Carolina. These two numbers could vary significantly, as these are only comparable estimates found online. The floor insertion for the office reuse was a complete estimate, based on conversations with teammates, with our studio Professor, Suzanna Barucco, and a real estate developer.

The team hopes that these numbers, and their scale, will help to give an indication of the areas of St. Andrew's Chapel that are going to need the most work when a reuse is proposed, and will serve as a guide for future conditions assessments.



MANAGEMENT SCHEMES AND FUNDING OPTIONS

Reuse Proposal A

Possible Management Scenario:

- University City Arts League (or similar organization) as main tenant
- UCAL acts as the building management entity
- Option 1: BYOB space and café space are rented out to separate tenants (or same tenant) with the rent going towards overall building maintenance
- Option 2: BYOB space rental income put towards building maintenance, but cafe is operated by UCAL with proceeds going towards UCAL programming etc.

Fund Availability:

- Grant Opportunities
- William Penn Foundation – The overall objective is to foster an environment in which arts and culture flourish, and in which artists are valued and enabled to undertake a wide range of creative pursuits and investigations.
- Valentine Foundation – The goal is funding initiatives that empower women and girls and achieve the tangible results required for sustainable social change.

- Loan Opportunities
- Preservation Pennsylvania – To make low interest loans directly to organizations and government agencies for the restoration or rehabilitation of specific historic properties. (maximum amount \$50,000)
- The National Trust Loan Fund – NTLF specializes in predevelopment, acquisition, mini-permanent, bridge and rehabilitation loans for residential, commercial and public use projects. Eligible borrowers include not-for-profit organizations, revitalization organizations or real estate developers working in designated Main Street communities, local, state or regional governments, and for profit developers of older and/or historic buildings.
- Capital Campaign/Year End Appeal – as a 501-c-3 non-profit organization, a group like the University City Arts League has the opportunity to solicit funds from donors and community members, which could be done through a traditional year end appeal, or through a focused capital campaign.

ST. ANDREW'S CHAPEL MIXED USE PROPOSALS						
	Sanctuary	Crypt	Basement	Deanery Basement	Library	Deanery
A.	Performing Arts	Gallery	Arts Center	BYOB	Café	Office

MANAGEMENT SCHEMES AND FUNDING OPTIONS

Reuse Proposal B

Possible Management Scenario:

- Boys & Girls Club of America (or similar organization) as main tenant
- Boys and Girls Club (or similar organization) acts as building management entity
- Option 1: Organization occupies entire building, and rents out the café space to outside operator, with rent going towards building maintenance
- Option 2: Organization operates as overall building manager, occupying office space, sanctuary etc. & leases out some ancillary spaces to other organizations with similar missions— dance troupes, UCAL etc.

Fund Availability:

- Grants
- William Penn Foundation – The overall objective is to foster an environment in which arts and culture flourish, and in which artists are valued and enabled to undertake a wide range of creative pursuits and investigations.
- Sovereign Bank Foundation – The Foundation seeks to enhance the quality of life for individuals by supporting local non-profit organizations in the communities they serve.
- Valentine Foundation – The goal is funding initiatives that empower women and girls and achieve the tangible results required for sustainable social change.
- Loans
- Preservation Pennsylvania – To make low interest loans directly to organizations and government agencies for the restoration or rehabilitation of specific historic properties. (maximum amount \$50,000)

- The National Trust Loan Fund – NTLF specializes in predevelopment, acquisition, mini-permanent, bridge and rehabilitation loans for residential, commercial and public use projects. Eligible borrowers include not-for-profit organizations, revitalization organizations or real estate developers working in designated Main Street communities, local, state or regional governments, and for profit developers of older and/or historic buildings.
- Private donation

ST. ANDREW'S CHAPEL MIXED USE PROPOSALS						
	Sanctuary	Crypt	Basement	Deanery Basement	Library	Deanery
B.	Climbing wall/Dance	Arts Center/Locker Room	Arts Center/Locker Room	Study Center	Café	Office

Reuse Proposal C

Possible Management Scenario:

- Option 1: A Single business as the main tenant (i.e. law office) that acts as the building management entity and takes on the building renovation
- Leases additional office suites to other business(es) and they share in some communal spaces like copy rooms and library conference room
- Leases the BYOB space to a restaurant operator
- All proceeds from the leases go towards building operations/management
- Option 2: Each office suite is occupied by a different business with no majority share
- This situation would require either the involvement of a developer to take on the renovation OR for UPenn to take on the renovation and lease the space
- The businesses would pay rent to either Penn or a developer who would then oversee building management and operations

MANAGEMENT SCHEMES AND FUNDING OPTIONS

Option 1, Fund Availability:

- Federal Rehabilitation Tax Credit
- PIDC emerging business guarantee program – Available to any small business or non profit located or planning to locate in Philadelphia that is having difficulty accessing traditional financing.
- PIDC growth loan program – The PIDC Growth Loan Program is generally available to industrial and commercial enterprises located or planning to locate in Philadelphia. The program is intended to finance job-creating activities and is funded by a variety of federal, state and local government sources.
- The National Trust Loan Fund – NTLF specializes in predevelopment, acquisition, mini-permanent, bridge and rehabilitation loans for residential, commercial and public use projects. Eligible borrowers include not-for-profit organizations, revitalization organizations or real estate developers working in designated Main Street communities, local, state or regional governments, and for profit developers of older and/or historic buildings.

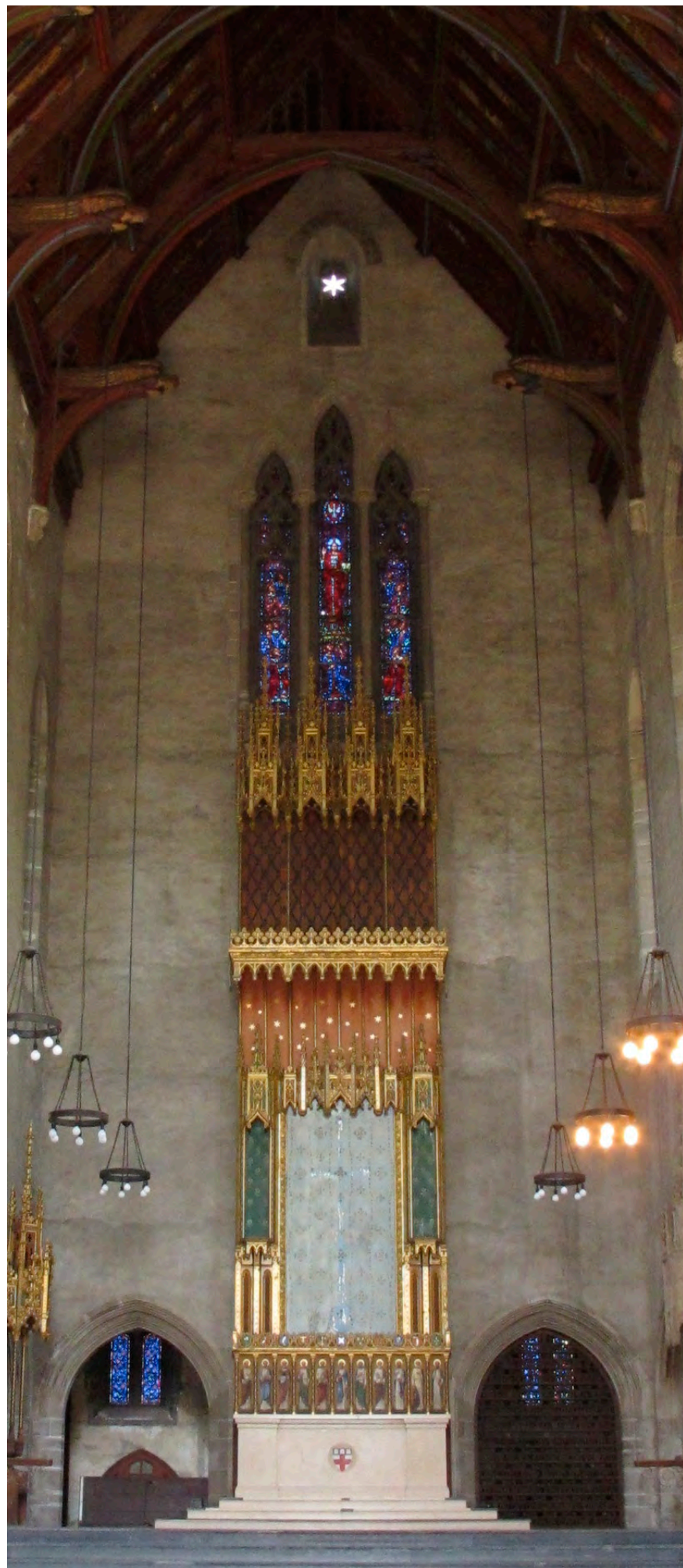
Option 2, Fund Availability:

- Developer
- Federal Rehabilitation Tax Credit
- PIDC emerging business guarantee program – Available to any small business or non profit located or planning to locate in Philadelphia that is having difficulty accessing traditional financing.
- PIDC growth loan program – The PIDC Growth Loan Program is generally available to industrial and commercial enterprises located or planning to locate in Philadelphia. The program is intended to finance job-creating activities and is funded by a variety of federal, state and local government sources.
- The National Trust Loan Fund – NTLF specializes in predevelopment, acquisition, mini-permanent, bridge and rehabilitation loans for residential, commercial and public use

projects. Eligible borrowers include not-for-profit organizations, revitalization organizations or real estate developers working in designated Main Street communities, local, state or regional governments, and for profit developers of older and/or historic buildings.

- University of Pennsylvania
- Preservation Pennsylvania Loan – To make low interest loans directly to organizations and government agencies for the restoration or rehabilitation of specific historic properties. (maximum amount \$50,000)

ST. ANDREW'S CHAPEL MIXED USE PROPOSALS						
	Sanctuary	Crypt	Basement	Deanery Basement	Library	Deanery
C.	Office/Stacks	Office/(Entrance)	Gym/Locker Room	BYOB	Conference Room	Office



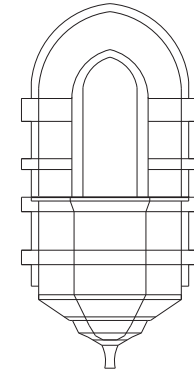
CONCLUSION

The purpose of this study has been to analyze and synthesize information regarding many aspects of St. Andrew's Chapel in order to design a values-centered preservation plan that is both feasible and sensitive to the historic fabric of the buildings. The culmination of the work is the proposal of several possible reuse options that adhere to a preservation philosophy formulated specifically for the site. This philosophy was realized through an exploration of the history, contexts, significance, character-defining elements, current conditions, and future potential for St. Andrew's Chapel.

This study, being completed within a constrained time frame of one semester, does not strive to comprehensively explore all possibilities for the preservation of St. Andrew's Chapel but, rather, to propose a select few reuse options that are compatible with the space and the context of the building, are approved by the stakeholders, and maximize the preservation of historic fabric. If time permitted, recommendations for future work would include exploring more extensively the financial aspects of the preservation of the chapel and structuring recommendations based on this important consideration. The chapel and deanery buildings require an

enormous amount of preservation work at a considerable expense. Future reuse proposals should focus on income-producing uses that will generate sufficient revenue to facilitate funding for the preservation of the building's fabric. One specific recommendation is to explore the feasibility and tolerance for exterior additions that would accommodate increased space for income-producing uses. This would require an evaluation of the tolerance for exterior change and further identification of specific character-defining elements of the exterior and the landscape in order to determine if and where an addition could suitably be placed.

St. Andrew's Chapel is a neighborhood landmark that has been under utilized for many years at the expense of its physical condition. The chapel, with its remarkable Gothic interior, and the deanery with its functional and malleable spaces together have great potential for an accommodating and unique reuse that could serve as a catalyst for the conservation of its historic fabric. Whether it is office space, a performing arts center, a recreation center, or some other use not yet identified, St. Andrew's Chapel could provide an inspiring environment for those it serves while remaining an important contributing element of the community.



APPENDIX

Before & After

Comparables

Methodology

Demographics

Condition Assessment of Deanery Windows

Photo Key of Proposals

Visibility & Light Study

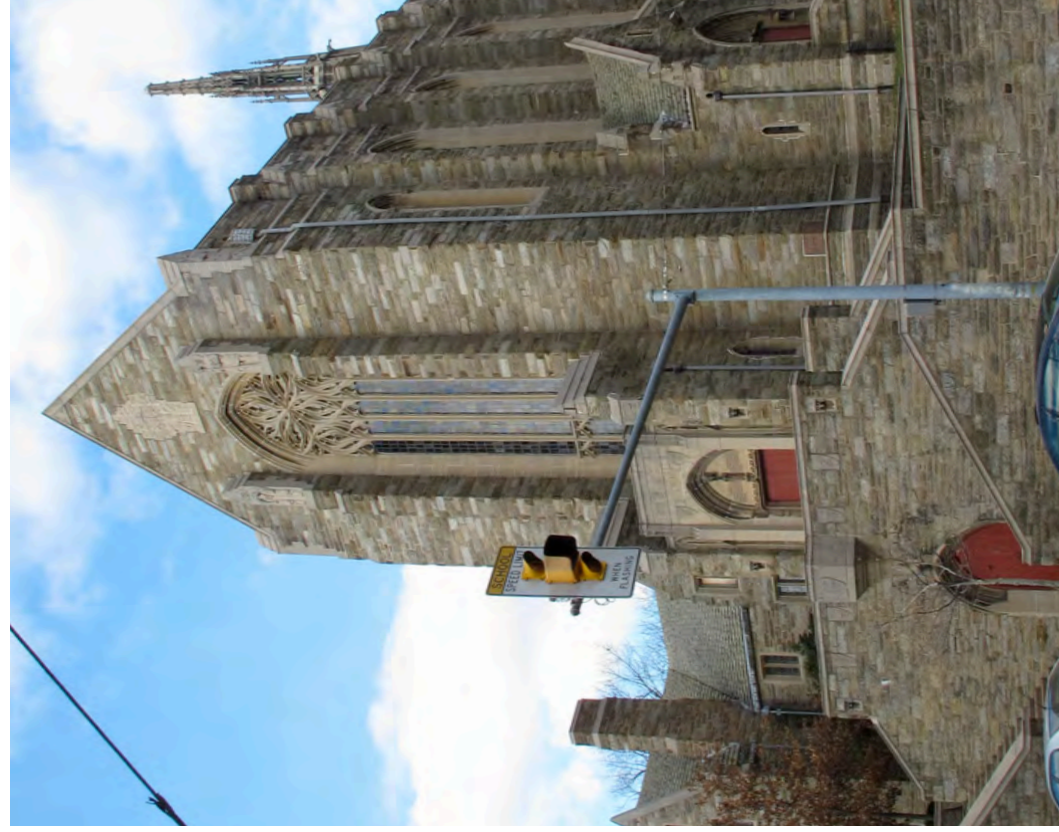
1960s

2010



Athenaeum of Philadelphia

2010



1978



Phillyhistory.org

2010



1963



Phillyhistory.org



McColl's Art Center Charlotte, NC (art center/community)



Mark's American Cuisine
Houston, TX (restaurant)

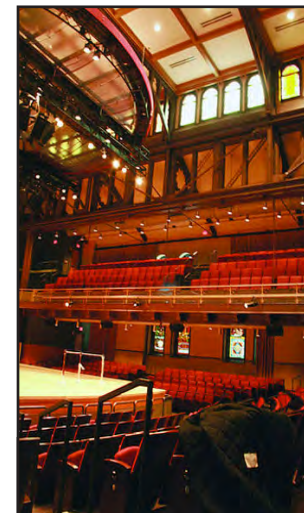


Bell Tower Place
Watertown, MA
(residential)

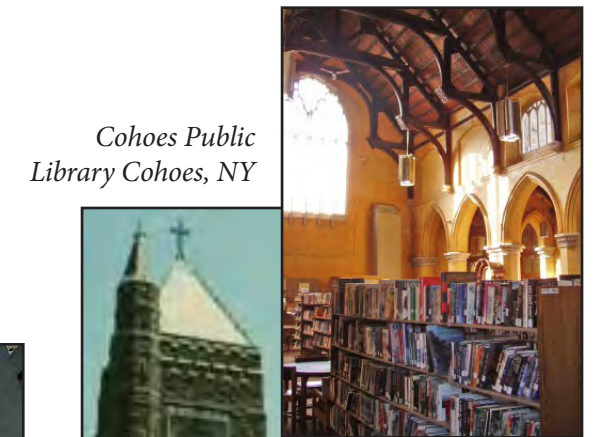
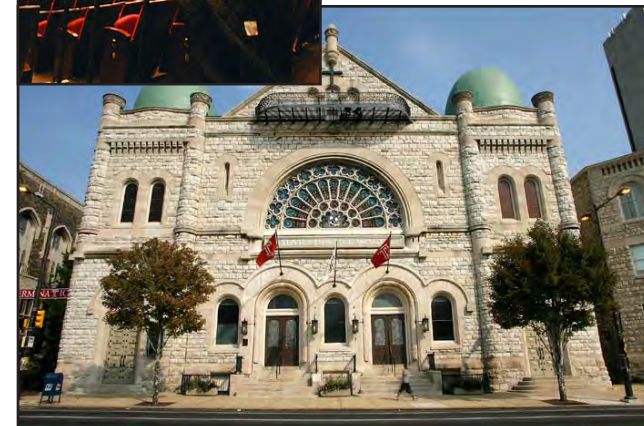


Church of the New Jerusalem Philadelphia, PA (office)

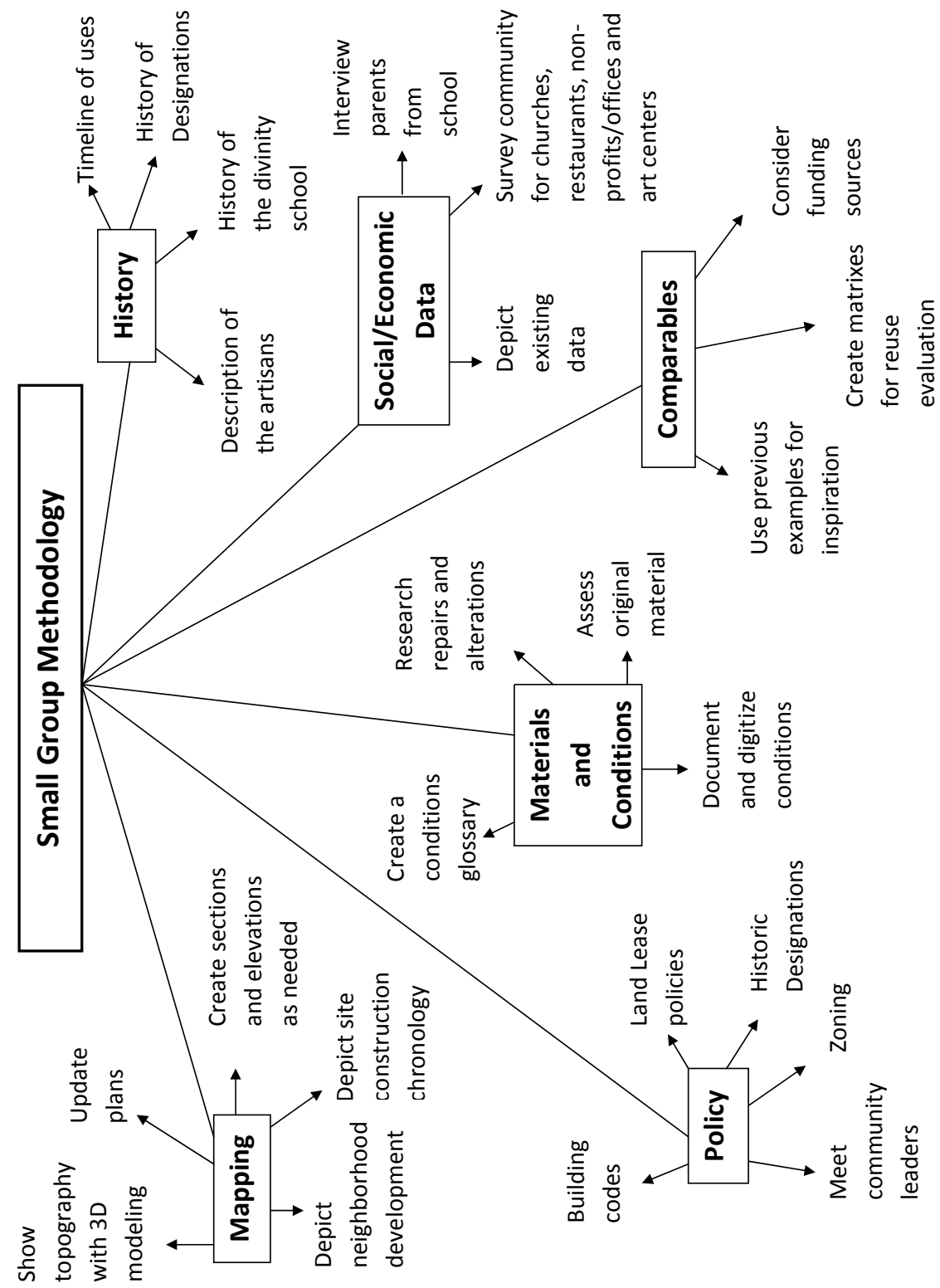
Mad River Bar & Grille
Charleston, SC (restaurant)



Temple Baptist
Church Philadelphia,
PA (performance)

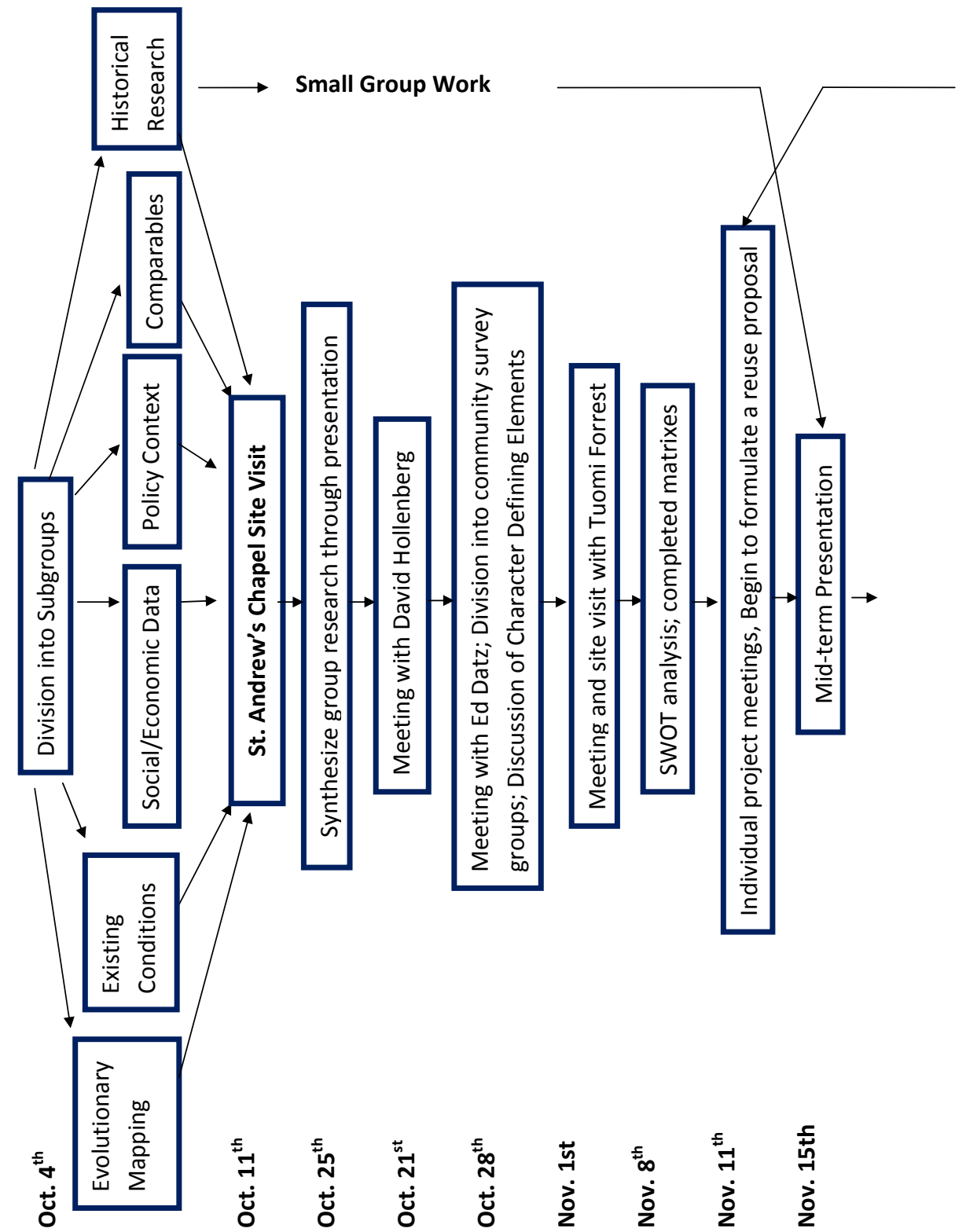


Cohoes Public
Library Cohoes, NY



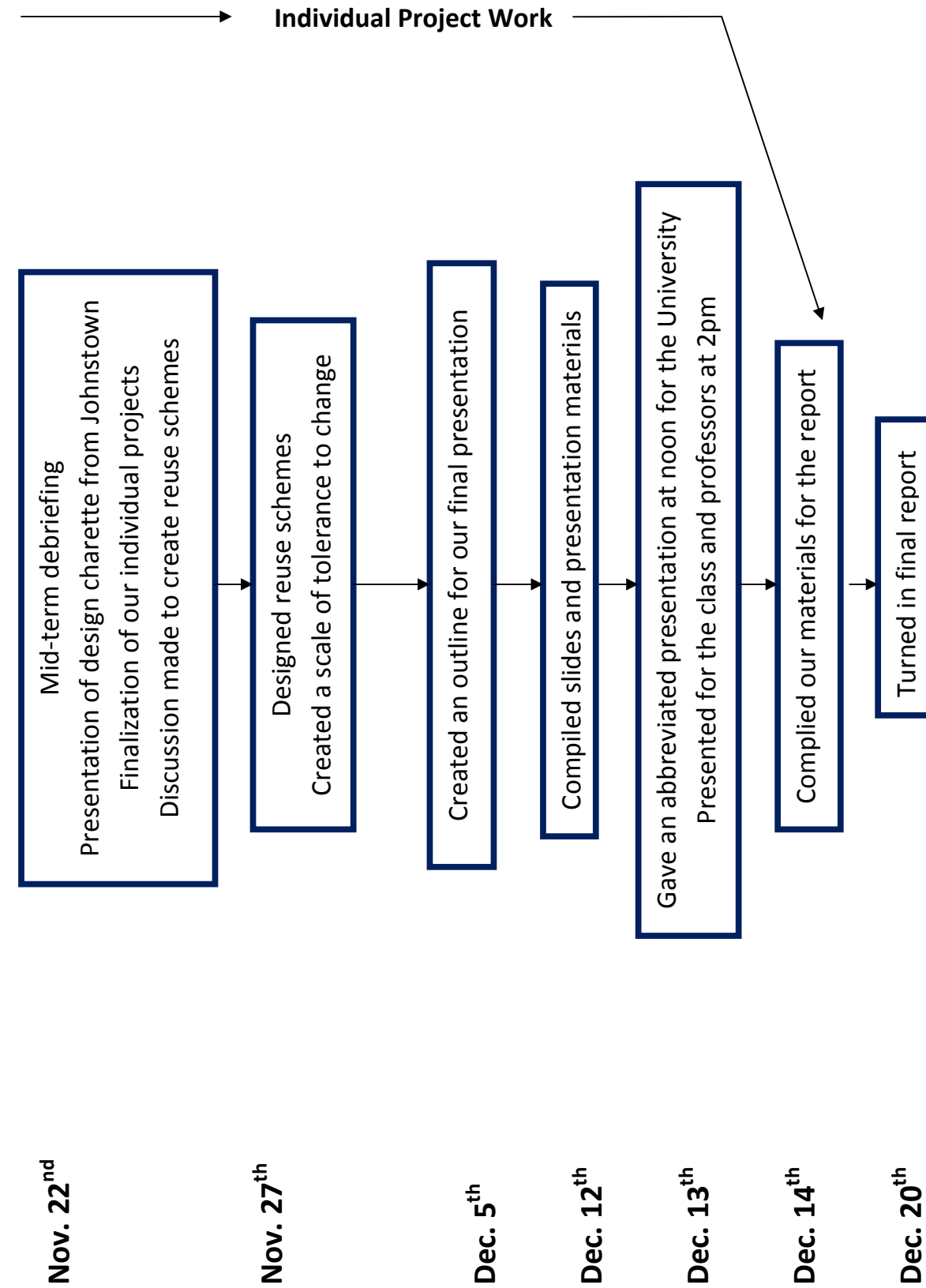
Methodology, 1 Small Group Methodology Diagram

This diagram shows the scope of the initial work we undertook in small groups for the initial investigation of the chapel and deanery.

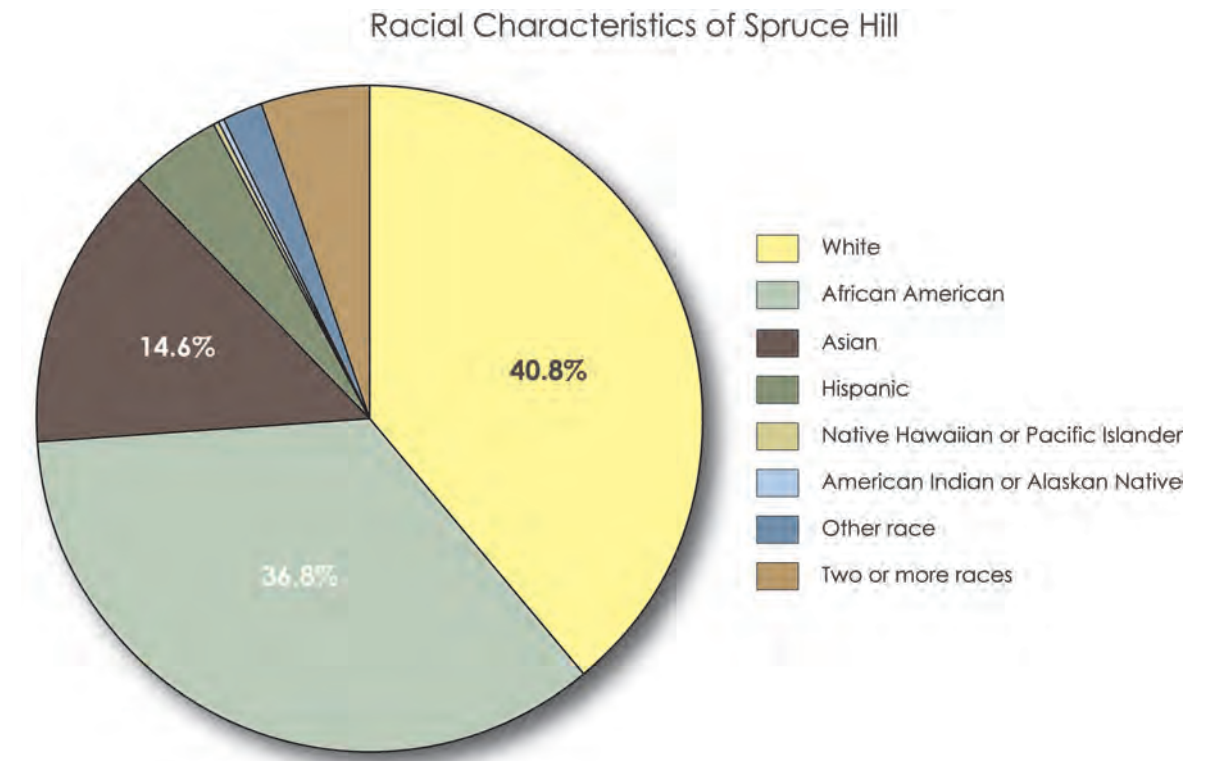


Methodology, 2 Methodology Timeline

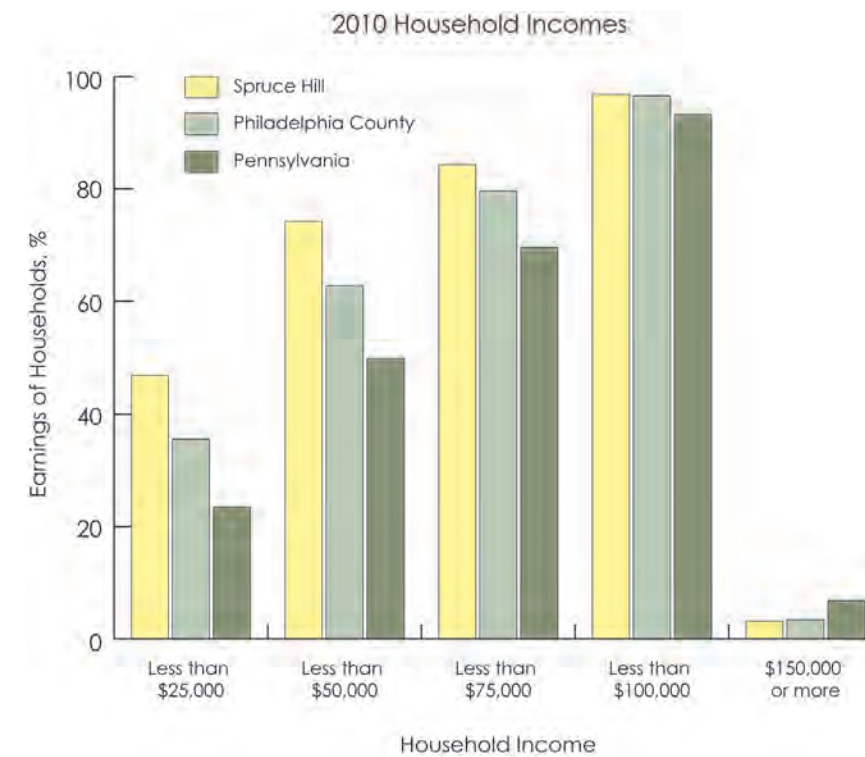
This diagram shows the activities we completed as a large group by the dates that each event occurred.



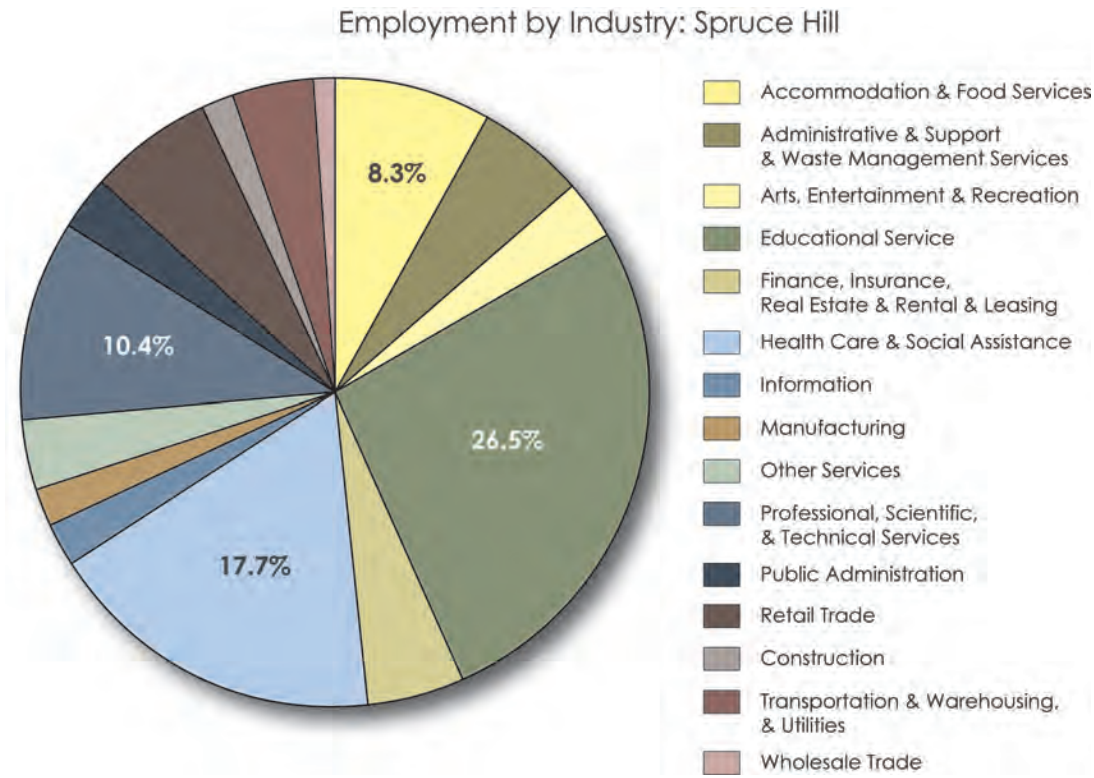
Methodology, 2 (cont'd) Methodology Timeline



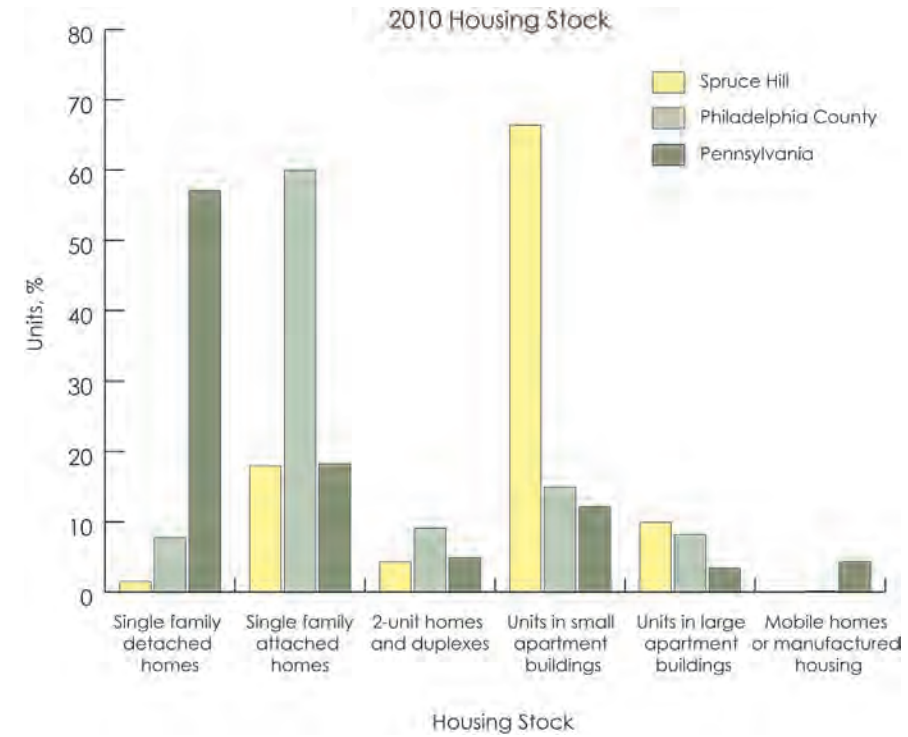
Demographics, 1 Racial characteristics of Spruce Hill, 2010. Source: 2000 US Census, Summary File 3; The Nielsen Company.



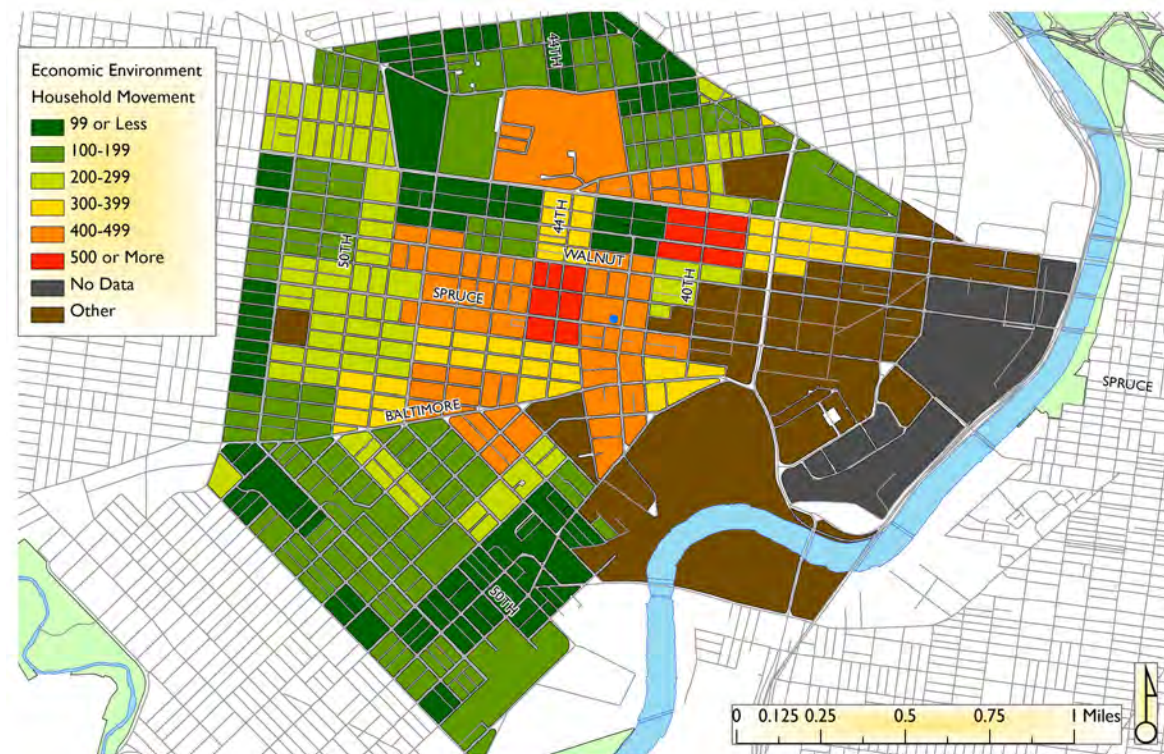
Demographics, 2 Household incomes of Spruce Hill, Philadelphia County, and the state of Pennsylvania, 2010. Source: 2000 US Census, Summary File 3; The Nielsen Company.



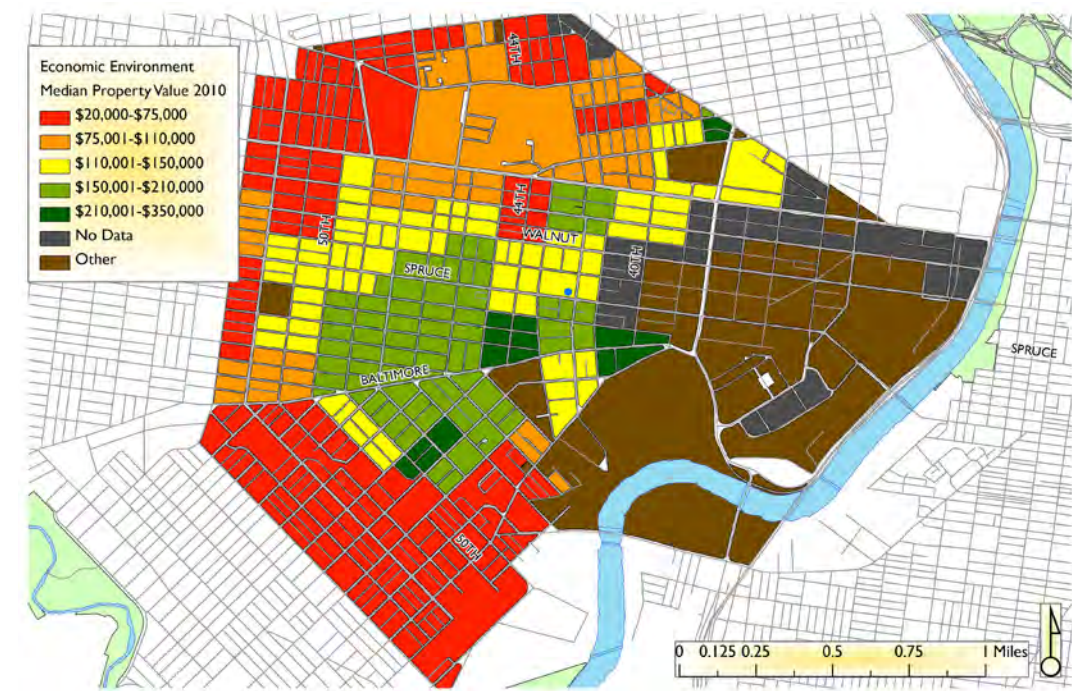
Demographics, 3 Employment broken down by industry in Spruce Hill, 2010. Source: 2000 US Census, Summary File 3; The Nielsen Company.



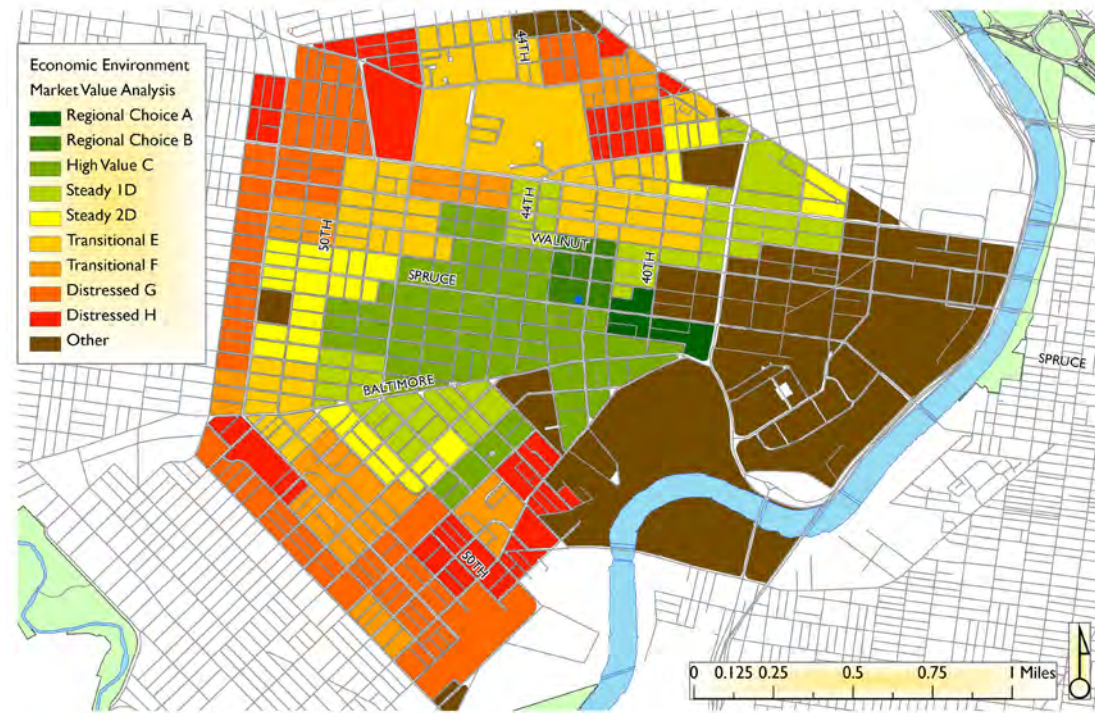
Demographics, 5 The type of housing available in Spruce Hill, as estimated for 2010. Single family homes include all one-unit structures, both attached and detached. Townhouses or duplexes include one-unit attached homes, as well as housing units with two units. Units in small apartment building are buildings with 3 to 49 units; large apartment buildings include buildings with 50 units or more. Source: 2000 US Census, Summary File 3; The Nielsen Company.



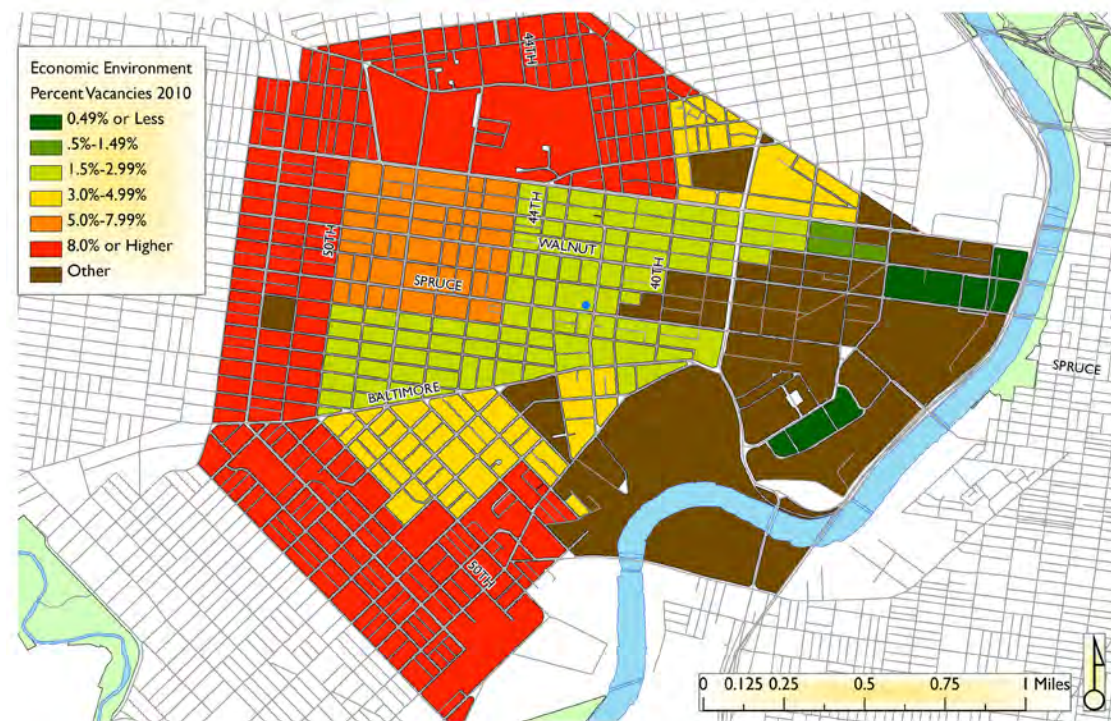
Demographics, 4 Estimated number of households who moved into their home in Spruce Hill since 2000, as of 2010. Source: 2000 US Census, Summary File 3; The Nielsen Company.



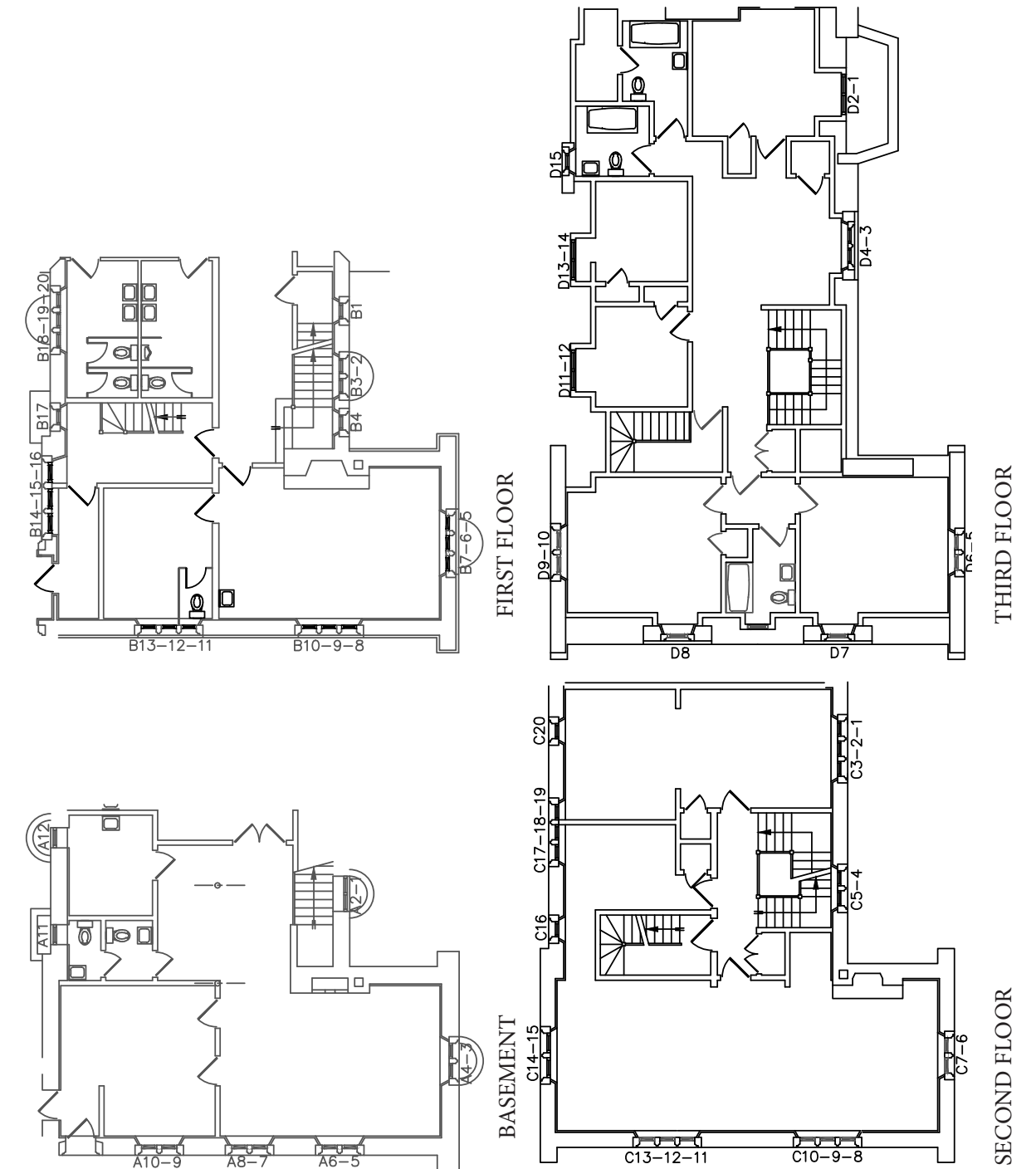
Demographics, 6 Estimated median value of an owner-occupied home in Spruce Hill, 2010. Source: 2000 US Census, Summary File 3; The Nielsen Company.



Demographics, 7 The Redevelopment Fund's market value analysis for Philadelphia in 2008. This distinguishes nine market types in the city. Spruce Hill falls predominately in the "Regional Choice B" or "High Value C" categories. Source: The Redevelopment Fund.



Demographics, 8 Percent of all units that are vacant in Spruce Hill, April through June, 2010. This count of vacancies is done by USPS delivery staff for addresses that have not collected their mail in 90 days or more. Source: HUD USPS address vacancies.



Window Location Key

Window #	Type	Glass	Lead Cames	Steel Frame	Subframe	Hardware	Glazing Putty	Operable?	Comments	Intervention
A1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	cemented over	n/a
A2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	cemented over	n/a
A3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	casement removed; sash glazing	n/a
A4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	N	casement removed; sash glazing	n/a
A5	B	3 of 12	3	3	3	3	2	Y	exterior protection glazing	maintenance
A6	B	1 of 12	3	3	3	3	2	Y	exterior protection glazing	maintenance
A7	B	1 of 12	3	3	3	3	2	Y		maintenance
A8	B	5 of 12	3	3	3	3	2	Y		repair
A9	B	10 of 12	1	3	3	3	1	Y	badly bowed panel	replacement
A10	B	4 of 12	3	3	3	3	2	Y		repair
A11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	previously covered over, vandalized	replacement
A12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	drywalled over	n/a
B1	A	5 of 9	1	1	1	2	1	N	missing part of panel; plywood covering interior	repair
B2	C	5 of 15	2	3	3	3	1	Y	slight bow of panel	repair
B3	C	1 of 15	2	3	3	3	1	Y		repair
B4	A	intact	1	2	2	2	1	Y	bowed panel, extreme rust	repair
B5	D	intact	2	2	3	2	1	Y, sticks	frame doesn't fit properly into subframe	repair
B6	D	1 of 15	2	2	3	2	1	Y	hardware missing	repair
B7	D	intact	2	2	2	3	1	Y, sticks		repair
B8	D	intact	1	3	2	3	1	Y	panel badly bowed and coming out of frame	repair
B9	D	intact	2	2	3	3	1	Y, sticks	panel bowed at top	repair
B10	D	1 of 15	1	2	3	2	1	N	panel badly bowed, deterioration of comes	repair
B11	D	intact	3	3	3	3	1	N		maintenance
B12	D	intact	2	3	3	3	1	Y		repair
B13	D	intact	2	3	3	3	1	Y	slight warping of comes	repair
B14	C	intact	1	2	3	2	1	Y	protection glazing on exterior	repair
B15	C	intact	2	3	3	3	1	Y	protection glazing on exterior	repair

Window Condition Assessment

Window #	Type	Glass	Lead Cames	Steel Frame	Subframe	Hardware	Glazing Putty	Operable?	Comments	Intervention
B16	C	intact	1	3	3	3	1	Y	protection glazing on exterior, badly bowed	repair
B17	C	1 of 15	2	3	3	3	1	Y, sticks	protection glazing on exterior	repair
B18	D	7 of 15	1	2	2	3	1	N	vandalized, bottom 2/3 of panel is destroyed and covered with plywood	replacement
B19	D	intact	2	3	3	3	1	Y	protection glazing on exterior	repair
B20	D	9 of 15	1	2	3	3	1	N	vandalized, bottom 2/3 of panel is destroyed and covered with plywood	replacement
C1	D	2 of 15	2	3	3	3	1	Y	top of panel warped	repair
C2	D	intact	1	2	3	3	1	Y, sticks	panel bowed, deteriorated comes	repair
C3	D	1 of 15	1	3	3	3	1	Y		repair
C4	C	intact	3	3	3	1	1	N	missing handle	repair
C5	C	intact	3	3	3	2	1	Y	missing pieces on hinge	maintenance
C6	D	intact	2	3	3	3	1	Y, sticks	some lead deterioration	repair
C7	D	intact	2	3	3	3	1	Y		repair
C8	D	1 of 15	2	3	3	3	1	Y	lead panel coming out of frame	repair
C9	D	intact	1	3	3	3	1	Y	glass pushing out of comes	repair
C10	D	intact	3	3	3	3	1	Y		repair
C11	D	1 of 15	2	3	3	3	1	Y		repair
C12	D	intact	3	3	3	3	1	Y, sticks		maintenance
C13	D	intact	2	3	3	3	1	Y, sticks	some lead deterioration	repair
C14	D	intact	1	2	3	1	1	Y	missing hinge, hot glue around comes on exterior	repair
C15	D	intact	1	3	3	3	1	Y, sticks	hot glue around comes on exterior	repair
C16	D	intact	3	3	3	3	1	Y		maintenance
C17	D	intact	2	3	3	3	1	Y		repair
C18	D	intact	3	3	3	3	1	Y		maintenance
C19	D	intact	2	3	3	3	1	Y, sticks		repair

Window Condition Assessment (Cont'd)

INTERIOR CASEMENT STORM WINDOW ANALYSIS

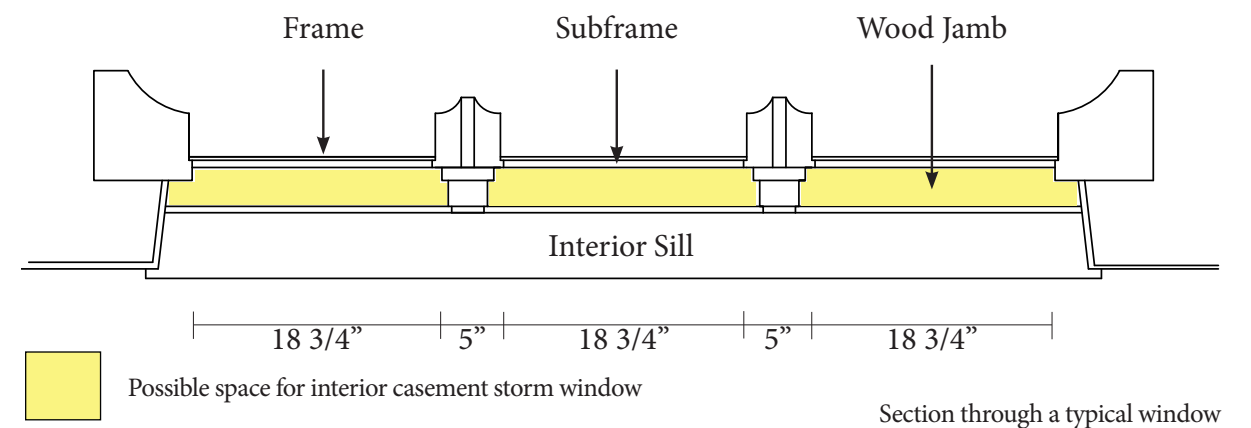
Window #	Type	Glass	Lead Cames	Steel Frame	Subframe	Hardware	Glazing Putty	Operable?	Comments	Intervention
C20	D	intact	1	3	3	3	1	Y	deteriorated lead cames	repair
D1	C	intact	3	2	2	3	1	N		repair
D2	C	1 of 15	1	3	3	3	1	Y	glass pushing out of cames, badly bowed	repair
D3	C	intact	2	2	2	3	1	N	badly rusted frame and subframe	repair
D4	C	n/a	n/a	n/a	n/a	n/a	n/a	N	destroyed due to vandalism, plywood cover	replacement
D5	C	intact	2	3	3	3	1	Y	gap between panel and frame due to missing putty	repair
D6	C	1 of 15	2	3	3	3	1	Y	gap between panel and frame due to missing putty	repair
D7	C	6 of 15	1	3	2	3	1	N	bottom half of panel destroyed	repair
D8	C	intact	2	3	3	3	1	Y	panel bowed at top	repair
D9	C	intact	3	3	3	3	1	Y		maintenance
D10	C	intact	2	3	3	3	1	Y		repair
D11	C	intact	3	3	3	3	1	Y, sticks		maintenance
D12	C	intact	1	3	3	3	1	Y	badly bowed panel, broken cames	repair
D13	C	intact	1	3	3	3	1	Y	missing cames	repair
D14	C	intact	1	3	3	3	1	Y, sticks		repair
D15	C	intact	2	3	3	3	1	Y	majority of glass is frosted	repair

Window Type Key

- Type A: 9 panes, 18 3/4" x 30"
- Type B: 12 panes, 18 3/4" x 40"
- Type C: 15 panes, 18 3/4" x 48"
- Type D: 18 panes, 18 3/4" x 60"

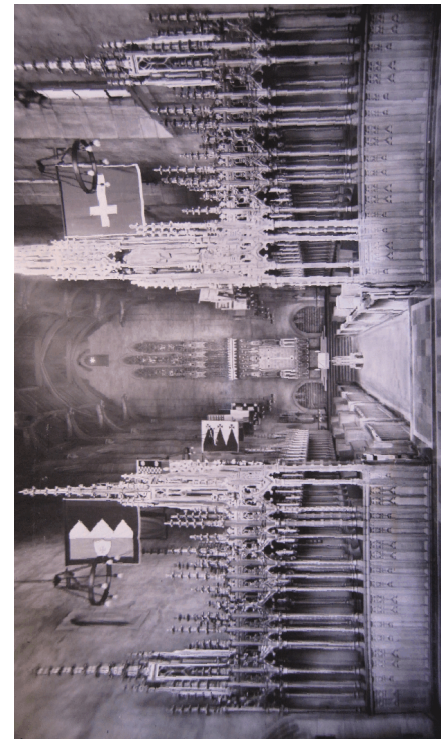
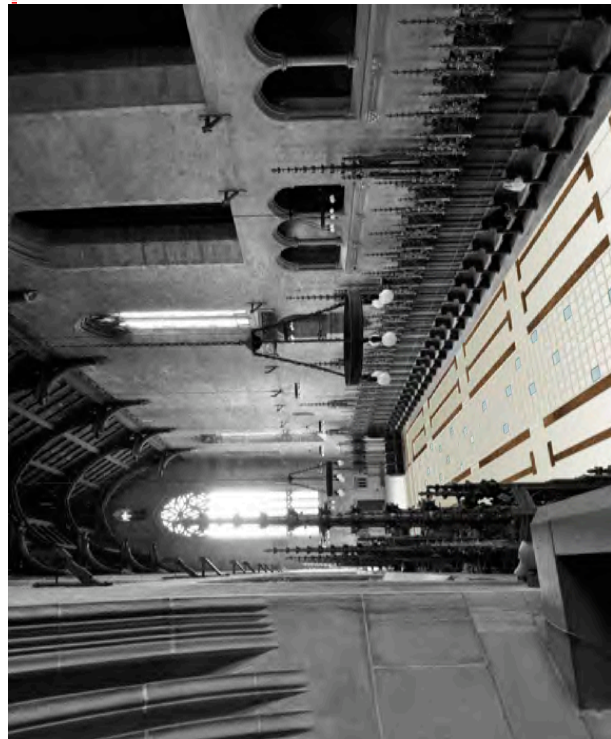
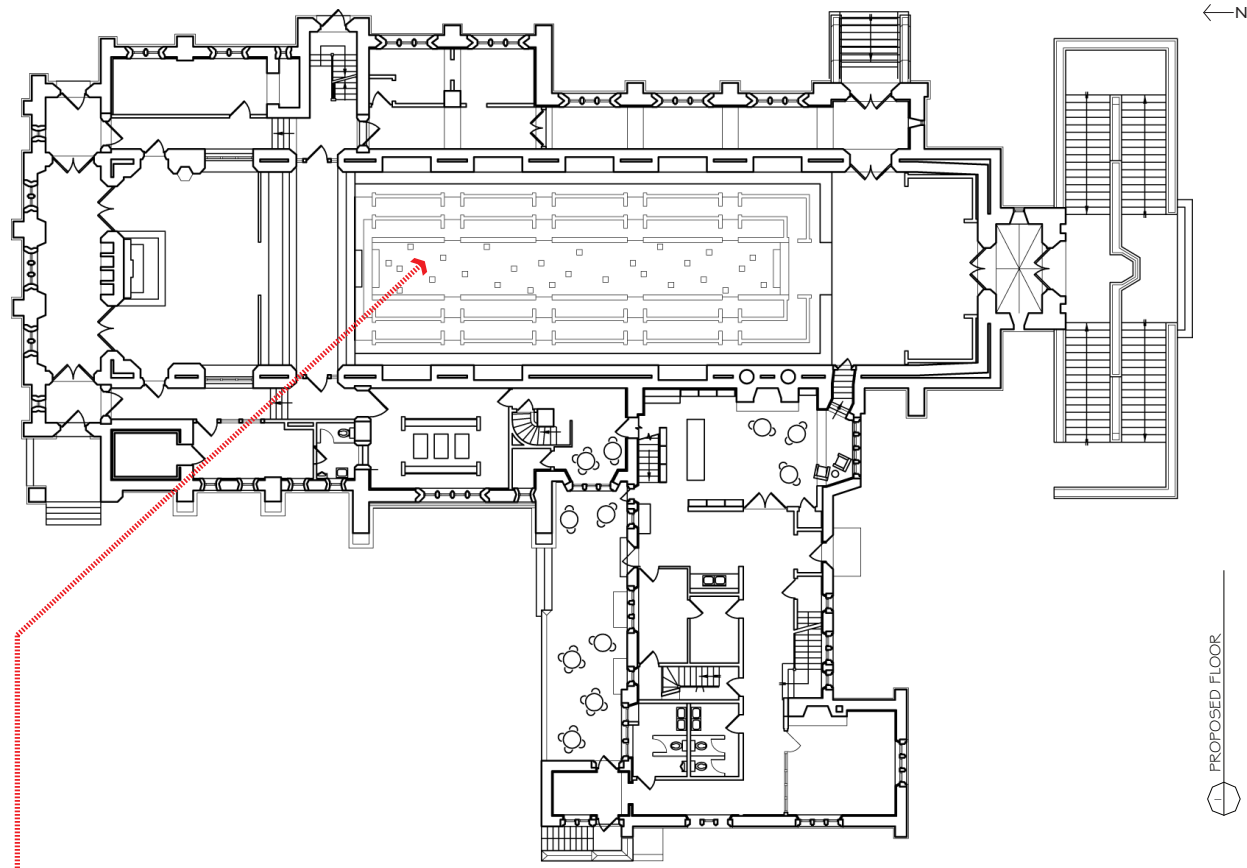
Notes

*Ratings based on visual observations of conditions, mostly an interior survey. 1=poor, 2=fair, 3=good.
 *Glass is rated based on number of panes that are defective. For example, "1 of 15" means that 1 pane out of the total of 15 in the window are broken, missing, or cracked. "Intact" means that there are no glass defects.
 *Intervention recommendation is based on numerical ratings + condition of glass + other observations. They are general guidelines and may need revision with a more careful inspection of the window.



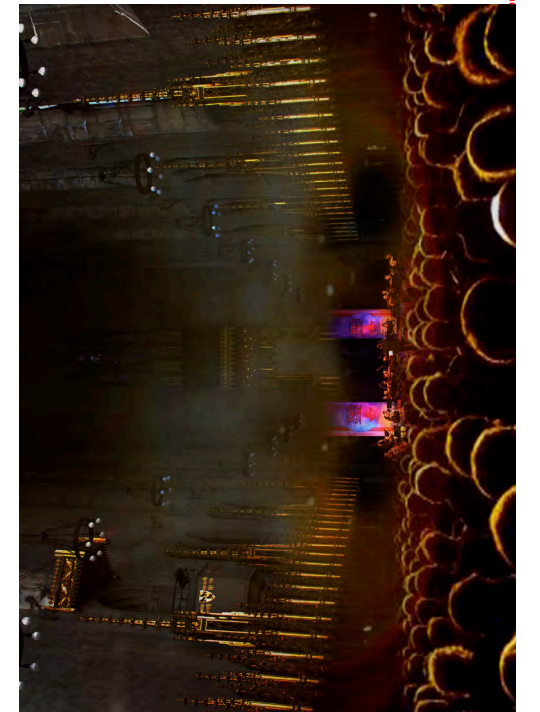
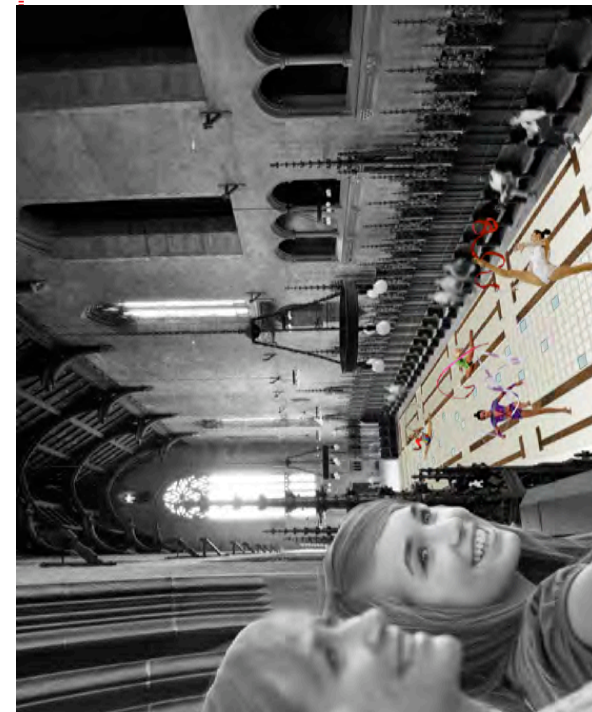
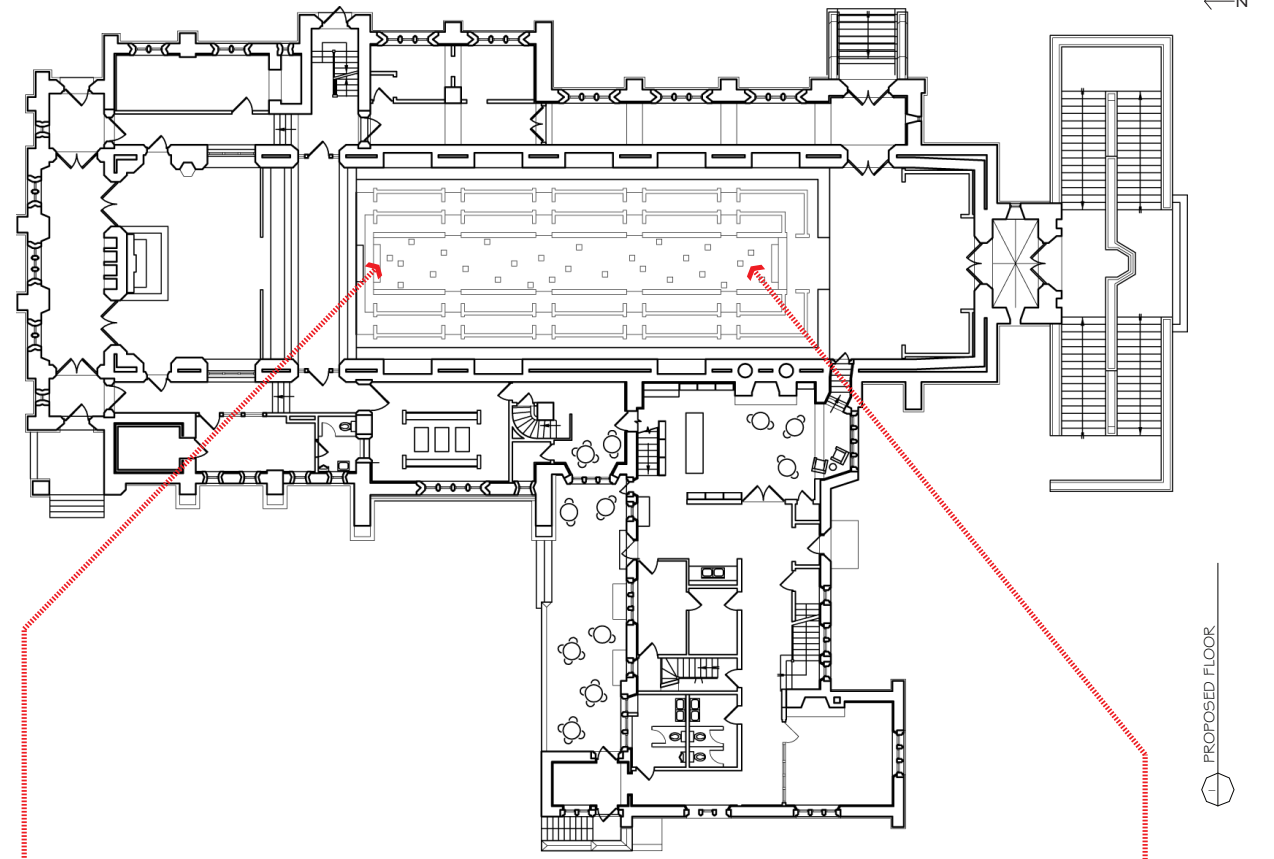
Note: Plan is produced from a combination of original drawings and hand measurement. It is primarily intended to represent space that might accommodate a storm window. Dimensions are approximate.

FLOOR INTERVENTION

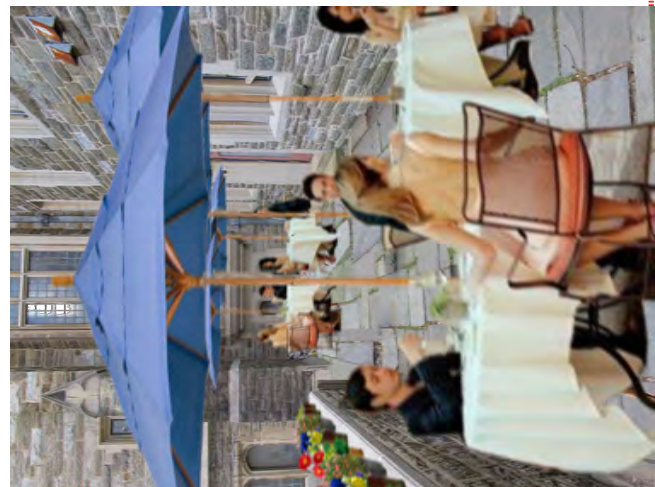
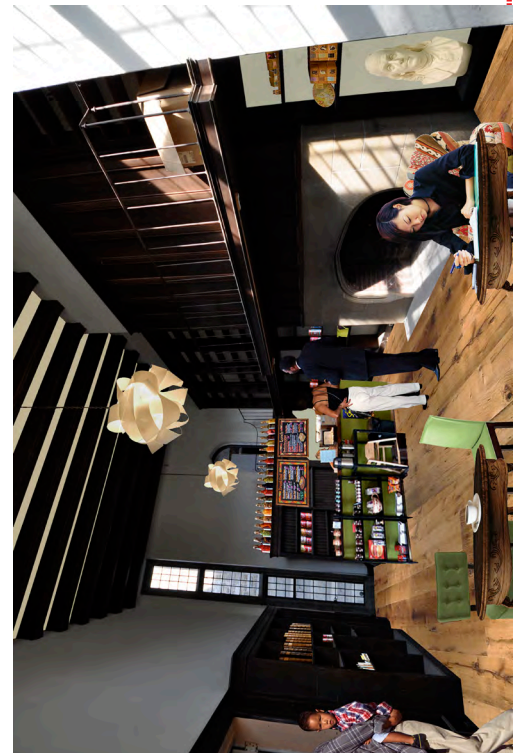
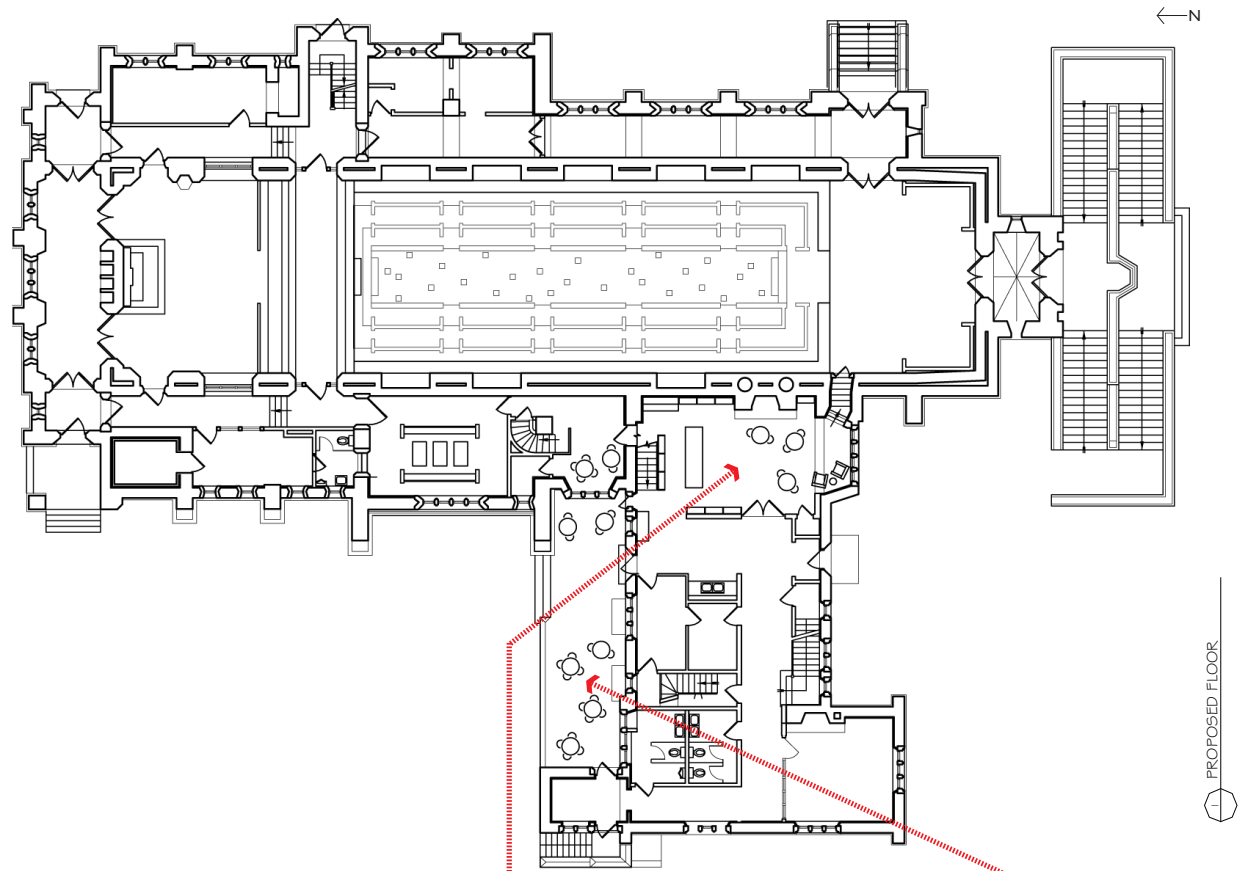


historic image of original pew configuration

PERFORMING ARTS



CAFE



LIGHT AND VISIBILITY STUDY: RECOMMENDATIONS FOR SANCTUARY INTERVENTION

The sanctuary of St. Andrew's Chapel is a space of great architectural merit, decorative elements of high integrity and an overall experience meant to evoke spirituality and reverence upon entry. Although a highly significant and beautiful interior, there are developers who might see its soaring height as an opportunity to increase usable square footage. As preservationists, we acknowledge that there is a possibility that the St. Andrew's complex could eventually fall into less sensitive hands, and that we, as part of our preservation plan, must account for these scenarios

and plan accordingly. Therefore, I conducted a study based on four possible insertion schemes in which I tested the impact on both light conditions and sightline obstructions of major character defining elements.

This analysis, called the Light and Visibility Study, was conducted by creating a digital model of St. Andrew's Chapel. Using the program Google SketchUp, I was able to create and test a series of floor plate configurations in the sanctuary space. The driving idea behind these massing designs was to predict some



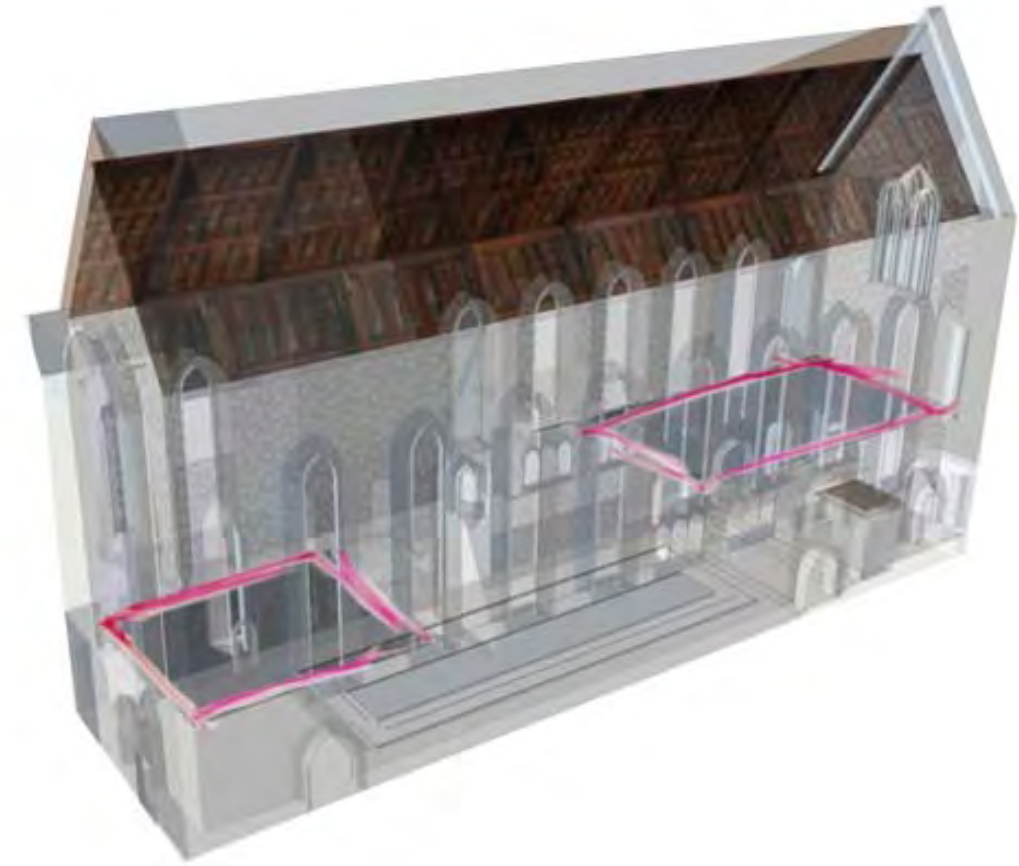
layouts which a developer may consider, and test them preemptively so as to be able to recommend an insertion with the least impact on both light and visibility of certain elements. This study will be a preparation for a hypothetical, yet very possible, future situation. My hope is that the results of the study may equip the owners with general guidelines for future design work within the sanctuary space.

Once the insertions were prepared, I was able to geolocate the model to the latitude and longitude of Philadelphia, PA- 39.57 N and 75.10 W. SketchUp has the ability to create a sun location compatible to the geographic location of the model, so it is assumed that the direction and angles are generally accurate. In order to conduct a comparative light study of each insertion, I had to delineate the variables and constants. As mentioned, the overall feeling intended by the chapel is meant to be experienced upon entry to the space. I decided that the light studies would be conducted from this entry point, creating a constant. This point also allows a perspective looking north, where the light conditions of the east and west windows can be easily seen at certain points of the day. The next constant would be the date of the study, and therefore the angle of the sun. I chose December 9, 2010 as the consistent date of the study. Also, the times of day of each study are a constant. I chose 8:30 AM, 12:00 Noon, and 3:45 PM after a test of which points of the day the light locations were most readable. This created constants of location, date and time, which allowed the only variable to be the floor plate intervention.

The visibility study began by prioritizing which character defining elements I would aim to keep unobstructed from view. After

creating a hierarchy of both importance and probability of consideration in any floor plate intervention, I identified the painted ceiling, north wall stained glass window, and south wall leaded glass window as the three character defining elements in which sightlines should be maintained. I then diagrammed in section what each floor plate intervention would look like in the space, and followed the path a visitor would take to experience the space in any given scheme. I recreated a walking experience following this path in the digital model and selected four points which I felt indicated the most crucial moments of the intervention. This study is much more subjective than the light study, and it will not be as easy to compare interventions as these moments of optimal sightlines do not occur at the same spot in each scheme. The visibility study is more about the aesthetic possibilities of each scheme relating to the sightlines allowed at each moment, and while I will still provide recommendations, the owners and developers may use this study to draw their own conclusions of which scheme maximizes the experience they are intending.

The Light and Visibility Study is organized into four sections, one for each intervention, containing a description of each design, light study comparing current conditions to the proposed conditions, and visibility study showing the four critical moments of the proposal. These will be followed by conclusions and recommendations based on the results.



INTERVENTION A

This scheme creates two separate floor plates, one on the south end of the sanctuary and the other at the north end altar area. The platform on the south side is level with the bottom of the east and west wall full height leaded glass windows, and falls just under the south wall leaded glass window, identified as one of the elements of visual significance. It extends only to the second full window of the east wall. The northern floor plate is of greater height, falling along the sill of the organ loft openings along the west wall. The variation in height accounts for the change in floor level by the altar stairs.

The south wall platform is meant to make the viewer feel they are in a compressed space upon entry, but then expansion occurs as they walk further into the sanctuary. The same feeling of awe upon the entry of sanctuary currently still exists, but it is delayed. The design was meant to call into question whether the experience changes if the moments still exist, but are simply framed differently. Through the visibility study I aimed to explore whether viewing the north wall floor plate really disrupted the viewing of the ceiling or stained glass window.

LIGHT STUDY

Current conditions versus conditions of Intervention A



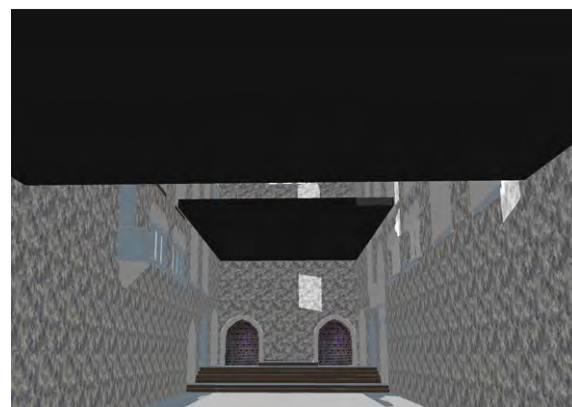
8:30 AM



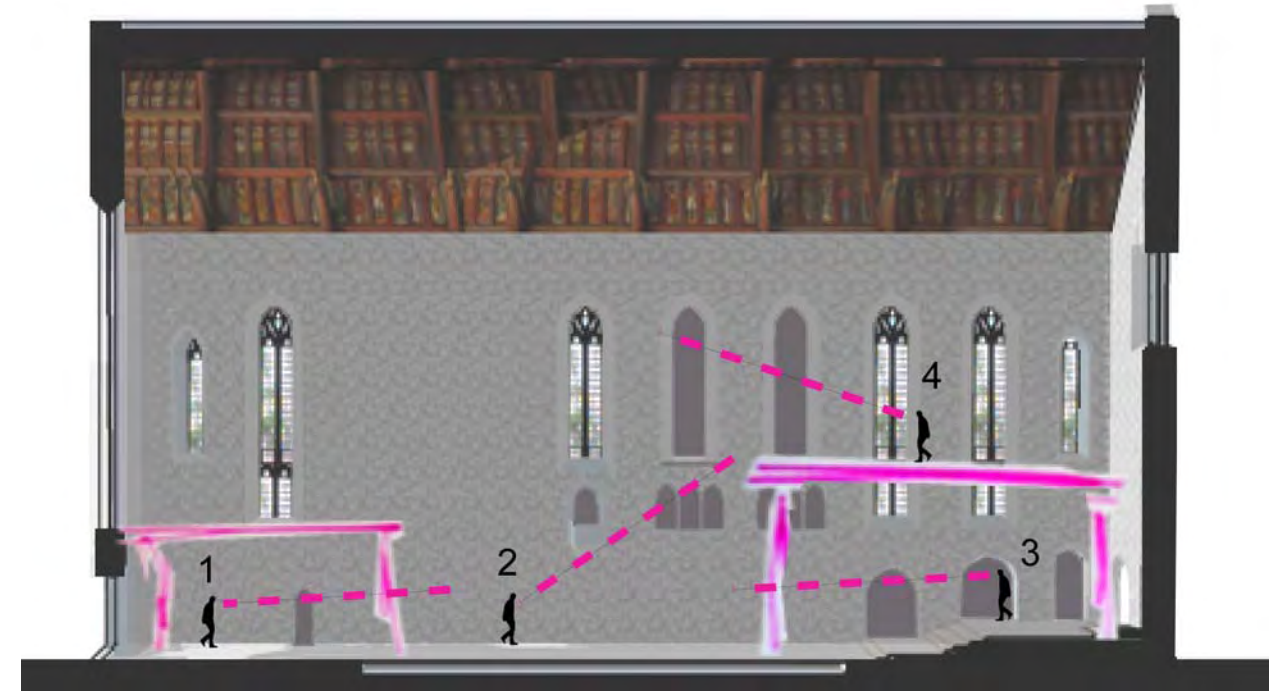
12:00 NOON



3:45 PM



VISIBILITY STUDY



Sightlines from critical moments of Intervention A



Moment 1: Located as soon as entering the space, stained glass window visible, ceiling obstructed

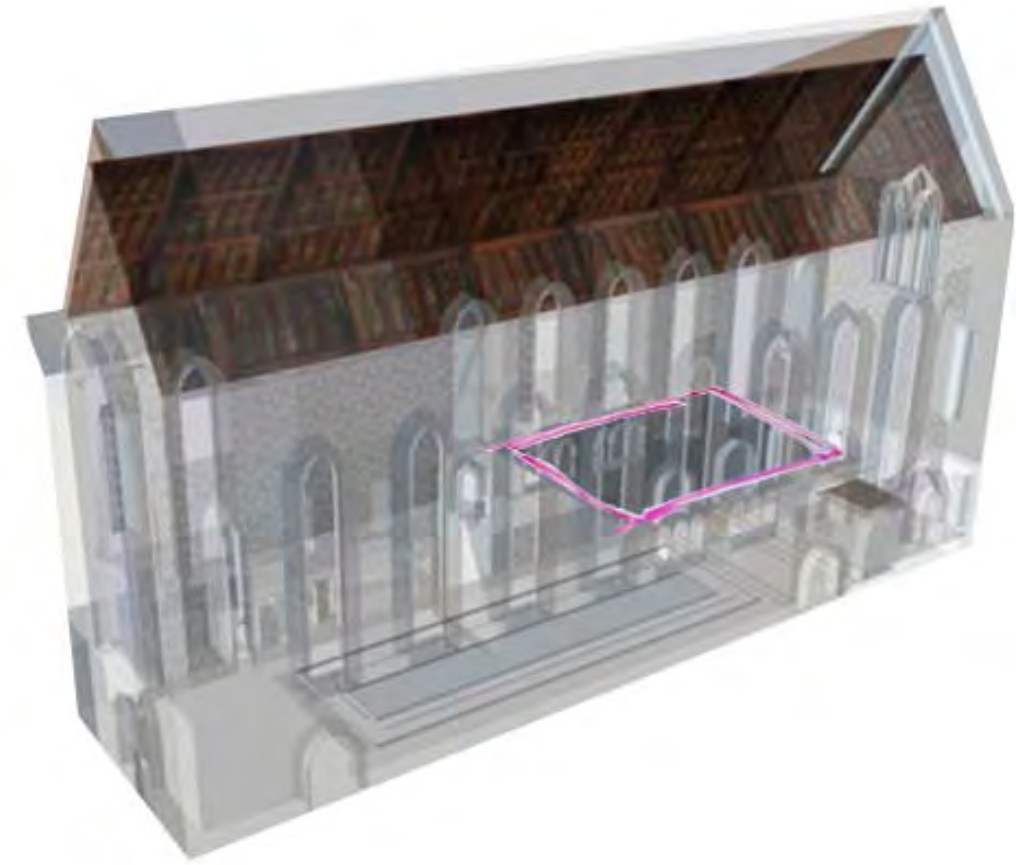
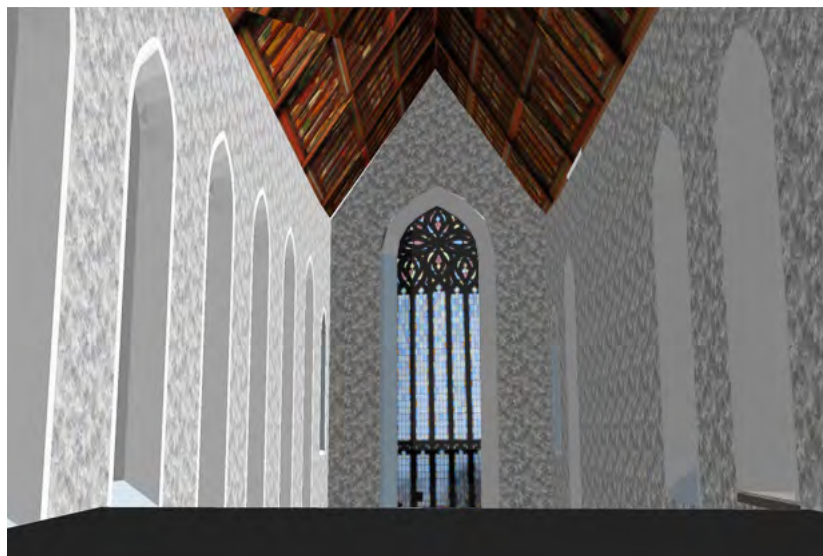
Moment 2:
Located at center of ground floor, stained glass window partially obstructed, ceiling entirely visible



Moment 3:
Located on altar looking south, leaded glass window entirely visible, ceiling obstructed



Moment 4:
Located on north side platform looking south, leaded glass window and ceiling entirely visible



INTERVENTION B

The second intervention contains a single free standing platform. This platform is located in the center of the sanctuary, slightly to the north. The location allows open areas both upon entry and at the altar. The height of the platform falls level with the organ loft openings of the west wall, while it extends towards the east and west wall, leaving a small amount of space between structure and chapel wall.

The intent of this design is to test a fairly straightforward, free standing intervention within the sanctuary. While intervention A created a central moment, compressing both the entry and altar points, this design does the

opposite. Here, the central moment is more compressed, and the entry and altar are left open. Intervention A created one moment to encompass the sanctuary in entirety, and in Intervention B two very separate moments are created on the ground floor. However, the central moment exists, but is elevated, happening instead on the platform itself.

LIGHT STUDY

Current conditions versus conditions of Intervention B



8:30 AM



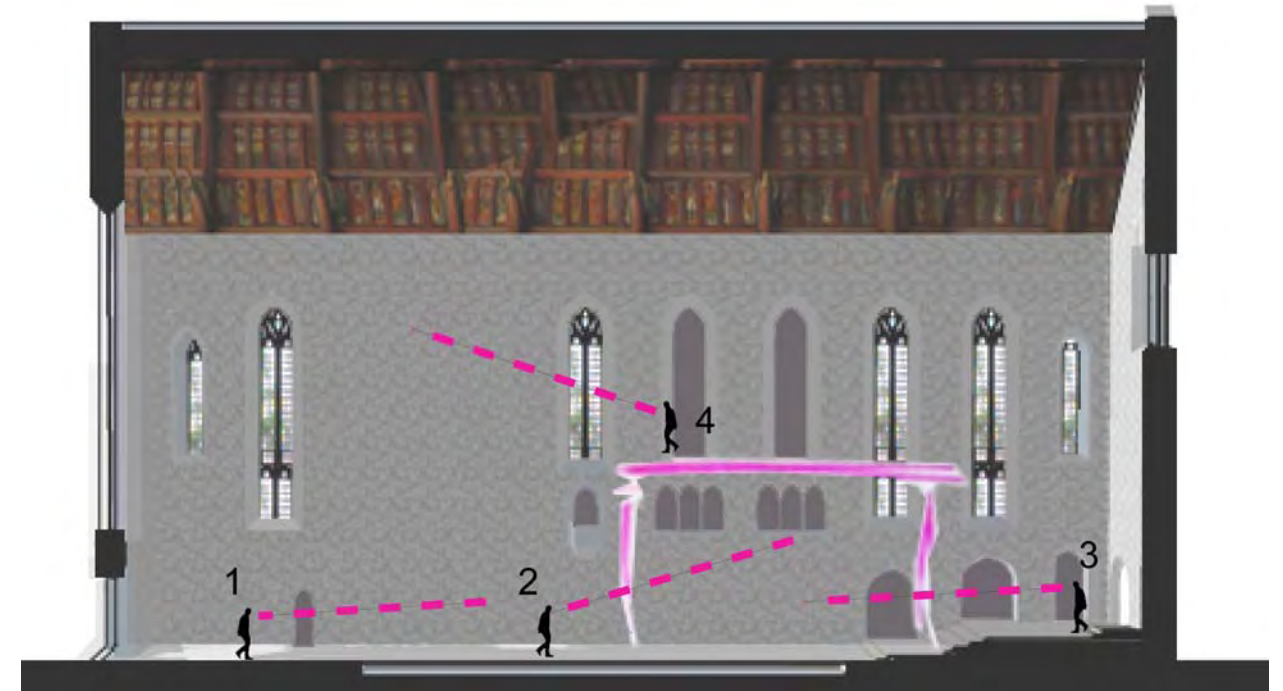
12:00 NOON



3:45 PM



VISIBILITY STUDY

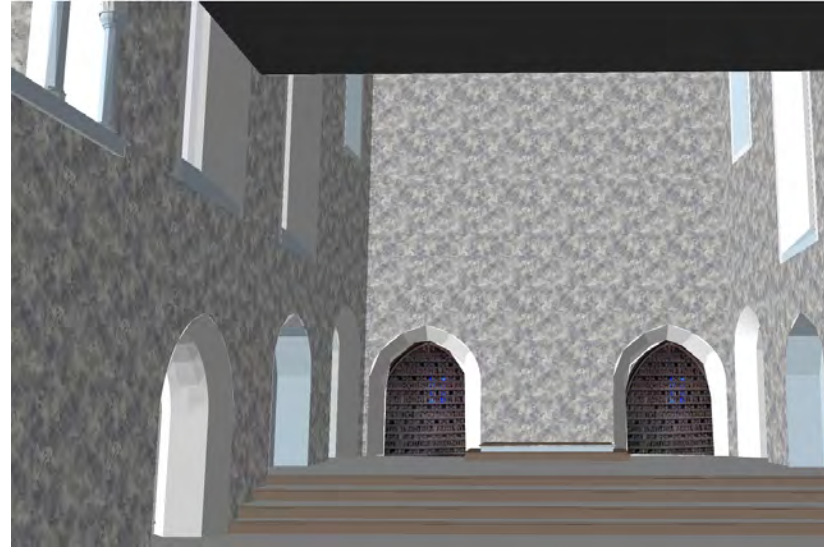


Sightlines from critical moments of Intervention B



Moment 1:
Located as soon as entering the space, stained glass window partially visible, ceiling entirely visible

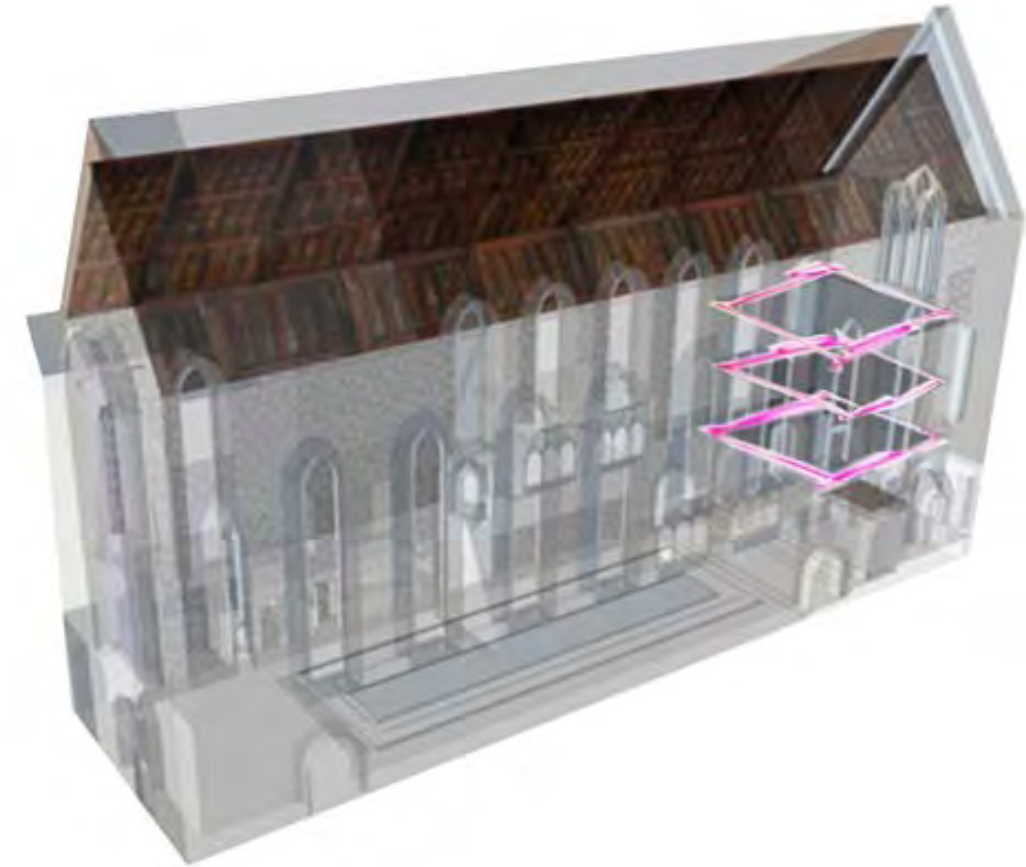
Moment 2:
Located at center of
ground floor, stained glass
window and ceiling
obstructed



Moment 3:
Located at altar
looking south,
leaded glass window
partially visible,
ceiling obstructed



Moment 4:
Located on top of
platform looking
south, leaded glass
window and ceiling
entirely visible



INTERVENTION C

Intervention C is a design which stacks three identical floor plates along the north wall of the sanctuary. The stained glass window, identified as one of the elements of visual significance, is located high on the north wall. The top floor plate is located along the sill of the stained glass window. The lower floor plates were then spaced below, creating four levels at the north wall. All floors extend only to the window second from the north wall on each side.

This intervention was an experiment in how floor plates could be stacked, and multiple levels created, without disrupting the massing

of the sanctuary. The north wall of the space is rather plain, other than the stained glass window. There is existing decoration from the stained glass window down to the altar, which could be maintained, with sections visible on each floor. Since the decoration was not chosen as an element of visual significance, it was deemed not necessary to be viewed as a whole. The moments created in this design would be unattainable as the sanctuary exists today, primarily the sightlines of the top floor plate, not only allowing direct access to the stained glass window, but also bringing the view much closer to the ceiling painting, another element of visual significance.

Light Study

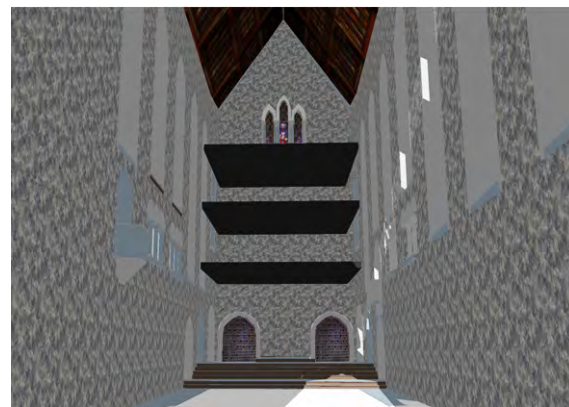
Current conditions versus conditions of Intervention C



8:30 AM



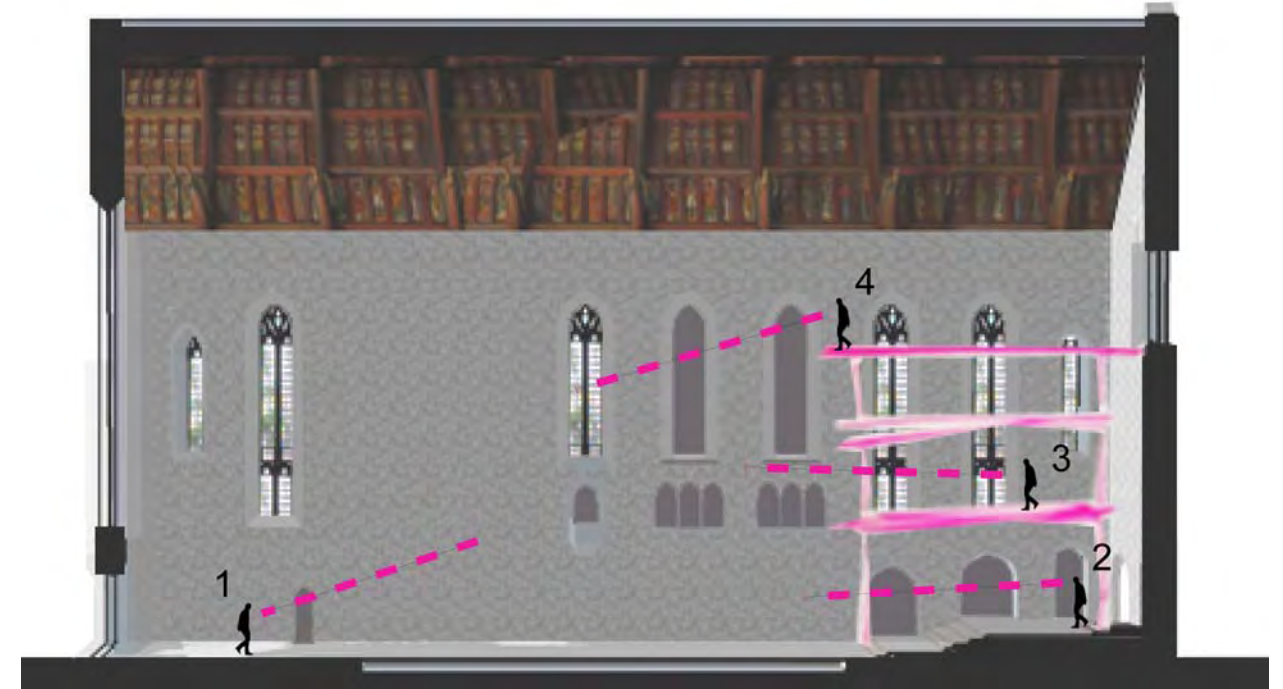
12:00 NOON



3:45 PM



VISIBILITY STUDY



Sightlines from critical moments of Intervention C

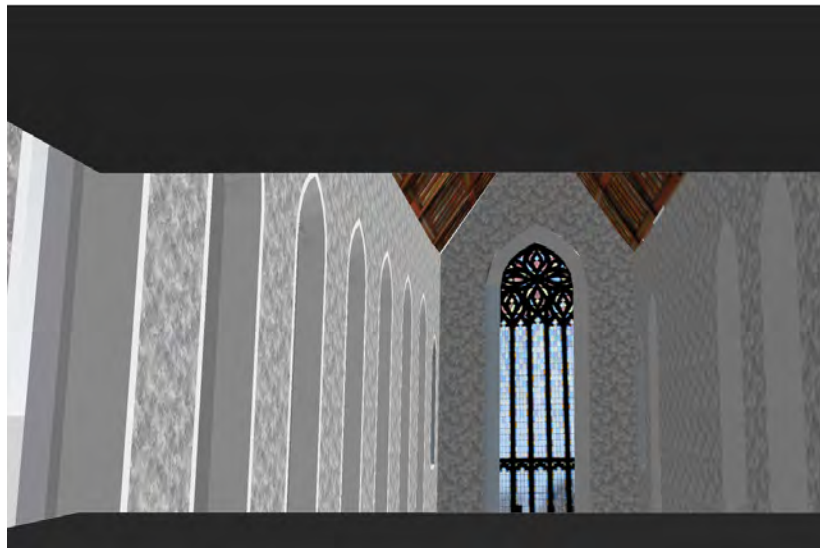


Moment 1:
Located as soon as entering the space, stained glass window mostly visible, ceiling entirely visible

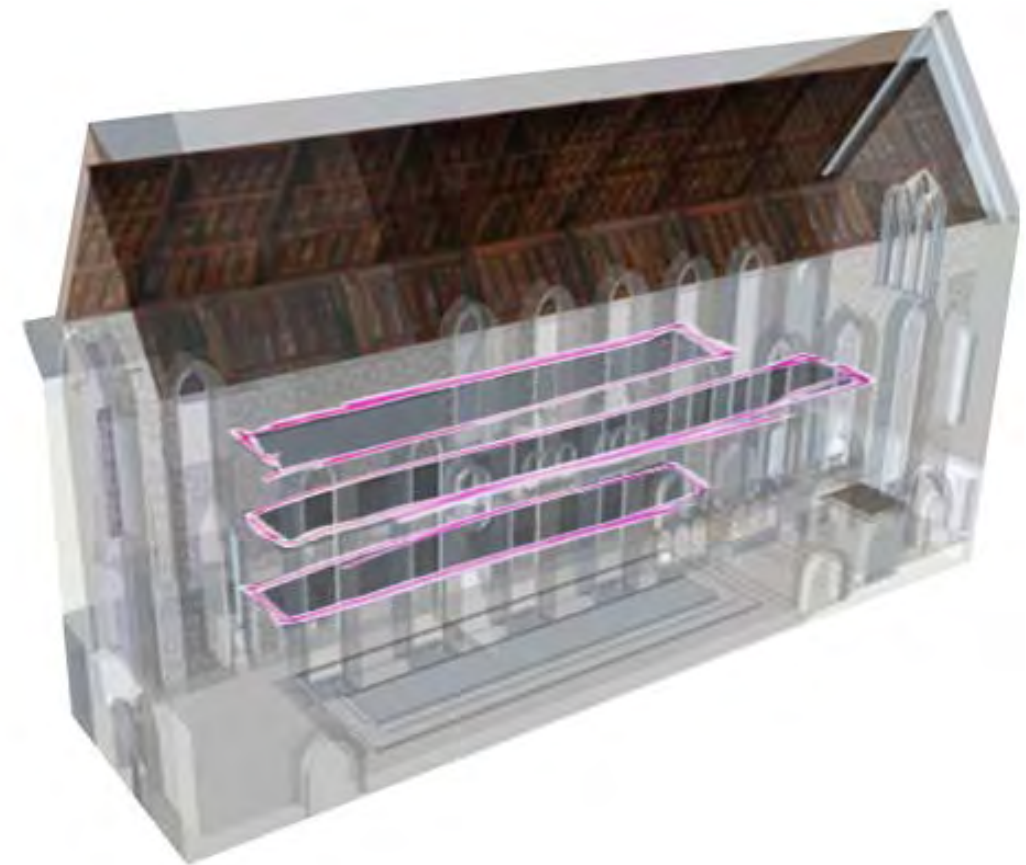
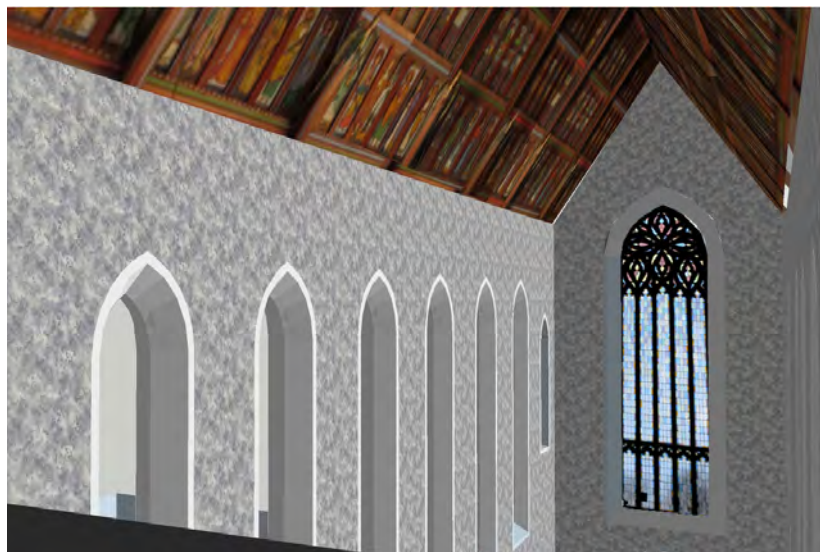
Moment 2:
Located at altar looking south, leaded glass window entirely visible, ceiling partially obstructed



Moment 3:
Located on first level of platform looking south, leaded glass window entirely visible, ceiling partially obstructed



Moment 4:
Located on highest level looking south, leaded glass window and ceiling entirely visible



INTERVENTION D

The final intervention is three stacked floor plates which run along the west wall of the sanctuary. By locating the floor plates on the west side, the plates are no longer directly interacting with the stained glass window or south wall leaded glass window. The main floor plate, which is the middle one, falls along the sill of the organ loft opening. The lower floor plate falls along the west side gallery and pulpit. The upper plate falls approximately at the height of the stained glass window of the north wall. The floor plates are approximately ten feet wide, or roughly a third of the overall width of the sanctuary.

Intervention D expands on the idea of stacking explored in Intervention C. This is the first insertion which recognizes the large blank area located on the west wall, where the deanery meets the sanctuary. All three floor plates utilize this space, ending at the windows near the entry. The middle floor extends all the way to the north wall, capitalizing on the fact that by running along the organ loft openings, it also falls along a break in the leaded glass of the west wall windows. The intent of this design is to create new moments by allowing an accessibility to all three of the elements of visual significance by bringing the visitor much closer than they can be today.

LIGHT STUDY

Current conditions versus conditions of Intervention D



8:30 AM



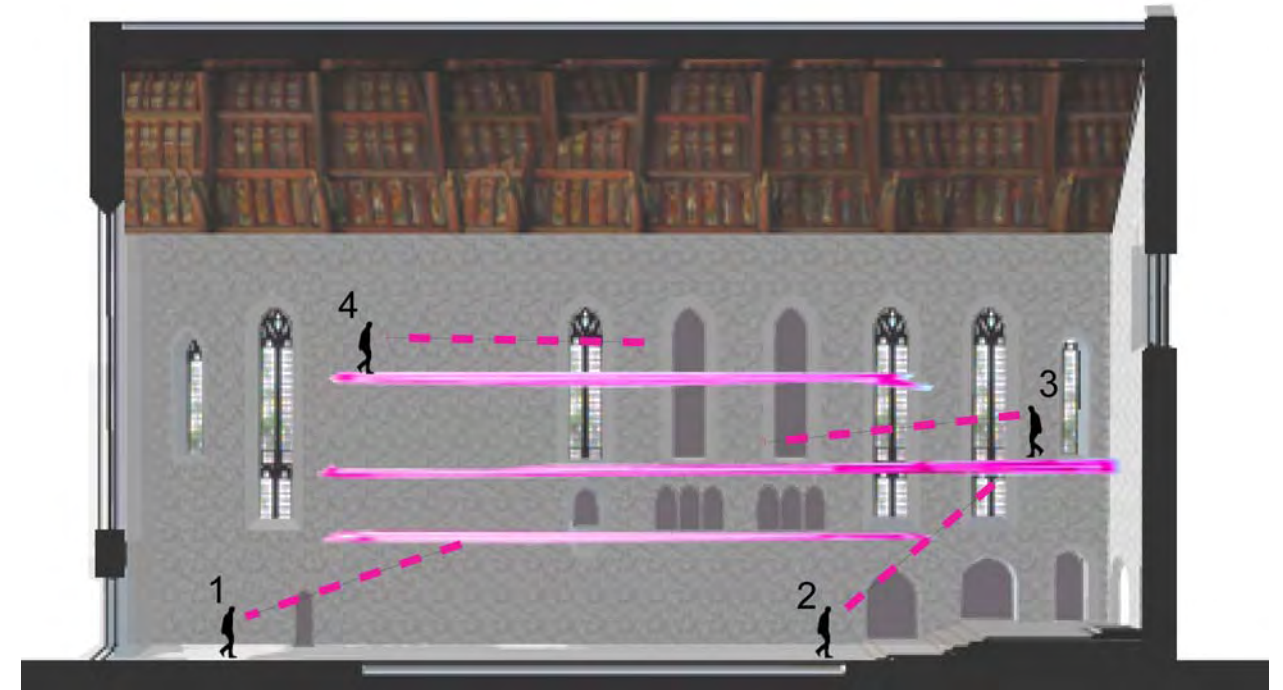
12:00 NOON



3:45 PM



VISIBILITY STUDY



Sightlines from critical moments of Intervention D



Moment 1:
Located as soon as entering the space, stained glass window entirely visible, ceiling partially visible

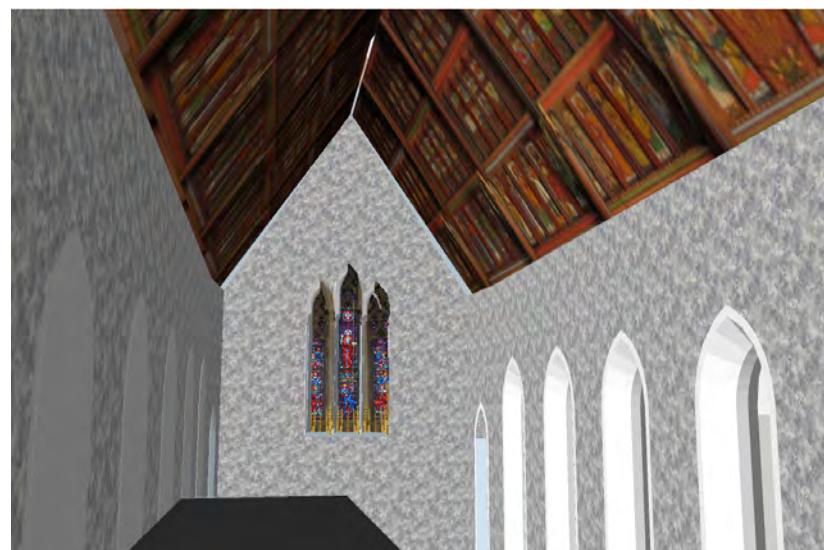
Moment 2:
Located just before altar,
stained glass window and
ceiling entirely visible



Moment 3:
Located on second floor
plate or main level looking
south, leaded glass
window partially visible,
ceiling entirely visible



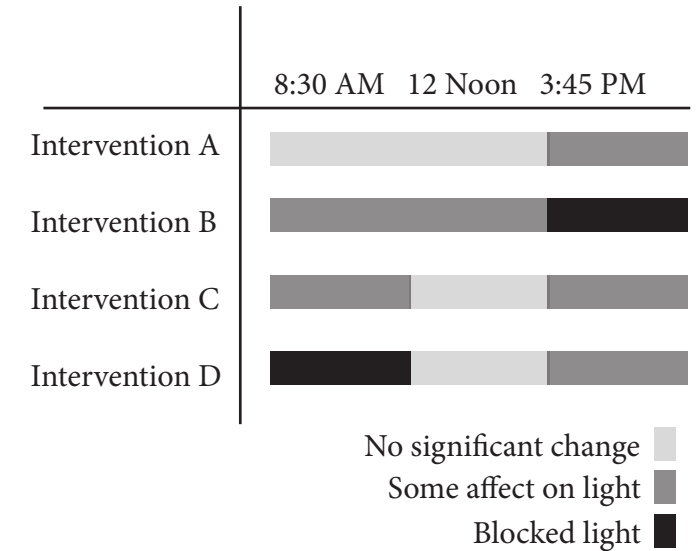
Moment 4:
Located on highest level
looking north, stained
glass window and ceiling
entirely visible



RECOMMENDATIONS FOR SANCTUARY INTERVENTION

RESULTS: LIGHT

After analyzing the differences between current light conditions in the sanctuary and the impact of each intervention, I identified which scenarios had no significant change, some affect on light, or blocked light entirely. Based on these results, Intervention B had the most negative impact, followed by Intervention D. Intervention C had only some affect, but Intervention A had the most desirable outcome. These results are based entirely on the constants set forth before the study, and changing one or more of the constants would cause significant changes in these results. A more thorough examination should be completed for any proposed insertion in the sanctuary.



RESULTS: VISIBILITY

As mentioned in the intent, this study is much more subjective than the light study, causing less clarity in the comparison of interventions since the moments of optimal sightlines do not occur at the same spot in each scheme. To quantify the information gathered, I started by identifying that in each view taken, the ceiling and one window had the possibility to be viewed, which window depending on whether the view was north or south. If one considers the possibility that two elements of visual significance were able to be viewed in the sanctuary's current condition,

any intervention view which blocked one would be impacting the visibility at a higher percentage. The goal would be to have the least possible impact on these sightlines, and therefore have a lower percentage of impact on the visibility.

I had already chosen four views per intervention that displayed a crucial moment in the design. Each view, facing north or south, had the possibility for a view of the ceiling and a view of a window. I assigned each one point. If the view allowed the element to be fully visible, there was

no impact on the sightline, so no points. If partially visible, the design had a partial impact and was assigned .5 points. If the element was no longer visible, the design was having an impact on visibility and was assigned one point.

As mentioned, each view had the possibility of two views. To block the visibility fully in all four views would have caused 8 points out of a possible 8, result in a 100% impact on the visibility. The lower the percentage of impact, the more successful the intervention. According to these results, Intervention D had the lowest impact on the visibility of elements of visual significance.

RECOMMENDATIONS

As seen in the results, these two studies do not propose the same intervention as the most desirable. In the light study, Intervention A had least impact, but in visibility ranked third of the four designs. In the visibility study, Intervention D had the least impact on the visibility of character defining elements, but in the light study also ranked third. The results of these studies are not meant to reflect each other, but rather meant to suggest ways of identifying different types of impact on the space when considering any intervention design.

Prior to construction, I recommend the light study undertaken again, with the proposed design, considering multiple times of the year and at various locations throughout the sanctuary. The examples shown here are meant to guide early designs, as the issues of a design

like Intervention B are apparent. The visibility study should be considered early in the design process as well. These four interventions show some opportunities and some unfortunate results. Moment 2 of Intervention B should show the weakness of a design not considering the character defining elements, while Moment 4 of Intervention D shows the opportunities that can be found in a new design. The visibility study is an aesthetic exercise, and therefore the results are not easily compared, but should be explored in any design. I feel this study was successful, as Intervention D and Intervention C had the least impact, yet also offered the most interesting and pleasing views within the study. I recommend these schemes as guidelines in how to effectively create new space while respecting the integrity of St. Andrew's.

% of Impact on Visibility

Intervention A 31 %

Intervention B 50 %

Intervention C 19 %

Intervention D **13 %**

EXTERIOR ENVELOPE	DESCRIPTION	QUANTITY	UNIT	UNIT COST (15-20% MARKUP)	AMOUNT	
EXTERIOR ENVELOPE	Roof	11,000	SQFT			
	Replacement	11,000	SF	\$30.00	330,000.00	
	Gutters	560	LF	\$60.00	33,600.00	
	Spire reconstruction	1	EA	\$150,000.00	150,000.00	
	Masonry	21,414	SQFT (CHAPEL/DEANERY)			
	Cleaning	21,414	SF	\$2.00	42,828.00	
	Heavy Cleaning	1,071	SF	\$8.00	8,565.60	
	Pointing	10,707	SF	\$17.00	182,019.00	
	Replacement	4,283	SF	\$250.00	1,070,700.00	
	Windows	120	SQFT (stained) 2,600 SQFT (clerestory)			
	Replacement	494	SF	\$275.00	135,850.00	
	Restoration of stained glass windows	120	SF	\$450.00	54,000.00	
	Restoration of clerestory windows	650	SF	\$150.00	97,500.00	
	Restoration of leaded glass windows	5,084	SF	\$100.00	508,400.00	
	Doors					
Exterior single leaf	3	EA	\$1,000.00	3,000.00		
Exterior double leaf	2	EA	\$2,000.00	4,000.00		
	SUBTOTAL				2,620,462.60	
CHAPEL INTERIOR	Walls	17,900	SQFT (CHAPEL/ANCILLARY)			
	Cleaning	7,160	SF	\$2.00	14,320.00	
	Heavy Cleaning	10,740	SF	\$8.00	85,920.00	
	Patching	1,790	SF	\$100.00	179,000.00	
	Re-pointing	14,320	SF	\$17.00	243,440.00	
	Stone Replacement	107	SF	\$250.00	26,850.00	
	Door Restoration					
	Interior high style	4	EA	\$2,000.00	8,000.00	
	Interior simple	18	EA	\$750.00	13,500.00	
	Floor Concrete Infill	1,327	SF	\$5.00	6,635.00	
		SUBTOTAL				577,665.00
	DEANERY / LIBRARY INTERIOR	Demolition				
		Walls	2,461	SF	\$1.50	3,691.50
		Walls	8410	SQFT		
		Option 1: plaster/lath Restoration	3,364	SF	\$175.00	588,700.00
Option 2: drywall		3,364	SF	\$75.00	252,300.00	
Ceiling		5398	SQFT			
Option 1: plaster/lath Restoration		3,779	SF	\$175.00	661,255.00	
Option 2: drywall		3,779	SF	\$75.00	283,395.00	
Floor		5398	SQFT			
Option 1: refinish wood		5,398	SF	\$5.00	26,990.00	
Option 2: replace w/ carpet		1,799	SY	\$25.00	44,983.33	
Option 3: replace w/ linoleum		5,398	SF	\$8.00	43,184.00	
Doors						
Interior Restoration		27	EA	\$750.00	20,250.00	
Interior Replacement		5	EA	\$1,000.00	5,000.00	
Exterior Restoration	2	EA	\$1,000.00	2,000.00		
Exterior Replacement	1	EA	\$1,750.00	1,750.00		
	SUBTOTAL				1,309,636.50	

CHAPEL BASEMENT INTERIOR	DESCRIPTION	QUANTITY	UNIT	UNIT COST (15-20% MARKUP)	AMOUNT	
CHAPEL BASEMENT INTERIOR	Demolition					
	Walls	365	SF	\$1.50	548.10	
	Walls	2,394	SF	\$75.00	179,550.00	
	Drywall	1,833	SF	\$75.00	137,475.00	
	Ceiling (without crypt)	2,798	SF	\$8.00	22,384.00	
	Floor (all)	10	EA	\$1,200.00	12,000.00	
	Replace w/ Linoleum					
	Doors (all)					
	Replacement					
		SUBTOTAL				351,957.10
	SYSTEMS	Mechanical				
		HVAC				
		New systems	14,510	SF	\$35.00	507,850.00
		Exhaust fans, louvers, ventilation	1	LS	\$5,500.00	5,500.00
		Elevator	1	EA	\$400,000.00	400,000.00
Electrical		1	LS	\$180,000.00	180,000.00	
Plumbing						
Toilet		13	EA	\$1,150.00	14,950.00	
Lavatory		12	EA	\$1,050.00	12,600.00	
Hot water heater		1	LS	\$3,500.00	3,500.00	
Sprinklers		14,510	SF	\$5.00	72,550.00	
New utility services		1	LS	\$30,000.00	30,000.00	
		SUBTOTAL				1,196,950.00
MISCELLANEOUS		Scaffolding	17,000	SF	\$5.00	85,000.00
			SUBTOTAL			85,000.00
		SUBTOTAL			6,141,671.20	
	CONTINGENCY			20%	1,228,334.24	
	TOTAL				7,370,005.44	

ANCILLARY/GALLERIES 2,332
 SANCTUARY 3,982
 CHAPEL BASEMENT 2,798
 DEANERY 5,398
TOTAL BUILDING SQFT 14,510

Cost Estimate Analysis

DESCRIPTION	QUANTITY	UNIT	UNIT COST (15-20% MARKUP)	AMOUNT
Reuse A: Arts Center				
BYOB Kitchen				
Fit out/installation cost	250	SF	\$94.00	\$23,500
Equipment	1	LS	\$75,000.00	\$75,000
Café				
Fit out/installation cost	100	SF	\$94.00	\$9,400
Equipment	1	LS	\$40,000.00	\$40,000
	SUBTOTAL			\$147,900
TOTAL W/ ARTS CTR REUSE				\$7,517,905.44
Reuse B: Recreation Center				
Rock climbing wall (incl. 20% markup)	1200	SF	\$108.00	\$129,600
Café				
Fit out/installation cost	100	SF	\$94.00	\$9,400
Equipment	1	LS	\$40,000.00	\$40,000
	SUBTOTAL			\$179,000
TOTAL W/ REC CTR REUSE				\$7,549,005.44
Reuse C: Office				
BYOB Kitchen				
Fit out/installation cost	250	SF	\$94.00	\$23,500
Equipment	1	LS	\$75,000.00	\$75,000
Floor structure	5000	SF	\$100.00	\$500,000
	SUBTOTAL			\$598,500
TOTAL W/ OFFICE REUSE				\$7,968,505.44