Mind the Gap

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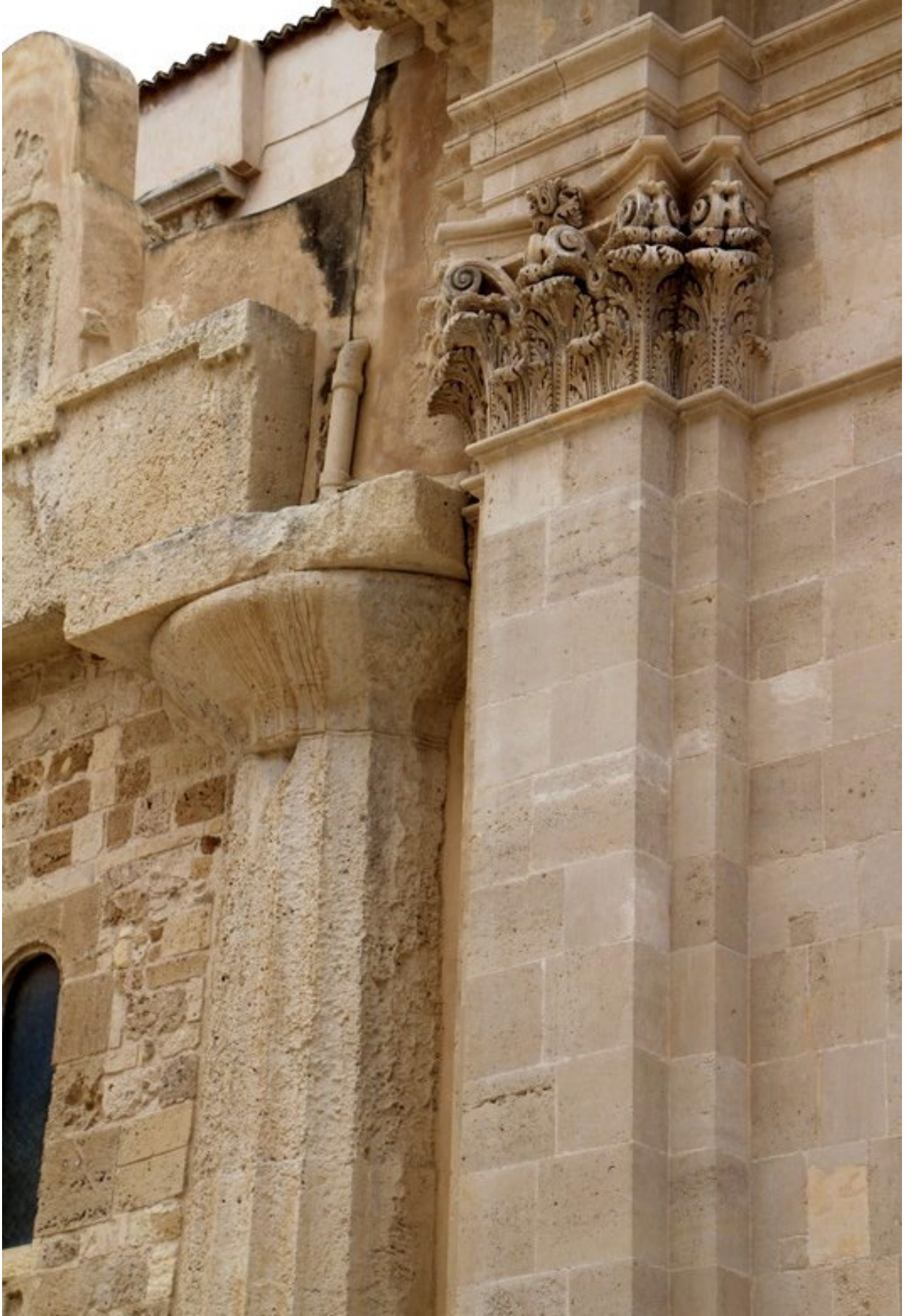
The majority of architectural projects in the United States today work on existing buildings. Architectural reuse, although fundamental to the profession, has seen a new resurgence in recent decades due to economic, sustainability, and cultural interests. However, contemporary architectural pedagogy rarely addresses this ubiquitous condition. Many educational programs rarely, if ever, offer design studios based around the idea of adaptive reuse. Architecture involving existing structures is often undervalued as somehow less provocative than new construction. This is largely due to typical notions of historic preservation as conservation rather than experimental. The devaluation of the majority of projects by the profession and the media creates a cycle of uninteresting historic preservation.

The spatial, material, political, and cultural design considerations that go into the architecture of adaptation far surpass the representational limitations of current architectural conventions. Through the development of a more adaptive toolset, architectural documents can begin to more accurately communicate the design complexities of such situations. As architectural documentation serves as a means of graphic communication, the development of a more articulate language will elevate the discourse, and thereby design, or architectural reuse projects. By refocusing innovative attention on this pervasive yet undervalued sector of the discipline, a new realm of inventive potential can be realized.

Fig. 0.1.
Duomo di Siracusa, Sicily, Italy
This Sicilian cathedral exemplifies architectural adaptation through the ages. Beginning as a Greek Temple of Athena in the 5th century BCE, it was later transformed by the Romans to suit the needs of their Christian faith. The church underwent yet another transformation in the Baroque period of the 17th century when an ornate facade and interior embellishments were added.



1

Introduction

We are living in an incredibly exciting and slightly absurd moment, namely that preservation is overtaking us[1].

The premise of the following research is based in the perspective that current preservation practice is both meaningful and "slightly absurd." To paraphrase Rem Koolhaas, that is to say the preservation movement has become so pervasive that it is chocking our future, both in terms of physical and innovative restrictions[1].

Historic architecture, including examples deemed "significant" as well as those which are simply "existing," carry many layers of meaning. When considering these structures there are countless issues to consider such as use value, aesthetics, architectural significance, sustainability. Many projects become contentious due to cultural values and emotional significance. There is a necessary balance to preservation, adaptation, and demolition which must consider the needs of various parties, but our current system has become unbalanced.

Architectural adaptation has always been a reality of the field. As long as a structure still retained use value, it was generally adapted to meet changing cultural demands. Since the development of historic preservation as a formal discipline in the 20th century[2], the period of architectural significance has gotten progressively more recent. Today, the National Park Service reviews buildings that are a minimum of fifty years old. Even this short time frame is being questioned as proponents of preserving the "Recent Past" argue for a shorter period of significance so that such buildings will not be demolished before their significance can be evaluated[2].

1. Koolhaas, Rem, and Jorge Otero-Pailos. *Preservation is Overtaking Us*. Print. New York: GSAPP. 2014.

2. Payne, David. Charleston Contradictions: A Case Study of Historic Preservation Theories and Policies (Doctoral dissertation). Clemson South, Carolina: Clemson University. 2013.

The historic preservation movement has created an environment which does not allow for the natural evolution of buildings as has been the practice throughout human history. By overly emphasizing the importance of historic preservation, we have created a system that cannot responded to changing cultural demands. This system tends to define buildings by a specific time period, which all restoration efforts must reinforce, rather than allowing for progression.

There are countless examples of historic architecture that are not clearly defined by a single time period. The Castel Nuovo, of Naples Italy (Fig. 1.2), has undergone various expansions and adaptations over its centuries. Initially erected in 1276, the castle was largely rebuilt in the 15th century but a portion of the medieval structure was reused[4]. The renaissance architect, Giuliano da Sangallo, is said to have radically rethought the preexisting medieval rooms[3]. The castle, now a prominent historic landmark of Naples, is largely associated with the Renaissance, though no preservationist would suggest removing the elements which clearly evoke a different architectural period. The dramatic juxtaposition of styles in Castel Nuovo is seen fondly as an interesting piece of historic architecture, yet this type evolution would likely never be allowed to be built today, least of all in the United States where preserving historic purity is heavily emphasized.

The Hearst Tower (Fig. 1.1) is a very rare example of a recent, dramatic addition to a historic building in the United States. Despite strong opposition from preservationists, the 2006 Foster + Partners addition was likely approved because

Fig. 1.1.
Hearst Tower, New York City
This 2006 Foster + Partners addition to the 1928 Hearth Building is frequently cited as a drastic example of new exterior additions to historic buildings.

3. de Divitis, Bianca. "Giuliano da Sangallo in the Kingdom of Naples: Architecture and Cultural Exchange." *Journal of the Society of Architectural Historians* v. 74. 2015.

the historic Hearst Building had originally called for a tower component. The Great Depression caused the construction to stop at the six story base. 70 years later Foster + Partners designed a contemporary steel and glass tower to complete the original scope of the project[4]. The Hearst Tower is regularly cited as disastrous addition by preservationists. However, in concept there is really no difference between Castel Nuovo and the Hearst Tower. Both structures show dramatically distinct elements from different time periods with no effort to conceal this fact. Yet, in practice the two are perceived completely differently because of their age. Castel Nuovo has the advantage of many centuries to soften its distinct styles and make is perceived as a unified work of architecture.

Fig. 1.2.
Castel Nuovo, Naples, Italy
Originally built during the Middle Ages, Castel Nuovo has undergone various phases of construction until its last renovation in 1823. The triumphal arch seen above was added in 1470 in the Italian Renaissance style.

4. "Hearst Tower." Foster + Partners. fosterandpartners.com. Accessed March 14, 2016.

Fig. 1.3.
Crystal Houses, Amsterdam, Netherlands
MVRDV's 2016 project, *Crystal Houses*, combines Dutch heritage with international architecture. By using custom glass brick to recreate a historic facade, the storefront is able to increase transparency while preserving traditional architecture forms.

5. MVRDV. "Crystal Houses." MVRDV.nl. Accessed May 31, 2016.

6. "MVRDV replaces Chanel store's traditional facade with glass bricks that are "stronger than concrete." Dezeen Magazine. 20 April 2016. Dezeen.com. Accessed May 31, 2016.

MVRDV's 2016 project, *Crystal Houses* in Amsterdam seeks to unify traditional architecture with contemporary alterations to suit new programmatic needs[5]. The project is located on a commercial street that was previously residential. MVRDV worked with a Venetian glass manufacturer to develop a pioneering structural glass brick. MVRDV believes that the resulting "technology offers a solution to the loss of local character in city centres around the world[6]." Although in this case the existing building was demolished, the central concept could be employed in situations were the existing structure remains.

Unlike previous examples, this project deals with preservation conceptually rather than physically. The existing residential structure was completely removed, but its replication in a modern material questions the purpose of preservation. Although *Crystal Houses* does not protect the existing building, it commemorates traditional vernacular architecutre. In this way MVRDV was able to contribute to the preservation of a significant streetscape without compromising the contempoary needs of retail architecture. Thus architectural preservation can succesfully occur without the literal conservation of historic architecture.

The Gare de Strasbourg, and other "shell" historic preservation projects, take an entirely different approach to preservation. Unlike the addition to the Hearst Tower or the dramatic replication of Crystal Houses, these preservation projects create modern enclosures around the existing architecture. The contemporary shells are completely distinct from the architecture they preserve.

By creating an independent canopy, these projects provide the most "pure" form of historic architectural preservation. The historic architecture can be carefully conserved without any direct additions since programatic expansion is contained within the glass canopy. However, shell projects are typically the most destructive to the historic streetscape. The glass envelopes create stinkingly modern facades that typically do not fit in with the surrounding context. Jean-Marie Duthilleul's Gare de Strasbourg glass dome almost completely conceals the historic station from the exterior[7].

In contrast Witherford Watson Mann Architects' 2013 renovation of Astley Castle directly alters the existing structure in order to preserve it. Astley Castle was largely in ruins when the Landmark Trust decided to renovate the site. The new masonry construction creates new enclosures and reinforces the crumbling existing structure. New materials were used without concealment thus, "At the dining table, you look out from twelfth and twenty-first century construction to fifteenth and seventeenth century walls - the dialogue across the centuries frames conversations between friends[8]."

Fig. 1.4.
Gare de Strasbourg, Strasbourg, France
Jean-Marie Duthilleul designed a glass dome in 2006 to house an expansion and reorganization of the Strasbourg Central Train Station.

7. "Central Train Station Strasbourg." architecturereviewed.com. Accessed May 31, 2016.

Fig. 1.5.
Astley Castle, Warwickshire, England
Witherford Watson Mann Architects reworked and rebuilt the historic Astley Castle in 2012 to create a new holiday home. The project one the 2013 RIBA Stirling Prize.

8. "Astley Castle." WWM Architects. wwmarchitects.co.uk. Accessed May 31, 2016.

The terminology used to describe a concept directly contributes to, and reflects, the motivations and understanding of the subject at hand. In the realm of architecture that involves existing structures, language is a vital part aspect of the conversation. Yet, the available terminology contributes to pre-mature definitions of work. The conventional language used for such scenarios have very specific connotations, which do not allow for an all-encompassing definition. Using established terms which may overly define a work can set back conversation as they introduce a multitude of preconceived notions.

The accepted terms available in English all have specific definitions and implications that do not apply to all work that uses existing structures. *Historic preservation* maintains architecture as informed by a specific chronological moment. *Rehabilitation* implies a functional or structural upgrade, and not necessarily design progression. *Re-model* references more minor alterations rather than overall change. *Addition* results in a new architectural element attached to an existing work. *Adaptive re-use* is perhaps the most flexible English term available, but it implies a programmatic change that does not necessarily take place. As a system of classification, it could be said that architecture that is not historic preservation nor adaptive re-use could then be considered a renovation, but this is not necessarily the case. Furthermore, the divisiveness of these definitions demonstrates the need for an overarching term.

In my research I have come across various texts on the subject in different languages. The terminology in these languages seems to reflect a more comprehensive view of the field. For example, in Catalan, such projects are referred to as *l'arquitectura sequencial*, meaning "sequential architecture." Defining architecture in this way implies a layering which in the end results in a new architecture that unifies old and new. In Spanish, the historic significance of buildings is less dominant in terminology. With these terms in mind, it is possible to consider new language that is able to encompass the various types of work that can occur when using an existing structure. This new term would thus not immediately categorize a project, but rather allow a period of ambiguity before the direction is more specifically defined.

Fig. 1.6.
Ethics of Dust, Jorge Otero-Pailos, Venice Biennale 2009
Jorge Otero-Pailos's Biennale iteration of his *Ethics of Dust* exemplifies the type of work not easily defined by current terminology. The work is a commentary on preservation but does not fit typical preservation terms.

2

Representation

The best way to understand the nature of a convention is to discover for what reason and under what circumstances it originated and how it was modified in the course of time[9].

In order to explore representational strategies for architecture involving existing buildings, it was necessary to first develop an understanding of the history of architectural representation. Architectural drawing is often perceived as dictated by a static set of conventions, unchanged by time or circumstance. Yet these representational norms are not timeless, but instead have been influenced and adapted over time.

The architectural profession began as the "master craftsman" of a building project. The master craftsman was the most knowledgeable member of the construction crew and took the main leadership and planning role. As buildings increased in size and complexity, and specialized trades developed within construction, the architect became the designer and coordinator. During this period architectural drawings were rarely used. Since the designer was always on site, far less documents were needed to communicate ideas. Evidence suggests that full scale building plans were typically etched on the ground[10]. Early representational methods also included one-to-one models of details and some drawings of complex geometric details (Fig. 2.3/4).

Throughout history, architectural drawing conventions have been dictated by technology. The architect's relationship to construction has in turn evolved because of these technological advancements. Overtime the distance between construction site and architect has steadily increased. And with it, in many cases, the architect's practical understanding of construction work.

9. Ackerman, James S. *Origins, Imitation, Conventions: Representation in the Visual Arts*. Cambridge, MA: MIT Press, 2002.

10. Goffi, Federica. *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican*. Burlington, Vermont: Ashgate Publishing Limited, 2013.

Fig. 2.1.
Roman de Girart de Roussillon, 1450s, Mons or Brussels.
Flemish painting depicts the construction of twelve churches to honor the Apostles. The architect, or master craftsman, of the project is the figure in the left foreground.

Fig. 2.2.
Photograph of Bertram Goodhue's architectural office circa 1930.

Fig. 2.3.
Photograph of Foster + Partners London office.

In many ways, this distancing of the architect is both a result of and made possible by technological advancements. While the master craftsmen had to be at the construction site continuously, modern architects are increasingly distant from their construction sites. The development of representation gave architects a non-verbal method of communication which removed them from the daily construction environment (Fig. 2.1). Architectural drawing became a practical reality in Europe as paper became increasingly available and affordable after the 14th century[11].

Architectural drafting tools continued to improve, causing drawings to become increasingly detailed. As architectural representation became more refined, architects began to rely more heavily on drawings to communicate their ideas (Fig. 2.2). The physical difficulties of transporting paper drawings and communicating with consturction workers limited, to some degree, an architects reach until the 20th century. Computers have further evolved architectural representation and made transmitting physical drawings unnecessary, thus increasing the practical range of an architect.

11. "History of Paper." Paper Online. paperonline.org. Accessed June 6, 2016.

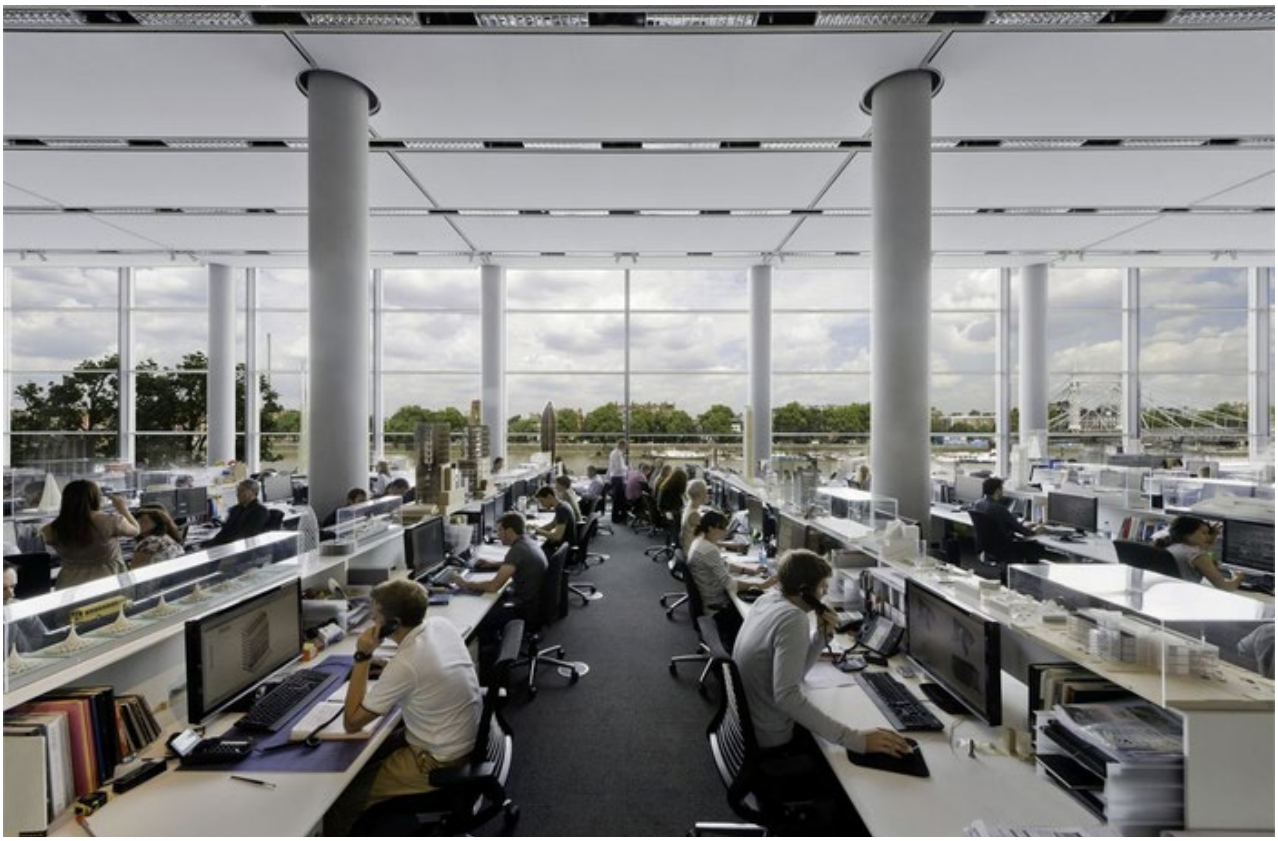


Fig. 2.4.

Architect's Drawing of the Ground Plan of the Palace of Nur Adad in Larsa

Dates: 1865-1850 BCE

Place of origin: Larsa, Babylonia

Description: Clay tablet, 12.0×8.8×2.5 cm, drawing of central courtyard surrounded by rooms and halls, matches proportions of the Palace of Nur Adad in Larsa

For thousands of years most buildings were planned on site by outlining a general plan at full-scale on the ground[12]. No translation between design and construction was needed since everything was done on site. At this time the role of architect had not been established, craftsmen were responsible for design and construction. In time, a 'master craftsmen' would emerge as a leader, and eventual designer. For elaborate buildings full-scale models were used to describe details and ornamentation to ensure consistency[6].

Because of these methods, ancient examples of architectural representation are highly rare. The Palace of Nur Adad clay tablet is one surviving example which demonstrates the methods of early space planning.

12. Forêt, Philippe, and Andreas Kaplony. *The Journey of Maps and Images on the Silk Road*. Leiden: Brill, 2008.

Fig. 2.5.

Ancient Egyptian Townhouse

Dates: Egyptian Third Intermediate (1070-712 BCE)

Place of origin: Egypt

Description: Limestone model of a house, 21×11×9.5 cm, depicts three stories with windows and doors, shows detailed exterior brickwork.

This early model of an Egyptian townhouse shows the possible communicative uses that models played in early construction. The model depicts facade and aperture elements in great detail. The inclusion of specific masonry types and coursing shows that this model was likely used to communicate the intent of the owner or builder to masons[13].

Although very few similar models exist, it appears that they may have been the most common early method of scaled architectural representation. They would have served as a construction reference as well as planning tool.

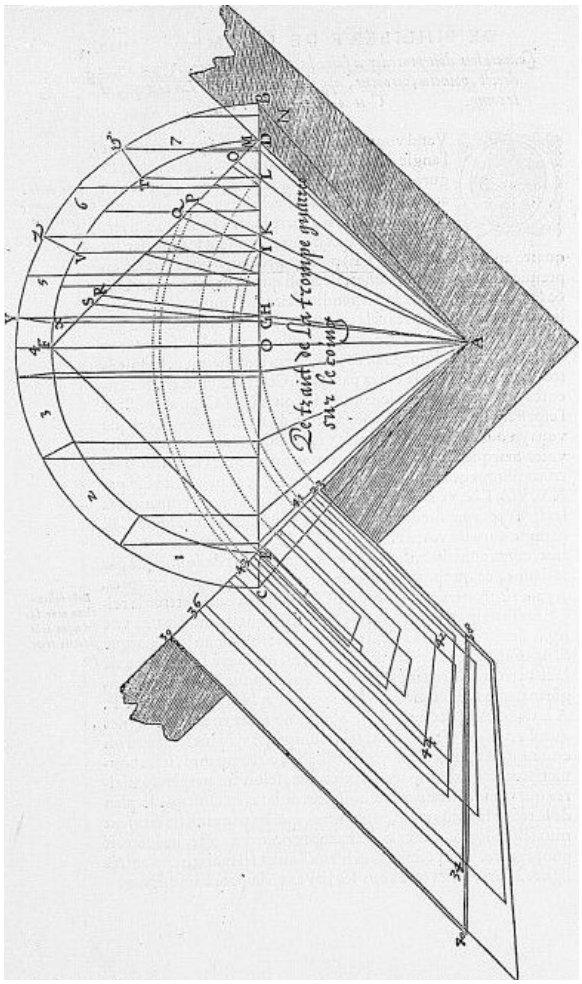
13. "EA2462." British Museum Collection Database. britishmuseum.org/collection. Accessed March 16, 2016.

Fig. 2.6.

Le Premier Tome, Philibert Delorme

Dates: 1510-1570 CE

Description: Early treatise on architectural principles.



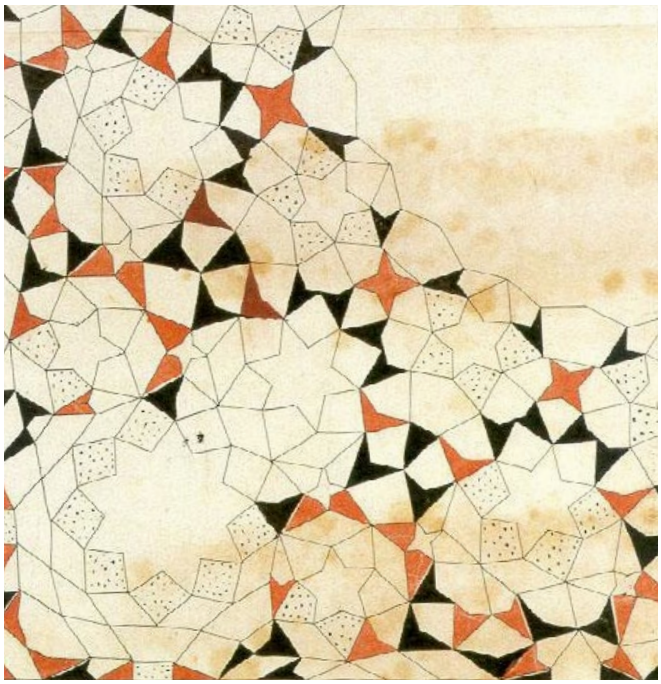


Fig. 2.4.

Topkapi Scroll

Dates: Late 15th or early 16h century CE

Place of origin: Iran

Description: 30m scroll of 114 architectural drawings used to record builder practices.

In addition to on-site full-scale models, ornamentation pattern books developed to communicate complex three dimensional designs. This was an effective method of creating unified architectural styles across large empires. The Topkapi Scroll was created in western Iran and is thought to have been a tool of the Timurid builders[6]. Similarly, Phillibert Delrome's *Le Premier Tome* sought to codify and communicate three dimensional stone cutting practices[14].

Both of these examples are seen as a record, rather than invention, of well established practices of their time[8]. Therefore the need for detailed representations of ornamentation drove the progression of architectural documentation as a whole.

14. Evans, Robin. The Projective Cast: Architecture and Its Three Geometries. Cambridge, MA: MIT Press, 1995.

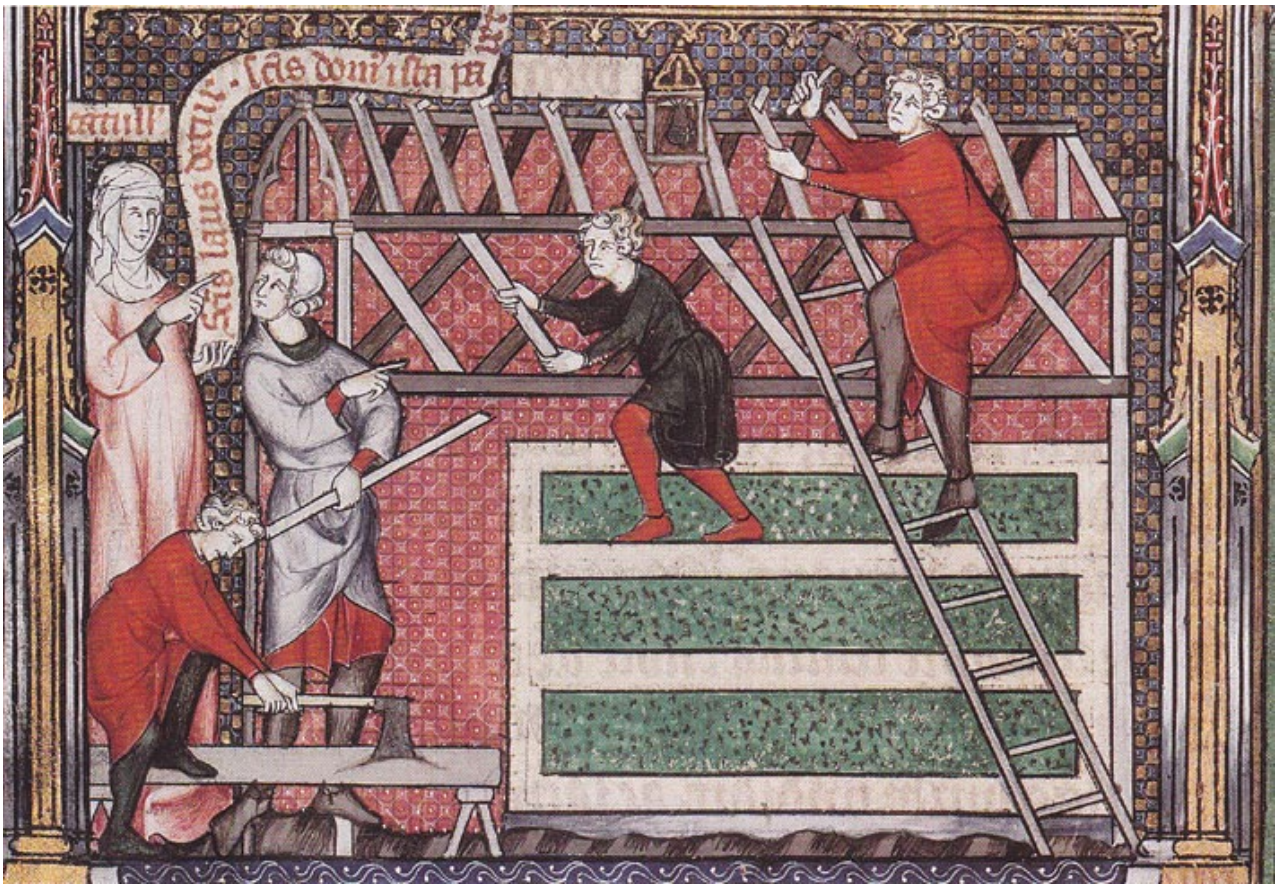
Fig. 2.7.

Illustration from *Life of Saint Denis*

Dates: 1317

Place of origin: Paris, France

Description: Illuminated manuscript depicting the life of Saint Denis.



The most common record of "master craftsmen" as the original architects comes from illustrations and paintings of the construction process of important monuments. This illustration comes from a manuscript depicting the life of Saint Denis, the first Bishop of Paris. This scene shows the Basilica of St Denis under construction. The second figure from the left holds a ruler, signifying him as the master craftsman[15].

The role of the architect is clearly beginning to take shape as the master craftsman here is depicted as a leader and intermediary between client and trades. The figure on the far left is described as the supervisor of the project[9] and is likely a member of the church designated to follow the construction progress. The master craftsmen can be seen receiving instruction with the intention of overseeing the work of the three carpenters.

15. "Les métiers du bois.." Historie des Arts et de Métiers. micale-vauvenargues.net. Accessed May 31, 2016.

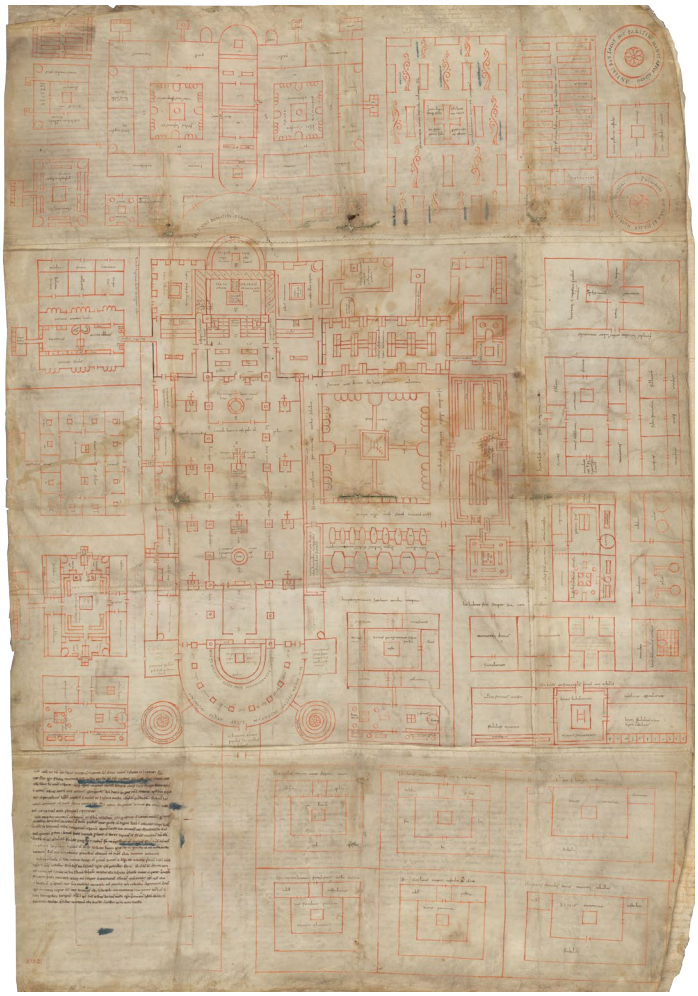
Fig. 2.8.

The Plan of St. Gall

Dates: 816-837 CE

Place of origin: St. Gall, Switzerland

Description: Five pieces of sewn parchment, 112×77.5 cm, drawings and annotations for over forty buildings that comprise the visualization of the ideal monastic complex.



The Plan of St. Gall is one of the earliest surviving architectural ink drawings. The plan is seen by scholars as a "generic solution for the ideal monastery" rather than a site-specific plan[16]. The plan suggests a burgeoning desire to communicate spacial ideas through drawing. The speculative nature of the work may reflect a representational need not yet required for construction. Throughout much of history, buildings were designed on-site without drawings, thus it would seem logical that a design without site would require an alternate mode of communication.

16. "The Plan of St. Gall" Carolingian Culture at Reichenau & St. Gall. stgallplan.org. Accessed March 16, 2016.

Fig. 2.9.

Façade of Strasbourg Cathedral

Dates: 1260

Place of origin: Strasbourg, France

Description: Partial exterior elevation of Strasbourg Cathedral. Ink on parchment. 33 7/8 × 23 1/4 in.

During the rise of Gothic architecture in Europe, architectural drawing progressed with the complexity of major projects. A few surviving examples from the period suggest that drawings began to serve as a more important tool of design, at least on the most complicated projects[17]. The 1260 drawing of the Strasbourg Cathedral demonstrates the development of elevation representation. The existence of such a drawing suggests that architectural drawing likely played a roll in the development of Medieval construction[10].

17. "Façade of Strasbourg Cathedral." *Pen and Parchment: Drawing in the Middle Ages*. Metropolitan Museum of Art. blog.metmuseum.org. Accessed March 25, 2016.

Fig. 2.10.

The School of Athens

Artist: Raphael

Dates: 1511

Place of origin: Vatican Museums and Galleries, Vatican City, Italy

Description: Fresco in the Stanza della Segnaura of the Vatican. Depicts Greek philosophers.

The main shift in architectural drawing beyond the advent of triadic system (plan, elevation, section) was the development of perspective[18]. Beginning as tool for painters, linear perspective developed overtime to limit foreshortening and use scalable dimensions. The Italian Renaissance painter Raphael took the final steps in establishing perspectival accuracy and utilizing the technique as a tool for architects[10]. Raphael's *The School of Athens* shows the technical advances of linear perspective during the Renaissance.

Linear perspective was the first method, besides models, of combining the information of two dimensional triadic drawings. Perspectives, while still two dimensional, are able to represent depth thus allowing for greater possibilities for architectural visualization.

18. Evans, Robin. The Projective Cast: Architecture and Its Three Geometries. Cambridge, MA: MIT Press, 1995.

Fig. 2.11.

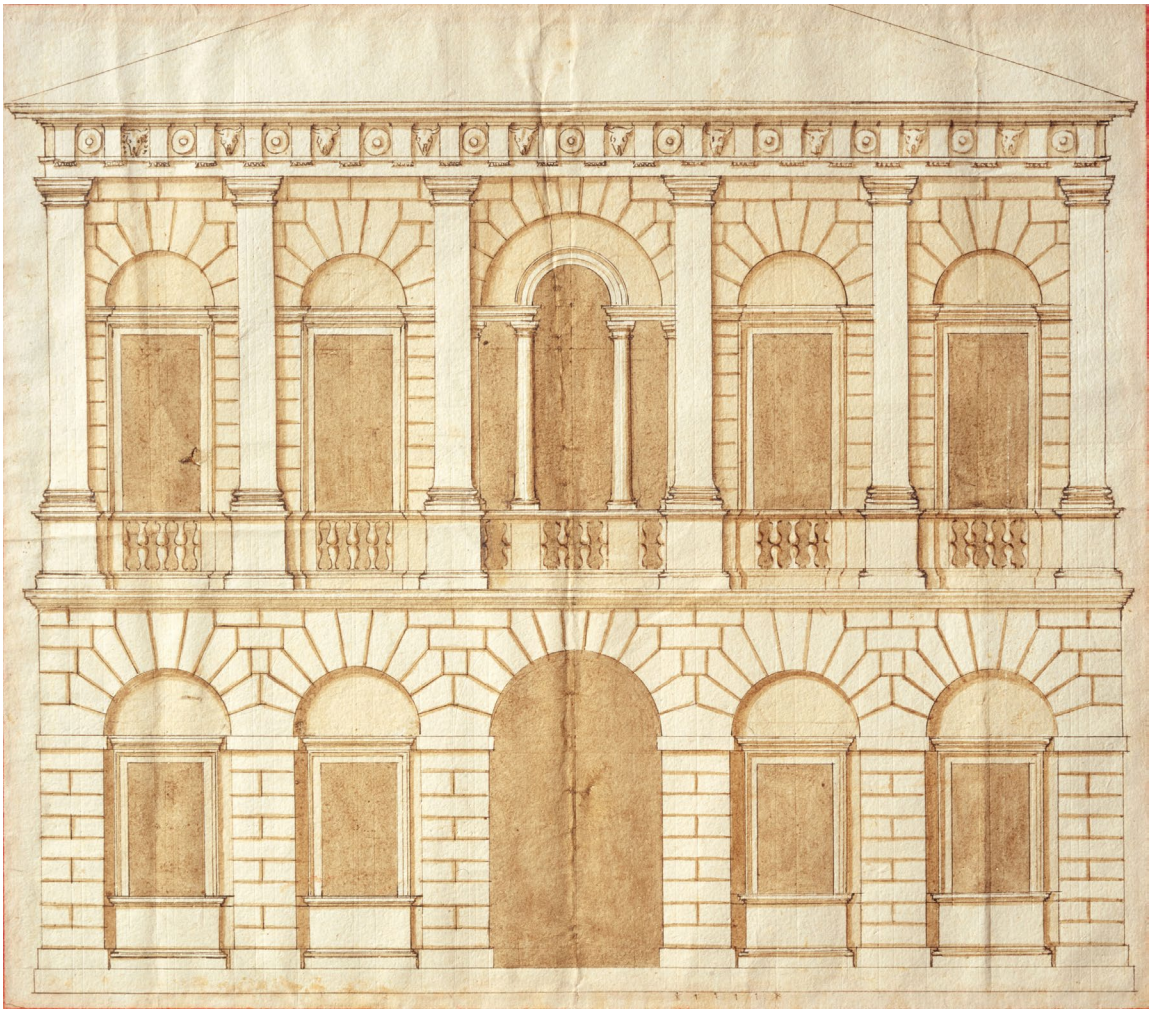
Palace Design

Architect: Andrea Palladio

Dates: 1540s

Place of origin: Italy

Description: Ink on paper.



Andrea Palladio reestablished many Greek architectural ideas, such as those of Vitruvius, by publishing illustrated books. Through his publications he was able to transmit his ideas to a wider audience[19]. His stylistic and organizational theories spread across Europe and eventually to North America. His publications also helped spread the beginnings of architectural drawing conventions.

19. "Drawing out Meaning." Architecture.com. Accessed April 13, 2016.

Fig. 2.12.

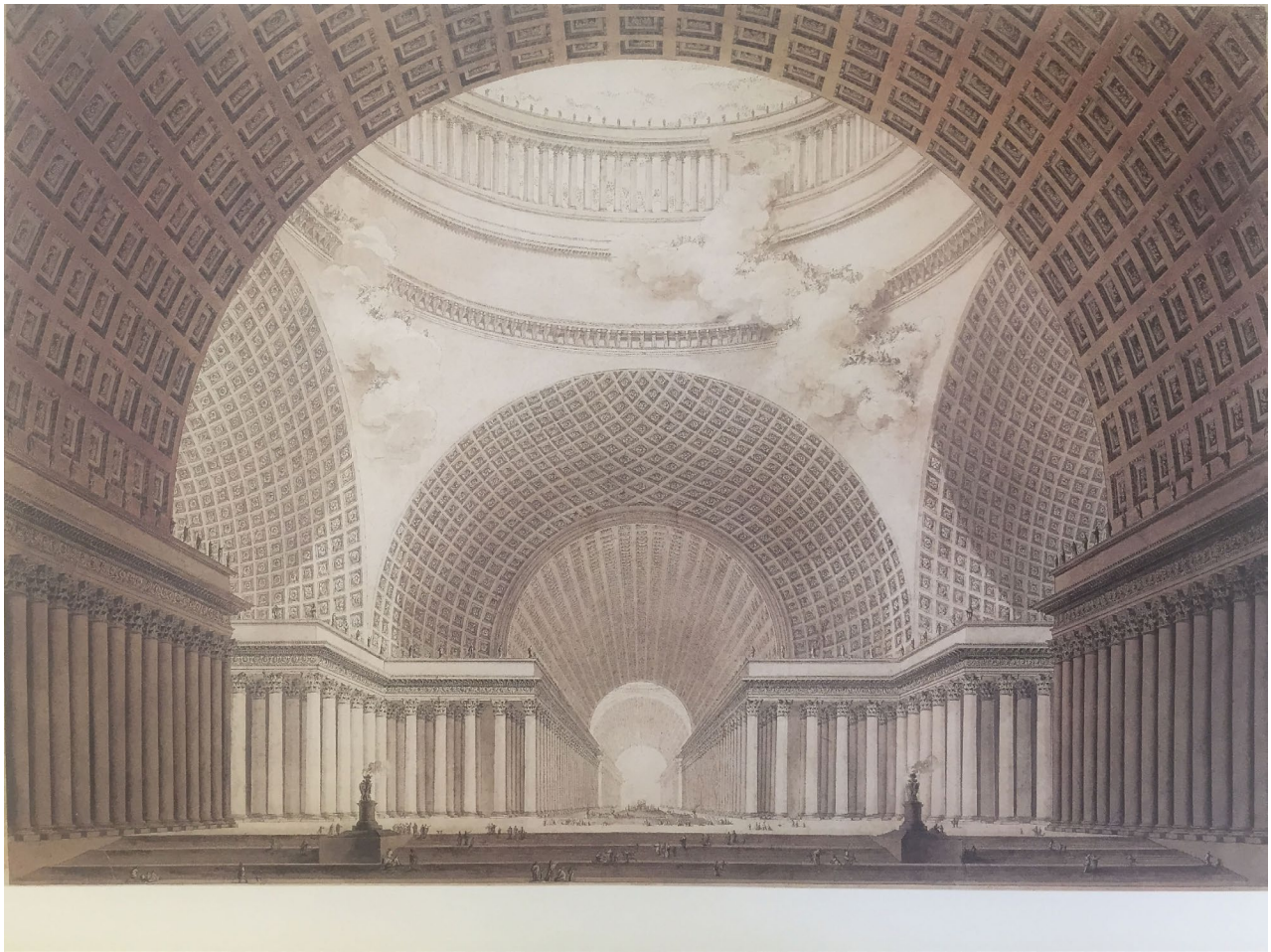
Tempio Della Morte

Architect: Étienne-Louis Boullée

Dates: 1790

Place of origin: France

Description: Ink on paper.



Étienne-Louis Boullée, a French 18th century architect, was largely an academic with few built projects[19]. He was highly influential to the later Beaux Arts movement. His work, and that of some of his contemporaries, shows "the increasing sophistication of architects and their ability to communicate ideas of scale, perspective and detail[20]." This advancement of communication was directly related to the development of architectural representation. It is during this era that formal architectural education was established and conventions of both representation and design were developed.

19. "Drawing out Meaning." Architecture.com. Accessed April 13, 2016.

20. "AD Classics: Cenotaph for Newton / Étienne-Louis Boullée." Arch Daily. archdaily.com. Accessed April 13, 2016.

Fig. 2.13.

Church of St. Matthias

Dates: 1852

Architect: William Butterfield

Project Location: London, England

Description: Pen and black ink, graphite, coloured wash on wove paper.

This drawing for the Church of St. Matthais by William Butterfield reflects the increasingly defined sensibility of the architectural profession during the Victorian Era. After the Beaux Arts period, architectural education became more widespread thus increasing the ubiquity of formally trained architects[19]. This had the effect of unifying the profession and distingushing the architect from the "master craftman," even on small scale projects. The drawings also illustrate the rise of regulation and coordination as aspects of the profession. Contract drawings such as these were legal documents and, "were usually accompanied by specifications that established the materials, processes, and order of construction[21]."

19. "Drawing out Meaning." Architecture.com. Accessed April 13, 2016.

21. "Contract Drawings of the Nineteenth Century." Canadian Centre for Architects. cca.qc.ca. Accessed April 13, 2016.

Fig. 2.14.

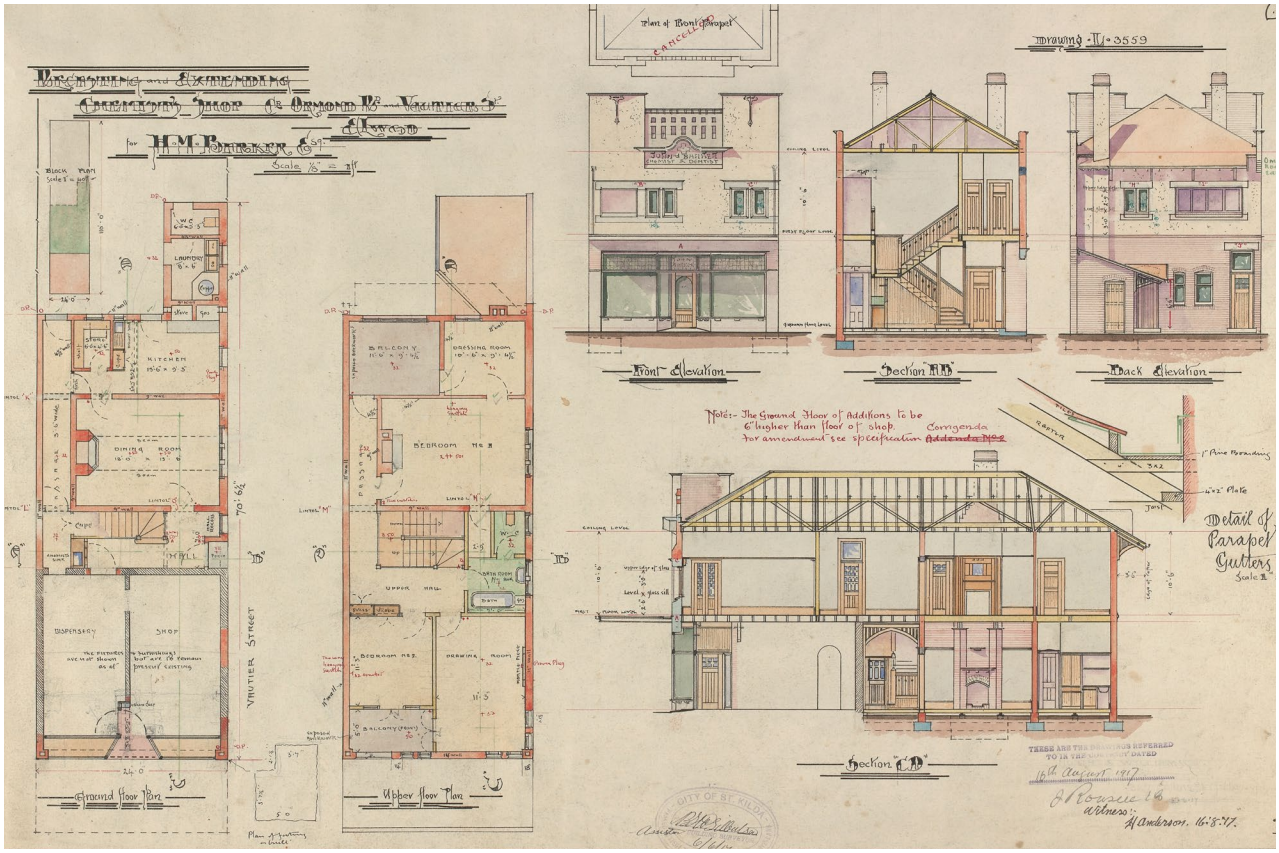
Recasting and extending chemist shop

Architect: Louis Reginald Williams

Dates: 1917

Project Location: Elwood, Victoria, Australia

Description: Ink watercolor on cartridge paper



Slightly after the Victorian era, this drawing by the Australian architect Louis Reginald Williams shows the proliferations of architectural conventions that occurred over the 19th century[22]. This was largely influenced by the industrial revolution and technological advances. The increase in mass-produced materials made precise architectural drawings possible[19]. The drawing also show the continuation of the red/black convention that had existed since 16th century Europe. This representational convention rendered existing elements in red and new construction in black. The use of this convention clearly codifies the changes occurring in this remodel. The presence of the red/black convention in early 20th century Australian architectural representation demonstrates that it was once part of the standard architectural graphics.

19. "Drawing out Meaning." Architecture.com. Accessed April 13, 2016.

22. Williams, Louis Reginald, Recasting and extending chemist shop, 1917. Ink watercolor on cartridge paper. State Library Victoria, Melbourne. slv.vic.gov.au. Accessed April 13, 2016.

Fig. 2.15.

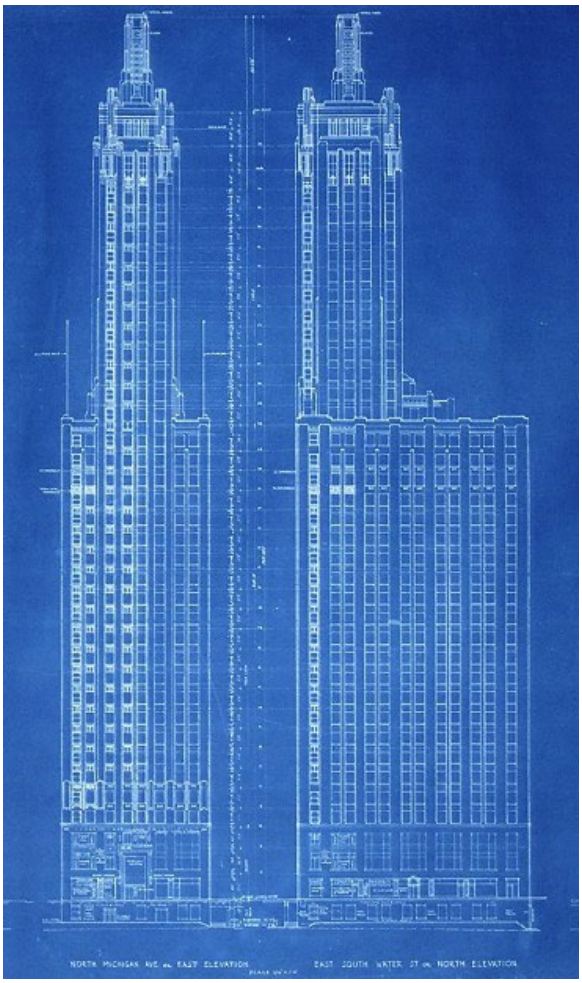
Carbide and Carbon Building Elevations

Dates: 1928

Architect: D.H. Burham

Project Location: Chicago, Illinois

Description: Cyanotype, 35 1/2"x42"



The development of blueprint technology in 1842 was integral to the history of architecture in the early 20th century. Cyanotype prints use a photosensitive chemical to transfer line drawings from translucent paper to bond paper[23]. This process finally allowed architects an economical method of duplication. In turn this convenience pushed architectural drawings farther into the construction process, thus making building bigger and faster possible.

23. "Blueprints, Then and Now." New-York Historical Society. blog.nyhistory.org. Accessed April 20, 2016.

Fig. 2.16.

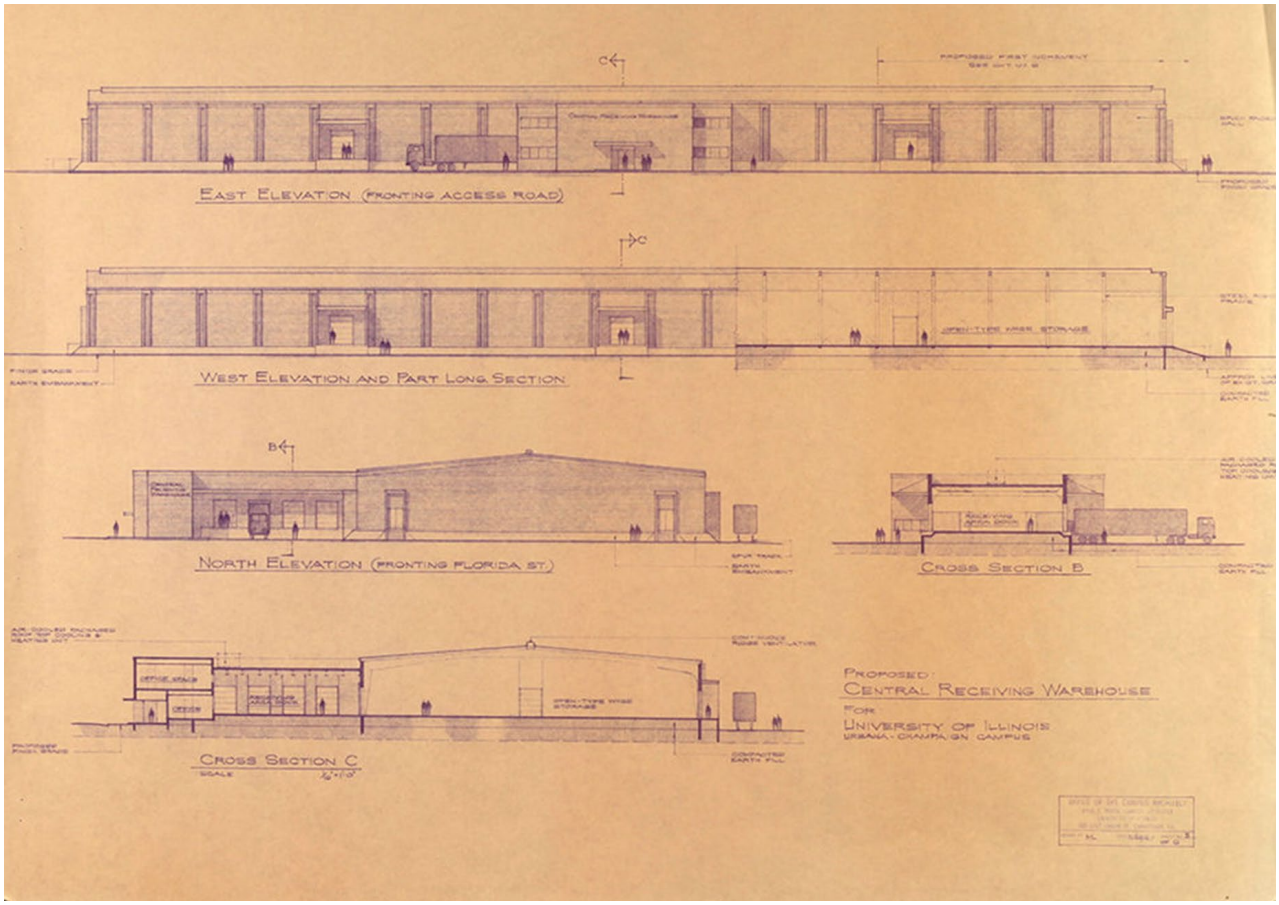
Central Receiving Warehouse

Architect: University of Illinois

Dates: Unlegible date, likely 1940s.

Project Location: Urbana-Champaign Campus, Illinois.

Description: Diazo print.



Between blueprints and the modern plotter there were various iterations of duplication technology such as diazo prints[24]. Diazo prints were the most common large-scale reproduction method in the middle twentieth century due to its dry printing process[25]. The chemical process was able to reproduce a wider variety of lines including pencil. Despite their ubiquity, the residual chemicals make these prints very fragile overtime.

24. "Blueprint." newworldencyclopedia.org. Accessed April 20, 2016.

25. "Diazo Print." *Architectural Drawing Reproduction*. Preservation Self-Assessment Program. psap.library.illinois.edu. Accessed May 31, 2016.

Fig. 2.17.

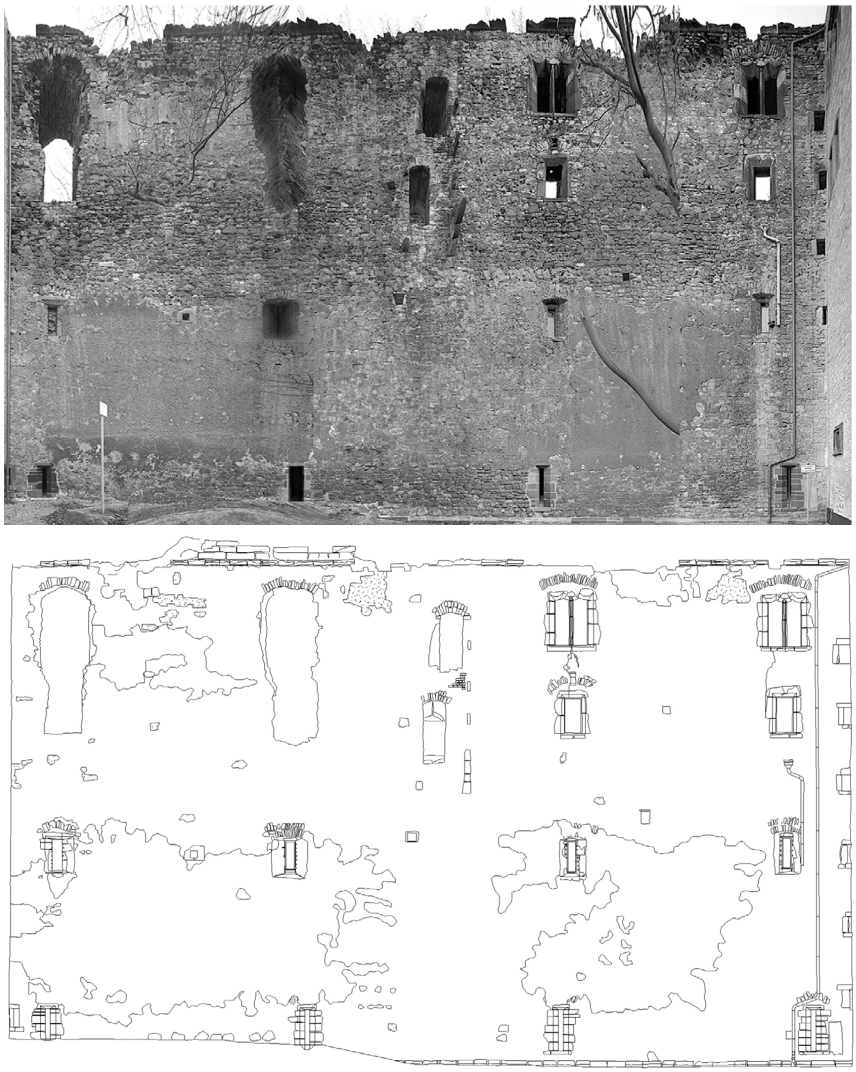
Drawing of *West-Tower of the Moritzburg*

Architect: Matthias Hemmleb and Albert Wiedemann

Dates: 1997

Project Location: Halle, Germany

Description: Digital unwrapped image mosaic (above) and photogrammetric plot (below)



Photography became an increasingly important architectural documentation method as it became cheaper and easier throughout the twentieth century. These images show the measured data that could be layered through photometric processes[26]. This example is from 1997, but the method began to be implemented as early as the 1960s and 70s.

26. Hemmleb, Matthias and Albert Wiedemann. "Digital Rectification And Generation Of Orthoimages In Architectural Photogrammetry." *Proc. of the CIPA Int. Symposium '97, Photogrammetry in Architecture, Archaeology and Urban Conservation, Int. Archives for Photogrammetry and Remote Sensing, Band XXXII, Part 5C1B*. 1997. Pages 261-67. citeseerx.ist.psu.edu. Accessed May 31. 2016.

Fig. 2.18.

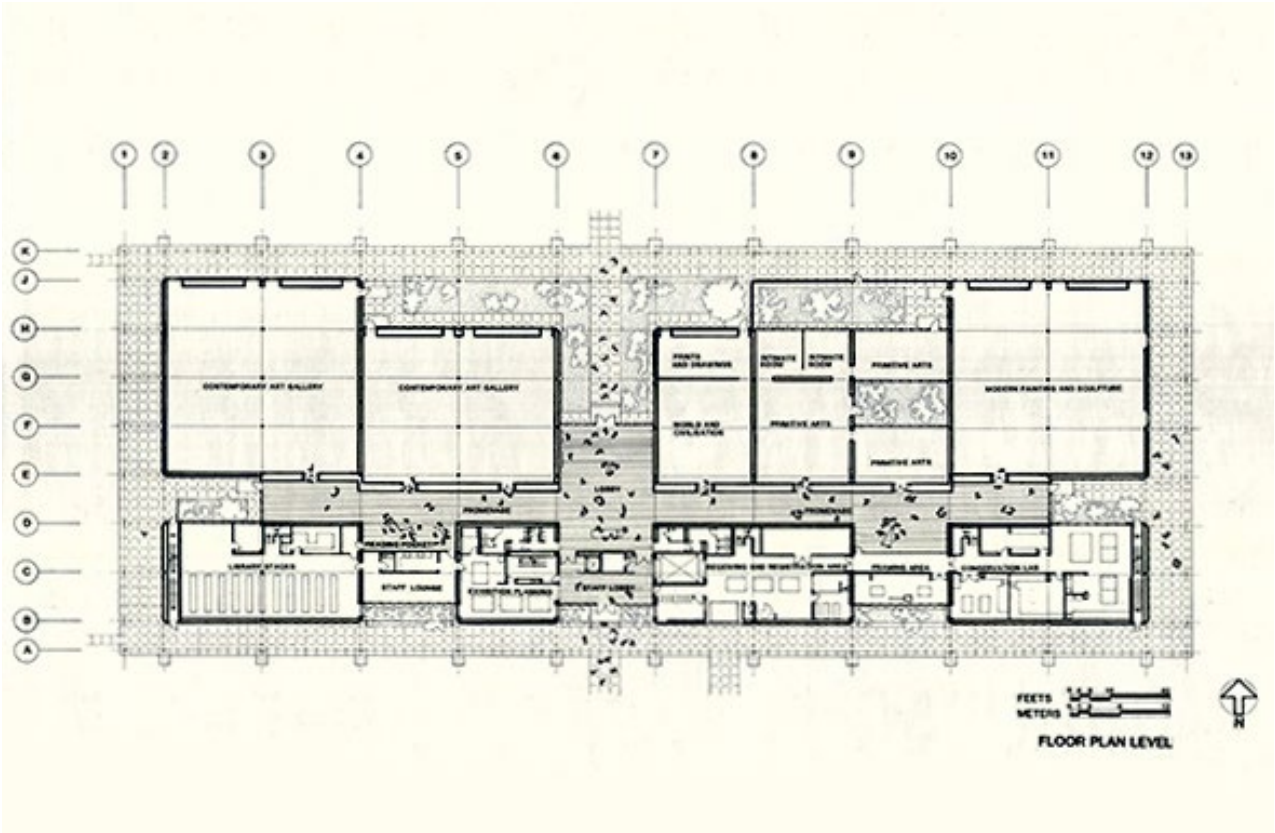
The Menil Collection Museum

Architect: Renzo Piano and Richard Fitzgerald

Dates: 1987

Project Location: Houston, Texas

Description: Digital scan of toner on paper from a CAD program.



The emergence of Computer-Aided Design in the 1970s and its increasing dominance through the 1980s effectively eliminated the need for full scale duplication of drawings by creating print-ready files[27]. Like the advent of the blueprint, Computer-Aided Design drastically changed the architectural field. It greatly reduced the number of draftsmen needed and increased the speed with which drawings could be produced. Digital drawing also increased the feasible distance architects could work from as graphic communication became easily transferable.

27. "Blueprint." newworldencyclopedia.org. Accessed April 20, 2016.

Fig. 2.19.

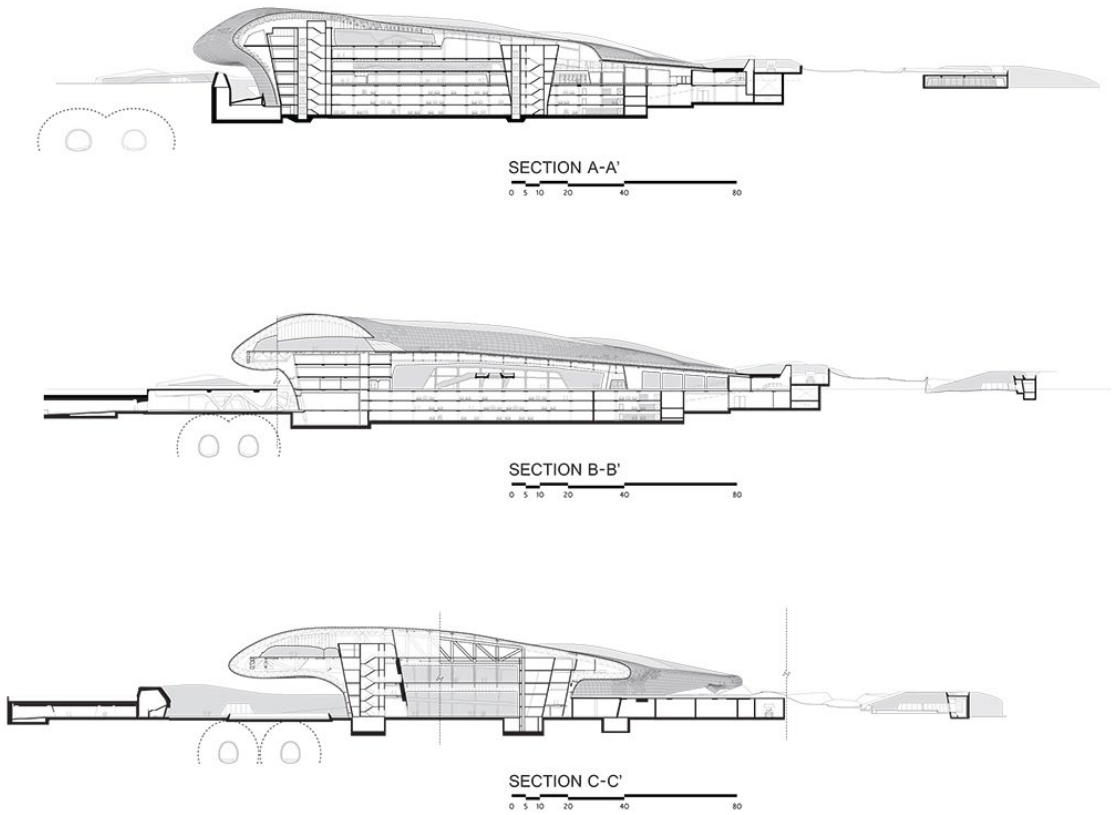
Dongdaemun Plaza

Dates: 2009

Architect: Zaha Hadid Architects

Project Location: Dongdaemun, Seoul, South Korea

Description: Digital Drawing



The proliferation of intricate three-dimensional architectural models since the 2000s has created new challenges for architectural representation as a whole. The use of 3D software makes architectural forms that were previously impossible a reality. Zaha Hadid famously employed dramatic curvilinear forms in her designs, such as the Dongdaemun Plaza in South Korea. In such cases, the current graphic conventions which have been carried over from hand drafting, are not sufficiently sophisticated to capture the model information. Architects facing this situation have used "serial sections," many sections through the building displayed in sequence, to make up for this shortfall. Serial sections help illustrate the complexity of the structure, but still do not completely document the complex geometry.

Improving digital representation techniques to correspond to the intricacy of the models from which they are generated would help facilitate the design and construction processes that use highly three dimensional forms. In this way representation technique advancements can further possibilities for the field as a whole.

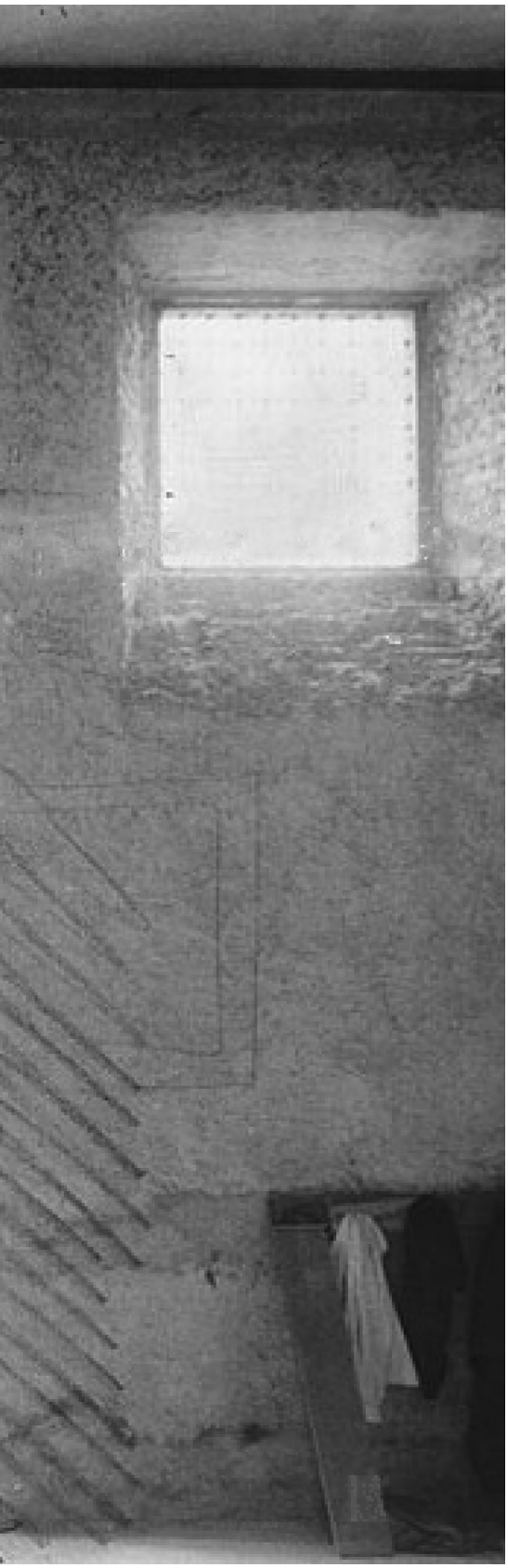
3
Hybrid Drawing

distortions and partial disintegrations are disturbing, unwelcome ingredients for historic value[28]

Architectural documentation of existing conditions are always a filter through which reality is viewed and interpreted. Every building generates an infinite amount of information that is impossible to completely represent. There are countless physical details as well as spatial properties that could be documented. Whether this data originates from physical measurements or a points cloud through 3D scanning, elements must be omitted so that the amount of information is not overwhelming. Drawing is the main method of sifting through the data to produce a legible product.

While drawing has the ability to emphasize information intelligibly, it also has the tendency to disguise. Assumptions are frequently made to make the scale of documentation reasonable. By filtering what is deemed most relevant to the project at hand, the implicit biases of the documenter are embedded in the drawing. Although some of these assumptions are necessary and harmless, others can inadvertently direct future designs decisions. Ideally architects would be able to balance information and legibility through the use of various media.

28. Alois, Riegl. "The Modern Cult of Monuments: Its Essence and Its Development." Originally published as *Der moderne Denkmalkultus: Sein Wesen und seine Entsehung* (Vienna: W. Braumuller, 1903). *Historical and Philosophical Issues in the Conservation of Cultural Heritage (Readings in Conservation)*, edited by Nichoilas Price, M. Kirby Talley Jr., and Alessandra Vaccaro, 69-83. Los Angeles: Getty Conservation Institute. 1996.



Architects have used various techniques in order to gain the deepest understanding possible in spite of representational limitations. Since these efforts are usually part of the initial design phase, their methods vary widely. These schematic exercises are generally not widespread as many architects that deal with existing structures quickly move past the documentation phase of a project.

Carlo Scarpa was infamous for focusing on the minutia of the existing buildings he adapted. His attention to detail allowed him to combine historic structures with dramatically contemporary elements while respecting the significance of the architecture as a whole. Because of this careful juxtaposition Scarpa's work has the ability to "elude time[29]." The archive of his drawings reflects his attention to detail and involvement in the construction process. He frequently worked on a single small fragment of the building at a time.

The sketch seen here layers Scarpa's thoughts for a new windows system directly on top of a photograph of the existing structure. By using a photograph of a small part of the building, he is able to easily capture a huge amount of existing detail. A typical interior elevation of this same view would likely miss many of the ephemeral qualities Scarpa was working on. The condition of the brick, depth of the window aperture, and quality of interior light would normally be omitted from an interior elevation. By sketching directly on a photograph of the existing conditions, Scarpa was able to more accurately visualize the outcome of his design.

Fig. 3.1.
Mueso di Castelvecchio, Carlo Scarpa, 1950s-1970s, Venice, Italy.
Carlo Scarpa's adaptation of Castelvecchio in Venice, Italy was completed in 1973. This hand ink drawing of new window mullions layered on a photograph of the existing windows show Scarpa's process of combing elements from various time periods.

29. Co, Francesco Dal, and Toshio Nakamura, eds. *Carlo Scarpa*. Tokyo: A + U Publishing. 1985.

The Historic American Building Survey implores rigid standards to mitigate the individual influences of building documenters. Although these conventions help minimize the individual, HABS standards still cause the biases of the institution to be expressed in architectural documentation. The graphic standards imposed by HABS reflect the underlying purpose of the organization to, "document America's architectural heritage.[30]" The HABS documentation initiative is an important effort to record American architecture throughout history, but in doing so the documentation typically ignores or minimizes the contemporary context. Under this system qualitative aspects of buildings also remain undocumented.

To examine the potential role of hybrid drawings in historic documentation, initial studies focus on reworking HABS documents. By beginning with a HABS survey of a local site, the Francis E. Willard house in Evanston, IL, I was able to analyze the discrepancy between documentation and reality. In this case the absence of surrounding context in the HABS drawings implies that the building exists in isolation. Instead, the small house stands out from the larger scale, more recent neighbors that directly abut the property. These elements, such as neighboring buildings, signage, decay, and other details, greatly effect the experience of architecture although they are not typically documented. By using HABS survey work as a base to layer additional information, greater depth of information is produced. The hybrid drawing process could help inform any future interventions.

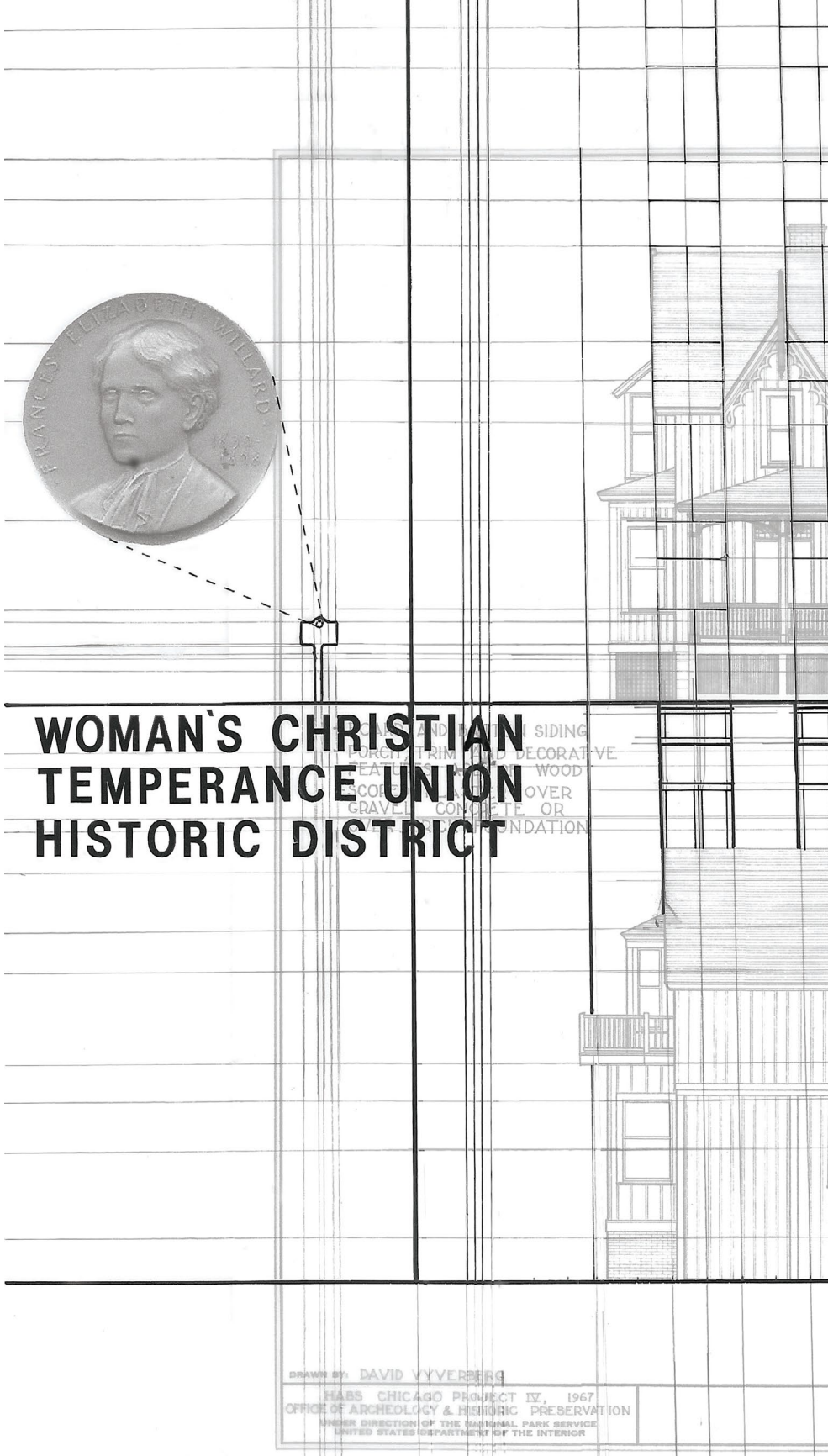


Fig. 3.2.
Frances E. Willard House. 2015. Drawn by author.

30. "Historic American Buildings Survey (HABS)" nps.gov/hdp/habs. Accessed October 30, 2015.

EAST ELEVATION

5' 0 5' 10' SCALE 3/16"=1'-0"

SOUTH ELEVATION

NAME AND LOCATION OF STRUCTURE

FRANCES E. WILLARD HOUSE

1730 CHICAGO AVENUE EVANSTON, ILLINOIS

SURVEY NO. ILL. 1095

HISTORIC AMERICAN BUILDINGS SURVEY

SHEET 2 OF 5 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

While further investigating the representation of historic structures I became interested in how adaptations to existing structures were represented in the past. Architectural adaptation has been such a ubiquitous condition throughout time that it is important to consider how these historic interventions may have been represented during the time of their creation.

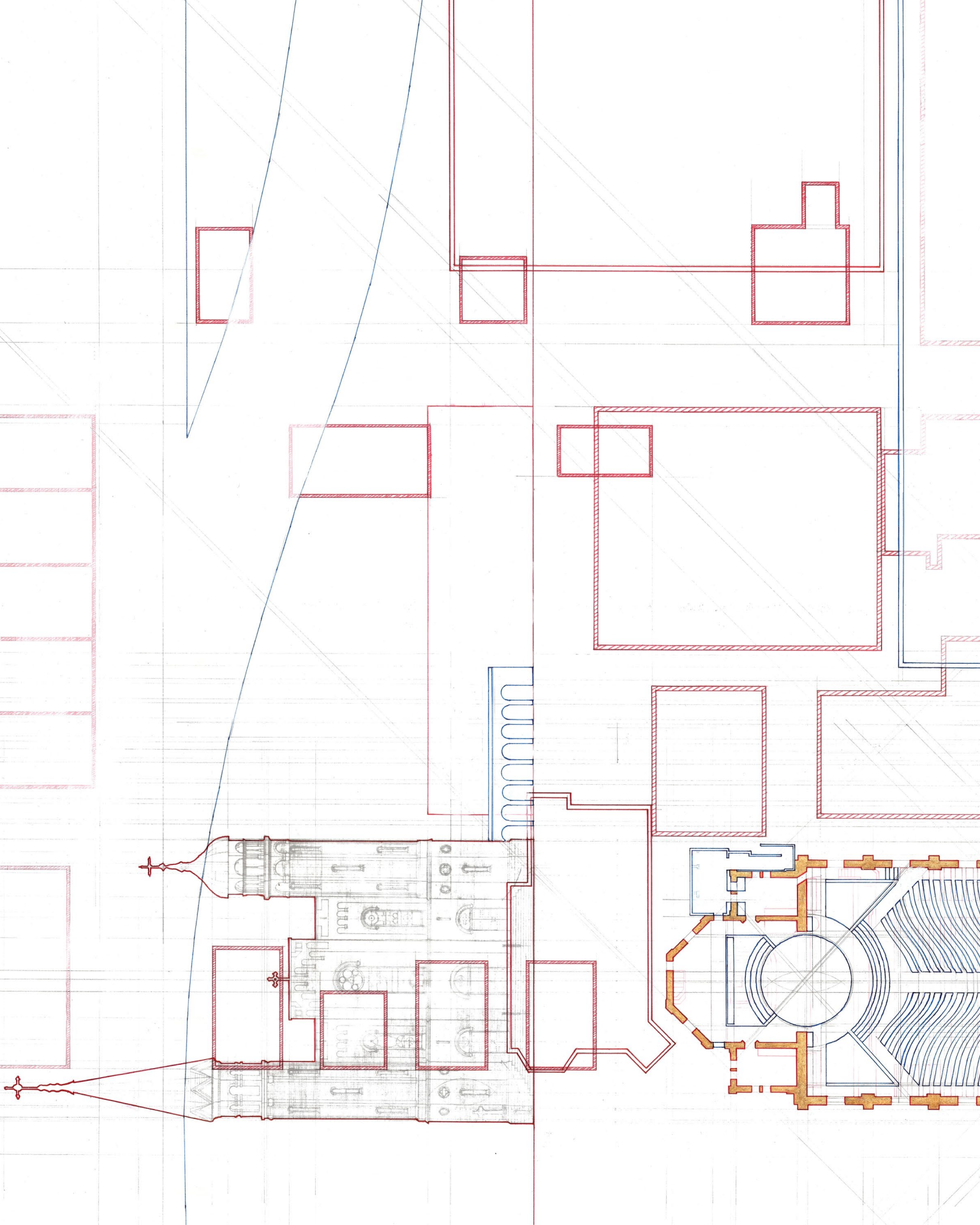
Very few examples of architectural drawing older than the 17th century remain, and even fewer representations of adaptation exist. This is likely due to the prevalence of craftsman and builders rather than architects throughout much of history. It is thus typical that drawings were only created and preserved for highly significant buildings. One such example of historic representation of architectural adaption is Tiberio Alfarano's drawing of St. Peter's Basilica from 1571. This drawing, as detailed in Federica Goffi's dissertation *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, The Vatican*, superimposes the Michelangelo's new plan over the already demolished Old St. Peter's.

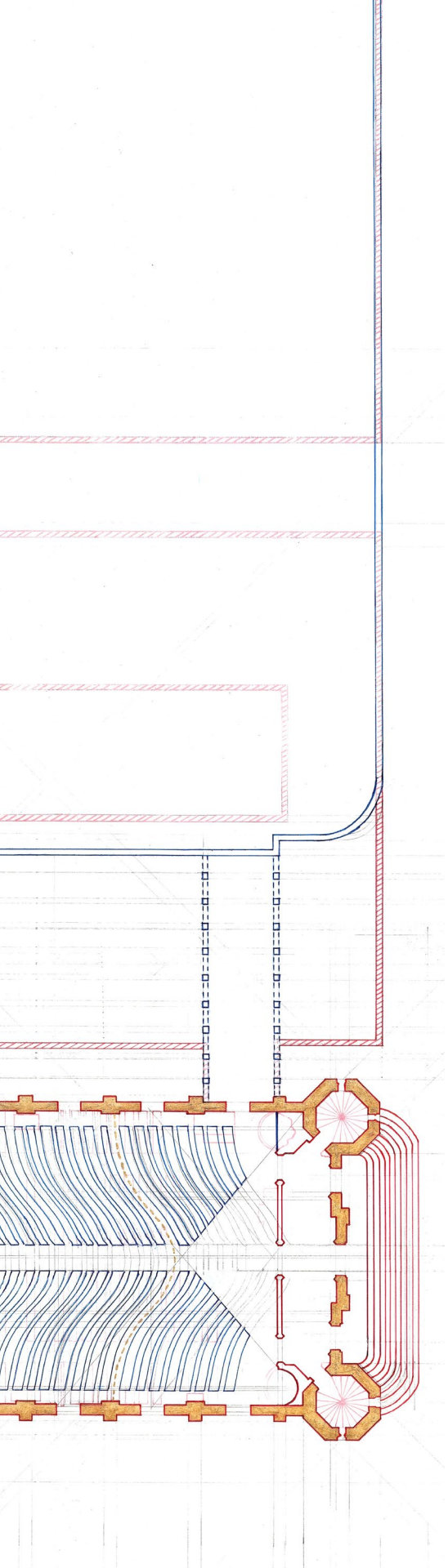
Tiberio Alfarano's drawing layers time, with ancient roman temple sites acting as its graphic foundation. According to Goffi, "Alfarano contemplates past and future simultaneously, through a metaphoric transparency achieved through a multilayered plan, a quasi-palimpsest demonstrating a simultaneous presence of old and new members[25]." However, the drawing has largely been reproduced in black and white, thus loosing its original dimensionality[22]. Hybrid drawings such as this example allow the viewer to contemplate various layers of information at the same time.

In her dissertation, Frederica Goffi describes Alfarano's drawing as a "brouillon" or a "work intended to be copied," in that "hybridity mirrors the making of a building, with a hybrid body by multiple auhtors[31]." Thus, hybrid drawings have the capacity to describe complex architectural situations, including their evolution over time. By accepting the multiplicity inherent in architecture the overall design process can be improved through deeper representation.

Fig. 3.3.
Tiberio Alfarano, St. Peter's Basilica, 1571.

31. Goffi, Federica. *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican*. Burlington, Vermont: Ashgate Publishing Limited, 2013.



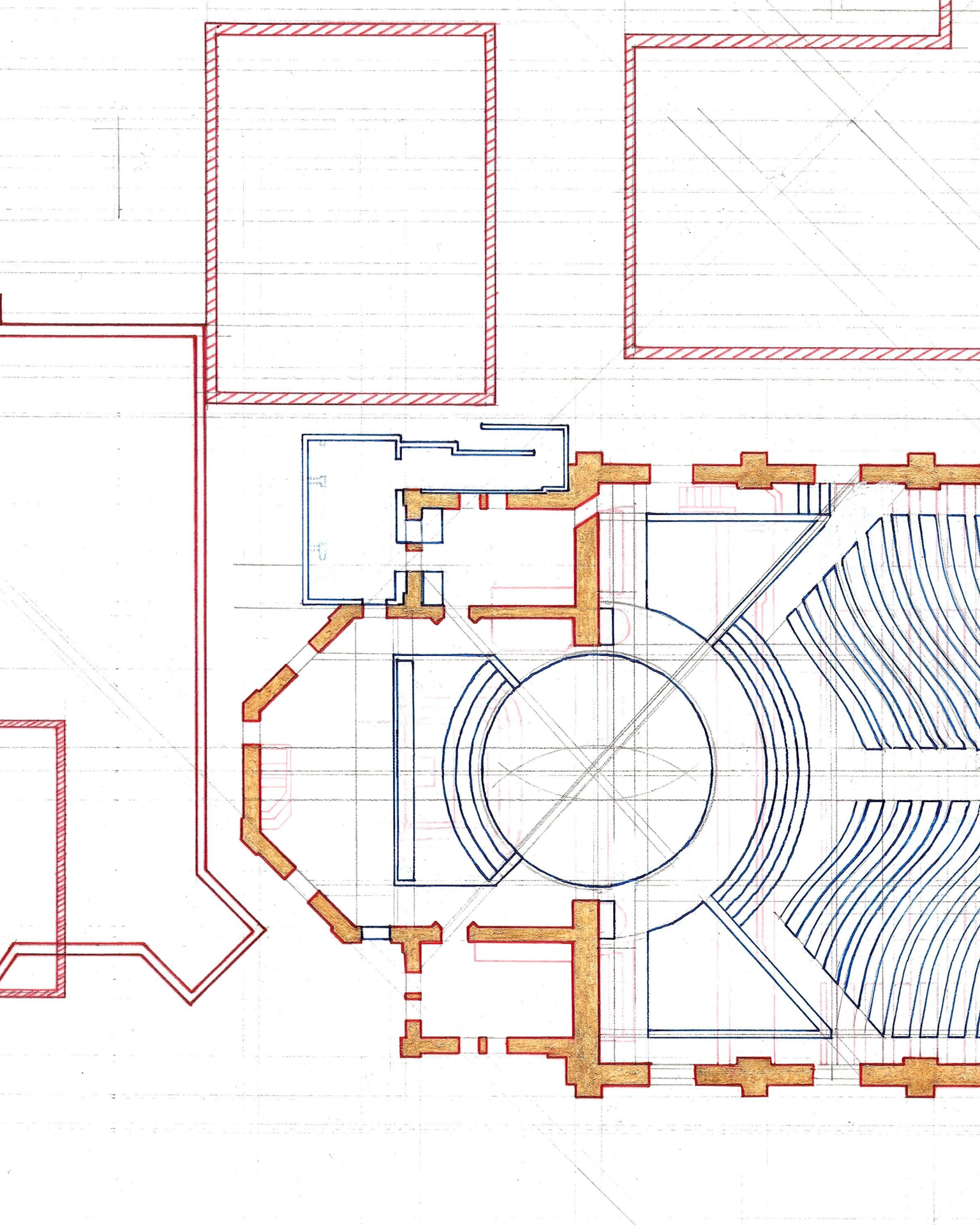


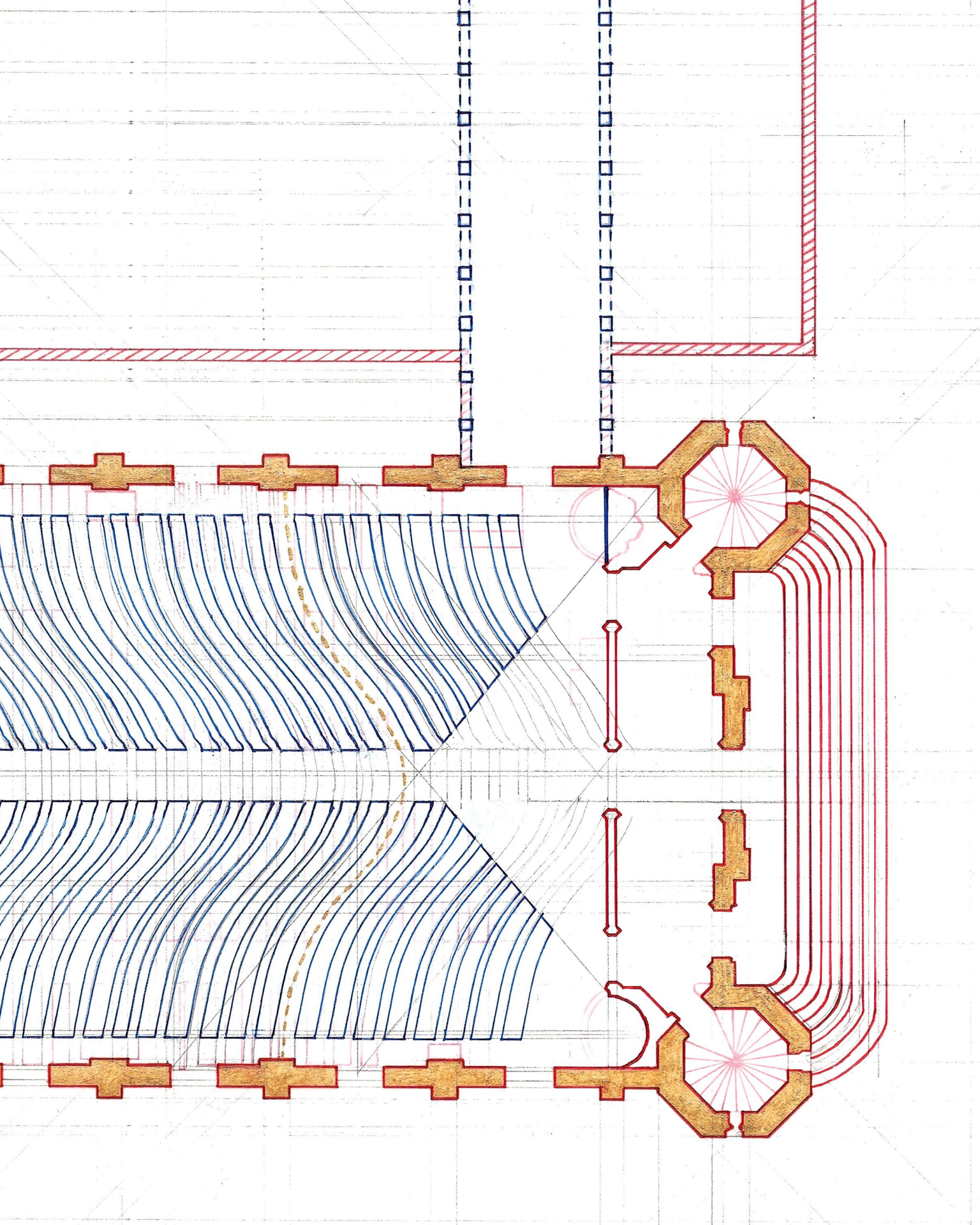
This study draws upon Tiberio Alfarano's study of Old St. Peter's as a representational precedent. Using a Chicago example of historic religious architecture, Old St. Patrick's Church is drawn using similar representational conventions. Initially the intent of this study was to follow Alfarano's methods exactly, but as the drawing progressed, it became evident that the adaptations of the two structures were distinct enough to warrant some representational deviation. The prevailing notion of Old St. Patrick's is its steadfastness within a changing city, while Old St. Peter's was the site of various distinct iterations over centuries. The neighborhood surrounding Old St. Patrick's has changed drastically and its interior has undergone various renovations, but the exterior has stood largely unchanged.

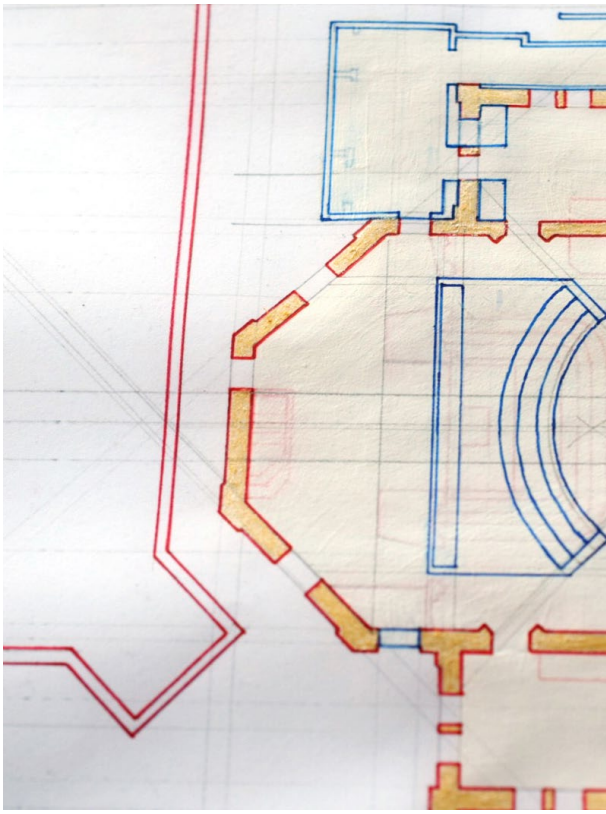
The infallibility of the church's walls is emphasized by the layering of recent interior renovation. Historic neighborhood transitions are made visible by the simultaneous interpretation of various structural demolitions. It can be seen that the area was once comprised of small residential homes, with the church as the largest structure. Over time the area began to transition to a more light industrial area with larger structures and the construction of a major highway caused another even larger scalar intrusion. Through it all the walls of Old St. Peter's have stood largely unchanged. Its interior has evolved with the times, but its presence has always remained.

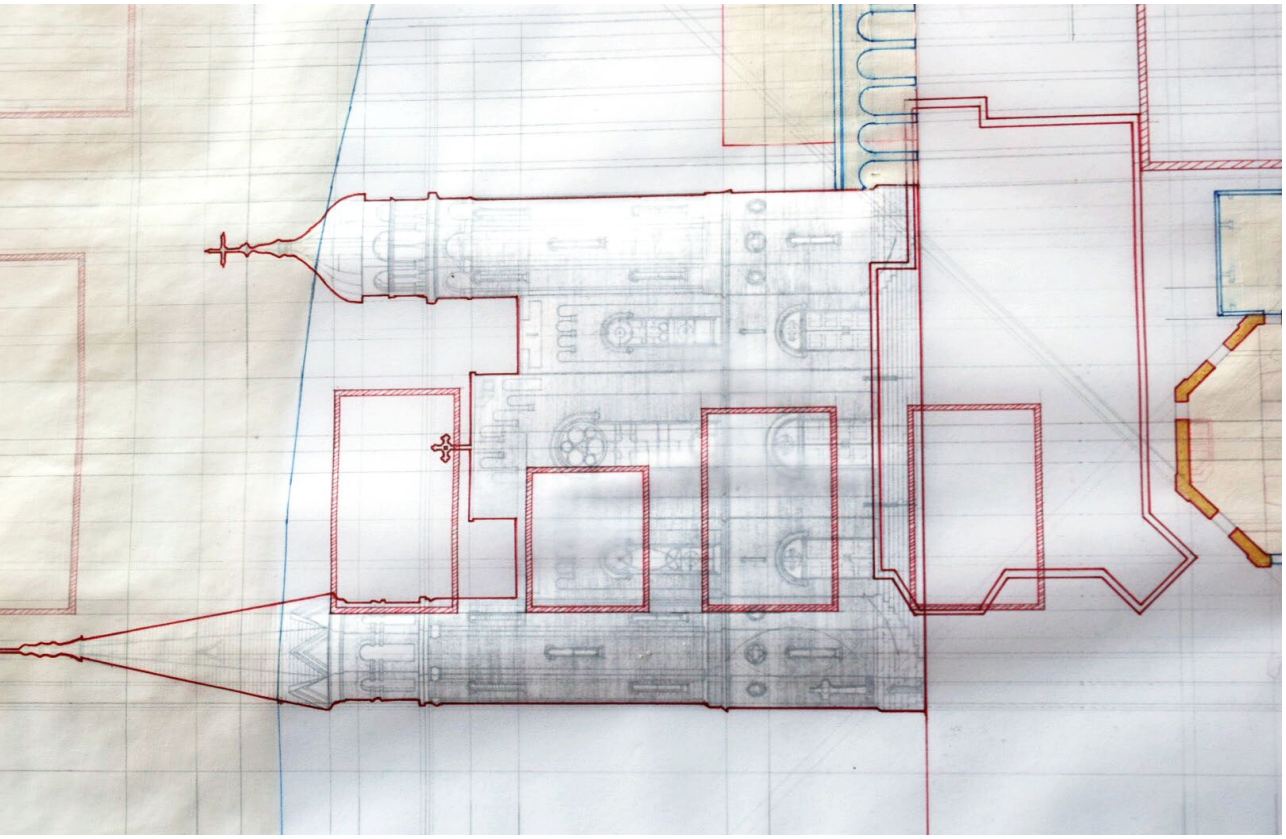
The construction of a hybrid drawing served as an informative research tool. Although the historic elements of this drawing may not be completely precise, the information it portrays creates an important starting an informed conversation about any future designs. Implementing this type of interpretive drawing at the beginning of the design process would allow for an enriched discussion throughout the design an alteration to an existing structure. Hybrid drawings allow a moment to expand the focus of a project beyond the existing architecture to include a broad spectrum of influences.

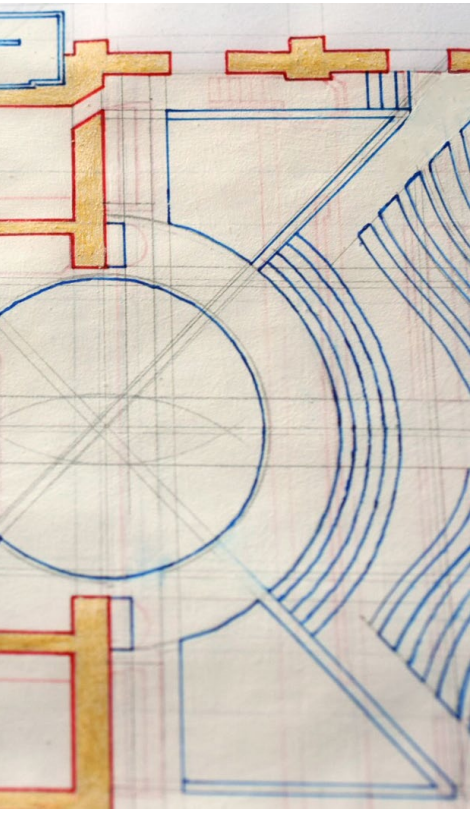
Fig. 3.4.
Hybrid Plan / Old St. Patrick's Church. 2015. Drawn by author.

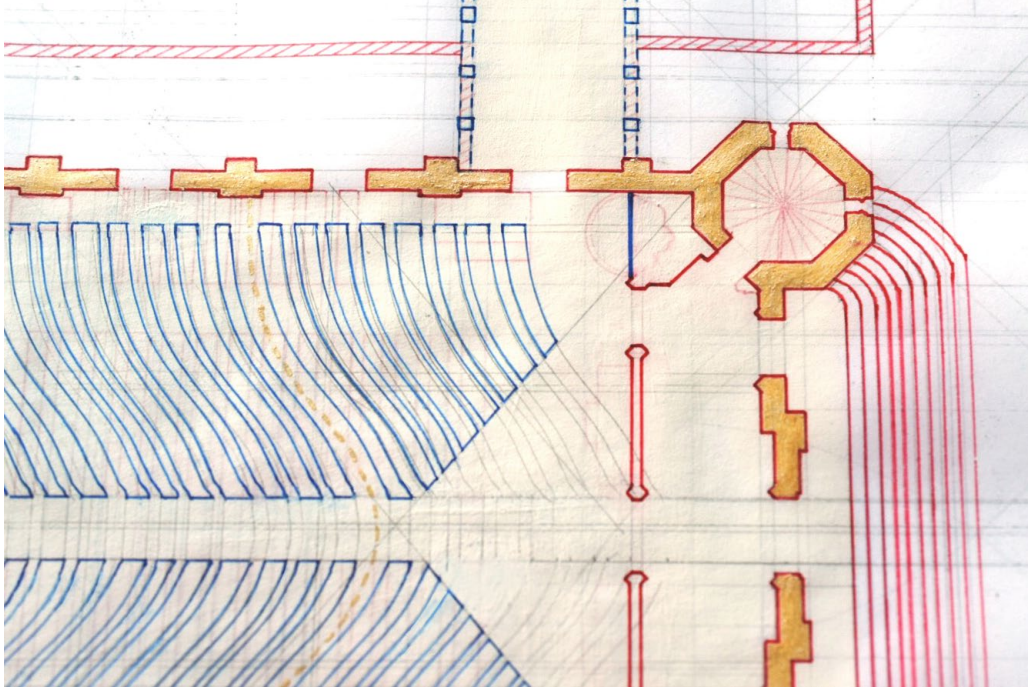


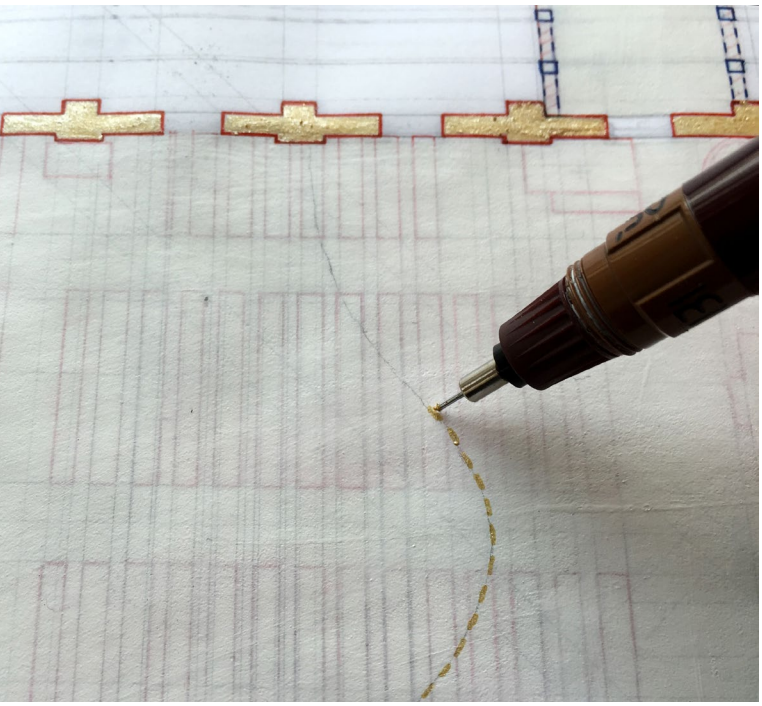












4

Sequential Architecture

The process of designing is one of assembling parts by taking away, adding or altering an existing palimpset[32]

The concept of architecture as a continuum has largely fallen out of favor. Prior to 1950's Modernism, architecture was typically perceived as long-lasting and adaptable[32]. After this period, "instant architecture" took hold, valuing construction speed and cost over building life span[32]. Today, the overtness of Modernist goals has subsided, but the psychological effects still linger. In general the American public prizes new construction and historic architecture, but both seen as static. The middle ground is adaptable, but of low value. As referenced in Rem Koolhaas's book *Preservation is Overtaking Us*, the future of architecture must better reconcile these issues[33].

Historically, architecture was seen as constantly evolving. Buildings, and their components, were constantly being reused and adapted to suit changing needs. Frederica Goffi states that "renaissance corporeality of buildings is based on the Zeuxian body, understood as an assembly of individual members, through a process of selective unification[33]." Thus at this time period restoration was focused on the evolution of a building. Renaissance ideology was thus "a dialogue between past and future building, allowed for renewal, meanwhile assuring continuity of identity, embracing change rather than denying it[32]."

32. Goffi, Federica. *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican*. Burlington, Vermont: Ashgate Publishing Limited, 2013.

33. Koolhaas, Rem, and Jorge Otero-Pailos. *Preservation is Overtaking Us*. Print. New York: GSAPP. 2014.

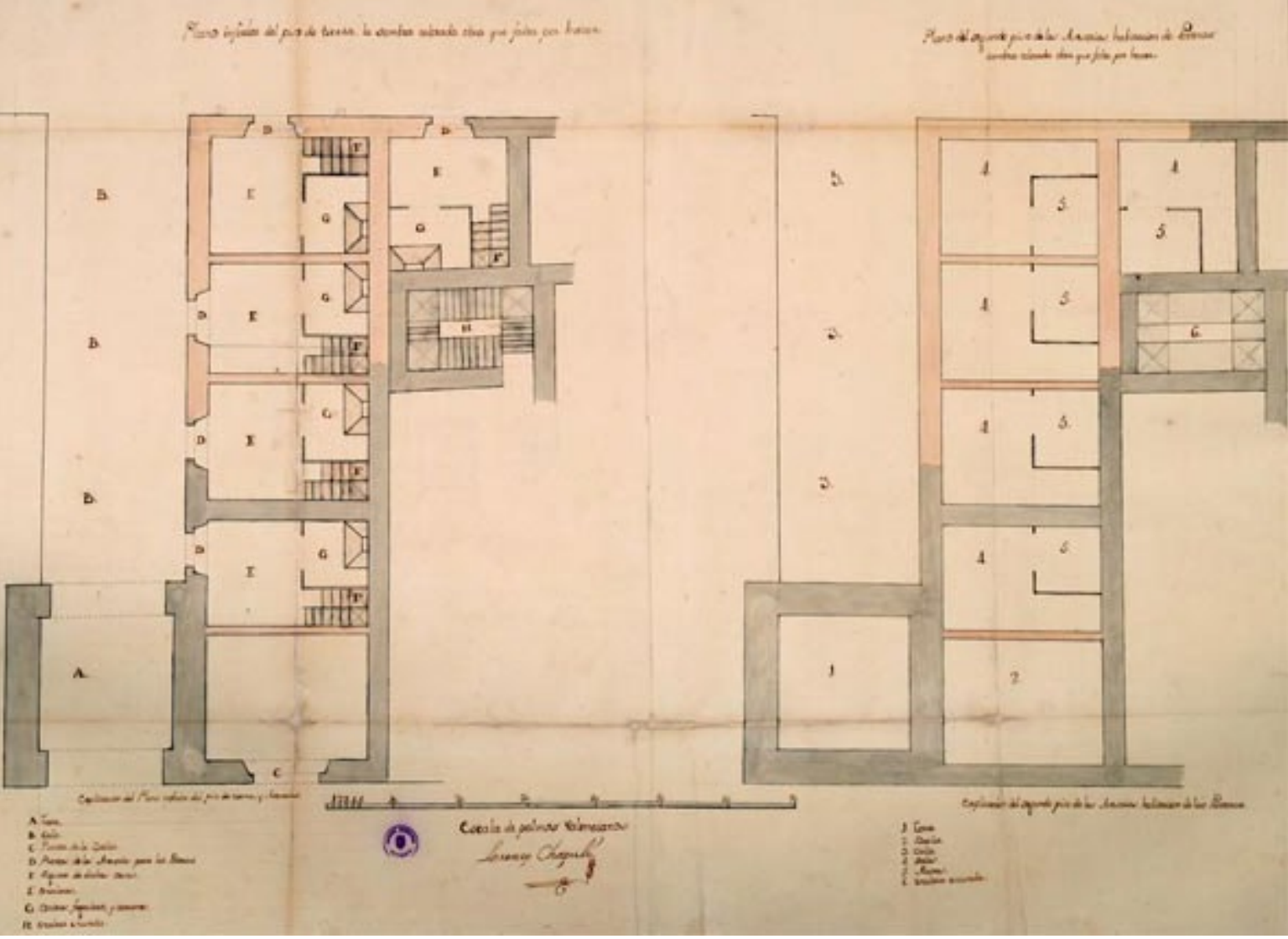
Contemporary architectural conventions reflect this ideological transition as well. Historic architectural drawings tend to layer new construction over existing architecture so that both are visible at the same time. Current conventions dictate a devision of phases so that the existing conditions are only represented on a demolition plan. This choice characterizes the majority of contemporary thought on the subject because it strictly defines and divides the old from the new. Greater design possibilities could be seen from uniting these aspects in construction and in drawing.

Although Frederic Goffi specifically traced this interest in architectural continuity to the Renaissance, it was the prevailing ideology prior to, and for centuries after the Renaissance. Few contemporary architects have returning to this method of thought, as it is generally perceived as overly experimental.

Peter Zumthor's adaptation of St. Kolumba Church in Cologne Germany exemplifies the philosophy of "sequential architecture." The new museum nestles into the ruins of the Gothic church destroyed during the Second World War[34]. The building is able to simultaneously fortify exterior walls, protect the ruins, and reprogram the site. In unifying these desperate functions, Zumthor was able to create an "exchange between history and the present day[34]."

Fig. 4.1.
Kolumba Museum, Peter Zumthor, Cologne, Germany.

34."Architecture" Kolumba: Art Museum of the Archdiocese of Cologne. kolumba.de. Accessed May 2, 2016.



Throughout this research, Tiberio Alfarano' drawing of St. Peter's Church (Fig. 4.1.) from 1571 was the oldest example of architectural representation I encountered that depicted change to a building or site overtime. After the Renaissance, when architectural drawing begins to be more commonplace, more examples of the documentation of architectural adaptations exists. Despite different time perioids and locations, the historic drawings I found that depicted existing buildings all used the same drawing convention to show existing and new consturction at once.

Most of the drawings I was able to uncover rendered existing structures in red ink and new additions or alterations in graphite or black ink. The Spanish plan of the Alicante City Hall from 1772 (Fig. 4.3.) shows a typical example of this convention. Tiberio Alfarano's drawing of St. Peter's Church shows perhaps the beginning of this technique, although in his work new architecture is draw in blue ink. The black and red documentation method appears to have been the prevailing convention in Europe, and its colonies, from the 16th century till the late 20th century. There are surviving examples from early 19th century Australia and American architects, such as Daniel Burnham, which shows its widespread. Later, Carlo Scarpa used the convention in his late 20th century work such as Castelvecchio[35].

This technique of red and black was clearly widespread, but seems to have all but disappeared today. This method was never taught during my architectural education and I found no descriptions of this technique as a convention beyond the notes written on archived drawings. I reached

Fig. 4.2.
Planta inferior del Ayuntamiento de Alicante (Lower level of the Alicante City Hall), 1772.

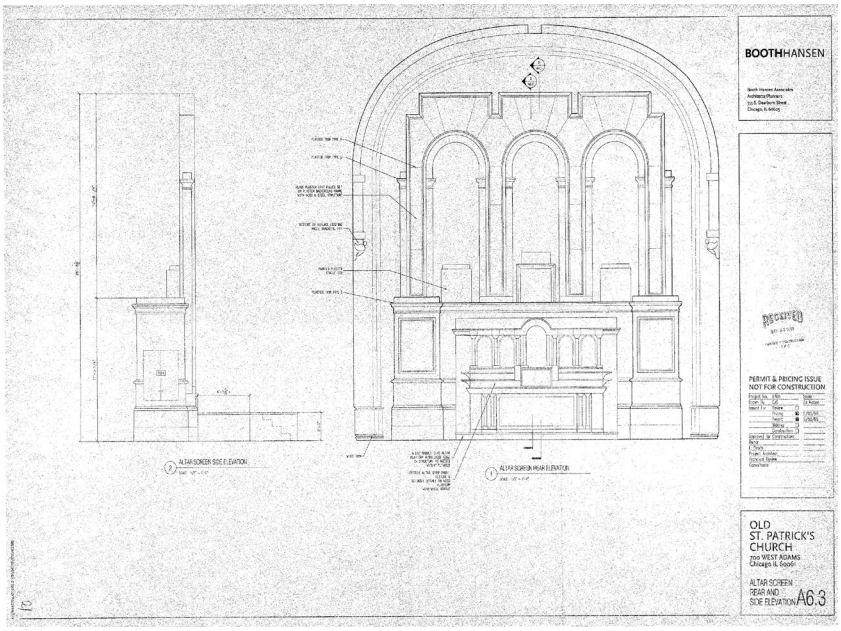
35. Scarpa, Carlo. *Museo di Castelvecchio*. Galleria delle Sculture. Graphite, pastel on brown paper. 1959-61. Museo di Castelvecchio. archiviocarlosscarpa.it. Accessed April 22, 2016.

out to an architectural historian, Susan Turner, to help understand the role red and black drawings had. According to Turner, this was the convention until around the 1980s. As far as she is aware, there was no definitive decision to abandon the technique, but that as drawing shifted to computer aided design (CAD) this convention was lost in the translation. During this period drawings were increasingly produced by computer specialists, with architects marking up changes to be completed in these departments. Turner believes that this enlarged gap between architects and drawings caused this technique to slip away.

Although drawing with the typical all black lineweights is convenient and advantageous, for some circumstances, the red and black convention had a clarity and layering ability that is difficult to achieve with line weight and type alone. Multiple time periods of additions and alterations can be layered, enabling simultaneous interpretation. This minor discovery inspired further exploration into the role of color within architectural representation.

Perry Kulper's experimental work often uses various layers of color, line weigh and type. His *Central California History Museum, Cryptic Site Drawing, v.02* (Fig. 4.4) shows a possible precedent for incorporating color into architectural representation. This use of red and black is not related to existing architecture, but rather another layer of data. A tool for architectural design should be able to combine the accuracy and clarity of typical architectural conventions with the information layering and codification of Kulper's work.

Fig. 4.3.
Perry Kulper, *Central California History Museum, Cryptic Site Drawing, v.02*, Detail



Perry Kulper's representational methods, and even the historic red and black drafting convention, contrast sharply with current graphic standards. Today, architecture that involves an existing building is usually represented in construction documents with separate demolition and new construction drawings. There typically would be no drawing where complete existing conditions and new construction are clearly overlaid. Drawings for new construction typically indicate existing elements that are to remain with hatch or lineweight differentiation.

This division of project phases is helpful for some aspects of the construction process, but it often unfortunately carries over to schematic and design development phases. Demolition plans are not the most logical way to quickly understand a renovation since they do not show planned construction in relation to the existing conditions of the building and site. By eliminating elements that are seen as unnecessary in the very first drawing of the set, and usually very early on in the project, it encourages a definitive attitude towards their demolition. Using a more layered representational method would allow the existing conditions to be present farther into the design process.

The reductive quality of typical construction documents is evident in Booth Hansen Associates interior elevation of Old St. Patrick's Church (Fig. 4.5.). This drawing shows the new alter screen that was added during a renovation of the historic church. The clarity of this drawing is suited to the needs of a contractor building the screen, but fails to shows relationships to the original structure.

Documentation methods for existing conditions are evolving and with them, representation is as well. More and more existing buildings are being documented through 3D scanning. The point clouds and photographs produced by this process have the possibility of providing highly detailed architectural drawings. The exterior elevation of the restoration of the Basilica Palladiana (Fig. 4.6.) shows an example of what this data can produce.

The Palladian Basilica elevation provides a view of the building with photographs that could not be seen without the *orthophotography* that 3D scanning is able to produce. These images behave like drawings in that they are dimensionally accurate[37]. By combining image with drawing, architects are able to visualize the qualitative aspects of a space at the same time as the precision of quantitative drawings[36]. These types of drawing are currently used for documentation, but they also have great potential to be combined with new construction of renovation work.

Fig 4.4.
Rear and side elevation of the new altar screen from Booth Hansen Associates 1999 Renovation of Old St. Patrick's Church. From the Old St. Patrick's Church Collection of the Archdiocese of Chicago's Archive and Record Center.

36. Aaslestad, Peter. "Orthophotography." Aaslestad Preservation Consulting. aaslestad.com. Accessed May 4, 2016.

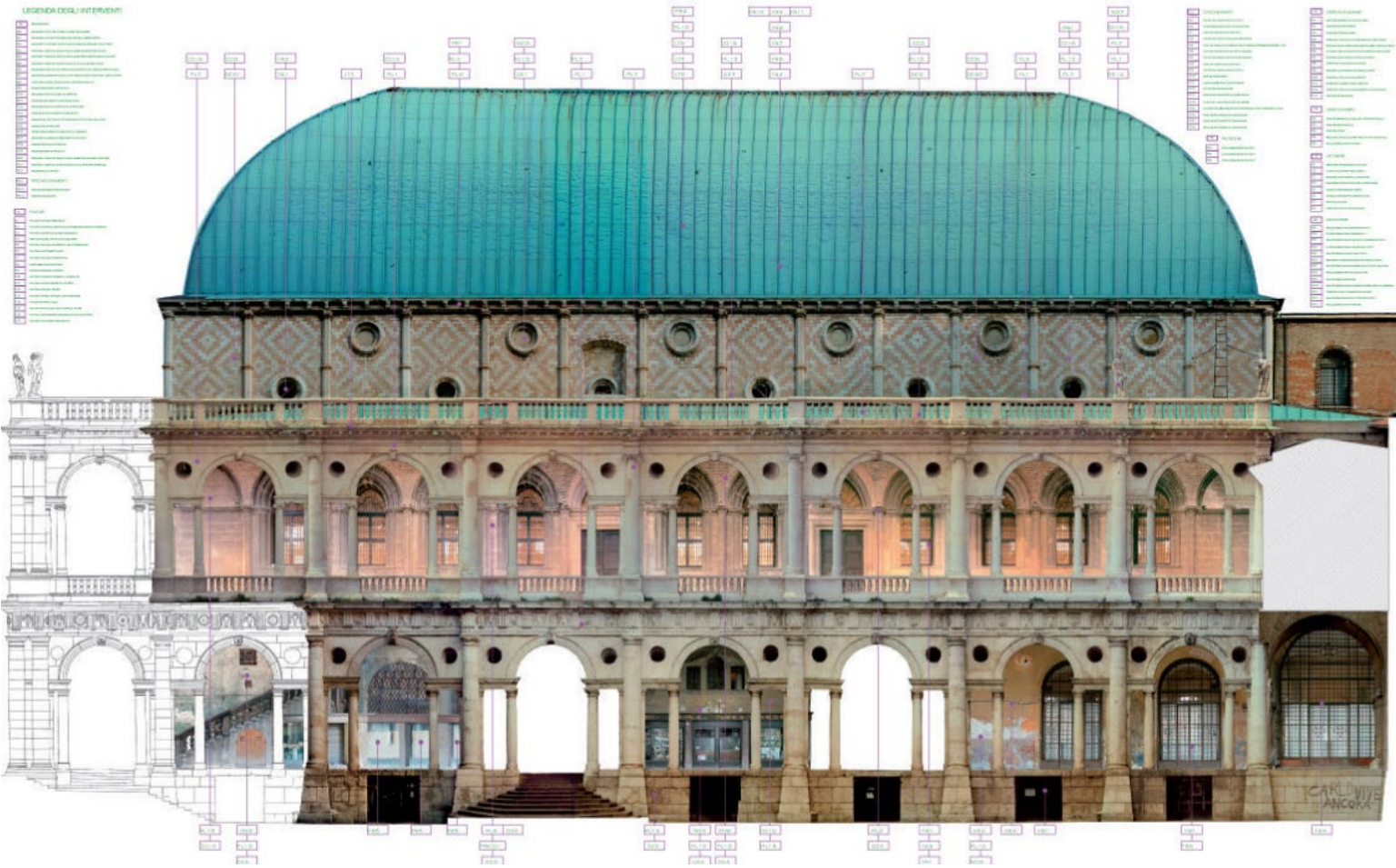


Fig. 4.5.
Restoration of Basilica Palladiana, Vicenza, Italy, 2007.
Orthophotographic elevation of the Palladian Basilica. The complete elevation is constructed using images from a 3D scanning survey to produce a measured image and drawing.

Fig. 4.6.
Old St. Patrick's Church, Chicago, 1931
Despite many changes in the neighborhood surrounding Old St. Patrick's Church, its exterior walls have largely stayed the same. This has created a strong sense of continuity within the community for over a century.

Fig. 4.7.
Interior Toward Chancel, Old St. Patrick's Church, Chicago, 1963
The original interior of the church was elaborately ornamented, in a style typical of turn of the century Catholic churches.

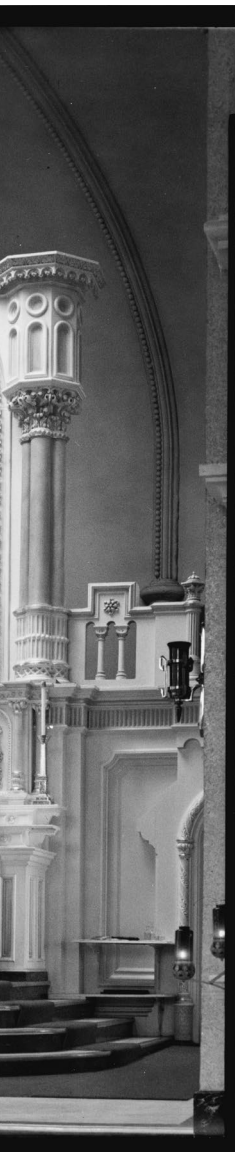
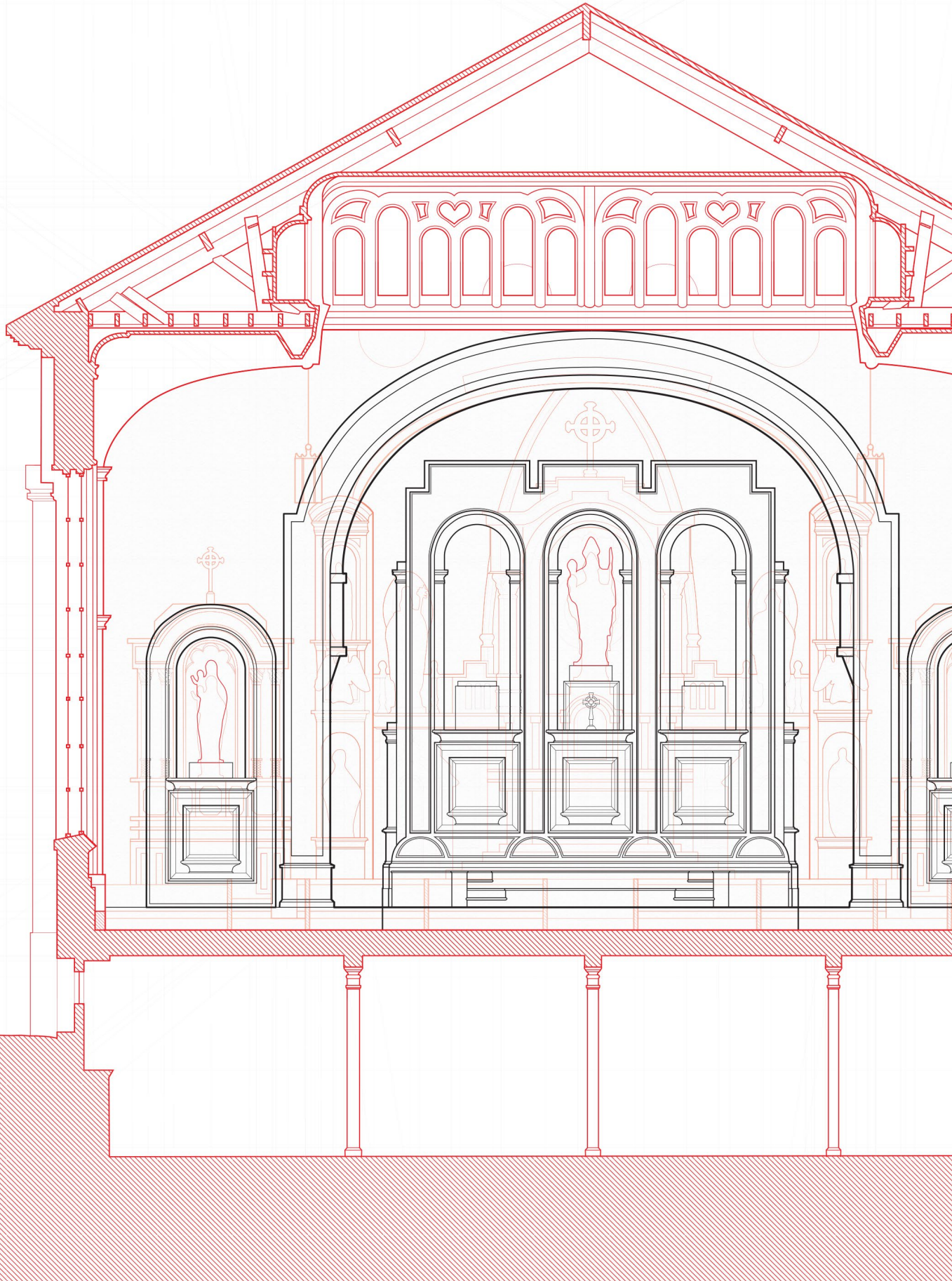
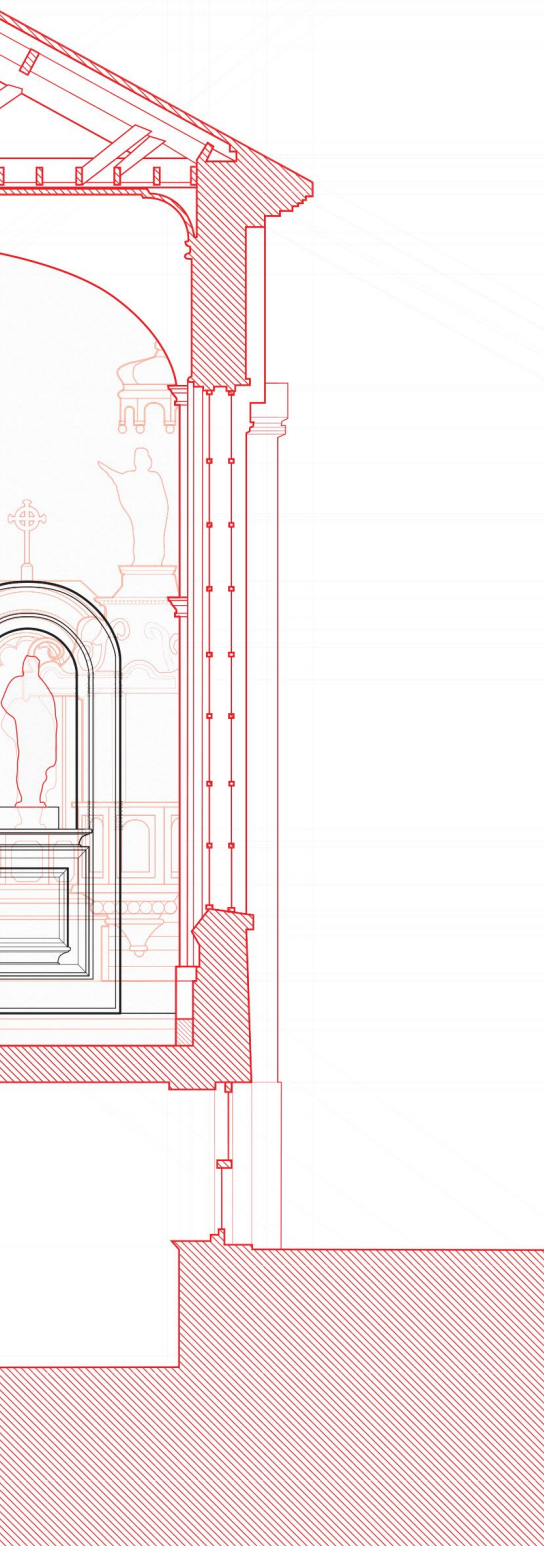


Fig. 4.8.
Old St. Patrick's Church, Chicago, 2015
Over the course of the 20th century, Old St. Patrick's Church saw a massive decline in prisoners due to various urban factors. In 1996, after a slight rebounding in population, the Church began an extensive renovation by Booth Hansen Associates.





In order to develop the idea of a representational method that could describe the many intricacies of sequential architecture, I revisited Old St. Patrick's Church. Using the codification system of the historic red and black drawing convention I drafted the building section of the church through two major periods. Using this method the existing conditions are drawn in red and new construction is black.

The church's Historic American Building Survey from 1963 served as the initial underlayment of the drawing. Although this was not the beginning of the church, it is the oldest surviving architectural record of its history. More recent history was researched through the drawings of its 1999 renovation from the Archdiocese archive, photography and written records. Using this variety of records I was able to construct a legible illustration of the Church's history from one section view.

In this type of intense layering, line codification and weight becomes of the utmost importance. The red and black drafting convention allows more line types to be used simultaneously without confusion. By clearly categorizing the lines, the evolution of the architecture is able to be read. Although this method may over simplify a building's long history, it helps illustrate design progression over time. In this drawing the new 1999 alter clearly draws from the original alter. In conventional drawings where this new construction is drafted independently, the historic continuity is lost.

When contemplating a future design intervention, having a drawing such as this would allow for a deeper understanding of the building's history. This information would help quickly inform those involved on past design intentions. Facilitating this knowledge would likely have an effect on future designs interventions.

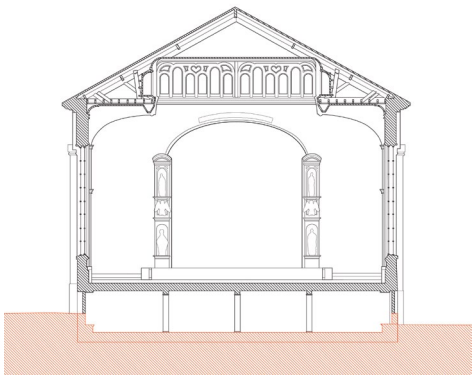
While developing this sequential section it became apparent that using an animation technique could further the intentions of the drawing. Animation and video are becoming increasingly popular methods of architectural representation, but they are not typically used for projects that involve existing conditions. However, these methods are especially useful for describing existing conditions since there are various time periods to consider.

Fig. 4.9.
Sequential Section / Old St. Patrick's Church. 2016. Drawn by author.

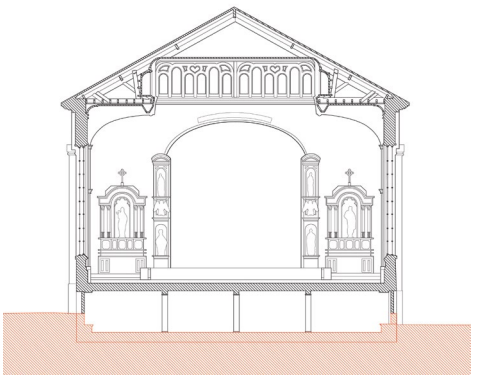
1835

1852

1856



1856



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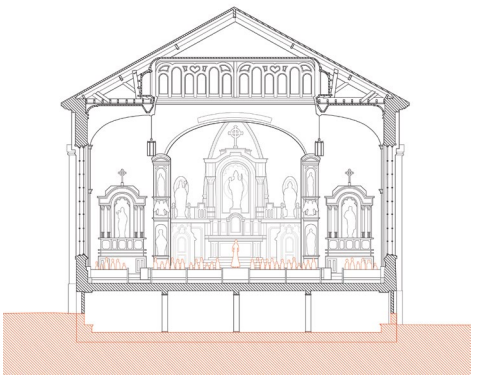

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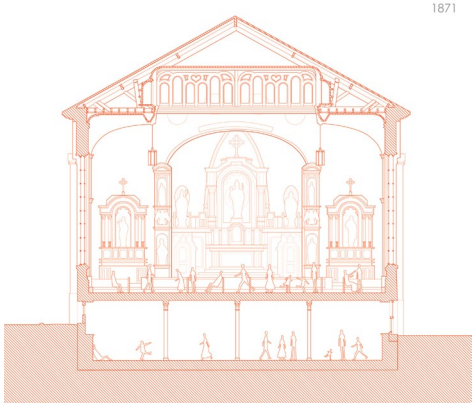
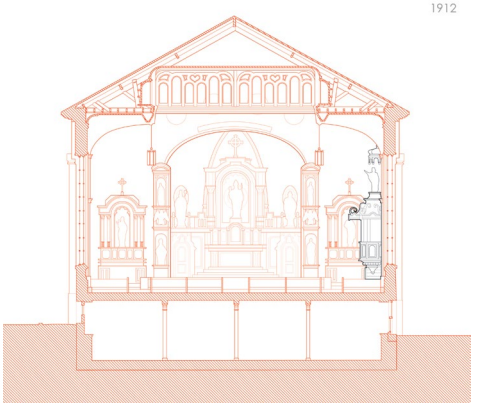


1912



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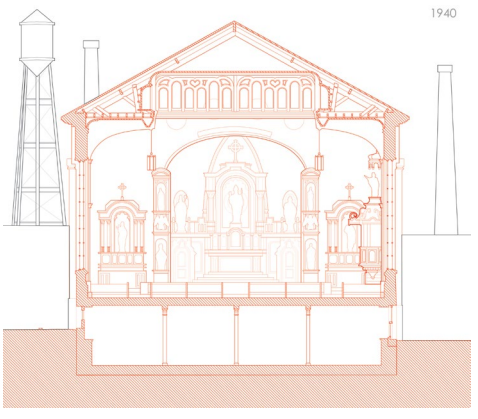

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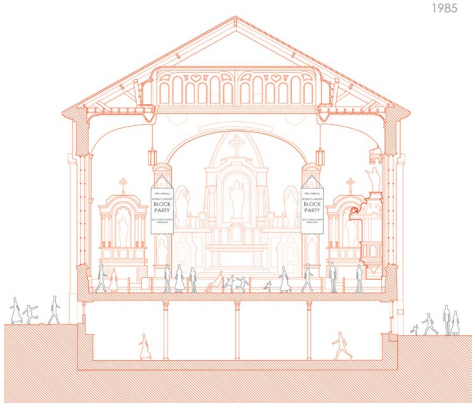

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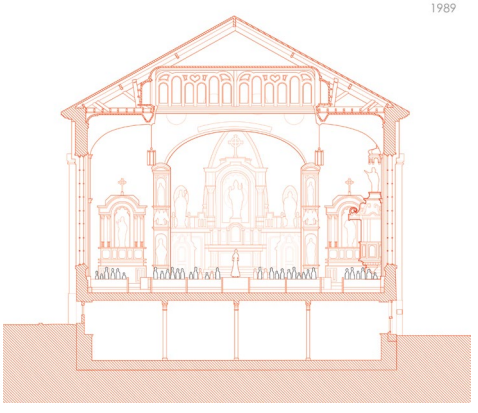

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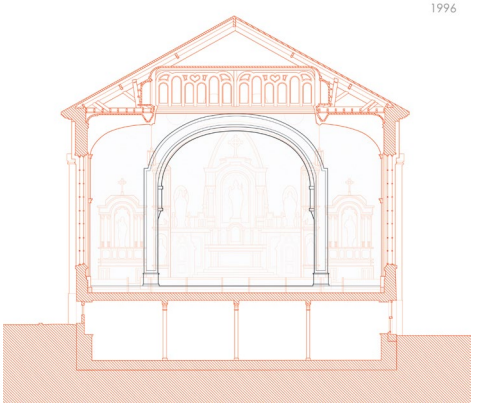

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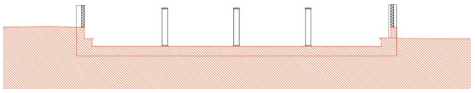
1855



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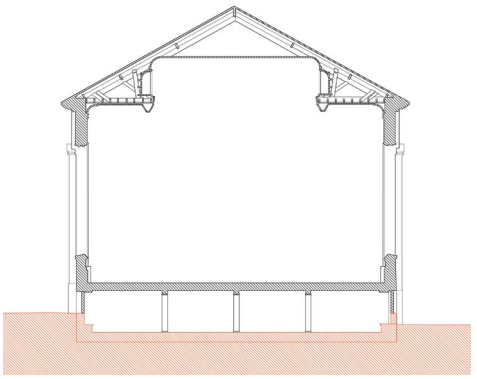

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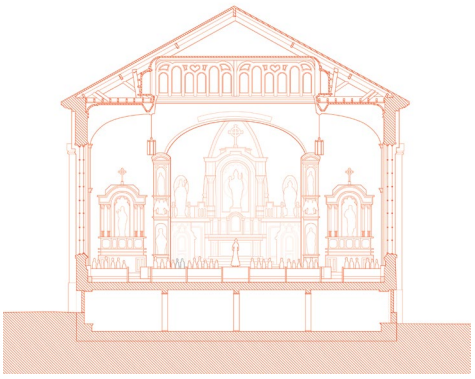

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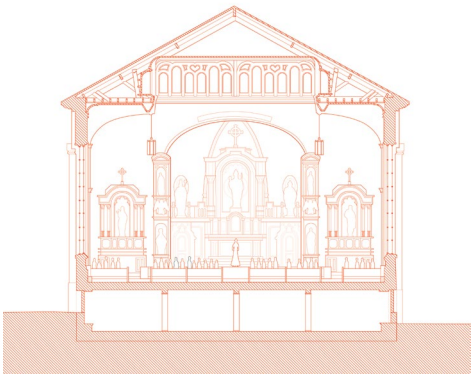

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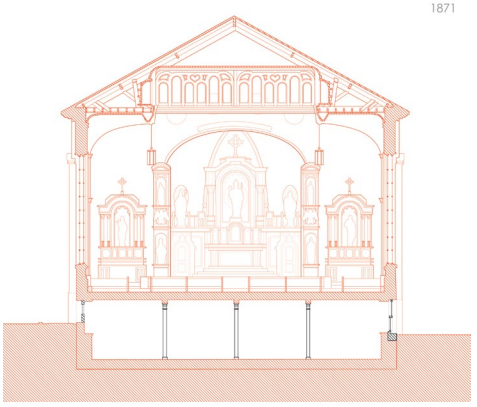
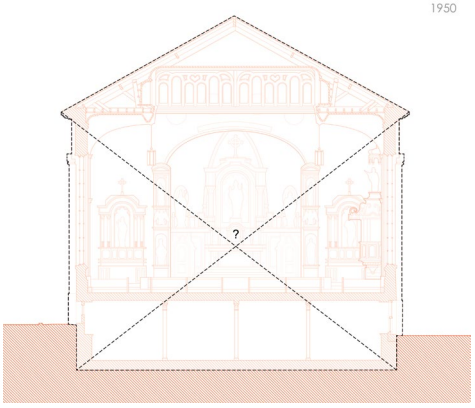


1950



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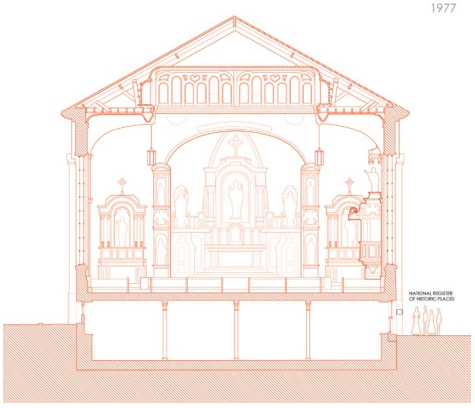

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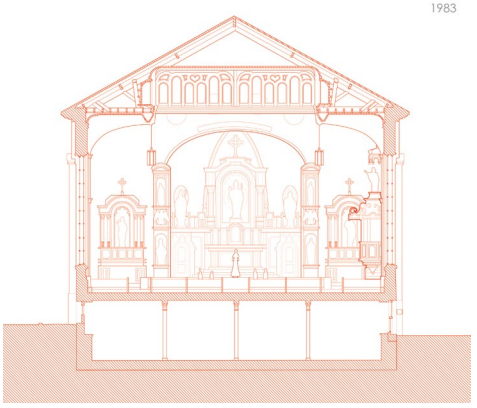

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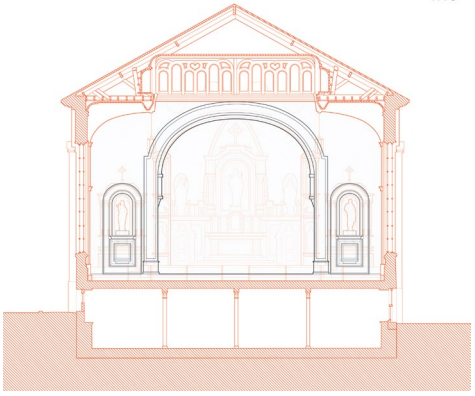

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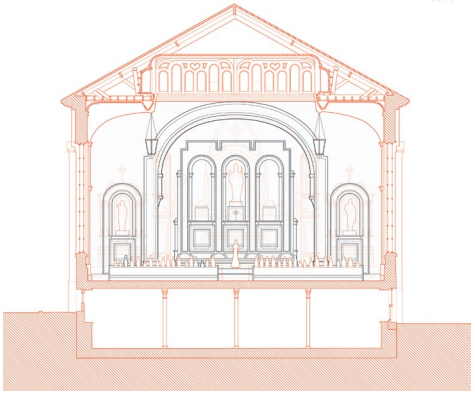

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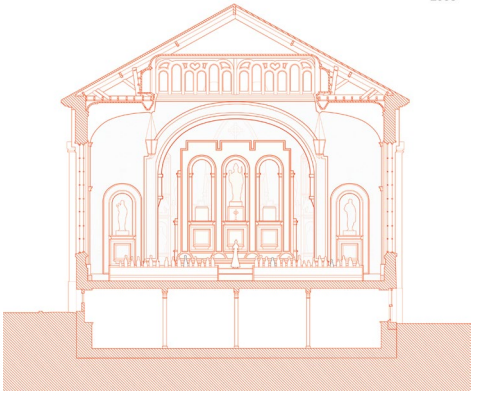

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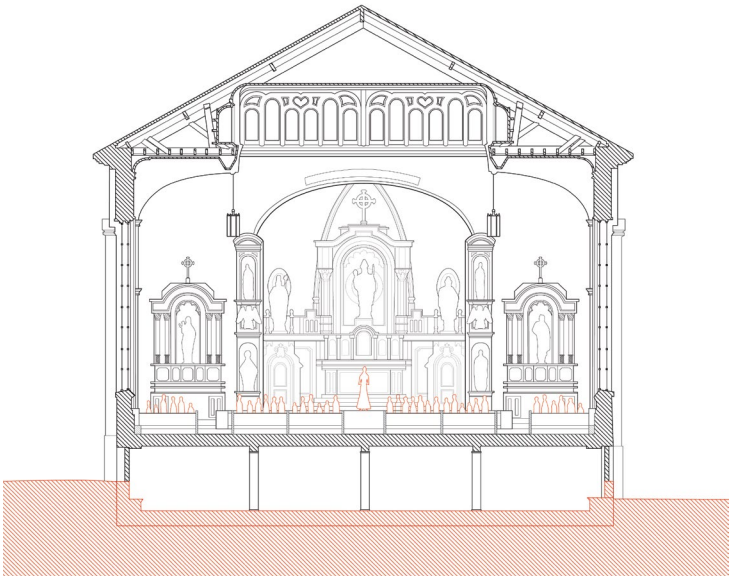
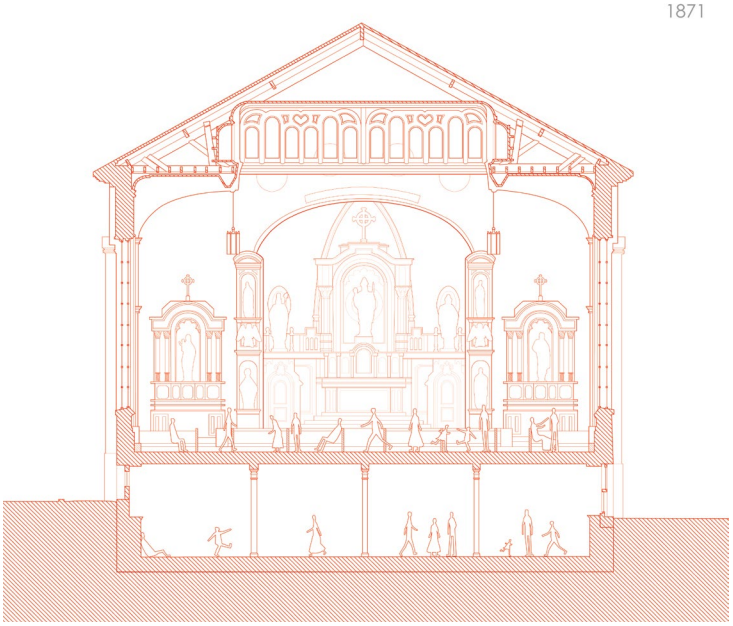
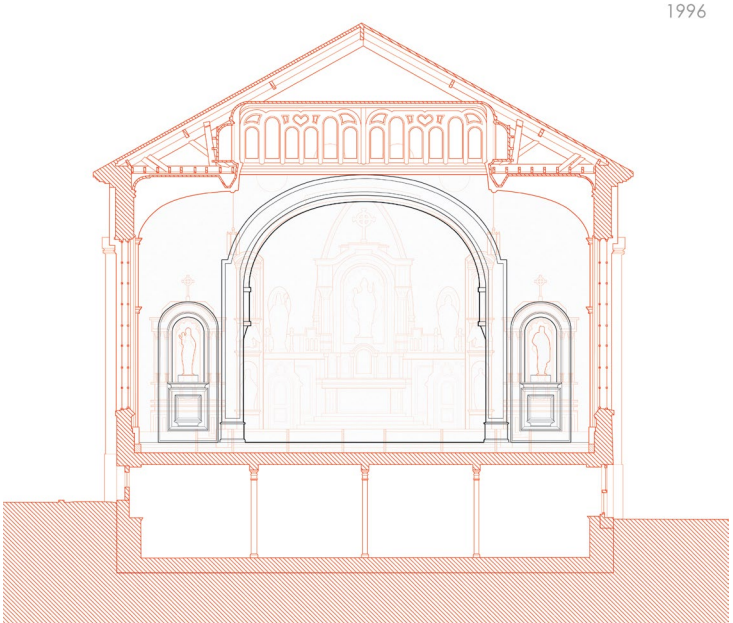


1871



1996



This animation sequence, represented here as stills, is able to go deeper into the history of Old St. Patrick's Church. The sequential section attempts to layer different time periods to illustrate more information about the Church's history, but it faces some limitations as a static image. Once the possibility of movement is added to a drawing, more detail can be represented.

Beginning with early residential settlement of the area, the church became the focal point of the neighborhood. During the Chicago fire of 1871 Old St. Patrick's church, one of the few structures in the area to survive, became a shelter for those displaced. Throughout the years the church and its neighborhood have undergone many changes. From dwindling to four registered church members in 1983, the church rebounded and underwent a major renovation in the 1990s.

By using an animation rather than a static drawing, the evolution of the building is able to be clearly shown. This method of representation fully embraces the sequential nature of architecture. Incorporating these ideas into the design process would allow for the history of a building to be understood as a continuum as opposed to the convention of strict divisions between existing conditions and new construction.

Animation could become a useful tool for architectural preservation practice. Creating an architectural history animation is a useful research and design aid for designers. The same animation can also help educate the public about a building. Representing a historic building as a timeline of various phases could help more experimental works of preservation to be accepted.

Opposite:
Fig. 4.10.
Sequential Animation / Old St. Patrick's Church. 2016. Drawn by author.

Fig. 4.11.
Sequential Animation / Old St. Patrick's Church. 2016. Drawn by author.
Top:
1857. Old St. Patrick's Church is dedicated on Christmas Day.
Middle:
1871. The church is one the few buildings in the area to survive the Chicago Fire of 1871. It was used to shelter those displaced by the catastrophe.
Bottom:
1998. Following a revival of the church and its neighborhood, the building undergoes a renovation by Booth Hansen Associates.

5
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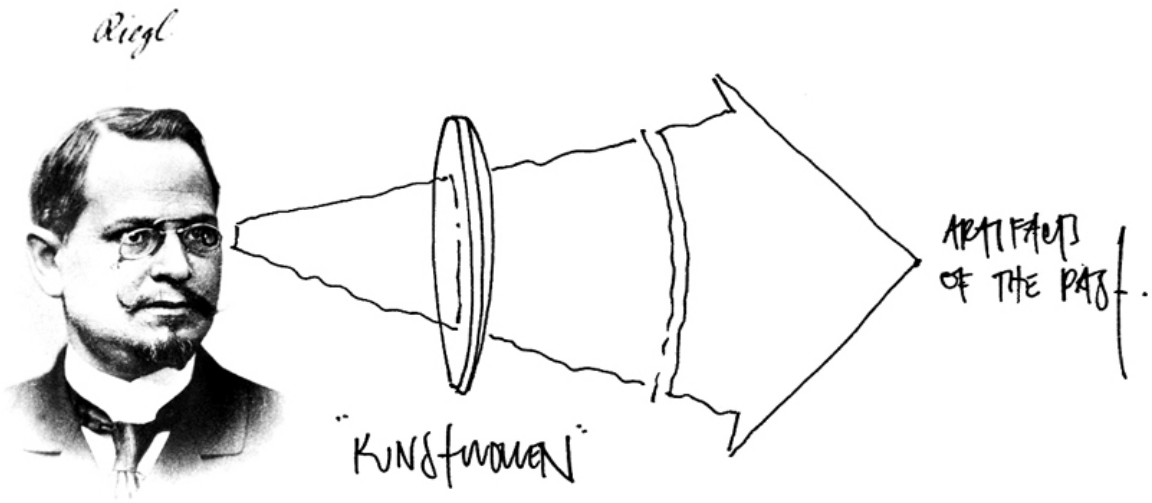


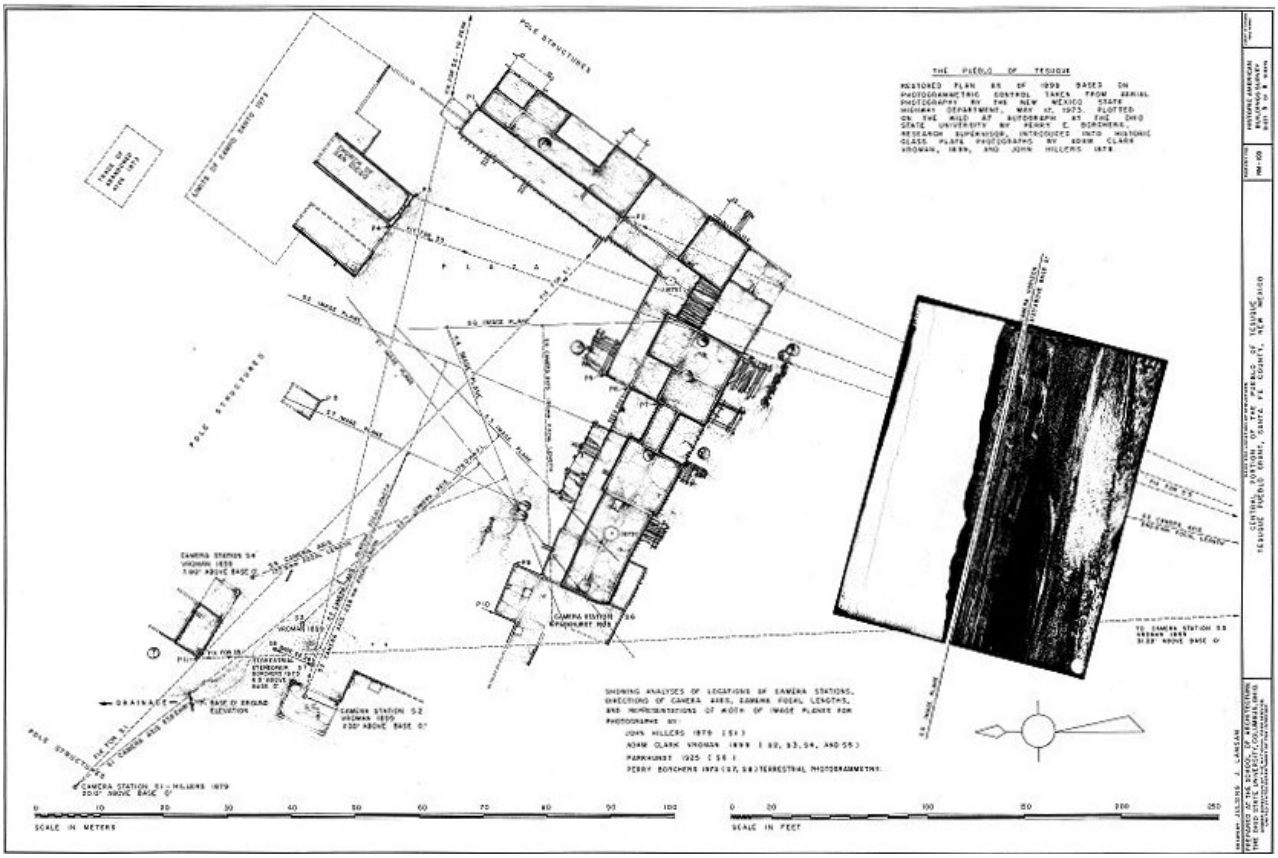
Aloïs Riegl was an Austrian art historian and scholar. Much of his work focused on public perception and the culture of preservation. He theorized about cultural tenancies to prize historic artifacts, often despite any functionality. His work is commonly seen as the beginning of modern preservation theory.

In 1901 Riegl published Spätrömische Kunstindustrie (Late Roman art industry) in which he explored his ideas of "Kunstwollen" through a study of late antique art[37]. Riegl's "kunstwollen" concept can be seen as "our immediate cultural belief system[38]" which filters our perception of artifacts from the past. Thus there is no inherently correct way to handle such artifacts, but rather it is heavily influenced by shifting cultural trends. Aloïs Riegl's work is highly relateable to architecture in understanding of perceptions around historic preservation.

Fig. 6.1.
Kunstwollen Diagram, ERA Architects, 2011.
ERA Architects blog post introduces some of Aloïs Reigl's theories with useful diagrams. This diagram describes how he theorized that "Kunstwollen."

37. "Riegl, Aloïs." Dictionary of Art Historians. dictionaryofarthistorians.org. Accessed May 3, 2016.

38. *Alois Riegl and the Modern Cult of the Monument*. 2011. ERA Architects: Blog. eraarch.ca. Accessed September 6, 2015.



The Historic American Building Survey was a 1933 initiative that set out to document historic structures of all scales and programs using regimented standards throughout the United States[40]. An impressive record of American architecture has been captured through these techniques. Over 500,000 HABS surveys have been archived in the Library of Congress[39].

These drawings are useful for many types of research because they are easily accessible and depict a wide range of structures across many locations. The graphic standards HABS implemented has created a unified collection, but in many cases results in a simplified view of the building. The clarity of these drawings can mask the age of the building as newer additions and even decay seem to appear cohesive in drawn elevation.

The combination of photography and measured drawing, as shown above, presents great possibilities for capturing the intricacies of existing conditions. Photogrammetirc mapping has been used to generate measured drawings, but it also has the capacity to instigate a new form of representation.

Fig. 6.2.
Plan Showing Location of Camera Stations, Pueblo of Tesuque, New Mexico
This plan from the HABS documentation of the Pueblo of Tesuque begins to illustrate some possibilities of combining photography with measured drawing through photogrammetric mapping.

39. "Historic American Buildings Survey (HABS)." Heritage Documentation Programs. nps.gov/hdp/habs. Accessed October 30, 2015.

Carlo Scarpa was born in Venice, Italy in 1906. He began his career as a professor of architectural drawing. Without formal training in architecture he was never able to be a fully recognized architect[40]. Despite his unusual path, Scarpa left a profound impact on the architectural field.

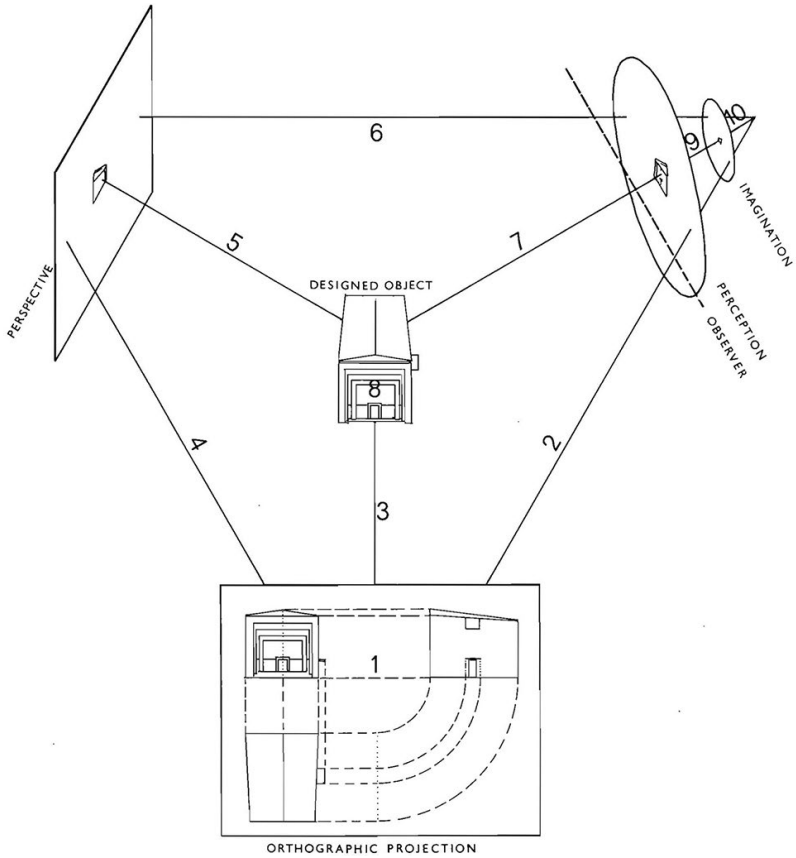
Scarpa's work is known for being heavily influenced by crafts trades. He took great care in detailing all of his projects. Much of his work, perhaps largely due to his locale in Venice, involved existing buildings. He used the concepts and materials of his own time in the context of historic architecture. He idolized Frank Llyod Wright, and his work shows Prairie Style influences[41].

The steel staircase in Scarpa's adaptation of Castelvecchio shows his material sensitivity. Although the style is drastically different than the historic Castelvecchio, Scarpa manages, through careful detailing and material selection, to unite contemporary and historic in a coherent whole.

Fig. 6.3.
Museo di Castelvecchio, 1950s-'70s, Venice, Italy.
In Carlo Scarpa's renowned Museo di Castelvecchio he juxtaposed an exposed steel stair against the existing masonry walls. This moment exemplifies his interest in revealing the layers of history inherent in an architectural work.

40. Carlo Scarpa." Famous Architects. famous-architects.org. Accessed May 2, 2016.

41. "Carlo Scarpa: Architect Biography." Modern Architecture. architect.architecture.sk. Accessed May 3, 2016.



Robin Evans was a British architect, teacher, and historian. His 1995 book *The Projective Cast: Architecture and Its Three Geometries*, published shortly after his death, illustrates his theories on the role of geometry in architecture[42]. His research shows that geometry and drawing techniques are not neutral elements in the design process, but rather that they actively influence the work they produce. Evans looks at the evolution of drafting conventions and their subsequent effect on architecture of the period. His study of technique effectively shows how technology, as any too, subtly manipulates its output.

This architectural theory is important to recognize in terms of historic architecture as well. The methods used to represent existing conditions influence the design process. Current conventions do not provide adequate information to advance this sector and thus many designs are stifled by their representational methods.

Fig. 6.4.
Diagram by Robin Evans.
In this diagram Robin Evans describes the various methods of perception and representation that apply to a designed object.

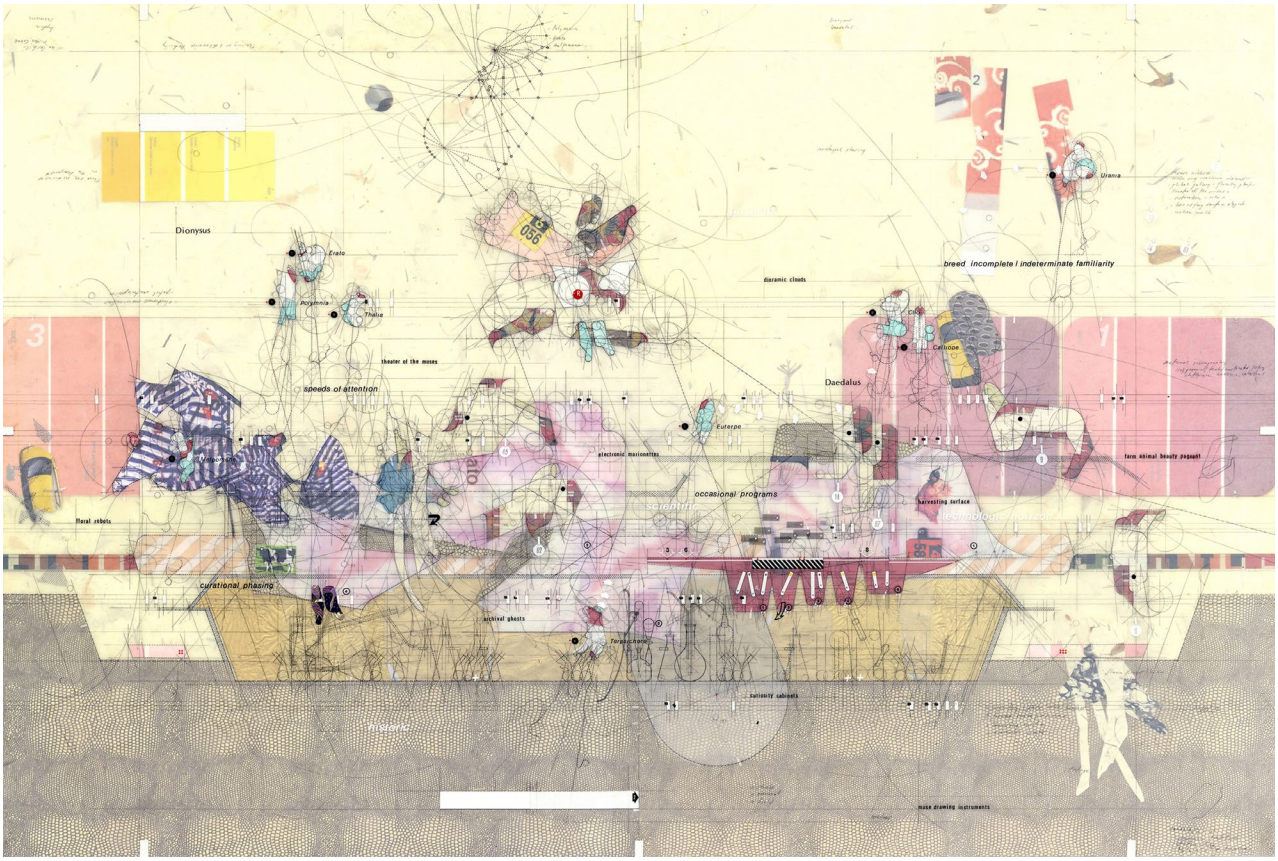
42. Evans, Robin. *The Projective Cast: Architecture and Its Three Geometries*. Cambridge, MA: MIT Press, 1995.

Peter Zumthor is a Swiss Architect who began his career as a cabinet maker[43]. He works under his own practice in rural Switzerland and is a professor at the Academy of Architecture, Universitá della Svizzera Italiana, Mendrisio. In 2009 he won the prestigious Pritzker Prize. Although he has completed only a few built projects, he has written extensively on architectural theory. Despite his seclusion, Peter Zumthor has reached critical acclaim. His work is minimalistic in aesthetic but highly detailed to produce specific effects. His use of materials as a major design element creates uniquely atmospheric environments.

One of Zumthor's recent projects was an adaptation St. Kolumba Church in 2007. Zumthor's dramatic addition to the church ruins serves to preserve the ruins and an addition for new museum functions. The renovation fearlessly combines contemporary design and materials with the ruins. The resulting design clearly delineates new from old, yet creates a unified whole.

Fig. 6.5.
Kolumba Museum, Peter Zumthor, 2007, Cologne, Germany.
Peter Zumthor's rennovation of the ruins of St. Kolumba Church dramatically combines contemporary and historic. Thoughtful use of lighting produces atmospheric effects.

43. "Peter Zumthor: Biography." 2009 Laureate. Pritzker Architecture Prize. pritzkerprize.com. Accessed May 3, 2016.



Perry Kulper is an Associate Professor of Architecture at Taubman College of Architecture and Urban Planning. He holds a M.Arch from Columbia University and previously taught at SCI-Arc and the University of Pennsylvania. His work is largely academic as he focuses on competition and writing work. The interests of his work, "include the roles of representation and methodologies in the production of architecture and in broadening the conceptual range by which architecture contributes to our cultural imagination[44]."

Working mainly through drawing, Kulper develops design by allowing a multitude of factors to exist simultaneously[45]. Allowing this freedom avoids the typical instinct to eliminate "extraneous" information and ideas early on. Kulper argues that these seemingly irrelevant elements can create connections and ideas that otherwise he would not have made. The theory behind his working drawings would greatly benefit projects using existing buildings because they would allowed for greater informational layering across time and locations.

Fig. 6.6.
Central California History Museum - Formal Section
This section demonstrates Perry Kulper's analytical techniques that utilize various methods of representation. His work focuses on layering many influences to consider them simultaneously, especially in the initial phases of design.

44. "Perry Kulper." Taubman College: Faculty Directory. taubmancollege.umich.edu. Accessed May 3, 2016.

45. "Perry Kulper - Revisited." dpr-barcelona. dprbcn.wordpress.com. Accessed May 3, 2016.

Jorge Otero-Pailos is an Associate Professor of Historic Preservation at Columbia University. He is the founder and editor of the journal *Future Anterior*, the first architectural journal devoted to experimental preservation. Otero-Pailos "works at the intersection of art, architecture, and preservation[46]." He has exhibited widely and has published several books on the subject of contemporary preservation practices.

In 2009 Jorge Otero-Pailos was invited to participate in the 53rd Venice Biennale. The resulting work, *The Ethics of Dust*, questions the common preservation practice of cleaning. By displaying the latex film used to remove the dust from an ancient Venician wall, Otero-Pailos illuminates the result of cleaning processes. He argues that dust is a significant element of historic architecture and should be considered in renovation processes[47]. Otero-Pailos's work has elevated preservation practice as an experimental and significant facet of the architectural field.

Fig. 6.7.
Jorge Otero-Pailos casting "The Ethics of Dust," 2008, Bolzano, Italy.
Here Jorge Otero-Pailos is seen peeling back a latex film used to remove dust from historic buildings. Through his work Otero-Pailos examines the role of cleaning in preservation practice.

46. "Biography." Jorge Otero-Pailos. www.oteropailos.com. Accessed May 3, 2016.

47. Raskin, Laura. *Jorge Otero-Pailos and the Ethics of Preservation*. January 2011. Places Journal. placesjournal.org. Accessed May 3, 2016.

Federica Goffi is a professor of architecture at the Azrieli School of Architecture & Urbanism. Her work focuses on time as an overlooked element of design[48]. She researches representation and architectural restoration projects.

Her 2013 dissertation, T*ime Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican* has been an invaluable resource in this research. Her study of Tiberio Alfarano's drawing of Old St. Peter's church focuses on representation of architectural work that involves an existing building[49]. The layering evident in this historic example illustrates the possibilities of hybrid architectural drawings to layer information and provide a deeper understanding of projects.

Fig. 6.8.
Federica Goffi's "Analog intercollage revealing a true effigy embedded in Alfarano's drawing" from her 2013 dissertation, *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican*. A study in the embedded symbolism of Tiberio Alfarano's drawing of Old St. Peter's church.

48. "Frederica Goffi: Biography." Azrieli School of Architecture & Urbanism. carleton.ca/architecture. Accessed May 3, 2016.

49. Goffi, Federica. *Time Matter(s): Invention and Re-Imagination in Built Conservation: The Unfinished Drawing and Building of St. Peter's, the Vatican*. Burlington, Vermont: Ashgate Publishing Limited, 2013.

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