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ABSTRACT

The reclamation and reuse of architectural elements is already an occurring and popular practice, especially in terms of green design. However, the technology of green design often greatly overshadows the history, theory, and connection behind reused elements, thus missing out on a potentially powerful aspect of design. This thesis delves into the following question: Is there cultural history and meaning embodied in reused architectural elements, and if so, how can we expound upon their significance in terms of design?

The architectural elements reclaimed from older buildings and then reused in other structures act as symbols of their respective cultures. An element’s age, composition, origin, purpose, patina, and appearance tell a story about the people who created and employed it. A reused item acts as an urban artifact that tells a story about a culture rather than just existing as a usable material.

As artifacts, these elements serve as links within the larger web of components that work to form and preserve the history of a culture. Ferdinand de Saussure’s theory of the sign helps with the understanding of how objects trigger mental associations, and reused elements act as Saussurian signifiers to provide a means of connection to memory, recollection, and culture. So why incorporate reused urban artifacts into building design? The practice provides unique opportunities in which individuals can immediately trigger an association to a building because some of its components are already connected to the people and their past. This allows observers to remain intimately attached to those items which represent them, thus increasing the richness and meaning of a structure built with meaningful elements.
An examination of reuse in architecture is developed through the analysis of existing examples of reuse from ancient times through today. Research is done to determine the difference between artifacts and materials, and how Saussure’s theory of the sign can relate to reclaimed elements that are the embodiment of time, history, and culture. These aspects of reuse are then explored through a design project sited in a neighborhood outside Panama City, Panama where there is extensive functional reuse of building materials. The project is then evaluated based on a conceptual framework model.

Through the research and investigations presented in this thesis, the idea of reused elements acting as cultural signifiers can be applied to building designs in which both locally reclaimed materials are available and there is a desire for cultural attachment to the building. The development of ties to reused elements is beneficial because it encourages integration of the building into its context on the community level and greatly improves the richness of green design.
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People often talk about hindsight in a regretful tone, wishing they had done something differently only after unfavorable events have unfolded. Too often we forget about hindsight when the results are positive, as we are caught up in the satisfaction of a job well done. Therefore, I look back in a favorable light and would like to credit those who enabled me to accomplish so many goals.

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I thank Professor James Kalsbeek, our instructor while on Study Abroad in Rome during Fall 2005 and thesis committee member. Without his willingness to let our class use the time abroad as a true semester of architectural study, I may have never discovered the intriguing spoglia of Santa Maria in Trastevere and other instances of reuse lining the streets of Rome. It was this project that triggered my interest and an additional two and a half years of research and investigation.

Many thanks to Professor Bret Peters who arranged the student trips to Panama City, Panama that allowed me to study reuse in that culture. Thanks to Professor Darla Lindberg of my thesis committee, and all the other architecture professors who have opened up the doors of opportunity to me while on my journey.

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To them, and all the others who contributed their encouragement, I say thank you.
CHAPTER 1

INTRODUCTION

1.1 Thesis Overview

Most architects will agree that responding to a building’s site and context are crucial for a successful design, but how often do designers inadvertently let the imbedded historic and cultural context slip away? In order to design buildings which are better ingrained within their context, we need to find ways to use materials connected to the past to establish ourselves better in the present and future.

This thesis examines architectural reclamation and the reuse of building materials, and how a culture’s history, memory, and values are ingrained within them, transforming them from virgin material to meaningful artifacts. Reused materials possess the potential for designers to be able to connect back to the past and establish their new building in time. Thomas Fisher asserted that:

Human beings, organizations, environments – all come laden with memories and associations of various kinds. Although this often makes the design process more difficult . . . memory and architecture in most projects remain closely intertwined. (285)

I am pursuing Fisher’s claim, and then exemplifying it by employing it in a strategy for design sited in Panama City, Panama, where the reuse of materials is a way of life in some of the lower income neighborhoods.

By investigating the importance of cultural ties that are developed through reuse, and developing strategies for their application, we improve upon the richness and contextual relationship a building has with its observers and site.
1.1.1 Signifier and Signified: The Conceptual Framework

In this thesis I am investigating the associations and relationships people form to building materials over time. In the study of semiotics, this correlation between object and meaning is the fundamental basis of a sign. Ferdinand de Saussure offers a two-part model of the sign, where the signifier is the form and the signified is the concept the form represents (67). The signifiers of signs can be in the form of words, sounds, colors, textures, actions, objects, etc., but they are meaningless until we apply a meaning to them. Therefore, saying the word C-A-T is only a mumbling of sounds (the signifier); it is not until we assign those sounds to the animal do they then represent a feline (the signified). In Saussure’s model of the sign (Figure 1), the two components of a sign are separate, yet interrelated by signification as shown by the arrows.

![Figure 1: Saussure’s model of the sign.](image)

In the case of this thesis, reused building materials act as signifiers of a larger signified cultural context. As seen in my conceptual framework model (Figure 2), when otherwise virgin building materials are used, exposed to human interaction, and infused with time, they are enhanced as an increasingly richer element signifying a greater amount of cultural history. The differences in value can be exemplified by distinguishing an ordinary brick from a brick of Monticello, or a common stone from a stone of the Baths of Caracalla. The model shows that with the increase of meaning within building materials over time, their role as cultural signifiers strengthens. As materials are reclaimed and then

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2
reused in new structures, it builds additional layers of meaning, while at the same time signifying a culture’s need or interest in reuse. This framework model is detailed further in Chapter 4.

\[\begin{array}{cc}
\text{SIGNIFIER} & \text{SIGNIFIED} \\
\text{Building Material} & \text{Reclamation} \\
\text{Use of Material} & \text{Need for Material} \\
\text{Material Selection} & \text{Implementation in Building} \\
\text{Culture/Society} & \text{Time & Human Interaction} \\
\end{array}\]

\[\begin{array}{cc}
\text{M E A N I N G} & \\
\text{Reuse} & \\
\text{Artifact} & \\
\text{Cultural Signifier} & \\
\end{array}\]

**Figure 2: The conceptual framework model.**

\[\begin{array}{cc}
\text{Building Material} & \text{Use of Material} \\
\text{Need for Material} & \text{Reclamation} \\
\text{Material Selection} & \text{Implementation in Building} \\
\text{Culture/Society} & \text{Time & Human Interaction} \\
\end{array}\]

1.1.2 Origins of the Study: Early Investigations on Reuse

The notion of “reuse” to contemporary architects relates to the rapidly growing green-building movement, where reclaimed materials are reused in new buildings often for LEED certification. However, reusing materials is not a new idea – this practice has been in existence for thousands of years. Aside from their practical use through the ages, these elements become part of the cycle of use, reclamation, and then reuse, which over time builds an embodied history. The piece transforms into an artifact to represent a fragment of a society’s history, and thus the reused item acts as a cultural signifier. I share the viewpoint of Eric Sandweiss when he explains that “human memory is both heightened and endangered in the urban landscape. Etched into their hardened fabrics of brick and stone, records of human interaction mark cities as sites of endurance as well as of change. It is perhaps this fact that distinguishes cities as cultural creations” (25).
During my semester of Study Abroad in Rome, Italy, I investigated the reuse that occurred there during the Medieval and Renaissance periods when Italian builders commonly reclaimed ancient Roman architectural elements to reuse in new buildings. These materials were known as “spoglia,” and after documenting the extensive use of spoglia at Santa Maria in Trastevere (Figure 3), the question remained: “What IS spoglia?” The remainder of the study focused on searching for the answer to this seemingly simple question. Could other things be considered spoglia, such as modern walls made from barn stone (Figure 4), the collage photography of Scott Mutter (Figure 5), or even film clips used within other films (Figure 6)? In each case, formerly used elements were reclaimed and used to assemble a new composition – just like Roman churches employing ancient columns to construct a new building.

A difference between each of these cases was the process in which reuse was employed. Because only the creator knew the design process used to create those examples, I conducted a few experiments of reuse to exemplify the different types and document the process in which the projects were perceived and executed.

Figure 3: Spoglia – reused ancient architectural elements in Santa Maria in Trastevere, Rome, Italy. (Author’s photograph)
Figure 4: Stone wall made of reclaimed barn stone at the Pennsylvania State University, designed by Phil Hawk. (Author’s photograph)

Figure 5: Collage photography by Scott Mutter. (Photography Museum)

Figure 6: A film clip used within another film. (Back to the Future)
The investigations that I conducted of reuse included experimentation of transforming used objects into items with new and different purposes. A project originating from Rome involved reemploying antique light-switch plates as frames for miniature drawings of scenes around Rome (*Figure 7*). Another later project involved the transformation of old suitcases from the 1950s into small coffee tables (*Figure 8*).

*Figure 7: Antique Italian light switch plate turned into a picture frame.*

*Figure 8: The suitcase coffee table.*

These design exercises provided me with direct insight into different ways that reuse occurs. In both examples, items were converted from their original purpose into a new form and purpose. However, I determined that the two projects differed in two main ways:

*Conceptualization:* In the case of the light switch plates, I discovered the items among other old miscellaneous electrical supplies at a flea market in Rome. Only after obtaining the items did creative exploration come into play which led to the design idea and execution. In the case of the coffee table, I needed a piece of furniture and a trip to a local secondhand store combined with some imagination led to the idea of transforming the old suitcase into the desired form.
Process: The picture frame represented a “one step” process of reuse, where the item was kept intact with no significant physical alteration – I simply used it for another purpose. The coffee table represented a “two step” process because it was physically modified in order to create the new item.

1.2 Key Notions: Definitions of Concepts

The definitions of the following terms are far reaching, but their most interesting and applicable parts are their association with the reuse of physical elements for new purposes. The precise narrowing of their definitions is necessary for the further study and application to reclaimed architectural elements.

1.2.1 Definition: Reuse

The definition of “reuse” is composed of the prefix “re-” meaning to do something again, and the root “use” meaning to engage something for a purpose. Therefore, to “reuse” something is to engage it for a purpose again.

Because all items are first “used” by nature (i.e., wood as tree trunks and rocks to support earth), everything could be considered “reused” when a human engages it for a purpose. This would mean nothing is “new.” Therefore, to differentiate between “new” and “reused” items, an item is considered “new” when a human first engages it, and “reused” once a human uses it again.

1.2.2 Definition: Spoglia

“Spoglia” is the Italian term commonly used to describe reused ancient Roman architectural elements, stemming from the Latin *spogliare* meaning to plunder. The definition of spoglia does not simply encompass any item that has been reused for
another purpose; instead, it applies to items that have undergone a rich transformation process turning it from a simple material to one which is highly valued and wholly integrated within its new context. Spogliated items have gone through the process of planning and designing with the intent of preserving the original material’s embedded history, patina, and inner substance. Items considered to be spoglia have a deeper meaning behind them than typically reused material because of this transformation process.

1.2.3 Definition: Cultural Signifier

A building’s elements act as signs of their context in physical form. If “all architecture has a collective value because of its relation to a place and a time,” then the building blocks act as smaller pieces of the puzzle, each representing a small component of cultural context (Van Reeth 115). The manner in which timber is cut and joined, the way stone blocks are cut and stacked, or the method of building and thatching a roof are symbols of a culture’s method for construction and represent a place and time. Those pieces that are selected and shaped by those methods are the physical evidence of that culture, and thus act as signifiers.

1.3 Architectural Reuse: Questions Investigated

The main questions for this study focus on how reused items act as cultural signifiers. Previous perceptions of the reuse of materials are confined to the appraised value of the tangible item, assessed by aesthetics, physical features, age, and rarity, but not assessed by its worth as a cultural artifact. The items called into question are those reclaimed from old buildings and reused in new or existing structures. This thesis investigates the following questions:
1. How is reuse a valid and viable design strategy for architecture?

2. Are reclaimed elements actually artifacts instead of just typical material, and does their preservation enable their history to carry on?

3. Is embodied culture in items transferred along with them when reclaimed and then reused, and if so, how do we ensure that knowledge of provenance is not lost through indifference?

4. Can reused elements become part of a larger web of components that work to form and preserve the history of a culture?

The answers to these questions are developed and help lead to a response through an architectural design program.

1.4 Application of Information: Relevance

The notion of reuse is an already occurring practice in architecture, especially in the rapidly growing trend of green design. However, green design has been dominated by technology and misses the history, theory, and connection behind reused materials. This thesis realizes that reused elements have deeper meanings behind them and investigates their use in a more highly developed manner. The investigation expands beyond the customary reasons people commonly reuse architectural elements, and gives additional reasons to employ reclaimed elements in structures and designs.

By reusing elements from a culture’s past in meaningful ways, the items act as cultural signifiers that people can relate and bond to. This develops positive, deep personal ties to the items and the building. It provides unique opportunities in which individuals can immediately draw attachment to a building because some of its components are already connected to the people through their history and culture.

Reusing materials allows people to remain sentimentally attached to those items which
represent them, thus increasing the richness and meaning of a structure built with significant elements.

The results of this investigation can be applied to designs in which a cultural attachment to the building is paramount, and its application is timely because of its relevance to the growing movement of green design.

1.5 Defining Boundaries: Limits of the Investigation

This study is limited to the reuse of architectural elements of building materials, ornament, fixtures, furnishings, and utilities. While the concept of reuse can encompass many aspects of today’s world, this investigation focuses only on items of an architectural nature, in both historic and modern terms.

A great deal of physical labor and time is required to find and carefully reclaim materials from existing buildings. As a result, the process and the materials themselves can become quite costly to those whose business is buying and selling reclaimed items. These commercial and marketable aspects of material reclamation are not factored into this study because different and fluctuating markets around the world would restrict the results from being all-encompassing. However, having a poor socioeconomic status is discussed, especially in terms of the residents of Panama City, Panama, because the status of the poor neighborhood influences the residents’ fundamental need for building materials.

Social theories about the relations of community, neighborhoods, and social groups are not a part of the investigation. The focus remains on the aspect of reuse and its representation of culture as a whole.
1.6 Research Intent: Objectives of Investigation

The broad goal of this study is to investigate a new approach of the interpretation of reused architectural elements. Currently, most people perceive these items through their assessed “green factor” or value of environmental friendliness, also taking into consideration the materials’ desirability, aesthetics, and physical features. Unfortunately, the theory, history, and cultural link behind the materials are forgotten in this process. This study is intended to make those factors more apparent and significant in reused material. The objectives of this thesis are:

1. To determine if reuse is a valid and viable design strategy for architecture.
2. To establish that reclaimed elements are not just material, but artifacts, and demonstrate that their preservation enables their respective history to carry on.
3. To identify how embodied culture in items is transferred along with them when reclaimed and then reused.
4. To recognize that reused elements are part of a larger web of components that represent and preserve the history of a culture.

1.7 Research Design: Composition

This study’s questions focus on the relationship of reused architectural elements to culture, a topic that evokes insight into the deeper meaning behind specific items. This type of subject lends itself to theoretical, rather than technical, investigation. Therefore, the design of the research process is suited to a qualitative approach. The work concentrates on the interpretation, representation, and associations of reclaimed objects, and thus does not attribute any formal quantitative evaluation.
The qualitative approach includes several key aspects in the progression of the study. These aspects include observation, documentation, field studies, design-build, historical and scholarly research, cultural studies, design development, and evaluations. While people accept the facts about reusing items for their aesthetic appeal, these qualitative elements of research provide the insight into the deeper meaning behind materials reclamation.

1.8 Research Paradigm: Methodology

The method of research involves several strategies. Initial techniques include observing and documenting existing reuse occurring throughout history. This work provides a foundation of personal experience to draw from, as well as information to refer back to as additional research is done. These observations in the field lead to experimentation with reclaimed items, as described in an earlier section. The design-build technique of the light switch plates made into frames and the suitcases transformed into coffee tables provide insight into the actual processes of reuse and the different manners in which reuse can happen.

Historical and cultural research helps explore the reasons behind the reuse observed firsthand. The circumstances under which materials are reused have an impact on the actual process of reuse, which ties into the placement of the culture within history. Likewise, the present situation of a culture, such as economic status, also influences reuse.

In response to these factors and research, an architectural project is presented as it develops into an architectural strategy for designing with reuse as a concept. The project, sited in Panama City, Panama, is used as a tool for evaluation to determine the success of reuse as an architectural concept in response to the cultural context.
1.9 Theory to Strategy: Who Can Use the Insights

The aforementioned research questions and objectives act as the main intent of this thesis, and the insights of this investigation are beneficial for architects and designers in the field of materials reclamation and reuse. By understanding the unique history each reused architectural element has to offer, reclaimed materials can serve a purpose beyond that of simply green intentions. This work supports the potential for designers to bring a building to life through the richness of reused elements and also to establish previously untapped connections between the building and its occupants.
CHAPTER 2

STUDIES OF ARCHITECTURAL RECLAMATION

2.1 Case Studies: Occurrences of Reuse

To reuse building materials or not has always been an option when considering the construction of a new structure, whether it is a farmer’s barn or the tallest skyscraper. The decision often comes down to a simple question: Which is easier to do? Would it be easier for the farmer to harvest, transport, and cut stones for a new barn, or to disassemble, clean, and transport stones from an old one? This question can usually be answered by doing some quick estimation of time and work, factoring in the age of the material and any relevant history. What if that old barn were on a battlefield and witnessed an important historical battle? Now those same stones become much more valuable, even though nothing is physically different than if they had not witnessed the battle.

Reusing building elements for both functional and nostalgic reasons has occurred countless times throughout history. And as that process continues, we are able to understand the cultures of the past through those preserved elements. Meanings, associations, and history have been connected to them, and those representations are carried with them through time.

2.1.1 Roman Medieval and Renaissance Reuse

Rome, Italy is the epitome of urban reuse, as its long enduring and layered history can be seen in both physical remains and built structures. Throughout the city, 500 year-old buildings use 2000 year old buildings as foundations, as the city is continually built
and then rebuilt upon its former self. At Piazza Navona, houses built during the 15th
century actually use ancient stadium seats from the 1st century as their foundations.
Even the geometrical shape of the piazza takes on the elongated shape of the former
Stadium of Domitian (*Figures 9 and 10*) (Moffett 365-367).

Figure 9: Ruins of Domitian’s Stadium under Piazza Navona. *(Dartmouth)*

Figure 10: Piazza Navona has taken the shape of the stadium, using its ancient stands as foundations. *(Palazzo Olivia)*

Between the eighth and the twelfth centuries, the popularity of using spoglia –
reused ancient architectural elements – grew tremendously. The abundance of otherwise
decaying building fragments from the once powerful city were virtually free for the taking,
despite unsuccessful laws created to protect the materials. During this period, everyone
from common citizens to the church employed these pieces in their architecture for
various reasons (Kinney 389). For some, using the relics of the former great empire may
have been a status symbol, which could have provided a link between oneself and the
greatness of Rome (*Figure 11*). For others, the beautiful marble of the public buildings
and temples was highly prized, especially because the quarries and shipping routes used
by the empire had closed permanently (Kinney 143). Not until the twelfth century did
stronger legislation push for the control of such artifacts.
Spoglia provided more than an implied association with power and aesthetic characteristics – it had deeper meaning behind it. The antiquated materials implied age, history, and wisdom to the buildings in which they were now incorporated. The elements had seen the rise and fall of a great empire and survived the ordeal as a physical remnant of that period in history. Spoglia suggested longevity and resilience to time, and to the Roman builders during the Medieval and Renaissance eras, the incorporation of materials with these connections was extremely desirable.

Figure 11: Reused Ancient Roman architectural element in Rome, Italy. Note the light above the column for highlighting the spoglia at night. (Author’s photograph)
2.1.2 Santa Maria in Trastevere, Rome, Italy

The finest example of reuse in Rome is the basilica of Santa Maria in Trastevere. As one of the oldest churches in the city, it has had many renovations throughout its 1,800-year history, with its current form being that of a rebuilding of the church in the twelfth century (Figure 12) (Webb 270). Many reclaimed elements were brought in from the ruins of Ancient Rome to construct the nave, which now provides a unique look at late medieval architecture employing elements already embedded with a millennia of history. In this case, spoglia was used because of political and aesthetic reasons, and harvesting new granite or marble in large sizes for columns became virtually impossible (Kinney 142). Because Rome had dried up most of the quarries and the travel routes were now broken, many of the columns inside Santa Maria came from the Baths of Caracalla on the opposite side of the city (Figure 13) (Kinney 382-387).

Figure 12: Santa Maria in Trastevere, drawn and rendered on a reused architectural board. (Author’s drawing)
Figure 13: Columns from the Baths of Caracalla reused in Santa Maria in Trastevere with “brackets” of ancient cornice work above them. Although all the elements are different, their uniform spacing and the architrave ties them all together. (Author’s photographs)
Smaller details and decoration inside the church also came from ancient sources around the city. The “brackets” of cornice work inside the basilica were reclaimed from several Ancient Roman temples, then sliced like bread into smaller pieces. The sections – although each one is different – form an even appearance because of their uniform spacing down the nave (*Figure 14*). Although the interior of the church is made up of columns and elements with varying sizes, shapes, and colors, the nave still flows together in harmony to create a highly aesthetic space (*Figure 15*).

![Figure 14: Reused cornice work. (Author’s drawings)](image1)

![Figure 15: The nave, although made up of varying elements, is uniform and harmonious as a whole. (Author’s photograph)](image2)

Much of the beautifully colored tile work that makes up the floor patterns are actually pieces of marble from the ancient temples. Columns were sliced into thin circular pieces, and smaller pieces of marble were broken into tiles to form beautiful geometric patterns. Ancient funerary slabs on the walls of the portico were added at the turn of the 18th century. It was a popular activity to reclaim such elements and use them as ornaments on exterior walls, much the same way that people today display memorabilia.
and old tools. Both examples are ways that people display items from the past in an effort to make some sort of connection back to their roots (Kinney 138-145).

Currently, reuse continues to be implemented at Santa Maria in Trastevere. A contemporary railing to the side of the nave actually uses pieces of Renaissance-era columns as supports (Figure 16). It is a detail that demonstrates that the people of Santa Maria in Trastevere are proud that their basilica includes many pieces from the past and they continue to employ spoglia in the same spirit.

![Figure 16: A contemporary railing still makes use of old Roman architectural elements. (Author's photographs)](image)

2.1.3 Panama City Reuse in the Original Spanish Settlement

Across the Atlantic Ocean, another city was employing reused elements in similar ways. Panama City was originally founded as a Spanish settlement in 1519 in an area northeast of the present day business district. When the coastal settlement was attacked, looted, and burned in 1671 by English pirates, the residents decided to rebuild in a more defensible area. This place was located on a small peninsula about five miles southwest of the original settlement (Focus on Panama).
There was an immense effort to rebuild their town after being so heavily devastated, and the residents also had a sense of urgency because they were so vulnerable to another attack. To expedite the process, much of the masonry was transported from the old town to the new site for construction. The stones had already been harvested and cut, so they needed only to be transported by land or sea to the new location a short distance away. Like the Romans, the Spanish settlers reused materials from a city in ruins to rebuild new structures, thus preserving pieces from the past.

Today, there are only a few stone ruins left from the original city, since most of the masonry had been hauled away for reuse (Figure 17). The act of rebuilding their devastated city from the very same stones is symbolic of their willingness to recover and continue on – only this time in a more secure location.

Figure 17: The remaining ruins of the original Spanish settlement of Panama City, Panama. (Author’s photograph)
2.1.4 Panama City Reuse in Present Day

In present day Panama City, instances of reuse can be seen throughout the city in all of its different neighborhoods. In its highly restored historic district, by city law, the building facades must often be preserved for their historic and aesthetic values. If a building is to be razed, it can only be gutted and the shell of the building must remain (Ministerio de Vivienda). This in itself is a form of reuse, but sometimes the facades are not necessarily reused for a new building. Sometimes facades are used for other purposes, for example, to be a secure enclosure for a small commercial parking lot (Figure 18).

Reuse also continues to be a way of life for many people in some of the poorer neighborhoods, like El Chorrillo. Because of the low socioeconomic status of many residents, reuse becomes a necessity since new materials are not always available or affordable. Homes in these low-income districts utilize discarded scraps such as wood planks, windows, and corrugated metal roofing for building repairs and maintenance to such an extent that they start to become part of the vernacular architecture of the immediate area (Figure 19). These “cheap fixes” using reclaimed material become reflective of the culture in El Chorrillo.

Figure 18: The shell of a building turned into a secure parking lot. (Author’s photograph)
2.2 Case Studies: Characteristic Forms of Reuse

There are many forms in which people reuse architectural elements in buildings, which depend upon their specific intention of architectural concept or their current situation for building. The five most common forms of reuse can be defined as: Aesthetic, Functional, Sentimental, Symbolic, and Conceptual. In most cases, instances of reclamation and reuse will fall into one of these types, and in some instances, the final form may bridge two or more forms of reuse, which only adds to the implied value and richness the materials possess.

2.2.1 Santa Maria in Trastevere: Aesthetic and Political

Santa Maria in Trastevere is a prime example in which reclaimed elements create a highly aesthetic space. At the time of its construction, there was a demand for beauty, and the only practical means for acquiring such material was to gather any available elements from the local deteriorating buildings of Ancient Rome. However, in the eleventh and twelfth centuries, the reuse of Rome’s architectural ornatus was strictly
regulated and protected by the rulers, but were the rulers the Pope and the church, or the senate and the state? Numerous conflicts between the two arose as to who could grant permission for reclamation of materials. Kinney notes, “In 1162, the senate clearly thought that it was its job, not the pope’s, to protect and control the *ornamenta* of Rome. Documents from the thirteenth and fourteenth centuries also attest senatorial jurisdiction” (390). But for three years during Pope Innocent II’s reign, 1140-1143, the senate did not exist, and it was a perfect opportunity for the Pope to establish his jurisdiction by rebuilding Santa Maria in Trastevere using reclaimed materials (Kinney 390). This strong political move would show the city that he was in control of the ancient architectural artifacts, thus standing up to the secular rule.

Quarries and shipping routes used by the Great Roman Empire had permanently closed, so new and precious materials were simply not available (Kinney 143). Thus Pope Innocent II’s political move to use highly aesthetic elements from ancient buildings was a perfect opportunity to design the church with the beautiful marbles of the once great empire. The highly detailed and geometrical patterns were meant to be in sharp contrast to the otherwise plainly colored residences of the common people who frequented the church, as well as to set this basilica apart from the rest (Kinney 390). The nave is visually symmetrical and well balanced vertically to provide an extremely attractive space for the eye. Some of the elements, such as the columns, serve both as structural support and for appearance, but other pieces, such as the brackets made of sliced cornice work, are strictly for aesthetic design. In her essay about the spoglia implemented in the church, Kinney observes:
The 104 marble modillions supporting the cornice of the nave entablature are actually pieces of seventeen smaller ancient cornices, cut up. The use of ornamented marbles in this position is unparalleled in other trabeated churches of the period, where plain, simply molded corbels were used. (390)

2.2.2 Panama City, Panama: Functional

A functional form of reuse occurred during the rebuilding of the 17th century Panamanian settlement. As previously detailed, when the original city was destroyed, there was great urgency to rebuild the city as quickly as possible. To expedite the process, much of the masonry was transported from the old settlement to the new building site. In this case, the reuse of materials was done out of necessity and for functional purposes. It can be deduced that unlike today, stonework was not chosen particularly for its aesthetic qualities, but rather for its durability, strength, and availability. Therefore, these pieces were used strictly for their functional characteristics.

Today in Panama City, the instances of reuse going on in the poorer neighborhoods are also mostly for functional purposes. Objects are chosen for their physical capabilities to help build a shelter or serve some other utilitarian purpose (Figure 20). Because of the need for material that can simply do a job and fix something quickly and efficiently, the history of that item is not usually considered. In terms of shelter, as in the poorer neighborhoods, the need for a structure to protect people and possessions takes precedent before the consideration of a material’s past. Functional reuse is the result of a poor socioeconomic status in El Chorrillo, thus acting as a signifier of the culture.
2.2.3 Lititz Elementary School: Sentimental

The Lititz Elementary School located in Lititz, Pennsylvania employs a sentimental form of reuse. The brownstone doorways from the previous school on the site were reclaimed and then used as an entrance to the new building’s cafeteria and gymnasium (Figures 21 and 22). When the construction of a new school had been proposed, many old-time residents of the town opposed it because they had sentimental ties to the original school built on the site in 1916. In an effort to ease some of those feelings and also to incorporate a unique feature into the new school, the designing firm, RLPS Architects, reused some of the old school’s elements, including the brownstone doorways (Krieder). This form of sentimental reuse allowed some connection back to the town’s former school for the residents, many who attended there as children. Although demolition of the old school was inevitable, reusing some of its elements prevented the complete physical erasure of the past and preserved people’s sentimental ties to the building.
Figure 21: A postcard of Lititz Elementary School from 1916, showing the original use of the brownstone doorways.  
(Postcards of Lititz, PA.)

Figure 22: Reused brownstone doorways from the old school allowed the preservation of sentimental ties.  
(Larry Lefever Photography)
2.2.4 USS New York: Symbolic

The symbolic reuse of building materials most often occurs in smaller, more intimate ways, but not so in the construction of the USS New York (Figure 23). The bow of this ship was made with 24 tons of scrap steel reclaimed from the fallen World Trade Center following the attacks of September 11, 2001 (USS New York). What is especially symbolic is that the fragments and wreckage from such an attack are now used to arm the military that fights that very enemy. This use of the wreckage evokes many feelings of resolve for those who know about the ship, and also instills a sense of additional pride for those sailors aboard the ship. New York Governor George Pataki said, “On September 11, 2001, our nation’s enemies brought their fight to New York. The USS New York will now bring the fight to our nation’s enemies well into the future” (USS New York). This symbolizes the will to bring the memories of the past into the future, and in this case it is done by the reuse of special scrap steel.

Figure 23: The USS New York, made of scrap steel from the World Trade Center – a symbolic form of reuse. (USS New York)
2.2.5 Town Hall of Utrecht, Netherlands: Conceptual

In Utrecht, Netherlands, Enric Miralles designed the new addition to the town hall using reclamation as a concept (Figure 24). The design responds to the collage-like qualities of the existing architecture in the area, and the town hall does not try to unify either itself or the surrounding buildings. Instead, it expresses those qualities of the collage by incorporating additional elements into it, making the town hall part of the surrounding language.

The town hall works to preserve old building elements and offer more variation so that it becomes integrated within its context. The facade is broken and fragmented, with pieces obviously missing from the window openings as if they were lost over time. Miralles’ entire concept deals with the implication of age, history, depth, and patina by using both actual and faux reused elements in his concept.

Figure 24: The Town Hall Extension in Utrecht, Netherlands, employing reuse as a concept. (Utrecht, Netherlands)
3.1 Material vs. Artifact: Theoretical Nuances

The root of a structure’s materiality has been embedded within the construction and form of a structure ever since humankind built the first shelter. In the beginning, the first elements chosen for the purpose of building were logically selected by their immediate availability, and then by their structural characteristics and ability to be built into the desired form. It was the most basic form of materiality: using items from the earth to erect relatively simple structures for shelter and protection from the climatic elements. But as cultures developed over time, and civilized towns and cities grew with the intelligence and skill of humankind, the symbolism and tones of materials also began to evoke significance, substance, and deeper interpretations.

Those essences are imbedded within that tangible material, providing a definition that can only be read through feeling and experience. For example, heavy, damp, gray concrete walls evoke much different emotions than the softness and warmth of a room clad in wood. While both of these materials accomplish the task of forming a room, they provide much different feelings to the occupant. Therefore, materials carry tangible associations with them, which are read solely through the interpretations of a person’s mind.

People also associate many different forms of value to material. The most pragmatic form is that of supply and demand, where the commercial cost of a material fluctuates with the amount available. However, value is also related to intangible connections to material, which could be either sentimental or historical. When an element
attains this value, its chances of a longer “life span” through reuse can increase. As materials are used for longer and longer periods of time, they bear witness to more and more events. They become a keeper of history as those events become ingrained within the material. Likewise, physical changes happen to the material from both the natural processes of the weather and from interaction from living things. This is the process through which materials become artifacts.

Materials are items freshly harvested for the use of building and have no relative history to them. Their embodied value is significantly lower than the artifact, which has a much richer value. An artifact defines a material that has values beyond that of an otherwise nondescript piece of material. Artifacts contain intangible values imbedded within them that are only evident through the experience, recollection, or associations of people.

3.1.1 Early Architectural Material

Vitruvius Pollio devoted one out of his ten books in *De Architectura* to material alone. Vitruvius cites the first use of material for shelter as being directly from things at hand and easy to harvest, “some by making arbours with the boughs of trees, some by excavating caves in the mountains, and others in imitation of the nests and habitations of swallows, by making dwellings of twigs interwoven and covered with mud or clay” (Pollio).

Vitruvius explains that these simple shelters soon developed due to the nature of humankind’s desire for improvement; simple huts were enhanced from observing the techniques of others and utilizing increasingly refined materials (Pollio). He speaks of the advancement from boughs to branches, sticks to stakes, and logs to lumber. Still, these simple, natural materials hold no relative value and are used purely for the functional
purpose of shelter. Little craft or extra skill has yet to be applied to the materials to give them additional value or connection to the individual. They are newly harvested from the land, and have no previous history attached to them (Figure 25).

Vitruvius continues with a discussion of technical characteristics of varying materials, providing the first organized database of information for architects. He presents selection processes for wood and masonry that detail their behavior in structures, and relates their specific uses to the architect. However, his information does not extend beyond that of the immediate structure to examine how time will influence the value of those materials.

![Figure 25: Primitive huts built from new material with relatively no historical value. (Vitruvius)](image)

3.1.2 Time and Material

Today many will agree that any physical materials used two millennia ago during Vitruvius’ day would be much more valued now than during his time. These elements are now preserved in museums and collections, and are highly prized pieces from the past. The only major ingredient added to these materials to make them so much more special is the factor of time.
In *Constancy and Change in Architecture*, co-authored by Malcolm Quantrill and Bruce Webb, one chapter is devoted to how time transforms a building and its material components. The authors present a desire for the whole building – form, material, and all – to acknowledge and respond to the effects of time. They ask if there is “an architecture that doesn’t try to take charge of time, but makes peace with it – open to both past and future” (Quantrill and Webb 39-40). An example that the authors give of this statement is the 1563 painting of the Tower of Babel by Peter Bruegel (*Figure 26*), reasoning that the tower is “a paradigm of an architecture of prideful self-assertion, but also of human impotence. Even as the building goes on, the building becomes ruinous, reverting to the landscape” (Quantrill and Webb 39). This is an interpretation of a building that is moving forward and backward at the same time – its structural materials are returning to their origin (the earth) while still being erected, seemingly to make no progress. It deals with the cycles of time going around and around. The building’s materials are brought forth from the earth, used in construction, then fall into ruin and become part of the earth once more. It is a continuous, never ending cycle of material from earth, to building, to ruin, and back to earth.

*Figure 26: Bruegel’s Tower of Babel.* *(Tower of Babel)*
To convey this notion of time and meaning in materials, George Kubler points out in his book, *The Shape of Time*, that an entity with special components must be contrived. He describes that “every thinking person will accept it as a truism that no meaning can be conveyed without form. Every meaning requires support, or a vehicle, or a holder” (Kubler xii). In order to express that notion of peace with the past which Quantrill and Webb describe, there must be a carrier.

Kubler, however, differs from the thoughts of Quantrill and Webb because he believes that historical events are signals which people reproduce or carry with them, but he does not specify if nonliving things are able to do the same (Kubler 20-21). So can nonliving pieces of matter also carry history with them? If history is a signal of time, and time comprises meaning, then meaning (and thus history) can be conveyed through form. This equation then tells us that a message could be carried through materials.

Kevin Lynch writes in his book, *What Time is This Place*, that “it is the signs of the past which we connect with our own continuity as a living person” (61). Here he begins to examine the interrelations of people with the items that represent their past, as he feels that by interacting with those elements, it provides a sense of place in time for them. This is the common theme throughout Lynch’s book: how people actually perceive time and the ways it places people in it. He continues to make relations between objects from the past which have been brought forth into present day for a purpose, and remarks that “the management of change and the active use of remains for present and future purpose are preferable to an inflexible reverence for a sacrosanct past. The past must be chosen and changed, made in the present. Choosing a past helps us to construct a future” (Lynch 64).
Therefore, a certain connection is established between people and items from the past that embody the elements of that time. This serves as a contrast to typical materials used in the present, which contain no connections to the past and do not embody elements or components from history (Figure 27).

Figure 27: Used wood has a history behind it and a story that people can connect to . . . (Montana Originals)

. . . while the new materials' story is not yet written and has little embodied meaning. (Rolaine Enterprises)

3.1.3 Artifact: Material Embodied with the Past

The “active use of remains” Lynch mentions could be considered as giving new life to material from the past (64). In other words, Lynch is explaining that physical pieces from the past (what he calls “remains”) can be brought forth into the present day and serve as carriers of meaning – which is exactly what Kubler meant when he stated, “Every meaning requires support, or a vehicle, or a holder” (xii). The vehicle is the material brought forth through time, and supports a historical element or meaning within it. These elements, when acting as a carrier, now make the transformation from standard materials into valued artifacts.

Both the uses and the places that could respond to those pieces from the past are discussed in Robert Newcomb’s 1979 book, Planning the Past. In a chapter of this text relevant to the subject of past elements being brought forth for the purpose of carrying
meaning, he describes historical remains and their influence on the urban fabric, from social, spatial, and conceptual standpoints. He emphasizes that these elements can greatly increase the experiences that the spaces have to offer. Newcomb observes this notion by applying it to planners wanting to escalate their urban areas as he states:

[The] recycling of historic relics within the urban context greatly interests planners and presents economic opportunities to modern cities. Threats to the urban patrimony originate with the processes of chance which characterize the modern city, and urban inhabitants need to be on guard to ensure that useful relics from the past are not sacrificed needlessly in the interests of urban renewal. (159)

Through this, Newcomb carefully outlines that “relics” or artifacts can most certainly have a positive influence upon the urban context when factored into the designs of planners. But in what way are artifacts used to create this sort of urban opportunity? Can they be implemented to establish an identifiable point at which people cannot just convene, but also a point that would draw culture and community from the surrounding urban fabric? Or are urban artifacts larger nodes of influence that are not necessarily defined by a specific material or item?

3.1.4 Urban Artifacts

These urban artifacts are the subjects of study by Aldo Rossi, who examined this notion in his 1966 work, *Architecture of the City*. Rossi’s underlying thesis was that the architecture of the city is the fundamental artifact of human culture and the repository of our collective memory. His definition of the artifact expands a little beyond it being simply a material enhanced with historical or personal value; instead, it takes on the whole form of a structure. Rossi explains:
Where does the individuality of such a building begin and on what does it depend? Clearly it depends more on its form than on its material, even if the latter plays a substantial role; but it also depends on being a complicated entity which has developed in both space and time. We realize, for example, that if the architectural construction we are examining had been built recently, it would not have the same value. In that case the architecture in itself would be subject to judgment, and we could discuss its style and its form; but it would not yet present us with that richness of its own history which is characteristic of an urban artifact. (29)

Rossi’s breakdown of the urban artifact’s composition can then be simplified into the following equation:

\[
\left( B + U + I + L + D + I + N + G \right) + \left( \text{Human Interaction} \right) \times \text{(Time)} = \text{VALUE}
\]

The value stemming from the building comes directly from its historical characteristics, and helping to make the building an artifact, both in terms of form and material.

Each artifact has a different story to tell. Over time, as a building’s form is adapted to numerous and different purposes and functions, the history becomes even richer. Every modification or event upon the urban artifact increases its historical value. Typical materials do not have this kind of regard behind them – artifacts, however, are characterized by their own history and form. Each artifact embraces its own quality and uniqueness that has been derived from time (Rossi 29-32).
Therefore, artifacts are valued because they have withstood the passage of time and also act as witnesses to the events of time. While an event in history may have actually physically occurred only for a moment, the witness to the event can live on and preserve that moment, whether it is an animate object or not, thus becoming an artifact of the event. It serves as a tangible representation of both history and development (Figure 28).

However, a single artifact may bring about numerous different types of reactions to different people. Any artifact – urban or not – is “read” by people differently, and even if one wanted to describe his or her reaction to it, those attempts are merely representations of the true experience. “Thus, the concept that one person has of an urban artifact will always differ from that of someone who ‘lives’ that same artifact” (Rossi 33).

![Figure 28: The aged, urban artifact is rich with history and value. (Monnikenwerk)](image)

### 3.1.5 Artifacts over Material

Rossi’s conception of the urban artifact puts much value on those elements over the ordinary material that has no history embedded within it. He sees that they define the city and give it a true character and richness that would otherwise not be present in a “new” city.
Dale Kinney supports the value of the artifact in a 2001 journal article about Roman architectural spoglia. What they reused was not simply material, but artifacts from times past.

The artifacts she describes are the elements and materials that embody the history of Ancient Rome, which act to preserve that period. She notes that when builders would reuse these pieces, there is “the possibility that spoglia might also be indicators of buildings that are ‘strong’ . . . i.e., whose relationship to Roman precedents involved self-preserving repulsion as well as attraction” (Kinney 140).

This supports Rossi’s notion that artifacts are what make cities rich with culture, history, and achievements. As above, Kinney goes to say that the use of spoglia actually make the building strong. It works to make the building into a solid mass of resilience and durability, because these “carriers,” as Kubler dubbed them, must withstand the ravages of time (xii).

Despite the extreme value of an artifact for its historical qualities, one cannot forget that the value of the material itself can be involuntarily increased because of its availability. If a material is no longer accessible, then the pieces that do remain will continue to be used and thus their history will continue. Kinney describes these values as they are associated with ancient Roman spoglia:

In many cases it is probably anachronistic to privilege the quality of antiquity over the value of the material, even if antiquity is inescapable. A column shaft of Lucellean marble was timeless in its value, like a diamond; nevertheless antiquity was entailed in it because there was no modern production of the stone. (146)
This puts the artifact in a predicament because the shear availability of the material is what made it into an artifact. Should new materials have been procurable, the old material could have been replaced. Thus, it might not have achieved status as an artifact, yet the circumstances of history enabled it to be preserved and now viewed as such (Figure 29).

Figure 29: Because new columns and architraves were not available when Santa Maria in Trastevere was built, much richer spoglia was used. Had new material been employed, the ancient artifacts that were ingrained with so much history could have been lost. (Author’s photograph)
3.1.6 Summary

From the beginning, material has been a one-way tool to accomplish a goal, primarily in building. From its harvesting and then application into a structure, material embodies no history or sense of connection to the individual using the material. The two entities are separate beings, and share no common thread between them. They are strictly the user and the used.

But once that material is in place, it begins to develop a story all of its own. The weather wears it, sunlight bleaches it, people blemish it, and it bears witness to events surrounding it. The material slowly goes through a metamorphosis into being an artifact by adding one ingredient: time.

The artifact contains value embedded within it, and a certain connection is established between people and the artifact, linking individuals to the embodied elements of time within the artifact. This serves as a contrast to typical materials used in the present, which contain few connections to the past and do not embody elements or components from history. The value of an artifact is not limited to its materialistic value; instead, it also includes the rich history embodied within it.

The issue is not whether a material or an artifact is necessarily better, either standing alone or in an architectural context. What is more important is that the user of such terms knows their differences and similarities in order to be clear when talking about building components. While the materials of a building may structurally hold it together and provide an aesthetic, they lack the deep embodiment of history that artifacts possess. Those artifacts only achieve that value through the passage time, an ingredient that cannot be truly duplicated or falsified. An artifact is purely a unique building component, and unlike a material, it is specific to time, location, and events, all of which come together to form a deeply valued element.
3.2 Semiotics: Artifacts and Reuse

Saussure identifies signs as having two parts, the signifier and the signified, and they can be found in numerous forms. While this theory has served as the foundation for the study of signs, other theorists have modified his ideas or contrived their own reactions to his writings. So which principles can be applied to reclaimed urban artifacts used within buildings? If “any building is constantly sending out ‘messages’ . . . which can be received by one of the senses and ‘decoded’ according to the observer’s personal experience,” then all of the building’s individual components must also send out similar messages, or signs (Broadbent 127).

While modern functionalists attempted to break away from the implications of signs on buildings, postmodernists observe that the functionalists’ intentions actually only reinforced the theories of meaning. Roland Barthes’ overall theme in his essay, “Semiology and Urbanism,” was that even if functionalists try to remove the language of signs from the urban landscape, cities will continue to signify. There is no way to remove associations – as long as there is an item or notion, it must signify to validate its existence. This applies to all things, including languages and buildings.

In A Theory of Semiotics, Umberto Eco takes a post-structuralist view of signs. He critiques the notion of absolute truths behind all worldly objects, and claims that all items or concepts spur varied meanings in the minds of different people. Because of this, the same object can signify countless meanings, depending upon the person and his or her respective culture.

By examining reclaimed architectural elements as signifiers and incorporating them into the conceptual framework model, we can see how reused artifacts embody meaning and enhance the signification of a building.
3.2.1 Analysis of Signs

Saussure’s goal of his work on the theory of signification was to demonstrate how any item – a word, picture, object, smell, or building – makes us think of something else. It is a system of recognition and identification that allows us to communicate information, sensations, and thoughts. This most basic concept was originally introduced by Vitruvius, who described it in his section on the education of the architect within *The Ten Books of Architecture*. Vitruvius wrote that “in all matters, but particularly in architecture, there are these two points: the thing signified, and that which gives it its significance. That which is signified is the subject of which we may be speaking; and that which gives significance is a demonstration on scientific principles.”

The theories of Vitruvius and Saussure are simple, straightforward, and clear. Subsequent architectural writers later expounded upon their work; however, many of them attempted to make this seemingly basic principle into a cluttered and less streamlined system. All their works invariably revert to the basics of Vitruvius and Saussure.

Charles Peirce was a contemporary of Saussure who differed on the view of having just two components to a sign. Peirce defines them as:

An *icon* is a sign which refers to the object that it denotes by virtue of certain characters of its own . . . A *symbol* is a sign which refers to the object that it denotes by virtue of law . . . which operates to cause that symbol to be interpreted as referring to that object . . . An *index* is a sign, or representation which refers to its object . . . because it is in dynamical (including spatial) connection, both with the individual object on the one hand and with the senses or memory of the person for whom it acts as a sign. (qtd. in Broadbent 136)
So, in plain terms, his *icon* is an object that is similar to another, and thus can represent it, such as maps and photographs. This means a building as an icon could be the drawings or renderings of such, but the built structure itself can remind us of something else. Broadbent notes that: “Unfortunately though, Peirce’s definitions of icons are so ambiguous that a generation of semioticians is still concerned with trying to unravel what he actually meant by an iconic sign” (136). Peirce’s *symbol* says that the specific quality of the relationship between the symbol and the object it represents has to be learned by the individual. This is similar to Saussure’s sign in which the relationship or meaning between the signifier and the signified must be learned. A building could also be a symbol, like a church is a symbol of religion. The *index* term is a sign that indicates some sort of object in terms of its physical presence or relationship. This is like a directional arrow pointing which way to go, or in terms of a building, a museum with a set path to view the exhibits. Often, this is related to “functional” buildings that are intended to be “indices.” Here a set path of travel is obvious, such as a manufacturing plant in which streamlining and a necessary plan of assembly is at its essence (Broadbent 136).

The functionalist movement, particularly during the 1960s, was represented by simple forms, plain colors, the removal of ornament, and the elimination of any form of reference to another theme, idea, or style that may provide meaning to the structure. Not until 1967 when George Baird wrote the “La Dimension Amoureuse” about the theory of signs as applied to architecture, did someone formally oppose functionalism. The style had been with us for so long that many considered it to be the “right” answer for a building. But was it so? Did people truly demand or desire buildings with no meaning, and even if they did, was it the “right” thing to design as architects? I follow Broadbent’s answer to that question as he states:
Architects such as Le Corbusier, Gropius, and Mies, not to mention historians such as Giedion, Pevsner, and Richards, had told us most forcibly that architecture shouldn’t be a matter of mere superficial styling, applied cosmetically to the outside of buildings . . . [functionalist buildings] prove to be some of the worst buildings in history in terms of fitness for purpose, solar overheating, heat loss, noise penetration, costs in use, and so on. It so happens that hardly any of the pioneering “functionalist” buildings of the 20s actually remain in their original state. Those which do remain have mostly been altered to fit them for continued habitation, and whilst Le Corbusier’s Maison la Roche and his Villa Savoye at Poissy have been restored . . . it is so they could be used as museums! (125)

The functionalist approach of anti-meaning in buildings ultimately collapses in on itself. In an attempt for a design to have no meaning, it still has a meaning, which is to have “no meaning.” No matter how plain the walls or transparent the glass, it still conjures up relationships within the observer’s mind. Even Pevsner states, “Every building creates associations in the mind of the beholder, whether the architect wanted it or not” (352). Broadbent continues, “There is no getting away from it; just as Chartres Cathedral carries meanings, so does the meanest garden shed. That is why the functionalists’ dream of a machine-like and meaning-free architecture never was anything more than a dream” (125).

So if all buildings already carry meaning, why not develop that to create an extremely meaningful building? Buildings are not meant to be a mathematical computation, in which, if fed the correct data, it will produce a habitable result. People are not rigid math forms – they need connection to things on an internal level (Broadbent
130). By incorporating many rich signifiers into a structure, the result will have powerful signified meaning to people, as Saussure would agree.

But what do people see in signified messages? Saussure’s original theory of signs was that the signifier and the signified were united by a social contract, so that words – both spoken and on paper – will always mean the same thing. A person cannot simply invent a word and expect others to know what it means – there is a social agreement that the word “cat” means a furry feline animal. But Charles Ogden and Ivor Richards claim that “it is the actual conjunction of a form and a meaning which give rise to the word; that is, meaning itself is considered as inherent to the word” (Agrest and Gandelsonas 116). So they say that the meaning is found within the word, which is opposite of what Saussure believed, because he thought that a word had no inherent meaning in itself. Barthes agrees with the Saussurian claim as he remarked, “the association of sound and representation is the outcome of collective training” (417). The object did not pick the word; we as a society have agreed that a certain combination of letters or sounds represents that object.

In terms of language, we can agree that words, the signifiers, specify socially agreed upon objects, the signified. This theory can be applied to architectural reuse if we examine structures and their components as a language in built form that conveys meaning. So building elements take the place of words as the signifiers, which then convey the signified. Then a question arises about social contracts: How conventional is architecture? In language, certain words mean specific things, but in architecture this is not so. Every individual has different imagery when experiencing a building. Kate Nesbitt views postmodernism as a revival of meaning in architecture – which is good – but the idea that this led to architecture being a “linguistic analogy” or a “visual language” is limited (110). While it does convey meaning similar to language, it is not meaning that
has an agreed upon social contract. Agrest and Gandelsonas see that architectural objects do not have given associations; instead, people associate things to them in a personal and individual way (117).

The meanings of signs vary greatly as they are dependent upon the culture in which the signs reside. Eco argues in *A Theory on Semiotics* that the meaning of a sign is a “cultural unit” that is defined by its location and culture. He says that depending on the “world-vision” of a specific culture or society, the people of that group may view the signs differently from another culture. These cultural units can act together or separately to signify the readings that people form, and because of the varying meanings that the cultural units may have, they mean different things to different people (Eco 72-82). Eco’s view of the varying meanings of signs supports the viewpoint that architecture is not necessarily a “visual language” – the same signifier of a sign can have a different signified meaning depending upon the people observing it and the culture in which they reside.

This is the beauty of incorporating signs into a building. The structure takes on a life of its own, always changing and meaning different things to different people. The more opportunities to include rich trigger mechanisms for signified meanings, the better the experience for the building’s observers.

### 3.2.2 Reclaimed Building Elements as Signifiers

Saussure said that signifiers can be anything, so what could they be in terms of a building, and how do they signify? Sandweiss stated: “The problem facing the historian, as it faces anyone seeking to activate the latent memory residing within the urban landscape, is not to peel away the representation . . . but to be aware of its role as a trigger of memory and cultural meaning” (27). The trigger that Sandweiss refers to is the
signifier, the object that sparks a thought, memory, or imagery. As an individual uses any of his or her senses to detect that trigger or signifier, it sends signals to him or her, which then create connections in the mind. Broadbent stresses in his essay that architecture affects all of the senses; therefore, any architectural item could be a stimulus for a signified meaning, especially those that carry a heavy weight of representation.

Rossi’s equation of the urban artifact states that the influence of time and human interaction on building elements increases their value. Therefore, items that carry a heavy meaning are those which have been ingrained with the culture for a long period of time and are significant in the urban landscape. The implementation of these elements and their continual preservation and reuse allow for those items to continue on and act as signifiers within buildings.

As signifiers, the reused building elements infused with cultural significance provide the “trigger,” as Sandweiss calls it, to allow connection and association in the minds of the observers. The meanings they read are extremely beneficial, because they are sensed and decoded according to the observer’s personal experience, as Broadbent explains, and now those elements and building become ingrained within that person on an intimate level (127).

The incorporation of reused elements, or triggers, into building design will spark memories and other recollections in the minds of observers. This ties them to the building and offers an improved experience as a result. “Architecture deals with time as well as space, with memory as well as form, and the more expansive we are with the former, the better the latter will become” (Fisher 291).
3.3 Artifacts and Signs in the Conceptual Framework Model

The conceptual framework model integrates reused urban artifacts serving as signifiers within the larger design strategy. These components within the model are affected by time, use, and need. With the progression of those factors, they influence the degree of meaning that the reused elements now signify (Figure 30).

The components of Saussure’s signs are represented by the transition of reused elements serving as simple signifiers to intensifying with meaning and resulting with a strong signified message. The conveyance of the sign is shown at the top of the model with a dashed arrow, flowing in the same direction as its dependent building blocks.

The process is the result of other actions, which take place to enable and enhance the meanings that observers will associate with a building. These components are shown in horizontal groupings below the flow of the sign. The three groups work together to demonstrate the system in which building elements are transformed, and subsequently relate to being a meaningful sign.

![Figure 30: Breakdown of the conceptual framework model.](image-url)
Starting on the left of the diagram, a culture or society goes through the ritualistic process of material selection. Things like cost, availability, style, aesthetic preferences, and building context are factored into choosing a material. Once selected, the material is used (presumably for the first time) and implemented into the building. During the life of the building, both time and human interaction are ingrained upon the material, the key ingredients for value in Rossi’s equation. This includes both the conceptual notion of witnessing time and the physical changes such as weathering, human damage, and wear. Following a period of time and adhering to Rossi’s equation, the materials are transformed into artifacts of the culture.

After a period of time, the building falls into some form of disuse. When the building is short lived, its elements do not have as much culture ingrained upon them. Rossi’s equation demonstrates that the amount of time and human interaction infused into the building will determine its level of value. With the additional need of material for another structure, the materials are reclaimed from the disused building. The elements are reused in another building, and the elements are transformed into cultural signifiers.

By implementing reclaimed elements into a building, they make a reference back to another period of time, event, or occurrence in that culture. Observers connect with those items, thus establishing a cultural foundation for the new structure and binding the building within its context.
CHAPTER 4

INTEGRATION OF REUSE INTO THE DESIGN STRATEGY

4.1 Case Studies: The Incorporation of Reuse

As elements are reused in buildings and develop their value as artifacts, the circumstance of their being tells the story of the culture in which they reside. Typically, the characteristics associated with their specific form of reuse are key factors in determining the building’s cultural context. As signifiers, reused elements enable the observers to “read” the building through its signified meaning, and they can view the building not just as a stand-alone structure, but instead, as a part of the larger cultural picture. In each case study, reused elements stand out as artifacts and signify the building’s respective culture.

4.1.1 Santa Maria in Trastevere

In the case of Santa Maria in Trastevere, Pope Innocent II’s political motivations and aesthetic desires led to the reuse of ancient Roman architectural elements for adornment inside the church. The ornate mosaics on the frieze and in the floor were created with beautifully colored pieces of marble that were retrieved from the ruins of Ancient Rome. This was an effort to display grandeur and demonstrate to the secular rule that the Pope was in charge of regulating the highly prized spoglia. This aesthetic reuse signifies that the people during that time wanted to make the church a highly attractive place that would reflect the importance of religious worship, while at the same time attempting to show the church had power over the state.
On the aesthetic side, the reuse of materials employs the special qualities of reclaimed artifacts in an advantageous way. It maximizes use of the patina that develops physically and conceptually on items from past buildings. Reuse serves as a strong basis for design, because it takes those qualities and assembles them in unique ways to create a new aesthetic.

The aesthetic and political motivations behind the materials’ use then begin to tell a story about the culture’s past by acting as artifacts rather than typical material. In Santa Maria, the brightly colored marble, granite, cornice work, and entablatures are tangible signifiers of Rome’s elaborate past, when those materials could only be harvested and then imported from hundreds of miles away. Likewise, the reason for the Pope’s specific use of reused materials demonstrates the struggle between church and state specifically during the eleventh and twelfth centuries. Their preservation has enabled that part of history to carry on through the ages, and can still signify feelings of greatness to the observer.

All the aesthetic pieces not only form an intricate, highly pleasing experience, but they also become part of the larger web of components that form and preserve the history of a culture. Their unique physical properties make those pieces more valuable, and are thus preserved as such. The significance of aesthetic reuse is that it portrays a culture that values, upholds, presents, and embraces items from the past as beautiful and genuine artifacts.

4.1.2 Panama City, Panama

In the poorer neighborhoods of Panama City, materials are used for their structural abilities and not necessarily for their appearance. The pieces are used to build essential shelter for people, and they are not extravagantly decorated or in place simply for
appearance. Most reused elements have a specific purpose relating to the construction of a building, signifying a culture that is reliant not on the frills, but rather on composing buildings because of a utilitarian need (Ministerio de Vivienda).

Functional reuse like this only partially fulfills the role as a viable design strategy. Unlike aesthetic elements, it does not matter if a functional element is aged or ingrained with time – it is simply there to perform a specific task. Functional reuse needs to work in conjunction with other aspects to be considered a complete design strategy, as the elements need to tell an additional story of the culture and history behind them. Instead of simply recycling the material, it must be reused in a way that embraces its age and value. For example, reclaiming floor joists and reusing them as hidden joists in another building does not expound upon the uniqueness and age of the joists. By reusing the joists and finding other creative ways to display them would justify them to be used as a design strategy.

With the application of additional design methods for functional material, these elements can act as artifacts and evidence of a culture’s history. Standing alone, however, they do not fulfill that role. Their nature of functionality implies that they are there for a structural purpose rather than for the purposes of memory. While they have the potential to ensure the continuation of memory, again they need to have additional techniques applied to present their uniqueness.

Structures are essential architectural elements, and may partially act within the framework of the preservation of history, if appropriate methods are applied to make their history known. The significance of functional reuse is its ability to demonstrate that the culture is one that is concentrated on the necessity of utilitarian building materials and the bare essentials needed for the foundations of any civilization.
4.1.3 Lititz Elementary School

In the Lititz Elementary School, architectural elements with strong community ties are reused to preserve the memory of something important to the local people. The old building was important to the citizens of Lititz because many of them had attended the school when they were young (Krieder). Although razing the school was an inevitable event, at least the reused brownstone doorways allowed the citizens to connect back to the history of the town and their childhood. This type of reuse shows a culture in which the past is not soon forgotten, emphasizing that people want to have connections back to their history. While new doorways would have worked, instead there was a deliberate effort made to keep memories alive (Figure 31). Lynch would greatly approve of the reuse of those cultural artifacts at the elementary school, because it provides a connection to the past and creates orientation within one’s own life (61). By the “active use of remains” at the school, a powerful and tangible link is created between the community members and their history (Lynch 64).

Figure 31: The original 1916 brownstone doorways leading into the new gymnasium. (Larry Lefever Photography)
Sentimental reuse is the strongest and most valid design strategy for reuse. Because of the strong associations people have to certain elements, reusing and thus preserving them enables people to reconnect emotionally to buildings. This brings forth sentimentally important items and employs them within architectural design to remember the past.

Those elements become artifacts, as they have strong memories and associations attached to them by one or many people. Due to the nature of people’s attachments, the elements themselves often depict styles and trends from history, which allow insight into the culture. They are powerful signifiers that evoke distinct memories and signified meanings to the people who used the doorways as children.

Items reused for sentimental purposes are important artifacts from the past because their personal associations signify many memories and instances from history. As with Lititz Elementary, the brownstone entryways may trigger many stories that residents could have otherwise forgotten. They act as stimuli for bringing forth otherwise lost recollections. That embodied culture within the elements does remain with them, even when they are reclaimed and moved. While their relative immediate location will conjure up the most sentiment, relocation would not completely hinder the recalling of memories; rather, the signs themselves are the triggers, as Lynch observes (61).

These types of reuse are excellent and important components within the web of elements that work to form and preserve a culture’s history. Memories and recollections from the past are what create rich cultures, and help to signify an important sense of place and history within a community. Sentimental items reused from the past to be preserved through reuse help to enliven that spirit. The significance of sentimental reuse is that it serves as an important tangible element that people can hold onto in order to identify themselves with the history of a place.
4.1.4 USS New York

In the case of the USS New York, the steel from the World Trade Center was reused in a symbolic way. That steel could have been cast into any number of different things, but it was treated with special care and reserved to help build a fighting ship in the Navy (Figure 32). The reclamation of such an important artifact represented the will to continue on, and its action was pure and simple to American citizens. It represented the healing process from a great tragedy that touched everyone, and with that steel still in use, the memory of those events will stay alive and stay with the ship for a long period of time. Symbolic reuse demonstrates a group of people that wishes to remember the past, but turn it around and push it forward towards the future. It does not just memorialize, it also deliberately revitalizes and moves forward with new strength through signification.

Like functional reuse, symbolic reuse lacks the immediate viability to be a strategy for reuse on its own. It needs additional support through conjunction with other aspects to be considered a full design strategy. In the case of the USS New York, the symbolic reuse is not so much of a strategy but rather a happenstance. The use of the steel had no

Figure 32: The symbolic bow of the USS New York being constructed. (USS New York.)
influence on the design, but rather the signified meaning that people associated with it. Using reused or new steel would not have changed anything in the ship, but rather how people thought about it. Kubler acknowledges that “Every meaning requires support, a vehicle, or a holder,” and in the USS New York, the steel is that signifying holder which represents the resolve of the American people (xii).

Symbolic reuse enables the artifact to continue on, either in its original form or not. In the latter case, because the artifact has been modified to a form that is otherwise unrecognizable as the original material, the entire product then takes on the symbolism rather than just one element. For instance, since the World Trade Center steel was built into the USS New York, as opposed to being just one element of it, the entire ship as a whole took on the symbolism. That symbolism does follow the material as Kubler points out, but it only works as an artifact if people know the origins of the material and the tragedy behind it.

Symbolic reuse is a weak part of the larger web of the history of a culture. While symbolism does show a culture seeking to remember people and events, it does not provide too much other insight into a culture. It may show what people value and choose to remember or honor, but the outsider can draw little else from it. The significance of symbolic reuse is to show a culture that artfully remembers and honors past events and people in an effort to bring that history to the present day.

4.1.5 Town Hall of Utrecht, Netherlands

For the expansion of the town hall in Utrecht, the architect, Enric Miralles, began to work off the concept of reuse after observing the surrounding context had a collage-like quality of its styles and materials. The design is conscious to the occurrence of reuse, and thus acknowledges and actively responds to that condition. The design brings depth into
the work by developing layers and richness for the users while acknowledging the distinct context of the site. In this respect, Newcomb would agree with this practice because in his writings he states that the relics or artifacts from an urban context will have the most positive influence on the community when they are considered into an architectural design (159).

Conceptual reuse does work as a valid and viable design strategy for reuse. It works with the architectural context, and in the case of Utrecht’s Town Hall, it signifies the intricacies of the town government as numerous pieces fitting together, some old and some new. Rossi discusses how urban architecture is “the repository of our collective memory,” which is similar to the administrative compilation for Miralles’ design concept (29).

For this project, however, there are few genuine artifacts – there are mostly just simulated ones. The elements take on the appearance of being reclaimed pieces from old buildings when, in fact, they are not (Figure 33). In this case, the elements do not work for signifying actual history because the items are not genuinely original to the context, yet the elements implying reuse still tie the building to the environment.

Figure 33: The components of Utrecht’s Town Hall. (Amagerbro)
Because the elements only appear to be reused for the conceptual design of the building, there is no real embodied culture within them. They become simply materials rather than artifacts. The only way they interact with the context is because the surrounding areas of town are built from both old and new materials. It attempts to become part of the larger web of cultural components; however, the pieces are not genuine and therefore it lacks complete integration. Newcomb would not agree with this practice, because he wants the genuine relics and artifacts from the urban context to be used (159). The significance of conceptual reuse is to present a culture that consciously identifies reuse as a practice of building and as a complex structural framework of society.

4.2 Application of the Reuse Strategy: Iglisia de Fatima of Panama City

To investigate the application of reuse as a strategy and to see how to apply the conceptual framework model, I present an examination of my architecture undergraduate thesis project (Figure 34). For this project, I employed reused urban artifacts as a design strategy for the new live-in school of Iglisia de Fatima, sited in El Chorrillo, a low-income neighborhood in Panama City, Panama. Having reuse as a design concept was appropriate for this site because functional reuse is prevalent and common throughout

Figure 34: Live-in school in Panama City, Panama, employing reuse as a design strategy.
this residential neighborhood, so much so that it becomes part of a vernacular architecture unique to the area. Likewise, the adjacent historical district is where historical building elements and even whole facades are continually restored and reused to preserve the historical nature of the neighborhood, so the reuse design strategy signifies its context.

4.2.1 Strategy Analysis: The Site

Along the waterfront of El Chorrillo, 10 thirteen-story apartment buildings, known as the Barrazas, are slated to be razed by the city in the long-term master plan (Ministerio de Vivienda). The buildings’ conditions have deteriorated over the last 40 years, and their functionalist conception of efficiency has failed once again, serving as another example of Broadbent’s attestation of anti-meaning buildings (Figure 35).

Despite the buildings’ poor planning, this situation now presents an opportunity to revitalize and reuse elements from the Barrazas, yet still signify the past. The old apartment buildings are eyesores and in disrepair, yet they are still a part of the history and context of the neighborhood and should therefore still be remembered. Both the reused urban artifacts and the actual site will act as signifiers, enabling the connection for and the establishment of a new building in a context that readily employs reuse.

Figure 35: The Barraza apartment buildings. (Author’s photograph)
To determine what materials within the Barrazas are available for reuse, I first examined the buildings as a massive composition of construction elements (*Figure 36*). These pieces included the windows, plumbing fixtures, doors, railings, stairs, hardware, and volume of concrete. No matter what the size of the components, with the addition of time and a great amount of human interaction on the items, they are valued elements by Rossi’s equation, and therefore can serve as urban artifacts of this culture. Reclaiming those artifacts from the Barrazas and reusing them in the new live-in school turns them into signifiers of the culture. They act as the signifying trigger that will enable residents to connect with the items and make associations to the past.

**INVENTORY OF BARRAZA MATERIALS**

**STRUCTURE**
- 32 structural columns

**WINDOWS**
- 20 large sets, 5’ 2” x 4’ 0”
- 39 small, 3’ 1” x 4’ 0”

**STAIRS**
- 11 sets, 2 sets per floor

**PLUMBING FIXTURES**
- 5 toilets and 8 sinks per floor
  - total 104 toilets and 114 sinks

**DOORS**
- 8 large, 2’ 10” x 6’ 10”
- 8 small, 2’ 4” x 6’ 10”
  - total 104 large and 104 small

**TOTAL WEIGHT OF BUILDING CONCRETE**
- 2,218 tons

**Figure 36: Inventory of architectural elements in one Barraza apartment building.**
4.2.2 Strategy Analysis: Building Elements

Instances of reuse within the new live-in school demonstrate varying forms of reuse. Each instance has a different level of association to the old buildings and a degree of signification of the neighborhood’s culture. All of them demonstrate the common practice of reclaiming building elements and employing them in new, useful ways.

The most direct form of reuse in this project is the reclamation of the window units. The old apartment buildings use jalousie windows to shade interiors from the hot tropic sun and intermittent rain while still allowing airflow and light. The louvers allow the entire window to open up to outside breezes and effectively circulate air within the room. In a culture where air conditioning is rare and there is no need for sealed windows to retain winter heating, the use of jalousie windows are a sensible solution (Figure 37).

The windows are salvaged directly from the Barraza apartment buildings, selecting those in the best and most operable condition for reuse. In this particular system, the items are re-implemented for their original purpose without any physical modification. The windows act as straightforward items carried over from the previous building. Their function is fully appropriate for the region, which itself carries meaning with it. Likewise, over the decades countless people and families have cranked them open in the day and shut them at night, using them as a monitor to the world outside their apartment. As they continue to be used in the new building, their purpose will continue to be the same.

*Figure 37: Jalousie windows, directly reclaimed and reused again as windows.*
Also reclaimed from the buildings are dozens of sink faucets. While not nearly that many would be needed to serve again as faucets in the new live-in school, they are reused in a more creative way as brackets to attach stair handrails to walls (*Figure 38*). The reuse of these artifacts is a type in which the item’s physical form is not modified, but the item is used in a different way than its originally intended purpose.

Here, time will be visible on the metal faucets and act as a reminder of how long those devices were in use by common residents of the neighborhood. From those many years of use, continuous dripping, and sometimes leaks, different forms of corrosion have formed on the metal to make each faucet unique. Each has its own variegated pattern of corrosion, which creates an interesting collage of shades and colors. The faucets are signifiers of time that has already passed by expressing evidence of its use from former residents.

This uncommon detail made from common fixtures adds depth and an enhanced level of attention within the building, while creating a unique feature with reused elements that ground themselves in their time and culture.

*Figure 38: Sink faucets, unmodified but used as handrail brackets.*
Typical of the Panamanian culture, many doors have vents above them, allowing for the privacy of closed doors while not inhibiting air movement. This design is quite standard in the hot climate, because they assist with air circulation within the room by allowing cool air to pass through and carry the higher, warmed air out of the room. While the functionalist Barraza apartment buildings lack this architectural feature, it is incorporated into the design for the new live-in school. Because of the lack of these elements in the old building, there are no existing vents to simply reuse. This creates an opportunity to reuse something else as a substitute, just as seen in the surrounding context.

The slats, which form the “grate” of the vents, will be made from reclaimed copper or other metal piping that has been flattened (Figure 39). Because there are varying diameters of the original pipe, it will yield varying slat depths, which will provide a unique aesthetic variation. Like the sink faucets, the different patinas on the metals will also be a signification of time, while also providing a unique appearance. This third type of reuse physically modifies an item and also uses it for a purpose different from which it was originally intended.

Figure 39: Metal plumbing pipes modified and reused as ventilation grates.
To signify the context, the new school will be built from concrete. Many surrounding buildings are built from this long lasting and low maintenance material due to its availability, ease of construction, resistance to deterioration from salty air, and thermal massing – important in a region with a hot climate. The present apartment buildings are also made from concrete, and many of the surfaces, both interior and exterior, have been painted festive colors, typical of most buildings in the city.

When the Barrazas are demolished, the massive amount of concrete can be ground up to serve as aggregate in the structural concrete of the new building (Figure 40). While it may seem that the history and patina that the old buildings have acquired would be lost in this manner, something unique may occur. Because most of the surfaces are painted, it is hoped these pieces will show through in the recast concrete. The success of this method may result in an excellent tie back to the old buildings that once stood on the property. The variations of colors would provide evidence of the former buildings, and act as signifiers that would bring about the signified images of the buildings, thus preventing the complete erasure of them from memory.

Figure 40: Concrete from the Barrazas, painted colorful colors, serve as aggregate.
4.2.3 Strategy Analysis: Structure Design

Unlike the functionalist boxes of the Barrazas, the new school’s design has a much more intimate variation in its form. In the surrounding buildings, many have modifications or additions that make their forms anything but regular. Some structures take the shape of their plots of land, or incorporate courtyards and narrow volumes to aid with cool airflow through the spaces. Balconies are found on most buildings to provide both a social space and a means of shading the windows of the story below.

To signify these qualities of the context, the new school has slightly irregular forms to associate itself with being built over time. There are assorted supports, overhangs, and misshapen walkways that suggest parts being added impromptu. This technique counters the perfectly planned building in which nothing changes over time; instead, this building embraces the ability to be modified, and does not simply stand as a monument frozen in time that is never to be changed or adapted. This is the building typology that is associated with reuse – the ability to be altered and added onto using salvaged parts. If someone purchased brand new building elements to start fresh, the building would be something closer to a perfectly planned regular form, but this building reads as something that has been assembled from many different sources.

The interior is a reflection of the same type as the exterior. Corridors and rooms vary in width and depth to suggest being built at different times and by using materials at hand. The spaces become intimate with people rather than simply serving as a utilitarian space.

All of these components make the building a compilation of pieces, much in the same way as the Barraza apartment building was originally dissected (Figure 41). By using variation in form and materials, the building as a whole reads as a composition over time rather than a frozen fabrication.
Figure 41: The live-in school as a composition over time, showing a building design that suggests openness to modification and variation rather than permanent rigidity.
4.2.4 Correlation to the Conceptual Framework Model

The design of the live-in school in Panama City successfully correlates to the conceptual framework model to employ reuse as a design strategy. Aspects between the building and elements of the model can be traced, both in terms of steps and relevant connections. We can follow the process by examining the model as a timeline in which components are interrelated by both sequence and meaning (Figure 42).

![Diagram](image)

*Figure 42: The progress of reuse as it follows the conceptual framework model. It advances from the construction of the apartment buildings to the reuse of materials as cultural signifiers in the live-in school.*
Despite the modern functionalist qualities of the Barraza apartment buildings that are atypical to the surroundings, their existence in the neighborhood still make them part of the context’s history and character. The apartment buildings were built during the 1960s, a time when functionalism was at its peak and there was a growing demand for living spaces in Panama City. The stress on housing led to the quickly built apartment buildings in a functionalist style, as chosen and needed by society at the time. Following suit was the materials selection process. For the structure, concrete was used because it is a commonly used building material for its ease, cost effectiveness, availability, and thermal properties, all indicative to the context. Likewise, internal elements of the building were selected for similar reasons. They were employed in the building and integrated as standing fixtures ready for use by the inhabitants.

That process is an example of the initial use of the apartment building and its materials. It is like the inception of an idea that awaits further refinement and development. The next stage is when those items go through a metamorphosis as new aspects are added to create an even richer product. People move into the building and bring it to life. They use the rooms, lights, fixtures, and doors, embedding history in both tangible and intangible ways. Patinas form not just as physical wear, but also as conceptual layers of history and happenings. Time is essential – the more time, the more events the materials witness. The apartments’ once virgin materials morph into artifacts – keepers of history, time, and stories. As Kubler describes, they are the carriers of meaning that withstand the ravages of time (xii).

Now the process moves into the stage for the implementation of the live-in school, which will employ reuse. The conceptualization of such a design must coincide with or rely upon the previous apartment building falling into disuse or being planned for demolition, which was true according to Panama City’s master plan. With the design of
the new school, there arises a need for material. Elements are selected for reclamation, and then that task of reclaiming architectural elements from the old apartment building begins. The desired items are thus removed, and once construction on the new school commences, they are once again used in a building. This time their purpose is not solely for their originally intended function; instead, they may be used to perform other functions, such as the faucets being used as handrail supports and pipes substituting as ventilation grates. However, all reused elements do one thing differently than before – even if their original function is still the same as with the windows – they act as signifiers to connect observers with the culture, history, and people that employed and interacted with those materials before they were reclaimed and reused.

4.3 Implications: Cultural Signifiers

The reused urban artifacts are signifiers that represent the culture’s status quo when they were employed in a building. For the time during their reuse in a new construction, the culture ingrained in them is signified to the observer – the artifacts act as a holder of both place and time within a larger context.

The notion of reused artifacts signifying their context has been seen in all the case studies: the builders of Santa Maria in Trastevere needed highly aesthetic elements that were no longer available new at the time, and reused them to show power of the church over the state; the Panama City settlement needed to obtain building stone quickly as the result of a raid; the town of Lititz had to build a new school and simultaneously remember its old one; steel of the World Trade Center became part of a warship in defense of the country; and Utrecht’s Town Hall had an intelligent way of connecting with its varied context.
As artifacts, reused elements carry history with them and provide an imbedded timeline of a culture’s past. Those reused elements and all their ingrained attributes act as cultural signifiers, and by consciously exercising this notion in design, reuse can be incorporated into a design strategy that responds to the building’s physical and cultural context.
CHAPTER 5

CONCLUSION

5.1 Summary

In the struggle to integrate a building successfully into its cultural context, the crucial point is that observers are able to connect with it on a personal, intimate level. To draw these ties, urban artifacts can be extracted from the existing context and then reused in new construction. Ingrained with time and human interaction of the culture, those reclaimed architectural elements accumulate value specific to their context. They are Saussurian signifiers, triggering memory and relationships in those who interact with them, and when reused in a new building, they evoke a preexisting association among the elements, the building, and the observers.

By incorporating reuse as a strategy for design into a building project, existing architectural elements serve not only as links to the culture, but also as unique characteristics which enable the building to come to life. Every individual’s signified perceptions of the reused material will be different, because each person draws on many different past experiences in the culture to relate to the building. This results in the building having an endless variety of cultural associations that people can draw from and appertain to.

The objectives of this thesis were to investigate and answer four major questions concerning the reuse of architectural elements. The first objective was to determine if reuse is a valid and viable design strategy for architecture. The examination of several case studies in which reuse was a successfully incorporated into the design shows that it is a legitimate design strategy. While reuse was implemented for different reasons in the
examples of Santa Maria in Trastevere, the original Spanish settlement of Panama City, Lititz Elementary School, the USS New York, Utrecht’s Town Hall, and the live-in school in Panama City, the common thread through them all is that reclamation greatly enhances the completed work by giving it a deeper and more enhanced meaning. The notion of reused items having meaning was established by examining the meaning and definition of an urban artifact and Rossi’s equation which showed how materials acquire value through the addition of time and influence of human interaction.

This led to the investigation of the second objective, which was to determine the differences between material and artifacts. Reclaimed elements are considered to be artifacts of a culture because they carry history ingrained within them, and the preservation of such items enables that history to be carried on. Lynch’s idea of the “active use of remains” is a way to bring elements from the past into the present day and give them new life as reused elements (64). They are brought forth and serve as carriers of history and meaning, unlike typical materials, which do not. There is a certain connection between people and items from the past that cannot be duplicated, and not present in new items. However, over time, standard materials can begin retaining history and expressing it, thus making the transition into artifacts. With the addition of Newcomb’s observations of how historical objects (artifacts) have a very positive influence on the urban fabric and greatly increase the experiences of architectural spaces, we can see how employing reused urban artifacts increases connections to the past and provide for richer, more meaningful buildings (159).

The third objective focused on embodied culture found in items brought forth from the past and how that culture is transferred through reuse. This is seen in the analysis of the sign, particularly Saussure’s definition that describes the signifier and the signified. From developing and analyzing the conceptual framework model, we can see that through
an interconnected course, materials are transformed into artifacts and then cultural signifiers. All signifiers evoke images, feelings, or thoughts in the observer’s mind to signify the actual object, and reused items enable those mental associations.

Evidenced by the time the elements have been sustained and the human interaction they have undergone, they act as symbols to conjure up images of the culture’s past. The reused building elements, infused with cultural significance, act as triggers to provide observers a connection to the culture and subsequently to the building and its surrounding context. The meanings are sensed and interpreted on a personal level, tying the person closer to the structure and its cultural context.

Finally, the last objective of this thesis was to recognize that reused elements are part of a larger web of components that represent and preserve a culture’s history. This is exemplified in the case study of Iglisia de Fatima, the project of a live-in school in Panama City that employed reuse as a design strategy. In this building, there were many pieces that helped build up a larger web to integrate the building within the culture. Not just artifacts were reused, the actual site was also reclaimed and used once again. The dilapidated apartment buildings were to be razed and the site reinstated as a place for the school. Likewise, the entire neighborhood reuses material as part of their day-to-day maintenance on residences; therefore, reuse was already a common activity in this context. Also common to the area were irregular forms and additions onto existing buildings, all of which all played into the final form and design of the live-in school.

The project provided additional insights into the different forms of reuse, which have to do with an item’s originally intended purpose, its subsequent function as a reused element, and if it is physically modified for reuse. It also demonstrated that the understanding of the cultural context is imperative to a successful building, especially in a location with a lower socioeconomic status. A designer must draw inspiration from the
neighborhood’s context, but at the same time be sensitive to not intentionally mimic derelict conditions. For the live-in school, some architectural features began shift toward simulating the poor conditions of the context, despite the direct link to the functional reuse occurring. Instead, a more subtle response to the surrounding buildings would have benefitted the overall design and opened new possibilities for using reuse as a design strategy. Nevertheless, the project incorporated numerous aspects of reuse observed at its site. Contextual reuse, reclamation of the building site, and the use of varied geometric forms expressing the conditions and traits of the current neighborhood all contributed to a larger web of components that enabled the signification of the area’s history and character.

The questions and objectives in this thesis expounded upon Thomas Fisher’s claim that all things “come laden with memories and associations of various kinds . . . [and that] memory and architecture in most projects remain closely intertwined” (285). Following the research and investigations of this thesis, that idea can be successfully upheld and amplified by employing reused architectural elements as cultural signifiers in an urban architectural design strategy.

5.2 Significance

With the rising cost of construction materials and an increasing awareness of environmental concerns among architects, green design has been growing rapidly in popularity. However, in the attempt to develop the most efficient green systems, advanced technology often leaves out the history, theory, and connection behind reused materials. This circumstance misses a unique opportunity to create green buildings that engage as well as connect to the observer culturally.
The contributions of this thesis establish that reclaimed building materials are valuable artifacts, having both time and human interaction ingrained upon them. They are the physical products of a culture that have deep meaning embedded within them. Reclaiming and reusing them in another building can enable that meaning to carry on. The urban artifacts become cultural signifiers as they evoke personal attachment and recollection in the minds of observers.

The development of personal ties to reused elements is beneficial, because it sets the stage for immediate integration of a building into its context on the community level. Locally reclaimed items ground the building within the community and its culture, thus providing recognizable artifacts that already signify and draw ties to its surrounding context.

The insights of this thesis can be applied to building designs in which both locally reclaimed materials are available and a desire for cultural attachment to the building is apparent, which would be found in most cases of design. These findings can be applied immediately, as the green building movement is continually growing in momentum and can greatly benefit from the addition of history and theory.

5.3 Further Investigation

The insights presented in this thesis are not necessarily intended to be final or all encompassing; rather, they serve as a basis for additional exploration into architectural reuse. The connections that I have drawn from my research actually evoke many more questions about how reclaimed materials can be used in the urban landscape and how people interact with them. The investigation of additional questions in combination with the conclusions drawn here could result in grander ideas and many other progressive design strategies.
Some of the additional questions that could be investigated further stem from many different points of research in this thesis. The discussion on materials versus artifacts brings about additional questions on the matter. Can an artifact have an unknown history, but still retain history, and if it does, how can it be expressed? What kind of time span is needed before a building and its elements become valuable enough to preserve, and who determines that? Do the town planners or townspeople decide if an element is worthy of reclamation?

Saussure’s theories on the sign also spark some additional questions as they relate to architecture and memory. What is the benefit for having signifiers mean different things to different people in relation to a building? Are there good and bad signifiers, and should architects only use good ones? Is it necessary to employ cultural signifiers that are intended to have a predetermined meaning to everyone, or should just anything be used and allow the observers to make their own connections, and does one option have benefits over the other?

While the investigation as a whole produces reasons why employing reuse in building design is beneficial for the observers, there are still some additional thoughts to be considered. Can the theories of reused elements also be applied on a larger scope, such as the adaptive reuse of building sections or even an entire building? What has more effect on observers – large instances of reuse, small details, or does it matter? What are some comparisons to employing reuse as a way to integrate a new building? Does moving furnishings from an old house to a new one create a similar way to feel comfort and immediate integration?

For many of these questions, there are no clear-cut answers; instead, additional investigations could be done to see what insights can be gained from them. Then, by working in conjunction with the material presented in this thesis, the insights can be
successfully applied to architectural reuse and design, helping to further enhance experiences a building could offer.

This work is a steppingstone to future exploration with reuse. There are, and always will be, many opportunities to explore additional ways that reuse can benefit architectural design. There are numerous factors that play into the uniqueness of each element, such as age, composition, origin, purpose, patina, and appearance – endless possibilities to draw from in terms of design. Likewise, each urban artifact holds different meanings and is embedded with its own history, so that different associations and recollections will always be signified depending on the observer who makes those mental connections. Further investigations can be done on what kind of ties people have to building elements, especially ones which were part of a past home, a public building, or even an unfamiliar building.

The opportunities for the incorporation of reuse into architectural design are far reaching, and this thesis provides the basis for adding the history, theory, and connection into green design. The more ties and associations that can be drawn among people, their culture, and a building, the richer the experience will be for all.
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