New vs Old: New Architecture of Purpose in Old Settings

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Abstract

New architecture will invariably be placed next to old architecture because cities and human settlements last for generations. As humans, we are part of a tribal species, and we invariably congregate and build new buildings in which to live, work, and seek leisure. Thus, we create larger cities from ever increasing smaller settlements. The city is the playground where the new merges with that which has been built already – merging the new and the old.

Old Town Alexandria is one such place where new and old exist side by side. There is no question that new architecture will be built. The question is only: what will the new architecture look like? What will its existence respond to and what issues we will choose to tackle with new architecture, if any? Will the new architecture, and infill architecture, convey a purpose and meaning to rival that of its time-tested historic neighbors? How will meaning and purpose be achieved in new architecture?

This thesis explores the topic of infill architecture and how it can find its place in historic districts. Specifically, it looks at how infill architecture can find its place in Old Town Alexandria’s Historic and Parker-Gray districts. What has been the approach that has dictated the image and purpose of new architecture in historic districts in Alexandria? Can new architecture have meaning and purpose of its own to rival that of its predecessors?
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General Audience Abstract

New architecture in historic settings brings with it a lot of different notions and questions to explore. What was there before? What is the overall architectural style of the buildings around it? Does the new building relate or not relate to the existing older architecture? The questions surrounding new architecture in old settings are varied, like the multitude and variety of styles and purposes that the new architecture can adopt in an old setting. This thesis is an exploration of the new architecture – also oftentimes referred to as infill architecture – when positioned in a city or place which already holds previously built and oftentimes historic buildings that come with their own unique architectural style, language, and purpose.

How does new architecture find a common language with older architecture? Can it be done while giving new architecture its own voice, purpose and meaning?
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Introduction

Buildings provide an insight into the culture, traditions, and values of their builders. From the early caves and clay huts to modern glass skyscrapers, buildings are the story tellers of the advances and knowledge of the societies that built them. Clay huts tell us that clay was an available and acceptable building material and the workmen had only the knowledge to build clay huts, otherwise they would have built a structure that reflected another set of skills and desires. Similarly brick homes and glass office buildings tell us that the materials used in their construction are materials most workable by the craftsmen and builders of the time.

This direct narrative of knowledge, value and skill set is embedded in architecture. From small villages to big cities, the narrative of the past and present is everywhere. We value to a significant degree old buildings because of the ability to see directly into the past through the selection of windows, facade treatment, decorative ornaments and craftsmanship. Historic buildings show us what life was like 100 or 500 years ago and what materials, values and skill set were available and used in the past. The historic structures from different time periods lend richness to the passage of time, exhibiting centuries of culture via the built environment.

I believe that new architecture should continue the tradition of storytelling in cities - large and small. Architecture should remain honest to the present time and reflect available knowledge, values, and skill set. Architecture of the past should be valued and embraced, but it should not be isolated from the present. Care should be taken to not create places with preference for mimicry of historic styles for the sake of aesthetics alone. Value and meaning arrives from honest use of materials at hand, along with the knowledge and skills available.

This thesis investigates the relationship between new and old architecture in Alexandria’s historic districts. It also explores the meaning and value provided by architecture of the past while seeking to answer - what creates meaning and value in new architecture. This thesis will also explore history and guidelines that shape Old Town Alexandria, using sources from the experts and professionals who have tackled the subject of renovation, restoration and integration of new and old architecture.

Comparison and analysis will be provided between architectural elements from historic buildings in Old Town Alexandria and similar design elements in new architecture. With the help of statistics and real-life examples, I will make the case that new architecture should integrate Passive House design and sustainable design to create meaning and purpose in new buildings. Because architects and designers are tasked with creating solutions to design problems, they are responsible for the efficacy of such solutions and how the finite resources are used.

I will address zoning and applicable guidelines for a proposed design solution for two infill lots. One lot will be located at 517 Cameron Street in Old and Historic Alexandria District and the other at 1011 Cameron Street in Parker-Gray historic district. As part of the design solution I will provide site plan, perspective and four different facade options for each site. The facade options will be based on Passive House principles and sustainable design elements.

In conclusion, I hope to make the case for allowing new architecture to have its own voice, reflective of current knowledge and technology, in order to create good new buildings that can rival historic architecture in value and meaning.
Chapter 1: Historic Districts

Everything changes. Big and small cities, districts, and towns – all are subject to change over time. As some buildings deteriorate new ones take their place. Cities are the places where change is visible the most, due to more people occupying a smaller area, more densely. For those people living in cities, it is a place of many meanings – cultural, historical and material – representing people and builders of the past. And with the change, people can observe the change of the culture and traditions the best in a densely-built area.

Cities have many parts to them but invariably architecture provides the primary building blocks from which cities are formed. Without buildings, it is hard to imagine a city; buildings provide the very structure to the organization of the cities and all that is in them. Many cities have historic districts – areas with special importance due to the age and historic importance of the buildings in such areas – representing a significant cultural heritage for the city and its people.

Why are historic districts important to the life of the city and how they influence the shaping of the city? What are the guiding forces that shape historic districts? Are historic districts in European cities similar to historic districts in United States? How are they similar and how are they different?

My observations from traveling through many European cities and their historic districts sparked questions about architecture in historic districts and specifically new infill architecture in historic city neighborhoods. Visiting many cities with established history – Munich, Antwerp, Brussels, Edinburgh, Lucerne, Vaduz, Rome, Florence, London, Prague, Tallinn, and many other cities – I noticed an interesting occurrence – new or current architecture was present in historic districts in old European cities but not at all noticeable in Old Town Alexandria.

In many European cities, buildings composed of glass storefront and smooth concrete stood next to centuries old buildings and both stood for their time and told their story. The European historic districts had offered new infill architecture a chance and a place.

Figure 1.1   New Infill Building in Old Town Riga, Latvia at UNESCO World Heritage Site. 2014
The new and the old together strengthened each other's uniqueness and it was possible to tell immediately which building was historic and which building was new. Oftentimes, the new architecture blended in well because it had maintained certain parameters to honor its old neighbors. There were also bad infills. But where the infill was successful, the old and the new weaved an integral fabric telling a continuous story of human activity and development.

In turn, when walking around Old Town Alexandria, the presence of new architecture is not very noticeable. A professional eye can distinguish which building is historic and which is not, but for a person not in the design industry the ability to spot new architecture in Old Town is not easy. Old Town Alexandria looks much older than it is. The new architecture, although present, is masking itself very well, having adopted the expressions, facades, detailing, materials and forms of the historic architecture. New construction has taken on elements from historic buildings styles, to fit in with its historic neighbors. The inability to readily detect new architecture or new infill buildings in Old Town Alexandria made me curious as to why there is a difference between old cities in Europe and Old Town Alexandria in terms of new building integration.

These and similar questions around the appearance of new and old architecture in historic districts prompted me to delve into exploring infills and new construction in Old-Town and Parker-Gray Districts as well as research what governs the look of these two historic districts.

Why does Old Town Alexandria look the way it does?
Chapter 2: Guidelines And Alexandria’s Historic Districts

There are two historic districts in Alexandria: old and historic Alexandria district, established in 1946 and Parker-Gray historic district, established in 1984. Figure 2.1 shows a map identifying the boundaries and layout of both districts in relationship to Old Town Alexandria.

There are many factors that influence the outcome of our built environment, more so once a place has received a designation of a historic district. In Alexandria, the establishment of historic districts came with a creation of design. The design guidelines is a periodically revised document which governs the scope of the alterations allowed to a historic building. It also governs renovations and selection of design elements such as windows, doors, roofing materials and building height, among many other things. “Design Guidelines for the OHAD and Parker-Gray District direct renovation, restoration and new construction work in both historic districts” (City of Alexandria 33).

Design Guidelines applies to both historic districts “the information contained in the Design Guidelines applies to both the Old and Historic Alexandria District and the Parker-Gray District unless otherwise noted” (City of Alexandria 33).

The design guidelines outline preferable and encouraged window and door construction, material selection and aesthetic. The guidelines state that any new construction must be brought before the architectural review board and the board must agree that the proposed design or change meets the criteria outlined in the design guidelines.

Each historic district has a Board of Architectural Review (BAR) composed of architects, design professionals, and city government representatives. They review proposals for renovations, additions and new construction from residents and builders.
If the new construction meets the criteria established in the design guidelines and is approved by BAR, then it will be issued a certificate of appropriateness and the owner is free to proceed with the construction. The BAR has the power to not approve the new design and construction for the new building, if it deems it does not meet or adhere to the steps outlined in the design guidelines or if BAR makes a point as to how the new design is not compatible with the historic architecture of Old Town Alexandria.

The board of architectural review makes judgements on the aesthetics of renovations, remodeling and new construction. It is the body that protects and molds the image of historic Alexandria. In addition to design guidelines and BAR, Alexandria and historic districts are also governed by local zoning and building codes.

Looking through the design guidelines I would assert that the guidelines have a language that is both for and against new architecture in Old Town Alexandria. This is evident based on the language found in the guidelines. For example, when describing approaches to new design solutions the design guidelines state that “new and untried approaches to common design problems are encouraged and should not be rejected out of hand simply because they appear to be outside the common practices outlined in the guidelines” (City of Alexandria 4).

However, when describing the position of BAR on new architecture, the guidelines state that “as a rule, the boards favor contextual background buildings which allow historic structures to maintain the primary visual importance. Singular buildings in the latest architectural vocabulary are generally discouraged” (City of Alexandria 163). This duality, I believe, is confusing. Based on the evidence of the type and style of buildings that have been built in historic Alexandria over the last 50 or 60 years, it is obvious that singular buildings in the latest architectural vocabulary have not been encouraged at all, because they are not present. Buildings constructed over the last 50 or 60 years are reminiscent in materials and styling of historical architectural styles present in Old Town Alexandria. If buildings in the latest architectural vocabulary are present, they are hidden in the back alleys and away from the public eye.

What is the BAR worried about in relation to the historic fabric of Alexandria?

Alexandria, and particularly the historic Old Town, has a notable history and age when compared to other settlements and towns in the United States of America. Alexandria is one of the first colonial settlements on American soil. It has a history to be proud of. Established in 1749, it holds a lot of valuable architectural heritage from a very early period in American history (Cox, 15). From simple one story dwellings to row-and townhouses, Alexandria holds a notable architectural collection that cannot be found in many other towns in America. This reason makes Old Town Alexandria unique, and it is understandable why residents, city officials and other interested parties came together in early 20th century with an idea to establish a historic district and make provisions to ensure these valuable historic structures are well preserved and can continue to tell the story of the origin of the city of Alexandria.

The BAR’s task is to review any proposed alterations and renovations to this historic Alexandria fabric and to make sure the authentic architecture of Alexandria remains to tell Alexandria’s history. The BAR is worried that homeowners without specific knowledge and guidance will inadvertently change an authentic element, detail, and aesthetic of a house in a desire to improve it, but may in the process destroy an element of the property that is the very character of Alexandria’s heritage.
The BAR is composed of design professionals whose task is to guide and assist the homeowners who lack specific knowledge about historic architecture and related elements in preserving the unique aspects of their property.

However, the BAR and design guidelines also command authority over new architecture and in this regard their position is one of influence. The BAR no doubt believes that there are certain elements of contemporary architecture that will detract from the historic fabric of old Alexandria. It may be concerned that new architecture will be so different from colonial or federal style architecture that the new will clash with the old, or worse yet, detract significantly from the historic fabric. It is my belief that the board is trying to maintain the look of federalist and colonial Alexandria of the past by prescribing the use of similar materials, void to solid ratios, a similar design elements found in historic Alexandria to new construction. But in doing so, I believe, the BAR is diluting the line between historic and new architecture, in the hope of freezing in time a certain look that the BAR believes Alexandria should have. If this assumption is true, the question then would be, can new architectural style by its mere presence next to the old make the historic building lose its importance or meaning? Is the BAR grappling with the same questions many historic preservationists are grappling with: the questions of meaning and authenticity and how to preserve it?

My original impression was that majority of buildings in Alexandria's two historic districts are of notable age - buildings 100 years and older, and dating back to the founding of the city in 1749. However, during my research, I uncovered that my perception was not true. Not only is it not true, but “approximately 50 percent of all buildings in the OHAD today were built after 1946” (Smith 175).

This discovery is interesting in several ways. Visually examining the historic Alexandria districts, they appear older than they. I believe this has been achieved by the consistent use of similar materials in new construction to those on historic buildings – such as red brick. Many of the stylistic elements are taken from historic architecture, including recessed doorways, shutters for windows (even though oftentimes they come with no functionality as there are no hinges), lintels above doorways and windows that mimic those of historic structures. This is the essence of the conversation because it poses important questions such as: is this type of approach to new architecture in the historic districts good, when the outcome is an inaccurate perception as to the age of the city and large number of its buildings? Is it honest to the historic architecture and for that matter to the new architecture? The historic architecture would have a more distinct visual language I believe if it could be unique and the architecture around it was of a different vocabulary. This difference would highlight the uniqueness of the historic architecture. When the new architecture muddies the water so to speak and tries to look older than it is, does it do service to the preservation and appreciation of the historic architecture?
Figure 2.2 Old Town Alexandria map depicting buildings built in 1950 and onwards in red and dark red (left). Old Town Alexandria map depicting building stock in Old Town from 1749 to present day (right).
Chapter 3: Compatibility Factors

When considering the placement of new architecture within historic district, the idea of compatibility is oftentimes brought into consideration. Compatibility in architecture refers to design elements and attributes which aid in achieving visual and aesthetic connectivity between existing and new.

The word compatibility features prominently in the design guidelines as well as in the literature about new architecture in the historic districts. What is compatibility in terms of existing vs new architecture? What elements and attributes are important in the conversation of compatibility? How can we place new infill buildings respectfully next to historic structures? How is the concept of compatibility influencing the appearance of Alexandria?

The goal in the conversation about compatibility is to find the defining elements of design which when used will create harmony and balance between the new architectural style and the historic architectural style.

Compatibility factors considered in the conversation of merging the new with the old are:

- Size
- Scale
- Color
- Proportion
- Material
- Character
- Solid vs void relationship and
- Compatibility within the district, sub-area, or block

To further break down the understanding of compatibility metrics, we can delve deeper into looking at specific factors that need to be considered to arrive at an outcome where the new building is compatible with its surroundings.

Taking clues from the surroundings is a good way to ensure sensitive new construction in the historic district.

Figure 3.1 Two historic buildings in Old and Historic Alexandria District.
Such considerations are:

- Building height – should not exceed neighbors by a significant amount
- Massing and scale
- Material, color & details
- Streetwall – maintain relationship to the street and property line. Follow the precedent of already existing buildings
- Cornice line - consistent with adjacent buildings
- Facade composition – rhythm established by windows and doors
- Windows - should be of similar size and overall placement as adjoining buildings
- Solid to void ratio
- Pedestrian experience

Historically, buildings built around the same time and on the same block are of similar size and massing. The strict adherence to the streetwall in Old Town is due to the regulation passed by Alexandria’s governing members in 1749, which required all new construction to align with the property line at the street thus maintaining a uniform streetwall. Only buildings that were already under construction, for example such as the Carlyle house, were exempted. Also, the Alexandria founding fathers agreed on a provision that if a building had a gable roof, the end of gable roof should not face the main street facade (Cox X). This accounts for the uniform roof appearance in Old Town Alexandria. Further, originally one person could only buy a maximum of two parcels in Alexandria, which ensured the diversity in building fabric, even if the construction adhered to similar massing, building height, materials, and facade composition.

Compatibility aspects emphasized in this thesis investigation:

- Building height – should not exceed neighbors by a significant amount
- Massing and scale
- Streetwall – maintain relationship to the street and property line. Follow the precedent of already existing buildings
- Pedestrian experience

When looking at compatibility factors, I believe, there are four factors that are more important than others in ensuring compatibility between infill and historic structure. These factors are the basis on which to build a compatible new and old relationship. If they are achieved, the new building will align itself with the existing fabric in a fundamentally harmonious way, even other compatibility characteristics are not met as well.

**Building height** is important because it is one of the basic defining parameters of the structure. Its height is directly tied to how the building will be perceived visually. Its height will also affect the massing and scale of the building.
In considering compatibility with the existing architecture, the new building should not exceed existing buildings by a significant amount. The acceptable deviation in the height from the new to the old should be within one story upwards or downwards. The greater the height difference between the existing and the new, the greater chance of a discord between new infill building and existing buildings. The closer the building height between new and old, the easier it will be to visually tie the roof lines and the overall visual appearance of the structures.

**Streetwall**, wherein the building facade matches the adherence to the street line in exact same fashion as existing buildings on the block. If existing buildings are lined right up to the property line, then the new infill building should align itself to the property line and face the street in the same fashion as its older piers. This adherence to the existing streetwall solidifies the overall unity, which is strengthened by the new building fitting into existing streetwall alignment. Adhering to the existing streetwall is one of the strongest unifying aspects in how a building fits into an existing block. If it aligns itself with the rest of the streetwall, it will have achieved one of the fundamental steps to fit in

**Massing and scale** are important elements to consider in new and old compatibility. When the massing and scale of the new building are similar to that of existing, it enforces cohesion within the composition of the block and aids in the perception of the new building as compatible to existing street fabric.

**Pedestrian experience**, wherein the new building should provide similar visual experience to a pedestrian at a street level as the existing buildings. For example, if the existing architecture has an ornate facade, interesting brickwork or entryway treatment, the new building should offer similarly engaging experience for the eyes of the pedestrian either in the form of detailing, façade treatment of materials used. There should be a respite for the eye to investigate and be drawn to the details of the new building while enjoying the overall streetscape experience.

If these four important compatibility characteristics are considered, it becomes much easier to ensure the new infill building will be compatible with its historic neighbors due to having laid the groundwork for compatibility.
Chapter 4: Differentiated And Compatible

There are several other ways to look at the merging of new and old. During my research on compatibility I came across professor Steven Semes writings on four different design strategies to approach placing new architecture in historic settings. Steven W. Semes is an associate professor at the University of Notre Dame School of Architecture and a practicing architect for over 30 years as well as an author on historic preservation and classical architecture. His approach, called differentiated and compatible: four design strategies for additions to historic settings, explores four strategies when designing a new building for an existing historic setting:

- Literal replication
- Invention within the same or related style
- Abstract reference
- Intentional opposition

Literal replication is exactly that, a literally replica of a historic structure, designed to either mirror it or replicate it exactly in all design elements.

In this type of introduction of new to the old, there is very little to argue about regarding compatibility building wise, as it will blend and adhere to the existing vocabulary perfectly, being an exact replica. The question for architects may be if it is the best choice for the new building stylistically, but there will be little to no argument about compatibility.

In the image to the right we can see an example of Literal Replication. We can obviously see that the new aligns with the old in the height, street-wall adherence as well as massing.

Literal Replication relies on and utilizes “well understood historic elements, available technical means, scale considerations” and so on. “Many great European monuments visible today were completed not by the original designers but by a series of successive architects willing to realize their colleague’s designs” (Sense of Place 5).

Figure 4.1  Jewish Museum, New York, formerly Warburg Mansion (C.P.H. Gilbert Original (1908) right, with addition (left two bays) by Kevin Roche John Dinkeloo and Associates, 1993)
Invention within a style is slightly different. “This strategy, while not replicating the original design, adds new elements in either the same or a closely related style, sustaining a sense of continuity in architectural language” (Sense of Place 6).

Here we can see the massing of the existing and new buildings are very well attuned. In addition, both buildings correspond similarly to the streetwall – meaning they align to the street in the same manner. The new building is roughly one story lower than the existing building before the existing building steps back. Thus, the new building meets the height parameter for compatibility – honoring the +1/-1 story differential from the existing. “The intention is to achieve a balance between differentiation and compatibility, but weighted in favor of the later” (Sense of Place 6), when employing Invention Within a Style design approach in a new building.

Abstract Reference “makes a reference to the historic setting while consciously avoiding literal resemblance or working in a historic style” (Sense of Place 7).

The new building respects the building height, is of similar or compatible massing and size proportions and aligns to the streetwall. Despite differently sized windows, differently styled windows or even the different materials used, the new is compatible with the old. Abstract Reference is a “difficult strategy to execute because it requires an artistry and skill that are not often available” (Sense of Place 7). In employing abstract reference, “compatibility of the new and old is suggested by the reduction of composite form to abstract style” (Sense of Place 7).
Intentional Opposition is a “conscious opposition to the context and the determination to change its character through conspicuous contrast, prioritizing differentiation at the expense of compatibility” (Sense of Place 8).

Contrast is the clearest form of delineation between what is new and what is old. It highlights both architectural styles – old and new – in their difference of style and approach to architectural vocabulary, but gives each the privilege of being distinct next to each other.

“Sometimes contrast is the appropriate response to a context that is weak or otherwise unsatisfactory, but we must be careful making such judgements” (Sense of Place 8).

In this instance, the new infill building honors the adjacent building height, streetwall as well as massing and scale factors. And even though the material, color, texture and solid to void relationship does not match that of its neighbors, the new building is compatible with the old by adhering to certain basic principles – height, streetwall, massing.

Basing the analysis even on the compatibility factors as well as the four-differentiated vs compatible design approaches, we have tools to introduce new architecture into a historic context. But we also need to consider what would make the new building meaningful, as well as to ask ourselves what is its intended purpose? What is important in today's architecture in relation to new infills in historic settings and how should it inform the design?
Chapter 5: A Case For Architectural Styles Of Our Time

Authenticity. Purpose. Meaning

Does historic architecture gain or lose meaning when a new infill building in latest architectural style is placed next to it? Does it add value to the historic district if a new building is added in historic style? Is it respectful to historic architecture to borrow elements from it and integrate into new architecture? Maybe it is respectful to allow historic architecture to be unique and add new architecture in new style next to it?

Architecture is not isolated in the pursuit of answers to the question about new vs old relationships. It is also not alone in the quest for authenticity and meaning in its design and legacy. There are many industries where designs change over time – for example automotive and horology.

If we take for example the corvette of 1967, people appreciate it for what it could do for its time! The same is true for the current model! The inherent capabilities of its time are what make the design unique, and allow us to celebrate and appreciate the passage of time and human inventiveness!

When we dilute the perception of what is old and new, are we helping or hurting the cause of both? Are we being true to the old and the new when a design professional chooses to mimic the facade and architectural elements of the old? Or are we robbing one of its place in time for the perceived benefit of holding on to the other? Construction methods change overtime. Although a new building may display elements borrowed from the past designs, the likelihood of it being constructed in the same manner as the building 200 years ago is unlikely. What is being created in the process? Something that has elements of historic design but is not historic and is built with modern construction techniques? Is it admiration? Do we treat the borrowing of the design elements of the old as the appreciation for the old?

For example, there is only one Mona Lisa painting, and the other 100 copies of the painting do not change the fact that there is only one original.

In a wider conversation of old styles and imitation, the historic preservationists and architects agree that “when old styles were imitated, it was only rarely out of consideration for the old style of the immediate architectural context; rather, there was a desire for the added meaning that came by association with the borrowed style or out of respect for the authority of accepted historical models” (National Trust for Historic Preservation 29).
If we look at the horology industry, the patterns are similar to the building industry. There is an ongoing conversation about the value of tradition and whether elements from past designs should be borrowed or imitated, in part or in whole.

An original Rolex watch from 1950’s is a classic and has a specific style. It showcased what the watch industry was capable of producing in 1950’s and it reflects the style and design valued in the era the watch was produced. Presently, the vintage Rolex watch is considered valuable for its technological offering of its time.

The newer watch companies such as Steinhart are copying specific design elements from the vintage Rolex watch to bring an element of luxury to its offering, but the person buying the new Steinhart watch knows it is not a Rolex watch. The person knows they are buying a new watch that is made to look like a luxury brand, but is not the luxury brand watch. Similarly, to the building industry, a new watch company is borrowing design elements from an older, historic time-piece to add an element of luxury and prestige to their watch. But the question remains, does the new watch bring the element of luxury with it just by having the design features of the older watch? It clearly does not have Rolex displayed on its dial. Is the intention of the buyer to appear to others as if they are wearing a more expensive watch than what they can afford? Clearly, they are choosing the new Steinhart watch with the design elements of the Rolex for a specific reason. What is that reasons? Can they not afford a Rolex? What is the intention of wearing a Rolex looking watch that is not a Rolex? Is it to fool a casual passerby, who will not pay close attention and will admire the watch wearer for a seemingly expensive looking watch?

The practice of borrowing in the hopes of appearing luxurious, even though losing authenticity in the process is present in all three industries – architecture, auto and horology.

When examining design guidelines for Alexandria’ historic districts, the preference in the guidelines is on windows that match historic window make and performance even in new construction. The preferred window type for windows in historic districts is “single glazed true divided light wood windows with interior storm sash” (City of Alexandria 127). I believe design guidelines should be updated to reflect acceptance of other solutions including energy efficient windows with triple glazing and low e-coatings. It is acceptable for building owners of historic buildings to abide by the solutions recommended in the design guidelines that make their buildings maintain their historic appearance and function if the owners so desire.
It is another to recommend new infill buildings to adopt products that will not maximize their energy performance for the sake of matching or blending in with the historic character of the district. New buildings should utilize the best of new technology for the most efficient energy use in their operations and maintenance. New infill should be allowed to be its authentic self, same as historic architecture is allowed to display its own unique character and treasured for it.

In pondering the questions regarding old and new and the appeal that the old has on us, I conducted a visual survey of entrances, windows and facades in Old Town Alexandria and compared them to similar elements in new construction.

Why do we admire and enjoy historic architecture in Old Town Alexandria?

- Authentic materials and construction methods
- Skill of handcrafting
- Imaginative use of materials
- Attention to detail and texture

New architecture can offer similar value and meaning:

- New methods of construction and available technology
- Skill and knowledge in new design methods such as Passive House design, sustainable design, and net-zero energy
- Imaginative use of materials
- Attention to detail and texture
Figure 5.3 highlights variety of styles and colors for entrances in Old and Historic Alexandria as well as Parker-Gray Districts. The uniqueness of each facade provides the interest that invites the eye to explore and wonder from façade to façade.

Figure 5.4 highlights variety of styles, materials, and textures found in new construction. Uniqueness of each facade invites the eye to explore the texture, materials, and overall façade treatment, creating an engaging pedestrian experience with new construction.
.Entrance Images

Figure 5.5 Variety of building entrances in Old Town Alexandria and Parker-Gray Historic Districts

Figure 5.6 Variety of building entrances in new and contemporary architecture.

Figure 5.5 highlights variety of styles of entrances in Old and Historic Alexandria as well as Parker-Gray Districts. The uniqueness of each entry provides the rich tapestry that enchants the eye when strolling through the historic districts in Alexandria.

Figure 5.6 highlights variety of styles present in new construction. Although different from traditional entries, modern entryways can offer uniqueness and display craftsmanship when designed with purpose and care.
The images in Figure 5.7 display variety and styles of windows utilized in Old Town Alexandria. The uniqueness of each window type in the historic setting comes from craftsmanship of the window and the slight variation in style from house to house. Like building entrances, the variety of window styles adds to the rich tapestry of elements the passerby in short individual stories about each house, and provides a tireless feast for the eyes as one strolls down the streets of historic districts.

Figure 5.8 highlights the variety and different styles achievable in new construction and although different in styling, the modern fenestrations can be similarly enigmatic and display craftsmanship when thought out and designed with purpose and care.
Art Historian, Expert And Practitioner Opinion On New Vs Old Integration

During the research process, to understand the take on new vs old architecture by other industry sources and participants, I particularly focused on 5 different sources:

a) Viollet-le-Duc, a practicing 19th century architect, expert in the field of early renovation work in France in 19th century and an early advocate of the restorations of medieval buildings.

b) John Ruskin – an art and architecture critique from 19th century, England. In my readings on John Ruskin, I concluded that Mr. Ruskin strongly favored originality of the building and advocated to not renovate or modify existing historic structures but to leave them in their original, intended state,

c) Old & New Architecture, a book produced by National Trust for Historic Preservation based on a conference for industry professionals in architecture, historic preservation, and design. The book encompasses essays with diverse viewpoints on subject of new and old architecture by architects, historic preservationists, and art historians.


A closer look into the above five sources allowed me to form a better understanding on the relationship of old and new architecture through the lens of past thinkers, practitioners as well as current day historic preservation experts and designers.

Below are the takeaways from each of the five sources that I found useful and informative and which for me summarized the essential highlights from the writings and viewpoints of each source:

Violet-Le-Duc on the subject matter of materials, renovation, architecture, and restoration:

a) New construction techniques for new type of building materials. Don’t force new building materials into traditional construction techniques.

b) Various materials possess different properties; if we succeed in expressing these properties by the forms we give to materials, we interest the public by this constant endeavor to give every object the form that befits its nature...not to deceive is the first rule that person of taste lay down for themselves. (Violet-Le-Duc, “The Architectural Theory of Viollet-le-Duc” 192)

c) In restoration...every portion removed should be replaced with better materials, and in a stronger and more perfect way. (Violet-Le-Duc, “The Architectural Theory of Viollet-le-Duc” 275)

d) The term restoration and the thing itself are both modern. To restore a building is not to preserve it, to repair, or rebuild it; it is to reinstate it in a condition of completeness that could never have existed at any given time. (Violet-Le-Duc, “The Architectural Theory of Viollet-le-Duc” 269)

e) The materials used must indicate their function by the form we give them. (Violet-Le-Duc, “The Architectural Theory of Viollet-le-Duc” 192)
Violet-Le-Duc's ideas are important as they illustrate the architect's viewpoint on the state of restoration and preservation. Of interest, I find the idea to be honest with the materials in terms of what they convey through construction. I believe Violet-Le-Duc advocated an honesty in construction and embracing, and promoting the knowledge of its time.

Highlights from the writings and thoughts of John Ruskin on the subject matter of restoration materials, buildings, and construction:

a) When we build, let us think that we build forever. Let it not be for present delight, nor for present use alone; let it be such work as our descendants will thank us for. The greatest glory of a building is not in its stone, or in its gold. Its glory is in its age, and in that deep sense of voice-fulness, of stern watching, of sympathy.... mysterious.

b) It is impossible, as impossible as to raise the dead, to restore anything that has ever been great or beautiful in architecture....another spirit may be given by another time, and it is then a new building.

c) I cannot but think it an evil sign of a people when their houses are built to last for one generation only. There is a sanctity in a good man's house which cannot be renewed in every tenement that rises on its ruins.

d) I must not leave the truth unstated, that it is again no question of expediency or feeling whether we shall preserve the buildings of past times or not. We have no right whatever to touch them. They are not ours. They belong partly to those who built them, and partly to all the generations of mankind who are to follow us.

e) Restoration is the most total destruction which a building can suffer (Ruskin, “The Seven Lamps of Architecture” 184-186).

Rather opposite from Violet-Let-Duc's ideas of embracing new construction techniques and restoring the historic structures to new glory, Ruskin advocated leaving the historic structures to their ruin, seeing restoration as an evil done to a building. Ruskin advocated building good quality architecture but not altering it afterwards.

Highlights from the compilation of essays and writings on Old and New Architecture, from the Conference held in 1980 and compiled by National Trust for Historic Preservation:

a) We save old buildings because they are good ones. There are many ways to place new buildings successfully alongside old buildings, but what goes best with good old architecture is, simply, good new architecture. (36)

b) In analyzing old and new design relationships using historical examples, it is possible to say that, as a general rule, new building in the context of old building has almost always been done in the new style. (18)

c) If the historic buildings are part of a series, the problem of assimilation of the new structure becomes mostly one of volume and alignment. If, instead, the character of the district contains already different heights and forms (sculpted roofs, cornices, or bay windows) then the new design can be better assimilated as an element of variation and contrast. (42)

d) The problem of juxtaposing new buildings with old is a matter of urban design, not simply of the design of the new building. In the roman forums, for example, by keeping the sightlines clear through the use of axes that responded clearly to the symmetrical order of the architecture, it was possible to create ensembles of buildings that were constructed over a long period of time. (21)
When old styles are imitated, it was only rarely out of consideration for the old style of the immediate architectural context; rather, there was a desire for the added meaning that came by association with the borrowed style or out of respect for the authority of accepted historical models. (National Trust For Historic Preservation, 26)

The outlooks relevant to the topic of integration of new and old architecture discussed in the book *Old and New Architecture: Design Relationship* addresses the ideas of human civilization continually adding buildings to the cities and by default many buildings are built in the new style. New technologies and construction methods push the boundary of building and with each technological discovery a new way to build provides opportunities to build better and in a style that is relevant to its builders. Of note is the idea that what goes best with good old architecture is good new architecture. Our quest as a society and to a large degree part of this thesis discussion is understanding what constitutes good new architecture? Is it only found in the form and aesthetic realm or it is also the performance of the building and the functionality and purpose of the structure.

Excerpts and relevant ideas from the Secretary of the Interior’s Standards for the Treatment of Historic Properties:

- a) Not recommended - imitating a historic style or period of architecture in a new addition (112).
- b) Design a new addition in a manner that makes clear what is historic and what is new (112).
- c) New work should be compatible with the historic character of the setting in terms of size, scale, design, material, color, and texture (108).
- d) Use materials in kind that match in composition, texture, color, strength to material to be replaced in a historic building. Don't use stronger materials as they may change dynamic between existing and new material (ex., stronger bond Portland cement with existing masonry) (24).
- e) New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired (National Park Service 62).

These excerpts are relevant because they illustrate the direction provided by the Federal Government on the preservation, renovation, and rehabilitation of historic buildings. It states in the Design Guidelines that the Guidelines in many respects align with the Federal Government, and Alexandria has chosen even to be more stringent in many respects to historic preservation than what would be recommended by the Secretary of the Interior’s Standards for the Treatment of Historic Properties (City of Alexandria 2). As evident in the excerpts of the Secretary of the Interior’s Standards, the preference is to not imitate the historic style or period of architecture in new additions but to allow the new addition to be an expression of materials and design deemed most appropriate for the new construction. It is preferable to draw a clear distinction between the existing historic fabric and new architecture. Compatibility factors are important in arriving at a solution that will merge harmoniously the new and the old.
Chapter 6: What Is Our Responsibility To The Future?

In order to construct buildings, we require the use of natural resources, which are finite. With a rising world population seeking rising living standards, people will want to live in better places. It takes energy to service and maintain the built environment, and that amount is likely to increase in the near term.

There is nothing inherently wrong with wanting to live in better places; having running water, electricity, and comfortable homes are admirable goals. However, we should recognize that our increased demand for better things in life comes with a price of more resource utilization. Therefore, we need to find better and more efficient ways to construct and maintain our built environment, in order to make finite resources last longer.

Below are two graphs from the online publication Architecture 2030, which illustrate the immense consumption of energy by buildings in the US. The built environment is responsible for a significant amount of resource consumption, exceeding 40% of US energy consumption. If the past is any predictor of future, it is very likely that the demand for better living standards will only continue increasing across the world. If there are means and methods by which the building sector could become more efficient in its consumption of resources, I believe it is imperative that design professionals, architects and builders use them.

Figure 6.1 Graphs illustrating U.S. Energy Consumption by Sector and U.S. Electricity Consumption by Sector
The building industry is in the position of guardianship and stewardship of natural resources since it is design professionals who select the materials used in construction, as well as the construction methods used to build. It is the knowledge of the architects, designers, and engineers, and the construction company's workmanship that dictates how well the building will perform.

As stewards of the resources passed down to us from previous generations, it is our responsibility to do our best to pay this gift forward while having enjoyed it responsibly. The design industry has the knowledge to make better choices in construction techniques and resource management.

New construction and design methods, skills, and knowledge of how to best harvest solar, wind and other renewable energy sources are essential in tackling the problem of finite resources and energy consumption by the building industry. With statistics such as “buildings are responsible for nearly half of US CO2 emissions” (Architecture 2030), it is vital that the design industry act on knowledge it has and strive for more efficient buildings.

New construction, based on Passive House design, sustainable design and net-zero energy principles can provide purpose and meaning to the new architecture. In addition to being a well-designed aesthetically, buildings can also be designed to use far less energy compared to traditional building techniques. New construction has a potential to carry an immense purpose and meaning within it – provide a much needed & desired home, office, gathering space or any other building typology, while using minimal or no energy in its operation. The tremendous energy reduction potential alone is a worthy attribute in new architecture. It rivals the meaning behind historic structures but is based on its own merit of superior performance and responsiveness to societal needs.

What can we do today that people 200 years ago didn’t know about? We are aware of our impact on the resources and planet that people 200 years ago did not know about. We can build in a better and more responsible way. Our children and future generations will look back and will examine our decisions and ask if we built to the capabilities we had and how responsible were we with resources we had available.
Chapter 7: Achieving Meaning And Purpose In New Infill Architecture

Passive House design strategies alone or together with sustainable design elements could be the answer in the creation of the path towards responsible use of our resources and in the process, the creation of purpose and meaning in the new architecture.

The purpose is to reduce the energy consumption of the built environment by utilizing specific design strategies to maximize the heat retention of the building and utilizing the surrounding natural resources such as vegetation, location on site and position of the sun in relation to the house as to create the maximum heat retention and minimal reliance on the outside energy sources. In addition, sustainable strategies could be used to even further offset or compensate even the minimal amount of energy necessary to operate the Passive House. Strategies such as green roofs and solar panels on the roof could provide additional levels of insulation to the house and supply renewable source of energy to be utilized for the small energy needs the house has.
Figure 7.3 helps in understanding Passive House design by comparing a thermos with a coffee machine. The thermos has an inner layer, separated from the outer layer by a well-insulated core which slows down the temperature change between inside and outside. The insulation allows the liquid inside the thermos to stay warm without the help of any additional outside energy source. In contrast, the coffee machine relies on an energy source to keep the coffee stand hot. The coffee vessel has no insulation and if the energy source is removed the coffee would get cold very quickly. A Passive House is similar to the thermos. It relies on the superior insulation to keep the temperature inside the house constant and pleasant without additional energy sources. A traditional house is more akin to the coffee machine, in that it relies on a constant source of outside energy to maintain its temperature. If the outside energy source was to be removed the temperature change in the house would be drastic.

The Passive House design principles are as follows:

a) Exceptionally high levels of insulation
b) Well-insulated window frames and glazing
c) Thermal bridge free design and contraction
d) An airtight building envelope
e) Ventilation with highly efficient heat or energy recovery. (International Passive House Association, 10).

A Passive House requires very little energy to maintain a constant, pleasant temperature. It offers a 80% to 90% energy reduction over traditional, non-passive designs. In this sense, such buildings are almost "PASSIVE" as they need hardly any active heating or cooling to stay comfortable year-round. Excellent insulation and highly efficient heat recovery systems make this possible”. (International Passive House Association, 10).
The Passive House standard can be achieved by understanding the applicable concepts and then utilizing them in the process of designing a house, meaning: “the difference between a passive solar home and a conventional home is design.” (National Renewable Energy Laboratory.)

On the road to Passive House design it is very important to start the process early. Passive House elements should be considered thoroughly even in the pre-planning stages of the design, as the site, the location, and the positioning of the building all impact the success of the Passive House design. After the building has been correctly positioned on the site, considering relevant factors such as landscaping, the north and south orientation, and the relation to other buildings on site, further relevant design elements can be considered. These would include insulation, window selection and integration, and air supply methods.

In Alexandria, there is an abundance of south facing buildings based on the grid layout of the city, which is very advantageous for the implementation of passive solar design strategies. Southern facades need shading for summer months but can provide much needed sunlight and warmth during winter months for solar heat gain. There are huge advantages to utilizing Alexandria’s existing street grid for harnessing energy savings and other Passive House design advantages. However, the Design Guidelines do not favor placement of solar panels on the visible portions of the roof and similarly the Design Guidelines and zoning laws do not encourage flat roofs.

A Philadelphia-based nonprofit community development organization – THE ONION FLATS - was able to stay within the project budget of $130 per square foot by simplifying the building envelope, eschewing a basement, pre-fabricating modules in a factory, and specifying economical interior finishes and furnishings.” (Yancey, 5-4)

Worldwide, buildings are responsible for about 40 percent of carbon emissions, but in New York City, it’s closer to 71 percent. Building or retrofitting to the Passive House standard also improves the resiliency of buildings during natural disasters, significantly extending occupancy, while heating and cooling systems are unable to function. (Yancey, 5-4)

Can architecture and our approach to how we design new buildings help mitigate or solve socioeconomic problems?
Sustainable Strategies

Figure 7.5 Pervious parking surface.

Figure 7.6 Green Roof and Solar Energy.

Figure 7.7 Sustainable Landscaping.

Architecture with a Purpose

Figure 7.8 Onion Flats/ Stable Flats in Philadelphia

Figure 7.9 Merridian Hill Park Area, Washington, DC

Figure 7.10 23 Park Place, Park Slopes NYC 1899 Townhouse
According to the Pennsylvania Housing Finance Agency, the cost premium of Passive House projects was less than 2% for state-financed affordable housing. (Yancey, 5-4)

Designing affordable housing that requires a large amount of money to heat and cool makes little sense. Placing people with low income in houses that require very little money for heating and cooling is a more sustainable approach.

The Passive House provides resiliency of thermal comfort when the energy grid is overworked or energy supply is disrupted in the event of a storm or natural disaster. The Passive House also provides economic resilience for low income families, because their money can go to other places instead of energy bills. What better ways can there be to design new architecture with meaning than providing real, tangible economic and social benefits for the community?

Here in Alexandria, there are blocks of low-income housing that at some point will be rebuilt. How will the architects choose to contribute to these people’s lives? Will they build superior performing passive solar buildings that do not drain away resources and money? Or, will they choose to focus more on the aesthetic principles and not the construction techniques? Will the city of Alexandria encourage more responsible new architecture, architecture with meaning and purpose? We have means and methods to do it.

Figure 7.11 First Certified Passive Haus in Pennsylvania.

Figure 7.12 A comparison chart showing passive house energy costs vs regular house energy costs.
Chapter 8: The Site

After researching and gathering information, the next step was to delve into the details of Old Town Alexandria and gain a better understanding of the composition and design elements which make up the historic buildings.

I chose to focus on Cameron Street, and drew the side of the street with the southern exposure. This side of Cameron Street has a good variety of building typology, details, mix of building ages as well as several empty lots. In total, I drew nine street blocks which spanned both historic districts.

Cameron Street used to be the main street in Alexandria and holds a good amount of historic fabric. However, it also has new infill buildings and parking lots for possible future buildings. The gamut of housing types on Cameron Street is wide – it offers modest small historic houses as well as wealthy historic households and a lot of in-between household types. For example, Lord Fairfax House is located on Cameron Street, representing a large, private residence of its time. Many smaller type residences and commercial buildings are also located on Cameron Street, offering variety of details and styles.

Figure 8.1 illustrates a composite map of Sanborn Company Map from 1907 (light pink and yellow) and a current map (in dark gray). The composite map illustrates the building and lot layout in 1907 compared to the building and lot layout of the current day.

Figure 8.1 Cameron Street in Old Town Alexandria. Overlay of 1907 Sanborn Map and Current GIS map. Blue line delineates separation between Parker-Gray Historic District and Old and Historic Alexandria District. Red arrow indicates Cameron Street length of Cameron Street drawn.

Figure 8.2 Overall Cameron Street elevation from N. Henry Street to N. Lee street.
The idea behind drawing a street facade was to understand the factors that make Cameron Street visually appealing and tireless to look at, even though the majority of the buildings are built in similar time periods and are of the same type. New buildings feel and look less complete or authentic. They blend in well enough, but upon a closer examination and reflection, they do not have the quality and depth that the older buildings offer.
Zoning and Codes

I looked at Alexandria’s zoning codes to identify permitted building types for the two lots I selected for my thesis investigation. The two lots I selected are currently both utilized as parking lots. One lot is located at 517 Cameron Street in a residential medium zone, and the other lot is located at 1011 Cameron Street in commercial low zone.

Per local zoning regulations, buildings on both lots should not exceed 35 feet in height. With a special permit or exception from the City of Alexandria and/or the Zoning Board, the buildings on both lots could be built to a height of 45 feet. Buildings must follow the existing established streetwall alignment in both locations.

Per zoning regulations, flat roofs are strongly discouraged. However, there are at least three precedents for flat roofs located near both lots:

a) 200 N. Alfred Street - intersection of N. Alfred Street and Cameron Street, residence with parapet wall and flat roof
b) 811 Cameron Street - Cunningham Funeral Home with parapet wall and flat roof
c) 128 N. Pitt Street – intersection of N. Pitt Street and Cameron Street, two story commercial building with parapet wall and flat roof

Since flat roof lines allow for a discreet and advantageous placement of solar panels, the design solutions presented in my thesis will utilize a flat roof option.

Figure 8.4 Old Town Alexandria and Parker-Gray District zoning map. Circle to the left – 1011 Cameron Street – Commercial Low zoning requirements; Circle to the right – 517 Cameron Street – Residential Medium zoning requirements.
Based on Alexandria Zoning requirements for a Residential medium area, the permitted uses are as follow.

Permitted Uses:
- single family dwelling
- two-family dwelling
- townhouse/ multi-family dwelling
- accessory uses
- child or elder care home
- church
- home occupation
- park
- public school
- utilities

For this thesis exercise, I propose for the infill building at this lot to house a townhouse/multi-family dwelling.
Lot at 1011 Cameron Street

Figure 8.6 1011 Cameron Street – personal services, wellness facility infill. One of many possible infill options following passive house and sustainable design factors.

This infill is in Commercial Low zone - commercial, office and industrial zones. Based on Alexandria's zoning requirements for a Commercial Low zoning area, the permitted uses are as follows:

Permitted Uses:
- single & two-family dwelling
- townhouse/ multi-family dwelling
- animal care facility with no overnight accommodations
- business and professional office
- cemetery
- day care facility
- medical office/ medical laboratory
- motor vehicle parking or storage for 20 vehicles or fewer
- personal service establishment
- private/ public school commercial
- restaurant located within a shopping center
- retail shopping establishment, up to 20,000 gross square feet
- seminary, convert or monastery

For this thesis exercise, I propose for the infill building at this lot to house a health and yoga clinic.
Figure 8.7 Street Section at Cameron St. and N. St. Asaph St. Zoning requirements for step protrusion on public sidewalk.
Figure 8.8 Street Section at Cameron St. and N. St. Asaph St. Zoning requirements for the canopy and awning protrusions on public sidewalk.
Chapter 9: The Design

I have utilized two locations on Cameron street to test proposed design solutions.

There are many different solutions possible at each investigated site, however I have focused on four concepts at each site. These are four possible design solutions to the problem of creating a new infill design that is meaningful and purposeful in relation to their older neighbors.

Each site has a building of a different scale, which incorporates Passive House and sustainable design solutions.

Site at 517 Cameron Street is located in the Old and Historic Alexandria District, and is zoned as a residential medium lot by the City of Alexandria. (Alexandria City Council).
The site is located on a corner lot at the intersection of Cameron Street and N. St. Asaph Street. It is currently owned and operated by the City of Alexandria as a parking lot. It is approximately 18,595 sq. ft. in size and measures approximately 98 feet along Cameron Street and 176 feet along N. ST. Asaph Street. (Planning and Zoning).

The new proposed design shows two residential buildings located on the lot. Each building is approximately 35 feet tall and houses townhomes with individual entrances at the front and back of each building.
The new infill buildings are designed to have similar massing and streetwall alignment to their older neighbors. The buildings have been designed at 35 feet tall so that they do not exceed the height of the surrounding buildings. Brick is used for the facade cladding material to blend in with surrounding buildings, where brick is the prevailing exterior facade material.

The pedestrian experience is meant to be similarly engaging to that of older buildings, by providing well-designed detailing along the fenestrations and door openings at the entry of each townhouse.

Figure 9.2 illustrates the south-west facades of the infill site. The south facade has multiple trellises attached to it in designated locations, which allow for a green plant material on the wall.

Unlike the existing buildings, the new infill buildings would have exterior horizontal louvers on the south facade along the Cameron Street, and vertical louvers or fins along the N. St. Asaph Street side. This is to minimize the solar heat gain from direct sunlight in summer months and allow for solar heat gain in winter months based on Passive House design principles. The new building envelope would be designed to the Passive House standards for superior insulation based on the climate region designation for Alexandria, VA. Thermal barrier-free design would be utilized for both infill buildings to minimize the temperature change between inside and outside. The roof of both buildings would be flat, with a 3’ 6” stepped parapet which would hide the solar panels located on the roof. The stepped parapet would aid in segmenting the facade into smaller visual units.

There would be a low and hardy green roof on both buildings, utilizing local plants and vegetation to absorb rainwater as well as heat from the sun. A green roof would further aid in insulating the building envelope and providing green space. Permeable pavers would be utilized for sidewalks and parking surfaces on the lot. Open space would be designated for the planting of local trees and vegetation, and for access by residents.

The design solution for 517 Cameron Street shows simple facade, although opportunities for many different design solutions exist. To illustrate further that the Passive House design and sustainable design strategies are not tied to one limited look, I have created and utilized a total of four elevations for this site.

Facade Option No. 1 in Figure 9.3 illustrates the elevation of the proposed design for 517 Cameron Street.

Facade Options No.2, No. 3, and No. 4 show facade concepts based on already built Passive House design projects around the world. These facades are modified to fit the needs and parameters of the site at 517 Cameron Street.

Facade Option No. 2 is a modified facade design taken from the German Architecture firm Peter Ruge Architekten, from an apartment complex located in Changxing, China, built to Passive House Standards in 2014. This facade has solar shading on southern facade and large windows that provide plenty of daylight and outside views for building residents. The modified version for the 517 Cameron Street site location does not exceed the required building height per local zoning codes. It adheres to the streetwall and the massing of the building is harmonized with the historic buildings found in the neighborhood.
Façade Option No. 3 is a modified façade design taken from Doone Silver Architects, a London based architecture firm, for a 4-story apartment building located in London, UK, finished in 2014. The building was designed to local sustainability standards with Passive House design elements. The façade is brick with large glass openings. This façade does not exceed the allowed 35' building height which aligns well with the historic buildings in the vicinity. The façade aligns with the existing streetwall and is similar in massing and scale to the Lord Fairfax house across the street, at the Cameron and N. ST. Fairfax Street intersection. The design is clearly contemporary in the design of the window openings and solid to void ratio, but the façade also utilized brick which is a compatible façade material to the rest of the block. The two entrances into the new buildings are covered, providing a similar entrance experience to that of historic structures with covered and protected entryways in the neighborhood.

Façade Option No. 4 is a combination of three different and modified facades taken from three different projects that have already been built. Architect Paul A. Castrucci’s designed 951 Pacific Residence – the first residential Passive House and net-zero ready certification in NYC. (Castrucci). Two projects from ISA-Interface Studio Architects – a 100K Houses project located in Philadelphia, PA built between 2008 – 2012, and townhomes built in Boston, MA in 2013, as part of a net zero energy housing prototype. (IS Architects).

The mixed facade from three projects showcases the variety that a combination of different types of façade materials and designs can bring to Cameron Street, while successfully implementing Passive House and sustainable initiatives. The combined façade from three projects does not exceed the 35-foot height limit per zoning requirements. It adheres to the streetwall similarly to its historic neighbors, and is harmonious with its neighbors in terms of massing and scale. The varied façade treatment in this option also provides a lot of visual interest for the pedestrian at a street level. From various metal panel facade treatments to variety of color and textures, this façade is clear a departure from the historic fabric in the neighborhood, and it provides an inviting contrast between new and old, each showcasing its own unique value and meaning behind its creation.
Figure 9.3 517 Cameron Street. Examples of possible new infill strategies. Facade Option No.1 and No. 2
Figure 9.4 517 Cameron Street. Examples of possible new infill strategies. Facade Option No. 3 and No. 4
The site at 1011 Cameron Street is zoned as Commercial Low lot by the City of Alexandria. (Alexandria City Council).

The lot is located in the Parker-Gray Historic District. It is currently owned and operated by a private organization as a parking lot. It is approximately 3,000 sq. ft. in size and measures 30 feet along Cameron Street and is 100 feet deep. (Planning and Zoning)(2).

The new proposed design is a three-story building approximately 34 feet tall to not exceed zoning requirements for the Commercial Low lot. The building will house a health and yoga center, as per allowed permitted use for this area.

The new infill building is designed to have similar massing to its neighbors with adherence to streetwall alignment. The size, scale and solid to void ratio is compatible with the historic neighbors.

Facade material is painted brick with superior insulation and thermal-bridge-free design.

The pedestrian experience should be similarly engaging to that of older buildings, by providing well-designed detailing along the windows and door opening at the entry.

Figure 9.5 1011 Cameron Street Infill Site Plan
Figure 9.6 1011 Cameron Street Infill Perspective
Unlike existing buildings, the new infill building would have exterior horizontal louvers on the south facade along the Cameron Street, and vertical louvers or fins along the west façade of the building. This is to minimize the solar heat gain from direct sun in summer months and allow for solar heat gain in winter months based on Passive House design principles.

The new building envelope would be designed to the Passive House standards with high levels of insulation based on the climate region designation for Alexandria, VA. Thermal bridge-free design and an airtight building envelope would be utilized to minimize the temperature change between inside and outside. The roof of the new infill building would be flat, with a 3’ 4” parapet, which would hide the solar panels located on the roof.

There would be a low and hardy green roof utilizing local plants and vegetation to absorb rainwater as well as heat from the sun. A green roof would further aid in insulating the building envelope and providing green space.

Permeable pavers would be utilized for a sidewalk in front of the building and on the back patio. Open space would be designated for the planting of trees and local vegetation in the back of the lot to provide open space per zoning requirements.

The design solution for 1011 Cameron Street shows a simple facade, but the opportunities for many different design solutions exist. To illustrate further that the Passive House Design and Sustainable Design strategies are not tied to one limited look, I have created a total of four elevations for this site to illustrate the variety of design solutions possible.

Facade Option No. 1 in Figure 9.7 illustrates the elevation of the proposed design for 1011 Cameron Street. The proposed facade is simple but provides plenty of access to views and daylight. It adheres to the building height requirement per the zoning code, as well as the streetwall, massing and scale requirements to meet the compatibility factors.

Facade Options No. 2, No. 3 and No. 4 are derived from real-life examples, built to passive solar design standards or with incorporated sustainable design features that greatly reduce energy consumption.

Facade No. 2 is a modified depiction of multi-unit apartment building in Shaw, constructed in 2014 by Ditto Residential and designed by Chuong Cao of DEP Designs. (Ditto Residential).

The building was designed with sustainable features such as daylighting and views. All units have windows which offer direct access to daylight. The design employed sustainable materials to provide a high-quality aesthetic with low impact design. The building facade meets the compatibility factors that would lay the groundwork for a compatible new building in a historic neighborhood. The infill building adheres to the streetwall established by existing historic buildings, it meets the building height requirements, not to exceed its neighbors by more than one story and it’s massing and scale is compatible with existing buildings in the neighborhood.
Figure 9.8 1011 Cameron Street. Examples of possible new infill strategies. Facade Option No. 3 and No. 4
Facade No. 3 is a modified facade of a multi-use residence designed by Susan Fitzgerald Architecture and built in 2015 in Halifax, Canada. (Akkoush, S.) This new infill building option incorporates some Passive House design elements and sustainable features, such as a roof garden and terrace, abundant access to daylight and sustainable landscaping features. The building does not exceed the neighboring buildings by more than one story, in fact it complies with the 35 feet building height requirement. It adheres to the streetwall established by existing buildings and its massing and scale is compatible with the historic buildings in the neighborhood. Similarly, to Façade Option No. 2, it represents a contemporary take on the building facade with modern materials and construction techniques, providing a meaningful design solution to the problem of limited resources and site.

Facade No. 4 is a modified from original, multi-residential home designed by Malboeuf Bowie Architecture and built in 2015 in Seattle, WA. (Malboeuf). It houses 3 separate units, incorporates Passive House design features, and has up to 90% reduced energy costs.

The façade provides partial solar shade for the windows. It does not significantly exceed existing historic homes in the neighborhood, complying with the +/- one story height factor. It aligns with existing streetwall and is comparable in massing and scale to existing historic neighbors. The building’s unique façade and innovative use of materials provides ample respite for the pedestrian on the street to examine the detailing and treatment of the building façade. The design solution is engaging, providing meaning and purpose to the unique infill building.

Passive solar design does not prescribe a look, it prescribes design choices and construction techniques in achieving a 80% to 90% and better energy consumption reduction vs traditional designs. Most other construction elements are ‘hidden’ in the way the building is put together during construction. Passive solar design does not prohibit any specific exterior material use as long as the superior insulation and thermal barrier free design is achieved. Thus, the looks of buildings/ facades can be vastly varied allowing the architect or the designer an endless gamut of aesthetic design options to fit, contrast or harmonize within an existing neighborhood.

When our focus is to build architecture of purpose, the end goal provides meaning to the form and design of the building. Mimicking or borrowing design elements from historic architecture for the sake of aesthetic compatibility is not a strong enough purpose, especially when it is our responsibility as stewards of our environment, and to leave the place we inhabit the same or better than it was given to us. We can use elements of historic architecture if while doing so we are not limited in achieving energy efficiency. Since we have the knowledge and the tools to make smarter design decisions and build more energy efficient buildings, it is our responsibility to do so.
Conclusion:

Design professionals in the field of architecture and construction need to propose the best buildings that knowledge and technology make possible in the present, while minimizing the burden on natural resources. The knowledge and technology are available to create buildings which are purposeful and meaningful, due to providing needed space and comfort to the occupants while drastically reducing use of natural resources.

These superior-functioning buildings are the answer to the demand of better standards of living and lower energy-consuming spaces. Such buildings are meaningful and purposeful in the current economic and cultural environment because they directly address environmental concerns. Such energy efficient and/or net-zero buildings are our societies contribution to the built environment and would be our footprint in the sand of time.

The architects and designers of today will be responsible for the urban landscape that continues to unfold around us. If aesthetics is the only consideration behind a new building, while ignoring the tremendous opportunity to capitalize on the knowledge and technology to build more efficiently, we have missed an opportunity to be good stewards of resources given to us by our ancestors as well as the opportunity to safeguard a better future for generations to come. Architecture of purpose has an inherent meaning, depth, and richness in that it addresses the needs of the society with the tools it has. The historic buildings around us were built with the materials and technologies available at the time, reflecting the capabilities and values of the era that birthed them. We can have new architecture with meaning, if we allow new architecture to deliver the best it can offer, while addressing current societal needs.

While creating new architecture of purpose and meaning, we should not separate the old from the new, as both have a place in the city. As indicated by Osmund Overby, a professor of art history and the director of the Museum of Art and Archaeology at the University of Missouri, Columbia, “there are many ways to place new buildings successfully alongside old buildings, but what goes best with good old architecture is, simply, good new architecture. (National Trust for Historic Preservation 36). It is our responsibility to do our best to create good new buildings.

The conversation about new and historic architecture and the best way to honor both is ongoing, due to many factors that affect tastes, perceptions, and knowledge. Opinions are as diverse as the buildings themselves, but I believe the integration of purpose and greater responsibility by the architectural community in their designs is vital for this ongoing conversation. Our cities are our history books, reminding us of the places we have come from and allowing us to showcase our capabilities for the future. The city is the story-teller of our culture, values, heritage, and thing of importance. The new and the old belong in the city together, as one isolated from the other is not reflective of the whole story the city must tell. As Michele Lamprakos writes in her research paper The Idea of the Historic City, “there is only one city: a collective work of art, the outcome of a single historical process that continues to unfold. Throughout history the city has been shaped by a creative synergy between old and new, between change and continuity: indeed, it is this synergy that created the places we consider “heritage”. (Lamprakos 29)

I believe it is this heritage that is being continually polished and updated by allowing the old and new to interact and exist side by side. It is this togetherness of new and old that creates the richest and most honest fabric of what the city truly is: an ever-evolving work of human habitat.

Here are sample questions that could be useful for further investigation on the topic of new and old architecture:
Are design guidelines for historic districts adequate in capturing the difficult questions of integrating new and historic structures?

Are design guidelines adequate in promoting new and innovative design solutions in historic districts?

Is it preferable for a historic district to maintain a set image of a specific time period, and does it have an opportunity cost of ignoring new architecture and new design solutions?

Are historic districts across United States of America and cities like Alexandria being respectful to the character of historic buildings by promoting the use of similar materials in new construction?
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Figure 5.2 “Rolex and Steinhart Watches”. Media Cache. https://s-media-cache-ak0.pinimg.com/736x/c3/6f/9c/c36f9cf3e2ecc4403bb4521f8eed0feb.jpg. Accessed February 2017.

Figure 5.4


Figure 5.6


“Building Entrance & Texture”. *Media Cache*. [s-media-cache-ak0.pinimg.com/736x/d9/73/9a/d9739a9e880c4d9b82cba94f6a7b4d90.jpg](s-media-cache-ak0.pinimg.com/736x/d9/73/9a/d9739a9e880c4d9b82cba94f6a7b4d90.jpg). Accessed October 2016.


Figure 5.8


“Passive House Façade”. *Media Cache*. [https://s-media-cache-ak0.pinimg.com/736x/3d/de/28/3dde28119e2ad36e88e32fa2222f0b6d.jpg](https://s-media-cache-ak0.pinimg.com/736x/3d/de/28/3dde28119e2ad36e88e32fa2222f0b6d.jpg). Accessed October 2016.


Figure 7.2 “Green Roof and Solar Panels”. Media Cache. https://s-media-cache-ak0.pinimg.com/236x/37/a9/2e/37a92e27b361d8e1654adc6bc88c98b4.jp. Accessed October 2016.


Figure 7.8 Onion Flats. 2016. “Stable Flats in Philadelphia”. Philadelphia, PA. EcoBuilding Pulse.


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