RECONSTRUCTION OF ALEPPO, SYRIA: A DESIGN STUDIO AT THE UNIVERSITY OF NOTRE DAME, USA

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ABSTRACT

As we think about how to rebuild communities that have suffered destruction, it is imperative to discuss the recovery of architecture and culture. As the world of architectural education trends towards teaching the design of buildings that create "placelessness", we must teach students to look deeply at history, to synthesize its lessons, and apply them sensitively and appropriately. Aleppo in Syria has a rich heritage of Islamic architecture that spans millennia. While the destruction of Aleppo has left a scar in the hearts of its people, it is possible to rebuild using the lessons and forms of traditional architecture. At the University of Notre Dame, our current studio of fourth year students is studying and proposing how a neighborhood in the historic city center might begin to be rebuilt. This studio is a teaching tool that allows students to engage with a culture that is foreign to them; to see and apply universal principles adapted for climate, culture, and building technologies that have been honed locally over thousands of years. The core of the studio is analysis of traditional Syrian architecture, looking at how the architecture supports the community and engages with the unique climate. The students study how traditional building technologies, like dome and vault construction, support the functions housed within these forms. They delve into the distinguished history of craft as they study architectural ornament. All these lessons are ultimately applied to a building project, which they program, conceptually develop, and design at the scales of the urban, building, and detail. These students, while they may be practicing far away from Aleppo, are preserving the heritage of a place that has seen so much destruction. Their work is a testament to the power of design in recovering the memory of a city.

Keywords: education, traditional architecture, typology, reconstruction, heritage.

1 INTRODUCTION

The study of traditional architectural forms is a lesson in materiality and technology, climatic design, and cultural adaptation [1]. Universal forms can be found around the world, adapted to each individual place and its people [2], [3] Modern architectural education in the west is often limited in its scope to the study of other western architecture and does not value the architectural heritage of place. The resulting architectural designs produced in school often lack a historical understanding and are thought of as objects, devoid of local character. By deeply studying historical architectural, it is possible to sensitively design and build in foreign places. Through the process of research, analysis, and synthesis students are able to decipher an unfamiliar architecture and make a proposal for how to design today (Fig. 1). The undergraduate fourth-year studio conducted in Spring 2022 at Notre Dame was an academic exercise focused on a proposal to rebuild a neighborhood in the historic center of Aleppo, Syria. The students grappled with the question: how to build in Aleppo today? Should new building take reference from the past, or should they take on the character of glass towers that are all too familiar in today's contemporary cities? None of the students had ever travelled to Syria, yet, the students did not simply insert their own architectural follies, but carefully analyzed the historic Islamic architecture of the city and region to thoughtfully design both urban and architectural interventions in the neighborhood. Without this thorough study, it would be impossible for students, or practitioners, to understand the rich and varied

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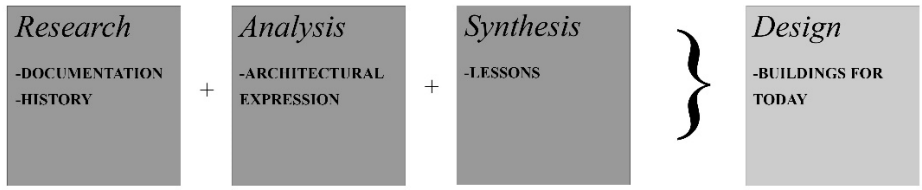

Figure 1: The methodology and process of the design studio. By researching and understanding the existing architecture of a city or region, it is possible to understand the architectural language that creates "place". Through this understanding, students can design buildings that are consistent and appropriate to the location of the building.

function of architecture in Syria and throughout the Islamic world. At its core, this studio is about learning to read and engage with foreign architecture so that one can thoughtfully design anywhere in the world. Therefore, the product of this studio investigation is not only the building design solution produced by the students, but also conceptual framework and process to be able to design in any context. With its diverse history, Islamic architecture is an ideal tradition within which to teach students about universal design, climatic and cultural adaptations, and shared architectural history. These principles are particularly important to apply in areas that are recovering from war or natural disaster. The history of place can and arguably should be recovered, not as an act of preservation, but as an act of contemporary design rooted in the principles of the place. In Aleppo, where so much destruction has occurred, the students' designs are based on the historic architecture and are designed to recall the character of the city that was so violently destroyed, while carefully designing for the modern community today (Fig. 2).

Figure 2: A stark image showing the destruction of the city of Aleppo; a once thriving city has been reduced to rubble. This studio tried to answer the question of what type of architecture is appropriate to rebuild the city? *(Source: Omar Sanadiki/ Reuters.)*

2 METHODOLOGY OF STUDENT RESEARCH AND ANALYSIS

The architectural design studio course began with research, followed by architectural analysis. To conceive their own unique designs, it was imperative that the students understand the historical architecture that has preceded them and created the existing city of Aleppo, Syria. There were two research and analysis projects in which the students engaged.

The first project lasted four weeks and focused on the study of one building in Aleppo. Each student selected a building and found all the existing visual documentation for that building (photographic, sketches, and measured drawings), they also researched the building's history and surrounding urban context. They used both library and online resources in their search, aided by a book and resource list (see appendix). The buildings the students studied ranged from larger buildings, such as the Great Mosque of Aleppo, to smaller, neighborhood buildings like the Bimaristan Al-Kamili. With their analysis the students were asked to understand the following areas: overall proportions, exterior versus interior character of the building, the proportion of the courtyard to the overall building footprint (if applicable), the solid void relationship of the window to wall ratio, the location of vertical and horizontal circulation, the internal hierarchy of spaces, the sequence of important spaces, the use of each space, and important green elements or elements of climatic design such as garden spaces, fountains, and natural ventilation techniques. The students were also asked to study the treatment of doors and windows, typical Syrian architectural elements (iwan, riwaq, liwan, tower, mashrabiya), and geometric patterning and ornament (Figs 3 and 4).

Through this analysis, each student began to understand how Islamic architecture in Syria was conceptualized and built historically. They examined the cultural milieus and climatic conditions that led to specific design solutions. This exercise allowed each student to begin to put together the elements that make Syrian architecture Syrian, especially religious and social traditions, building technology, and climate. By understanding the unique characteristics of the place, along with the universal principals of traditional design, something that was foreign started to become more familiar. The goal of each analysis project

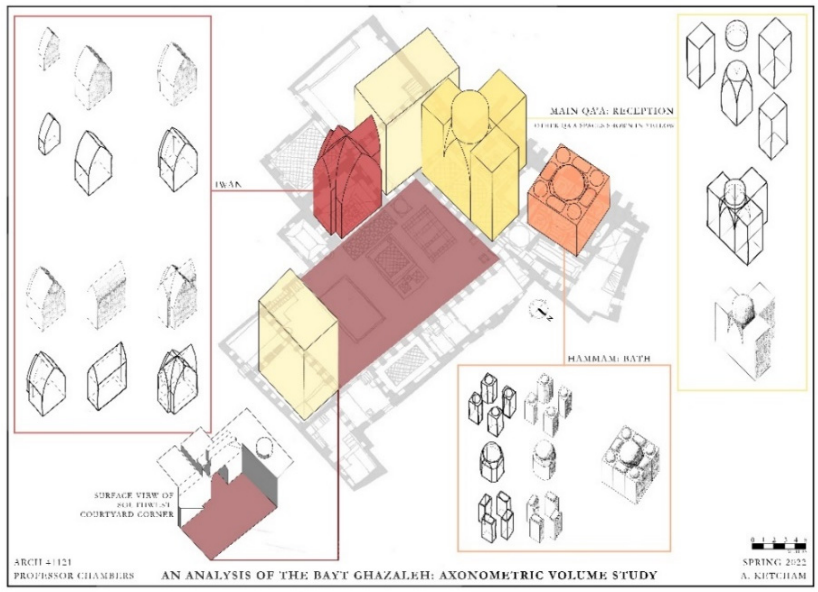

Figure 3: Analysis of a Syrian Bayt by Angelica Ketcham. The analysis studies the different volumetric forms that create the rooms of the house. This analysis breaks down each constituent element to understand how the forms come together to create space. It also looks at the disposition of rooms within a building complex.

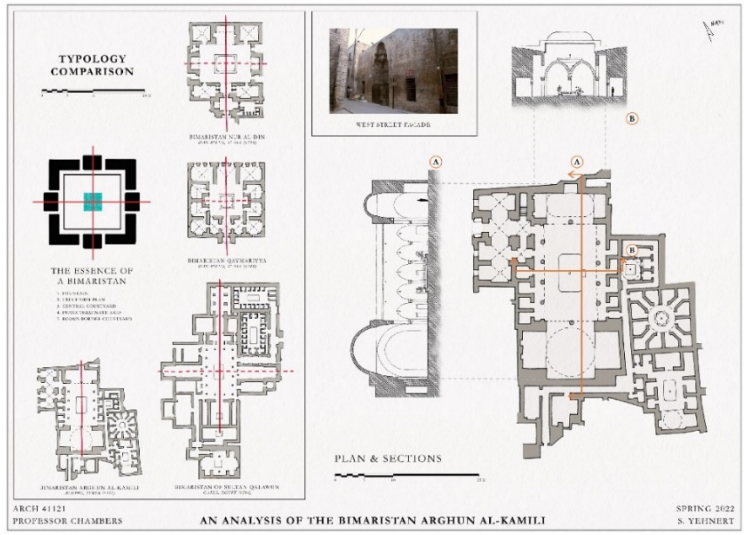

Figure 4: Analysis of a Syrian Bimaristan by Sharon Yehnert. The analysis compares different hospitals within the region to understand the typical arrangement of spaces. The hospital plans have then been distilled into their pure form, the universal parti of the hospital designs.

was for the student to synthesize the principles, to distill the essence of the architecture, and then to later apply the lessons of their analysis to their building design project. This process of research, analysis, synthesis, and later application to the design project is a process that students can apply to any architectural project. By learning the tools to extract and decipher the language of architecture, students can approach design problems within traditions all over the world. For this project, many students broke down their analysis to look at the constituent parts that make up the design. These typical rooms, or areas of the building, could later be rearranged and transformed in their own unique, modern designs. This analysis project helped the students to not only understand the rich architectural traditions of this ancient city but also to draw out the architectural lessons, the reason behind the building designs.

To further dig into the analysis, the students began their second project. This consisted of a one-week project which was a comparative study of western architecture and Syrian architecture. For this exercise, each student selected one building located in Syria and one building located in the west, primarily Europe. The buildings were shown together as a side-by-side comparative watercolor plate describing the two buildings. The comparisons were chosen based primarily on either form or use. This exercise was meant to help students parse out the difference between universal traditions and local Islamic and Syrian traditions. By doing this exercise, students began to decipher the pieces of the architectural language that are unique to Syria while also understanding how those things are part of larger, universal traditions. Through this drawing, the students were able to see that Syrian architecture, which at first seemed to be wholly different from its western counterpart, was part of the same world tradition of architectural design. Students saw the cross-cultural architectural ideas that linked buildings from different places and eras. The analysis included a comparison of the urban context, elevations and/or sections, plans, and details from each building (Figs 5 and 6).

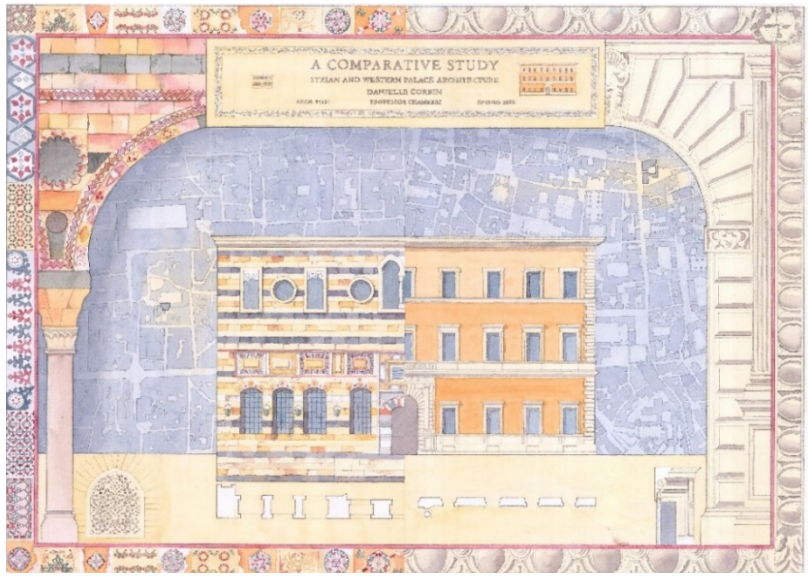

Figure 5: Comparative analysis of a Syrian Bayt and Italian Palazzo by Danielle Corbin. This analysis shows how similar the overall composition is between Roman and Syrian palaces. The student also looked at the different types of architectural decorative articulation and compared the two styles.

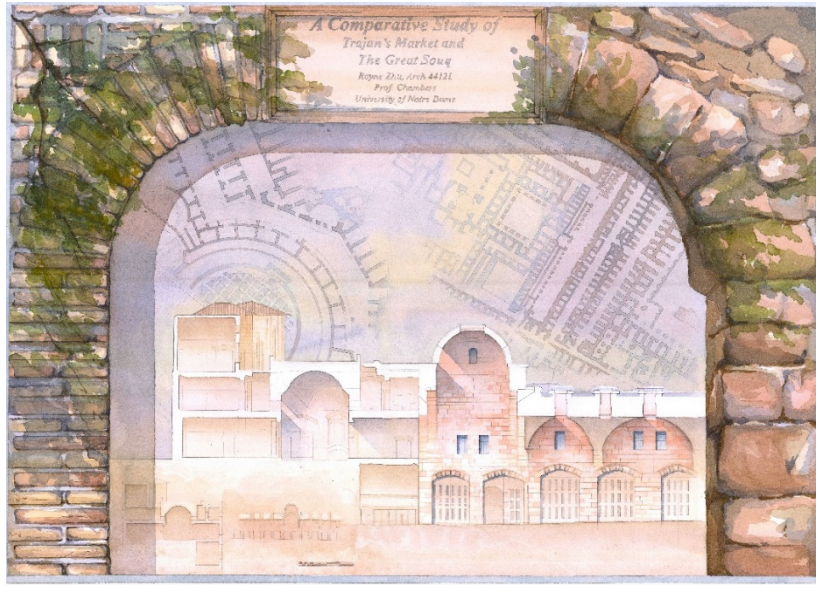

Figure 6: Comparative analysis of a Syrian Souk and Italian Market by Rayne Zhu. This student was looking at the function and form of markets and her plate describes how similar these forms are within these two contexts. She also shows, in an artistic way, the similarities in vault construction between the two markets.

Through this comparative study, students saw how building technologies suggest certain forms, and that many of these forms can be found around the world. However, they also began to study forms that are more unique to Islamic architecture, like muqarnas and geometric patterning. Through the comparative analysis the students were able to dive more deeply into these more decorative and local aspects of the designs. They learned how urban design shapes architectural design by comparing the buildings' placement within their urban environments. By comparing these side-by-side, the students were able to understand the unique elements of Syrian cities that inform the architectural design.

3 METHODOLOGY OF STUDENT URBAN DESIGN PROJECT

Following the analysis projects, the students embarked on a two-week urban design project as a single group. This project was focused on the north-west quarter of the historic center of Aleppo (Fig. 7). The goal of the urban design was to design an intervention that would bring back the historic character of the area while giving returning citizens a revitalized neighborhood that would meet their needs. The students had to contend with earlier destruction of the neighborhood caused by an intervention in the 1980s that destroyed a significant portion of the quarter, as well as destruction from the Syrian Civil War. The

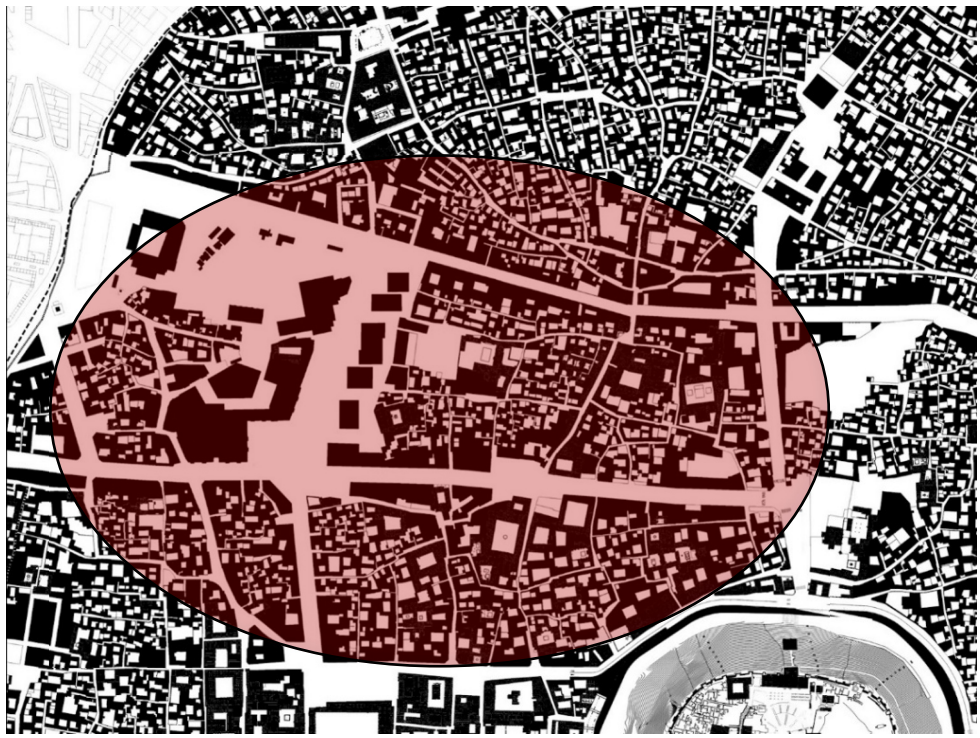

Figure 7: Existing figure ground prior to war, map produced collaboratively by C. Zorc, M. Meuth, R. Zhu, C. Russell, E. Hanley, V. Whitmore, D. Corbin, R. Palcyzski, S. Yehnert, T. Frame, and A. Ketcham. This map shows the large streets cut into the city in the 1980s, it also shows the areas that lack urban definition. By analyzing the existing context prior to the war and the current conditions of the city, the students were able to create a vision for rebuilding.

former analysis of the buildings helped the students understand the traditional settlement patterns of Aleppo and informed their urban design. The lessons they gleaned from their analysis about the historic city were the compact nature of the city, the grouping of commercial areas, the grouping and protective cul-de-sac, and the importance of green and cultural spaces. These lessons were supplemented by historical research of the area using information from the Middle East Cooperation Unit at Brandenburg University of Technology [4]. The students were asked to consider the following areas: climate conditions, historical conditions of the site, destroyed areas within the site, location and access to public parks and amenities, historical and current building heights, pedestrian and vehicular access, building uses, water use and accessibility.

The students did not propose to take down any existing buildings, but instead focused on filling in the gaps where buildings had been destroyed (Figs 8 and 9). This is an important consideration in the rebuilding of any destroyed city. They reconfigured the streets around the existing buildings to create through-streets as well as typical residential cul-de-sac. Their design considered what building uses might be suitable for different areas of the neighborhood, considering historical areas of importance and cultural needs for privacy. The students thought about how tourism might be brought back into the area, recognizing the site's proximity to other important historical sites within the city.

This intervention is the first step to rebuilding the city. It is a vision for how the city might be stitched backed together, while maintaining its historic and local character and heritage. The students documented not only where the new buildings would be located but also: accessibility to green spaces and new green spaces within the design, the proposed street hierarchy, vehicular and pedestrian street access, the location of existing and proposed cultural sites, the relationship of their proposal to the historic conditions of the neighborhood.

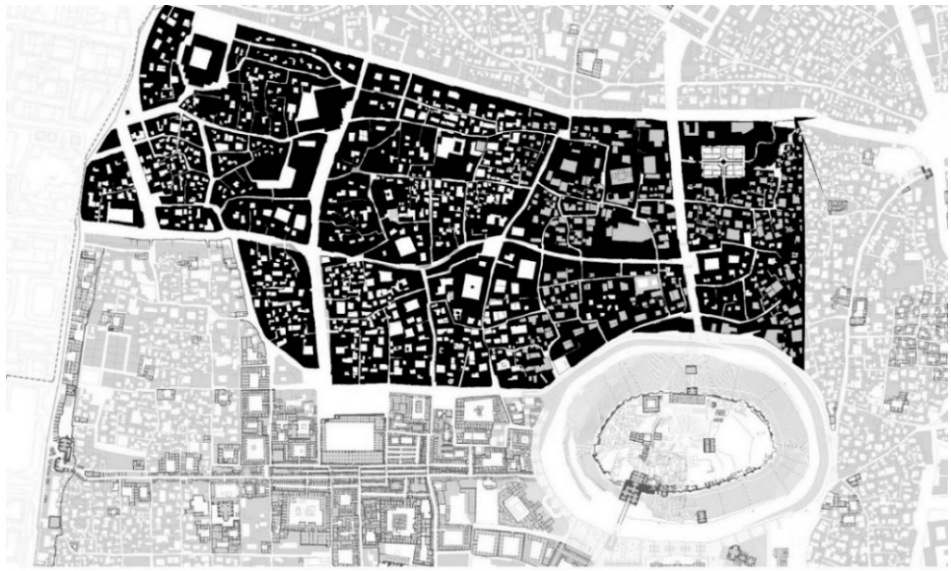

Figure 8: Proposed figure ground map produced collaboratively by C. Zorc, M. Meuth, R. Zhu, C. Russell, E. Hanley, V. Whitmore, D. Corbin, R. Palcyzski, S. Yehnert, T. Frame, and A. Ketcham. This map indicates the density of the new proposal, the design takes its cues from the traditional city and reconnects the ancient silk trade route into Aleppo.

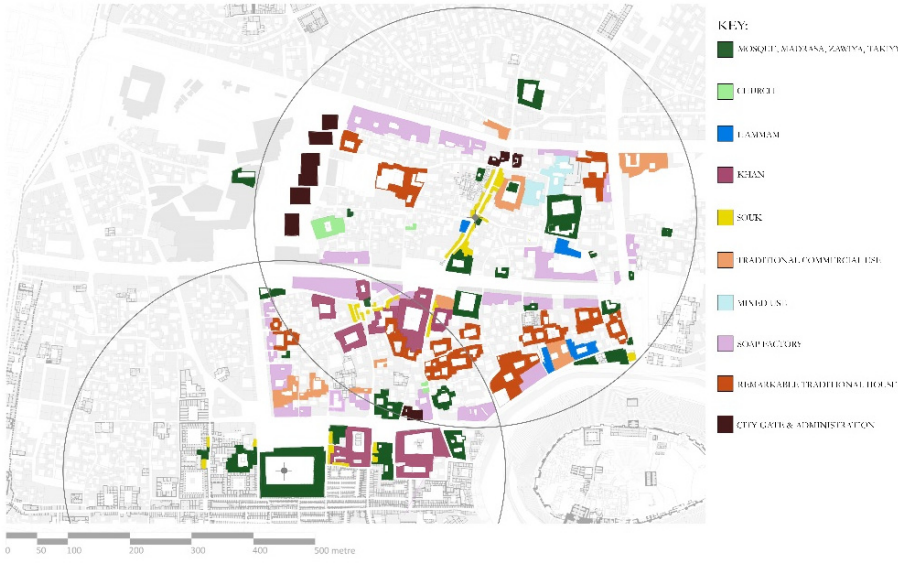

Figure 9: Proposed urban design describing public building uses. This proposal is a new design based in historical research and analysis of the function of the traditional and contemporary city. Drawing by C. Zorc.

All these factors helped them shape an urban design that has a relationship to the past and future of Aleppo.

4 METHODOLOGY OF STUDENT ARCHITECTURAL PROPOSAL AND DESIGN

Each student chose an empty parcel within the urban design to site their individual building project. The students proposed their intended projects to their fellow students and received feedback on their initial ideas, site locations, and programs. Many of the students chose to design buildings that would benefit the returning residents of the neighborhood including programs with transitional housing, work–live communities, and services such as baths and shops. While these proposals are only one conception for how rebuilding could happen, they show how it is possible to discover and use the existing architectural language to shape the future of the city. The students wrote a comprehensive program describing the size of each space within their project. From this they developed initial ideas, many of which were based on the buildings they had previously analyzed. The analysis projects became referenced in their own designs, helping them to design buildings that fit the climate, character, and culture using local building technologies. However, the students did not simply copy the historic architecture, they instead imitated its important qualities while making adaptations for life today. This difference between copying and imitation distinguishes the projects as contemporary, not historical, designs. It describes how the process of deciphering an existing architectural language and applying that language to a contemporary design today can be achieved.

The details and ideas incorporated by the students underscore the importance of studying the architectural and urban history of a place. Because the students understood the salient architectural characteristics, and how those characteristics supported the people of the place, they were able to produce buildings that fit seamlessly into the fabric of Aleppo (Fig. 10).

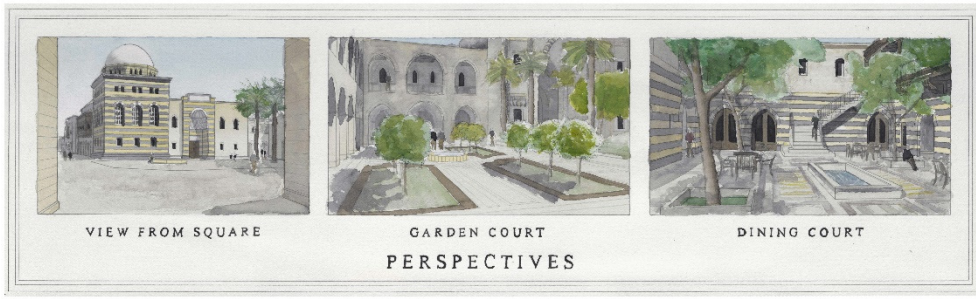

Figure 10: Perspectives from the transitional housing and market project by Max Meuth showing the architectural character of the entrance elevation and courtyards. This project utilized a partially destroyed existing structure but reimaged the use of the historic building. While the character is reminiscent of traditional Syrian architecture, the function of the building is centered on the needs of residents returning to the city today.

The projects are representative of the students' abilities to understand and utilize the local architectural language (Figs 11 and 12). This is one of the most important ways to enhance and carry forward the heritage of a place. Buildings that lack reference to the local architectural character will inevitably contribute to placelessness and lack of identity. Only by studying the existing and historic character of a foreign place is it possible to design seamlessly and integrate into the existing fabric while still creating buildings that function for daily life today.

Figure 11: A section detail from a mental health facility by Sharon Yehnert. The design of this facility uses traditional load bearing masonry and decorative devices to create a traditional aesthetic, while providing modern healthcare functions.

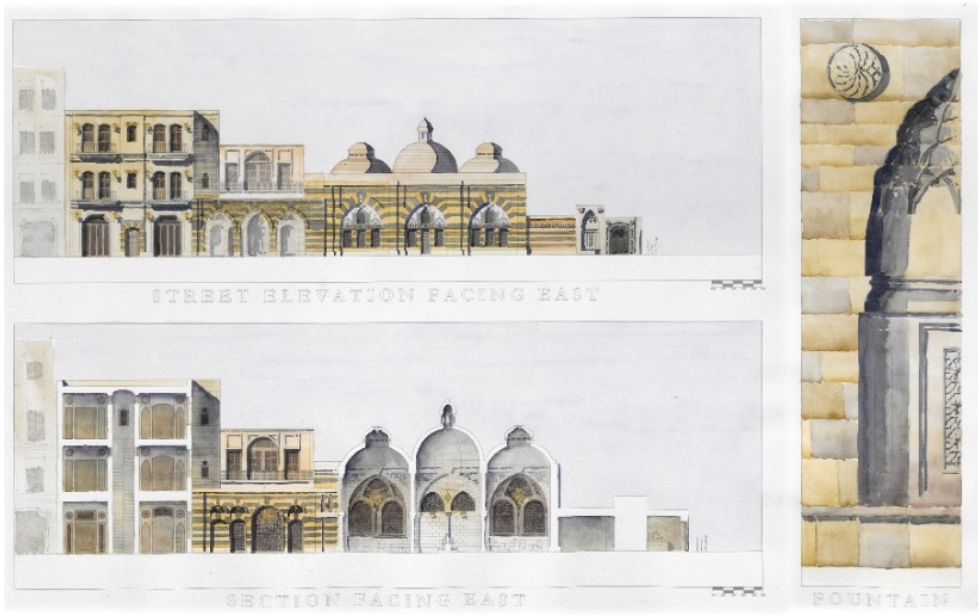

Figure 12: Elevations and details from a coffee shop and apartment design by Angelica Ketcham showing the local architectural character. This design project was ambitious and encapsulated the design of an entire city block. The student used local Syrian forms and motifs to recall traditional coffee houses that had been destroyed in the war.

5 CONCLUSION

By studying and analyzing a place, it is possible to unfold the unique characteristics that create it. Understanding both the universal principles of traditional design, as well as the distinct characteristics of a place allow for the design of sensitive and functional buildings. Particularly in places that have seen tragedy, it is imperative to redesign buildings that respect the heritage and culture of the place. This does not mean simple copying but implementing the unique design solutions that are responses to the specific place. This process of breaking down the architecture to its constituent parts allows those parts to be reinterpreted, while respecting the traditions and design solutions that have existed historically. Within the context of academia and education, these techniques can be used to teach students how to design in unfamiliar contexts. Islamic architecture is ripe for exploration as a teaching tool. Its rich and varied forms link to the collective of universal architecture, while distinguishing themselves by their cultural and climatic design responses.

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APPENDIX

The book and resource list provided to the students included the following:

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