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Louisiana State University Ogden Honors College

Adaptive Reuse

A Brief Introduction + Critique of Academic Methods

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Senior Thesis_HNRS 4000

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Introduction

The idea of adaptive reuse has become an increasingly more prevalent topic of both theoretical conversations and practical applications in the field of architecture within the past few decades. The increasing urban population along with a decrease in available undeveloped land, as well as an increased push in both culture and law making towards sustainability has all aided in bringing this idea to the forefront. However, as most things, the utilization of adaptive reuse can vary greatly, and its meaning can shift from architect to architect. How do we determine which buildings should be reused, rather than demolished? How much intervention should a building undergo? What should guide these adaptations and additions? These are all important questions with no concrete answers. By asking them, and by teaching architects and architectural students to ask them, we can better prepare tomorrow's designers for the future that lies ahead of them.

The best way to prepare for this ever-important shift is to document and study existing projects of this nature. How were these problems handled in the past? What drove the decision making in each one? And how can these projects be documented to allow for future architects to learn about them and make the most of the lessons learned?

Through a compilation of research and a series of case studies, I believe a framework for answering these questions can be created, even if not as cleanly and exactly as we may want them to be.

A Brief History

It could be argued that the reuse of buildings is a phenomenon that has been utilized for millennia, as the Romans often utilized materials from pillaged lands and buildings to construct their own cities and monuments; a scenario that they later found themselves on the other end of during the medieval times.¹ But the more contemporary idea of building reuse and specifically adaptive reuse can be traced back to the end of the 18th century, specifically with the French revolution. Prior to the revolution, the Church held an immense amount of land, valuables, buildings, etc. After the monarchy was overthrown, the National Assembly declared these as property of the state and began to classify and organize them as to their ‘useful(ness) for the public education of the nation,’ under the Commission des Monuments.^{2*} In 1837, a division of this commission focusing on historical monuments and how to handle them was created and Viollet-le-Duc was named its first chief inspector. In short, his approach to these new buildings did include additions and alterations to the existing buildings (many of which were Gothic churches), however being careful to stay true to the original style of the existing structure. While being a practitioner, Viollet-le- Duc also wrote heavily on his views of restoration, including the following: “...the best way of preserving a building is to find a use for it, and then to satisfy so well the needs dictated by that use that there will never be any further need to make any further changes in the building...”.³ This statement most simply and concisely lays out Viollet-le-Duc’s philosophy on the matter; a philosophy I will call ‘Restoration through Adaptation’. This

* This is widely regarded as one of the first governmental bodies that in charge of historical preservation, in the United States, this duty is left to the Department of the Interior and more specifically the National Park Service.

period, dubbed the Restoration Movement, garnered attention in Europe, and was soon being adopted throughout the continent.

Although widely regarded as innovative and successful, Viollet-le-Duc's strategies were not without detractors, most notably and more importantly, most outspoken of these detractors was English writer and philosopher John Ruskin. Ruskin, whose beliefs would eventually become the basis for the Conservationist movement of the time, were rooted in the pure conservation of a structure, rather than its adaptation, as a means of preservation. These beliefs are laid out in the following statement: "It is impossible... to restore anything that has ever been great or beautiful in architecture... Take proper care of your monuments, and you will not need to restore them."⁴ Ruskin's philosophy on restoration, if you could call it restoration, I will call 'Restoration through Conservation'.

These two opposing approaches lay the groundwork for adaptive reuse as it is even seen today: to intervene and use or to put in a theoretical glass box and admire. As the discipline evolved, more architects and academics began thinking about how and where this method should be implemented. This also led to more nuanced approaches to adaptive reuse. One of the first attempts at breaking down this complex idea was by Camillo Boito, a 19th century Italian Architect who proposed eight methods that should be considered and/or applied to any potential adaptation.

These were:

1. The differentiation of style between new and old parts of a building.
2. The differentiation in building materials between the new and the old.
3. Suppression of moldings and decorative elements in new fabric placed in a historical building.
4. Exhibition in a nearby place of any material parts of a historical building that were removed during the process of restoration.
5. Inscription of the date (or a conventional symbol) on new fabric in a historical building.
6. Descriptive epigraph of the restoration work done attached to the monument.
7. Documentation and presentation of the phases of the restoration, either on site or in a widely available publication.
8. Visual notoriety of the restoration work done.⁵

These methods prove particularly interesting because it addresses an idea that is a topic of discourse today, which is whether or not new interventions should attempt to imitate their surroundings. Here Boito seems to be advising against this, saying that materials, decorations, etc. should be of the contemporary time, and not imitations of the originals.

The next major resurgence in the field did not occur until the 1970s, when a series of publications and conferences brought the reuse and redesigning of old buildings back into the professional discourse. One of these publications was Radolfo Machado's "Architecture as Palimpsest", in which he describes architecture as a kind of on-going process, with a built structure simply being the first iteration of that building, to be

altered and layered through its existence as seen fit.⁶

As of today, adaptive reuse can be seen more and more readily, particularly with the reutilization of aging urban infrastructure as a base for contemporary spaces. Many cities who have transitioned from industrial powerhouses to more white-collar workforces have seen the structures connected to the former become mixed use office space, new housing opportunities, and even urban parks.[†]

Why not just rebuild? _____

We are reaching a point where building will likely mean one of two options, either demolishing and building anew or reusing existing structures. The obvious next question to ask is why is reuse the better solution? The first and primary argument for adaptive reuse is the factor of sustainability. As stated by Carl Elefante, former President of the AIA, “The greenest building is one already standing,” meaning the reuse of a building is almost always the more sustainable option.⁷ While this may seem questionable, seeing as how many old buildings can be extremely energy inefficient, the carbon cost of new construction often vastly overshadows any energy efficiencies found in more modern buildings. This claim was backed up in 2016 when the National Trust for Historic Preservation released its groundbreaking study that was able to put

[†] While the study and design of adaptive reuse is inherently nuanced and unique to every project, a trend has been growing in current adaptive reuse projects in which the beneficiaries are almost always the socio-economic upper class and often not only ignore the underserved of a community but actively damage their way of living. In simple terms, these projects often lead to gentrification of less wealthy neighborhoods in urban areas. Projects such as New York’s Highline and the Atlanta Beltway are prime examples of this phenomena. ^{8,9,10} While I recognize this as a major issue, I see it as a problem more with the implementation, funding, and legislation around the projects more than an inherent flaw in the design strategy as a whole, thus why I am not delving deeper into the topic in this paper.

numbers to the issue. They found that, based on an improved efficiency of 30% in new construction compared to reuse, it took between 10-80 years for that improved energy savings to make up for the negative impacts of the new construction.¹¹

Another advantage to reusing over rebuilding comes in the form of culture and community building. Buildings, particularly in urban areas, become landmarks overtime. By taking advantage of these cultural signifiers, developers can help strengthen the bond to the city, calling back to its history.¹² By linking the old to the new, communities are strengthened through generations, and are often more accepting of the new development as there is a sense of familiarity. All of this is not to mention the significant economic benefits of adapting an old space. Studies have shown that adapting a historic space can be anywhere from \$50-\$400 cheaper per square foot than new construction, depending on the size and project type.¹³ There are also often significant tax benefits to reviving historic and culturally significant parts of a city.

It should be noted that these advantages vary in every instance, and in many cases reusing a building is simply not feasible for a number of reasons (financial, safety, etc.). While many structures can be reinforced and adapted when necessary, it is a design strategy that should almost always be considered, but not necessarily always the final answer to a design problem.

Education

The idea to study adaptive reuse came from my time studying in Paris. After walking much of the city and noticing how dense and historic every street of the city seemed, I slowly learned how important a concept like adaptive reuse is in places like Paris. It fascinated me in terms of the differences between how Americans and Europeans view building and particularly building in dense urban areas. I approached this project with the aim to uncover and discuss these differences, and in the process found that a dedicated method to teaching this type of design was as developed as I had expected, and so I moved my focus onto studying why this may be and how it could be progressed in the future.

While studying the history and timeline of adaptive reuse and understanding its advantages can be extremely instructive on how the field has grown and shifted over time, with viewpoints becoming more nuanced and elaborate, using case studies to understand design concepts is still an invaluable skill. In the next part of this paper, I have chosen to research and examine two case studies, as well as a particular preexisting method for documenting and analyzing adaptive reuse projects. I will briefly describe the projects, and then use them as a vessel for explaining and critiquing the method.

Frøsilo

As mentioned before, one popular implementation of adaptive reuse can be found in old industrial districts of cities. This project, also known as the Gemini Residences,

finds itself located on the waterfront of the Copenhagen Harbor. Dutch architecture firm MVRDV has converted two abandoned grain silos, constructed in the 1960's, into 84 apartments on a site with incredible waterfront views. In order to take advantage of these views while maintaining the structural integrity of the existing silos, the architects placed the apartments on the outside of the silo, only piercing the concrete structure for entry doors.¹⁴ This gave each apartment full outward facing views, while also maintaining the wonderful 'emptiness' of the interior, which serves as lobby and circulation space. The building at once envelopes its predecessor while also embracing it. The eight floors of apartments are lifted off the ground, exposing the concrete silos at the ground level. By utilizing an existing structure, the architects found interesting spaces that otherwise may not have been explored. The circular diameter of the silos gave way to sweeping curved interior spaces, including extremely unique spaces where the two superimposed circles intersect. This project is a great example of a more outwardly physical and formal change that adaptive reuse projects can sometimes become. It has been visually completely transformed, while still maintaining the existing character of the structure it inhabits.



Fig 1. Exterior view of chapel prior to intervention.



Fig 2. Exterior view of chapel prior to intervention.



Fig 3. Exterior view of chapel prior to intervention.



Fig 4. Exterior view of chapel prior to intervention.



Fig 5. Exterior view of chapel prior to intervention.



Fig 6. Exterior view of chapel prior to intervention.

Maison Saint Charles

Another interesting utilization of adaptive reuse can be found in the world's capital of culture, Paris. As a city, Paris presents an extremely interesting architectural case study. Like most major European metropolises, it is rich with historical buildings and a very well-known and ever present 'feel'. It is, however, also an extremely active and living city, ever growing and always changing. This presents an interesting problem: how to add housing for a continually increasing population in a city with no free lots and buildings that are as integral to the cityscape as the Eiffel Tower. H2O Architects found an interesting solution to this problem in their project on 310 rue Vaugirard, located in the 15th arrondissement. What was once a vibrant religious convent, housing over 100 nuns, is today a much smaller congregation, consisting of only about a dozen who live and work on the property full time. When Antoine Santiard and Jean-Jacques Hubert were approached by the nuns about renovating their space, H2O worked with them to solve their problem while adding a value to the city as well.

Seeing as how the convent had consolidated greatly, the funds for a full renovation of the space simply were not there. H2O's solution to this problem involved altering the existing program in a fairly drastic way. Seeing as how the convent was much larger than the remaining nuns needed, they would incorporate intergenerational housing within the existing structure, while also adding a new addition that would house for sale units. The sale and leasing of these newly created units would help pay for the renovation, while also adding much needed housing to the incredibly dense neighborhood. One of the biggest alterations to the structure comes in the chapel space. The extremely tall and long design began to feel cavernous as its remaining

users were so few, so the architects used this as an opportunity to find new spaces. They shortened it in both of these directions (vertically and horizontally), lifting the sanctuary off of the ground and using the newly created space underneath as both a primary entrance and added community space.¹⁵ This space as well as the revamped central gardens provide ample space for the new and existing residents alike, now with much more diverse lifestyles and backgrounds, to intermingle and create a more robust sense of community.

This project stands as a great example of a potential case study for adaptive reuse. It has taken a culturally significant complex and refurbished as well as reinvented it for contemporary use, all the while maintaining its preexisting character and structure.

Maison Saint Charles

h2o Architects

Paris, France

2021



Fig 7. Exterior view of chapel prior to intervention.



Fig 9. Exterior view of chapel prior to intervention.



Fig 8. Exterior view of chapel prior to intervention.



Fig 10. Exterior view of chapel prior to intervention.



Fig 11. Exterior view of chapel prior to intervention.

Application

These two projects can be viewed as very different yet successful approaches to adaptive reuse. In terms of studying these projects more methodologically, I came upon a paper conducted by Prof. Dafna Fisher-Gewirtzman which laid out a series of methods for analyzing and documenting adaptive reuse projects.¹⁶ These methods, which aim to better teach adaptive reuse in academia, primarily focus on precedent study with a large emphasis placed on categorization and diagramming projects in their “before” and “after” phases. I found this to be an interesting approach to studying these projects, as it does a great job of documenting the outward facing physical changes a project goes through as well as helps to organize these projects into broad categories that describe the physical type of change that the project underwent, such as ‘parasite’ or ‘joint’ (a method also utilized by Françoise Bollack in her book “Old Buildings, New Forms”¹⁷). The crux of the analysis lies in two sets of diagrams. The first mapping out the categorization; what type of adaptive reuse was applied? Or what is the visual change that has occurred? The second set of diagrams is a set of 12 pairs of common architectural concepts and typologies. The pairs all represent the original (left) and the adaptation (right) of the building. Some of these include things like the general massing of the building, as well as how the adaptation has affected how natural light enters the structure. Below is an application of Fisher-Gewirtzman’s method I conducted for the Frøsilo project in Copenhagen. (Fig 12-13)

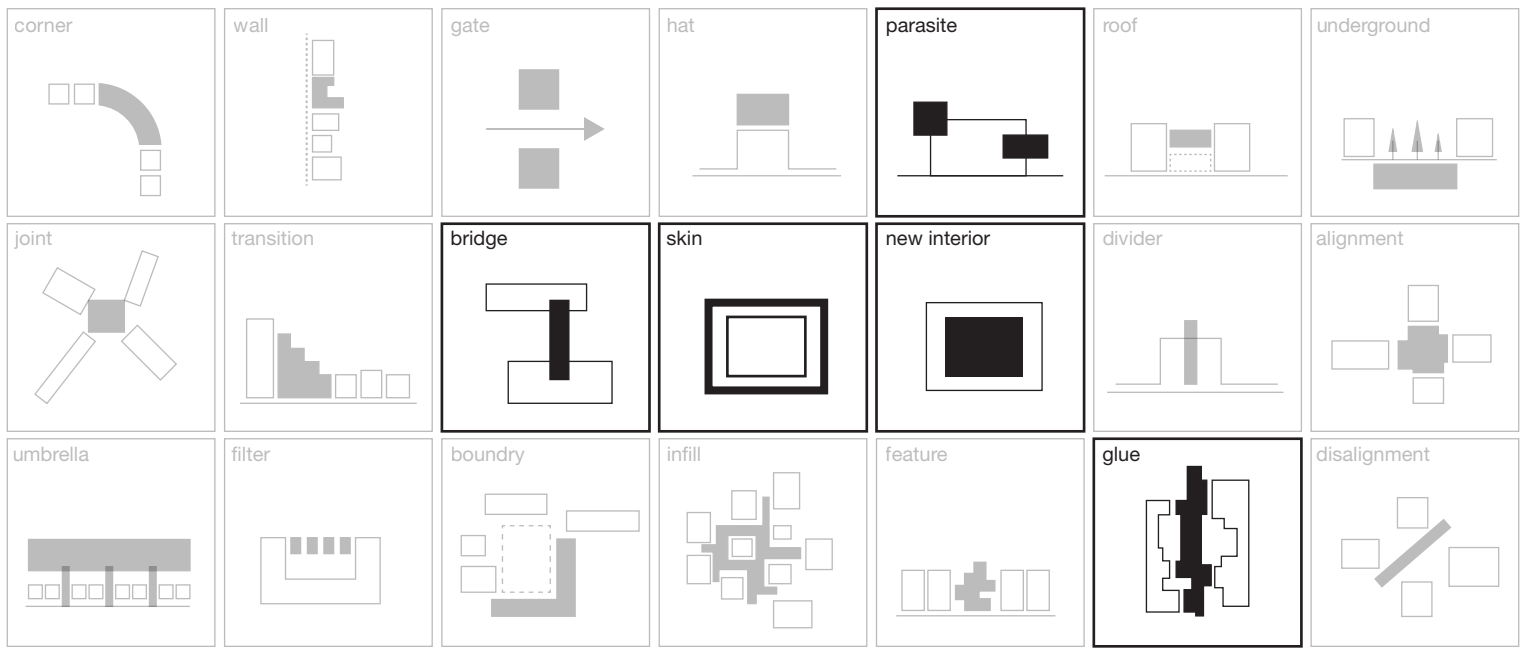
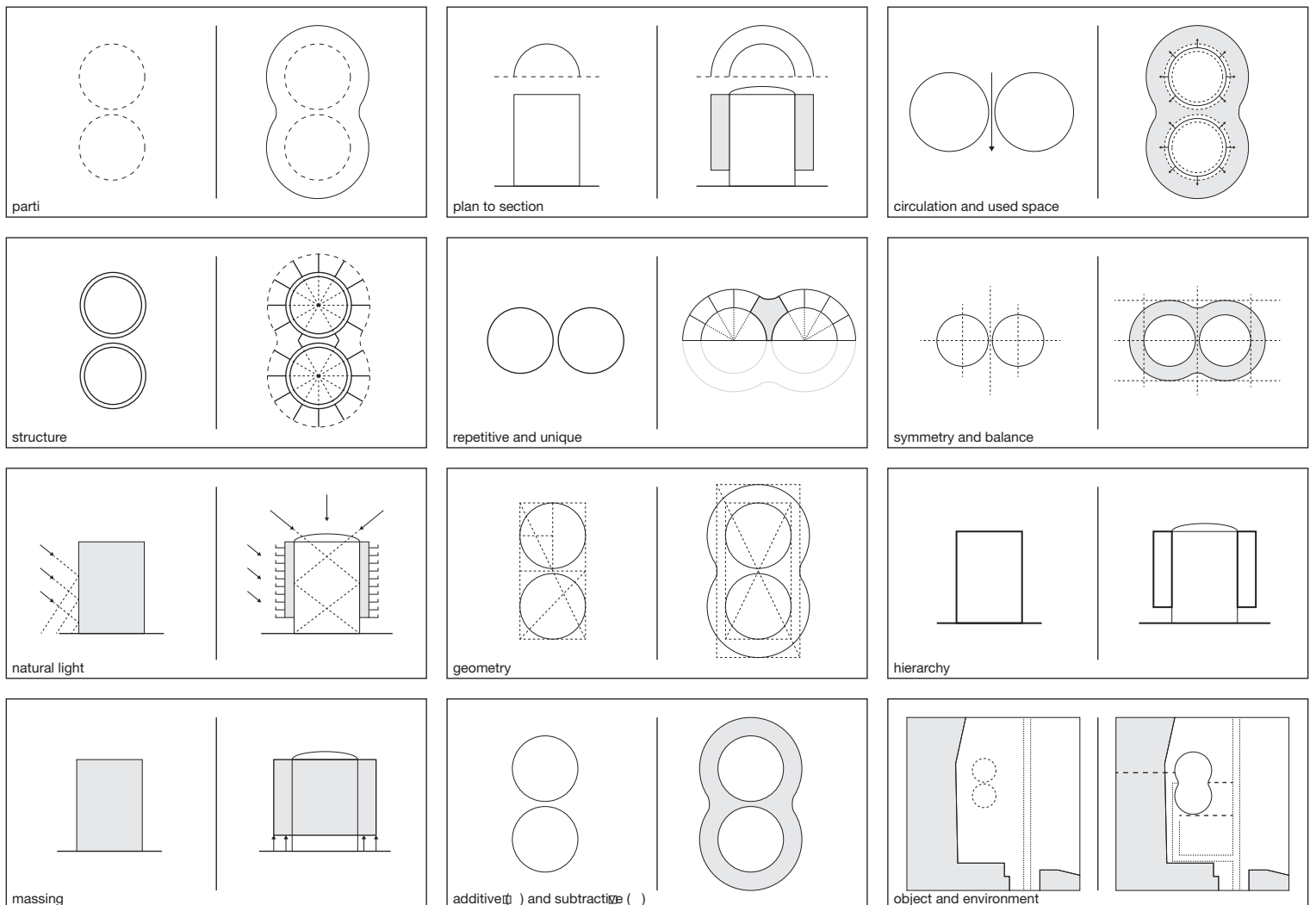


Fig 12. A list of the typological categorizations, with the ones applicable to this project highlighted.

Fig 13. Formal depictions of the Gemini Residences in both old(left) and new(right) form.



While these diagrams are useful in the sense that they can convey a fair amount of information very simply and quickly, the approach can also be quite limiting. Almost all of the diagrams used in this form of documentation focus on large, physical, and external changes to the existing structure. While these are things that are easily seen and represented in 2D diagrams, it limits the documentation process to only projects that fit this specific description: ones where a major visually formal alteration has occurred. In my research and experience, a large amount if not most adaptive reuse projects are largely interior changes, utilizing the existing structural bones and removing/creating/altering interior walls and finishes to create new spaces that work with a more modern program. This can even be seen in Fisher-Gewirtzman's own research, in which 36 of the 40 buildings her and her team studied fell under the "new interior" categorization.^{16‡}

This held true for the Maison Saint Charles, where most of the changes made were to the interior, with minimal updates and additions to the exterior. The most drastic change was the transformation of the chapel, piecing it into various different spaces to fit the new program focused on community. I attempted to use Fisher-Gewirtzman's method to document this project and realized I was left with a lot of blank spaces, for things where the change from before and after was unsubstantial, or simply categories that were not able to be diagrammed in a simple two-dimensional way. (Fig 14-15)

[‡] It is notable that most of these projects also fell under other categories. This is simply to emphasize that while almost all adaptive reuse projects do include a new interior as a primary change, the same cannot be said for significant external massing updates.

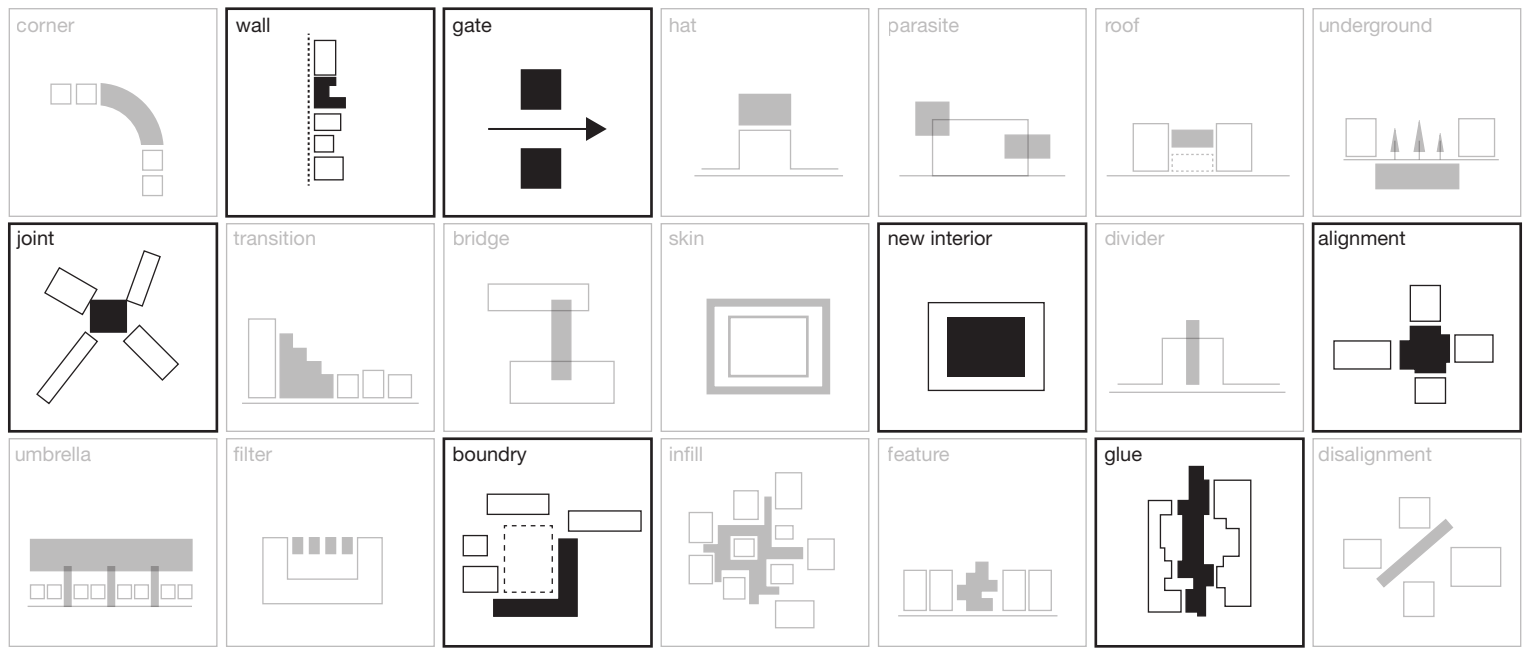
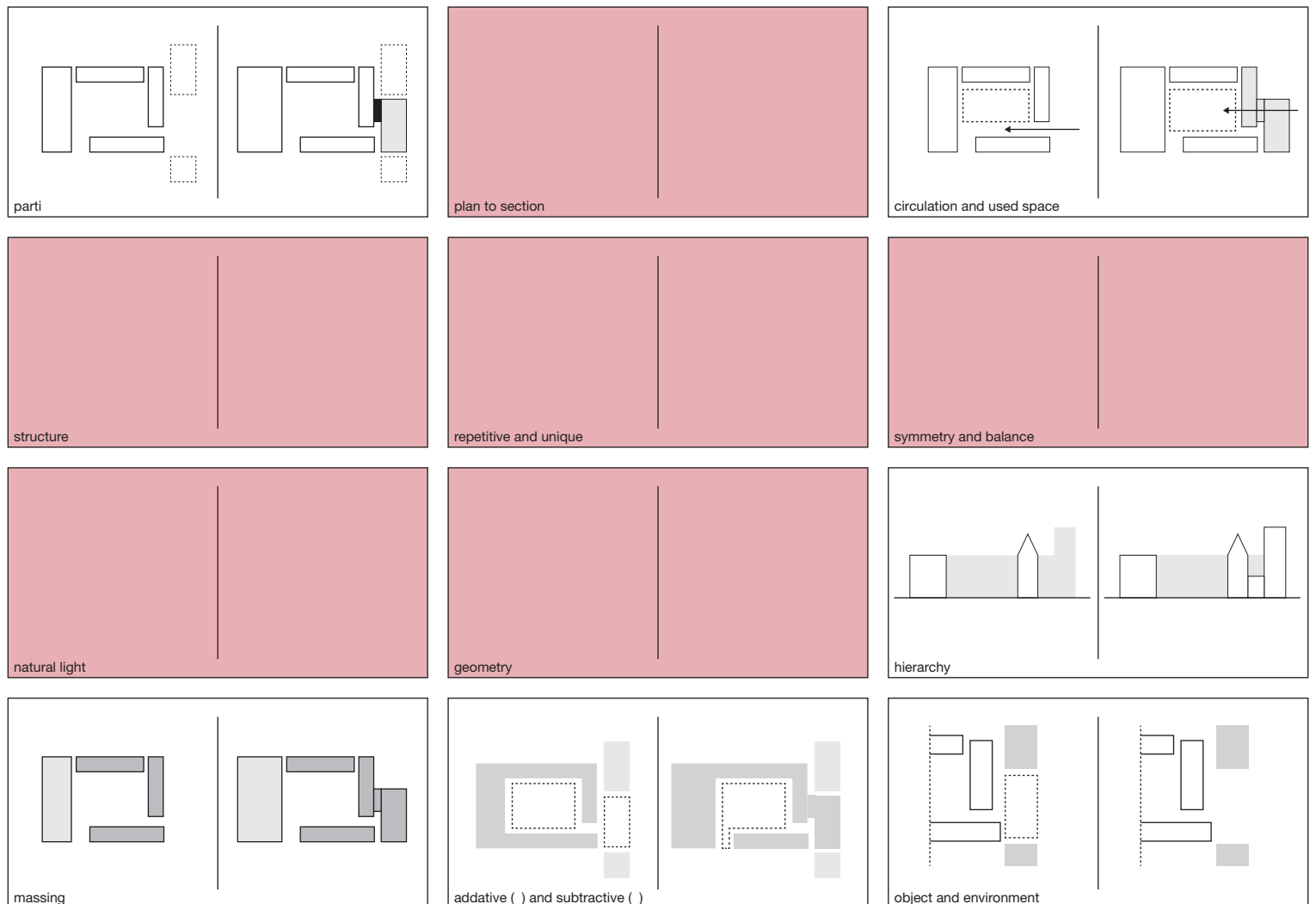


Fig 14. A list of the typological categorizations, with the ones applicable to this project highlighted.

Fig 15. Formal depictions of Maison Saint Charles in both old(left) and new(right) form.



I created another set of diagrams to help convey the project in its before and after state (Fig 20-21). While more slightly more complex, 3-D diagrams like these, which are still simple massing diagrams, better explain the changes that happened within the space. It also aims to take a more focused approach. Whereas the diagrams in Fisher-Gewirtzman's method take a holistic view to the project, I instead focused on the specific part of the project that has been altered the most, in this case the chapel, and am using it to explain how those interior alterations have been designed to fit the new user group and program of the complex. Having diverse diagrams and drawings such as these can help present the projects in a more complete and understandable way, helping with the comprehension and retention of the lessons and concepts to be learned from them.

The Chapel



Fig 16. Exterior view of chapel prior to intervention.



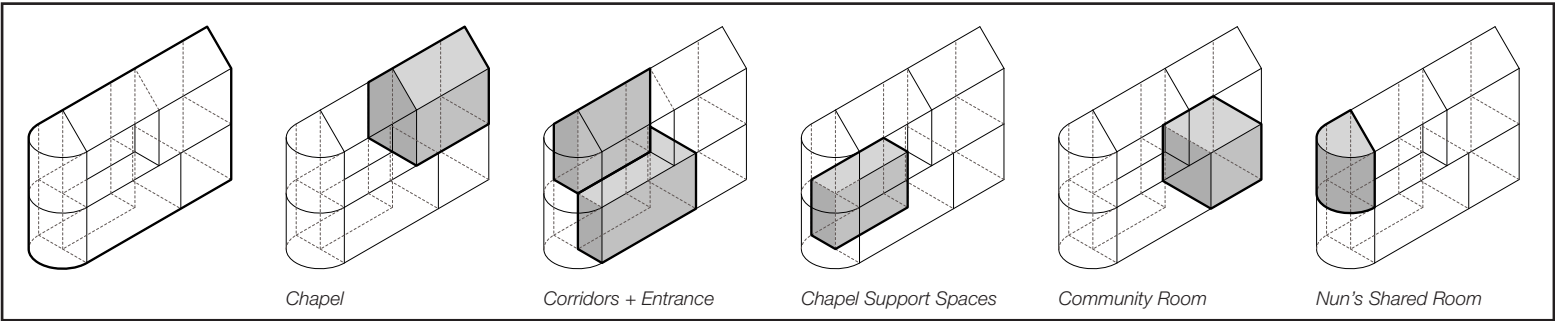
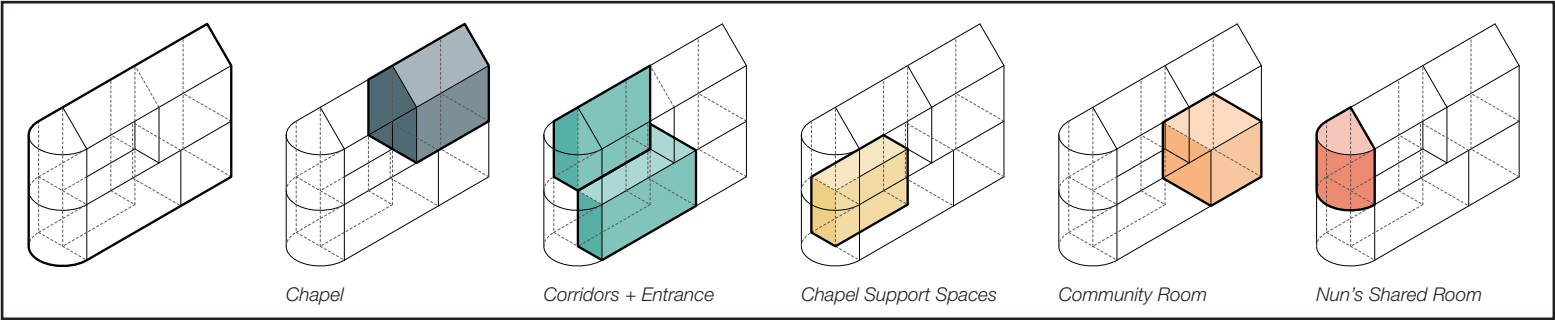
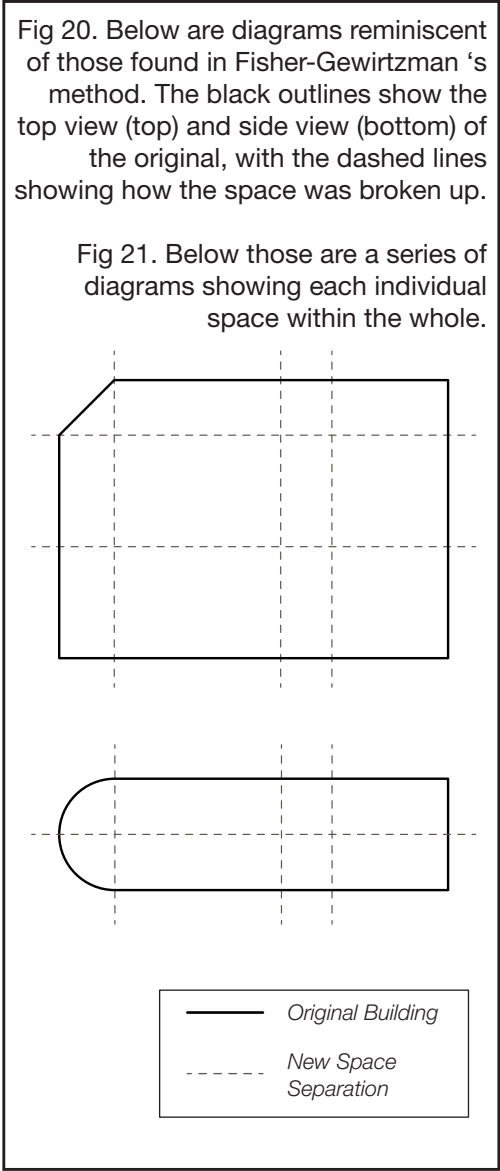
Fig 17. Exterior view of chapel post intervention.



Fig 18. Interior view of chapel looking away from the new sanctuary.



Fig 19. Interior view of chapel looking towards the new sanctuary.



Conclusion

The reuse of buildings and other architectural elements is not a passing trend to be quickly forgotten. It is a real and important design strategy that has been developing and evolving for centuries and one that will become ever more necessary in the coming decades and beyond. It is crucial for professionals and educators alike to put a larger emphasis on the documentation and analyzation of this field, from both an academic and practical matter, in order to prepare for the professional shift that I believe is already started. For this to happen, continual effort needs to be put into the research and development of teaching methodologies on adaptive reuse projects. While the diagrams I presented may act as a starting point, it should be an ongoing and ever evolving discussion. With a better understanding of the history and concepts that have permeated this field, we will be better equipped to tackle the problem as it continues to grow.

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“Frøsilø.” MVRDV, <https://www.mvrdv.nl/projects/143/fr%C3%B8silø>.

Fig 7 – Fig 11: Images courtesy of h2o Architects.

Fig 16 – Fig 19: Images courtesy of h2o Architects.