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Buildings:

1. Constitución Cultural Center by ELEMENTAL Architects in Constitución, Chile
2. Transitional Cathedral by Shigeru Ban Architects in Christchurch, New Zealand
3. Shipping Container Housing by Shigeru Ban Architects in Onagawa, Japan
4. Soma Home for All by Klein Dytham Architects in Soma, Japan

Institution:

Auburn University, School of Architecture, Planning, and Landscape

The Architect's Role in Disaster Recovery

Rebuilding and Reshaping Communities Affected by Natural Disasters

Fig. 1. exhibition documenting the Great East Japan Earthquake and Tsunami in March 2011, Sendai, Japan, 2018.

Our perception of every place is affected by the architecture. Greece would not be the same without it's whitewashed buildings sloping towards the ocean. Rome would not inspire such romance without cobblestoned alleys and earth-toned dwellings. Even Las Vegas would not carry such a reputation of mischief without "The Strip" and its imitations of international landmarks. These structures compose the architectural landscape of a place, but they also form communities built for and around people. The residences and public buildings in a city, town, or village serve as the built environment for the lives of the inhabitants. Not only do these buildings fulfill physical needs, they also give a sense of identity, pride, and places for

gathering. The architectural landscape of a place gives both physical and psychological refuge to those who live there. So, what if these buildings were suddenly gone? What if these cities had to restart?

The devastation caused by natural disasters has become an undeniable reality for nations across the globe. An earthquake can reduce a town to rubble; a tsunami can sweep away entire skyscrapers and hurricane force winds can tear apart homes. A natural disaster can destroy structures that took years to build in just a few minutes. The architectural icons that once stood proud within a community can quickly become reduced to crumbling foundations.

The effects of these events present new challenges for architects. Rebuilding community centers, schools, hospitals, and homes with enough speed to provide refuge to the displaced can become hard to balance with the need to build significant architecture that still maintains the identity of the people. So, how should architects respond in the aftermath of natural disasters? Is there still room for design with so many pressing problems and needs? Is there still a need for architecture?

This research sought to answer these questions through examination of four buildings that were designed and built following natural disasters: Constitución Cultural Center by ELEMENTAL Architects in Constitución, Chilé; Transitional Cathedral by Shigeru Ban Architects in Christchurch, New Zealand; Container Housing by Shigeru Ban Architects in Onagawa, Japan; and Soma Home for All by Klein Dytham Architects in Soma, Japan. All four of these structures were built to fill a need left behind by either an earthquake or tsunami, oftentimes both. By examining and understanding these projects, I sought to

determine architects' role in disaster response and recovery. After visiting all four buildings, I identified three elements that affected the success of each project, regardless of function or site:

1. Response to need
2. Role in the overall reconstruction
3. Community interaction, use, and ownership

While visiting each community, it became clear that they all had very specific and different needs based on the cultural context and particular effects of each disaster. Therefore, it was essential to look at the building within the context of its *place*. There was no universal solution or response. Similarly, each project site also varied in terms of their progress with reconstruction. While Constitución, Chile carries little evidence of a tsunami, Christchurch, New Zealand still bears numerous scars from the earthquake. Understanding the fragility and strength of each place present in the aftermath of these events became important in the design of the project. Finally, a project will not help residents if they are not the ones using it. Although all of these buildings have been celebrated in various articles and magazines, it was important to perceive their role in the community. A building doesn't help people when it's praised in architectural publications; it helps rebuild communities when it belongs and responds to the place.

As I traveled and visited these sites, I realized the complexity of these problems. Each country had a distinct culture and they could not have been more different. Even the same type of natural disaster

left varying problems and needs in different contexts. Examining all four projects through the lens of these three elements allowed important comparisons to be developed between the successes and failures of each structure and a step in understanding how to use architecture to better serve hurting communities affected by natural disasters.

Constitución Cultural Center

Residents, Architects, and the Government Collaborate on a Master Plan

Fig. 1. ELEMENTAL, front elevation of the Cultural Center through the tree line of Plaza de Armas, Constitución Cultural Center, Constitución, Chilé, 2015.

In February of 2010 Constitución, Chilé was hit by an earthquake at a magnitude of 8.8 on the Richter scale. At the time, it was the sixth strongest earthquake ever recorded.[1] Although there would be extensive damage from this event alone, the nightmare continued when a tsunami reached land less than twenty minutes after the initial tremor. The waves rose nineteen feet and killed over 500 people in Chilé; a quarter of the deceased were residents of Constitución. The combined forces of the earthquake and tsunami damaged or destroyed over a third of the buildings that lay within the flat coastal downtown. The earthquake mainly affected the commercial center, including businesses, restaurants and a historic community center.

However, the tsunami's damage was concentrated along the riverfront. Here, in an area called La Poza, the ocean splits the land to form the river Rio Maule. Over 100 homes occupied this area and almost all of them were destroyed.[2]

In an effort to restore the commercial, cultural, and residential areas that were lost following these horrific events, the Sustainable Reconstruction Plan of Constitución (PRES) was drafted and directed by ELEMENTAL, a firm based out of Santiago, Chile and founded by Alejandro Aravena. ELEMENTAL built numerous projects laid out in the Reconstruction Plan including the Constitución Cultural Center, completed in 2015. This was identified as a priority for the reconstruction plan, since the previous community center was destroyed in the earthquake. The center was relocated from the original site and moved closer to the commercial hub of the town. It now occupies most of the block lining the south-eastern edge of the Plaza de Armas, the heart of Constitución, which holds most community events. The location was essential to reaffirm its status as an important cultural and civic building.

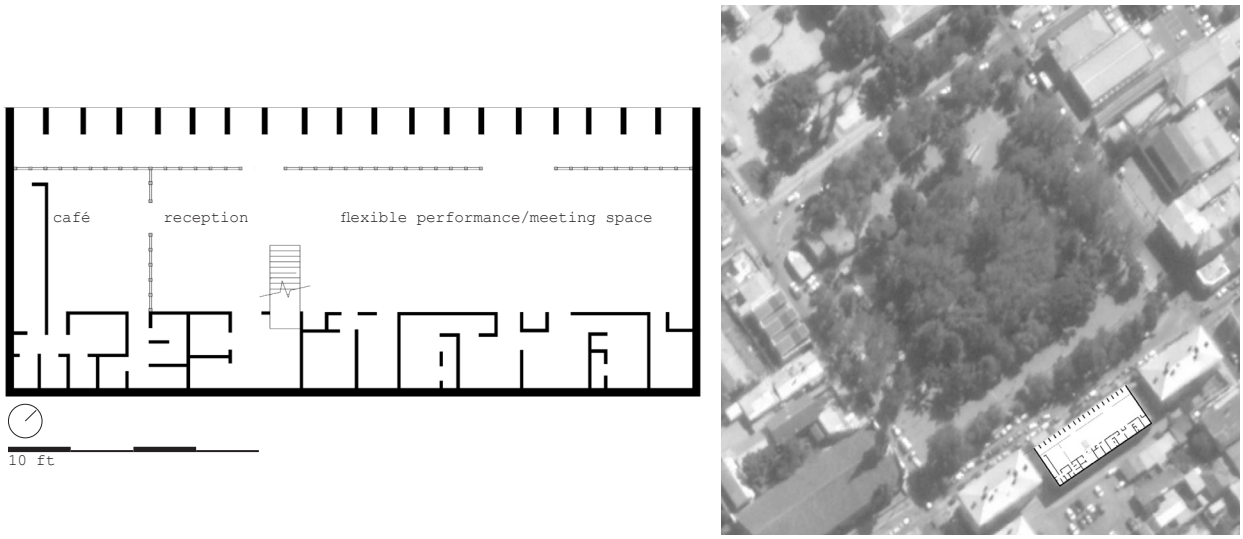

Fig. 2. ELEMENTAL, ground floor plan and location along southeast edge of Plaza de Armas, Constitución Cultural Center, Constitución, Chilé, 2015.

ELEMENTAL sought to design something functional and beautiful for the people of Constitución. The main performance space on the ground floor is designed to allow multiple activities with an open floor plan and space for a collapsible stage and sound table. Ample storage is integrated into the interior wall to store furniture or equipment not being used. The second level of the building contains offices and an art gallery. On the exterior, wooden fins span from the concrete plinth to the top of the second floor to create a reinterpreted arcade and entrance threshold. The monumental exterior was designed to become an iconic structure within the community and the outline of the wooden fins are now used for branding purposes for the town.

Fig. 3. public celebration in Plaza de Armas, Constitución, Chilé, 2018.
Fig. 4. ELEMENTAL, entrance threshold, Constitución Cultural Center, Constitución, Chilé, 2015.

Response to Need

After meeting with community members, ELEMENTAL identified housing as the most pressing need following the disaster, since La Poza and its residents received the most damage. ELEMENTAL designed an affordable housing project called Villa Verde to fulfill this need. After its completion, the second phase of reconstruction focused on

public institutions. This included the Cultural Center that was built in response to the loss of the town's historic community center, deemed irreparable after damages from the earthquake.

Fig. 5. ELEMENTAL, Villa Verde affordable housing, Villa Verde, Constitución, Chilé, 2010.
Fig. 6. ELEMENTAL, the Cultural Center hosts an educational play for children every Wednesday, Constitución Cultural Center, Constitución, Chilé, 2015.

Without the community center, the town lacked a protected and conditioned space for any events. ELEMENTAL's Cultural Center has successfully fulfilled that role. During my stay in Constitución, there was a different event every day. The center hosted musical performances on the weekends, a children's play every Wednesday, and meetings for various organizations from political committees to moms' groups. The intentionally designed flexibility of the space makes it suitable for multiple different types of gathering.

In a translated interview with Camila, an employee of the Cultural Center, she stated that "the new center is an improvement from the one it replaced"[3] because the previous center had never been renovated nor updated since its construction in the 1800s. The technology was outdated and practically nonexistent. In comparison, the sound and light systems as well as portable screens of the new Cultural Center has given it an expanded role as an adaptable performance space.

For Constitución, the events of 2010 brought new opportunities with an influx of money. Although still a limited budget considering the

extensive damages throughout the town, the government's financial aid gave the people of Constitución a chance to invest in improvements. Through ELEMENTAL's "participatory design" process, the community was able to voice what they thought these investments should be, including more public space. The Constitución Public Library, built on the adjacent street, works in tandem with the Cultural Center to give residents places to gather, meet, and work.

Additionally, the Cultural Center houses a gallery on the second level which features artwork from both local residents and students throughout central Chile. This is the first time the town has had such a space. The gallery is particularly important to residents such as Daslam Orellana who works in the gallery and says it has allowed him to practice his art. Previously, he had no dedicated space to display it.[4] This highlights the center's expanded role as a cultural space.

Fig. 7. ELEMENTAL, Daslam Orellana runs the gallery for the Cultural Center, Constitución Cultural Center, Constitución, Chilé, 2015.
Fig. 8. ELEMENTAL, listing of events and a gallery exhibit in the Cultural Center, Constitución Cultural Center, Constitución, Chilé, 2015.

Role in Reconstruction

When I arrived in Constitución, I was surprised by the recovery efforts that had already taken place. It has been rebuilt quickly, considering the extent of the damage. The portion that received the brunt of the tsunami already contains many new buildings that stand

Fig. 9. ELEMENTAL, some buildings still show water damage and remain empty, Constitución Cultural Center, Constitución, Chilé, 2018.
Fig. 10. ELEMENTAL, new construction directly across from river, Constitución Cultural Center, Constitución, Chilé, 2018.

out among the older city center. The commercial center of town, oriented around the only green space: Plaza de Armas, is already in full operation despite the devastation eight years ago. The Chilean people were able to respond swiftly due to a streamlined reconstruction process and plan.

ELEMENTAL designed the Reconstruction Plan, PRES, to direct the rebuilding process and respond to issues the town was facing. They were allotted a reconstruction budget, funded by the Chilean government, to aid those affected by the disaster. Although ELEMENTAL did not design all of the buildings built for the reconstruction, the firm drafted the overall plan and directed partnering firms on projects. With funding in place and a single architecture firm in charge, the process was able to progress smoothly and quickly. PRES highlighted particular programs and building types deemed important or necessary by the community. ELEMENTAL separated the timeline into three priorities: rebuilding housing, constructing public institutions, and adding public spaces including a riverfront park, sports complex, and completion of a seaside promenade.

The firm also strove to listen to citizens' concerns and design in direct response to them, stressing that community involvement and input was an essential part of redevelopment. Numerous meetings were held and open to all community members to help identify and prioritize needs to focus reconstruction efforts. One decision that came from these meetings was the design of a riverfront park to replace the destroyed homes along La Poza. This is an essential part of the Reconstruction Plan as the park will serve two important functions. First, it will act as a mediator for future tsunamis and flooding— a reoccurring issue brought up by many residents. Aravena proposed that La Poza be developed into a park with a forest of trees to help with these issues. The trees will help soak up floodwater as well as disperse and weaken the power of any future tsunami wave. Second, the park will serve to increase public space within the town as "before the earthquake, there were 2.2m^2 of public space for each of Constitución's 50,000 inhabitants." Once the park is completed, that number will rise to 6.6m^2, providing needed green space to the city.[5]

Fig. 11. ELEMENTAL, town hall constructed as part of the reconstruction plan, Constitución Municipalidad, Constitución, Chilé, 2015.
Fig. 12. ELEMENTAL, seaside promenade directs views of the ocean and rock formations, Constitución Seaside Promenade, Constitución, Chilé, 2014.

Of the several private and public projects proposed throughout the town in the Reconstruction Plan, many have been completed. Apart from the Cultural Center, other completed projects include the Public Library, the Seaside Promenade to develop the oceanfront, a public school, a new town hall, and Villa Verde affordable housing.

Fig. 13. ELEMENTAL, the Cultural Center adjacent to Plaza de Armas in relation to other reconstruction projects, Constitución Cultural Center, Constitución, Chilé, 2015.

The people of Constitución greatly benefited from the Reconstruction Plan. Through the "participatory design" process, residents were able to provide input instead of being subject to what architects, who did not live in the town, deemed important. The plan also allowed the rebuilding process to go beyond simply providing shelter. The PRES plan looked at areas for improvement and

established a link between the new projects. The Cultural Center is a prime example. ELEMENTAL sought to give back a public space while also improving and expanding it. Now, the center is an important gathering space. Its monumental design, scale, and updated facilities recreate it as a beacon of progress and a point of pride within the community. It also seeks to prove that architecture can not only replace what was lost but has the potential to improve the fabric of a place. A large part of the success of the Cultural Center is its inclusion in the overall plan for the city. The construction of a new town hall, library, gallery, and performing arts space, all within the border of the central Plaza de Armas, aided in bringing people back into the downtown.

Community Ownership

The Center was built with a close relationship to both the public library and the town hall, not only in location and function, but also in design. These buildings were given a strong tie to the community through the architecture. The design for all three structures celebrate the local materials and industry by using concrete, common to buildings in Constitución, and, most importantly, by incorporating wood. The library's interior is entirely clad in a light-washed wood and the town hall utilizes a wood screen. Comparatively, the exterior of the Cultural Center is framed by the wooden fins and steel cables. This detail is a significant representation of the main economic industry in Constitución: the lumber mill.

Arriving into Constitución over the surrounding mountain range, the bus passes miles of logging forests and lumber mills. This industry employs a large percentage of the population, however, the mill also

suffered damages from the earthquake. By designing the Cultural Center and other civic buildings with this in mind, ELEMENTAL not only enhanced the town's identity and pride by using a vernacular material, the firm's design also helped rebuild the industry and provide jobs. The wooden facade of the Cultural Center greatly contributes to the community's sense of ownership as the building's design relates to the aesthetic and economic context while also boosting an important industry also suffering from damages following the earthquake.

Fig. 14. ELEMENTAL, wood screen detail relates the town hall to its context, Constitución Town Hall, Constitución, Chilé, 2015.
Fig. 15. Sebastian Irarrázaval, interior of the library uses light, wood paneling and structure, Constitución Public Library, Constitución, Chilé, 2015.

Another successful element of the Cultural Center's design is the cafe attached to the ground floor lobby and performance space. It contains an indoor eating space with a counter and kitchen in the back and extra seating across the sidewalk. This is a common layout in Constitución. Most restaurants incorporate the sidewalk by using it as the bridge between the interior and exterior spaces. The commercial buildings in the town extend out into the street, occupying the public realm. By designing the cafe in a similar fashion, it further

integrates the building into the street edge, making it the Cultural Center's most active space.

The cafe and material selection greatly add to making the cultural center an integral part of the context and community. However, this sense of ownership is hindered by the scale of the building; the monumentality of the entrance and facade along the street edge creates a strong boundary between the interior space and exterior street life.

Constitución has a unique and quintessential South American atmosphere. People really *use* the streets. Street vendors are extremely common and a normal way to shop for anything from groceries to toys and clothes. Students hang out on the sidewalks and stoops of restaurants and businesses during lunch breaks. The sidewalks are a very popular place to meet up with friends. In the evenings, the whole town seems to be out; the pathways and streets are packed and stores are in full swing. Yet, the Cultural Center and the sidewalk in front seem to be the emptiest part of town. People do not linger; the center's street front is desolate compared to the blocks directly surrounding it. For comparison, during a ten minute span at 5:00 on a Wednesday, 25 people lingered around benches on the exterior of the library. During the same time, only four people passed in front of the Cultural Center, never pausing or stopping.

The deep, momentous, wooden fins of the Cultural Center hinder the social nature of the town. Each bay measures five feet across, blocking groups from gathering. The arcade that pushes the building back from the street creates an entrance threshold but also keeps the center separated from the street life. The curtain wall meant to bring light from the street into the performance space has black curtains that

are almost always drawn, making it impossible to get a glimpse of the events inside and further separating the building from the community. These elements all help distinguish the building and enhance its position as an architectural icon; yet it does not fit in with the social culture and atmosphere of the Chilean people.

Although the material selection and addition of a cafe give back to the town's economy, ignorance of the importance of gathering space on the exterior to become part of Constitución's street life makes the Cultural Center the least active downtown edge.

Fig. 16. ELEMENTAL, the scale of the center separates it from the street, Constitución Cultural Center, Constitución, Chilé, 2018.
Fig. 17. ELEMENTAL, a cafe on one end of the center is the only occupied space on the street front, Constitución Cultural Center, Constitución, Chilé, 2018.

Conclusion

Overall, the strongest element of Constitución's Cultural Center is its function. The center has successfully filled a large void in the community by providing an indoor space that is designed to meet the needs of any type of gathering. The flexibility in the setup and program of the space is essential to its successful role in reconstruction. Its integration into the overall reconstruction plan, PRES, adds to this success. Each building was chosen to fill a certain role and allows a complimentary partnership to fill all of the needs of

the community.

The greatest weakness is its lack of involvement with the street and social life of Constitución. The design of the entrance contributes to this separation. The building could have responded more to the cultural context of the town by engaging the public realm more. Although the scale of the building provides a sense of monumentality, the structure could have benefited from incorporating a more human scale to interact with the street front, important to relate to the humble nature of the people of Constitución.

The Cultural Center fills an important role in the town and has become a cultural symbol, but is not as successful in responding to the social nature and context of Constitución, thereby limiting its use. Many events are still held in the square when the weather permits, further stressing the importance of the public realm to the town that the Center does not address as well as other projects within the Reconstruction Plan.

Fig. 18. ELEMENTAL, a toddler enters the center, Constitución Cultural Center, Constitución, Chilé, 2015.

Christchurch Transitional Cathedral

Rebuilding as an Opportunity for Revitalization

Fig. 1. Shigeru Ban, front elevation, Transitional Cathedral, Christchurch, New Zealand, 2013.

The Transitional Cathedral was designed by Shigeru Ban Architects in response to a magnitude 6.3 earthquake in 2011 that decimated the city of Christchurch, New Zealand. Although the earthquake was not as powerful as the one which hit Chile, the epicenter of the quake was only 10 kilometers from the city center and occurred on a shallow fault line. This dramatically damaged the infrastructure and building foundations within the city. Christchurch experienced numerous aftershocks and is still currently dealing with unsafe ground conditions, slowing down the reconstruction process. These combined elements created an extremely difficult and unique challenge to the city. Approximately 80% of the buildings, about 1,200 structures, in the central business district were either entirely destroyed or

damaged beyond repair. Liquefaction was the biggest issue. This occurs when literal *cracks* in the ground form where layers of sand beneath the surface turn into unstable sludge. It became such an issue that the city center had to shut down immediately following the earthquake. Some areas in the business district remained closed for over two years.[6]

Even with these issues one of the biggest losses in Christchurch was the Christchurch Cathedral, a Gothic architectural icon built in the center of town in the late-1800s. It was the focal point of the city, located in Cathedral Square, and one of the first structures built in the area. During the earthquake, the cathedral's tower and front entrance were destroyed. The rose window adorning the main facade shattered in an aftershock. Now, the Cathedral is entirely fenced off. The gaping front has been stabilized with scaffolding, resembling open, broken jaws. Plants have overgrown the untouched ground around it, giving the once iconic building a sense of neglect and a reminder of the work remaining to be completed in Christchurch.

A member of the Anglican church contacted Shigeru Ban to help in the aftermath of this destruction after seeing one of Ban's famous

Fig. 2. the original Cathedral stands empty in the city center, Transitional Cathedral, Christchurch, New Zealand, 2013.
Fig. 3. Shigeru Ban, front exterior detail showing shipping container base, Transitional Cathedral, Christchurch, New Zealand, 2013.

paper structures in a magazine that he had been building in other areas affected by natural disasters and civil wars. Ban was commissioned to design a structure that would temporarily take over the functions of the destroyed Cathedral, a beloved icon. The task wasn't an easy one. At the time, the city was still unsure if the original cathedral could be rebuilt or would ultimately have to be dismantled. However, Ban agreed to visit.

During his first site visit, he immediately sketched an A-frame building due to its easy constructibility to quickly respond to the church's need. The Transitional Cathedral uses eight shipping containers to house offices, service sectors, and storage around either side of the Cathedral. They also serve as the base for the 98 paper tubes that serve as columns, covered by a polyurethane roof with a concrete slab foundation. These elements come together to create a low-cost, earthquake-resistant structure that was completed in 2013.

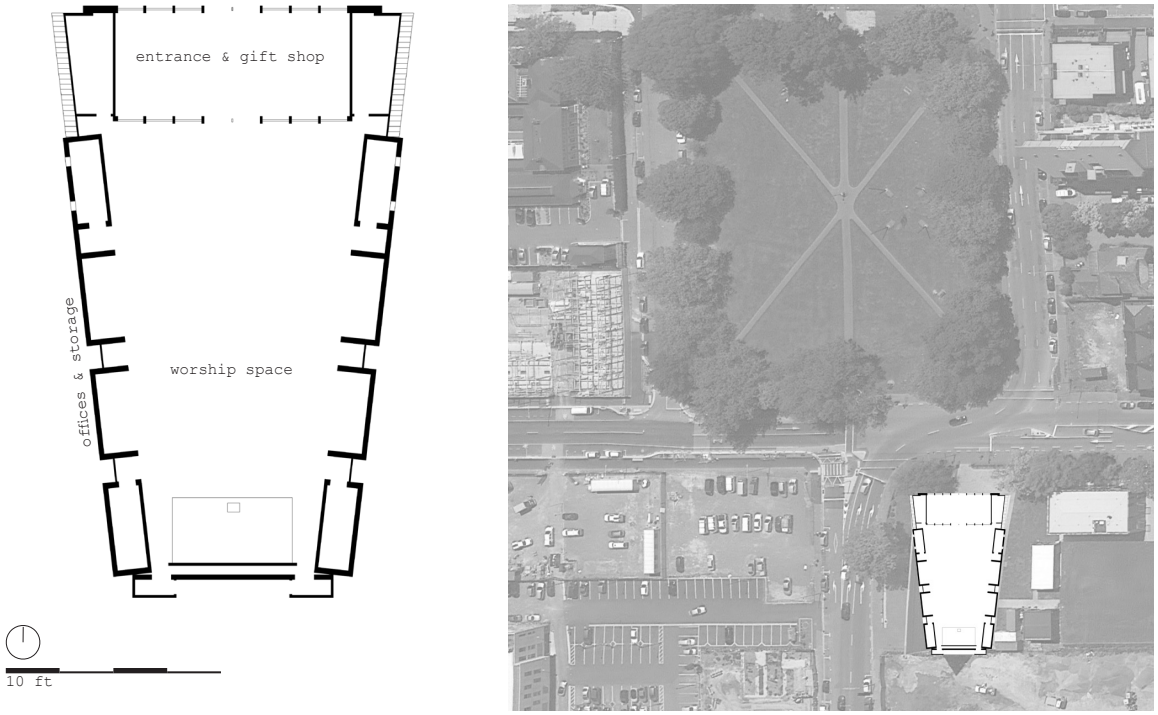

Fig. 4. Shigeru Ban, plan of Cathedral with four shipping containers on both the west and east ends serving as the base and its location adjacent to Latimer Square, Transitional Cathedral, Christchurch, New Zealand, 2013.

Ban has become a champion for disaster relief architecture, designing numerous ‘paper structures,’ claiming that the strength of concrete actually makes a building more dangerous and susceptible to be destroyed during an earthquake. His designs utilize paper towel tubes since they are easy to find, cheap, and sustainable but can be obtained quickly. These characteristics make these ‘paper structures’ extremely useful post natural disasters when time becomes crucial to provide refuge. The new Cathedral is also built to surpass Christchurch’s new building codes that were extensively edited to protect against future earthquakes, making it one of the safest buildings in the city. Many residents expressed that this was a great comfort in the aftermath of the 2011 event.

Response to Need

The Cathedral has successfully provided a temporary shelter for services to continue for the Anglican congregation originally housed in Christchurch Cathedral. Services and choral events are held every day, and the building is kept open to allow people to pray and meditate. In addition, Shigeru Ban’s structure has taken on an expanded role as a community center. The Cathedral hosts meetings and numerous events every month, from PechaKucha nights and cooking classes to concerts and dances. It is available for rent to host events and can accommodate up to 700 people.

Unfortunately, there was some backlash directed more towards the religious nature of the building and its perception as a replacement. The cathedral’s current reverend, Nicky Lee, stated that she used to make a point to talk to anyone who came in and said they didn’t like the building. According to Reverend Lee, “the building itself wasn’t

decisive, it was just seen as a replacement for the one in Cathedral Square."[7] These complaints were never about shortcomings of the Transitional Cathedral, rather expressions of loss over Christchurch Cathedral.

There were also limitations with budget, an unavoidable challenge in recovery situations. Although Reverend Lee expressed a deep appreciation for the functionality and utility of the space, there are issues of size. For instance, the children's area and bathroom are housed separately from the worship space in containers on the backside of the church. There also is not a designated fellowship hall; therefore, after the services, people gather in the back corner where chairs have to be rearranged or brought out to make space for coffee and snacks.

Fig. 5. Shigeru Ban, tourists visit the building as well as members of the community and congregation who come to pray, Transitional Cathedral, Christchurch, New Zealand, 2013.

Despite these limitations, the Transitional Cathedral was able to achieve important goals when responding to the needs of the community. First, the Cathedral has given the church congregation an adequate and functional gathering space to allow services to continue. Secondly, it has served the community by functioning as an event space and helping to bring tourists back to the city.

The Cathedral has also helped repair the deeper scars of the

2011 tragedy by responding to the psychological needs as well as the physical needs of the people of Christchurch. The original Christchurch Cathedral in the square played a role in the community that is impossible to fill. After all, the city was even named after it. The Cathedral was not only a shelter for the congregation and community members; it served as the iconic heart of the city. The Transitional Cathedral will never be able to replace the history and memories connected to Christchurch Cathedral, but it has given a sense of identity back to the community with its powerful design. The A-Frame building stands out among the apartment blocks and Gothic architecture of the old city center. At night, the light spilling out from the stained glass facade welcomes both locals and tourists to the city. It has given the people and city of Christchurch an identity to match their resiliency in the wake of so much destruction.

Role in Reconstruction

As a modern city suffering from historic loss and lingering aftershocks, the reconstruction process in Christchurch has been anything but simple and fast. Building codes had to be re-written; areas had to be shut down. Entire housing blocks and neighborhoods were wiped out, leaving nothing but the outlines of homes that no longer exist. Christchurch needed new infrastructure, a revitalized downtown, housing, and a new identity.

One of the most pressing issues was what to do with the land. Business owners were left with heavily damaged buildings and, without any income, they could not pay to demolish and rebuild. The city of Christchurch was fortunate in its ability to respond and purchase these properties, giving the landowners a fair price and acquiring

land that could be used in a comprehensive plan of the new city. Once aftershocks ceased and conditions were stabilized, these land acquisitions allowed the government, city council, and native Maori community to devise a plan to regenerate the central city.[8]

This led to the drafting and publication of the Christchurch Central Recovery Plan in 2012. The opening line of the manual states, "[t]he Canterbury earthquakes provided an unprecedented opportunity to rethink, revitalise and renew central Christchurch,"[9] showcasing the plan's intention to improve the city through the rebuilding process. It includes general design principles for the city's core and outlying areas along with a blueprint specifically for redeveloping the center, focusing on moving efforts from recovery to regeneration.

The Recovery Plan, shown below, separates the city into major precincts represented by the colored zones. Each 'precinct' focuses on a particular function such as arts, residences, and offices. The

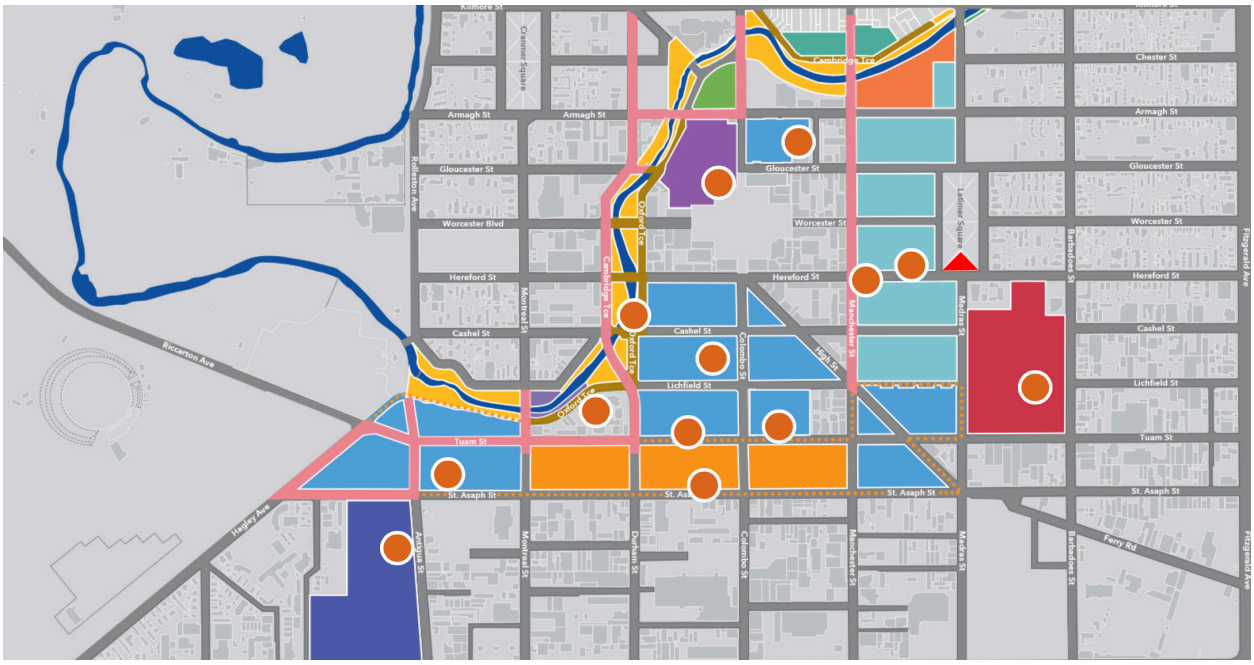

Fig. 6. Christchurch Recovery Plan showing planned precincts and anchor projects with the Cathedral's site shown by a red triangle, source: Ōtākaro Limited www.otakaroltd.co.nz

orange dots indicate 'anchor projects' within those precincts, defined as public facilities built with government funding to spur economic development. These projects include an art gallery, a sports complex and a new bus terminal.

Although managed by the government at first, an organization called Ōtākaro Limited was established to take over administration of the Recovery Plan. Andrew Trevelyan is the general manager of communication and engagement for Ōtākaro. In an interview, he stressed the importance of shifting the focus to regeneration and viewing the situation as an opportunity saying "you don't get chances to rebuild a city every day of the week [and]...the old city wasn't functioning well."[10] Trevelyan identified two major planning problems in the city, before the earthquake, that the Recovery Plan addresses. The first issue was that the city center was too spread out. To prevent this from reoccurring in the reconstruction, one of the guiding principles of the Central Recovery Plan is a compressed frame to contain downtown and improve density. These 'frames' will border the city center in each cardinal direction and will be green spaces to add life and pubic realms to an urban landscape.

The next issue in Christchurch was the infrastructure. The city had undergone major construction numerous times to widen streets, yet according to Trevelyan, "if we had just continued making bigger, wider streets then we would have had to account for 80,000 more cars by 2030," something the roads would have never handled.[11] The Recovery Plan instead focuses on the need for varied transportation methods. The infrastructure is being rebuilt to include bus stops, bus lanes, bike paths, and pedestrian friendly passageways to encourage other

Fig. 7. infrastructure 'complete street' renovation underway, Christchurch, New Zealand.

modes of transportation and reduce car traffic.

How does The Transitional Cathedral fit into the Recovery Plan and Blueprint? The simple answer is that it does not. When I asked Trevelyan about future plans for the Cathedral, he stated that it is "not part of any plans or any role in the recovery process but something the Anglican church funded as temporary while the Cathedral in the square is being rebuilt."[12] Many people label the Cathedral as "temporary." However, in my interview with Yoshie Narimatsu, who directly worked with Shigeru Ban on the project, she stated that "Shigeru never views a project as temporary. The Cathedral will last and it will be there as long as the people need it."[13] If it is no longer needed for the Anglican congregation, it will still be an important building within Christchurch. Labeling the cathedral as temporary, and failing to incorporate it into the city plans, reduces its potential impact. Ignoring the first community, and possibly most successful, building constructed since the earthquake is a lost opportunity to address the issues the Recovery Plan has focused on.

The improvements to the city have shown the benefits of a comprehensive plan, but the time taken to draft and administer

Christchurch's Blueprint has slowed down reconstruction efforts. Allowing the government to buy damaged property provided immediate relief to many landowners, but it also put a lot of land on hold, standing empty until decisions could be made. Construction on the Cathedral began in July of 2012, the same month the Central Recovery Plan was first published; therefore, all design and location decisions were made long before a plan for the city was established. It's location was largely determined by what that was available, and limited due to bureaucratic issues as the government held land, awaiting the master plan.[14]

Fig. 8. many buildings still stand empty and damaged throughout the city center, Christchurch, New Zealand, 2018.
Fig. 9. old foundations scattered throughout the city are now used as parking lots, Christchurch, New Zealand, 2018.

Currently, the city of Christchurch is struggling with how to activate Cathedral Square. Even though it is literally and figuratively the heart of the city, the disrepair of Christchurch Cathedral has made the adjacent plaza more of a thoroughfare than a destination. More people visit the Transitional Cathedral on a daily basis, and it is a lost opportunity to not bring this spirit into the city center that desperately needs it. Instead, the Transitional Cathedral is placed outside of the identified 'frames' in the reconstruction plan and lies within the zone identified for 900 new residences to be built

Fig. 10. Shigeru Ban, location of the Transitional Cathedral compared to the central location of the original Christchurch Cathedral, Transitional Cathedral, Christchurch, New Zealand, 2013.

in the next eight years. The Recovery Plan and Cathedral are currently working *against* one another.

Despite these limitations, the ignorance of the Cathedral in recovery plans ironically also showcases one of its greatest strengths. When asked about locals' perception of the Cathedral when it was first built, Jacque, an employee at the Quake City museum in Christchurch documenting the region's history of earthquakes, said the cathedral was instrumental in the community's psychological recovery. She stated "that in all this doom and trauma there was a beacon of hope."[15] The Transitional Cathedral goes beyond simply providing space. It was built as a symbol of moving forward following the earthquake because of its immediate response when the city was facing too many issues for a fast recovery plan. It came at a time in which the people needed a rallying point.

I talked to seven volunteers for the building, in charge of managing the gift shop and greeting visitors. All of them told me that they originally started to volunteer *because* of the building, none were originally members of the church. They found that it became a beautiful representation of the strength of the city they love. Christchurch Cathedral still shows up on postcards, paintings, and mugs in souvenir shops, but now the Transitional Cathedral is alongside it. Visitors from all over the world come to see the famous 'Cardboard Cathedral.' Ban's design has allowed the church to stay in the forefront of the city's identity. In the case of Christchurch, architecture became a symbol of resiliency.

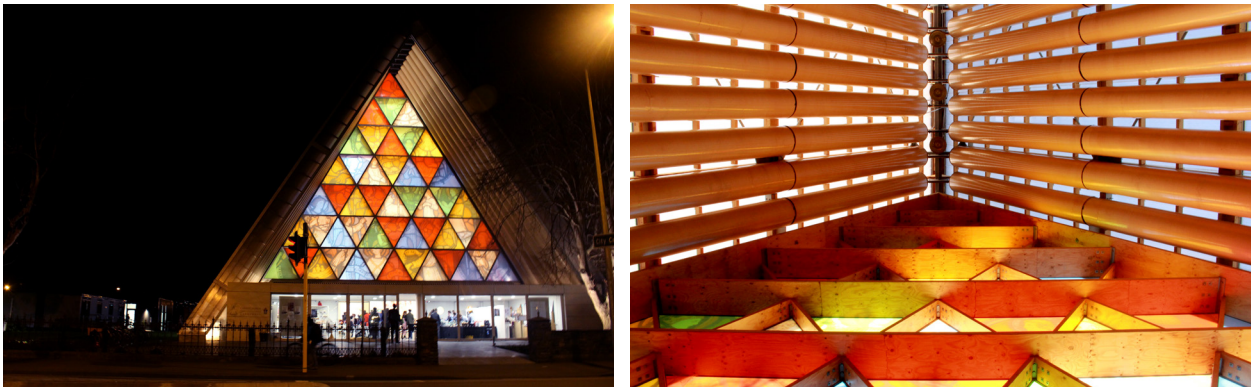

Fig. 11. Shigeru Ban, night and day view of stained glass, Transitional Cathedral, Christchurch, New Zealand, 2013.

The Transitional Cathedral's role in reconstruction for the city of Christchurch is complex. It defies the principles in the Recovery Plan and, therefore, does not contribute to the long-term goals of the city. However, it doesn't follow the Reconstruction Plan because it was the first public building constructed following the earthquake and before the master plan was introduced. This made it an important symbol of moving forward and providing hope to a hurting community. The building itself is extremely successful; the architecture responds to its context and uses subtle but beautiful design to create a

comforting space. The design of the facade and use of a triangular stained glass window enhances its role as a point of refuge in the city. Overall, it was built at a time it was needed and suffered from bureaucratic issues rather than flaws in its design.

Fig. 12. Shigeru Ban, Cathedral volunteers, Transitional Cathedral, Christchurch, New Zealand, 2013.
Fig. 13. Shigeru Ban, view approaching the eastern side of the Cathedral, Transitional Cathedral, Christchurch, New Zealand, 2013.

Community Ownership

The Transitional Cathedral has been hailed by architectural publications as one of the most important buildings in New Zealand. Even though it has received a lot of acclaim for the design, I wanted to know how the community felt, particularly since the cathedral was the only building I studied in which the architect was a foreigner. To study the sense of community ownership, I attended a Sunday morning service at the Cathedral. At the end of the service, the woman sitting next to me introduced herself as Joy Coles. She was with her husband, David Coles, who was a retired bishop for the Anglican church in Christchurch. She and her husband have special ties to the original cathedral that people complained Shigeru's structure was trying to replace. However she still enjoyed visiting the Transitional Cathedral

and told me, "I'm very happy with [it] since restoring the original will be lengthy. The space is so necessary and the simplicity is beautiful here."[16]

Fig. 14. Shigeru Ban, interior space highlighting repetitive cardboard beams, Transitional Cathedral, Christchurch, New Zealand, 2013.
Fig. 15. Shigeru Ban, detail of cardboard beams extending to the exterior, Transitional Cathedral, Christchurch, New Zealand, 2013.

Everyone I talked to had nothing but positive comments for the Cathedral. One of the volunteers, Catherine Harris, has lived in Christchurch her whole life, but was worried about whether the city could recover. She stated that the Transitional Cathedral "was integral to putting Christchurch back on the map as a tourist destination, an industry that has drastically slowed since the earthquake."[17]

The building is widely used by locals with a constant calendar of events and different religious services every day. Part of the success in community ownership comes from the nature of the building's program as a church for the largest denomination in Christchurch. The building also seems to foster a great level of comfort and peace for those who inhabit it. Most visitors remark on the beauty in the simplicity given to the cathedral by its use of a traditional cathedral form. The single nave with repetitive cardboard tubes leads to a beige back wall adorned with only a cross, also made from paper tubes. This tranquil simplicity is enhanced by the monotone interior leading to the vibrant

Fig. 16. Shigeru Ban, front and back walls of the Cathedral framed by cardboard tube beams, Transitional Cathedral, Christchurch, New Zealand, 2013.

stained glass front. Spatially, the building feels like an arrow leading and directing the visitors to a cross on one end and stained glass depictions of biblical figures on the opposite. Most of the people visiting immediately look up; the building encourages a sense of reflection and meditation.

The comfort experienced in this building by the locals can be attributed to particular design decisions made by Ban. The glass front not only brings color, light and vibrancy to the space, it also uses images from the destroyed Cathedral's rose window, abstracted and given new life in the triangular panels. Even the form of the building holds a memory of the original Cathedral as its proportions are not an even rectangle. Instead, it slightly opens up at the back end, following the proportions of the original church's nave. The cardboard beams supporting the frame are meant to be reminiscent of the columns that lined the interior of the original Christchurch Cathedral.[18]

Although these seem like small interventions, Ban hoped that incorporating subtle elements of the original Cathedral would allow people to walk inside and feel at home. In a city that lost so much, he did not want the people to lose the comfort they felt in their

Fig. 17. Shigeru Ban, the exposed concrete floor and wooden chairs allow the south wall to become a focal point, Transitional Cathedral, Christchurch, New Zealand, 2013.

beloved building. He also sought to remain respectful of the historic counterpoint. Reverend Nicky Lee said that her favorite part of the building was that "you can't compare it to Neo-Gothic so when you come in it's a completely different experience and it's still functional."[19] Although Ban alludes to the original Cathedral, he does not overshadow it and allows the Transitional Cathedral to provide its own contribution to Christchurch, making community ownership an important aspect of the project. The daily users and visitors of the building show the success of Ban's intentions. Joy Coles stated that she felt "an immediate sense of peace when [she] entered for the first time— it immediately felt like a home."[20]

Conclusion

The greatest success of the Transitional Cathedral lies in its power as a symbol of resiliency in Christchurch. It encompasses the potential healing power of a place of refuge in a hurting city. It has restored a sense of community by providing a place for events and gatherings of all types. It also brought hope to the city when it needed it the most as the first public building to be built after the earthquake, representing the city's progression and strength.

Yet the future of the building remains uncertain by being labeled a temporary structure. Whether the Cathedral will continue to positively impact and contribute to the city long-term is still unknown. This will possibly be limited by its ignorance in the Recovery Plan, a location determined by what was available, and bureaucratic issues. However, none of this should undercut its present success. Incorporating the Cathedral into a master plan would have only increased its role in the revitalization of the city, something Christchurch is currently struggling through. This may not be the architect's stated responsibility when hired independently to design a single building, but it is something worth considering.

Overall, the Transitional Cathedral demonstrates the benefits and negatives of a fast response when rebuilding a city after a natural disaster. In the case of Christchurch, the timeline of construction excluded the cathedral from having a role in the Reconstruction Plan. However, Christchurch also shows how having such a comprehensive plan comes with its own drawbacks by creating a static city during the interim period which the Transitional Cathedral helped to combat.

Onagawa Shipping Container Housing

An Exploration of the Role of Impermanent Structures

Fig. 1. Shigeru Ban, front elevations, Shipping Container Housing, Onagawa, Japan, 2011.

The Great East Japan Earthquake and Tsunami on March 11th, 2011 devastated many communities along the coast in the northern Tohoku region of Japan, including the small fishing community of Onagawa on the northern end of the island. The tsunami decimated the ports and commercial sector along the coastline, as well as hundreds of residents in the low-lying region of the town. It is estimated that 70% of the buildings were lost, and one in every twelve residents were killed.[21]

The Shipping Container Housing was built in November, 2011. It was designed by Shigeru Ban Architects to improve upon past temporary housing projects, built under the government, and be more responsive to residents' needs. The project was taken on by Shigeru Ban's studio

after they initially implemented a paper partition system as immediate relief directly following the tsunami. Recycled cardboard tubes were used to create partitions in order to give families privacy that were temporarily housed in fifty different evacuation sites.[22] Given the massive loss of housing in Onagawa, Ban's studio installed over 1,800 units of this system, but it soon became apparent that the housing crisis needed another solution— and it needed one fast.

A large deterrent for constructing temporary housing in Onagawa is the topography of the area. Onagawa has a small, flat coastline that leads into a hilly region. The housing could not be constructed on flat land since it was still covered in debris and would be unprotected from a future tsunami. The only area suitable for building was a baseball field, which was limited in size. As a solution, Ban's studio designed nine buildings, each two-to-three stories. Previous housing projects in Japan have traditionally been one level, but this would have drastically reduced the number of units that could be built in Onagawa with such limited space.

The design uses stacked shipping containers. This allowed the

Fig. 2. Shigeru Ban, checkerboard pattern of containers, Shipping Container Housing, Onagawa, Japan, 2011.
Fig. 3. Shigeru Ban, residential building with community center behind, Shipping Container Housing, Onagawa, Japan, 2011.

units to be built swiftly and inexpensively. Using these containers as a module also facilitated a variation in the size of living space, creating three different unit types to accommodate different family types. Stacking the shipping containers in a checkerboard pattern creates open-air space that provides light and airflow into the homes. Another benefit of using the containers was the ease in construction as prefabricated units, making it an ideal system to be replicated for future areas affected by natural disasters.

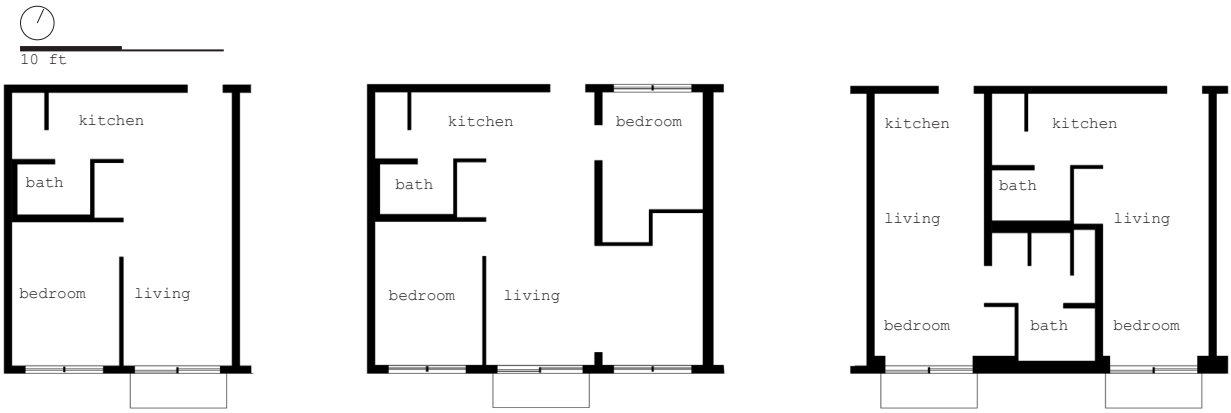

Fig. 4. Shigeru Ban, plans of the different unit types that use shipping containers as a module that adjusts for different family sizes, Shipping Container Housing, Onagawa, Japan, 2011.

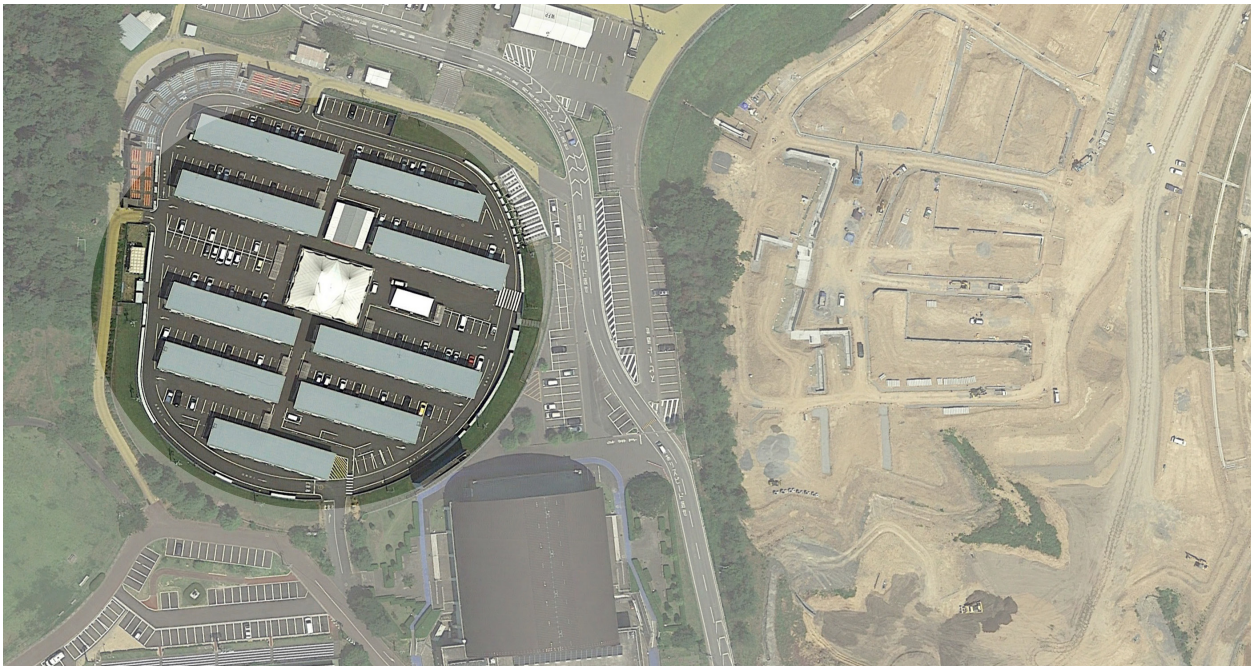

Fig. 5. Shigeru Ban, nine buildings compose the Container Housing Complex, Shipping Container Housing, Onagawa, Japan, 2011.

Response to Need

The challenge for temporary housing in disaster relief initiatives is more than the loss of a building; it's the loss of numerous *homes*. In Onagawa, entire kinship networks and communities were lost in the tsunami and needed a place to be reformed. The Container Housing was designed to address these issues more than the government's standard temporary housing projects that are built based on budget, time, and space. Although these are important considerations in the aftermath of a natural disaster, it is oftentimes at a great cost of comfort to the individuals. The families that move into these structures have already lost the place they have built their lives in; it is necessary to design housing that can give dignity back to the inhabitants and allow their lives to return to normal as much as possible.

Fig. 6. Shigeru Ban, interior of open air market, Shipping Container Housing, Onagawa, Japan, 2011.
Fig. 7. Shigeru Ban, interior of open community center, Shipping Container Housing, Onagawa, Japan, 2011.

In my interview with the project manager for The Container Housing, Yasunori Hirano, he said the firm's first step in the design process was to study past and existing temporary housing projects throughout Japan to determine any issues.[23] They found that the two

biggest drawbacks for these projects was a lack of community gathering space and a lack of storage. In response, the Container Housing includes a community center, open air market and atelier as a study and work space for children. It also incorporates built-in cabinetry within the units to maximize storage and functionality in a small space.

The temporary housing facility is filled by the displaced: those who not only lost homes but entire neighborhoods, and in some cases their friends and families. The community space incorporated into the housing fills a much greater need than simply a place to host events. After natural disasters, entire neighborhoods and *communities* need to be re-formed. With the community center and outdoor market, the shipping container housing responds to this need by providing multiple spaces to meet neighbors, hold workshops and events, and form the bonds that humans need.

Role in Reconstruction

In the aftermath of these natural disasters, with the people facing so much loss and destruction, how do you give a reason to stay? Can architecture provide a starting point? This was the reality in Onagawa after the tsunami in 2011 and the question Shigeru Ban's Container Housing begins to answer.

Perhaps the biggest achievement of the project is that it resulted in the largest number of housing units to be built in the shortest amount of time than any other emergency housing project.[24] Ban's housing not only added quality to the built environment of the community, but it also responded swiftly to the immediate need. This was extremely important in Onagawa after such a devastating loss of

lives, homes, and businesses. According to Mr. Hirano, in a town of 8,000 people, around 1,000 died and 1,000 subsequently left, wary of the town's future.[25] This resulted in a twenty-five percent decline of the entire population of the town. However, if temporary housing was not constructed as fast as it was, this number would have increased dramatically. After interviewing a few of the remaining residents, every one said they would have been forced to leave if the Container Housing had not been built.

Now, Onagawa is viewed as the poster-town for rebuilding. It is one of the most progressive, tourist hot-spots despite being one of the most devastated areas on Japan's coast in 2011. "The Japanese Fishing Town that's Reinventing itself as a Hipster Hub Since the Tsunami" is an aptly title article on Indepedent's website that talks about the growth of Onagawa. According to the article, "'Keep Walking,' has been adopted as a kind of motto for the post-tsunami spirit, and a general openness to investment and entrepreneurship has made Onagawa a kind of model village for regional reconstruction."[26]

Fig. 8. businessmen taking a lunch break on Seapal Pier, Seapal Pier, Onagawa, Japan, 2018.
Fig. 9. Shigeru Ban, view of Yupo'po train station looking from the Seapal Pier as well as the interior, Yupo'po Train Station, Onagawa, Japan, 2011.

This growth has been led by the Seapal Pier built along the waterfront, which was nothing but debris and fallen trees a few, short years ago. Now, walking through this development on a Saturday, it is the complete opposite. People are everywhere; young children are running around the potted plants, elderly couples rest on park benches, teenagers skateboard down the center walkway. The pier has numerous local stores such as a hand-painted tile shop, wood-working studio, and jewelry designer, with more opening soon. The Bar Sugar Shack is a popular evening stop and is packed as young adults from nearby towns arrive by train to get a drink. There is even a craft

Fig. 10. Shigeru Ban, siting of housing project with other reconstruction efforts, Shipping Container Housing, Onagawa, Japan, 2011, source: Restart Onagawa community exhibit

brewery producing an Onagawa Ale. It has turned into a modern town, attracting young adults and families to visit, or even stay. Nearby a new apartment complex has recently opened, and new neighborhoods are in various stages of development, pushed back into the hills with the hope of protection against a future tsunami.

The Container Housing is not part of the re-branding that Onagawa is undergoing. It is not part of any master plan or reconstruction effort. It is actually slated to be demolished within the next month, and when I visited, only seven of the 189 units were still occupied. The Container Housing is included in this research in the hopes of understanding the role of temporary structures when rebuilding a city. Is it needed? Are architects necessary for temporary projects or can it be the standard government response? Onagawa isn't just a remarkable example of how a town can make a comeback. It is also an example of how architecture, even temporary, can play an important role in the process. The Container Housing filled a purpose at the time that it was needed. Although set to be demolished, its success should

Fig. 11. Shigeru Ban, housing opening and community dinner, Shipping Container Housing, Onagawa, Japan, 2011, source: Restart Onagawa community exhibit
Fig. 12. Shigeru Ban, interior of an empty one person unit, Shipping Container Housing, Onagawa, Japan, 2011.

Fig. 13. image taken after tsunami showing extent of destruction, Onagawa, Japan, 2011, source: Restart Onagawa community exhibit 2018.
Fig. 14. Seapal Pier development now occupies the waterfront, Onagawa, Japan, 2018.

not be discounted. The housing uses design to not only put a roof over people's heads but to also give them a space to continue their lives. It gave them an opportunity to not live like refugees but live as a community; to gather and rebuild relationships and have a place to begin to re-imagine their town.

It cannot be said with certainty that Shigeru Ban's attention to detail in constructing fast and functional housing is the reason Onagawa has prospered in the aftermath of March 2011. However, it is not preposterous to think that the achievements were connected. How can a town ever be expected to pick itself back up if it is not given a starting point— if people are not given a home?

Community Ownership

The integration of a community center, an atelier to provide study space for children, and the community market greatly contributed to the people's sense of ownership. Images taken during the first few years after the housing was completed show that the public areas were extensively used for events, gatherings, and even community meals.

Fig. 15. Shigeru Ban, residences and community center, Shipping Container Housing, Onagawa, Japan, 2011.
Fig. 16. Shigeru Ban, view of atelier through open air market overhang, Shipping Container Housing, Onagawa, Japan, 2011.

However, the sense of ownership is not as strong compared to other projects included in this research. In many cases, this is an unavoidable pitfall of a temporary structure. The biggest issue I observed was the lack of green space. The housing was built on a sports field that was paved to allow easy construction. This space was chosen because it was a temporary structure and the land was readily available, being the largest flat area in town. The exterior space is unfortunately the aspect of the project that gives it a sense of 'refuge.' The units are set against the backdrop of aging stadium seating; it is fenced off and unused but serves as a reminder of the actual and intended purpose of the residents' temporary neighborhood.

Fig. 17. Shigeru Ban, stadium seating in the background, Shipping Container Housing, Onagawa, Japan, 2011.
Fig. 18. Shigeru Ban, residents of ground floor attempt to claim outdoor space with small garden, Shipping Container Housing, Onagawa, Japan, 2011.

The design focuses on the interior living space but neglects the outdoor common spaces. The entire ground is paved in asphalt, which does nothing to integrate the buildings and offers no surface change to delineate between parking and pedestrian space. The approach to the building is unmarked and nothing more than a gate in a chain link fence. There is no green space within the complex and very little surrounding it. The desire for room to plant is apparent on the ground floor where families have constructed makeshift gardens, requiring a

fence to be added in order to contain them. A community garden, even if it was nothing more than a patch of grass residents could share, would have contributed greatly to the housing and has often been included in previous Japanese, disaster relief housing projects.

Conclusion

The Shipping Container Housing by Shigeru Ban proves that architecture, even when temporary, can be useful in the immediate response to natural disasters. The lack of permanency does not make *good* design impossible or unnecessary. Contrarily, in a time when people have lost so much, architecture may become even more important. If our jobs as architects is to serve people, why would we not serve them when they need us the most?

We tend to think of architecture as a long-term environment but the Container Housing supports that temporary structures also have value. Particularly when dealing with housing, the impermanence of a structure should not mean that people have to sacrifice beauty, comfort, and functionality more than necessary. Onagawa also shows how

Fig. 19. Shigeru Ban, entrance through a chain link fence entering a sea of asphalt, Shipping Container Housing, Onagawa, Japan, 2011.

providing a fast and well-designed living space can encourage growth and development in the town by maintaining the community that is left. Providing comfortable housing allowed reconstruction efforts to focus on commercial and public buildings, the first structures to be rebuilt. This is important to, once again, allow people to make a living and support the town's economy. Housing, even if temporary, is necessary as a starting point.

This project also highlights the importance of green space in a temporary housing project. A community garden or small park would turn the project from separated housing blocks to a more integrated neighborhood. A park would have provided some needed breathing space at a time when Onagawa no longer had any. This weakness in the project can be explained by the relatively short timeline of the housing's use. It was originally intended to be lived in for two years. However, since the residents were comfortable and housing was still being built, this was expanded to seven years.[27] It is important to consider this when providing temporary architecture after a natural disaster. Timelines are not guaranteed, and buildings should be designed to be as flexible as possible.

Soma Home for All

Providing a Flexible Community Space to Serve Long—term Goals

Fig. 1. Klein Dytham Architects, front elevation, Soma Home for All, Soma, Japan, 2016.

The Soma Home for All was designed by Klein Dytham Architecture, in Tokyo. The project was constructed in Soma, Japan, which lies on the eastern coast, south of Onagawa. Like the Onagawa Shipping Container Housing, the Home for All was also built in response to the Great East Japan Earthquake and Tsunami of March 2011. Completed in 2016, the building is located in an area greatly impacted by radiation levels from the Fukishima power plant meltdown. Astrid Klein, the principle of Klein Dytham Architecture and in charge of the project, estimated that the effects of this disaster forced more than 100,000 people to leave their homes and move elsewhere in Japan.[28]

The project is a community center designed specifically for children. It is part of Toyo Ito's: Home for All Initiative, launched

right after the events of 2011. The initiative focuses on building community centers in devastated areas along the Tohoku coastline. The Soma project, like most Home-for-Alls, was funded by both financial and material donations. A large donation of wood led the design and gave Klein Dytham Architecture inspiration for the interior and roof structure. The building is circular in plan with a lattice roof designed to look like a straw hat, using nine layers of wooden slats, measuring up to sixty-five feet, joined together to span the length of the structure. It is met by columns in the interior constructed from glue-laminated wood to resemble trees with “branches” that extend out. Some of the branches feature wooden, cut-out creatures such as birds and squirrels and are wrapped in colorful wire to support lights and add a whimsical, child-like design to the space.

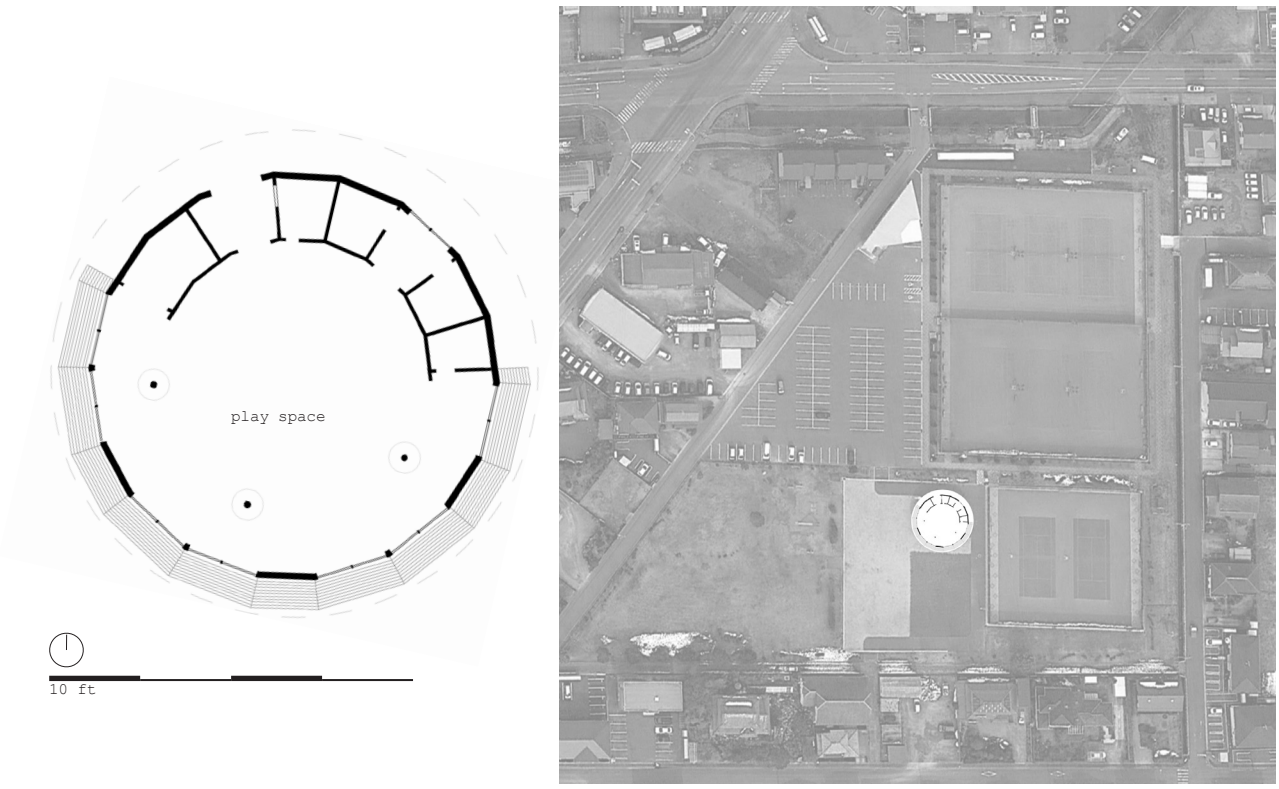

Fig. 2. Klein Dytham Architects, plan drawing of the community center and its location within the park and residences, Soma Home for All, Soma, Japan, 2016.

The exterior of the building is painted with vertical red, white, and pink stripes. In Japan, this is known as *kōhaku*, used for celebratory events, so that the building resembles a circus.[29] The Soma Home for All is in a residential area within an existing park, surrounded by a grass field and multi use courts. Now that radiation levels have stabilized, children are safe to play outside. However, the building is still highly used and its exterior bench seating now allows children to easily move from inside to outside, without fears of contaminated soil.

Fig. 3. Klein Dytham Architects, interior space, Soma Home for All, Soma, Japan, 2016.
Fig. 4. Klein Dytham Architects, exterior detail of "kōhaku" paint pattern, Soma Home for All, Soma, Japan, 2016.

Response to Need

In Soma, the radiation levels of the ground and soil were the communities' biggest concern. In my interview with Astrid Klein, co-owner of Klein Dytham Architecture, she stated that the first twenty centimeters of soil were removed throughout the town in any green or open space, due to dangerous amounts of radiation from toxic rain and snow. Klein said, "parents would literally carry their children, even if it was just thirty meters, from the building to avoid touching the ground."[30] When the firm was contacted by Toyo Ito to become part of his Home for All initiative for the town of Soma, they decided

the community center should be specifically for children who could no longer play outside due to the unique challenges the families in Soma were facing. This sets it apart from the prior Home for Alls which were built to facilitate groups of all ages.

Over seventy percent of the land in Japan is mountainous, greatly limiting the amount of build-able area, and much of this is still used for rice fields and other agriculture. To accommodate this, Japanese homes are designed to be small and functional; therefore, children rely on community centers and public parks for space to play. Fear of radiation levels removed many of these areas from the children's daily lives. While the two parks in Soma couldn't be used, Klein Dytham Architecture's small, wooden structure filled a large need. A volunteer working the front desk knew very little English but managed to use one word to describe the impact of the center: safe. In towns suffering from radiation, like Soma, the biggest concern was safety of children. Many young families left, leading to a significant decline in population for towns in the Fukishima Prefecture.

Soma needed safety more than any particular building type. Klein Dytham Architecture listened to those needs and responded with a building that gives children a sense of the outdoors while

Fig. 5. Klein Dytham Architects, columns disguised as trees, Soma Home for All, Soma, Japan, 2016.

protecting them from exposure to radiation. Klein Dytham Architecture accomplished this by incorporating natural elements into the design, specifically the donated wood. The tree-like columns and wooden canopy roof are strongly reminiscent of a forest. The sprawled-dome shape of the space is light and open making it easy for visitors to forget that they are indoors. The large windows also give children views of the surrounding park, integrating the building into its site.

Although a space for children was identified as the primary need, the Home for All was designed with more long-term uses in mind. Klein stated that they plan to have the center evolve to fill other needs in the community as radiation levels subside. The structure is designed to also act as a multi-use space for community gatherings, a concert venue, and events space. Klein anticipates that the building will change in response to the town's needs.[31] This begins to tackle the

Fig. 6. Klein Dytham Architects, siting within the town of Soma around one of the few green spaces in the community, Soma Home for All, Soma, Japan, 2016.

problem of *time* and future necessities in disaster relief recovery by addressing immediate needs, while also recognizing how these needs may change.

Role in Reconstruction

The first time I visited Soma was on a Saturday afternoon. Before heading to the Home for All, I walked the length of the town to reach the main commercial center, where locally-owned storefronts lined wide sidewalks. I had just visited Onagawa's thriving Seapal Pier and was shocked to find that Soma was quite different. The downtown was silent; I only saw two people walk into a store. In fact, most stores were closed and did not look like they were opening any time soon. While walking back towards the train station, I passed through neighborhoods that seemed empty. I was surprised to find how many houses look deserted. This is a common problem in areas affected by the Fukishima power plant meltdown. The people in these areas lost a sense of security and were skeptical that radiation would ever return to safe levels. This pushed people out, concerned about lasting radiation effects that seemed harder to tackle then damage to the buildings.

Fig. 7. relatively empty downtown and deserted homes, Soma, Japan, 2018 .

Yet, when I arrived at the Home for All, the scene was very different. The parking lot was completely full and tennis practices filled the six courts adjacent to the center. Inside the Home for All, eight children were with their parents— playing with the plastic kitchen, jumping around on animal scooters, and sitting on the ground coloring. After the eerie, quiet atmosphere of the town, I felt like I was suddenly in a different place. Although the community center could not give back a sense of security within the town of Soma as a whole, the obvious comfort of the families using the center displays how it did provide a small point of refuge.

The Home for All did not change the statistics. Soma lost a comparatively similar number of people as the surrounding communities. The population declined and the center did not necessarily bring any of those people back. However, it did give protection to those who chose to stay, for however long they would need it.

The Home for All Initiative directed under Toyo Ito was featured in the 16th Venice Architecture Bienalle. The Exhibition was titled: Architecture. Possible here? *"Home for All"* and focused on the question, *"Is there still a need for architecture?"* This specifically related to the area in northern Japan affected by the events of 2011.[32] The Soma Home for All provides important insight in answering these questions. The radiation levels have been deemed stable, and kids are free to play in the grassy areas their mothers once carried them over. Yet the center is full, and families still often prefer the comfort of the lumber woodland creatures inside the circus-inspired building. This proves that architecture can contribute more for towns suffering from natural disasters by providing a well-designed structure that

will look beyond the initial need and serve a long-term purpose.

Toyo Ito wanted to know if architecture was possible and necessary in the face of natural disasters. After these events, it can sometimes seem as if the fastest solution is superior to a well-designed one. The fast and cheap solution for Soma would have been building a wooden box to protect the children, but no child wants to play in a box. The Soma Home for All was so successful that children still choose to spend time inside it, supporting the thesis that architecture can help. Designing something well, even at a small scale, can have a lasting and positive impression on the community it services, even after the town has recovered.

Community Ownership

The biggest surprise with the Soma Home for All is its seamless integration into the site. As such a distinctive building, I expected it to be proudly displayed, similar to the Cultural Center in Constitución or the Transitional Cathedral in Christchurch. However, the approach to the building humbles it. It isn't within sight from the main road and visitors have to pass through the park to reach it where it is tucked away, abutting one of the tennis courts. The pink and red stripes match the paving color for the courts and the small

Fig. 8. Klein Dytham Architects, families playing in and around the center, Soma Home for All, Soma, Japan, 2016.

scale of the building allows it to successfully blend into the park and single family homes of the surrounding neighborhood.

Klein states that the relationship between the firm as the architects and the town of Soma as the clients was extremely important

Fig. 9. Klein Dytham Architects, interior space, Soma Home for All, Soma, Japan, 2016.

to the design. According to Klein, "at KDA [Klein Dytham Architects], we are really concerned to be human centric and [to] make comfortable places. In that sense, nothing changed for us with this project."[33] This philosophy is evident in the Home for All. The entrance isn't loudly announced because the building is not meant to be a monumental structure; unlike Christchurch, it isn't designed to be an iconic point in the city. Klein understood this was not the building's intention and designed it to integrate seamlessly into its context and provide the refuge the community needed. In a way, the Soma Home for All demonstrates the highest sense of community ownership. It isn't a tourist destination in the town, so the visitors are the people who *use* the building. The center's main purpose was to provide security to the residents.

The Home for All was also extremely private. As a foreign visitor, I was only able to photograph the building at particular times of the day. For privacy reasons, I was not allowed inside if

the center was very busy. Although other architects had visited the building, a log was kept marking who and when for security purposes. Only four visitors had come in the eight months prior to my arrival, all from Japan. Visitors were not accepted freely or often, enhancing the feeling of safety for the families inside. This was consistent with the Japanese culture. People were timid when I tried to speak with them, accustomed to keeping to themselves. The society as a whole is very closed-off and private; they do not have the same social atmosphere as the people of Chile. Whereas The Cultural Center in Constitución would have benefited from a more open and social street front, the hidden approach to the Soma Home for All perfectly responds to the Japanese society. The entrance is a small door to the side, not uninviting for the families but a quiet threshold that provides a sense of asylum.

The Home for All was clearly designed *for* the people of Soma. It gave the community a safe space for their children to play, their biggest loss in the nuclear meltdown. Its location contributes to this security. The building is not put in the center of town where it would be most visible. Instead, it quietly sits in a park, far from any busy streets, but widely used by the families of Soma.

Conclusion

The Soma Home for All is a small building with a large impact. Communities cannot prosper without a feeling of safety and well-being within their own town, and this round community center helped restore that for its users. Klein Dytham Architecture looked at the community's specific needs to determine that a space for children would

be most useful, which adds to the success of the project. During her interview, Klein stated that the biggest problem for building in the Tohoku region after the tsunami were people's perceptions, stating that, "It was hard to tell communities that architects were there to help. There was a lot of mistrust. Architects can help a lot, but I think nowadays the developer mentality is so much stronger than the actual human-centric values that are given to architecture projects."[34] By making decisions that limited the exposure of the building but enhanced the ownership within the community, The Home for All restored some of this trust in Soma, Klein Dytham Architects established a strong sense of community ownership through a direct response to a specific need.

Fig. 10. Klein Dytham Architects, everything from the furniture to the scale of the table is designed for children to make them feel at ease, Soma Home for All, Soma, Japan, 2016.

The biggest strength of this project represents the success of the entire Home for All Initiative, that focuses on responding to the particular problems and context of the towns in which they are built. Astrid Klein stated, "These Home for Alls should be built into the newer communities; seeing how they've been used in a community way, every ward in every city should have a Home for All."[35] Spaces

for gathering are important in all communities and this need is only enhanced following the destruction. Architecture can help restore not only the built environment but also the relationships between the people by providing a space that will allow these communities to form. The Soma Home for All focuses on this interrelationship between people, rather than the identity of the city, which contributes to the overall success of the project.

The Home for All Initiative also focuses on fostering a long term positive impact within the communities. For the 16th Venice Biennale the initiative was featured in, a Home for All in Rikuzentakata, Japan was displayed. A Japanese photographer, Naoya Hatakeyama, summarized an important goal of the project, and likewise of the entire initiative, as a challenge "...to come up with something that would help to energize people in a dire situation, yet be more than a mere quick fix."[36] This principle is shown as a strength in the Soma Home for All by beginning to think of the flexibility and evolution of the use of the space.

The Architect's Role in Disaster Recovery

Rebuilding and Reshaping Communities Affected by Natural Disasters

Fig. 1. an exhibit in Arahama Elementary School that saved numerous lives of those who escaped to the roof during the Great East Japan Earthquake and Tsunami, Sendai, Japan, 2018.

The most surprising discoveries throughout this process have been the radical differences in every place, context, and situation. All of the research sites suffered similar tragedies: being ravaged by nature, physically and emotionally. In some capacity, all four towns needed a level of rebuilding and restarting. I had a preconception that all of the buildings would be responding to the same problems and that each building would be responding in the same way. On a surface level, the problems that cities and towns face after natural disasters may seem similar, but a deeper exploration reveals the complexities that accompany the unique identity and atmosphere of any place. The success of providing an iconic beacon to represent Christchurch would

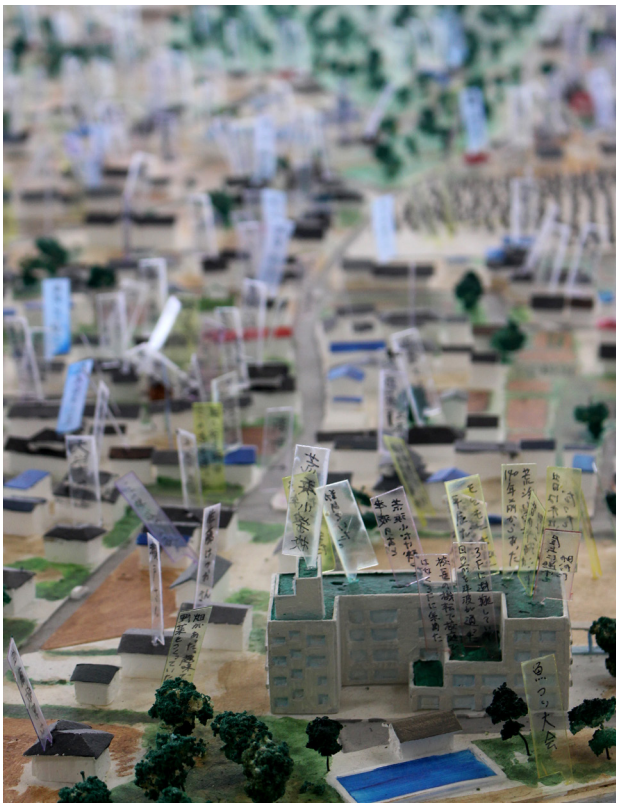

Fig. 2. display showing the neighborhood lost in the tsunami surrounding the school, Arahama Elementary, Sendai, Japan, 2018.
Fig. 3. front view of Arahama Elementary School that saved many students lives and the current view from the rooftop showing the devastation, Sendai, Japan, 2018.

not have helped Soma. Likewise, the humble and protective nature of the Soma's Home for All would have contradicted the gregarious nature of the community in Constitución. As architects, this highlights the importance of fully understanding *where* we are designing and for *whom*.

The differences that I found in each project and site contributed to a wide reaching view of the role of architecture in rebuilding these communities. The Cultural Center in Constitución shows how integrating a building into a larger, comprehensive reconstruction plan can allow a building to act in partnership with surrounding projects, which adds to its success. It's also an important example of how communities can be involved in the process to make sure we are building the right type of structures at the right time. It's immensely important to respond

to the actual problems. The Transitional Cathedral in Christchurch demonstrates the need to focus on not only the physical problems but the psychological and emotional scars from which a city might be struggling to heal. Christchurch's Cathedral provided much more than a roof and four walls to gather; it gave people hope. However, unlike the Cultural Center, the cathedral was not part of an encompassing reconstruction plan but was built at the time in which it was needed. This project, as well as the Onagawa Shipping Container Housing, shows the importance of timing. Responding swiftly can sometimes be the most

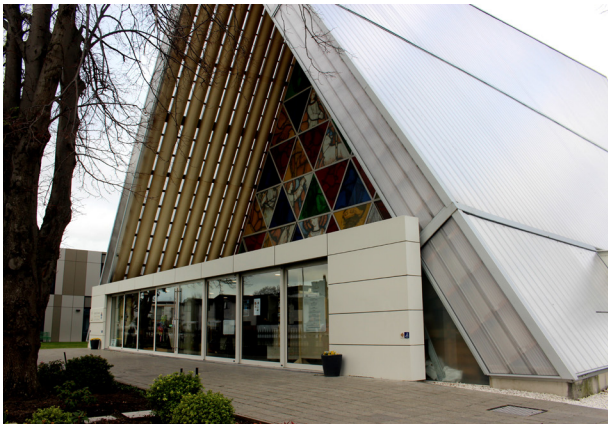

Fig. 4. ELEMENTAL, exterior facade of the Cultural Center, Constitución Cultural Center, Constitución, Chilé, 2015.
Fig. 5. Shigeru Ban, pedestrian entrance approaching from city center, Transitional Cathedral, Christchurch, New Zealand, 2013.

Fig. 6. Shigeru Ban, community center with housing, Shipping Container Housing, Onagawa, Japan, 2011.
Fig. 7. Klein Dytham Architects, entrance within park, Soma Home for All, Soma, Japan, 2016.

important part of a project following a natural disaster.

The Shipping Container Housing starts to prove that temporary structures can benefit from *good* design, and providing housing that seeks to instill a sense of refuge and dignity also gives people a place to begin to rebuild their lives and town. Lastly, the Soma Home for All gives an understanding of the importance of *place*. It shows that a humble, small scale building can have a large impact when it responds to the particular needs of a community, creating a strong sense of ownership.

Spending months observing the challenges facing these four places deepened my belief in the importance of architects responding to these crises. It is not easy to design for a place facing such deep and complicated issues when rebuilding, but it is necessary. To answer the question that Toyo Ito posed at the Venice Biennale, architecture is possible, and we would not be doing our jobs as architects if we did not step up to the challenge and use our education and skills to help heal these communities.

At the press release for the Venice Bienalle Exhibition in 2012, Toyo Ito poses a challenge for architecture with his closing remarks: "as architects, and even more as human beings, what can we do in the face of this reality for those people?"[34] This research shows the complexity of building post natural disasters. However, it also shows the large *importance* of architects accepting the challenge and considering the immediate need, overall reconstruction, and role of the community.

Endnotes

1. Alain Musset, “Learning from Vulnerability: Environmental shock strategies in Chile”, (TVK—Trévelo & Viger-Kohler, 2015).

2. Gideon Long, “The rebuilding of Chile’s Constitución: how a ‘dead city’ was brought back to life”, (The Guardian, 2015), https://www.theguardian.com/cities/2015/feb/23/rebuilding chile constitucion earthquake-tsunami.

3. Camila. Interview with Lauren Ballard. Field interview. Constitución, May 15, 2018.

4. Orellana, Daslam. Interview with Lauren Ballard. Field interview. Constitución, May 17, 2018.

5. Long, “The rebuilding of Chile’s Constitución.”

6. “Christchurch earthquake kills 185,” (New Zealand History, 2011), https://nzhistory.govt.nzpage/christchurch-earthquakekills-185.

7. Lee, Nicky. Interview with Lauren Ballard. Field interview. Christchurch, May 31, 2018.

8. Trevelyan, Andrew. Interview with Lauren Ballard. Phone interview. Christchurch, June 6, 2018.

9. Central City Recovery Plan, (Christchurch, Canterbury Earthquake Recovery Authority, 2012), 1.

10. Trevelyan, Andrew. Interview with Lauren Ballard. Phone interview. Christchurch, June 6, 2018.

11. Trevelyan, Andrew. Interview with Lauren Ballard. Phone interview. Christchurch, June 6, 2018.

12. Trevelyan, Andrew. Interview with Lauren Ballard. Phone interview. Christchurch, June 6, 2018.

13. Narimatsu, Yoshie. Interview with Lauren Ballard. Personal interview. Tokyo, July 6, 2018.

14. Lee, Nicky. Interview with Lauren Ballard. Field interview. Christchurch, May 31, 2018.

15. Jacque. Interview with Lauren Ballard. Field interview. Christchurch, June 7, 2018.

16. Coles, Joy. Interview with Lauren Ballard. Field interview. Christchurch, June 10, 2018.

17. Harris, Catherine. Interview with Lauren Ballard. Field interview. Christchurch, May 31, 2018.

18. Narimatsu, Yoshie. Interview with Lauren Ballard. Personal interview. Tokyo, July 6, 2018.

19. Lee, Nicky. Interview with Lauren Ballard. Field interview. Christchurch, May 31, 2018.

20. Coles, Joy. Interview with Lauren Ballard. Field interview. Christchurch, June 10, 2018.

21. Stephen Phelan, "The Fall and Rise of Onagawa", (New York, The New Yorker, 2016).

22. Shigeru Ban, Humanitarian Architecture, (Aspen, Aspen Art Museum, 2012), 211.

23. Hirano, Yasunori. Interview with Lauren Ballard. Personal interview. Tokyo, July 4, 2018.

24. Ban, Humanitarian Architecture, 211.

25. Hirano, Yasunori. Interview with Lauren Ballard. Personal interview. Tokyo, July 4, 2018.

26. Phelan, "The Fall and Rise of Onagawa."

27. Hirano, Yasunori. Interview with Lauren Ballard. Personal interview. Tokyo, July 4, 2018.

28. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

29. Amy Frearson, "Klein Dytham builds latticed community hall for Toyo Ito's post-earthquake recovery programme," (Dezeen, 2016), https://www.dezeen.com/2016/03/11/klein-dytham architecture soma-city-home-for-all-community-hall-tohoku-earthquake-tsunamirelief.

30. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

31. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

32. Toyo Ito, *Architecture. Possible here? "Home for All.",* (Tokyo, Toto, 2012).

33. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

34. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

35. Klein, Astrid. Interview with Lauren Ballard. Video interview. Tokyo, July 6, 2018.

35. Toyo Ito, *Architecture. Possible here? ”Home for All.”*, 101.

36. Toyo Ito, *Architecture. Possible here? ”Home for All.”*, 21.

Bibliography

Ban, Shigeru. *Humanitarian Architecture.* Aspen, Aspen Art Museum, 2012.

Canterbury Earthquake Recovery Authority (2012). *Central City Recovery Plan*. Christchurch: Canterbury Earthquake Recovery Authority.

"Christchurch earthquake kills 185." *New Zealand History*, February 22, 2011. https://nzhistory.govt.nzpage/christchurch-earthquake kills-185

Frearson, Amy. 2016. "Klein Dytham builds latticed community hall for Toyo Ito's post-earthquake recovery programme." *Dezeen*, March 11 2016. https://www.dezeen.com/2016/03/11/klein-dytham architecture soma-city-home-for-all-community-hall-tohoku-earthquake-tsunami relief/

Ito, Toyo, et. al. *Architecture. Possible here?"Home for All."* Tokyo, Toto, 2012.

Long, Gideon. 2015. "The rebuilding of Chile's Constitución: how a 'dead city' was brought back to life." *The Guardian*, February 23, 2015. https://www.theguardian.com/cities/2015/feb/23/rebuilding chile constitucion earthquake-tsunami.

Musset, Alain. 2015. "Learning from Vulnerability: Environmental shock strategies in Chile." *TVK—Trévelo & Viger-Kohler.*

Phelan, Stephen. 2016. "The Fall and Rise of Onagawa." *The New Yorker.* March 18 2016.