In Pursuit of Better Sheltering and Housing After Disasters: The Architectural Perspective Through Ideas Competitions

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Abstract

In the past, post-disaster sheltering, and rehousing involved a limited field of expertise. Architecture was deemed loosely related to the context. Today, architecture involves in post-disaster issues more than ever and does that in collaboration with other disciplines. It uses technological developments in any field related that can bring better solutions to post-disaster shelter crises. For the past few years, many architectural competitions were launched within this theme. Architectural competitions aim to find the most appropriate design for a problem through the accumulation of wide range of ideas in a short period of time that would not be possible if a case assigned to only one architect. This can be deemed as an indirect way of participatory approach in post-disaster sheltering and housing with the inputs of professionals and students. Eventually, the architectural competitions became the arena of this pursuit since architecture began to step out of the comfort zone and started to 'design' for people in need, for emergencies and for rebuilding for societies after long trouble times in disastrous areas. The paper reviews a range of competitions fall under the topics of post-disaster sheltering and rehousing by examination of the outstanding projects.

Keyword: Architectural competition; Post-disaster housing; Architectural design; Shelter design.

1. Introduction

"Millions are displaced from their homes each year by conflict and natural catastrophe. Can architects provide a solution?" Davison (2015) asks in her article, which argues the role of architecture and the lost connection of architecture with the society. She emphasised that architects became more into creating of grand buildings than pursuing humanitarian projects, a "naive or idealistic" attitude, in words of Davison. Sanderson (2010) explains: "Architects are taught to focus on the product, whereas humanitarian practitioners major on the process. For architects, ownership of the design rests with them and fellow professionals; for the aid world, engaging beneficiaries through sharing decisions is paramount". Thus, he claims that architects need to be taught if they want to contribute for the better. Rose (2010) wrote that many people "felt powerless to help, but not architects" after the Haiti Earthquake, referring to many architecture-based humanitarian organisations worked in the area. Davison (2015) marks the year of 2014 that the world-renowned Shigeru Ban was honoured with the

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Pritzker Award, not only because of his architectural masterpieces, but also mostly because of his creative and low-cost humanitarian project solutions for diverse post-disaster cases around the world. Tom Pritzker states, "Shigeru Ban's commitment to humanitarian causes through his disaster relief work is an example for all. (...) Shigeru has made our world a better place". It would not be wrong if we say that Ban has changed the way we see architecture as a discipline. The award he won made everyone in the 'design' world to think the same: "creating buildings for people, rather than glamor and prestige" (Berg, 2014). After the 1995 Kobe Earthquake he designed easy-to-build paper log houses for people in need of emergency shelter. He used the same principle on an elliptical plan of a church (Figure 1, Left) as the Earthquake destroyed local one in Kobe.

Figure 1. (Left) Paper-log Church in Nagata, Kobe (Inhabitat.com, 2007); (Right) Cathedral in Christchurch, New Zealand (Floor Nature.com, 2013).

Ban used his practical low-cost paper-log solution for any applicable cases; for emergency sheltering of Rwanda refugees in 1999; for temporary housing along with some local materials after the 2001 Gujarat (Bhuj) Earthquake in India; for an elementary school in Chengdu after the 2008 Wenchuan Earthquake; for a concert hall in Italy after the 2009 L'Aquila Earthquake; for emergency sheltering in Port-au-Prince after the Haiti earthquake in 2010; and, for a big cathedral (Figure 1, Right) with capacity of 700 people in New Zealand after the Christchurch earthquake in 2013 (Archdaily, 2014). He became the face of 'humanitarian architecture' that addresses the sheltering crises for refugees and survivors. Alejandro Aravena founded the ELEMENTAL in 2001 and since then cared social impact and participatory design. He won the Pritzker Award in 2016. The jury valued his humanitarian works: "His built work gives economic opportunity to the less privileged, mitigates the effects of natural disasters (…) He shows how architecture at its best can improve people's lives." Lately, The RIBA Charles Jencks Award (2018) honoured the versatility of his designs by stating: "Aravena's

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encouragement for architects to reach beyond their traditional remit and investigate the concealed environments of conflict zones and the favela, housing shortage, migration, and environmental disasters invites the development of new modes of practise and helps define a socially and formally relevant architecture for the 21st century". After the 2010 Chile Earthquake, Aravena helped to re-plan Constitución and to build post-disaster social housing projects.

Figure 2. Villa Verde Housing by ELEMENTAL (Archdaily.com).

Villa Verde Housing (Figure 2) for 484 families was one of them and based on the approach of *incremental* construction; a family unit was built in two parts under a roof with one side fully completed and the other to-be completed by the inhabitants in time. For example, some added more bedrooms (Valencia, 2016). In Design Indaba (2018), Aravena expressed that his approach to the reconstruction of Constitución was participatory, '*horizontal'* in his words, and highlighted the questions "Do we rebuild fast or good?" and "Do we care more of speed or quality?"

Ying-Chun Hsieh is a renowned Taiwanese architect in humanitarian architecture. Following the Jiji Earthuake in 1999, he moved his office to a rural village and designed for Thao people to rebuild their houses. As the critiques that architecture is largely ruled by financial and power consumption, Hsieh states that almost only 30% of the world population live in this kind of consumerism whereas "70 % of people have not been within the reach of architects, particularly in rural and poor communities". Thus, he focused his architectural practice to improve the environmental and living conditions of these people. Hsieh believes that architectural education emphasises the individuality, hence in reality architects are "unable to respond to both the physical and psychological demands of local residents

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(...)" (Chiu, 2015). Hsieh's designs for post-disaster reconstruction projects begins with a primitive structural system and the rest remains buildable by local people using locally available materials or reusing of materials of collapsed buildings. Hsieh believes that contemporary architecture made us forget how to build *simply*. Simplification of building process is the key approach in post-disaster reconstruction, but the contemporary focuses on the speed and the use of high technology (Cesal, 2018). Hsieh has a huge interest in tribal communities. The Qiang was one of them, who were severely affected by the 2008 Sichuan Earthquake. He designed houses with light structural steel and wood (Figure 3) so that the local people could join the construction process. In 2011, Hsieh received the Curry Stone Design Prize with his RiYue Village work in Taiwan. The Award noted his approach "leaving floor plans and aesthetic details to the residents' discretion" (Curry Stone Foundation, 2018).

Figure 3. (Left) Qiang people erect the light-steel frames of their houses; (Right) The street view of the village (Archinect.com, 2012).

Humanitarian crises give architects the opportunity to act with social responsibility (Wood, 2017). The works of Ban, Aravena and Hsieh and many others raised a worldwide interest. In the past, post-disaster sheltering, reconstruction and rehousing were under care of governments that involved a limited field of expertise and became an issue when needed. Architecture, as a discipline, was deemed loosely related to the context, whereas engineering (particularly civil engineering) was the leader of the process, speaking of natural disasters. This was the result of the perspective that damages in the built environment was due to its lacking physical quality. In decades, the perspective has changed to the fact that the natural disasters are not purely natural, and they are a complex result of 'root causes'. The concepts like 'building back better' and 'building resilience' idealised 'rehousing' way forward, while it made the process more complicated and multidisciplinary. Today, architecture involves in post-disaster issues more than ever and in collaboration with other disciplines. It uses technological

developments in any field related that can help to bring better solutions to post-disaster crises. Unlike the thoughts that architects 'cannot' design for people in need, today they are more aware of disaster conditions than before and can design shelters and houses by considering the people's environment, their cultural background, their past and future economic status, their expectations and perceptions, the shortage of material, time and budget while they put their artistic perspective in creation.

2. Post-disaster Humanitarian Architecture

A crisis and an urgent need of sheltering and housing emerge from disastrous conditions. The process is not as fluent as it is under ordinary conditions. It often lacks budget, time and human resources to organise, to plan and to begin the reconstruction phase, which results with delays not months but years (e.g. after 3/11 Tohoku Earthquake). Post-disaster sheltering solutions vary depending on the phase in the course of disaster management. There are emergency shelters, temporary shelters, temporary housing and permanent housing. Some add transitional shelter between the temporary and the permanent (Bashawri et al. 2014) with a range of pros and cons (Rohwerder, 2016). Tom Newby, from CARE International, highlighted that what is built 'temporary' after a disaster often becomes 'permanent' in most cases considering they are built as a mixture of permanent and temporary (Newby, 2016). Kilian Kleinschmidt similarly highlighted that "refugee camps are the cities of tomorrow", implying that an average stay in a camp is 17 years (Radford, 2015). These are to highlight that solving the issue of post-disaster housing through temporary solutions is not always for short-term. In some cases, it may last for a decade depending on the complex dynamics of the disastrous area or simply because of poor governance. In Japan, the Mega-disaster in 2011 caused over 473 thousand to flee their towns and six years after, there were still almost 123 thousand either living in temporary houses or in rented flats (TheJapanTimes, 2017). Temporary housing is often judged with 'flaws', i.e. the cost it requires to manufacture, to locate and to assemble, the temporary infrastructure (e.g. roads, clean water, sewerage and so on), the problem of disassembly or to remove, the irrelevant design of local climate, and from the cultural perspective, and that they are usually too rigid to be flexible (e.g. according to the size of households and livelihood) (Felix et al., 2013). Aravena also argued temporary shelters and houses as he says "The problem with a tent is that when you use it you throw it away, so it's money that melts" and emphasises that "temporary disaster-relief shelters should be seen as "payment in advance" for a long-term solution to the world's housing shortages" (Mairs, 2015). Felix et al. (2013) define five criteria to design promising temporary housing units: understanding the context, community participation, use of local resource, plan ahead and finally, design beyond units. Charlesworth strongly emphasises the significance of local source and labour cooperation. Particularly,

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working closely with local people on post-disaster shelter and housing designs deemed far better than imposing the use of new materials and building technologies by sweeping away the traditional techniques (David, 2015). Post-disaster humanitarian architecture is, thus, more than a 'good will' and requires local knowledge and experience. Lately, there is a professional interest channelled in this topic and through private firms or charity organisations architecture began to step out of the comfort zone and started to 'design' for people in need, for emergencies and for rebuilding of societies after long trouble times in disastrous areas. Today, the architectural competitions became the arena of this pursuit as a new approach; that is to seek ideas before it (disaster) happens.

3. In pursuit of good-design and the role of architectural competitions

"Design competitions play a fascinating role in the history of architecture" says Professor Bates and reminds us that the Chicago Tribune Tower in 1922, the Sydney Opera House in 1956 and the Centre Pompidou in Paris in 1971 which are among the architectural symbols realised through competitions. In their book, Architectural Competitions – Histories and Practice, Andersson et al. (ed.) wrote, "the architectural competition is a future oriented production of knowledge through architectural projects". They claim that architectural competitions are futuristic and do not seek for the ultimately correct solution, rather they provide "the potential of alternative good solutions to the competition task at hand". Guilherme (2014) defends that "competitions based in design evaluation are crucial to professional identity and reinforce the architect's role in society". In general, architectural competitions aim to find the most appropriate design, which means not always the 'best looking', for the problem/topic given. Most of the time, the ultimate goal is not to award whoever the winners are, rather the aim is to open a debate among people who are likely to interest in the subject given and put, expectedly, controversial and/or innovative ideas forward through means of architectural graphics. The accumulation of wide range of ideas happens in a short period of time that would not be possible in case of working with one architect from the beginning. Besides, while there are some competitions evaluated only by the jury panellists, there are some competitions that the first evaluation is to eliminate the finalists and then they go public exhibition for voting. For the latter, participatory approaches begin to involve that a community can have what they prefer. Utilising architectural competitions as source of innovative ideas for emergency and temporary sheltering has become a trend only in the past few years. This paper reviews a selection of the competitions (Table 1) and seeks what is the common approach to designs and how the jury evaluates them. The review is descriptive mainly based on the winners and finalists' submissions and the juries' reports. A critique was given in the

conclusion by highlighting what is overlapping with the suggestions in humanitarian architecture and how the competitions should be improved more appropriately to this topic.

Table 1. The list of the architectural competitions reviewed (Source: Author, 2018).

Competition name, Organiser	Country	Year
Urban post-disaster housing prototype for New York City, NYC	USA	2008
Hurricane Sandy Design Competition, The Rebuild by Design	USA	2014
Post-War Housing Competition, Matterbetter	Syria	2016
Mosul Postwar Camp, Archstorming	Iraq	2017
Rebuilding Iraq's Liberated Areas: Mosul's Housing, Tamayouz	Iraq	2017
Shelter International Architectural Design Competition, Home for All	Japan	2018
Resilient Homes Challenges	UK	2018

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3.1 Urban post-disaster housing prototype for New York City, USA

The competition organised by the Federal Emergency Management Agency, Regional Catastrophic Preparedness Grant Program and other local and nationwide agencies. Architecture for Humanity was one of the partners as well (NYC Design Competition, n.d). The brief title questions "W*hat would happen if a catastrophic coastal storm strikes the City?"*. The competition asked to draw innovative solutions for post-disaster provisional housing to shelter thousands of people who could lose their homes. The proposals for temporary shelter should have addressed the requirements for safety, environmental quality, durability, site flexibility and comfortably universal designs that serve dense urban settlements while the reconstruction under in progress. The areas dedicated for design of temporary shelters were two types of plots. One was for a block design in Manhattan area allowing 20 sqm per household, suitable to the urban pattern of the city, and the other was for provisional housing as a trailer park allowing a 400 sqm per household. In September 2007, the competition was launched and in the early February 2008, ten finalists and ten honourable mentions were announced. It was expected to consider mobility-impaired people and respect the community presence since the temporality could extend from one month to five years depending on disaster and recovery circumstances. Adoption of green building criteria along with technical feasibility and cost efficiency with respect to adaptability, disassembly and deconstruction for easy stocking and reuse for potential future disasters were further expectations. 62 of 117 submissions were from the United States. One of the designs was inspired by the hexagonal shape. The proposal dismantled the shape into regular triangles to create volumes with basic equipment ready inside (e.g. bedroom and bathroom). This modularity approach helps to speed up and provides a range of apartment sizes from 41 sqm to 59 sqm and 77 sqm depending on the size of households. The design also drew how fitting the units to truck-transportation and easy to stack and assemble through cranes, the jury marked the lightweight design with built-in components and the flexibility to create urban-like spaces for households (Fig. 4).

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Figure 4: The proposal by C. Laursen and M. Norup Fassov, Denmark (Source: What If New York City – Competition Gallery).

Another design was inspired by the solutions invented for car manufacturing and parking. The design is based on the idea of scissor-hinged extension system up to three-storey with moveable partitions made of manufactured car panels that was defined as 'the best of the fast' by the jury. The system can be stacked side by side and uses existing infrastructure, e.g. parking lots (Fig. 5, Left), sidewalks and highway underpasses (What If New York City, 2008). Another proposal with a similar approach was also awarded with honourable mention. The design utilised the idea of a tent assembly, first the fixation of structural elements and then vesting the skin of tent. The design uses a type of sandwich panels foldable in longitudinal midline to create the possibility of stacking more in less space when not in use and easy and quick assembly in case of an emergency. A modern-looking skin made of two elements, a geometrical framework also foldable and a fabric vesting, which is versatile, durable, flexible and strong polyester film, provides a quality facade and better protection from weather (Fig. 5, Right).
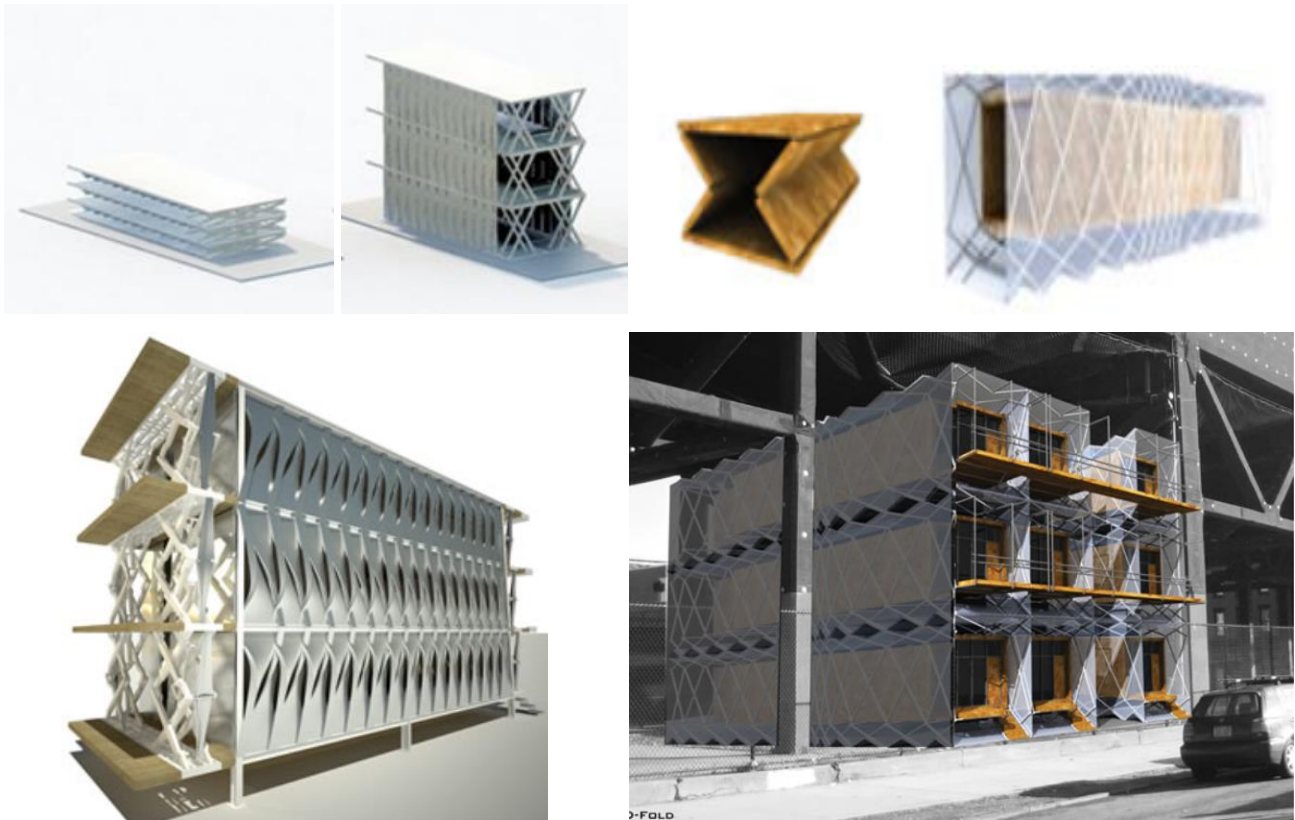
Figure 5: A winner design by O. Ruano and his team (Left); A design received honourable mention by C. Azolas, A. Enfield (Source: What If New York City – Competition Gallery).

Six years after the competition, a prototype was built near the NYC Emergency Management headquarters in Brooklyn. The prototype has two blocks side by side. One block is three storeys, two of which are 3-bedroom units and the other is one-bedroom unit (Fig. 6). The other block is two storeys. A three-storey staircase block serves the access to the upper units while the unit on the ground level is for physically impaired people. The construction was conducted in a parking lot with a size of 12 meters by 30 meters, for practising the complexities of construction work in a dense urban settlement. The topic of high quality, affordable, and buildable residential design as a leading actor of disaster recovery remained a hot topic in USA, as the American Institute of Architects launched a competition in August 2013, yet again in collaboration with Architecture for Humanity. Three areas were particularly selected for the proposals of post-disaster permanent housing solutions; New Orleans in Louisiana, Joplin in Missouri and Queens in New York. One outstanding design per area was awarded by the jury, acknowledging the fact that the awarded designs are not in attempt of resulting 'the right design for everyone'. What three winning designs focused on included less interior partitions, efficient natural ventilation and daylight use, less energy consumption by harvesting solar energy and rainwater

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collection for reuse as means of sustainability, above-ground designs considering the floodplain, modernised local typology and cost efficiency in building (AIA, 2013; Bustler, 2013).

Figure 6: The prototype assembly. Resulting a Request for Proposal, by Garrison Architects in collaboration with Wohl & O'Mara Civil Engineers and Land Surveyors, Plus Group Consulting Engineering, and Anastos Engineering Associates (Source: https://www.garrisonarchitects.com)

3.2 The Rebuild by Design Hurricane Sandy Design Competition, USA

In October 2012, a Category 3 hurricane and a post-tropical cyclone flattened from the Caribbean Islands up the East Coast of the United States. A state of emergency was declared for Connecticut, Washington, Delaware, Maryland, Massachusetts, New York and Rhode Island and the near areas. It caused $70 billion of economic recovery in the countries affected. The Hurricane Sandy is deemed the fourth the most damaging hurricane after the Katrina, Harvey and Irma disasters respectively (CNN, 2017; Amadeo, 2018). In June 2013, the Rebuild by Design (RBD) together with the U.S. Department of Housing and Urban Development (HUD) launched a design competition in order to rebuild the devastated areas making more resilient. The competition required "multi-disciplinary work of architects, planners, designers, engineers and academics to develop innovative solutions to the challenges of post-disaster rebuilding". A year after, in June 2014, the HUD announced ten finalists among more than 140 submissions. The finalist designs were showcased at public exhibitions and the teams presented their proposals to the jury members. Finally, seven designs were announced winners. In total, $930 million was allocated to the projects, all of which are at different stages today towards their completion (Rebuild by Design, 2018; Basalaev-Binder et al., 2018).

"The Big U" (Fig. 7) proposal focused on the area of Lower Manhattan, "home to approximately 220,000 residents and is the core of a $500 billion business sector that influences the world's economy", given the fact that Sandy caused the closure of New York Stock Exchange for two days

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likewise the disaster in March 1888, the Great Blizzard. The design proposes "a 10-mile protective system that encircles Manhattan, protecting the city from floods and storm water while simultaneously providing public realms specific to the needs of the city's diverse communities", which emerged from the world-renowned characteristic approach of Bjarke Ingels, the hedonistic sustainability (Quirk, 2014). In one of his speech, he emphasised the changing role of architects as: "Architects have to become more than designer of two dimensional or three-dimensional architecture objects. We have to become designers of eco-systems of both ecology and economy that channel not only the flow of people, but also the flow of resources like heat, energy, waste and water into some sort of perpetual motion engine, some sort of stop seeing our presence on the planet earth as a sort of detrimental to our ecosystem" (Rosenfield, 2012). In short, as Basulto wrote: "Hedonistic sustainability is what happens when you stop thinking about buildings as structures and start thinking about them as ecosystems" (Basulto, 2011). Accordingly, what The Big U (2014) proposed was more than a flood protection as a defence against the harsh weather events, but more of building physical resilience in benefit of community needs from the approach of building community resilience as the group intensively worked with local NGOs and representatives to develop a model to be built incrementally. The project is under progress in two phases. The first is the East Side Coastal Resiliency (ESCR), and the second is the Lower Manhattan Coastal Resiliency (LMCR) projects (Rebuild by Design, 2018).

Another design in the lead of MIT Center for Advanced Urbanism focused on the areas called The Meadowlands, which were inundated by Hurricane Sandy. The area is critical for the region in terms of providing nearly 150,000 jobs through 14 separate municipalities governing the area. The proposal aims to address the significantly insufficient sewer system that "cannot handle rainwater runoff", as the area is frequently flooded whenever strong rainstorms strike, through "expanding past marshland restoration with a system of berms and marshes" and "enhancements to public transportation, new energy sources and distribution systems, and creating a series of public spaces and recreation zones" that also allocates mixed-use housing facilities. The group defined their design as it would "contribute to a new balance by rebuilding eco-system as water storage landscapes with recreational use. These will add value and create new development opportunities along the edges of the Meadowlands. We will focus efforts on including and defining edge zones between the natural and urban systems". They focused the efforts on the alleviation of coastal flood-prone landscape, the protection of the wetlands, water basins and biodiversity, the connectivity of the Meadowbank to the city and assure sufficient infrastructure and the development of future residential opportunities and further investments that

contribute to the sustainable development of the area (Rebuild by Design, 2018; The New Meadowlands, 2014).

The proposal in the lead of OMA focused on the theme of "comprehensive urban water strategy" for the city of Hoboken, which is "the fourth densest city in the United States and once marshland and a filled-in island". The design combines the water management strategy based upon four integrated components. The first one is Resist and functions hard infrastructure and soft landscape together to act as barriers against high tide and storm surge events. The second one is Delay, which is about forming legislations and urban green infrastructure. The third one is Store, which is to improve green and grey infrastructure considering the efforts of the City of Hoboken's existing Green Infrastructure Strategic Plan. The last one is Discharge. It enhances Hoboken's existing stormwater management system (State of New Jersey, 2018).

Exhaustive analyses enabled a detailed implementation plan to develop in three phases. The first phase included the actions to be taken in the first five years, which suggested running extensive flood risk analyses, forming stormwater management guidelines and drawing zoning recommendations with reference to green infrastructure. The second phase was designed to run from the fifth year to the 20th which focused on the construction of flood defence structures that assure delay and store solutions increasing the storage capacity. The third phase was about the long-term achievements, from the 20th to the 50th year, towards the completion of a resilient New Jersey coastline with a separated rainwater discharge system (OMA, 2014). The remaining seven proposals also thematically focused on specific regions to develop ecological and infrastructural improvement plans with the aim of increasing resilience in the long-term. All the ten projects are undergoing at different stages, mostly improving projects by further analyses, designation of cooperation with stakeholders and laying out implementation plans in consecutive phases. All target starting the construction by the end of 2019, according to the timetable accessible on the page of Rebuild by Design.
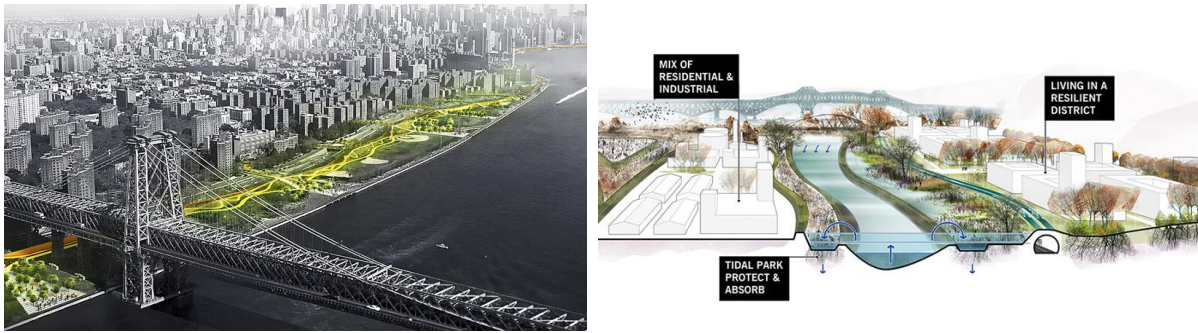
ICCAUA2019 Conference Proceedings, Alanya HEP University, Alanya, Turkey

Figure 7: (Left) ESCR project aims developing not only coastal protection system that reduce the risk but also facilitate access to the waterfront, and create improved public spaces (Source: https://www1.nyc.gov/site/escr/vision/vision.page) (Right) An illustration of the New Meadowbank proposal (Source: https://inhabitat.com/mit-receives-150-million-for-new-meadowlands-plan-to-protect-new-jersey-from-the-next-superstorm/new-meadowlands-mit-cau-zus-urbanisten-6/)

3.3 Post-War Housing Competition, Syria

Matterbetter launched an international ideas competition for new housing concepts for the future of the post-war Syria in February 2016. The war had begun in March 2011. The civil war internally displaced 6.1 million Syrians and 5.6 million have fled abroad. In many of the districts, more than 90% of the buildings destroyed by attacks (BBC, 2018; Rodgers et al., 2018). The competition stresses the future housing crisis when refugees start to come back (when the war ends) where they used to live. They sought for designs that for "people, who spent years in temporary shelters and adapted buildings" and who would need a "solid ground" to begin a new life. Their evaluation criteria included architectural innovation; aesthetics and originality; flexibility of the housing layouts; adaptability for various target groups and reinterpretation of the local building culture; and finally, sustainability, functionality and structural efficiency. In July 2016, they announced the results. There were three winners, seven honourable mentions, and editor's choice award along with top 50 finalists of recognition (Santos, 2016; Rinaldi, 2016).

The winner design proposed a prefabricated concrete system for the new building stock and integrated the local housing typologies (max. two storey buildings with private patio) into their proposal. Among the mentions, one design proposed the use of well-known building tradition -mud- and strengthening the social relation between people in order to build close connection (that could speed social recovery). Another design received mention focused on building on the existing ruined sites by structural steel truss that multipliable units hanged on. Another design proposal also addressed the immediate

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construction need in the existing ruined area, which referred to Phoenix as a metaphor that the new tall building design would raise from the ashes of the demolished surrounding, but also addressed the energy efficiency (Fig. 8). The competition received 245 submissions and as of the winners and honourable mentions, what can be said is that the ideas valued local culture and post-war conditions by integrating different building technologies and materials aimed to offer innovative approaches to housing reconstruction in post-war zones and conflict areas (Santos, 2016; Rinaldi, 2016).
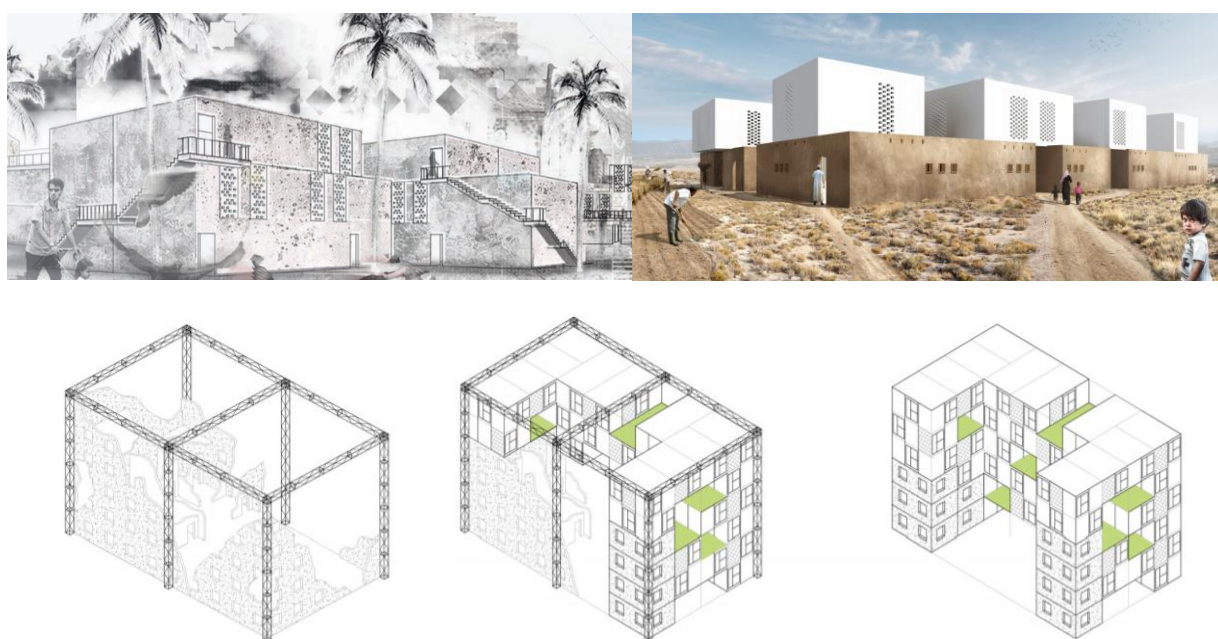
Figure 8: (Top Left) The winning design of the Post-war Syrian Competition (Top Right) A visual graphic of a mention-awarded design (Down) The structural illustration of a mention-awarded design, it proposes rebuilding on rubbles by hanging on steel trusses (Source. Santos, 2016; Rinaldi, 2016).

3.4 Post-War Camp Competition, Iraq

Since the war began in 2014 in Mosul, the attacks caused severe destruction in the city, which left no 'city' indeed (ABC, 2017). This humanity problem was brought into the attention of architects through an international competition by Archstorming in August 2017. The aim of the competition was to seek for ideas "to create an infrastructure that provisionally shelters all the refugees who wish to return to Mosul while their homes are rebuilt, and the city regains its living conditions". Functions sought in designs included offices for family registration and reunification, canteens, storage areas and distribution of humanitarian aid (mattresses, mats, food etc.), basic health and vaccination assistance,

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psychological care area, places for religious worship, spaces designated for leisure time, green areas as well as a massive housing infrastructure which allocate housing units for each family, areas designated for the education of children and adults and also a market place (Archstorming, 2017).

As of December 2017, the winners were announced. There were three winners, people's choice award and 10 honorable mentions. The winner design proposed to cluster families in groups of six in each unit (Figure 9), which would be simply built with sand and gravel, and gather all under a big shell that provides community spaces. What was highlighted in the design was the community-based approach to post-disaster housing reconstruction. In honourable mentions, the titles of the designs included "Temporary Permanence", "Rubble to Resurgence" and "Spiritual Recover" highlighted the length of temporality of post-disaster sheltering and the significance of post-war communal recovery phase and the sense of rebuilding. Another design in this category proposed a "Sprouting City" model, a hybrid organism that evolve from temporary to permanent in time. By that, it prevents people from moving from one place to another. What is temporary becomes permanent in time as the people lead this transition process as they live. Some proposals were symbolic. The design received the people's choice award proposed "the City of the Future", which referred to "a self-empowering and zero-emission city structure" that maximizes the use of wind, sun and energy sources along with large plots of urban agricultural lands. The hand illustration of the design focused on the icon of peace, which guided the proposed city layout as well. Another design proposal among the finalists that took attention of the media used the concept of building Babel Tower (Fig. 10) back as a war monument, when people move into their permanent houses leaving their temporary units.
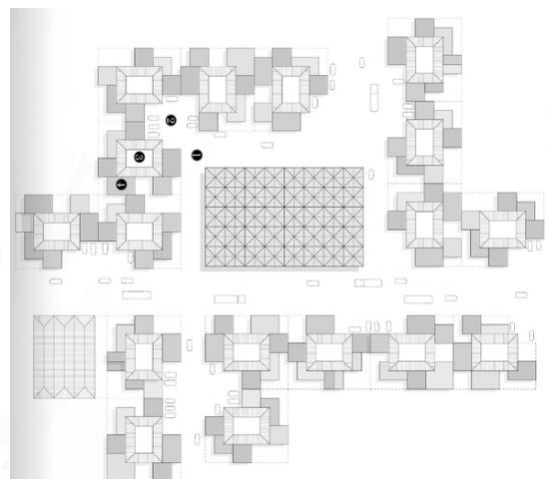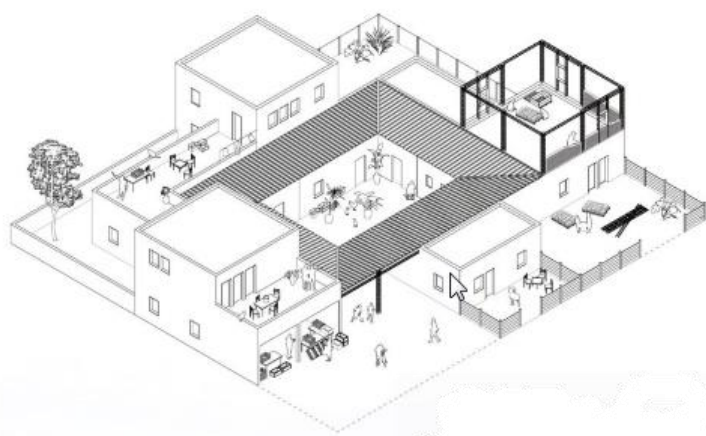

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Figure 9: The winning design by A. Houdet, V. Aguiar, A. Belot and H. Fritsch, which proposes temporary establishments evolve into permanent through added permanent units around to-be built in time (Source. Rinaldi, 2016; Archstorming, 2017).

Figure 10: (Left) The hand-sketch of the 'City of Peace' proposal by S. Erdem (Right) A visual graphic of the proposal 'New Babel Tower' by K. Göktaş, M. Abdellatif, D. Karabacak and M. Dursun (Source: WorldArchitecture, 2017; Erman, 2018).

3.5 Rebuilding Iraq's Liberated Areas: Mosul's Housing, Iraq

The devastation the war caused took attention all over the world. Another open-ideas architectural competition was launched by Rifat Chadriji Prize for Architecture, as a part of Tamayouz Excellence Award in February 2017. The competition stressed the severe shortage of housing stock of the city, and the crisis expected over the return of refugees. The aim focused on the easy replicability and adaptability of housing units in order to address "the objective of increasing the capacity of housing" of Mosul. The jury's evaluation based on considering local challenges, from water and power shortage to waste disposal, spatial pattern of cultural reflection, material and technical buildability, recognition of positive social transformation. Chadirji, in his interview for Tamayouz Award launch in 2016, said: "This prize is important for architects and organisations interested in the built environment as it raises awareness of our role as architects and of our profession in building a civilisation" (Youtube, 2017a). The Award was launched to celebrate the work of Chadirji for Iraq, who was born in 1926 in Baghdad and is considered as "a distinguished 20th century architect and theorist from the Middle East" (Alsammarae, 2017). A member of the judging panel, Angela Brady, the past president of RIBA, said

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in her interview (Youtube, 2017b): "You will always get some wild dreamers, and why not, we are looking for inspiration after all; but we are also looking for something that has got some real practicality and something that relates to Mosul's history, culture and identity". In November 2017, from 223 submissions, three winners, seven honorable mentions, and a sustainability prize and top 20 finalists were announced. The winning design was entitled Re-settlement and proposed refugees to "settle by their own in a very traditional way and designing the house space by the inhabitants according to the various needs of the different family (size, faith, culture)". The jury reported also "This proposal fits in very well with its context; it is not as though they are putting big tall buildings. It is a low-rise dense building. It complements the fabric and the density of the city". The runner up design brings "the sense of informality into the city" according to the jury. "It encourages self-build, but not manufacturing. It is a building approach, not industrial. It brings it to a personal level". The second runner up design proposed, by Belgian architect Vincent Callebautan, an ecological system using the five bridges in Mosul to build affordable and adaptable bridges topped with modular housing units, such as the mythical hanging gardens of Babylon. The housing units would be 3D printed using debris from war ruins and drones would be the hands in construction. The modularity of units was thought in a similar pattern of *muqarnas* ornamentation of Islamic architecture (Narea, 2017; Nelson, 2017; Tamayouz, 2017), in Figure 12. The jury highlighted that "Sometimes a design competition needs to recognise a more imaginative and distant possibility for the future than for the immediate present" (Strelka, 2017) pointing to such extraordinary rebuilding visions. Another honourable mention was awarded to the proposal of a UK firm, which proposed building gabion walls filled with rubbles (Fig. 11) that envisions "for a range of simple and fast self-build construction techniques" (WestonWilliamson, 2017).
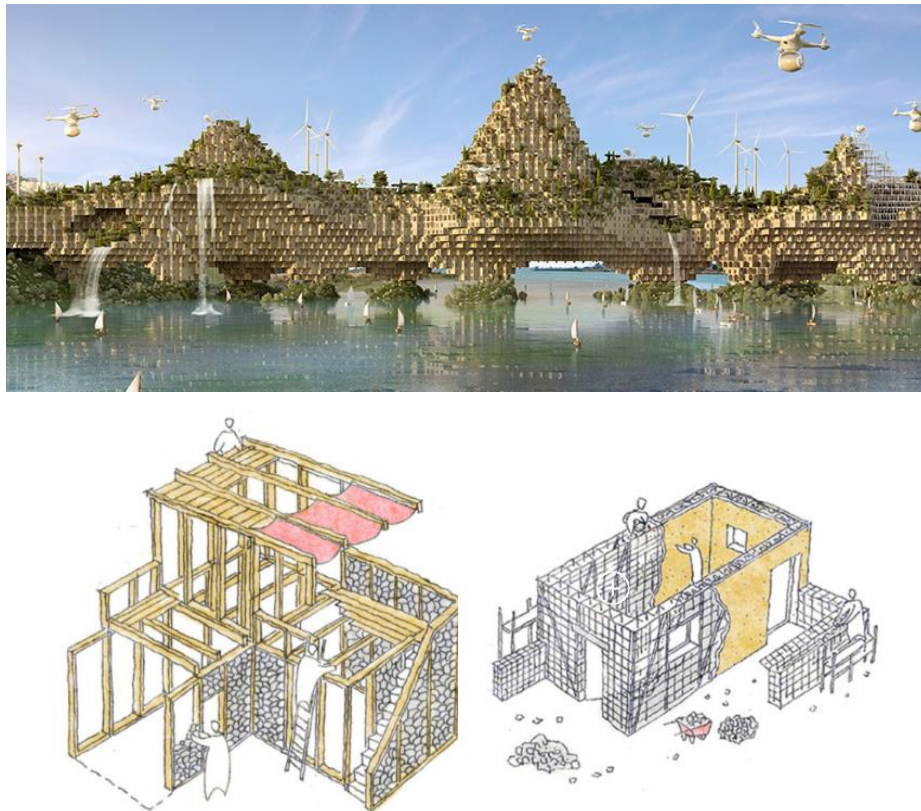
ICCAUA2019 Conference Proceedings, Alanya HEP University, Alanya, Turkey

Figure 11: (Top) A visual graphic of the 3d printed with drones city-bridge, runner-up (Source: Narea, 2017). (Down) The illustration of gabion walls with rubbles (Source: WestonWilliamson, 2017).

3.6 Shelter International Architectural Design Competition, Japan

In May 2018, the Competition was launched by the Home-for-All team. It was founded by Toyo Ito and Sou Fujimoto, after the 9/11 mega-disaster "to build small community centres in the heart of the acres of temporary housing that were built to replace the 250,000 homes that were destroyed" (Soma City Home-For-All, 2017). Rather than focusing on private units, the team builds gathering places to revive the sense of unity "where evacuees could eat and talk together" (The Japan Times, 2013). In the brief of the competition Ito argues the role of architects as he posed the question of "Are not architects simply looking upon society in an abstract way, detaching themselves from reality with a third-person's point of view?" The competition ended on 7th September 2018 and the jury gathered on 8th December 2018. 45 of 186 submissions were from Japan. Five were announced winners and two were awarded 'encouragement prize'. The first prize was given to the proposal 'Roadscape' with a focus on the Shaxi Ancient Town that designed a path connecting various commercial, social and touristic

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activities around. The second winner design focused on building and working together. For example, their illustration in Figure 12 highlighted the making process of roof tiles from excavation to covering.
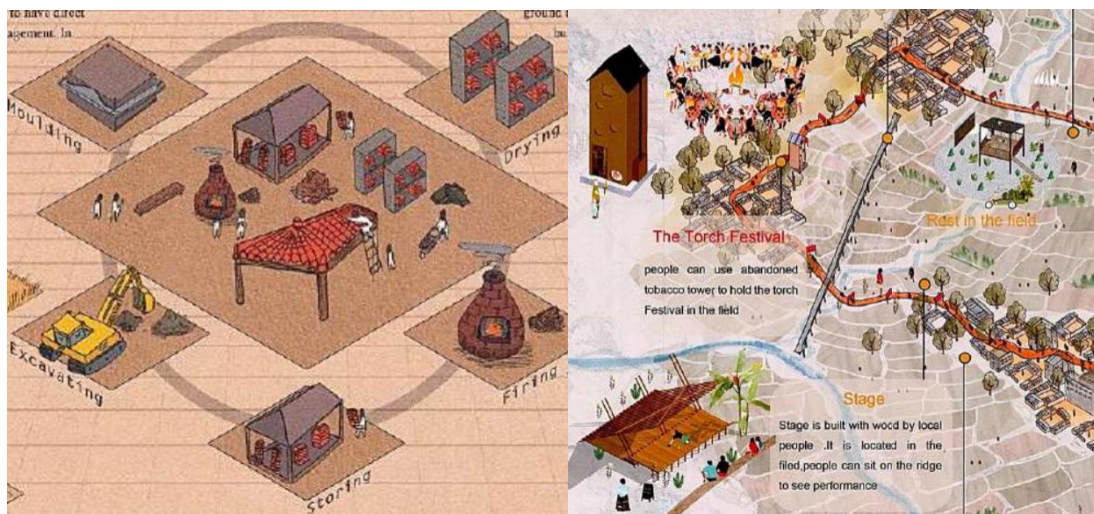

Figure 12: (Left) The second winner design, the illustration of roof-tile work, by W. Muhleisen and L. Patterson; (Right) The social gathering spots on Roadscape proposal by Z. Ma, X. Ye and L. Jianhong (Source: http://www.shelter.jp/compe/2018/eng/result.html).

By Home-for-All team, the first community-home was built in October 2011 in Sendai and six more in Miyagi and Iwate Prefectures. In Soma, with the specific consideration of children between the ages of 0-4, mostly prohibited to play outside due to radiation risk in the area, an indoor play space with an area of 152 sqm was built in 2015 by Toyo Ito and Associates and Klein Dytham Architecture, in Figure 13 (Soma City Home-For-All, 2017). Another specific work was completed for fishermen in Kamaichi, based on the design idea of the Bahrain Pavilion exhibited at the 2010 Venice Biennale. It was a simple wooden structure. In Kamaichi, the design was adapted and built with the aim of providing a warm and a cosy place for fishermen during winter. The community-home built in Rikusentakata had a proper big house concept in response to the requests of the survivors in the area, such as veranda in entrance and a stove inside. It was built through voluntary work and after long deliberation that almost took 10 months to finalise the design and construction. The project received the Golden Lion Award for Best National Participation at the Venice Biennale in August 2012.

Figure 13: (Left) The interior of the indoor play space for children in Soma, in Fukushima Prefecture (Source: Soma City Home-For-All, 2017); (Right) A fishermen's hut in Kamaishi (Source: http://www.home-for-all.org/soma-city-1-1/)

3.7 Shelter **International Architectural Resilient Homes Challenge**

Building Academy opened a competition to submit proposals for modular housing solutions that cost no more than $10 thousands. The competition is organised in collaboration between World Bank Group, Airbnb, GFDRR (Global Faculty for Disaster Reduction and Recovery) and UN-Habitat. Proposals were expected to address the three scenarios of the competition provided: island countries that are exposed to earthquakes and tropical highly hazardous storms (Category 1), mountainous and inland countries that are exposed to severe earthquakes along with landslides (Category 2), and coastal countries that are exposed to strong hurricanes and floods as a result (Category 3). The competition sought for housing solutions in range of 40 to 50 sqm to accommodate four or five people as a family. The evaluation criteria were mainly based on the quality of the design based on the resistance for 25% and design for 20%, the cost effectiveness for %15 and the estimation of construction for 15%, the sustainability for 15% and the clarity of the presentation for % 10. In the end, three winners in each category were announced along with three honorable mentions (BuildingAcademy, 2018). The winning proposal in Category 1 was designed considering Caribbean Islands (by KZ Architecture), which had a bamboo structure elevated above the ground for avoiding floods. The design targeted the benefit from sun exposure through solar panels on roof and a rainwater collection system. A detailed

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estimation of the construction unveiled a budget saving $1900 that could be used for interior furniture and appliances (Fig. 14). Another winning proposal for this category came from an executed project in Haiti in 2013 by CSW Architecture. The project was built as a mixture of timber structural system supported and filled with confined stone walls, which required no reinforced concete unlike the usual applications. The roof was enveloped with corrugated sheets. The final cost of a house was $3 thousands, which was less than one-third of the budget (Fig. 14). For the Category 2, the proposal considered the case of Nepal earthquake in 2015. The design had a modular timber structure enveloped with stone masonry wall with mud mortar. This way, the team Baja Spatial Agency aimed to revive the traditional techniques through safer building instructions in a modular system. The home proposal had two storeys that would save much of $10 thousands by using local materials and skilled labour. The winner of Category 3 entitled the proposal 'Core House', which had a massive design with quite complicated look but resistant to seasonal floods and hurricanes. This proposal also rises above the ground and describes a clear waste management system while considering rainwater collection system, electricity reproduction and natural lighting. Although the proposal appears huge in size, the total cost of building one remains under the budget allowed. The home design is one story with a smaller cantilever floor.
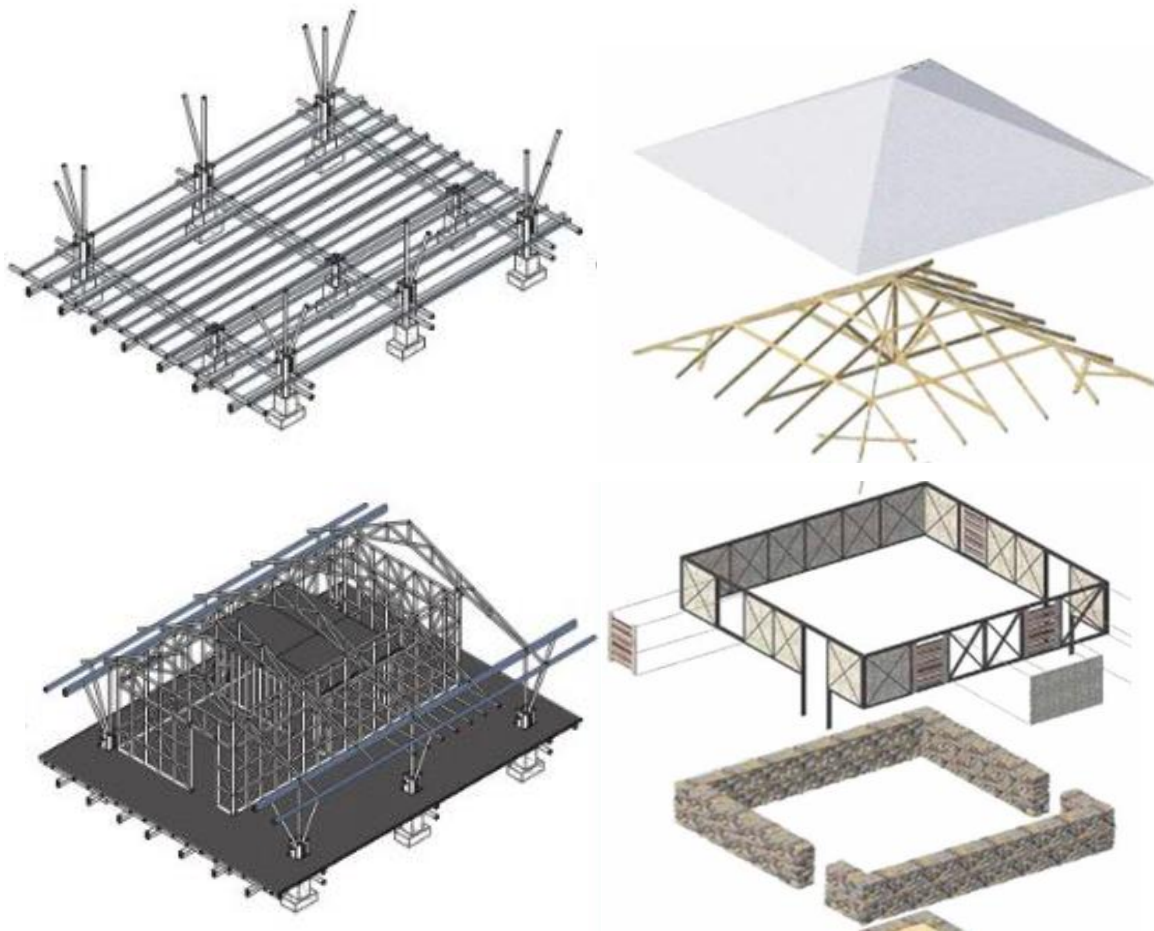
Figure 14: (Left) The structural illustration of the proposal rise above the ground, by J. Ebanks, V. Esteves, A. Johnson, J. Kader, G. Otaola (Source: https://buildacademy.com/project/kzarchitecture/); (Right) The illustration of the project built in Haiti, by S. M. L. Tumbarello, L. Jonard (Source: https://buildacademy.com/project/cswarchitecture/)

4. Conclusion

The review of seven competitions launched in the last decade (2008-2018) made clear that a competition idea emerges from a 'need', unlike ordinary architectural design competitions. For example, the catastrophe Hurricane Sandy and to mitigate future vulnerabilities was the reason behind the competitions that sought for long-term intervention plans through established institutions and architectural companies. Natural disasters are not the only trigger of this competition concept, but also the results of civil wars are behind to look for reconstruction ideas and unconventional visions. Iraq and Syria were the countries specified in this category. While some designs were kindly approaching to the local culture and lies with the reality, some were disputable in sense of catching reality and remain more of symbolic meaning. Some competitions emerged from the experience of the panellists,

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like in the competitions launched from Japan. The aim was not the design of residential units, but rather question the ways of strengthening the communities under a 'shelter'. The competitions launched were either location-specific or disaster-specific. This was because both plays an indicative role in post-disaster sheltering and housing. This became very much clear in the competition launched by the Building Academy, which offered three scenarios to select and join, simply because 'one-does-not-fit-all'. Hence, the categories expected a diverse collection of proposals. Nevertheless, the submissions of all had some common features. The material approach was one of them. Particularly, in local cultures the choose of locally available materials and building techniques, which involve local skilled labour and participation, as Hsieh did, for instance, was highly preferred. In urban areas, the proposals focused more on the speed construction and use of modules in any shape (triangles or rectangular container units). The use of timber as a building material was frequent and enveloping the structure with a layer of fabric or stone wall was preferred as well to protect its deterioration. The proposals also widely considered the issue of sustainability. In smaller scale, designs had waste management, rainwater collection, solar energy use and electricity saving and reproduction. In larger scale, like in the competition of Hurricane Katrina, the water management system was analysed in-depth with buffer zones, considering tides, heavy rainfalls, riverbanks and river floods, and building a healthier ecosystem through the urban area under risk. Most of them were single stage competitions, only the competitions launched from USA were two-staged and targeted to implement. The architectural competitions require a good level of visualisation skills and this is also valid for this kind of competitions. However, it is also expected a clear illustration of the system proposed or information of 'how-to-build' as part of submission. The cost and the transportation or import of materials for construction are among the serious criteria in this kind of competitions that mostly all submissions evaluated by juries touched the issues either slightly or analysed in-depth according to the requirements of the competition. The architectural competitions became popular in the field of post-disaster sheltering and housing. They started to launch frequently for the past decade and took attention both professionals and students, depending on the criteria of competition. This paper reviewed seven of them and laid out winning proposals and other outstanding ones. It is hoped to provide a preliminary guide for beginners who have an interest in design and practice of the humanitarian architecture.

Acknowledgment

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