Alejandro Aravena

Alejandro Aravena has gained international honours and awards for his pioneering work at Elemental. An independent practice with a ‘social conscience’, Elemental seeks to deliver greater equality for urban dwellers and improve the quality of people’s lives. It has formed key partnerships with Universidad Catolica de Chile (Chile’s Catholic University) and the Chilean oil company, COPEC. Here Aravena describes some of the works that have informed Elemental’s strategy: from its first housing project in Iquique in northern Chile to a sustainable masterplan with Arup for the coastal town of Constitución in the wake of the Chilean earthquake.

Elemental is a for-profit company with a social conscience working on projects that capitalise on the city’s capacity to create wealth and provide a short cut to equality by improving quality of life without having to wait for income redistribution. Elemental has operated since 2002, and since 2006 has worked in partnership with Universidad Catolica de Chile (Chile’s Catholic University) and the Chilean oil company, COPEC. This unusual combination of academic excellence, corporate vision and entrepreneurship has been instrumental in enabling Elemental to expand its scope in the city. It is currently engaged in upgrading urban infrastructure, transportation networks, services and housing.

Elemental Housing
When Elemental first took off at Harvard University in 2000, social housing was associated with a dearth of economic and professional resources that meant limited options for poor families. Elemental sought to change this negative association, using professional skills to work with social housing providers. The aim was to generate a technical scenario that would guarantee value gain over time without the need to change existing policies or market conditions.

‘There have been perhaps two major moments in the history of social housing. The first came in 1927, when, in the Weissenhofsiedlung of Stuttgart, the best architects at the time, made built contributions to try to solve the problem of low-cost housing. The second came in 1970, after the PREVI-Lima project (1968–75), when attempts by avant-garde architects to help overcome a housing deficit came to an end. We are planning to write the third chapter of this story by again bringing the best architects to solve that most difficult of architectural issues: extremely low-cost housing that can be a real means to overcoming poverty.’1

Elemental Iquique (2003) was the first project in Chile to apply the company’s design criteria and confirm that the methodology worked. Five years after its construction, there was an overall increase in the value of both houses and neighbourhood. The project, in a city in the North Chilean desert, involved settling 93 families on the site – where they had been squatting for the last 30 years in the heart of Iquique’s downtown – instead of displacing them to the periphery. The budget was US$7,500 per family. The opportunity to develop this site allowed Elemental to test its own developed design criteria for ensuring that each unit appreciated in value so that social housing could become a social investment instead of a social expense. Success was achieved by clearly identifying the restrictions and then working with the families themselves in participative workshops, proving feasibility on a local level. The results? People were able to double the area of their original homes (36 square metres/387.5 square feet) at a cost of only $1,000 each. Today, five years later, any house in the Elemental Iquique project is now valued at over $20,000.
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Scale and Speed

By 2030, the population of the world living in cities will have increased from 3 to 5 billion, with 2 billion of these living below the poverty line. The problem the world needs to solve is to build a 1-million-inhabitant city per week for the next 20 years for $10,000 dollars per family. Elemental is working on a ‘scale and speed strategy’ to share its experience and quality standards with poor communities around the globe.

Scale

Resolving the housing problem of the world’s poor requires action on a massive scale that can only be achieved by worldwide cooperation in the transfer of technology. Elemental is committed to developing projects together with local builders and governments around the world, transmitting its experience through specific projects. For example, the company has worked in partnership with the Make It Right Foundation-New Orleans, the City of São Paulo and the government of Nuevo León, Mexico, to develop projects using Elemental’s design principles. In Mexico, the Housing Institute of Nuevo León commissioned a group of 70 homes on a site of 0.6 hectares (1.48 acres) in a middle-class neighbourhood in Monterrey (2010). This project demonstrates the adaptability of the design criteria abroad, empowering local builders by giving them the knowledge that allows them to take these same innovations and apply them themselves.

Speed

The key to increasing the speed of construction lies in prefabrication. Historically, prefabricated systems have been criticised for their inability to adapt to varied situations. However, if the goal is to prefabricate only half a house, this problem no longer exists. Each owner, when building the second half of his or her house, is responsible for customising the final solution. Moreover, while the first half becomes more strategic (ie, concentrating on the difficult parts of the house), it achieves a more universal application, justifying and confirming the advantages of prefabrication. These concepts were implemented in the Milan Triennale prototype (2008) that can be assembled in 24 hours, successes which then led to the second phase development of the E-block, a second-generation of prefab prototypes that with speed and flexibility can generate housing for whole neighbourhoods where resources are scarce.

Elemental’s Response to the Chilean Earthquake

On 27 February 2010, an earthquake measuring 8.8 on the Richter scale, and resultant tsunami hit Chile, affecting the greater part of the country. Two days after the incident, Elemental began work on three different projects, at varying speeds and scales, to assist the people and cities of Chile.
1st-Day Response

The process of collecting water from a central distribution tank is inefficient for two reasons: water is heavy, making it impossible to carry large quantities at any one time, and containers that can efficiently hold and carry water are not readily available. Under normal circumstances, a family needs between 20 and 25 litres (5.5 gallons) of water daily to meet their basic drinking, cooking and washing needs. Obviously, these simple tasks will require much more time if water has to be collected several times rather than once.

Referencing methods of transporting water in Africa, Elemental proposed rolling water instead of carrying it. Rolling water is a more efficient means of transporting this necessity. The process, which is so easy that even a child can do it, consists of: 1) filling plastic bottles with water; 2) packing the bottles tightly inside a tyre; 3) lifting the tyre into an upright position; and 4) rolling the tyre alongside you.

10th-Day Response

Each 32-square-metre (344.4-square-foot) Elemental emergency housing unit was designed to utilise natural light and cross-ventilation and to be assembled within 48 hours by a team of three people. Made from 14 structurally insulated panels (SIPs) that can later be reused for constructing permanent accommodation, it is possible to build 50 units daily. The goal was to buy time so that the quality of reconstruction was of a higher standard; otherwise the urgency and pressure to provide solutions would compromise the end result.

100th-Day Response

The municipality and government of Constitución contacted Elemental inviting the company to join a team of Chilean organisations and the international engineering firm ARUP to work on PRES, a masterplan for the sustainable reconstruction of this coastal city. About 80 per cent of the city was destroyed by the earthquake and resultant tsunami; the team had 90 days to completely redesign the city including its infrastructure, energy distribution systems, waste management, housing, public spaces and facilities.

One part of the masterplan consisted of a 7-kilometre (4.3-mile) long park to be situated along the river and coastal edge of the city. Not only does this provide much-needed green space, but a heavily wooded area serves to mitigate the effects of future tsunamis, with a modeled potential reduction in the force of the water of up to 41 per cent and of its height by up to 28 per cent. PRES also plans for increased density at the city centre while transforming certain streets into pedestrian walkways. In addition to the reconstruction of keynote public buildings, different housing typologies were designed to take account of variables such as surface area and to allow for the possibility of expansion. And with reconstruction came the opportunity to capture the city’s renewable energy potential. Photovoltaic lights were incorporated into the new pedestrian walkways and, rather than electricity, solar
panels are used to heat water for homes. Also, the residual heat produced by the cellulose plant near the city centre would be harnessed to heat public buildings and facilities.

**Citizen Participation**

Implementing PRES involved meshing the know-how and experience of professionals and local authorities with the views and aspirations of the citizens. Utilising the design of Elemental’s emergency housing unit, a town hall was built in the city centre that housed various forums and discussion groups on the city’s development. During the 90 days within which the redesign of the city had to be completed, the town hall received 6,300 visitors, more than 1,200 ideas were deposited in its mailbox, and 4,230 votes were counted in community polls. It was an unprecedented level of participation that allowed the vision and priorities of the city’s citizens to be incorporated within the final proposal.

Chile has a history of destructive earthquakes, but each one has left behind a legacy of improved construction standards. In part due to the latest disaster, Elemental believes it is now necessary to design coastal cities with an inherent ability to withstand tsunamis, and to consider seismic isolation for basic services and utilities serving all cities.

One last point. Under normal circumstances, Chilean (and other Latin American) cities do not grow at the same rate as per capita income. Which is why the process of reconstruction with its emphasis on public space within the city’s natural and geographic setting is an opportunity to improve upon the city’s potential for growth.

**Note**