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# A Room for Archaeologists and Kids

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*Keywords*

– territory, archaeology, design-build, survey, community.

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*Beginning in June 2018, some forty-five students from Zurich and Lima led by Guillaume Othenin-Girard (ETH Zurich) and Vincent Juillerat (PUCP) worked together to produce a structure in the heart of the archaeological landscape of Pachacamac, Peru. The project was the culmination of a half-year collaboration between Studio Tom Emerson of D-ARCH, ETH Zurich and Taller 5 of the Facultad de Arquitectura y Urbanismo, PUCP Lima, at the invitation of Denise Pozzi-Escot, the director of the Museum of Pachacamac.*

*In this new structure, archaeologists make their first examination of artefacts emerging from the digs, shaded from the punishing Andean sun and in view of passing visitors and school children, who in turn, perform their own exploration in the sandpits across the courtyard. At each end, new finds are stored in rooms enclosed by woven cane walls before being transferred to the museum for permanent conservation. The structure was collaboratively designed and*

*constructed by the students in three weeks in June and July, following a joint research project over several months that produced a new topological survey of the territory: the Pachacamac Atlas.*

*The reality of a landscape changes according to the perceptions of time and memory that underlie it. The visual essay that follows is an attempt to recall the intuitive relationships and invisible links arising from the superimposition of the Atlas onto the processes of design and construction. The collective knowledge gathered over the course of the territorial survey draws an understanding of the place which is larger than the ancient sanctuary per se – unveiling ways of making and the material flows between humankind and the environment on various scales. This methodology of survey drawing reveals the inherent capacity of the architecture student to think both as a maker and a territorial agent, thus triggering an awareness of the designer's social and environmental responsibilities within the design and construction process.*



fig. 1 A Room for Archaeologists and Kids with  
the Pachacamac Islands.  
Photographed by Philip Shelley.

fig. 2 [next page]  
Pachacamac Sanctuary, Atlas drawing.  
Drawn by Géraldine Recker.





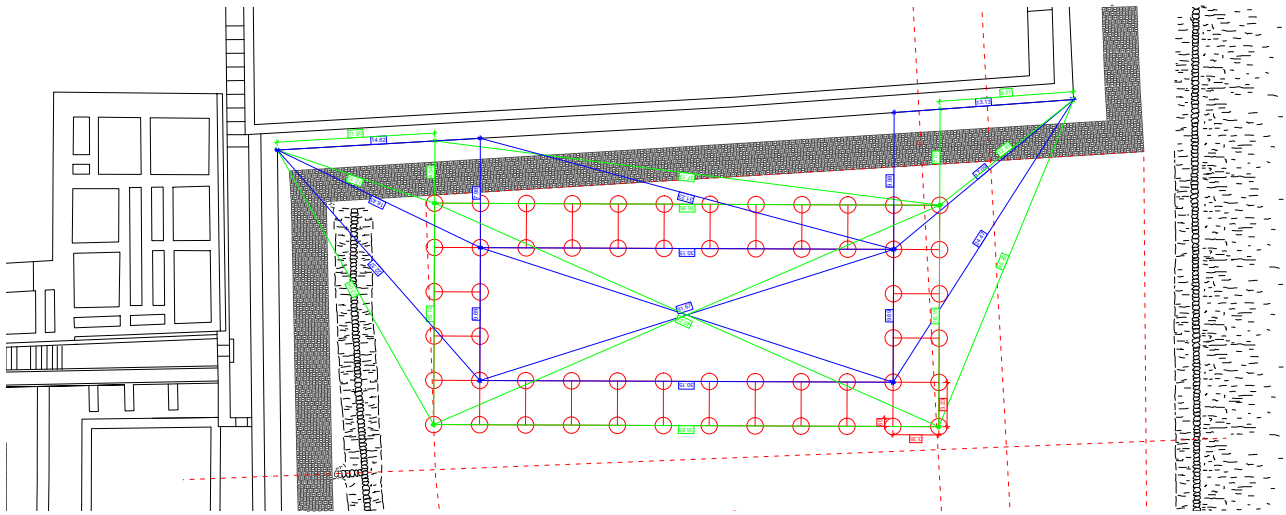


fig. 3 [previous page]  
 Hoisting the first roof module.  
 Photographed by Philip Shelley.

fig. 4 Triangulation plan to define base points,  
 Working drawing.  
 Drawn by Studio Tom Emerson.

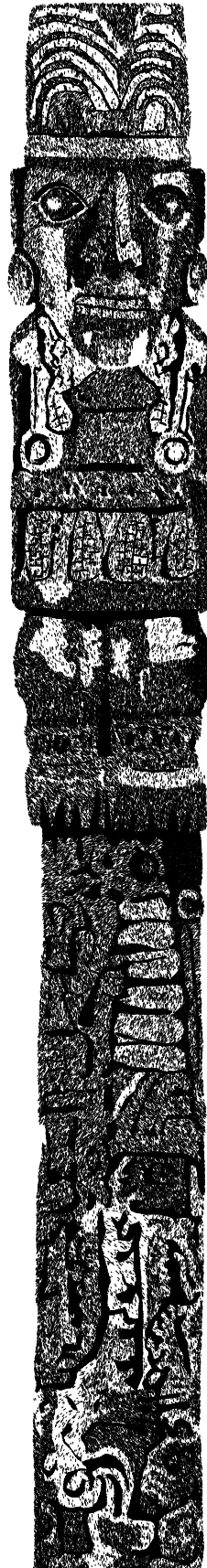


fig. 5 Pachacamac Idol, Atlas drawing.  
Drawn by Severin Jann.

fig. 6 [next page]  
Pilgrimage plateau, pre-colonial  
reconstruction 1533, Atlas drawing.  
Drawn by Ellen Reinhard.



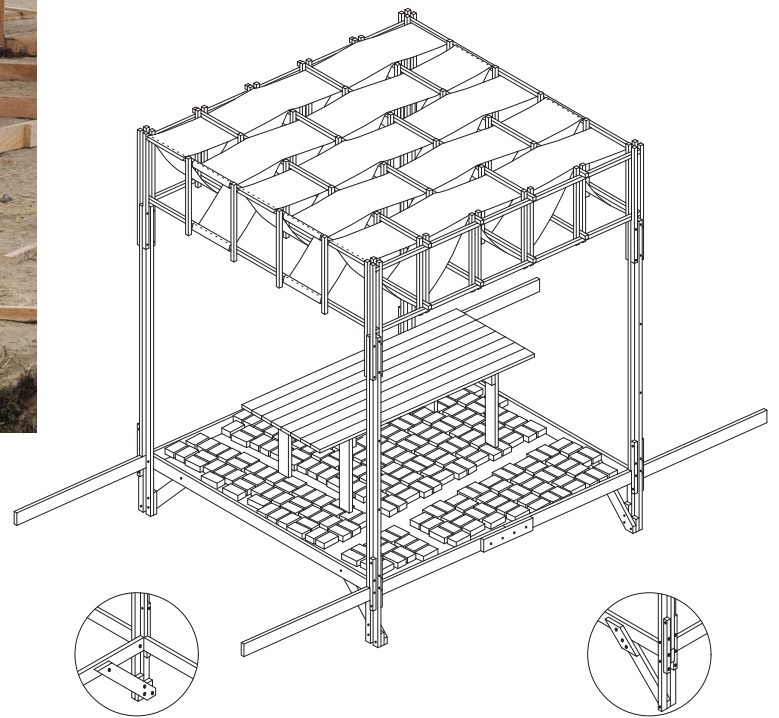
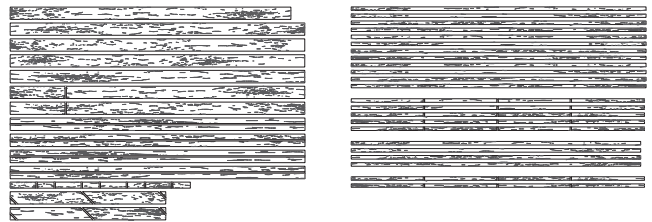


fig. 7 Structural system described as an 'upside-down' table.  
 Photographed by Philip Shelley.

fig. 8 Archaeologist single unit module.  
 Drawn by Studio Tom Emerson.





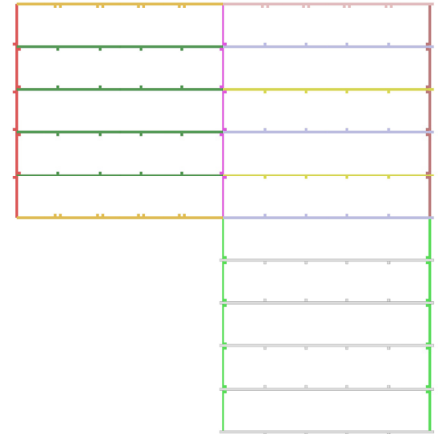
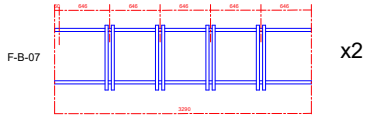
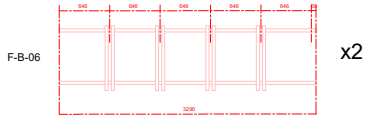
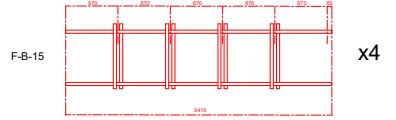
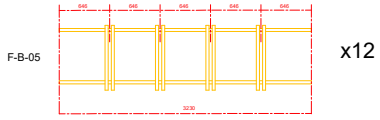
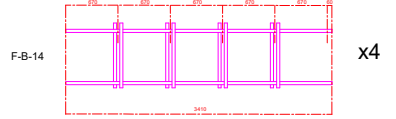
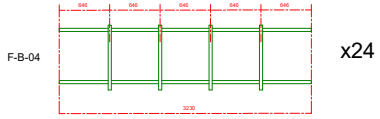
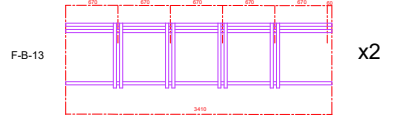
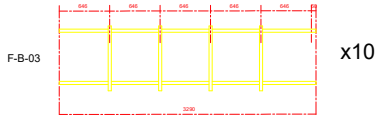
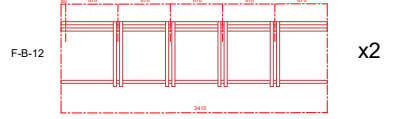
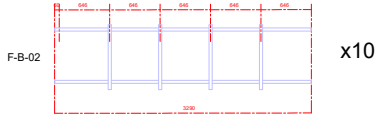
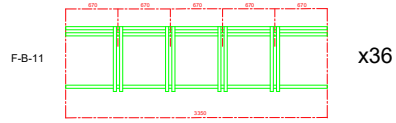
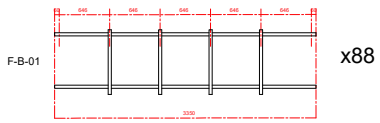


fig. 9 Roof trusses, Working drawing.  
Drawn by Studio Tom Emerson.

fig. 10 Corner roof modules, Working drawing.  
Drawn by Studio Tom Emerson.

fig. 11 Cement and oil industry, Atlas drawing.  
Drawn by Shen He.

fig. 12 [next page]  
Woven canopy embedded within  
the Acllawasi.  
Photographed by Géraldine Recker.





fig. 13 Acllawasi, Atlas drawing.  
Drawn by Stefan Liniger.

fig. 14 [next page]  
Adobe brick erosion.  
Photographed by Géraldine Recker.

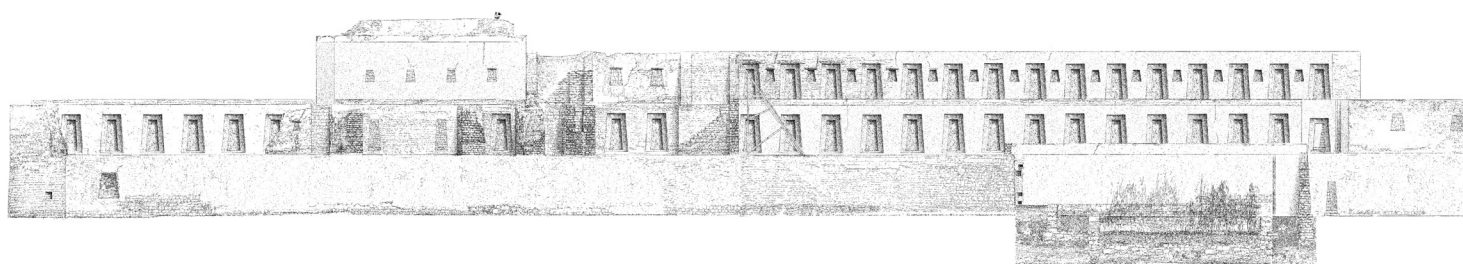






fig. 15 Woven canopy and bamboo cane panel.  
Photographed by Philip Shelley.

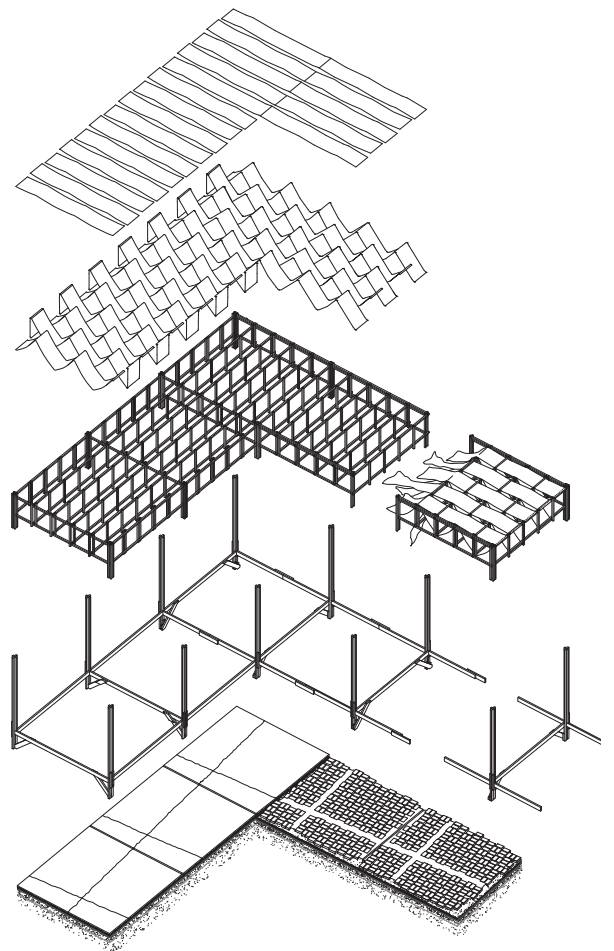
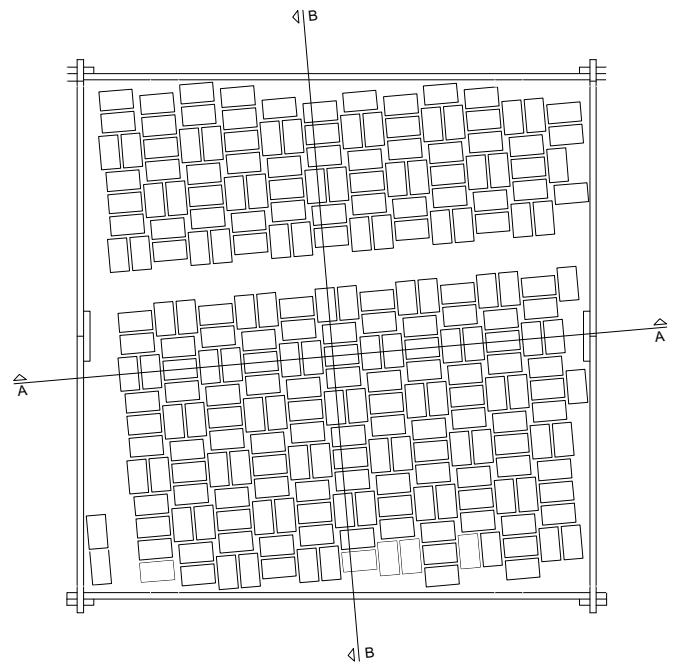


fig. 16 Structural and assembly principle.  
Drawn by Studio Tom Emerson.



fig. 17 Laying the adobe ground.  
 Photographed by Philip Shelley.

fig. 18 Adobe ground module, Working drawing.  
 Drawn by Studio Tom Emerson.



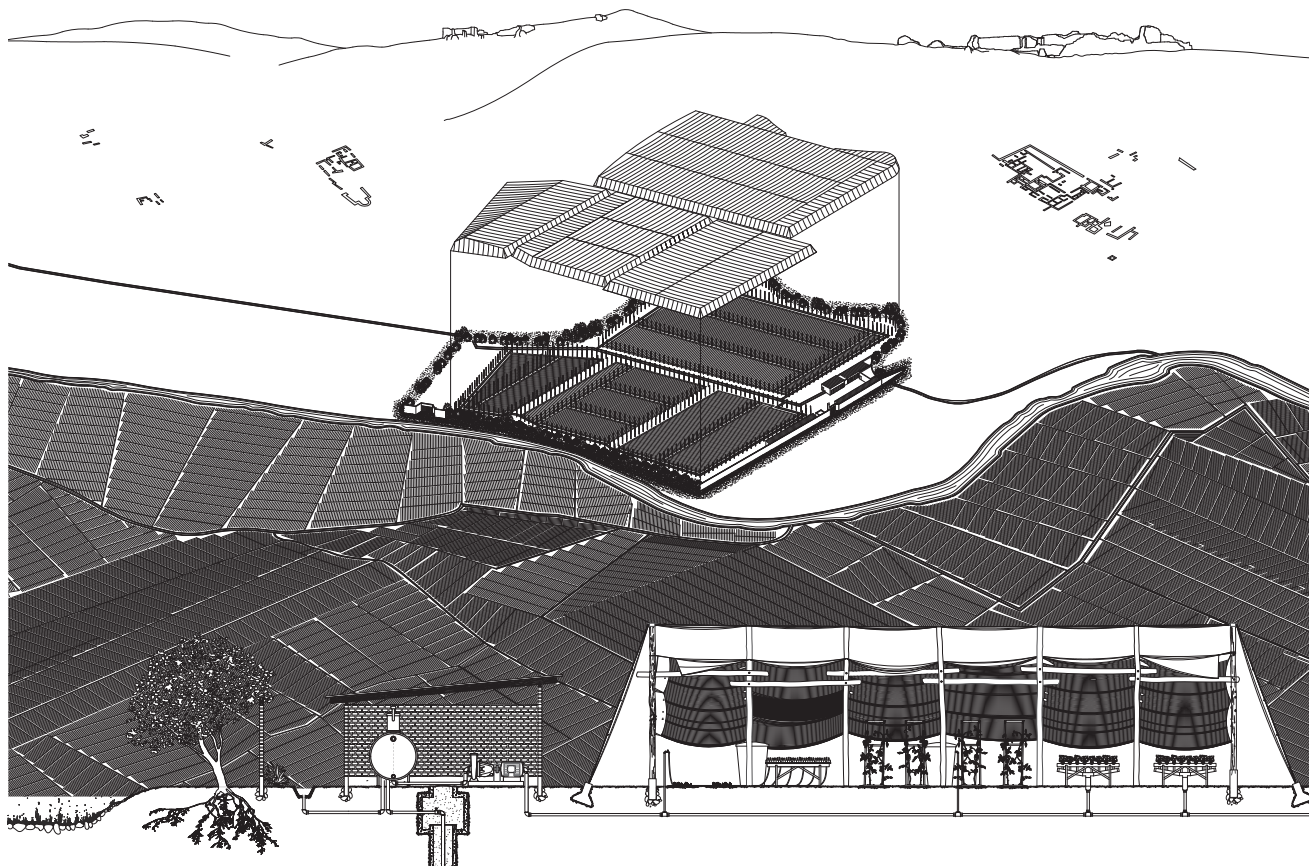


fig. 19 Lurín valley irrigation systems and hydroponic greenhouses, Atlas drawing.  
 Drawn by Lucio Crignola.

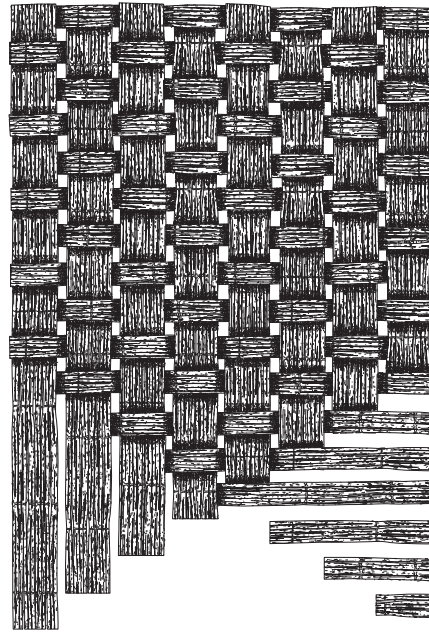
fig. 20 [next page, top left]  
 Esteras panels.  
 Photographed by Juliette Martin  
 & Gabriel Fiette.

fig. 21 [next page, top right]  
 Esteras weaving principle, Atlas drawing.  
 Drawn by Juliette Martin & Gabriel Fiette.

fig. 22 [next page, bottom left]  
 Ichma decorated cotton fibre cloth.  
 Technique: discontinuous warps.  
 Origin Pachacamac.

fig. 23 [next page, bottom right]  
 Complimentary-weft weave, Atlas drawing.  
 Drawn by Juliette Martin & Gabriel Fiette.





A black and white line drawing of a traditional loom. The loom is made of four vertical posts and two horizontal beams. A piece of woven fabric with a geometric pattern is shown on the loom. The drawing illustrates the structure of the loom and the way the fabric is woven.



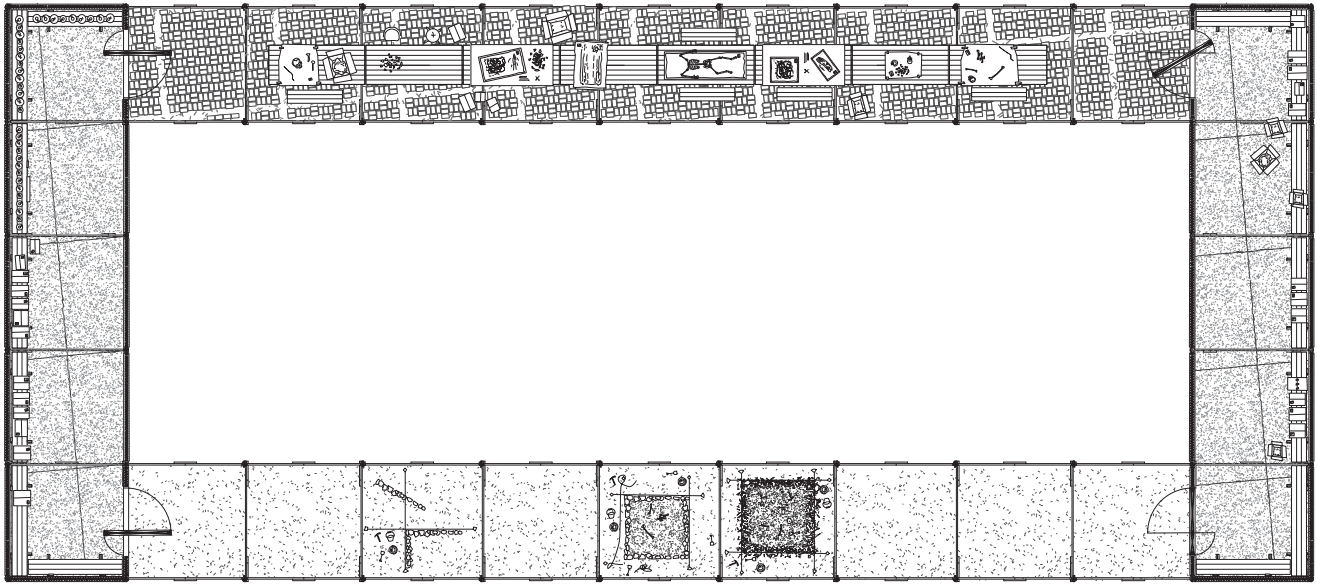


fig. 24 [previous page]  
Inner courtyard facing the Acllawasi.  
Photographed by Philip Shelley.

fig. 25 Floor plan occupation.  
Drawn by Studio Tom Emerson.

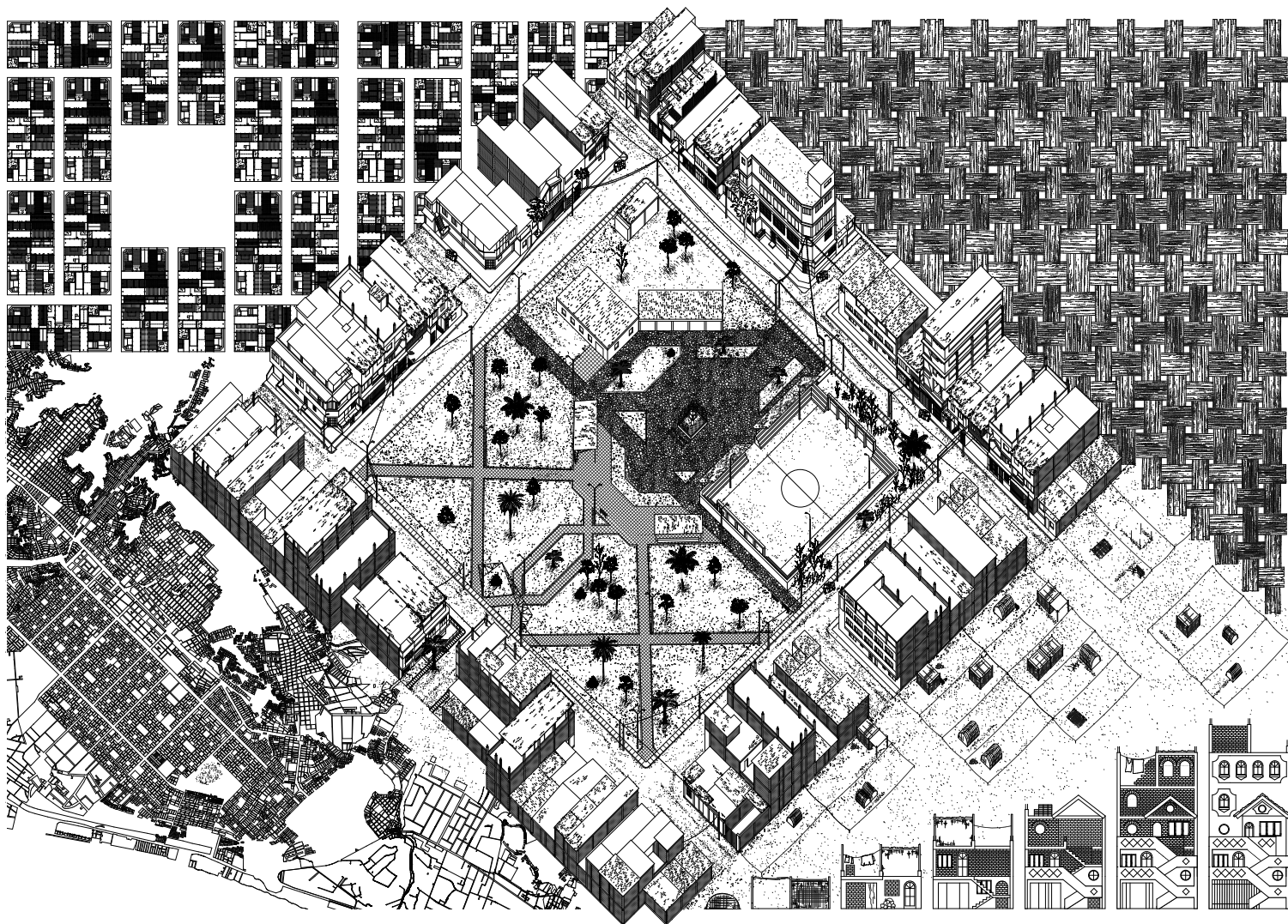


fig. 26 Barriada typology, Villa San Salvador,  
Atlas drawing.  
Drawn by Sara Lazarevic.

### **The Territory: Pachacamac**

The sanctuary of Pachacamac is a most extraordinary constructed landscape: the site was first settled around 200 AD and flourished for thirteen hundred years, becoming one of the biggest and most important of such city-complexes in what is today Peru, extending over roughly six hundred hectares of land. The site is host to numerous overlapping layers of civilisation. Its final role in the pre-Columbian era was as an important node of the Incan *Qhapaq Nan* network of trails that stretched over half the length of the continent, weaving the Pacific coastline with the Andes.

Though now situated on the southern edge of the metropolitan region of Lima, it was once an isolated citadel: a strategic point located where the Lurín River meets the ocean, from which the entire surrounding territory could be controlled; its powerful underlying hill topography was extended upwards with adobe and stone temples and palaces to form what must have been an unbelievably impressive place – the largest hill later becoming the Temple of the Sun in the Incan era. It is no coincidence therefore, that for the Ichma civilisation (later subsumed into the Incan Empire), this site was the centre of the world; indeed it is named after their principal god: *Pacha Kamaq*, whose name in Quechua literally means *Creator of the Universe* – a figure whose powers included the ability to animate the world and to predict the future. The mythology of Pacha Kamaq is embedded in this landscape and the nearby islands, and is still kept alive today.

Following the cataclysmic effects of colonisation (1533 onwards), the sanctuary of Pachacamac fell into ruin. In the centuries that followed, it was slowly enveloped by the drifting sands of the desert. Active investigations of the site only properly began in the twentieth century, led by Julio C. Tello (1880–1947), a pivotal figure in the development of Peruvian archaeology, and today much of the story of Pachacamac remains to be unearthed.

### **Pachacamac Today**

Today, Pachacamac is one of the most visited archaeological sites in Peru. The sanctuary is managed by the Ministry of Culture through the Museum of Pachacamac, an institution that both manages the site as an educational/cultural experience for visitors and as an archaeological site in progress. In 2015 a new complex of buildings by Llosa Cortegana Arquitectos was completed to house the museum and its ongoing archaeological work.

The northern two thirds of the site are still yet to be excavated; it remains open land awaiting future studies. But the monumental area of the sanctuary is a significant archaeological site with active excavations and ongoing discoveries of artefacts and architectural remains. With the construction of the National Museum of Archaeology (MUNA) underway on an adjacent site, the government aims to restore this territory to its

former grandeur by transforming it into a new centrality, embedded within the urban-fabric of Lima.

Yet Pachacamac is currently perceived as a void, a patch of open desert inhabited by ruins, caught between the baffling growth of the capital and the mouth of the Lurín River, the last remaining agricultural valley of the region. Its edges are constantly under threat of encroachment by informal settlements and land invasions, the latest of which took place as recently as eight years ago.

Given its proximity to Lima and the inevitable encroachment of the city into the territory, we were compelled to ask how a culture can live with ruins; to comprehend what they represent without being suffocated by their monumental presence.

### **Territorial Survey: the Atlas**

The first phase of the project involved a new territorial survey of the site and its surrounding landscape, drawing on a methodology which Studio Tom Emerson has refined over the past decade. Through carefully made drawings and photographs, each presented in A2 format, the *Pachacamac Atlas* sought not only to represent the archaeological structures of the site (which are already well documented), but also the contemporary reality of the wider landscape – of coastline, industry, housing, agriculture, leisure, building culture, ecology and infrastructure – hence, the overall title of the project: *The Archaeology of the Territory*.

Such a survey of this unique landscape had never been made before, and revealed a new understanding of the place that enfolded its history within its contemporary condition. Together, the survey and structure that form the two parts of the overall project offer a new territorial vision for Pachacamac – both in terms of projecting it forward into the future, but also in perceiving more clearly what was already there.

### **A Living Archaeology – the Purpose of the Structure**

Even for Julio C. Tello, archaeological investigation in Peru wasn't solely motivated by historical discovery; it was also about engaging Peruvians with their own history, renewing a sense of pride in their indigenous roots and giving them a vision for the future.

Pachacamac's archaeological wealth represents significant cultural and historical value, yet this meaning has to be continually renewed in relation to contemporary society. In the words of Denise Pozzi-Escot, the director of the Museum of Pachacamac, 'archaeology here can only survive in the community, not in the ground.' As such, the museum is active in its engagement with the local community. The design and build project was intended to help the museum develop its existing outreach programme, providing a space within the landscape where educational and community events can take place, helping increase engagement with the people that live nearby and those in the wider region.

Reflecting the spirit of this outreach programme, the project was called A Room for Archaeologists and Kids.

It primarily serves as a place for gathering; a sheltered space to host the programme of events and workshops led by the archaeologists at the museum. Conceived as an extension of the museum within the sanctuary itself, the new structure had to create a space that was well lit and ventilated, and which in time could act as a form of *Schaulager* that the archaeologists and their workers could use to sort, analyse and display excavated material before it is taken to conservation laboratories inside the museum.

In order to restore the balance between the urban, the natural, and the cultural heritage in the city of Lima, the museum recognises that the focus of conservation must shift from the mere preservation of physical archaeological sites, which have lost their meaning and value for the inhabitants, towards revealing and making legible the ancient knowledge embedded in their built heritage and their relation to the territory.

### **The Site: Beside the Acllawasi**

Located on the western side of the sanctuary of Pachacamac, not far from the Museum of Pachacamac itself, the site chosen by the museum for the structure was on a clearly defined square piece of land beside the Acllawasi, a complex of courtyard buildings that were largely reconstructed by the archaeological efforts in the early twentieth century. It is bounded on two sides by the perimeter walls of the Acllawasi and by a nature reserve on the other two. A small ditch bounds the site on three sides, and between the walls and the site lies a stone path that is part of the main visitor route leading out from the museum.

### **Description of the Structure**

The *Room for Archaeologists and Kids* is a timber structure 37 m × 16.3 m and 3.6 m tall, which forms a covered arcade around a courtyard. The structure is made from twenty-eight square fields of 10 m<sup>2</sup>, defined by a column in each corner, and with a lattice-work roof above. The five fields at each short end are enclosed by vertically set, woven bamboo panels, with a concrete floor to provide a robust surface. These rooms contain wooden shelving that offers space for storage and exhibiting archaeological finds, as well as wooden tables that can be brought outside when required.

The revolving doors are made of timber frames filled with bamboo cane elements, laid horizontally and woven around vertical pieces. The doors rest on wooden blocks and can be locked from the outside to keep the interiors secure.

Outside, along the side nearest to the walls of the Acllawasi, adobe blocks aligned to the walls, and marking an underground channel, form a robust surface for events, where wooden tables can be placed.

On the other side, the arcade is filled with earth to provide a space where archaeological digs can be replicated by visiting school children.

The geometry of the central patios of the Acllawasi informs the orientation of the new courtyard structure, creating an oblique relationship with the stone walls that surround it on two sides.

The columns and foundations were prefabricated and assembled on site. Fields of roof-lattices were individually prefabricated and raised using hoists on moveable temporary works. The joints were made either with stainless-steel bolts (primary joints) or nickel-plated screws (secondary joints).

Lengths of white, polyester, open-weave textile commonly used in agricultural greenhouses nearby were woven in between the upper and lower planes of the latticework, and fixed with staples. The woven canopy provides two or three layers of shade, whilst retaining certain moments of views of the landscape beyond and the sky.

### **A Collaborative Design and Build Process**

In our view of architecture, constraints are necessary prerequisites that serve as the drivers of design rather than being limitations that diminish it. When the team assembled in June, some major parameters for the project had already been established: the site had been chosen, and the quantity and dimensions of the timber available had been determined. Perhaps most importantly, the structure was to be designed and built within three weeks.

The project began with an intensive design workshop, where the students worked in teams of three over two days. Each team developed ideas that dealt with the structure as a whole and how it would relate to the site, as well as structural and spatial ideas as to how the design could work and how it could be made. The result was fifteen projects that were presented and discussed as a group. The challenge was how to integrate the best ideas, discoveries and insights produced by the fifteen teams into a single project.

Over the following week, the team formed smaller groups, dividing tasks and responsibilities to begin developing the design for the structure that could be described as an ‘upside-down table’; a rigid assembly of beams and columns anchored in the ground, supporting fields of lattice-work. In short: the roof was to do little more than support its own weight and stay rigid.

### **Choice of Materials**

The principal material of the structure is wood, specifically, sections of kiln-dried Tornillo (*cedrelinga cateniformis*), a tropical hardwood found in the rainforest in Peru and elsewhere in the Amazonian basin. Tornillo is a wood with extraordinary properties: very dense (555 kg/m<sup>3</sup>) yet paradoxically extremely flexible. It is recognised as a general-purpose



construction wood in South America, especially because it is naturally resistant to fungus and humidity, requiring no chemical treatment. In the persistently humid climate of the Peruvian coast, less resistant timber would begin to rot within months.

All material except for the timber was drawn from the everyday palette of building materials in Peru. Cane, cut and woven in the form of prefabricated *esteras* (ultimately not used), or woven by us into panels; adobe bricks for the floors, with compacted earth joints; and synthetic open-weave textiles, widely used for making shade, for the canopy.

## Inventory

### *Materials*

- adobe bricks 20×40 cm
- bolts & nuts
- caña (bamboo cane)
- esteras cascara (3×2 m)
- concrete (pre-mixed)
- nails
- screws & tips
- textile (roll of 4×100 m)
- 1000 pieces of 4×4×335 cm (Tornillo cedrelinga catenaeformis, 450 kg/m<sup>3</sup>)
- 500 pieces of 4×13.5×335 cm (Tornillo cedrelinga catenaeformis, 450 kg/m<sup>3</sup>)

### *Tools*

- 5 carpenter's squares
- 10 clamps
- 6 chisels
- 3 extensions 50 m
- 1 generator 10 kw
- 1 grinder
- 1 jigsaw
- 15 hammers
- 20 hand drills
- 15 hand saws
- 7 harnesses
- 40 helmets
- 1 laser
- 2 mitre saw
- 40 pairs of gloves
- 5 power strips & adapters
- 1 ratchet
- 1 sanding machine
- 2 scaffolding 6 m high
- 3 shovels & pickaxes
- 1 soccer ball
- 1 straight edge 2 m
- 10 tape measures
- 2 toolboxes
- masking tape
- strings

## Project Credits

### *Students, ETH Zurich*

- Turi Colque, Lucio Crignola, Gabriel Fiette, Shen He, Severin Jann, Jens Knöpfel, Tamino Kuny, Sara Lazarevic, Stefan Liniger, Juliette Martin, David Moser, Géraldine Recker, Ellen Reinhard, Sara Sherif.

### *Team Studio Tom Emerson, ETH Zurich*

- Prof. Tom Emerson, Guillaume Othenin-Girard, Philip Shelley.

### *Students, PUCP Lima*

- Keicko Aliaga, Gianmario Alva, Maria Andia, Ximena Arevalo, Valeria Armijo, Andrea Avendaño, Sebastian Blas, Daniela Cahuana, Martin Cevallos, Luis Miguel Enriquez, Diana Farje, Rosa Grados, Paola Medina, Arturo Meza, Andrea Montani, Nicolle Murrugarra, Valeria Namuche, Brigith Nuñez, Sebastian Ortiz de Zevallos, Milagros Ramos, Erika Ramos, Anahy Rimachi, Diego Rojas, Brenda Salcedo, Andrea Tezen, Angie Tipe, Carla Zegarra.

### *Team Taller 5, PUCP Lima*

- Vincent Juillerat, Renato Manrique.

### *Museum of Pachacamac Team*

- Director Dr. Denise Pozzi-Escot, Rommel Ángeles, Janet Oshiro Rivero, Carmen Rosa Uceda Brignole, Rocio Villar Astigueta.

### *Engineering*

- Andrea Biancardi, Chair of Structural Design, D-ARCH, ETH Zurich.

### *Timber Construction Experts*

- Jonatan Egli, Francisco Otero Berta.