

# BUILDING BONDS, BUILDING SAFETY

## A BAMBOO PAVILION FOSTERING COMMUNITIES OF CARE

LOOKING FOR A BLUEPRINT FOR CO-CREATION, SUSTAINABILITY, AND EMPOWERMENT



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AY. 2023/2024  
TU Delft

TOPIC AND ITS RELEVANCE

PROTESTS ON MARCH 8 - THE INTERNATIONAL WOMEN'S DAY



International Women's Day, Chile on March 8, 2023. source: Ociel Moya Plaza, Diario Chile.



International Women's Day, Mexico on March 8, 2020. source: Raquel Cunha, Reuters.



International Women's Day, Uruguay on March 8, 2022. source: Nairí Aharonián y Liroy Rodríguez – UCUR.

# WOMEN'S FIGHT FOR THE ELIMINATION OF VIOLENCE IN LATIN AMERICA

PROTESTS ON NOVEMBER 25 - THE INTERNATIONAL DAY FOR THE ELIMINATION OF VIOLENCE AGAINST WOMEN



International Day for the Elimination of Violence against Women, Argentina on November 25, 2019. source: Qué digital.



International Day for the Elimination of Violence against Women, Ecuador on November 25, 2023. source: Cristina Vega Rhor, Ecuavisa.



International Day for the Elimination of Violence against Women, Colombia on November 25, 2023. source: Somos Un Rostro Colectivo.

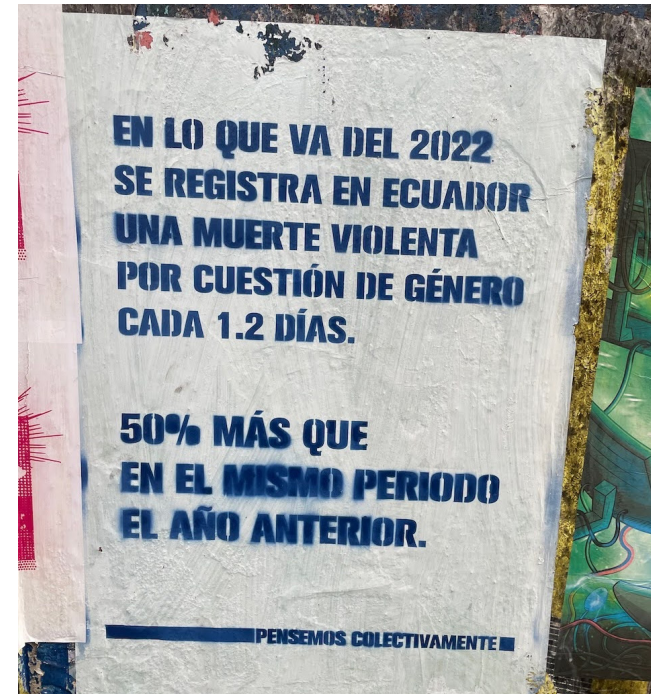
FIELDWORK: SIGNS OF THE STRUGGLE AGAINST VIOLENCE IN PUBLIC SPACES



Graffiti: "No is no!", "Freedom", "Not one more".



Painting: "#No one less"



Poster "So far in 2022, a violent gender-based killing is registered in Ecuador every 1.2 days. 50% more than in the same period last year."



Banner: "This body is mine, it is not to be touched, not to be raped, not to be killed, #Ecuadorians (of all genders) against violence."



Poster: "Alive".



Card: "#No more domestic violence"

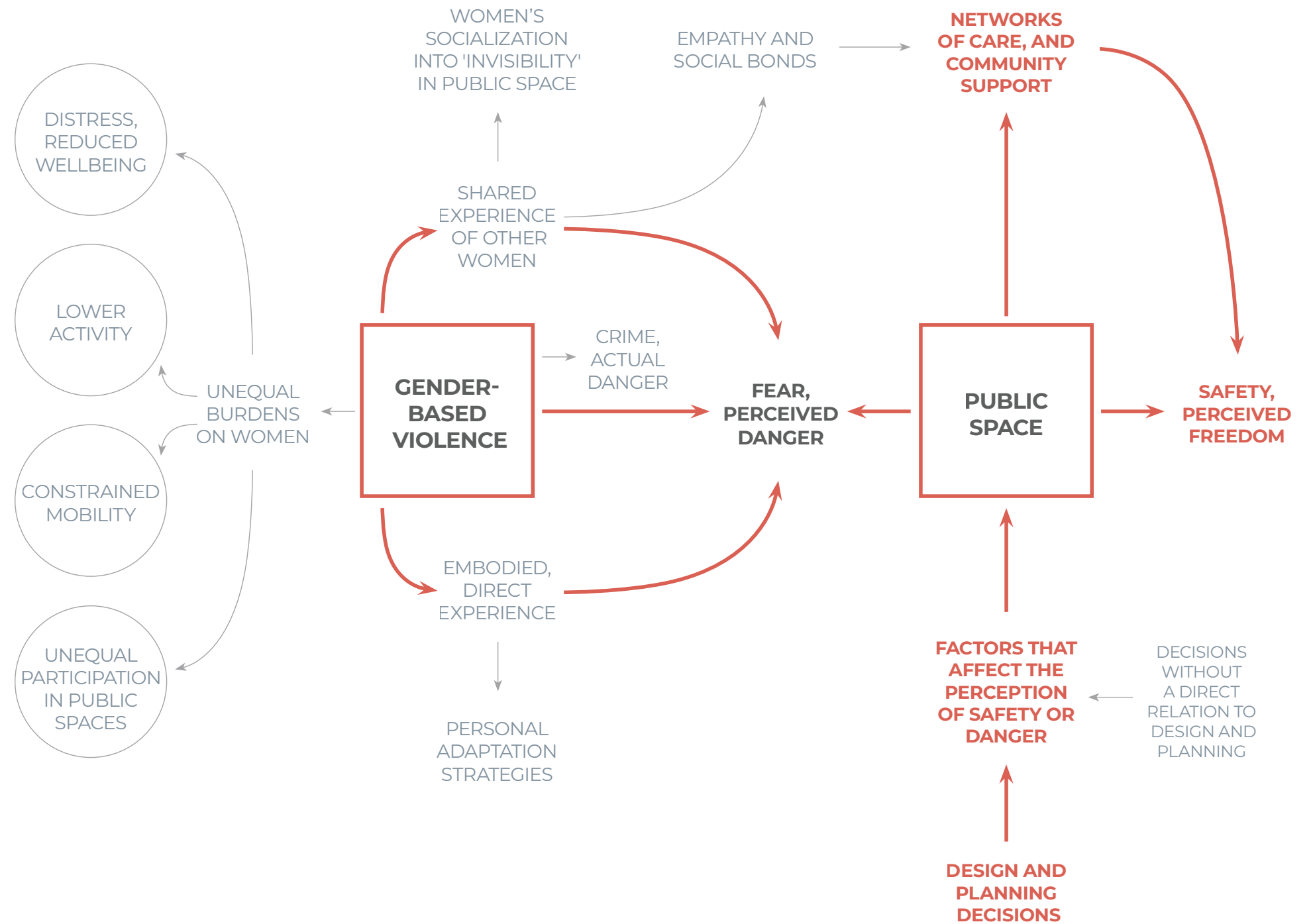


Posters: "Love. Fight.", "Sister choose how you dress and with whom you undress."

# RESEARCH DIAGRAM



**FOR MANY WOMEN, FEAR IN PUBLIC SPACE IS A CONSTANT AND SHARED EXPERIENCE. CAN THE PUBLIC SPACE INSTEAD ENHANCE A SENSE OF SAFETY AND FREEDOM?**

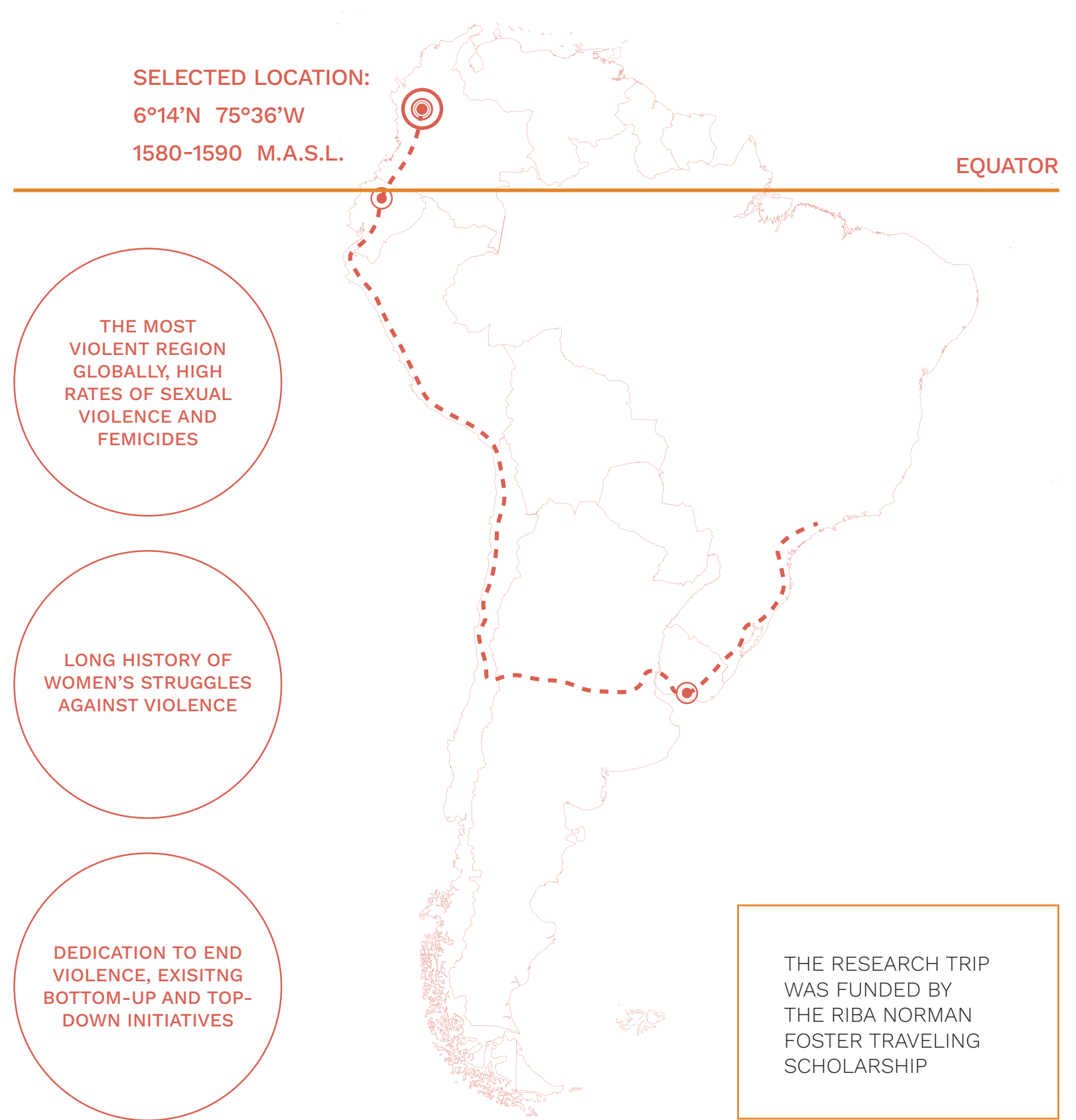


## THE PERCEPTION OF FEAR RESTRICTS WOMEN'S EQUAL ACCESS TO AND USE OF PUBLIC SPACES.

Beyond the actual danger demonstrated by the alarming data, a pervasive sense of anxiety restricts women's activity and participation in public spaces. (Stanko, 1990; Kern, 2021) This fear is an objective reality, but it is also commonly reinforced by pressures arising from social constructs, (Condon, Lieber, and Maillochon, 2007) which is manifested in the gendered division of public space (Falú, 2009; Taylor, 2011) and differences in how women and men use it. (Loukaitou-Sideris, 2014; Pain 2001) The societal expectation that socializes women into 'invisibility' in public spaces, ostensibly for their protection (Pain 2001; Rivas 2009), results in nuanced entitlements to certain locations while discouraging their presence in others (Condon, Lieber, and Maillochon, 2007). Women face exclusion from certain areas of cities also due to inadequate planning that neglects safety considerations.

- excerpt from the research paper of this graduation project

# RESEARCH TRIP THROUGH LATIN AMERICA



## INTERVIEWS



Women are not only robbed of their mobile phones, but we are also exposed to other forms of violence, such as rape, sexual aggression and harassment. And so, this means that we have been deprived of the public space.(...) **And harassment is a constant in the city, not only in public transport, but in all spaces. It is a constant.**

You move around Montevideo, and you manage the risks and fears and the ways of moving in space according to those first marks. **When you are becoming an adult, a woman, the city tells you: 'this is not a space for you'** - the place for you is to be sexualised by a big man, who shows you a penis, or tells you something outrageous.. and that happens a lot.

A woman walks down the street and **men feel entitled to say anything to her**, and that should not be the case. Well, I don't need you to tell me 'how beautiful you are'; or to tell me 'how nice to do this or that to you'. Neither. It doesn't interest me nor help me.



a woman from Quito, politologist



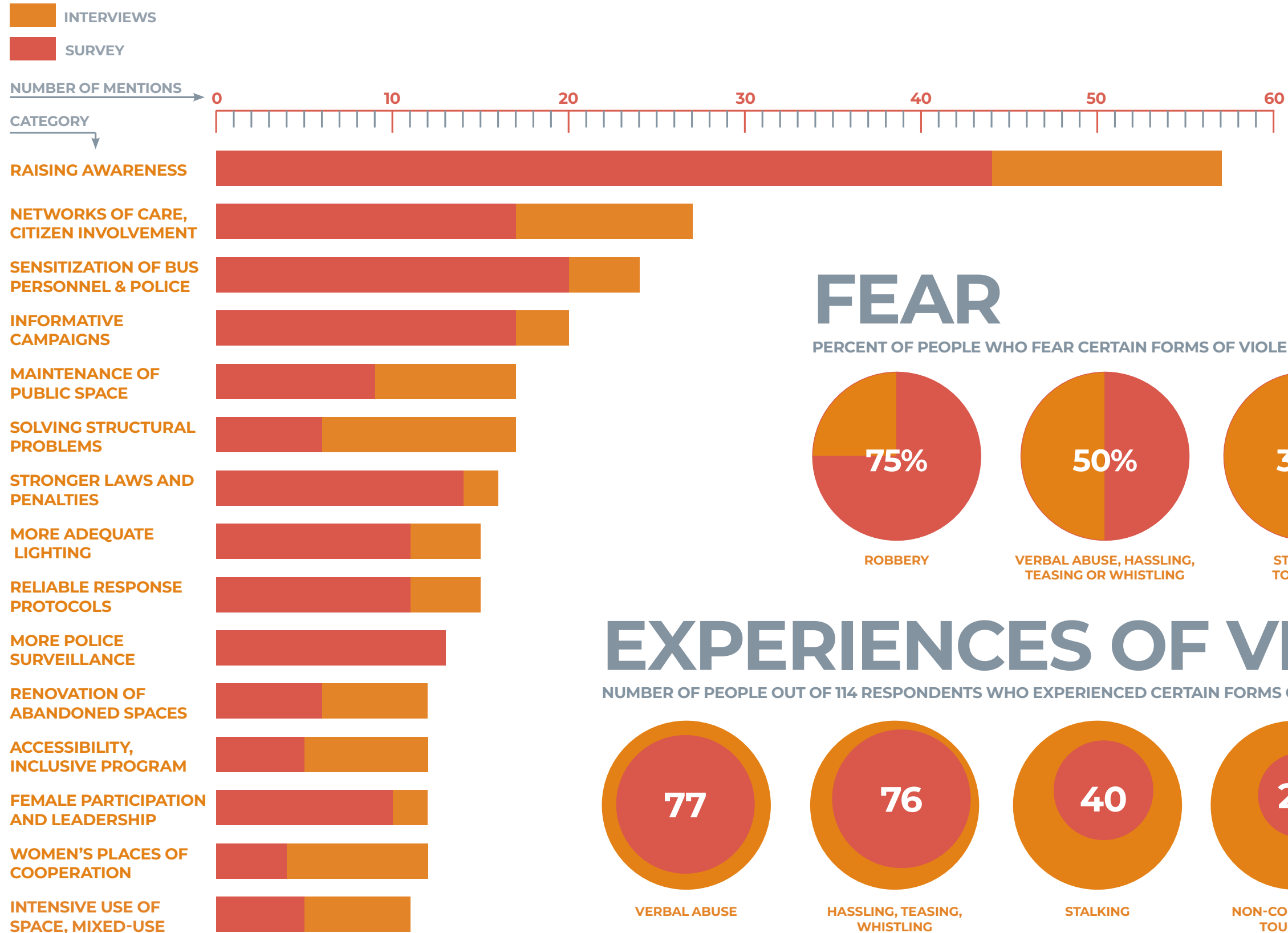
a woman from Montevideo, sociologist



a woman from Medellín, office worker

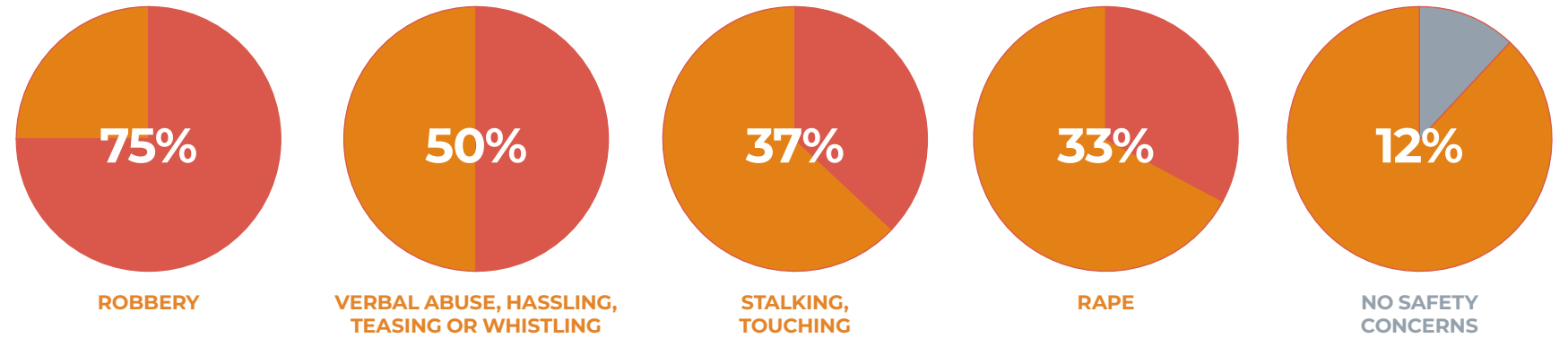
# SURVEY

THE 15 MOST RECURRENT THEMES IN RESPONSE TO AN OPEN QUESTION: WHAT CHANGES DO YOU CONSIDER TO BE THE MOST IMPORTANT FOR YOUR CITY TO ACHIEVE SAFETY FOR WOMEN IN PUBLIC SPACES AND TRANSPORT IN THE COMING YEARS?



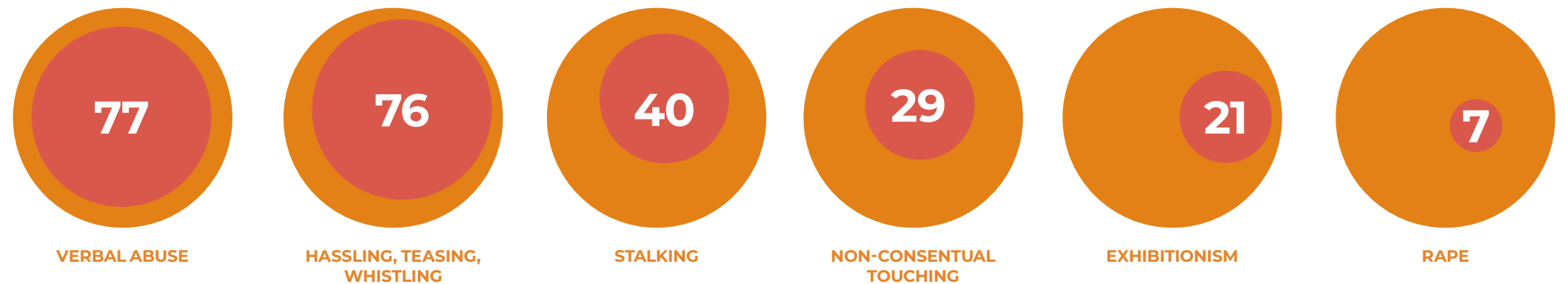
## FEAR

PERCENT OF PEOPLE WHO FEAR CERTAIN FORMS OF VIOLENCE IN THEIR NEIGHBOURHOOD



## EXPERIENCES OF VIOLENCE

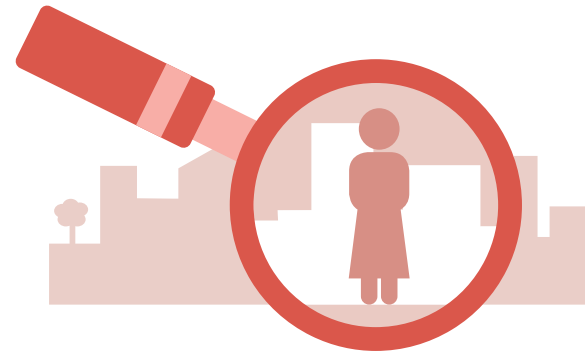
NUMBER OF PEOPLE OUT OF 114 RESPONDENTS WHO EXPERIENCED CERTAIN FORMS OF VIOLENCE IN THE PAST TWO YEARS





## RESEARCH HYPOTHESIS

### UN WOMEN'S AREAS OF ACTION:



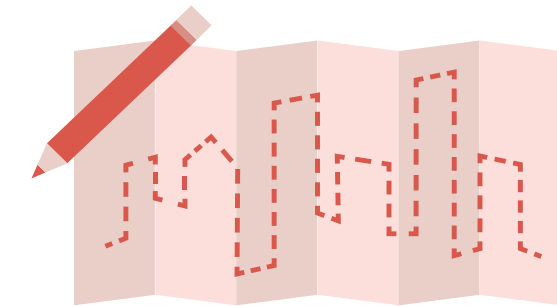
EVIDENCE, SCOPING STUDIES



LAWS AND POLICIES



TRANSFORMING SOCIAL NORMS



SAFETY OF PUBLIC SPACES

## RESEARCH QUESTIONS

How do infrastructure and public space interventions affect women's sense of safety?  
How to enhance women's perception of urban safety through design and planning principles?

## METHODOLOGY

The study identifies common themes in women's voices and issues in the process and outcome of infrastructural developments, based on four months' fieldwork, semi-structured interviews with thirty women (prompted by the evaluation of UN Women's interventions), and an online survey.

## RESEARCH HYPOTHESIS

The 'Safe Cities' program has been important in supporting legal changes, transforming social norms, and broadening the debate on women's safety in Latin America, including through data collection. **However, the interventions related to public spaces implemented within the initiative received less attention and often failed to incorporate indications proposed by feminist researchers.**

EXAMPLES OF SPACES PERCEIVED AS UNSAFE



WOVEN GRAFFITI



VISUALIZING NETWORKS OF CARE, PROTEST, DISCUSSION WITH THE COMMUNITY

“We weave the community and protest against urban problems”

GRAFFITI AND STREET ART



PROTEST, VISUALIZING PROBLEMS, DISCUSSION WITH THE COMMUNITY

“Street art helps women feel belonging to a place. It creates a sense of safety and makes it harder for perpetrators to enter spaces with a united community and people taking care of their space.”

BALCONERAS (BALCONY FLAGS)



VISUALIZING NETWORKS OF CARE, SYMBOLIC PRESENCE

“You can see that there are so many people who are part of this community of care, and that you can ask for help. And in other neighborhoods it came up spontaneously.”

LAS PIONERAS



SPACE FOR COOPERATION, DISCUSSION, AND ORGANIZING FOR WOMEN

“It is a space that is very well designed, conceptually achieved from care and deconstruction, and it is very powerful. (..) The women who are feminists, we all know each other, because we go there as much as we can - and we love it.”

**UVA WATER TANKS**



PHOTOGRAPH BY CAMILO ROZO

**RENOVATING UNDERUSED SPACES,  
DISTRIBUTED URBAN MODEL**

“UVAs, the tanks of the public company that provides water, they were closed spaces and it was decided to open them. And the success was that they filled it with so many different activities.”

**SAFE PARKS**



**ACTIVATING PARKS WITH FUNCTIONS -  
CULTURE, SPORT, FOOD, BARS**

“When there is movement it always helps. It brings light, it brings people, there is noise. A bar is not a closed thing that doesn’t contribute something to the public space. I love bars, I would love them to be spaces that are more caring.”

**METRO EXIT SQUARES**



**INCLUSIVE FUNCTIONAL PROGRAM,  
MIX OF FUNCTIONS, INTENSE USE**

“These metro squares are always in movement, there are many people, there are small shops which means that there is someone there, that there are these watchful eyes that don’t allow crime to happen, the squares feel secure.”

**BOGOTÁ CARE SYSTEM**



PHOTOGRAPH BY CÉSAR MELGAREJO

**URBAN BLOCKS OF CARE, EASY ACCESS,  
DISTRIBUTED URBAN MODEL**

“Care Blocks are areas of the city in which infrastructure and services are concentrated to provide proximate and simultaneous care to caregivers and receivers. They are a land-use planning model that integrates care and tactical urban planning with a gender perspective.” ~OPSI

## RESEARCH OUTCOMES - DESIGN GUIDELINES

SUPPORTING  
EXISTING  
NETWORKS OF  
CARE

PLANNING  
TRAJECTORIES  
AND AREAS OF  
INFLUENCE

INCLUSIVE  
FUNCTIONAL  
PROGRAMS

TEMPORALITY  
AND  
SUSTAINABILITY

EQUAL ACCESS  
TO LOCALIZED,  
HIGH QUALITY  
INFRASTRUCTURE

CREATING SPACES  
FOR ORGANIZING  
AND COLLECTIVE  
ACTION

DISTRIBUTED  
MODEL OF URBAN  
INTERVENTIONS,  
STRENGTHENING  
NETWORKS OF  
MUTUAL CARE

FLEXIBILITY OF  
SPACE THAT ALLOWS  
APPROPRIATION,  
RICH PROGRAM OF  
INCLUSIVE ACTIVITIES  
AROUND THE CLOCK

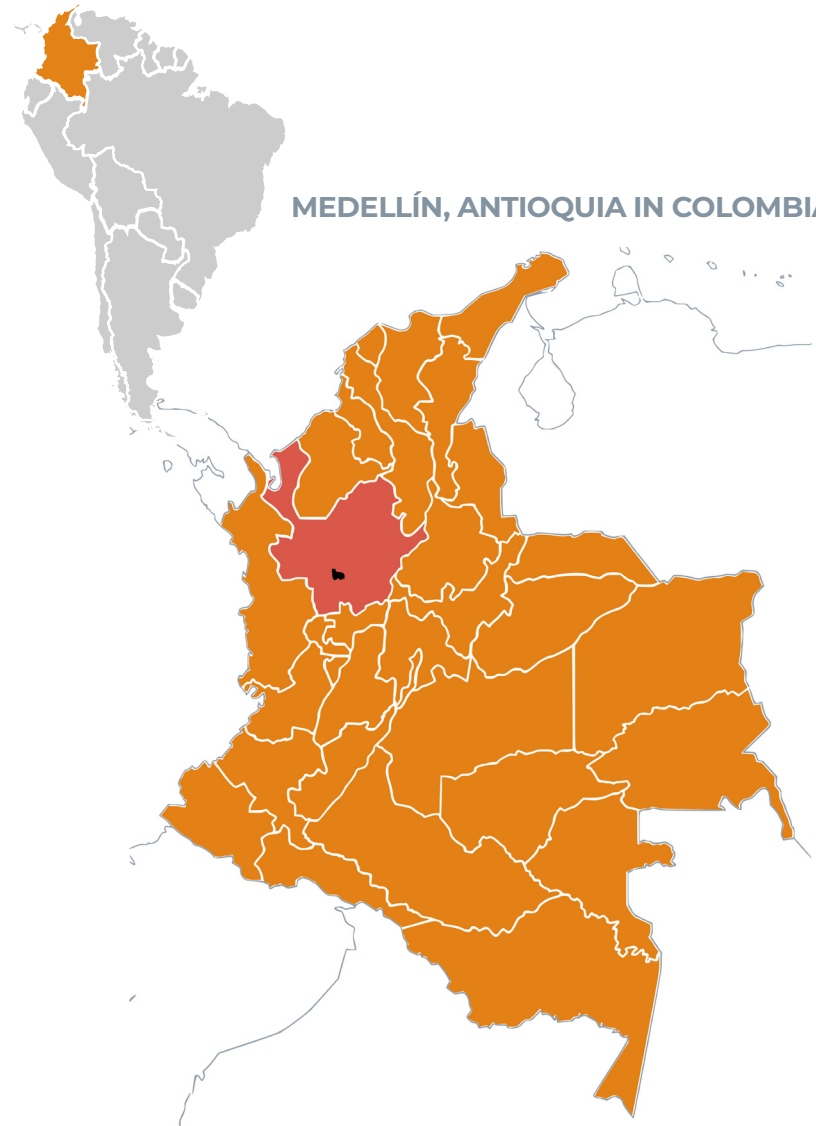
PROXIMITY OF SPACES  
DEDICATED TO  
COLLECTIVE ACTION,  
ORGANIZATION, AND  
PARTICIPATION OF  
WOMEN

RESEARCH: 4 MONTHS OF TRAVEL - FIELDWORK AND OBSERVATIONS  
INTERVIEWS WITH 30 WOMEN - 100 SURVEY RESPONSES

KEYWORDS:  
SAFETY, WOMEN, LATIN AMERICA, PUBLIC SPACE, UN WOMEN, BAMBOO

# PROJECT LOCATION - MEDELLÍN, COLOMBIA

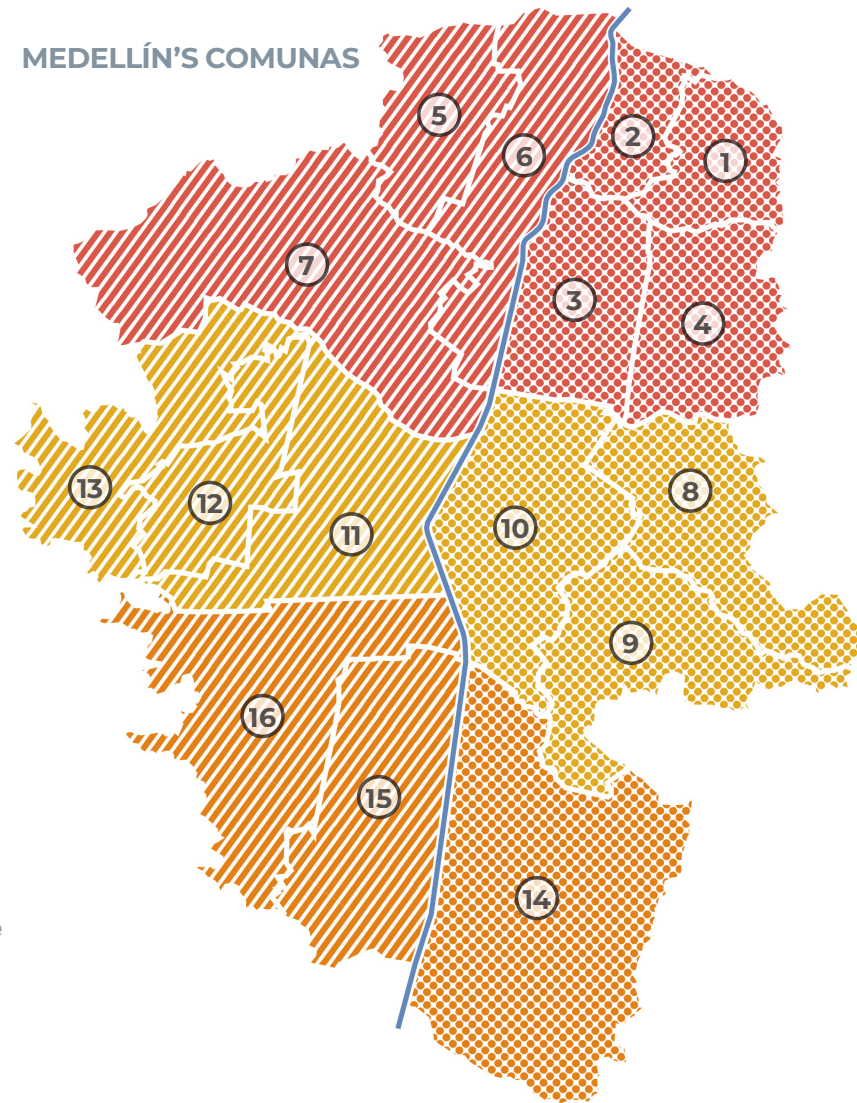
## COLOMBIA IN SOUTH AMERICA

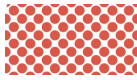





MEDELLÍN, ANTIOQUIA IN COLOMBIA

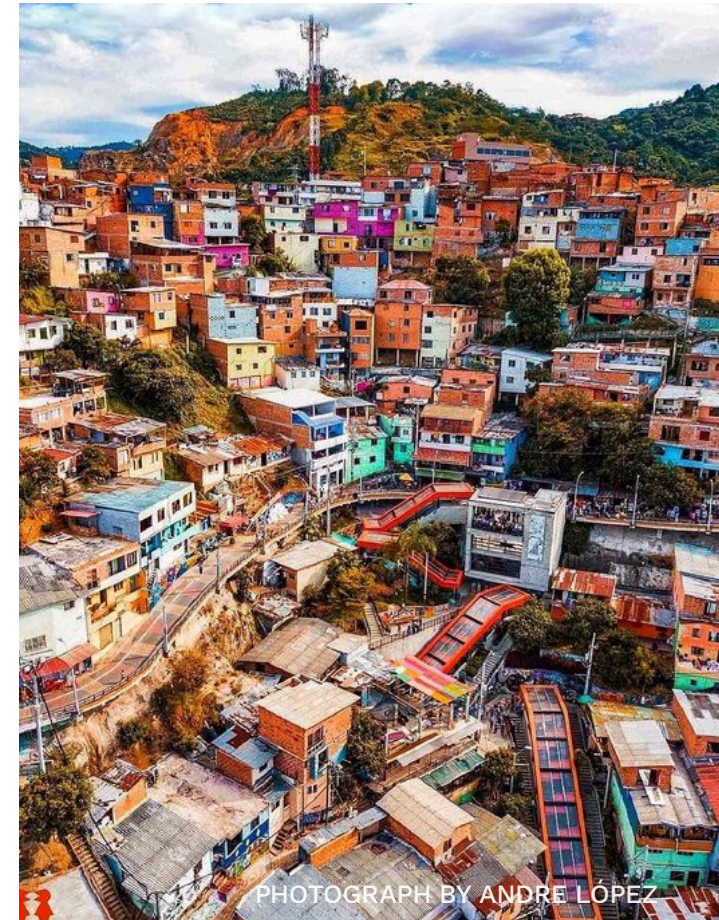
“In the case of Medellin, they have built an amazing political structure, to let organized women to have place in the municipality. The story of the Women’s Secretary is amazing! (...) The effort they [women in Medellin] have been doing is to translate, in a language that their co-workers can understand (...) and than incorporate. So, it’s a very different approach than what we normally see from feminist groups, who tend to be politically active in a revolutionary, or sometimes very violent way. (...) Their main focus is not to be coherent in political, academic discourse, but to get things done.”  
 ~ Liliana de Simone for The Funambulist

## MEDELLÍN'S COMUNAS



- |  |                          |   |                          |
|--|--------------------------|---|--------------------------|
|  | <b>North East Zone</b>   |  | <b>North West Zone</b>   |
| 1. Popular   | 2. Santa Cruz            | 3. Manrique   | 4. Aranjuez              |
|  | <b>Central East Zone</b> |  | <b>Central West Zone</b> |
| 8. Hermosa   | 9. Bunoos Aires          | 10. La Candelaria   | 11. Laureles             |
|  | <b>South East Zone</b>   |  | <b>South West Zone</b>   |
| 14. El Poblado   | 15. Guayabal             | 16. Belén   |                          |

quote source: Lambert, L. (Host). (2020, December 27). The Architecture of Gender in South America (No. 57) [Audio podcast episode]. The Funambulist.



PHOTOGRAPH BY ANDRE LÓPEZ



PHOTOGRAPH BY JORDI BRESÓ



## UNITS FOR THE ARTICULATION OF LIFE

In 2010, while developing an urban lighting master plan for Medellín, the analysis of the state-owned company EPM (Empresas Públicas de Medellín) revealed islands of darkness in the middle of the urban fabric, corresponding to 144 water tanks that were once built on the periphery of the city. They realized that those abandoned lots became focal points of violence and insecurity in neighbourhoods lacking public spaces and basic facilities. As a response, those lots were opened and turned into public spaces, with the aim to improve safety and promote citizen participation.



BEFORE



source: UVA Community Formation Strategy Presentation from March 11, 2014. Photograph date - unknown.

AFTER



source: Archdaily article from June 16, 2020. Photograph date - unknown.



source: UVA Community Formation Strategy Presentation from March 11, 2014. Photograph date - unknown.



source: EPM archives. April 6, 2014.



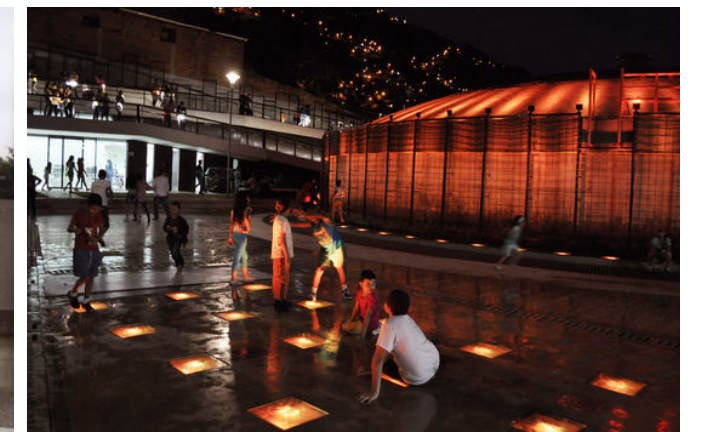
source: EPM. Photographic material for the competition. Photograph from January 24, 2012.



source: PROA Arquitectura. April 24, 2020.



source: Presentation by Juan David Echeverri EPM from September 30, 2015. Photograph from January 16, 2013.



source: EPM archives. April 6, 2014.

COMMUNITY OF THE UNITS FOR THE ARTICULATION OF LIFE



Photograph by Camilo Rozo.



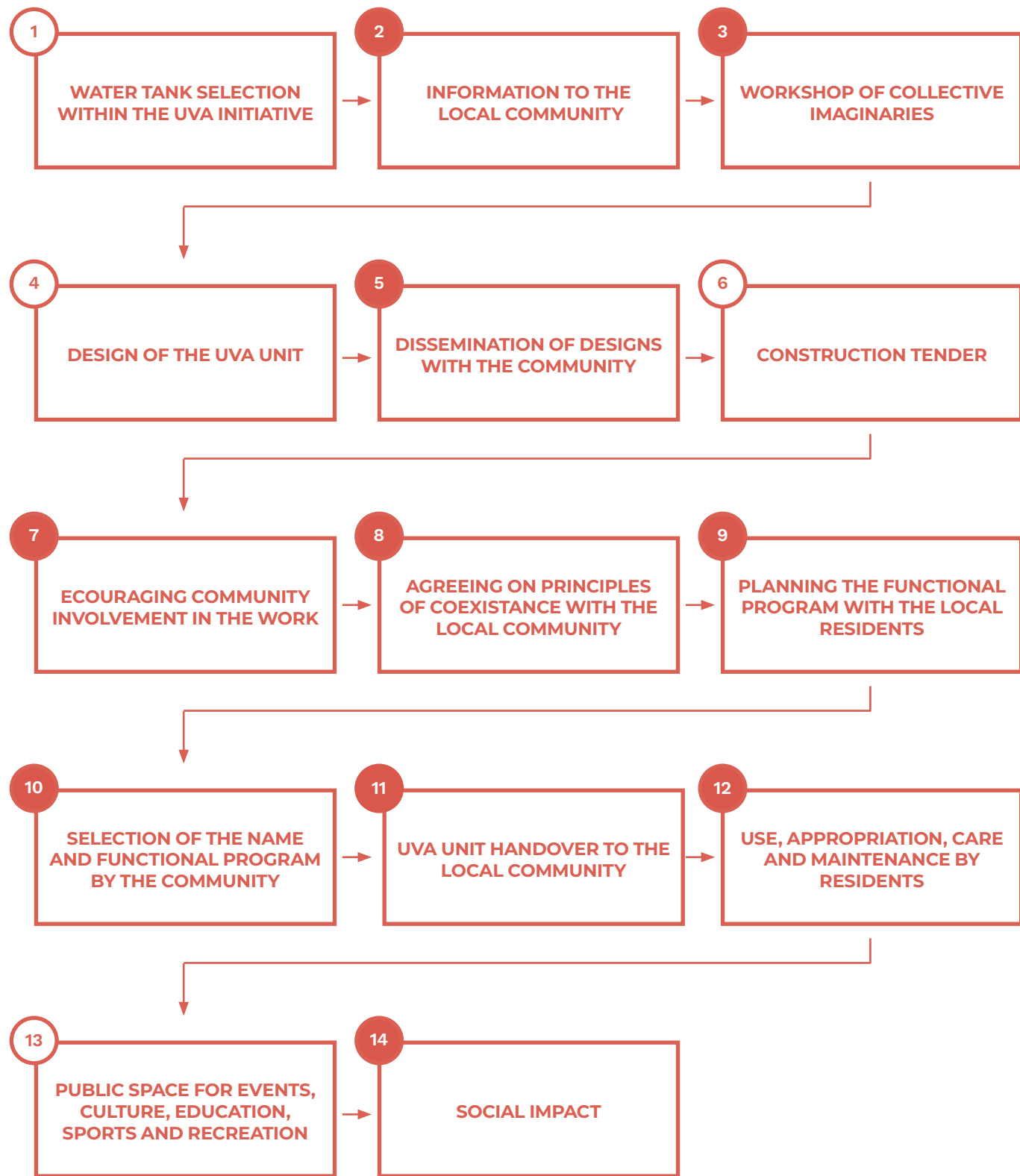
Source: EPM archive.



Source: EPM archive.



# PARTICIPATORY PROCESS - UVA COMMUNITY



Based on the information from Presentación Estrategía de Formación Comunidad UVA Marzo 11 de 2014.

## PARTICIPATORY DESIGN:

WORKSHOPS OF COLLECTIVE IMAGINARIES, LOCAL RESIDENTS HAVE INFLUENCE ON THE FUNCTIONAL PROGRAM AND SELECT THE NAME OF THE UVA UNIT



source: Mollard, M. (2015, June 10). Colombia's infrastructure reclaimed as public space. Architectural Review.

The participation of the community was an important part of the project. The projects were conceived together with the local community through a series of **workshops on the collective imaginary**, where everyone was invited to express their vision for the new public square through writing and drawing. Each design implementation is **adapted to the needs and specificities of its context**.

## COMMUNITY BUILDING:

EMPOWERING THE COMMUNITY AND CREATING SOCIAL BONDS TO ACHIEVE GREATER COHESION, SAFETY AND EQUALITY THROUGH MUTUAL CARE



image source: EPM archives, text source: EPM newsletter from 8 July, 2013.

Under the principle “Remove the fence to be closer” (“*Quitar la cerca para estar más cerca*”), the UVAs propose an approach based on the **culture of coexistence and equity** of the community in harmony with the infrastructure of public services. There is a commitment to create the **community's culture of care** and protection of our infrastructure as **it is more important for safety than the fence that surrounded the tanks**.

# EXAMPLES OF SITES ALREADY COMPLETED WITHIN THE UVA PROGRAM IN MEDELLÍN



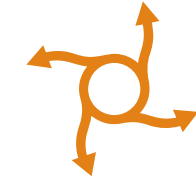
playground



library



event space



multi-purpose



amphitheatre



viewing deck



picnic area



child care



toilets



shop



maintenance



prayer room



music room



Internet café



laundry room



gym



playroom



skate park



ICT room



reading room



sports area



aula



contemplation

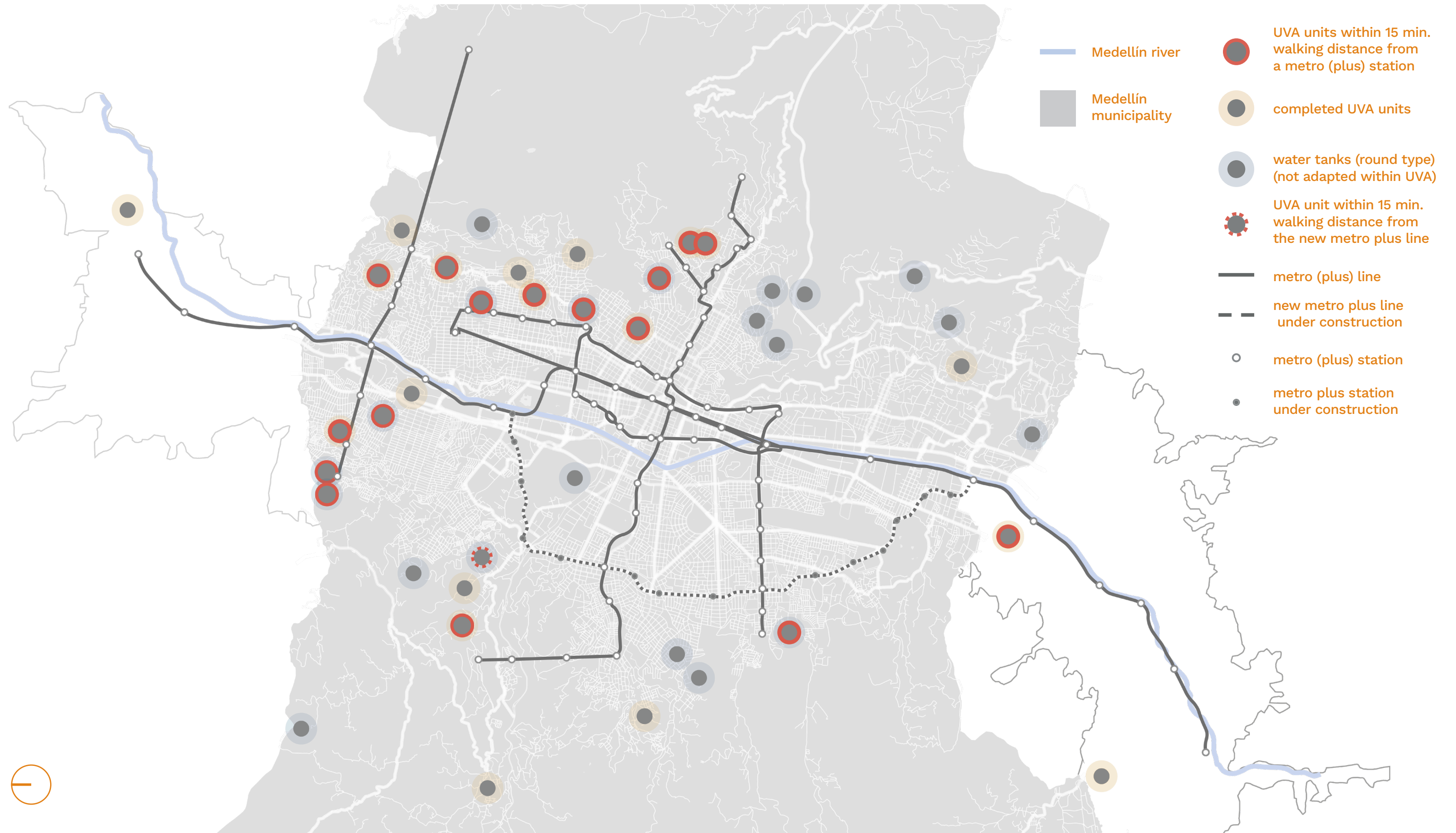


psychologist



storage

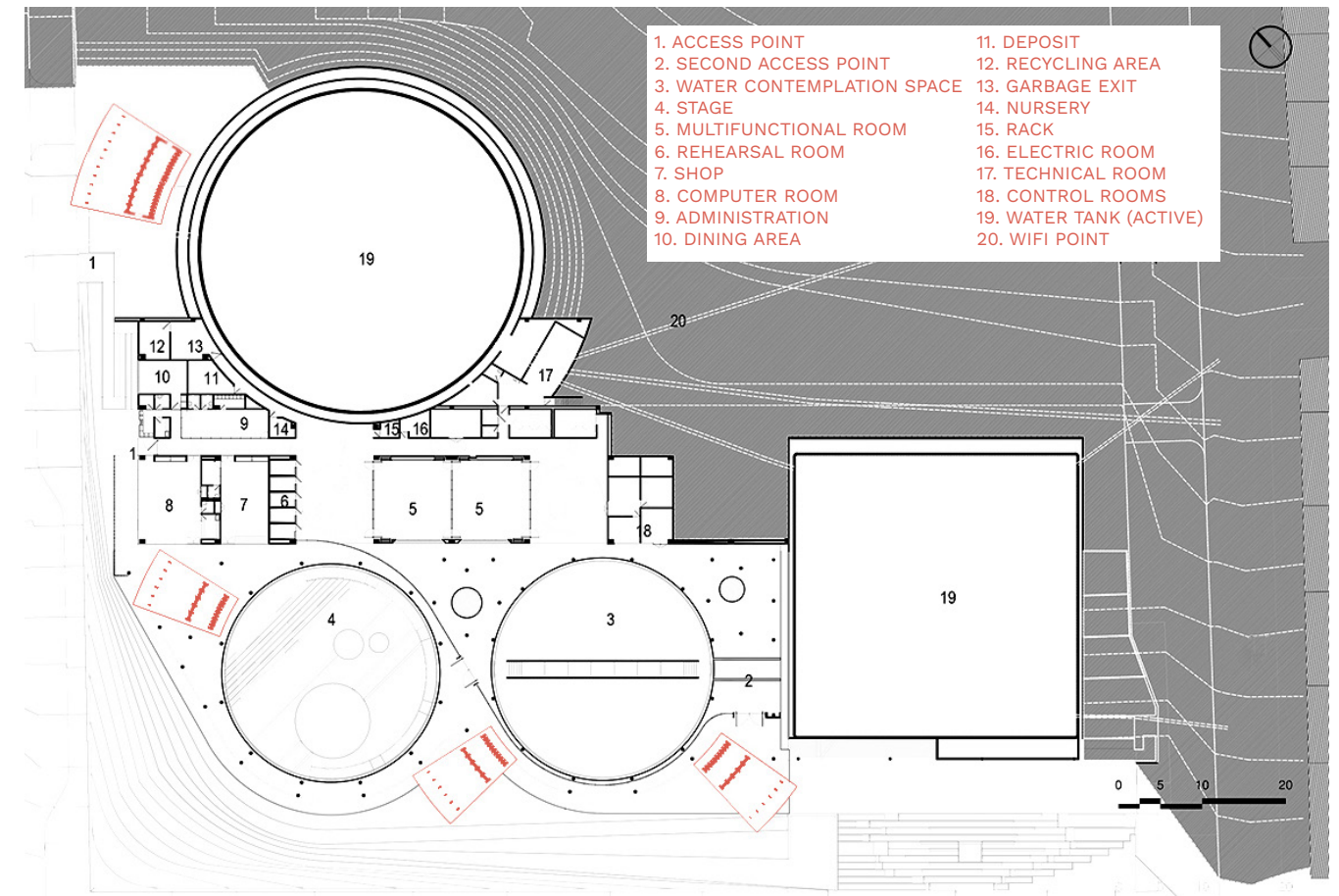
# URBAN CONCEPT - NETWORK OF SAFE TRAJECTORIES AND SAFE PUBLIC SPACES



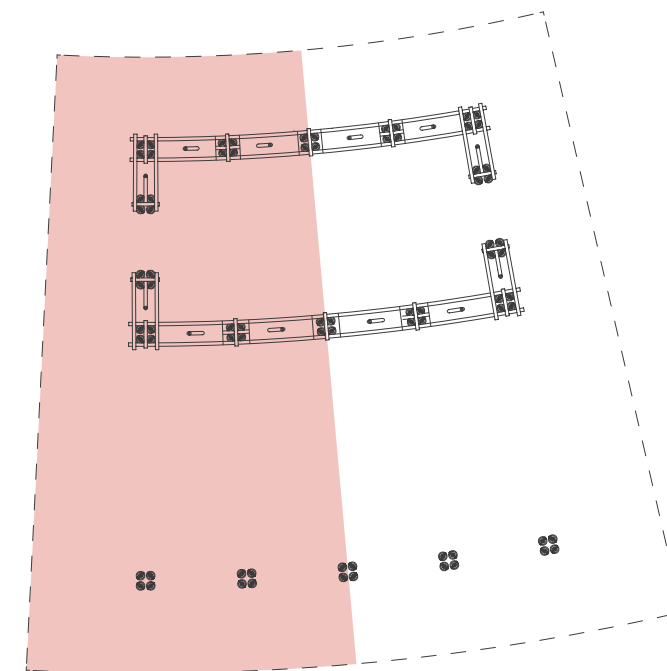
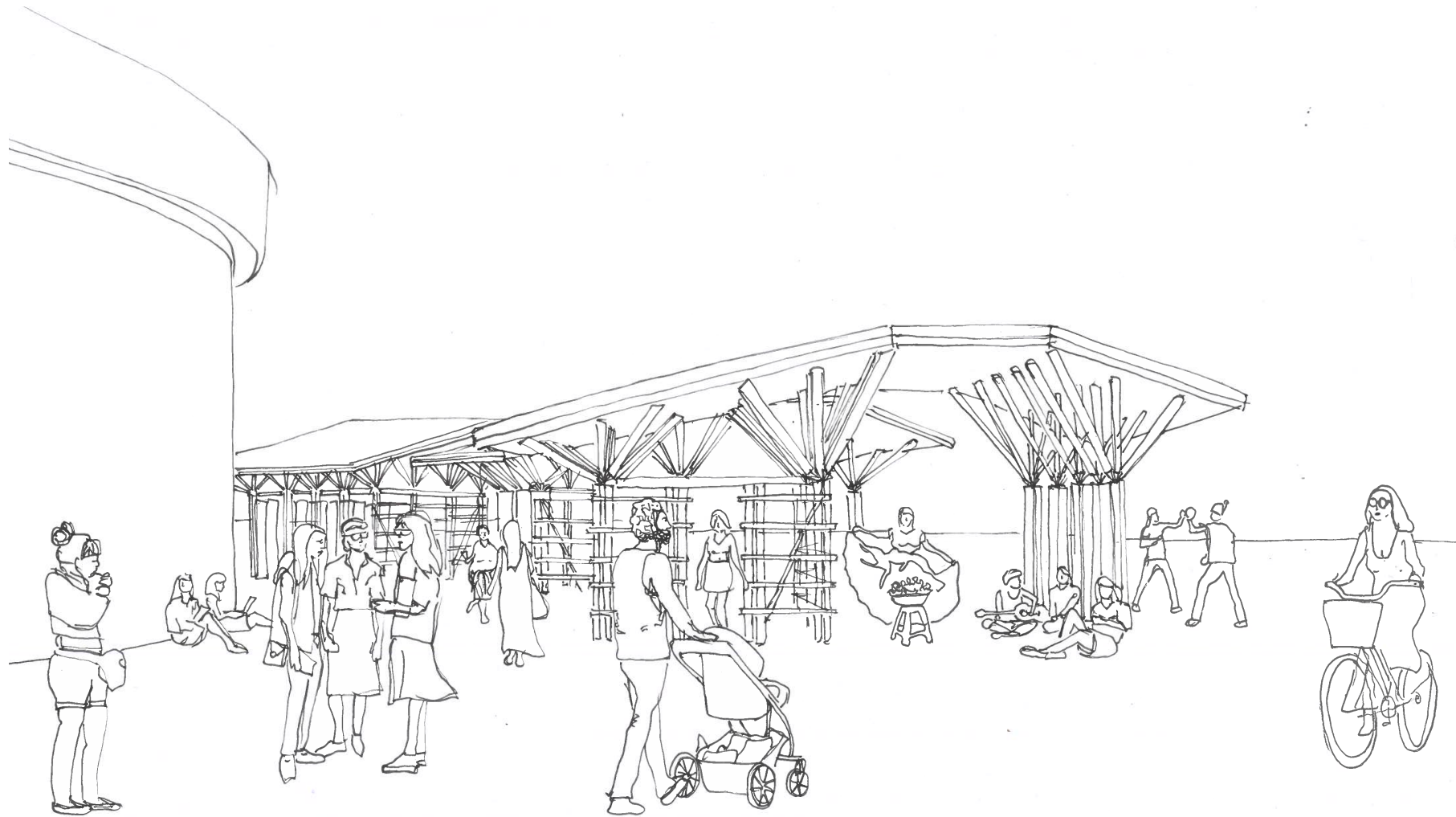
## EXPANDING THE UVA PROGRAM WITH A GENDER PERSPECTIVE

I propose to locate the pavilions near the units of the **UVA** (Units for the Articulation of Life) - an existing **network** of well-functioning public spaces spread around the city. Within the UVA program, citizens are involved in the building of cultural, recreational and sports venues at **previously inaccessible and insecure** open areas in the middle of disadvantaged neighborhoods, near the water tanks.

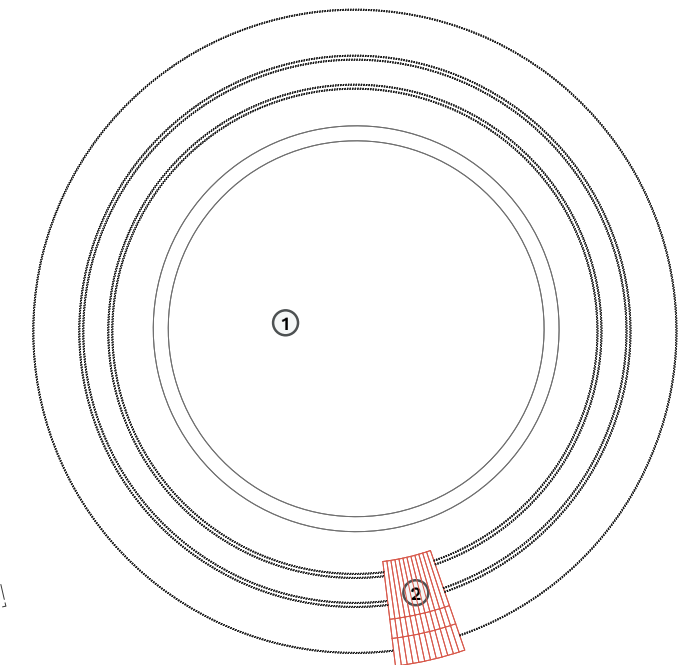
The aim of adding the pavilion is to expand the functioning of the public spaces within this program to meet **women's needs** related to safety. The size and use could be **adjusted** according to the possibilities and needs of the local community.



EXEMPLARY SITE PLAN. BASED ON A PLAN OF UVA LA IMAGINACIÓN. SOURCE: ARQUINE.



MODULAR CONSTRUCTION



- ① WATER TANK
- ② THE PAVILION

# PARTICIPATION AT THE DIFFERENT STAGES OF THE PROJECT

INTERVIEWS:  
WOMEN'S  
EXPERIENCES AS  
A STARTING POINT

UNDERSTANDING  
OPINIONS ON  
PREVIOUS  
INTERVENTIONS

FEEDBACK FROM  
THE LOCAL  
FEMINISTS  
AND OTHER  
RESIDENTS

PARTICIPATION  
WITHIN THE UVA  
PROGRAM

CONSULTATIONS  
OF DESIGN,  
DECISION ON  
THE FUNCTIONS



image source: Urban Nouveau

CONSULTATIONS  
DURING DESIGN

LEARNING FROM  
THE KNOWLEDGE  
OF LOCAL  
ARCHITECTS AND  
ENGINEERS



image source: Ruta 4 Taller

PARTICIPATORY  
BUILDING PROCESS

CHOICE OF  
MATERIAL WHICH  
EMPOWERS  
WOMEN IN  
CONSTRUCTION

KNOWLEDGE  
EXCHANGE,  
COMMUNITY  
BUILDING  
PROCESS

APPROPRIATION  
AFTER THE  
CONSTRUCTION

MAINTENANCE,  
MANAGEMENT  
AND DECISIONS  
OF FUNCTIONAL  
PROGRAM



image source: Bamboo U

# CLIMATE-APPROPRIATE DESIGN STRATEGIES FOR COLOMBIA



LOW PITCHED, VENTILATED ROOF WITH OVERHANGS

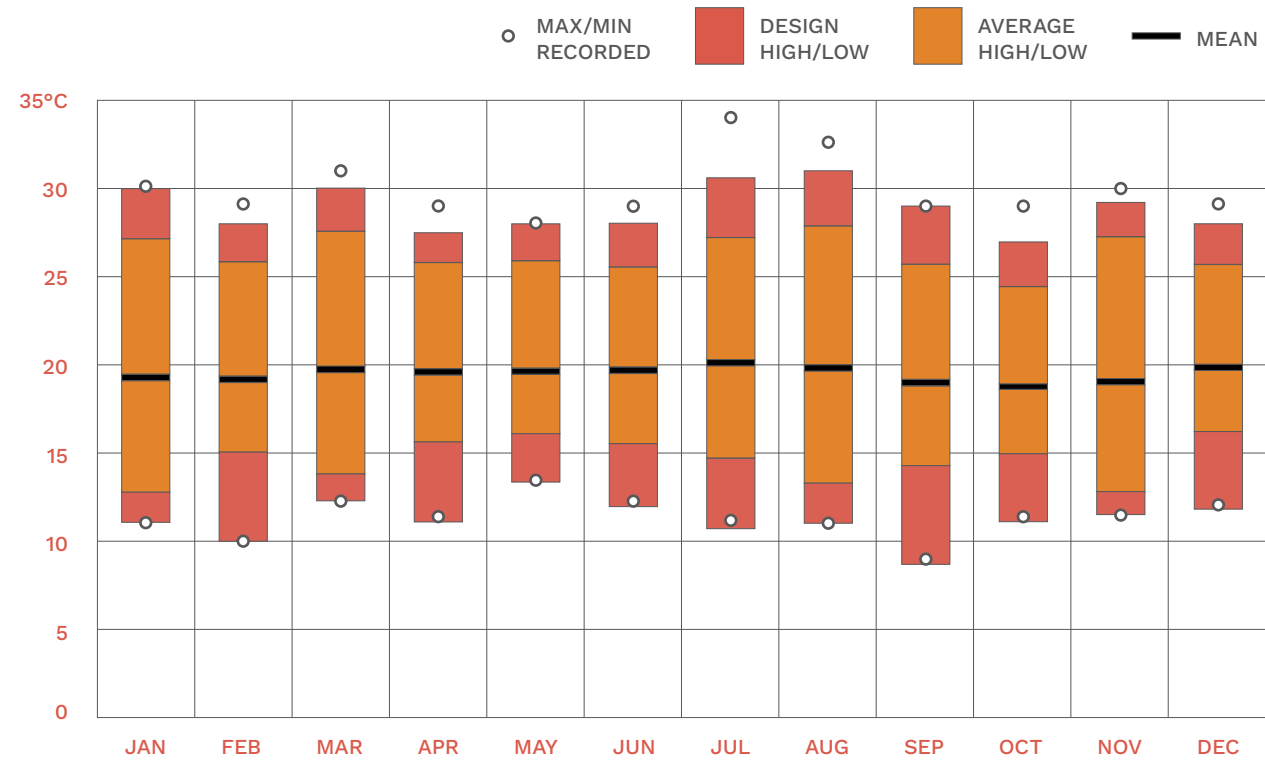


EARTHQUAKE RESISTANCE

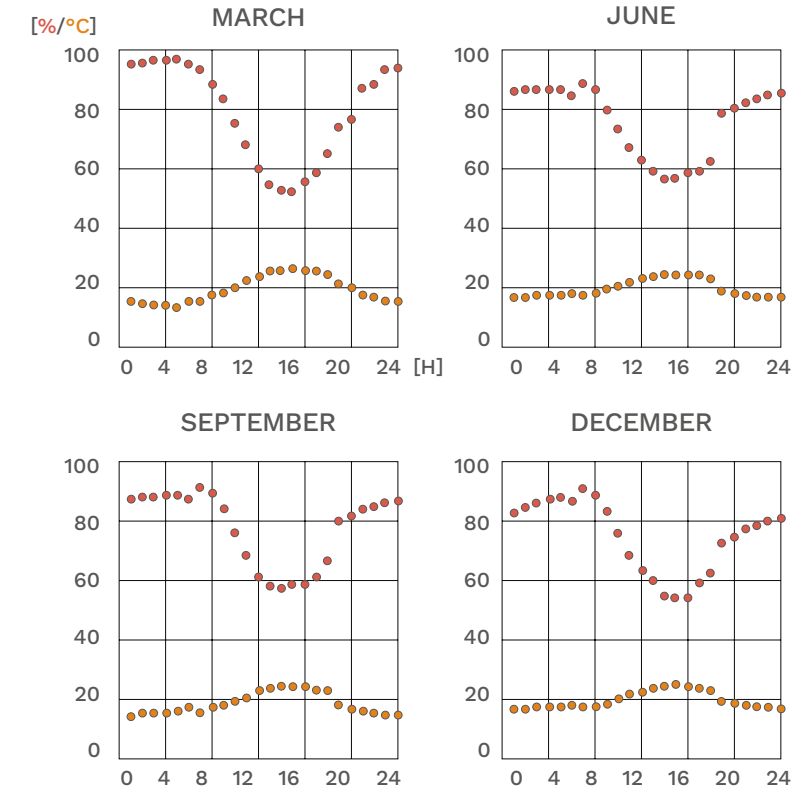


SHADE TO PREVENT OVERHEATING (ALSO SHADED OPEN SPACE)

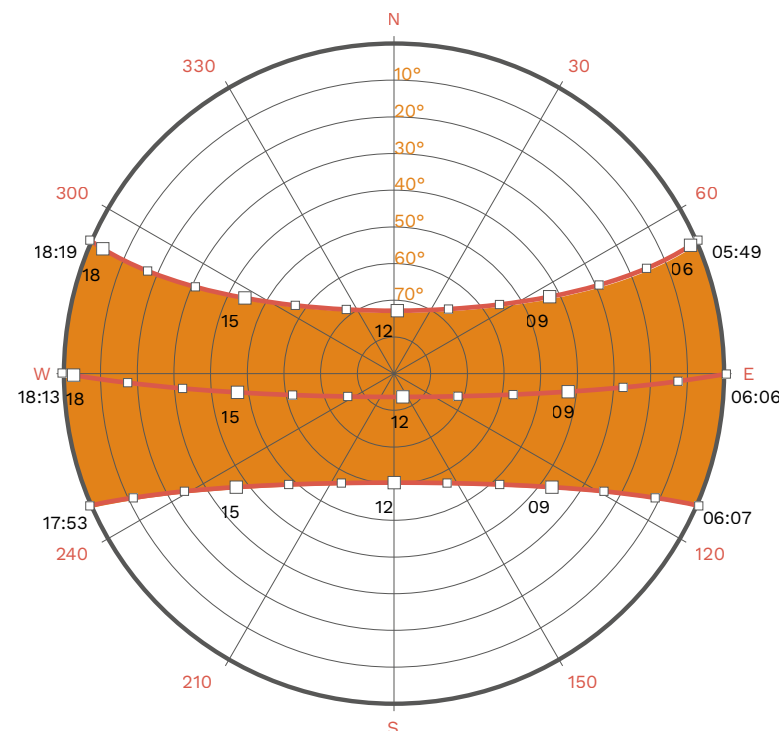
DRY BULB TEMPERATURE



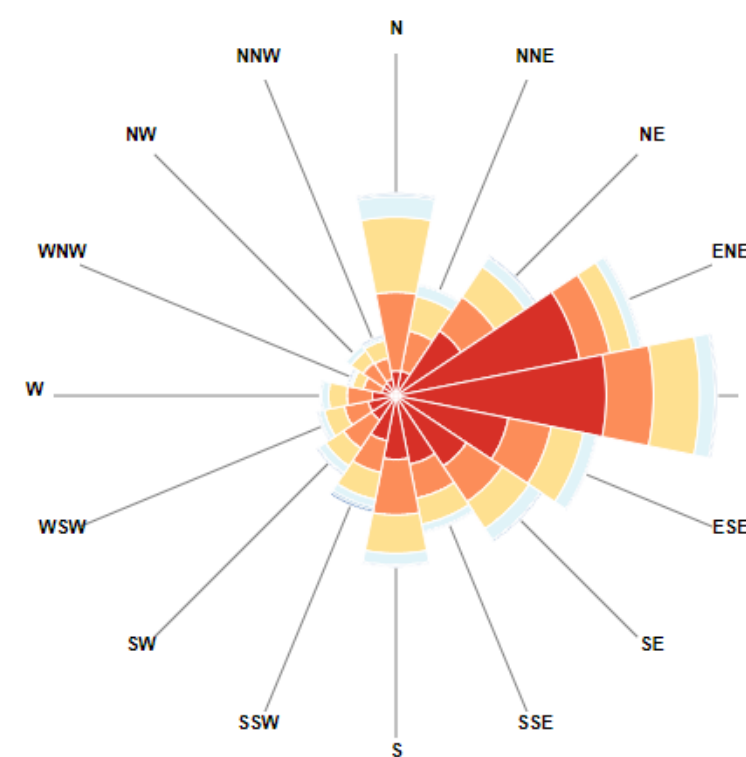
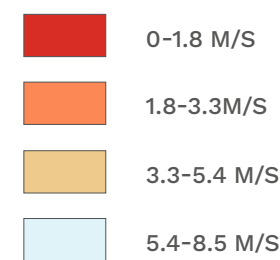
TEMPERATURE X HUMIDITY



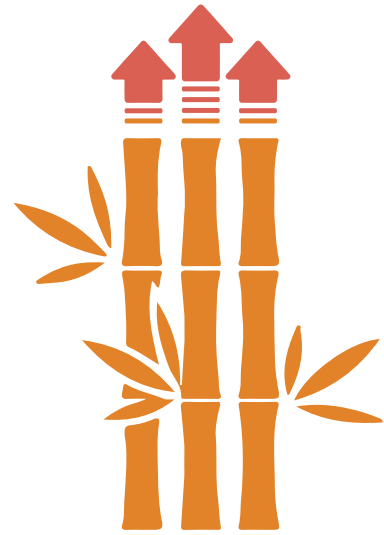
SUN PATH DIAGRAM



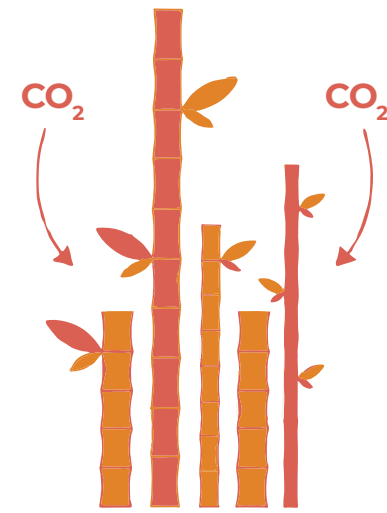
WIND ROSE



REASONS FOR THE CHOICE OF BAMBOO - ENVIRONMENTAL



RAPIDLY RENEWABLE,  
HIGH ANNUAL YIELD



CARBON SEQUESTRATION  
CAPACITY (CARBON SINK)



OPPORTUNITIES TO RECYCLE,  
BIODEGRADABLE / SOURCE OF  
ENERGY IN WASTE PHASE



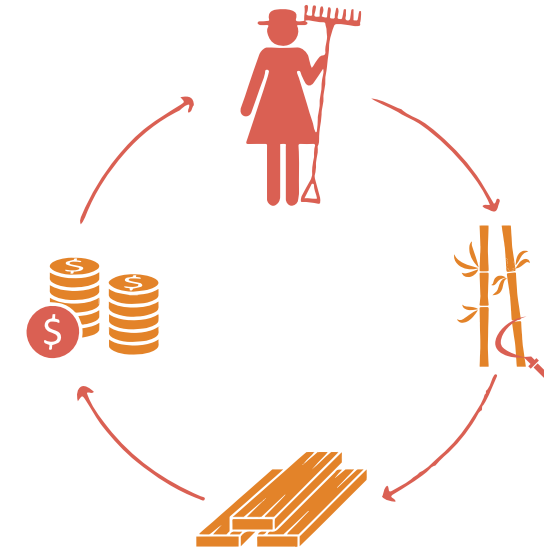
## REASONS FOR THE CHOICE OF BAMBOO - SOCIAL



AVAILABLE LOCALLY,  
HISTORICALLY SIGNIFICANT



LIGHTWEIGHT, SUITABLE FOR  
CONSTRUCTION BY WOMEN



EMPOWERING FEMALE FARMERS



source: Pousaz, L (2013, June 28). Discovering the architect of bamboo. EPFL news.



source: Ruta 4 Taller de Arquitectura Facebook profile.



source: Duque Escobar, G., & Ortiz, D. (2022, October 4). Reflexiones para el Manejo de la Guadua en Palestina – Caldas.



EMPOWERING WOMEN IN CONSTRUCTION - WOMEN'S MINGA



Workshop in Colombia by HabarQ. Source: [habarq.com/experiencias](http://habarq.com/experiencias)



Pavilion by Eleena Jamil. Source: <https://ej-architect.com/>



Workshop by Ruta 4 Taller in Colombia. Source: Facebook fanpage on Ruta 4 Taller.



Pavilion by Eleena Jamil. Source: <https://ej-architect.com/>



Community Sewing Workshop Amairis by Ruta 4 Taller in Colombia. Source: Archdaily.

PROJECT VISION

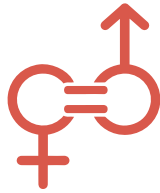
EXEMPLARY FUNCTIONAL PROGRAM



caferia, bar,  
event space



school of  
participation



gender equality  
education

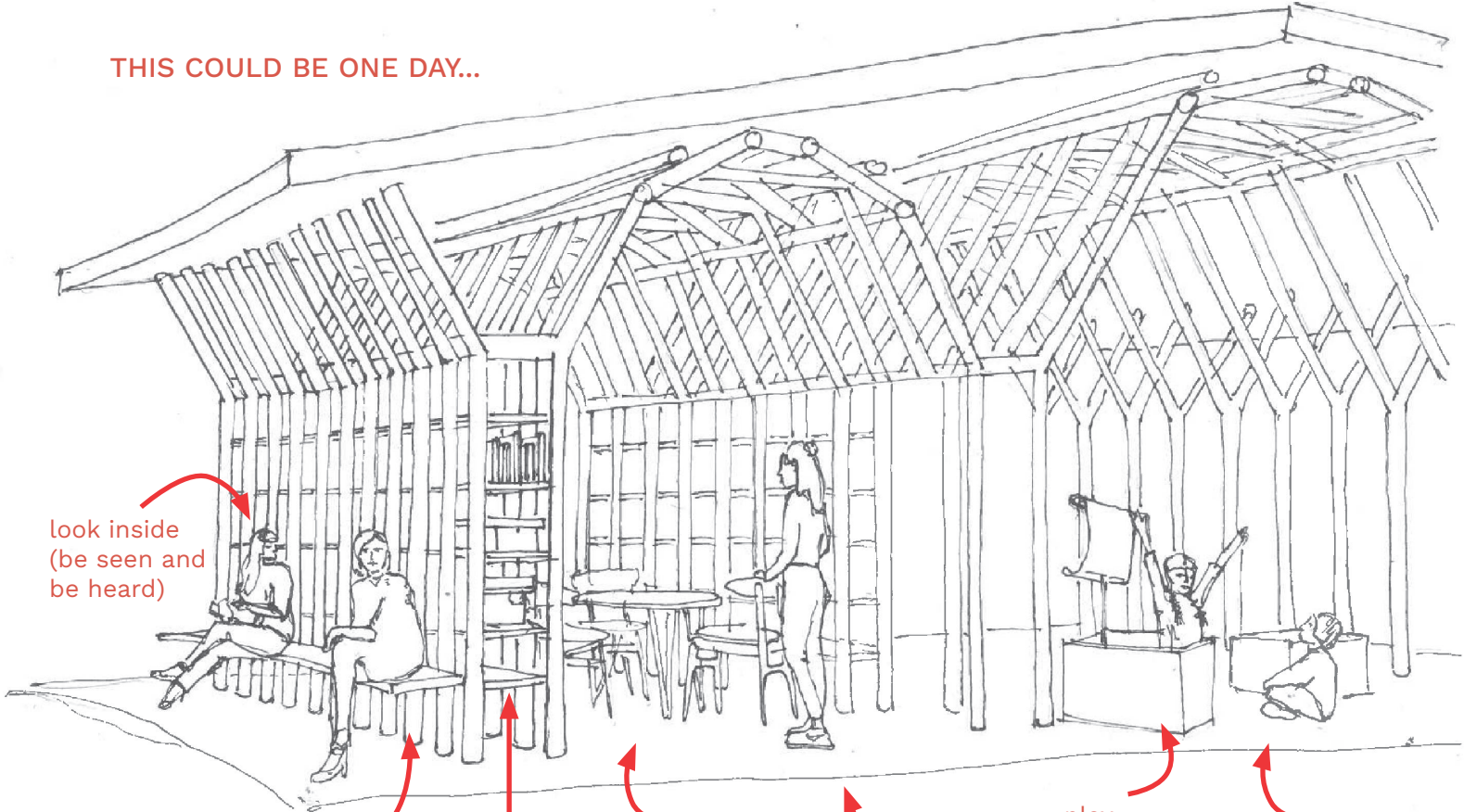


women's  
collectives



area for relax  
and meeting

THIS COULD BE ONE DAY...



look inside  
(be seen and  
be heard)

rest

read or easily  
store your things

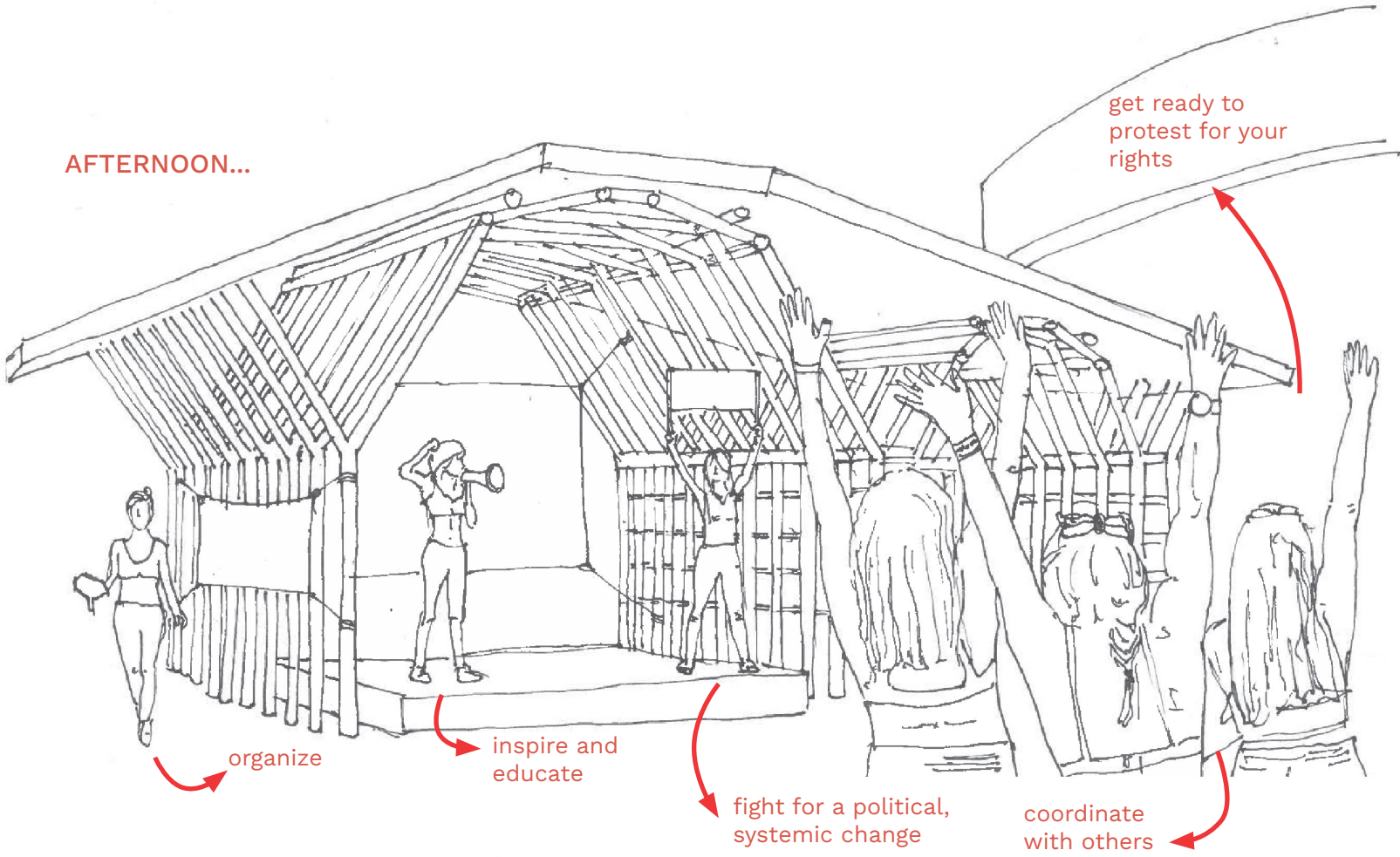
work, cooperate,  
participate, learn

have time  
for yourself

play

leave your kids  
nearby and be  
sure they are safe

AFTERNOON...



organize

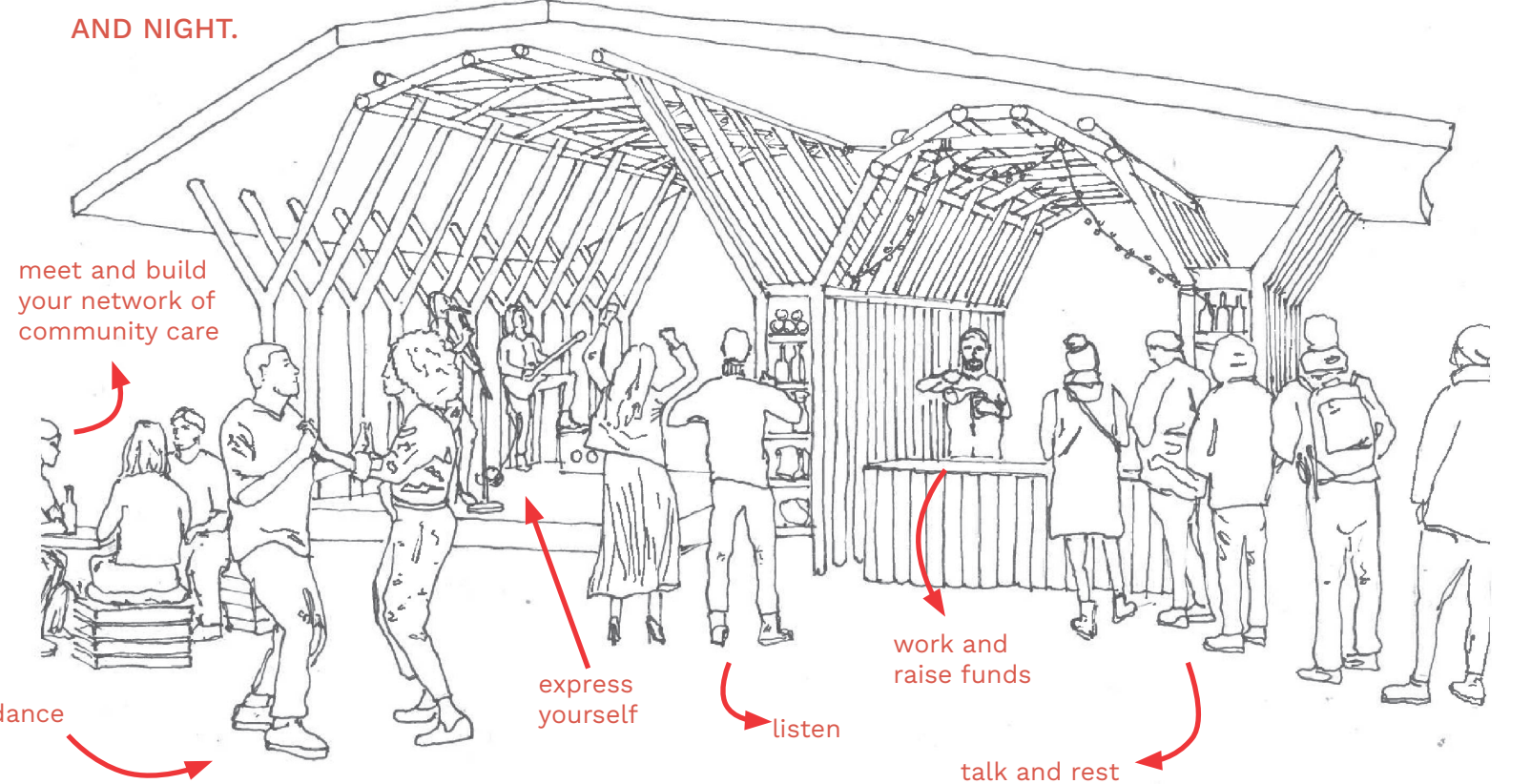
inspire and  
educate

fight for a political,  
systemic change

coordinate  
with others

get ready to  
protest for your  
rights

AND NIGHT.



meet and build  
your network of  
community care

dance

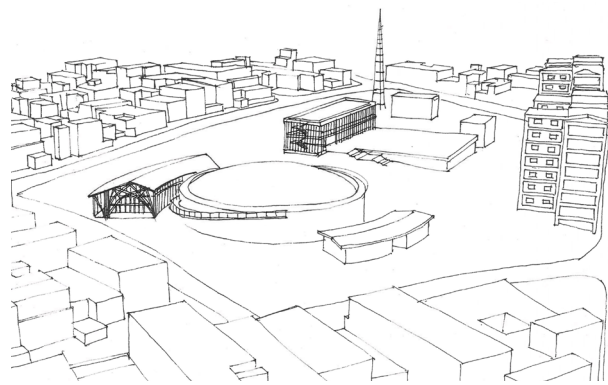
express  
yourself

listen

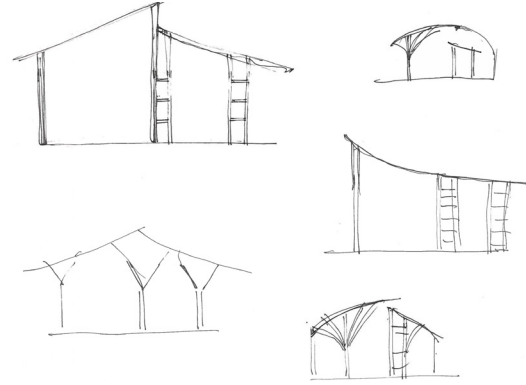
work and  
raise funds

talk and rest

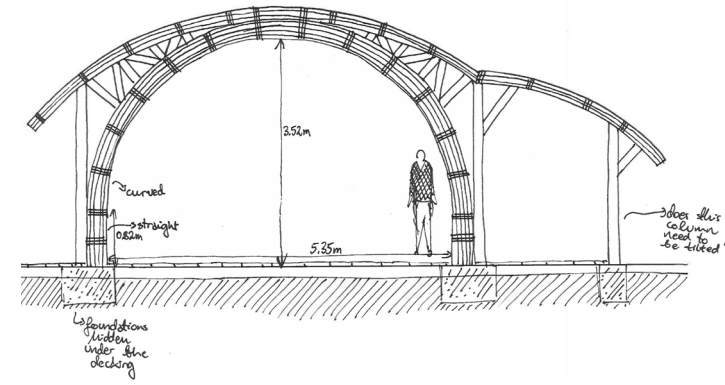
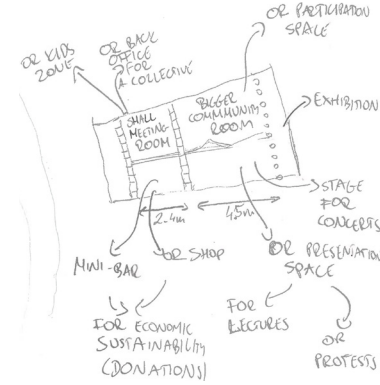
# DESIGN PROCESS



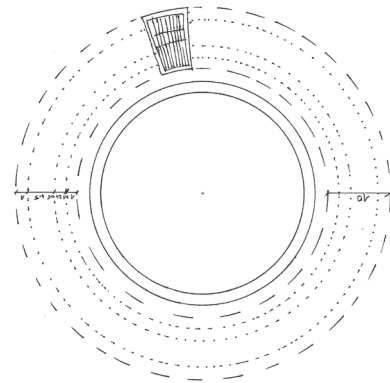
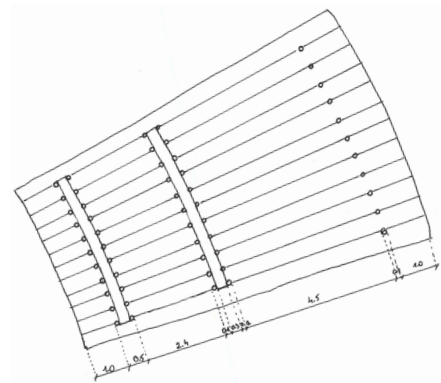
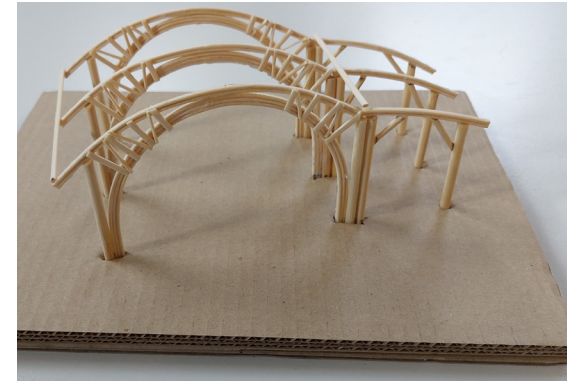
CHOICE OF LOCATION



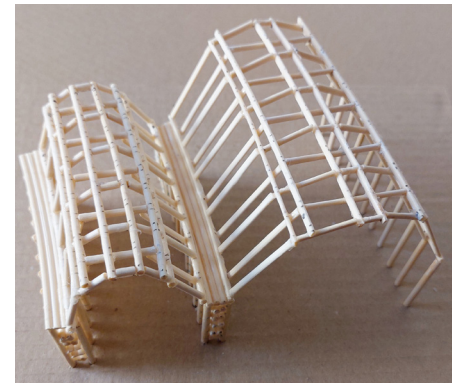
CHOICE OF SCALE - PAVILION



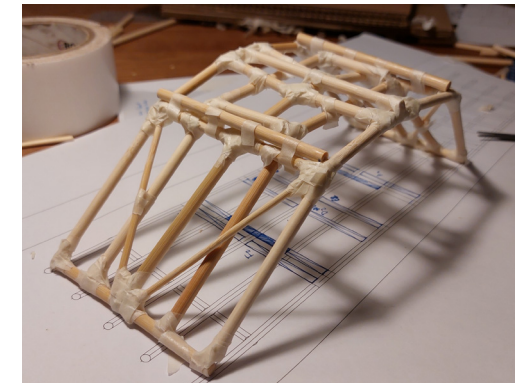
CHOICE OF MATERIAL - BAMBOO



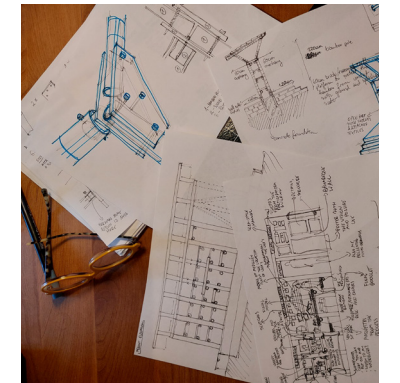
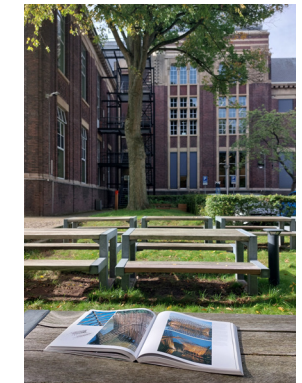
MODULARITY



DIVISION INTO TWO ARCHED SPACES



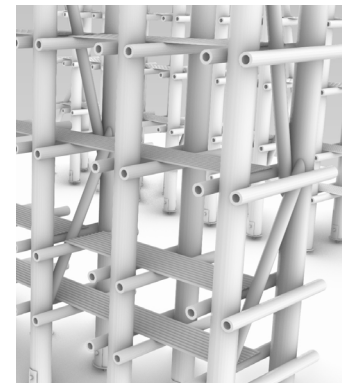
CHINESE WOVEN ARCH BRIDGES



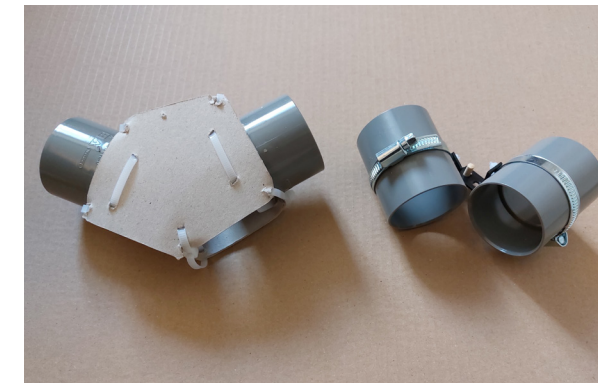
MEETINGS WITH VARIOUS EXPERTS



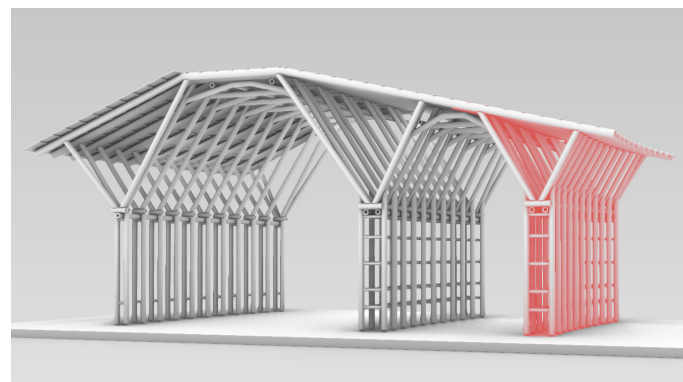
PROJECT VISION



WALL-SHELF SYSTEM, LASHING



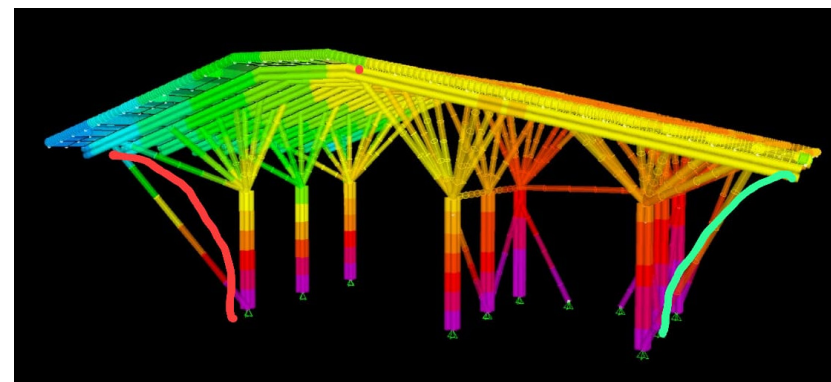
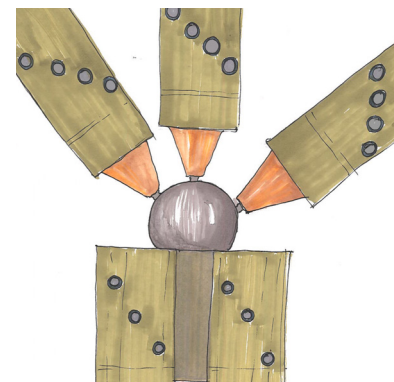
VARIOUS IDEAS FOR JOINTS



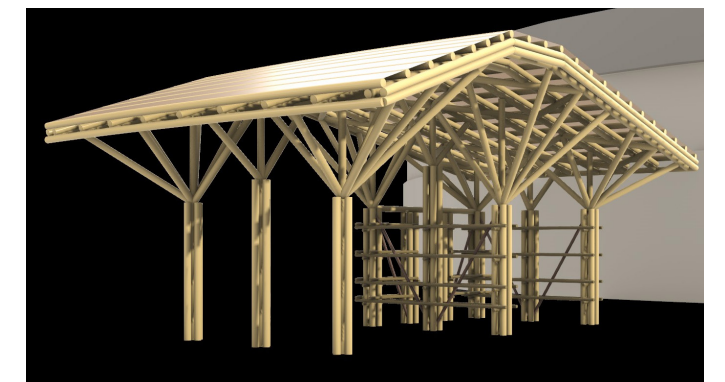
GREEN VILLAGE - 1:1 PROTOTYPE IDEA



PREFABRICATION IN COLOMBIA - JOINT CONCEPT

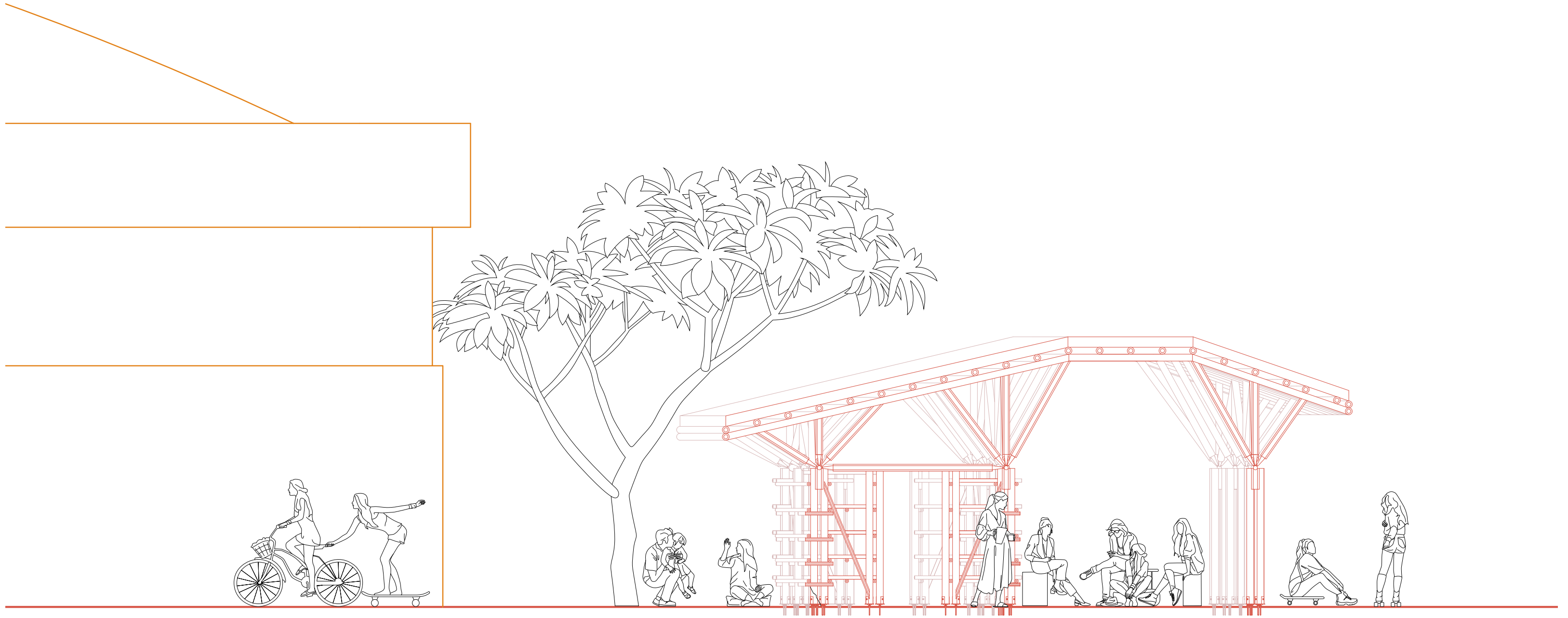


COOPERATION WITH A STRUCTURAL ENGINEER

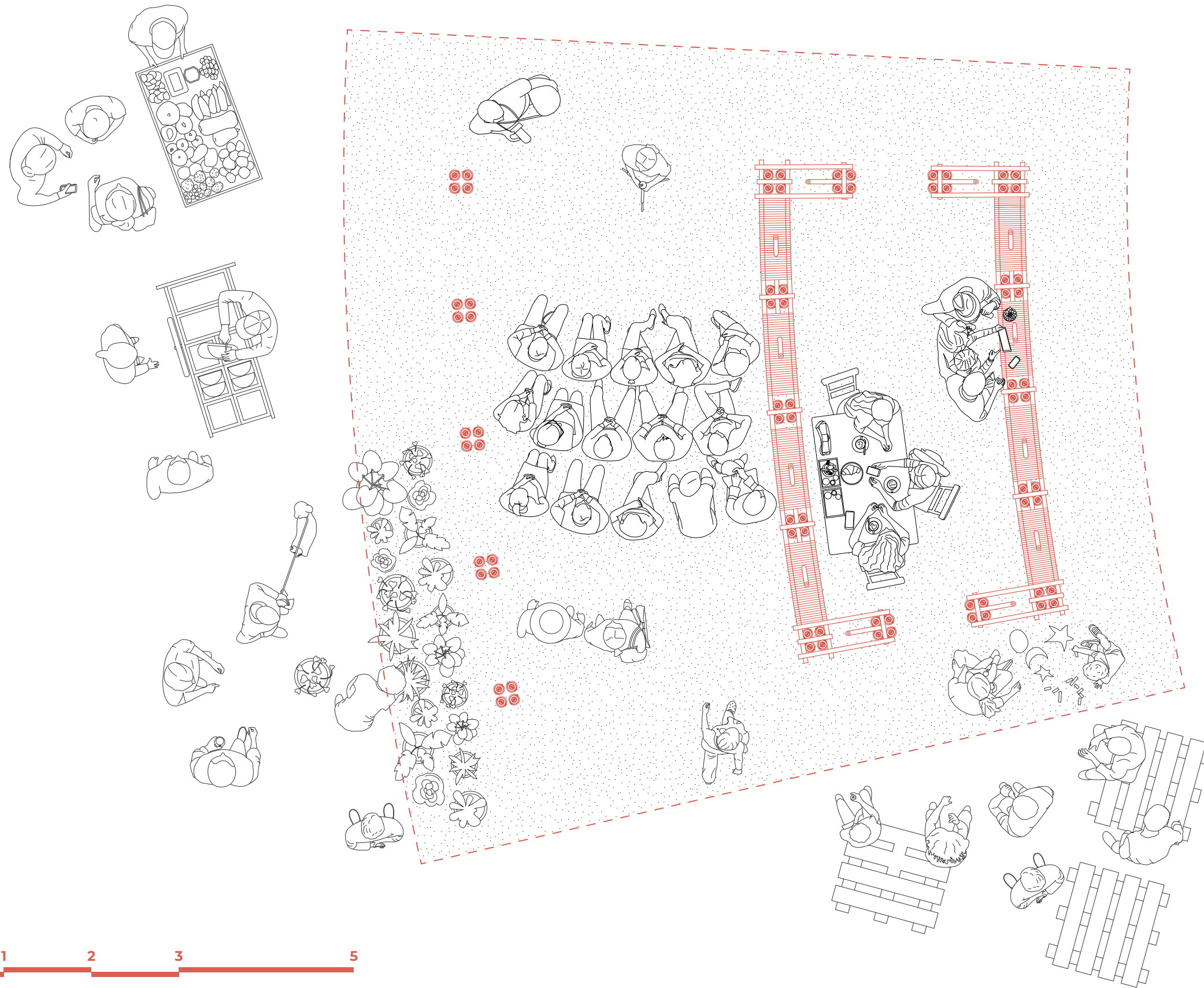


CHANGE OF STRUCTURAL SYSTEM

SECTION



# FLOOR PLAN



# ARCHITECTURE AND REFERENCE IMAGES

A SMALLER AND MORE APPROACHABLE SCALE IN THE CONTEXT OF A LARGE PUBLIC SPACE, AND A BIG, RIGID WATER TANK

PROTECTION FROM SUN AND RAIN, BIO-BASED AND NATURAL ELEMENTS IN AN URBAN SPACE WITH A LOT OF CONCRETE

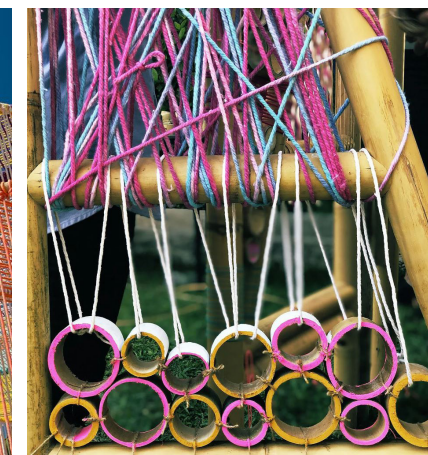
CONSTRUCTION SYSTEM, THAT EVERYONE CAN UNDERSTAND, FIX, AND CARE FOR, EMPOWERMENT THROUGH CONSTRUCTION



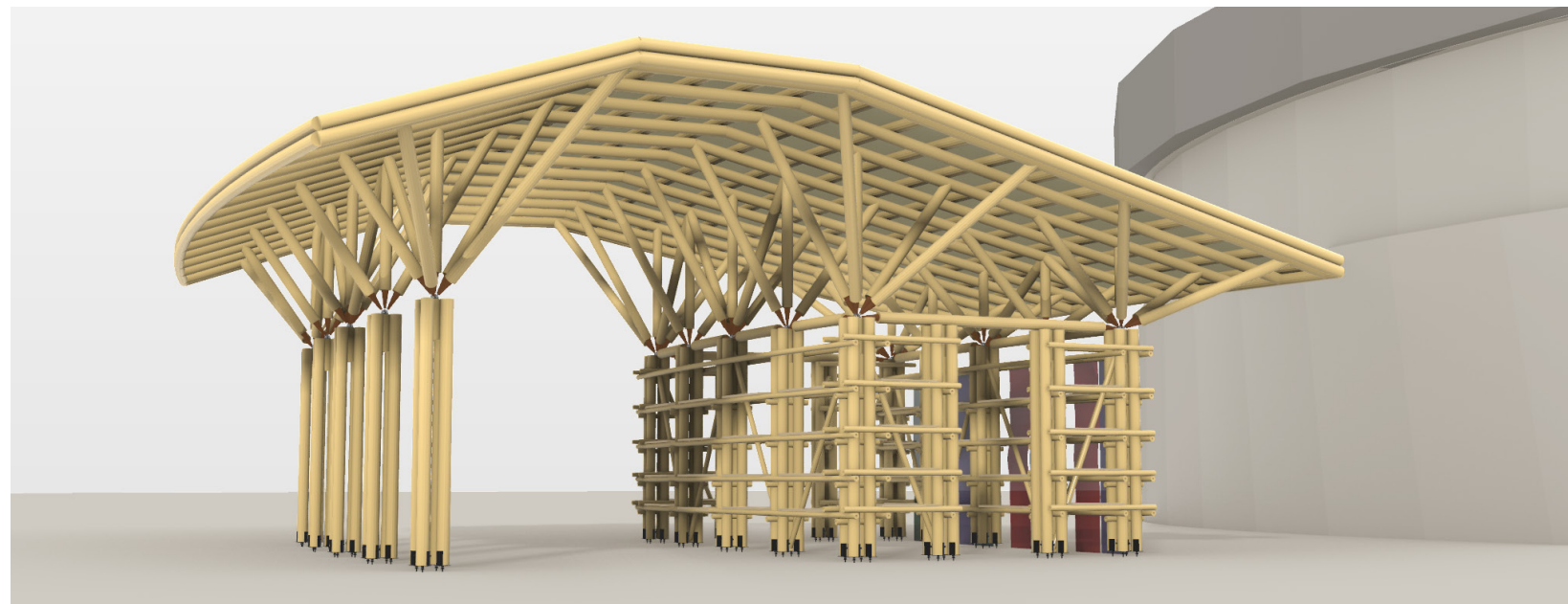
Source: Morag Myerscough.



Source: Torjans.



Source: Eleena Jamil Architect.



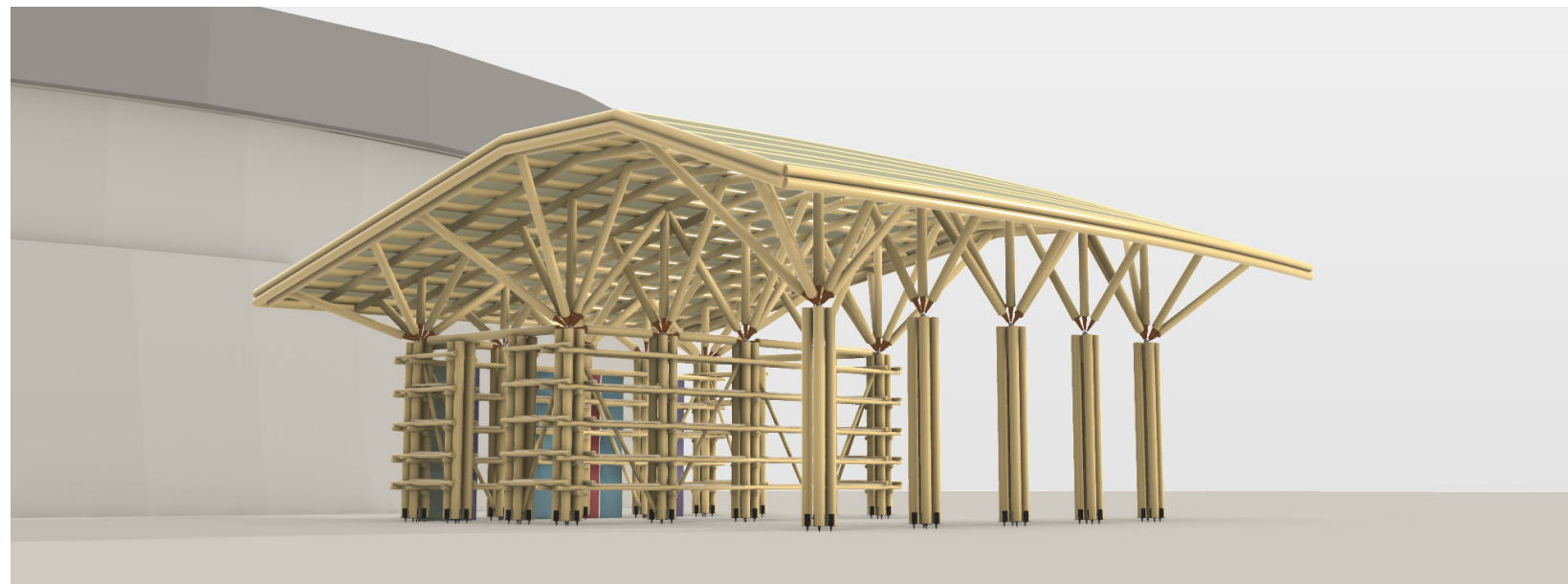
Source: Bamboo Import Europe.



Source: Eleena Jamil Architect.



Source: Ruta 4 Taller.



Source: Chiangmai Life Architects.



Source: Bamboo U.



Source: Eleena Jamil Architect.



Source: AtArchitecture.

CHOICE OF MATERIALS



GUADUA BAMBOO  
POLES AND SPLITS



NATURAL HEMP  
ROPE



GALVANIZED STEEL,  
THREADED RODS



LOW VEGETATION,  
SUBSTRATE WITH  
RECYCLED BRICKS



RECYCLED  
EXPANDED CORK



RECYCLED JUTE  
FROM COFFE AND  
COCOA BAGS



PEACH STONES  
(PEACH PITS)



TEXTILES



## APPROPRIATION AND USE

The pavilion is designed as a frame or skeleton, which can be easily altered. The walls serve as shelves, and the entire pavilion becomes a piece of furniture. It is inviting and natural to change something or add new parts. Women can easily hang or screw additional elements, like lightweight textiles, ropes, decorations, lighting or they can fully enclose some parts for privacy, for example with glass panels, additional bamboo pieces, weaved mats, or a Colombian *bahareque* technique, similar to wattle-and-daub.



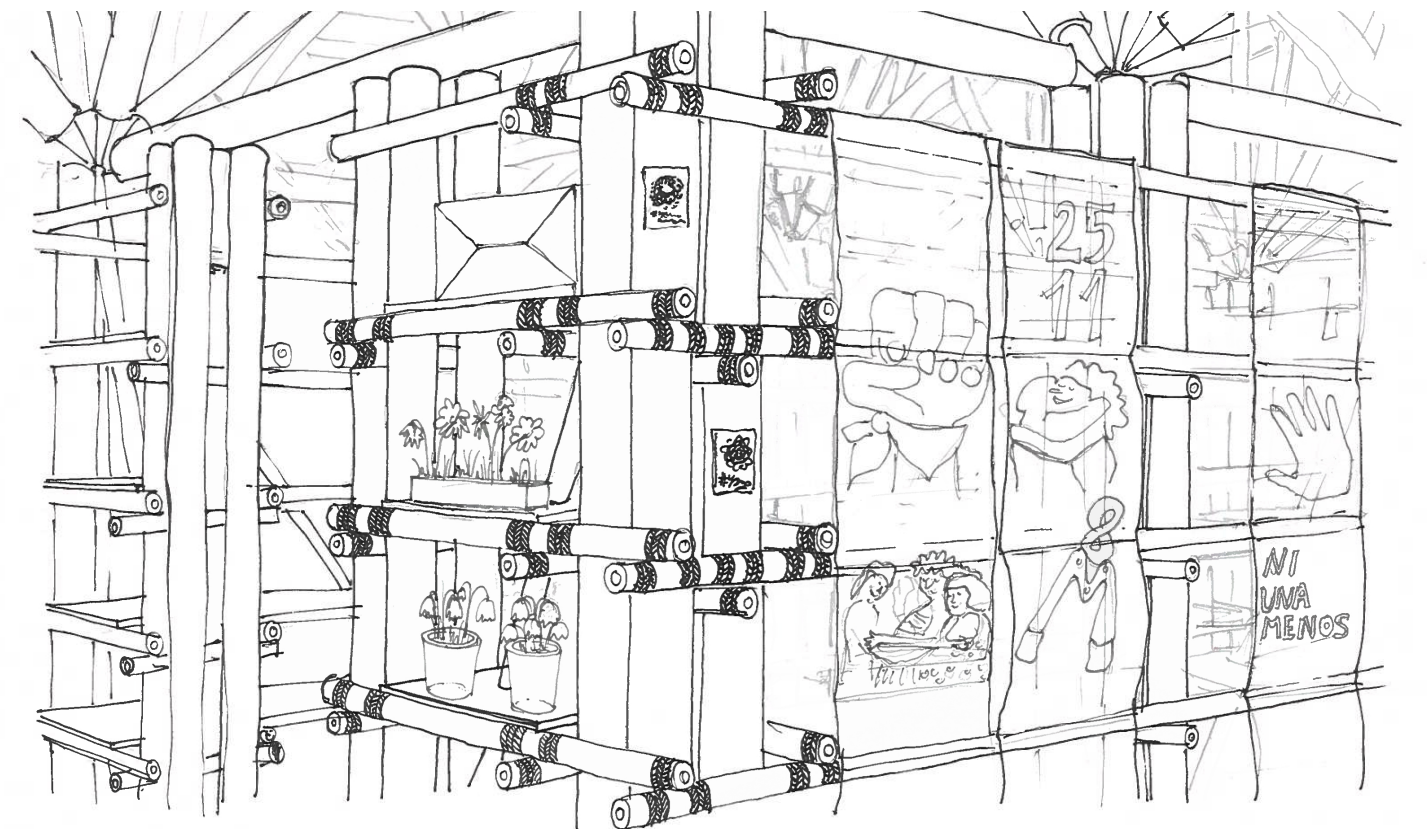
IKN Bamboo Pavilion. Source: <https://ej-architect.com/>



Improved bahareque by Álvaro Mosquera. Source: ArchDaily.



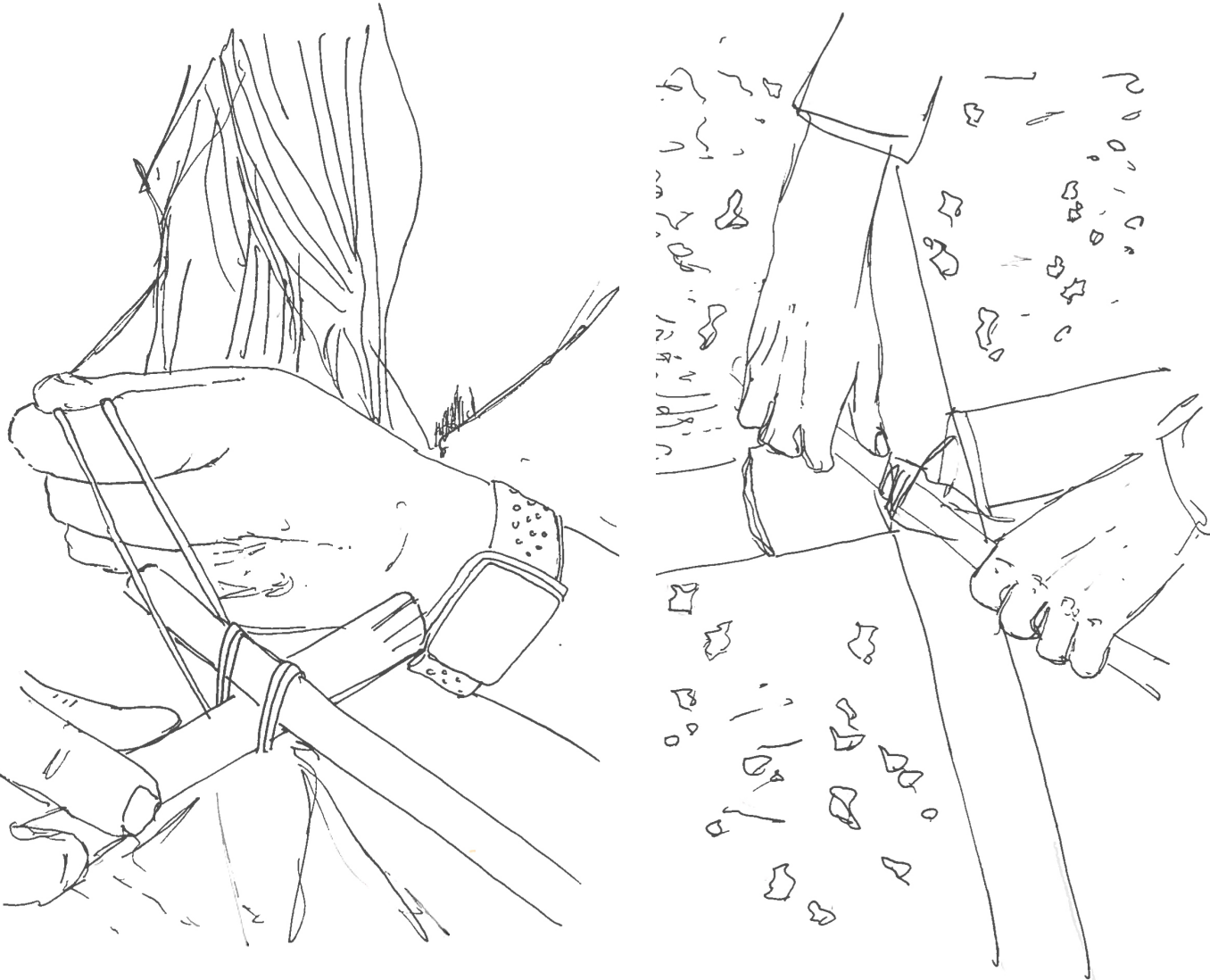
Villaggio Save The Children Source: ArchDaily.



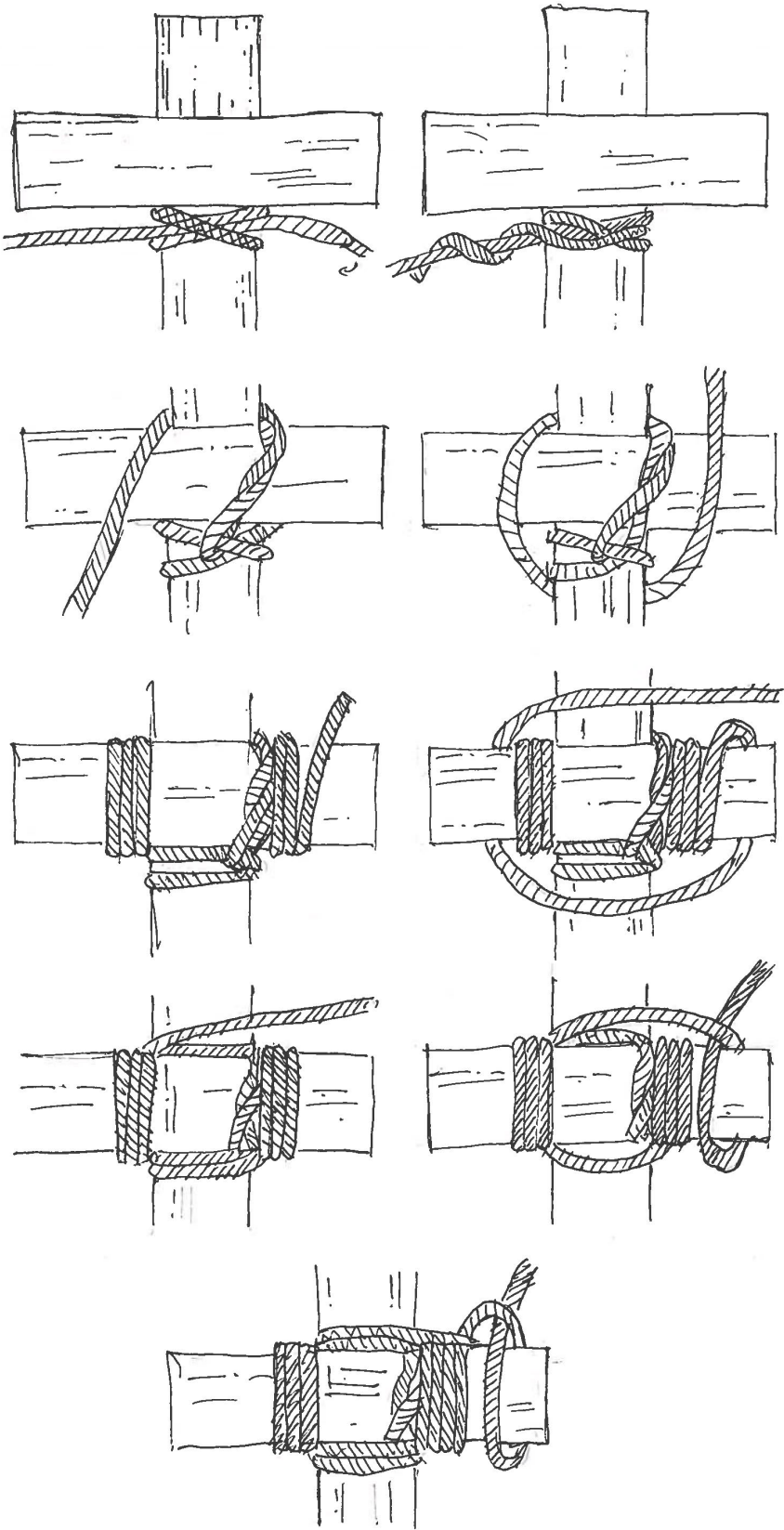


LASHING JOINTS

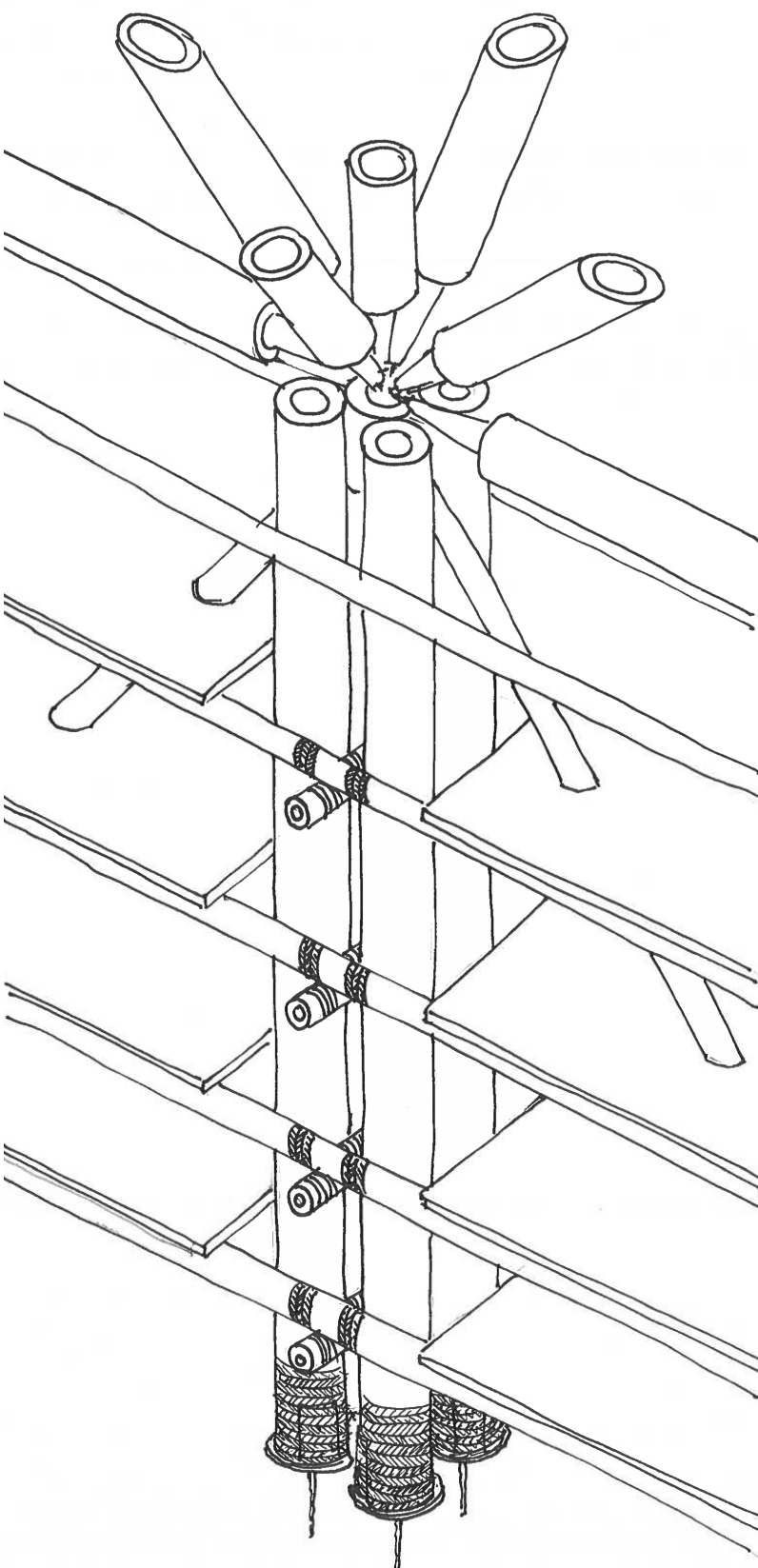
Lashing joints are low-tech, safe, and require no tools - they are suitable for community building. In the process of lashing the joints, there is time for being together, getting to know each other - creating bonds. These connections are ecological, dismantable and low-cost. However they tend to loosen over time, they are time- and labor-consuming, and require some skill.



WOMEN FROM THE NEIGHBOURHOOD WILL BE INVITED TO CREATE LASHING JOINTS IN THE LOWER PARTS OF THE STRUCTURE, CREATING A FLEXIBLE SHELF/WALL SYSTEM.

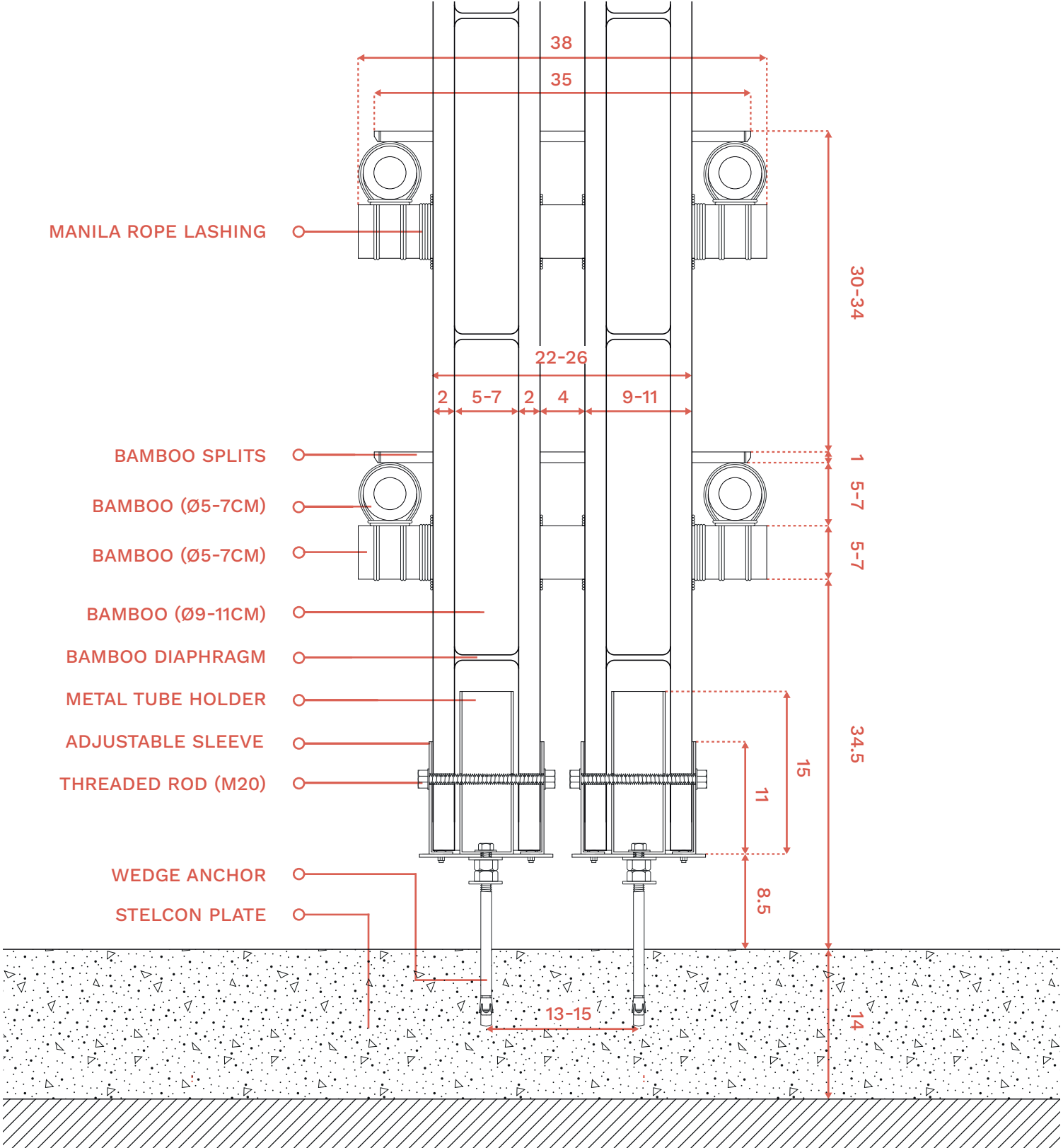


SQUARE LASHING AND THE PROCESS OF TYING THE KNOT

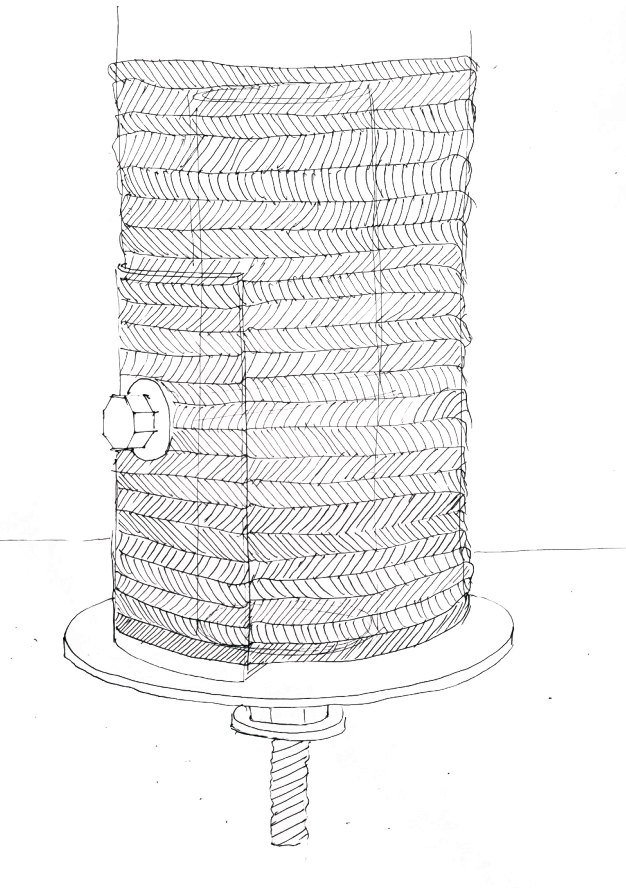


VIEW OF THE SHELVES MADE WITH LASHING JOINTS

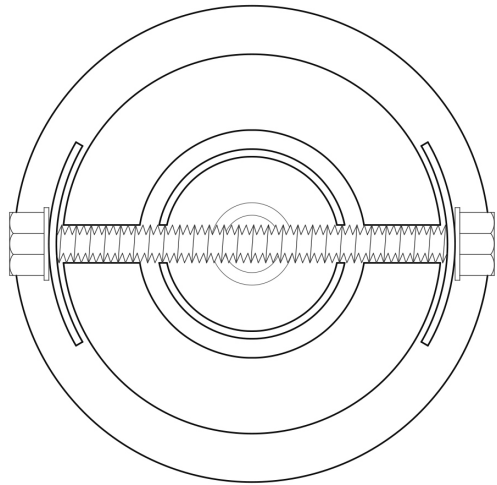
# REVERSIBLE FOUNDATION



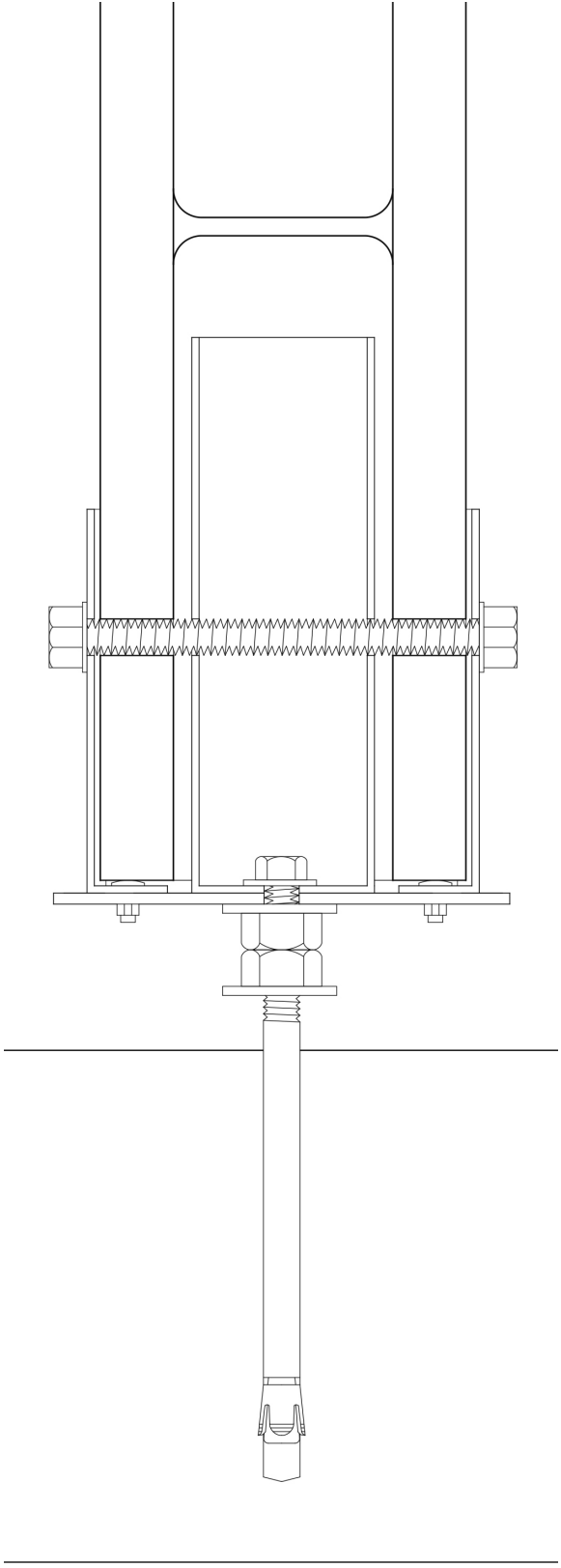
SECTION - PAVILION BASE DETAIL  
1:5



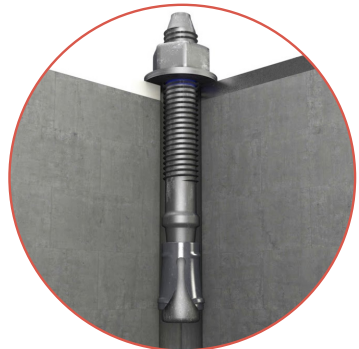
PILLAR BASE FINISHED WITH  
WAXED NATURAL ROPE



PLAN - FOUNDATION DETAIL  
1:2



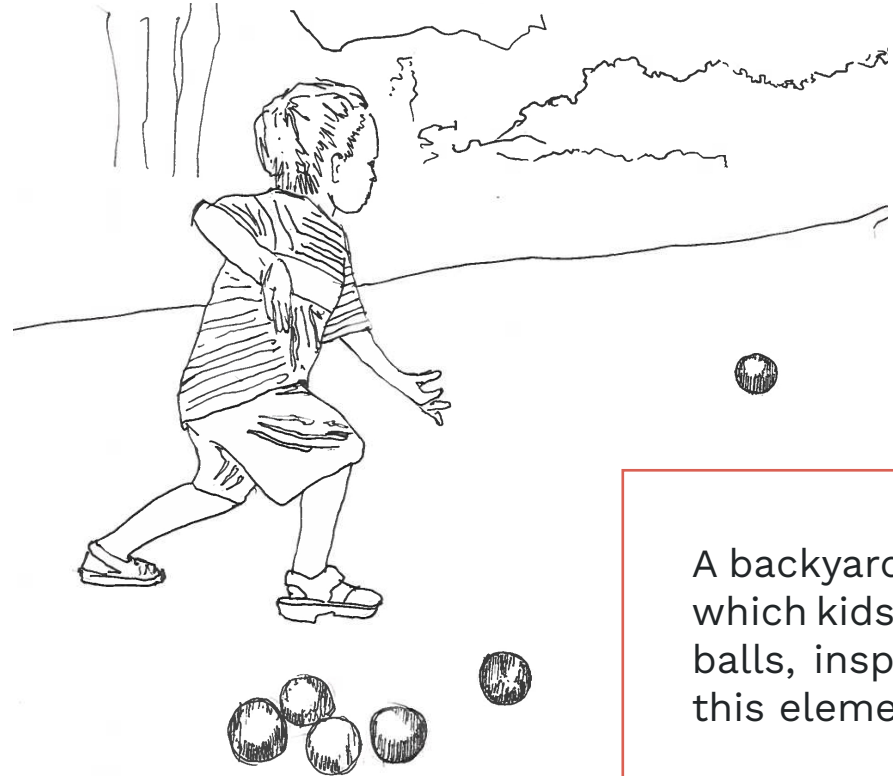
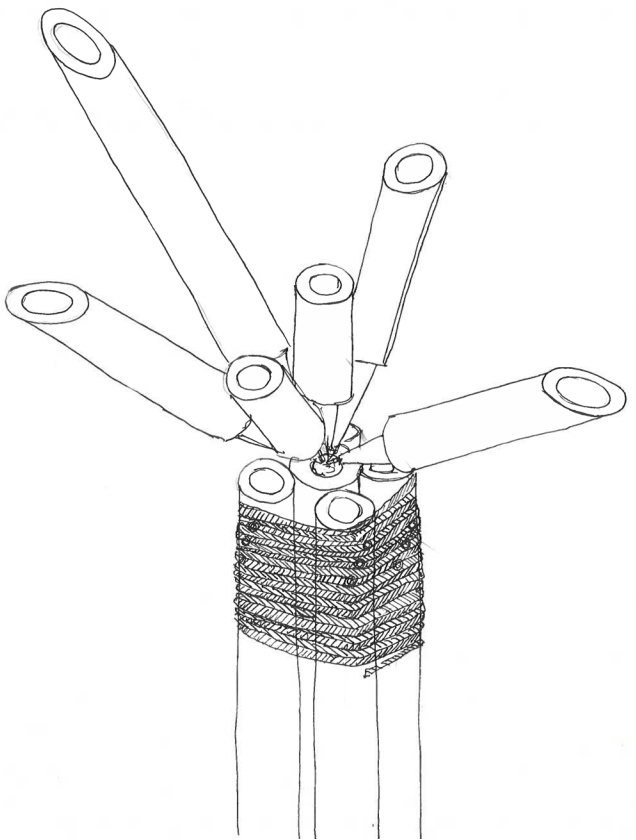
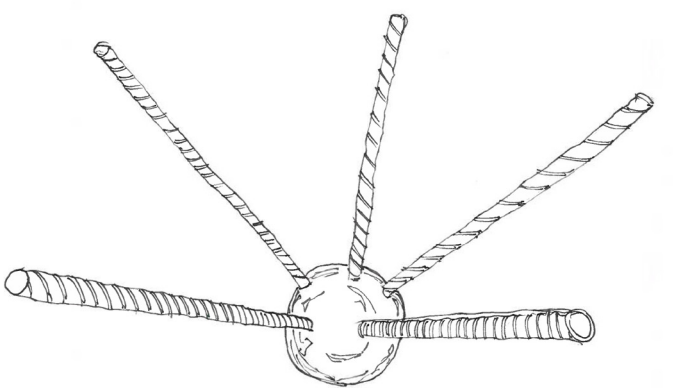
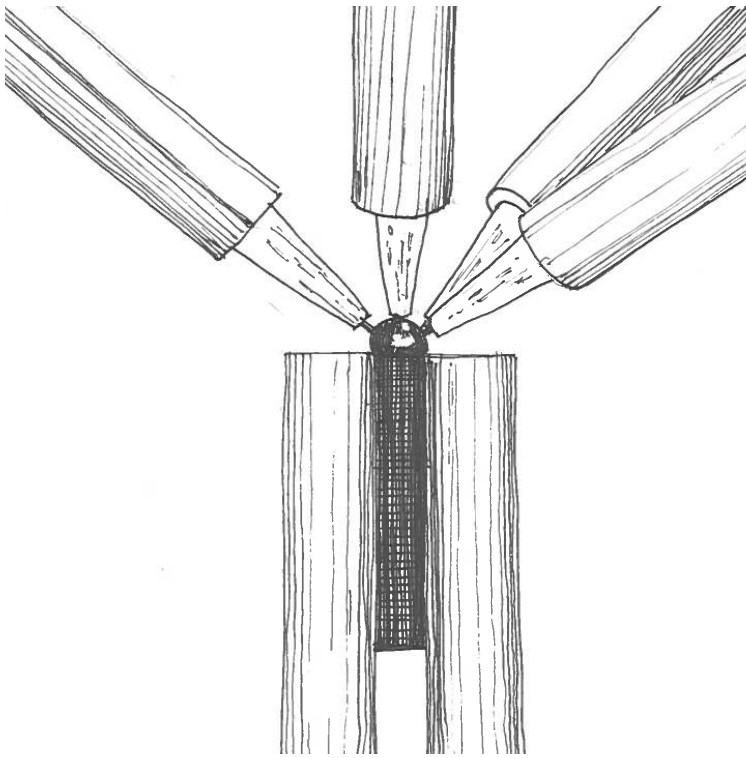
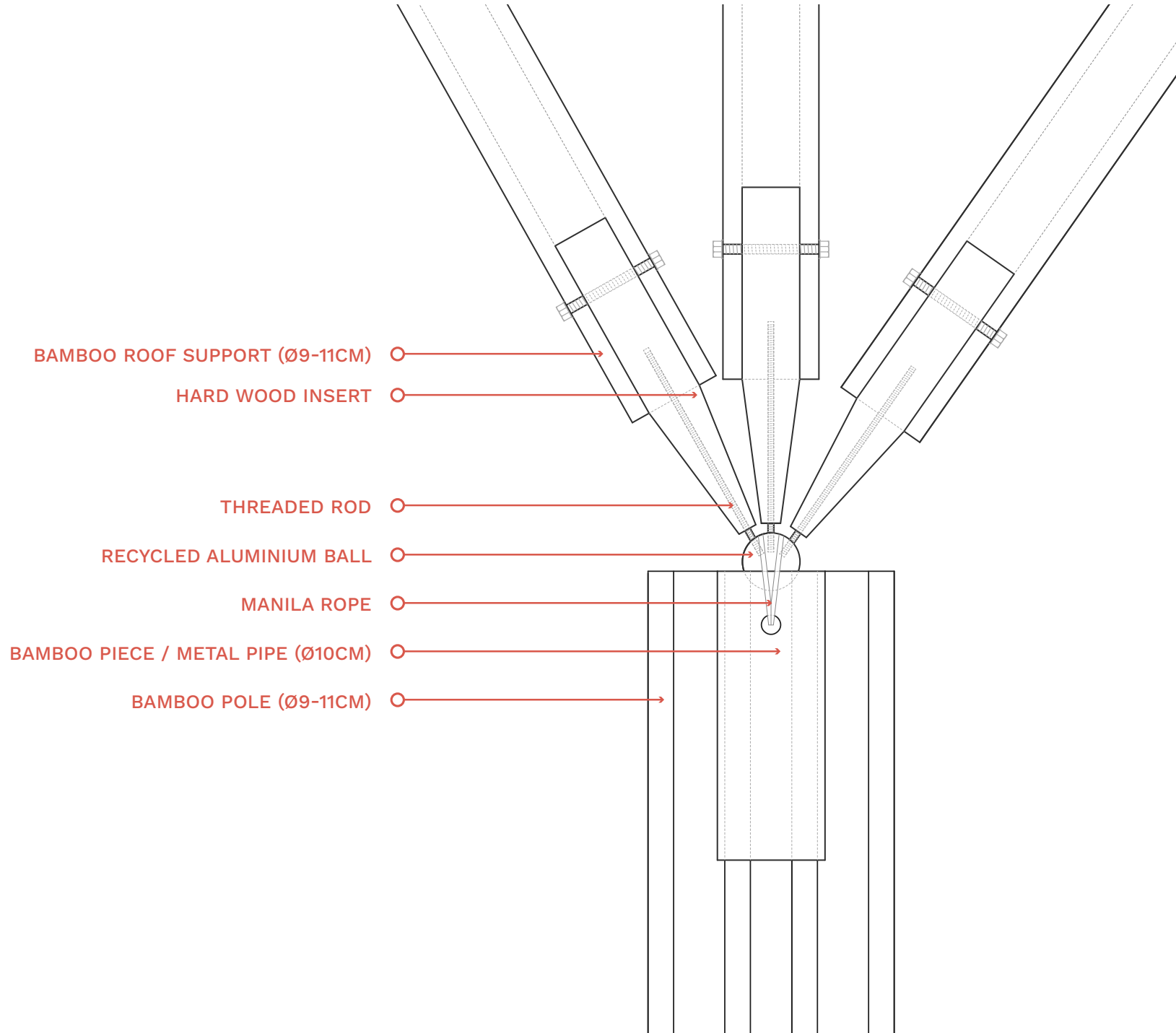
SECTION - FOUNDATION DETAIL  
1:2



REFERENCE IMAGES OF  
FOUNDATION ELEMENTS

PREFABRICATED JOINTS CRITICAL FOR SAFETY AND EASE OF CONSTRUCTION

The most complex joints, which are also critical for safety, will be prefabricated. A recycled aluminium ball, resting on a cylinder inserted between the columns will serve as the main connector. This joint allows for great flexibility in connecting several bamboo poles at various angles.



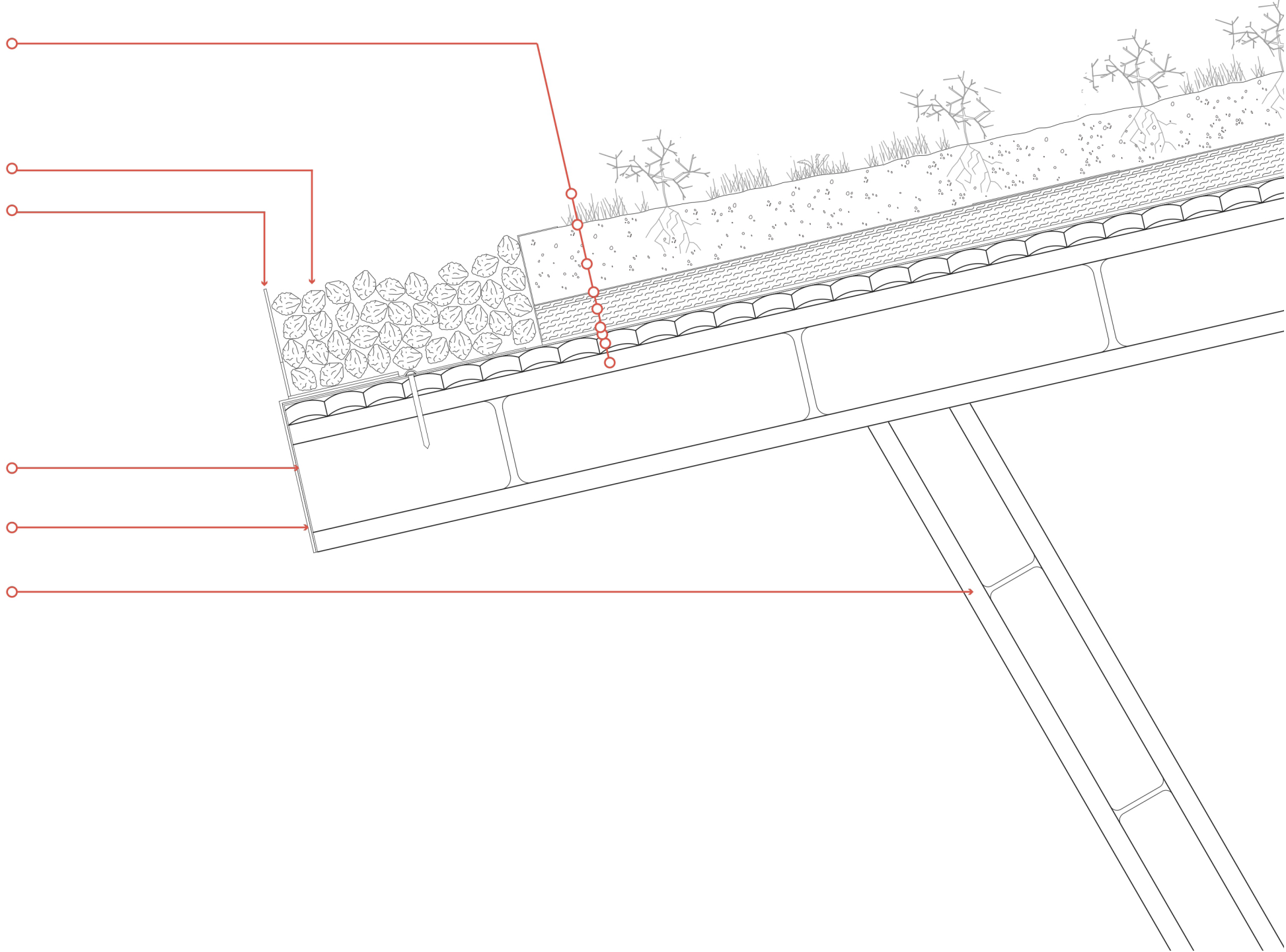
A backyard game popular in Colombia, in which kids play with recycled aluminium balls, inspired Esteban Morales to use this element in a bamboo joint.

# GREEN ROOF WITH NATURAL AND BIOBASED LAYERS

ROOF LAYERS (FROM THE BOTTOM):  
 BAMBOO RAFTER (Ø13-15CM)  
 LAYER OF BAMBOO SPLITS - MAT  
 BIOBASED SUGER CANE 'EPDM' 1.5MM  
 JUTE-BASED GEOTEXTILE 2MM  
 EXPANDED CORK 4CM  
 JUTE BAGS FROM COFFEE AND COCOA  
 INDUSTRY - FILTER  
 SUBSTRATE (COMPOST, SOIL,  
 RECYCLED BRICKS, SHEEP WOOL) 8CM  
 ANTI-EROSION JUTE MESH  
 GREENERY LAYER

PEACH PITS (ALTERNATIVE TO GRAVEL)  
 ALUMINIUM RETENTION ANGLE 12X12CM

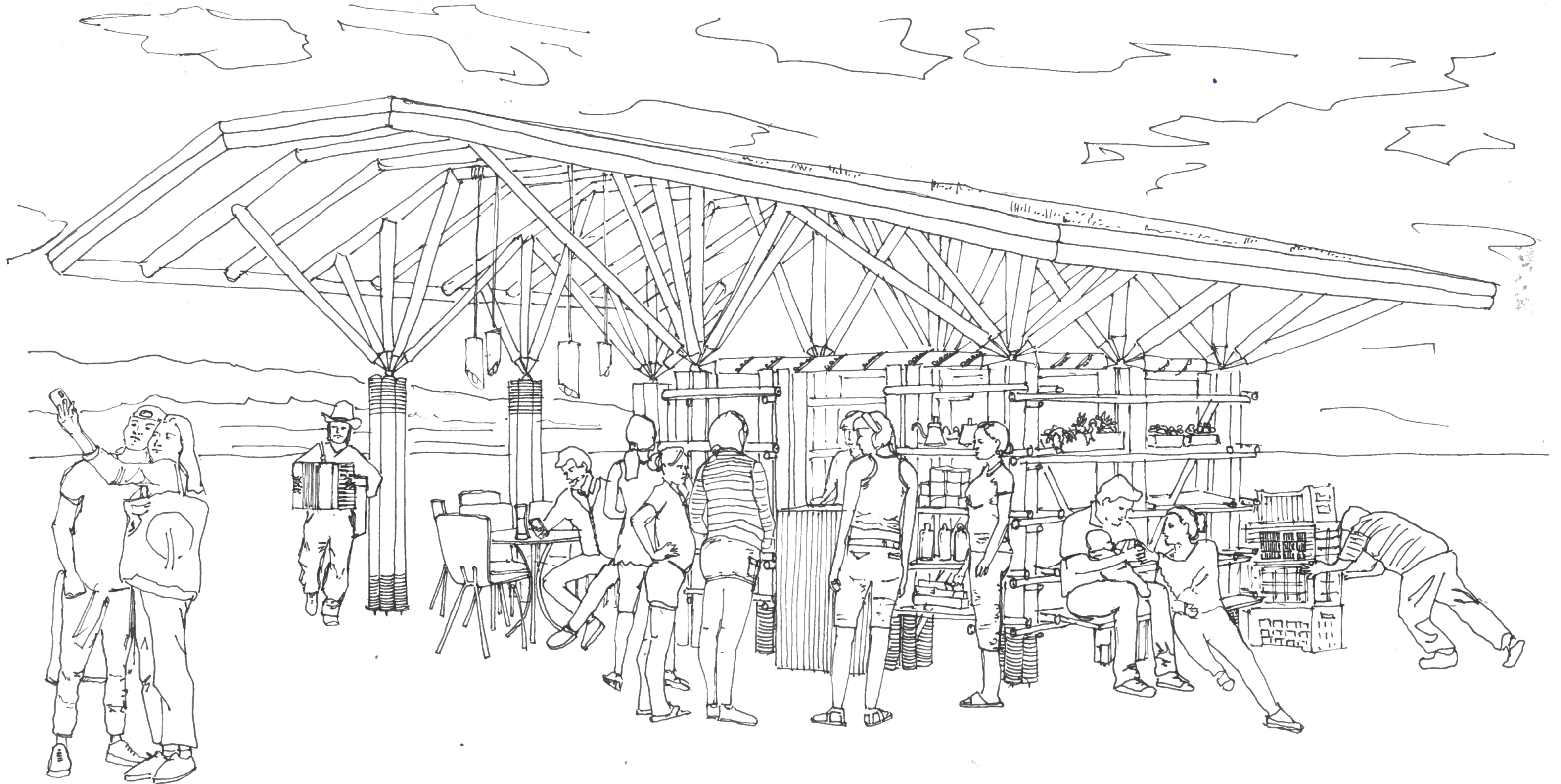
BIOBASED SUGER CANE 'EPDM' 1.5MM  
 ALUMINIUM ANGLE  
 BAMBOO SUPPORT (Ø9-11CM)



DETAIL: ROOF BOTTOM EDGE

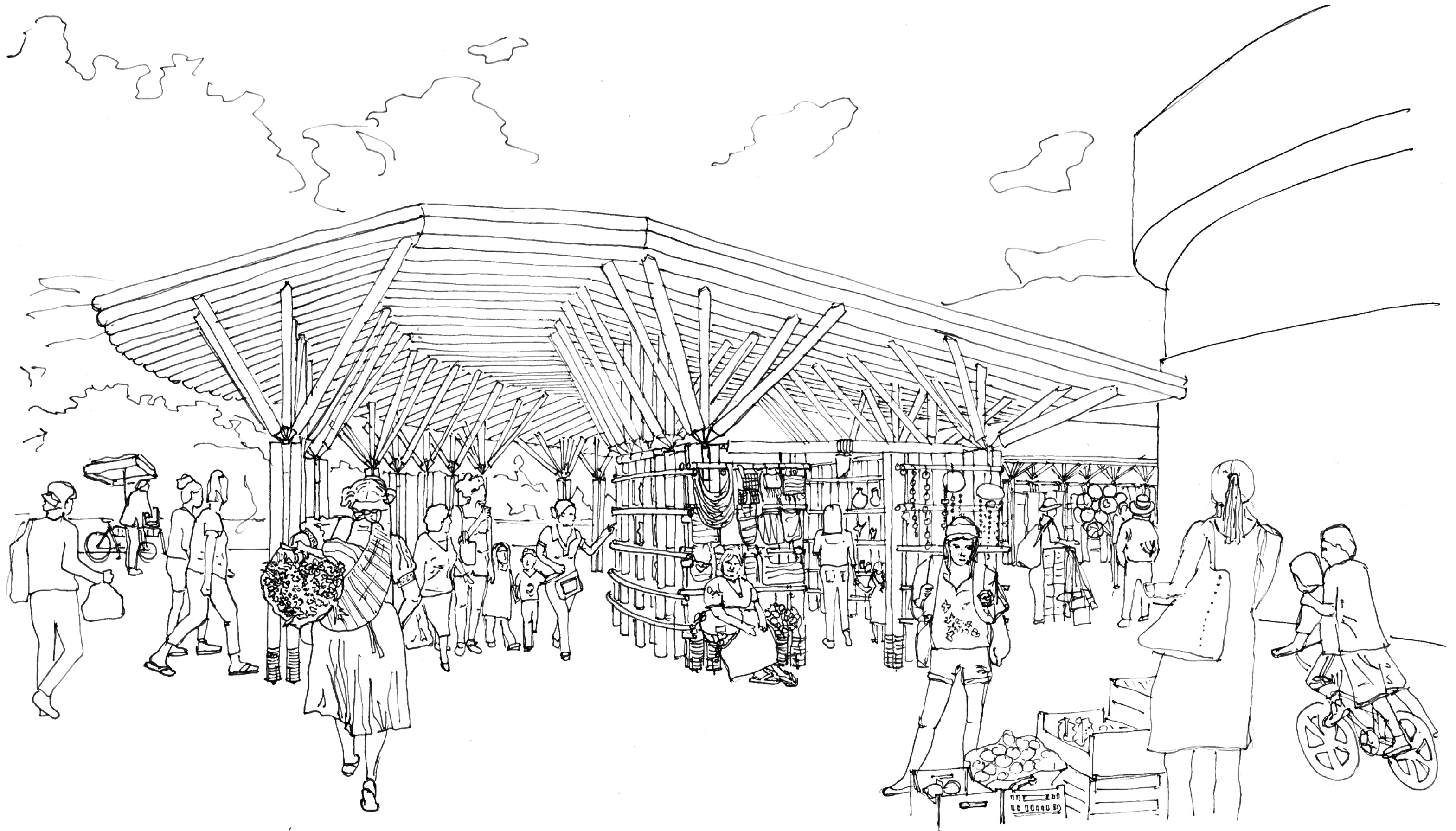


REFERENCE IMAGES



ARCHITECTURAL EXPRESSION AND USE OF THE PAVILION - 2 MODULES





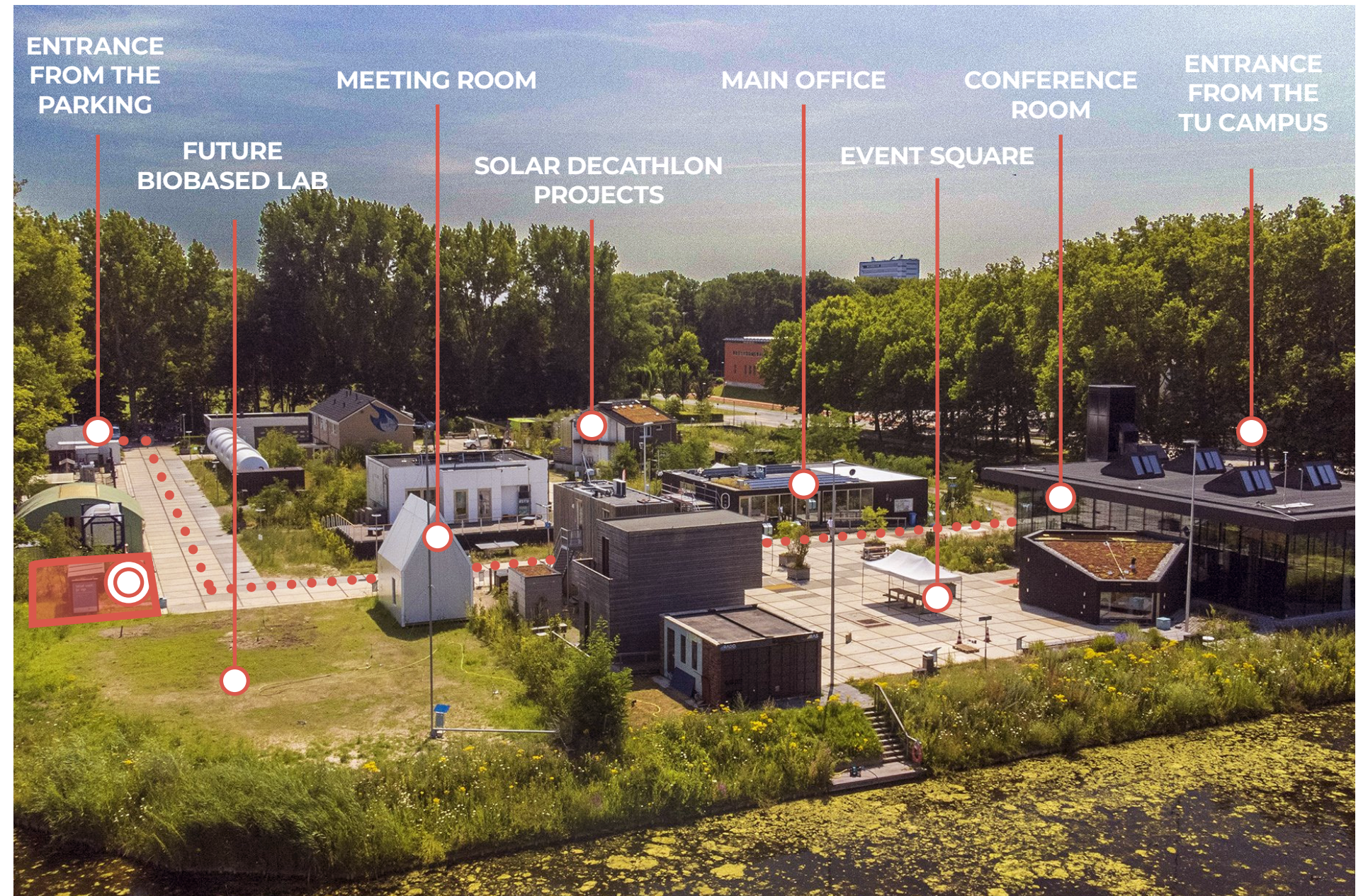
# GREEN VILLAGE - 1:1 PROTOTYPE - NEW CHALLENGES: TWO CLIMATE ZONES, PREFABRICATION, SHIPMENT

A unique opportunity to prototype the pavilion in 1:1 scale is considered at the **Green Village** in Delft. The Green Village is a field lab for sustainable innovations in built environment. The terrain is approximately 1,4 hectares (150m \* 95m) and is situated in the **center of TU Delft Campus**, Van den Broekweg 4. More than **10,000 visitors annually** witness the innovations demonstrated there.

COMPLYING WITH COLOMBIAN NORMS TO RESIST HORIZONTAL LOADS DUE TO SEISMIC ACTIVITY

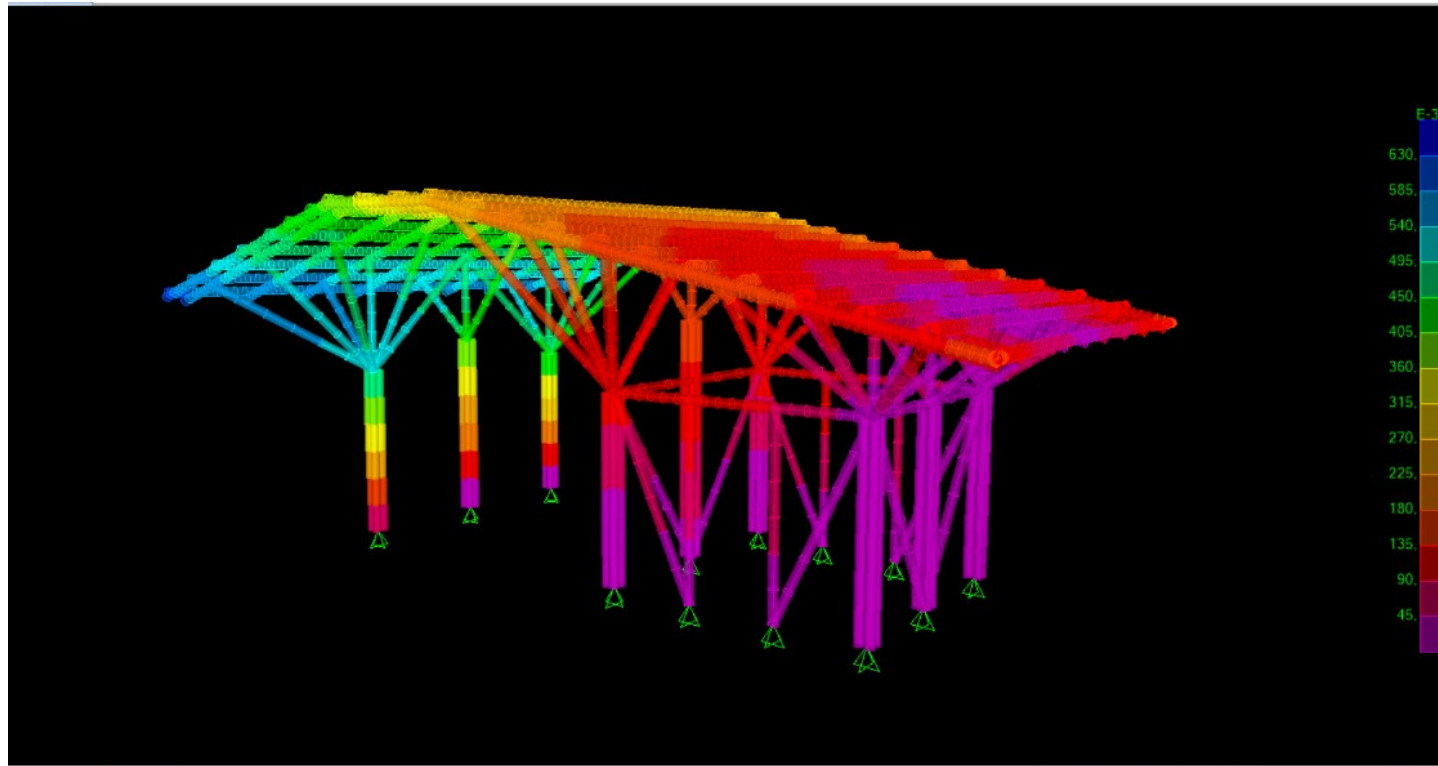
MEETING THE EUROCODE REQUIREMENTS FOR HORIZONTAL LOADS DUE TO WIND AND VERTICAL LOADS DUE TO SNOW

OPTIMIZING THE MATERIAL USE TO FIT ALL BAMBOO INTO ONE SMALL 20FT CONTAINER, AND TO FIT ON THE SELECTED LOT

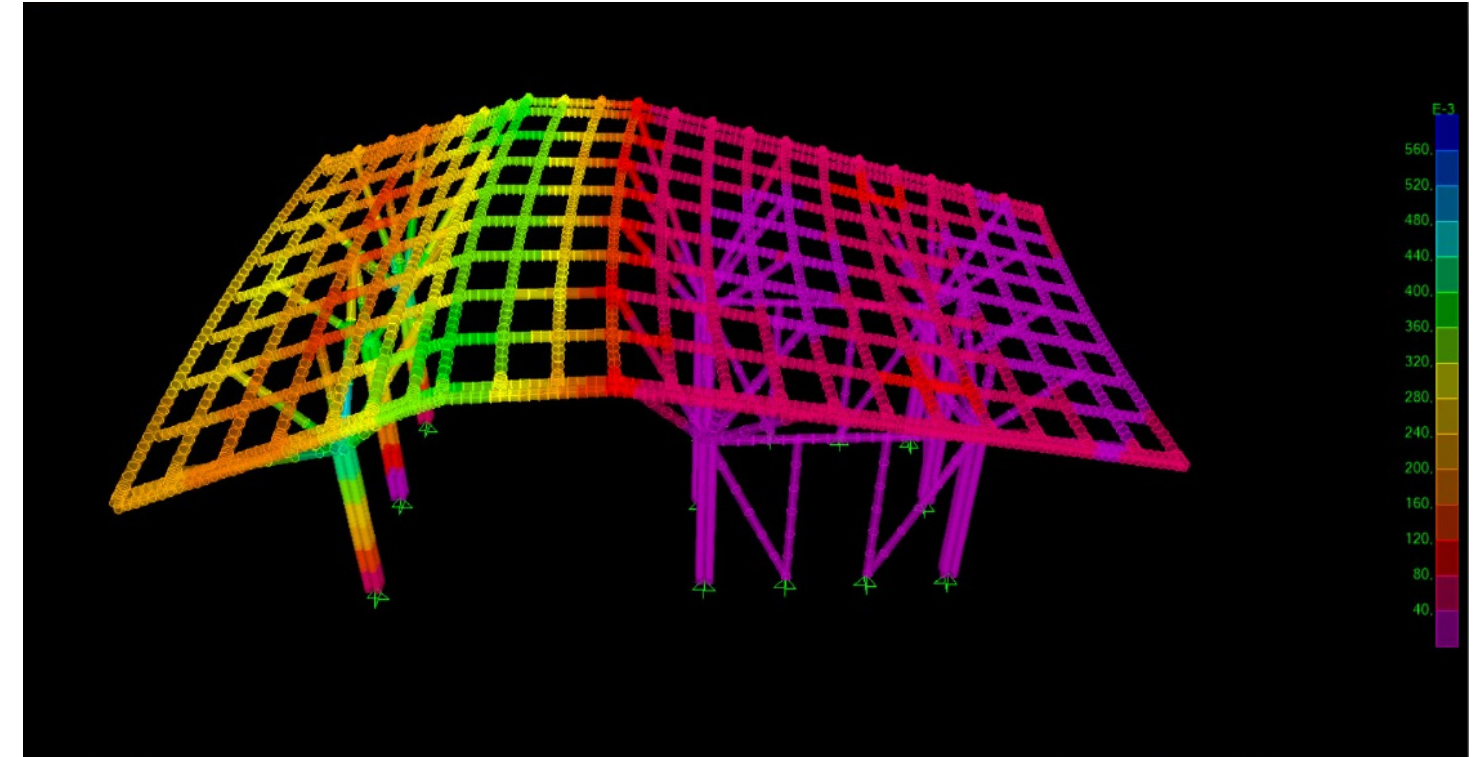




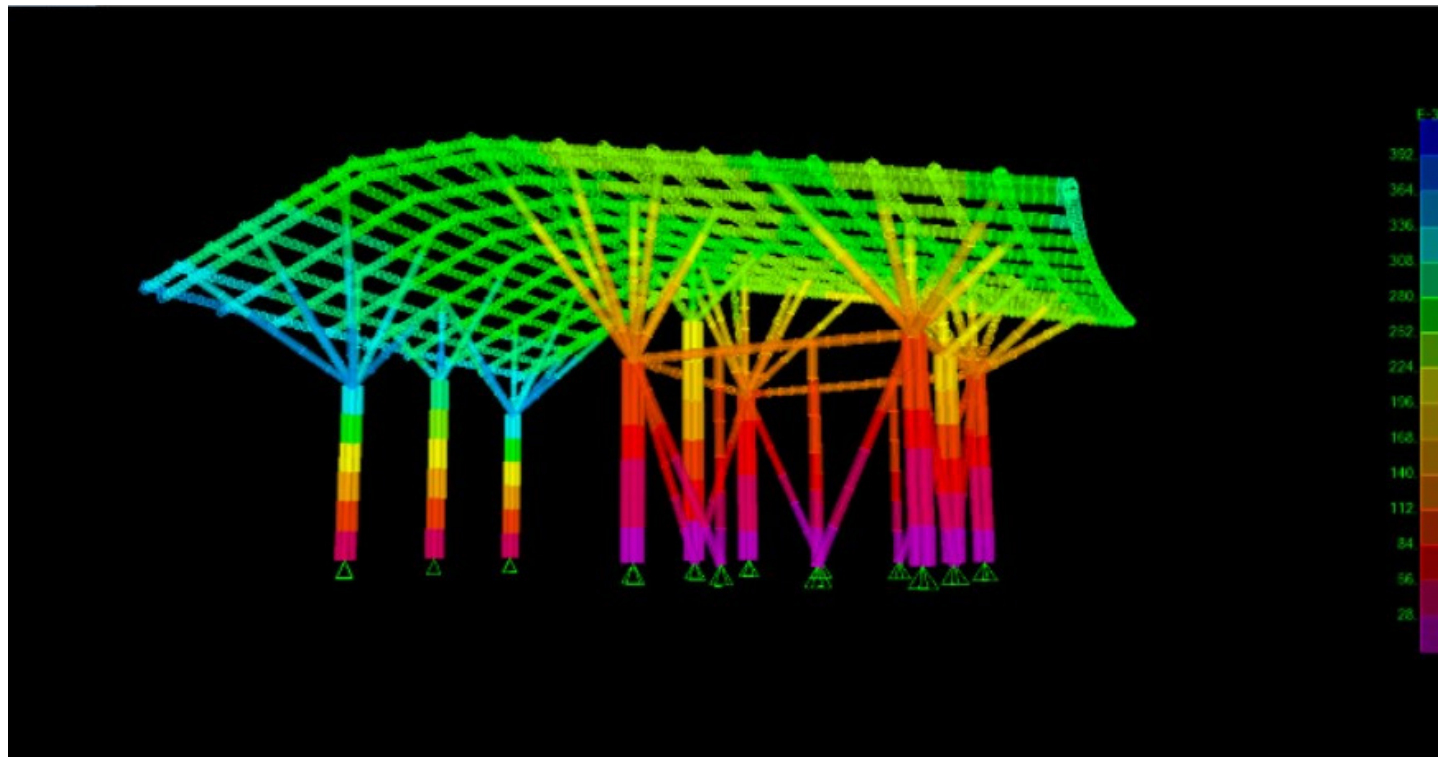
# STRUCTURAL ANALYSIS



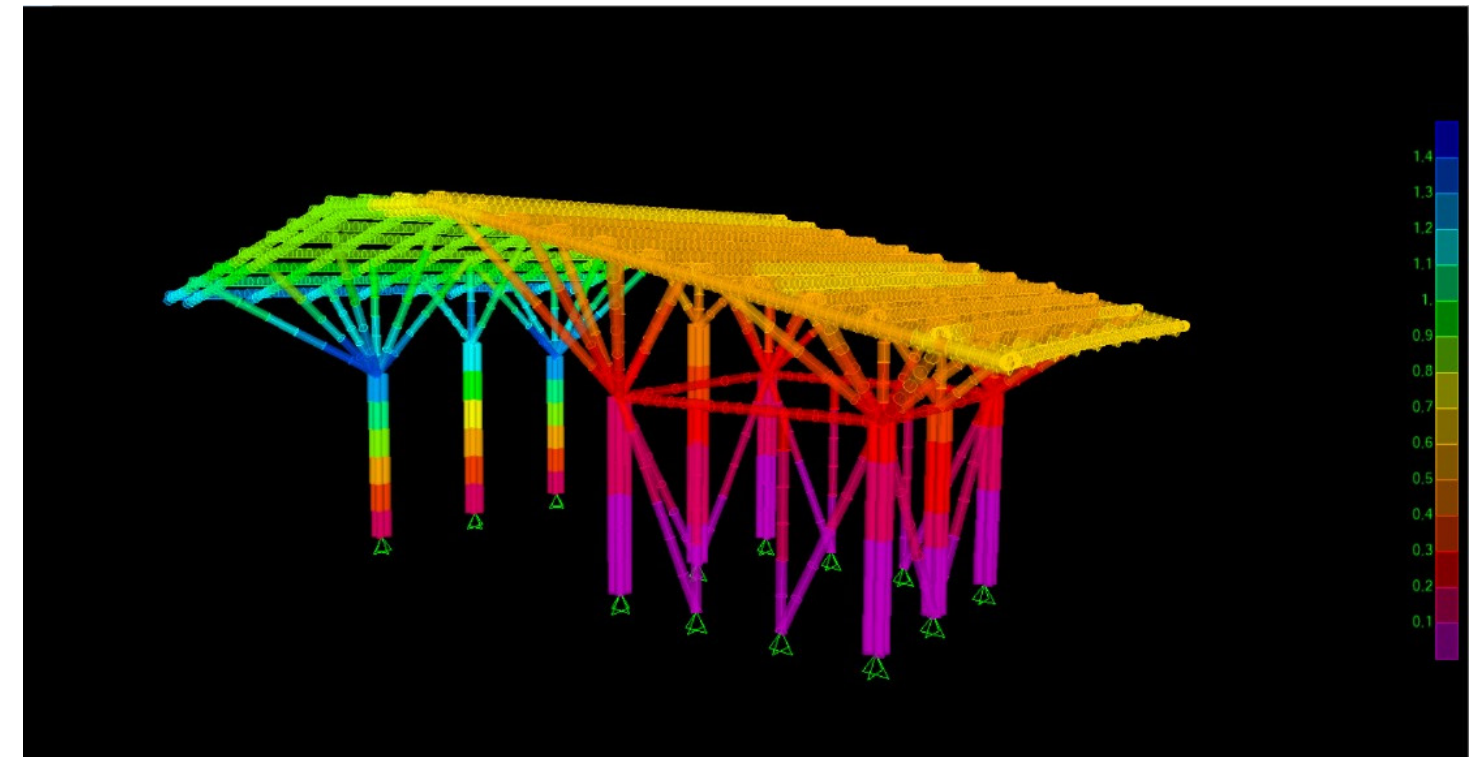
Assumed loads: green roof layers 80kgf/m<sup>2</sup>, snow 70kgf/m<sup>2</sup>, temporary presence of people on top 35kgf/m<sup>2</sup> - in accordance with the Eurocode and the Colombian standards. Structural analysis by Esteban Morales.



Deformations due to vertical loads - weight of the green roof, snow and temporary access of people. Structural analysis by Esteban Morales.



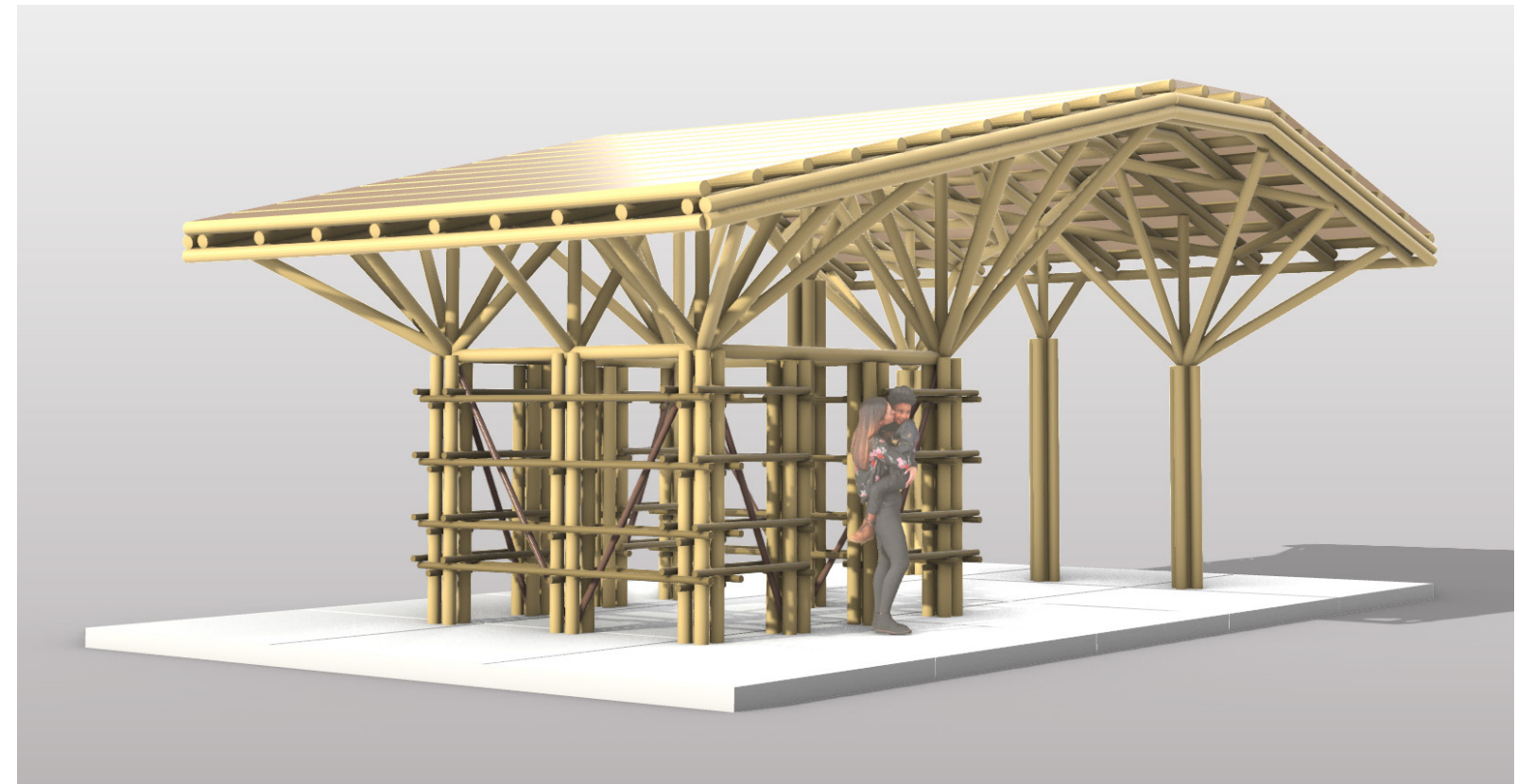
Displacements due to wind. Meeting the Eurocode for the Netherlands. Structural analysis by Esteban Morales.



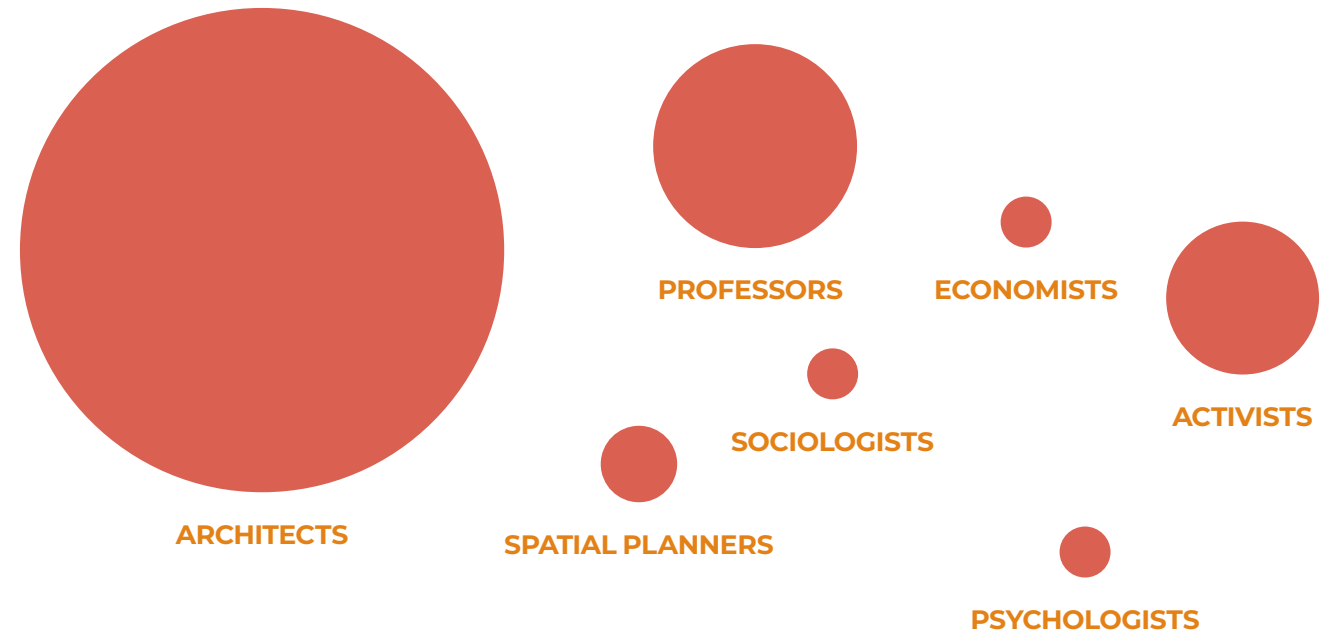
Displacements due to seismic activity. Meeting the Colombian building codes. Structural analysis by Esteban Morales.

## PROTOTYPE AT THE GREEN VILLAGE - EXHIBITION SPACE

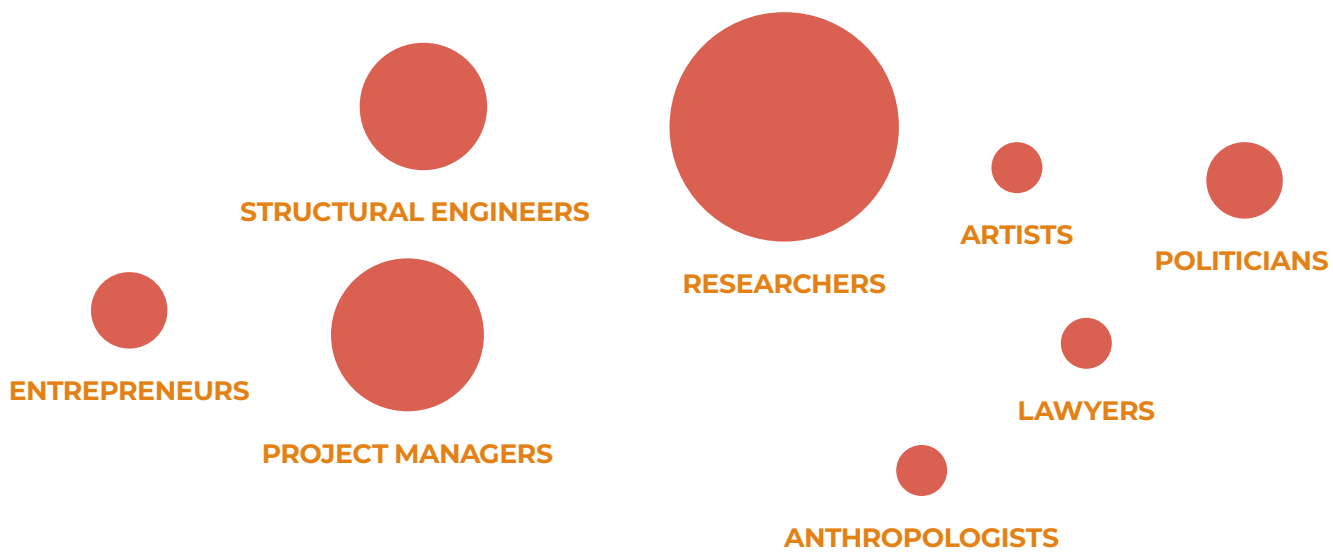
I hope that the pavilion at the Green Village will become a space for the exchange of knowledge and interaction on the topics of social and environmental sustainability. If built, the pavilion could become a significant innovation, as to this date there are no permanent bamboo structures in the Netherlands, and in Europe.



- DELFT, THE NETHERLANDS
- ROTTERDAM, THE NETHERLANDS
- UTRECHT, THE NETHERLANDS
- AMSTERDAM, THE NETHERLANDS
  
- BOGOTA, COLOMBIA
- MEDELLIN, COLOMBIA
- PEREIRA, COLOMBIA
  
- QUITO, ECUADOR
  
- SANTIAGO DE CHILE, CHILE
  
- MONTEVIDEO, URUGUAY
  
- BALI, INDONESIA
  
- LONDON, ENGLAND
  
- DORTMUND, GERMANY
  
- GHENT, BELGIUM
  
- KRAKÓW, POLAND
- WARSZAWA, POLAND



# INTERNATIONAL AND INTERDISCIPLINARY EXPERT NETWORK

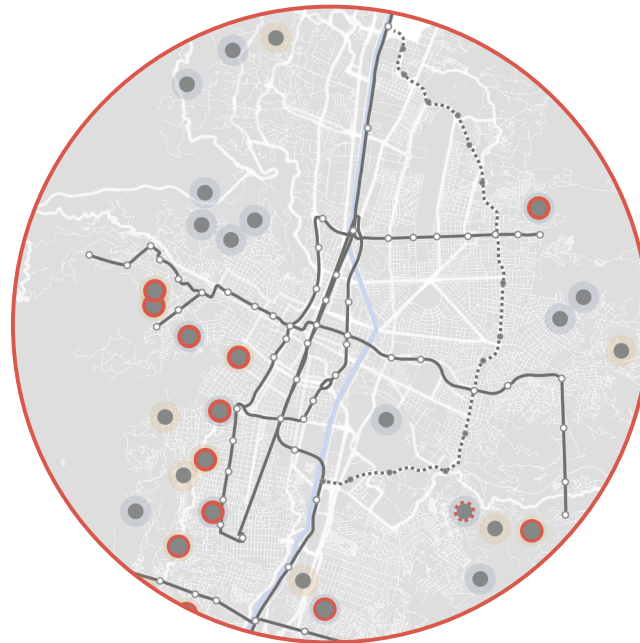


- LEONTINE DE WIT
- RUFUS VAN DEN BAN
- AMY THOMAS
- CAROLINE NEWTON
- ROBERTO ROCCO
- MARCEL BILOW
- TIM JONATHAN
- MEREL MIEDEMA
- FLOOR HOOGENBOEZEM
- ESTEBAN MORALES
- SANTIAGO PERDOMO
- P. L.
- J. D.
- S. V.
- M. P.
- R. S.
- I. K.
- D. V.
- J. L. M.
- V. B. C.
- A. M. M. R.
- M. P.
- M. M. R.
- M. G.
- N. D.
- L. C. M.
- A. M. G. M.
- M. E. R.
- A. P.
- O. S.
- P. F.
- E. S.
- P. T. S.
- M. J.
- M. U. D.
- P. J.
- S. S.
- V. T.
- C. R.
- M. T. V.
- M. S.
- F. B.
- S. C. D.
- L. F. K.
- A. B.
- J. C.-P.
- M. V. R.
- NORMAN FOSTER FOUNDATION
- RIBA
- BAMBOO U

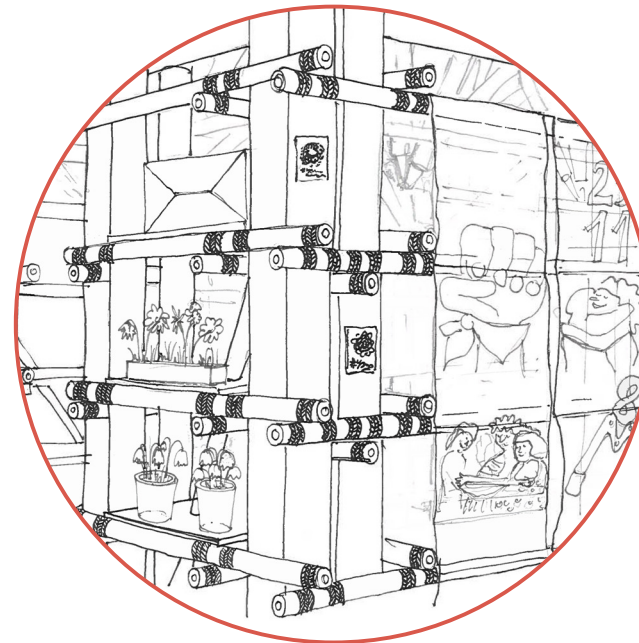
- TUTOR
- TUTOR
- TUTOR
- HPM TUTOR
- HPM TUTOR
- TUTOR
- SPONSORSHIP/PROMOTION
- SPONSORSHIP/PROMOTION
- SPONSORSHIP/PROMOTION
- BAMBOO CONSULTANT
- SPONSORSHIP/PROMOTION
- BAMBOO CONSULTANT
- BAMBOO CONSULTANT
- BAMBOO CONSULTANT
- BAMBOO CONSULTANT
- SPONSORSHIP/PROMOTION
- BAMBOO CONSULTANT
- BAMBOO CONSULTANT
- TRANSPORT AND GBV EXPERT
- GBV EXPERT
- GBV EXPERT, UN WOMEN
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT, UN WOMEN
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT, UN WOMEN
- PUBLIC SPACE EXPERT
- PUBLIC SPACE EXPERT
- TRANSPORT AND PUBLIC SPACE EXPERT
- PUBLIC SPACE EXPERT
- PUBLIC SPACE EXPERT
- PUBLIC SPACE EXPERT
- GBV EXPERT
- GBV EXPERT
- TRANSPORT AND GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- GBV EXPERT
- SPONSORSHIP/PROMOTION
- SPONSORSHIP/PROMOTION
- SPONSORSHIP/PROMOTION
- SPONSORSHIP/PROMOTION
- BAMBOO CONSULTANT

## RESULTS

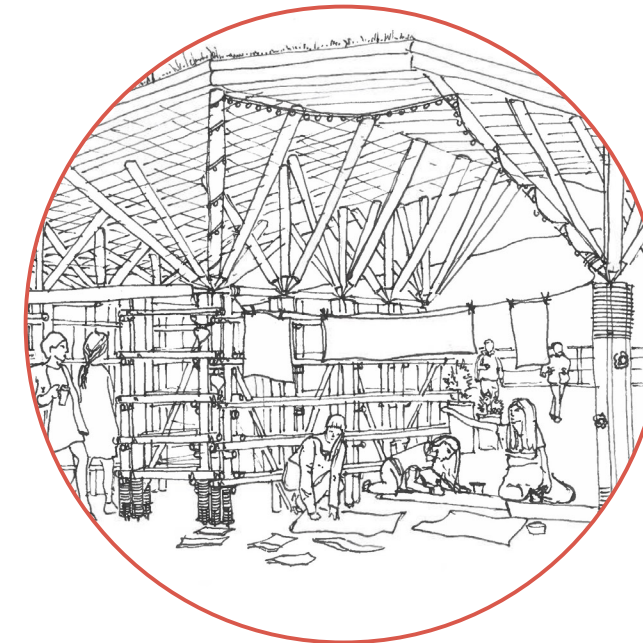
DISTRIBUTED  
MODEL OF URBAN  
INTERVENTIONS,  
STRENGTHENING  
NETWORKS OF  
MUTUAL CARE



FLEXIBILITY OF  
SPACE THAT ALLOWS  
APPROPRIATION,  
RICH PROGRAM OF  
INCLUSIVE ACTIVITIES  
AROUND THE CLOCK



PROXIMITY OF SPACES  
DEDICATED TO  
COLLECTIVE ACTION,  
ORGANIZATION, AND  
PARTICIPATION OF  
WOMEN



RESEARCH: EVALUATION OF PREVIOUS INTERVENTIONS - INTERDISCIPLINARY APPROACH - CONSTRUCTIVE PROPOSALS FOR STRATEGIES (BUT NO SIMPLE SOLUTIONS)

DESIGN: ENHANCING AND VISUALIZING NETWORKS OF CARE - DEDICATED SPACE FOR WOMEN'S NEEDS - PROXIMITY AND ACCESSIBILITY - NETWORK - EMPOWERMENT IN CONSTRUCTION - APPROPRIATION - PARTICIPATION - INCLUSIVE PROGRAM - INTENSE ACTIVITY AROUND THE CLOCK - SENSE OF OWNERSHIP, RESPONSIBILITY

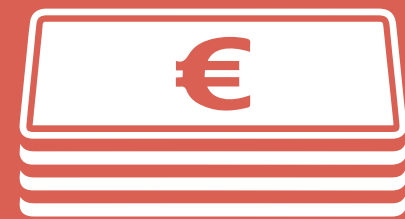
## NEXT STEPS



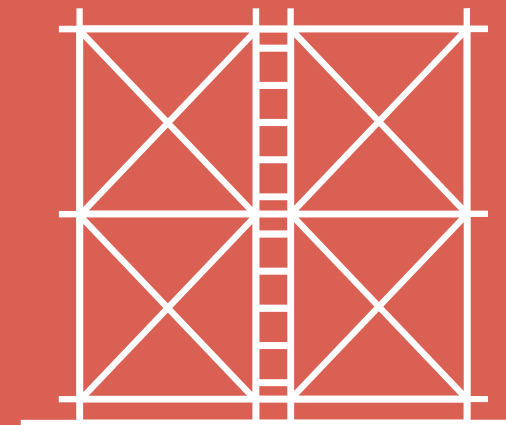
EUROPEAN BAMBOO EXPO,  
BOUW MET BAMBOE,  
BAMBOO COURSE IN BALI



PREPARING THE RESEARCH  
PAPER FOR PUBLICATION



FUNDRAISER, SEEKING  
SPONSORSHIP FOR CONSTRUCTION



CONSTRUCTION IN DELFT  
AND / OR IN COLOMBIA

