

BUILDING BONDS, BUILDING SAFETY A BAMBOO PAVILION FOSTERING COMMUNITIES OF CARE

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

Explore Lab graduation studio AY. 2023/2024 KIKA ZDZIARSKA
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TOPIC

Women worldwide are disproportionately affected by safety issues and fear in public spaces. In Latin America, amidst pervasive inequality and high rates of sexual harassment, struggles against gender-based violence have a profound societal impact. This fight resonates deeply in social discourse and manifests itself in public spaces, from protests to visual expressions like posters and graffiti. Several urban interventions have also been proposed by local and international institutions to improve urban safety. This project delves into the effectiveness of several urban interventions, particularly those under the UN Women's 'Safe Cities' program in three cities: Medellín, Quito, and Montevideo.

The aim of this study is to identify key planning and design strategies that foster safer and more inclusive public spaces for women.



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



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



Some of the visual traces of the struggle against gender-based violence in public space. Photographs from the fieldwork.

METHODOLOGY

The research employs a methodology centred on evaluating the long-term impacts of interventions in public space and infrastructure under the UN Women's 'Safe Cities' program. Based on three months' fieldwork, including semi-structured interviews with thirty women, questionnaires, and extensive on-site analysis, I identify common themes in women's voices and issues in the process and outcome of infrastructural developments. The findings form the basis for key strategies to enhance women's safety: 1) temporality and sustainability, 2) inclusive functional programs, 3) equal access to localized and high-quality infrastructure, 4) planning trajectories and areas of influence, 5) supporting existing networks of care, 6) spaces for organizing and collective action.

These categories guide my design approach and serve as a reference for project decisions.



PERSONAL MOTIVATION

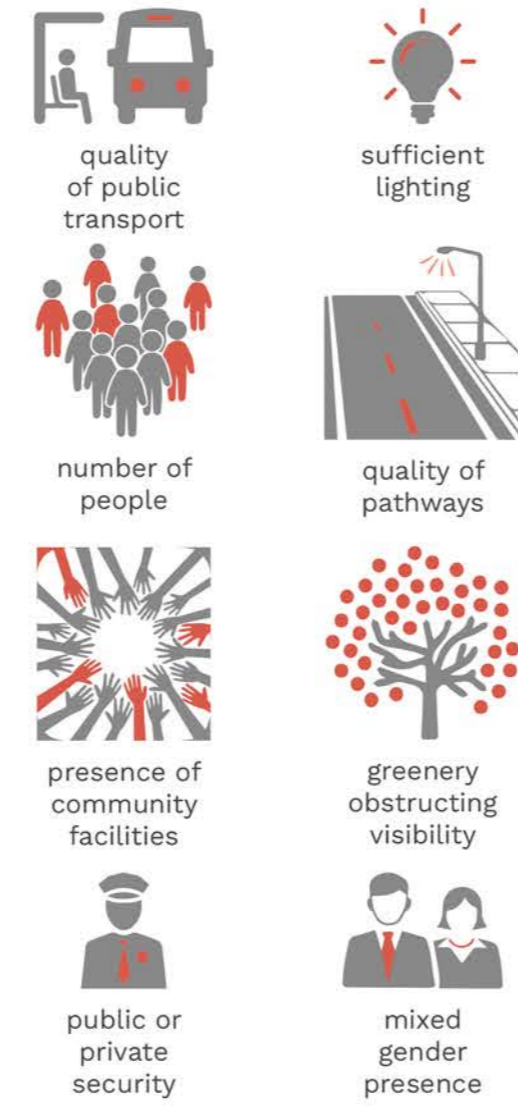
As a woman, I have experienced gender-based violence in the cities I lived in. Since I was a girl I was warned not to stay out alone, and I knew where it was not safe for me to go. I often felt fear in the city, and its perception was related to the quality of space that surrounded me.

I believe that with research-based design decisions, we can contribute to greater safety in our cities and make them more inclusive and equally accessible for all.

PREPARATORY RESEARCH AND STUDY TRIP

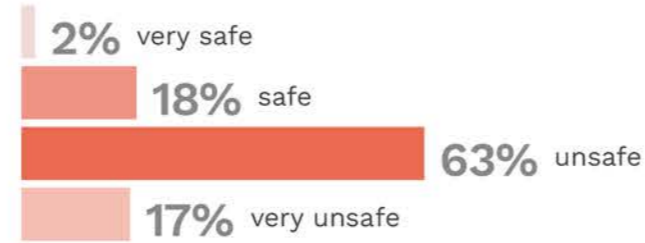
VARIABLES AFFECTING THE PERCEPTION OF SAFETY

source: Me nuevo segura, Development Bank of Latin America



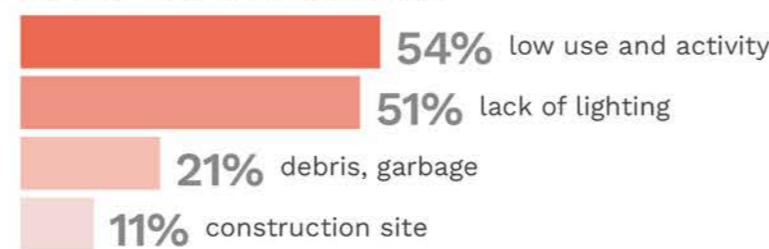
HOW WOMEN FEEL WHEN ALONE IN PUBLIC SPACE?

source: Mujeres de Matria Latinoamericana



WHICH FACTORS AFFECT THE PERCEPTION OF SAFETY?

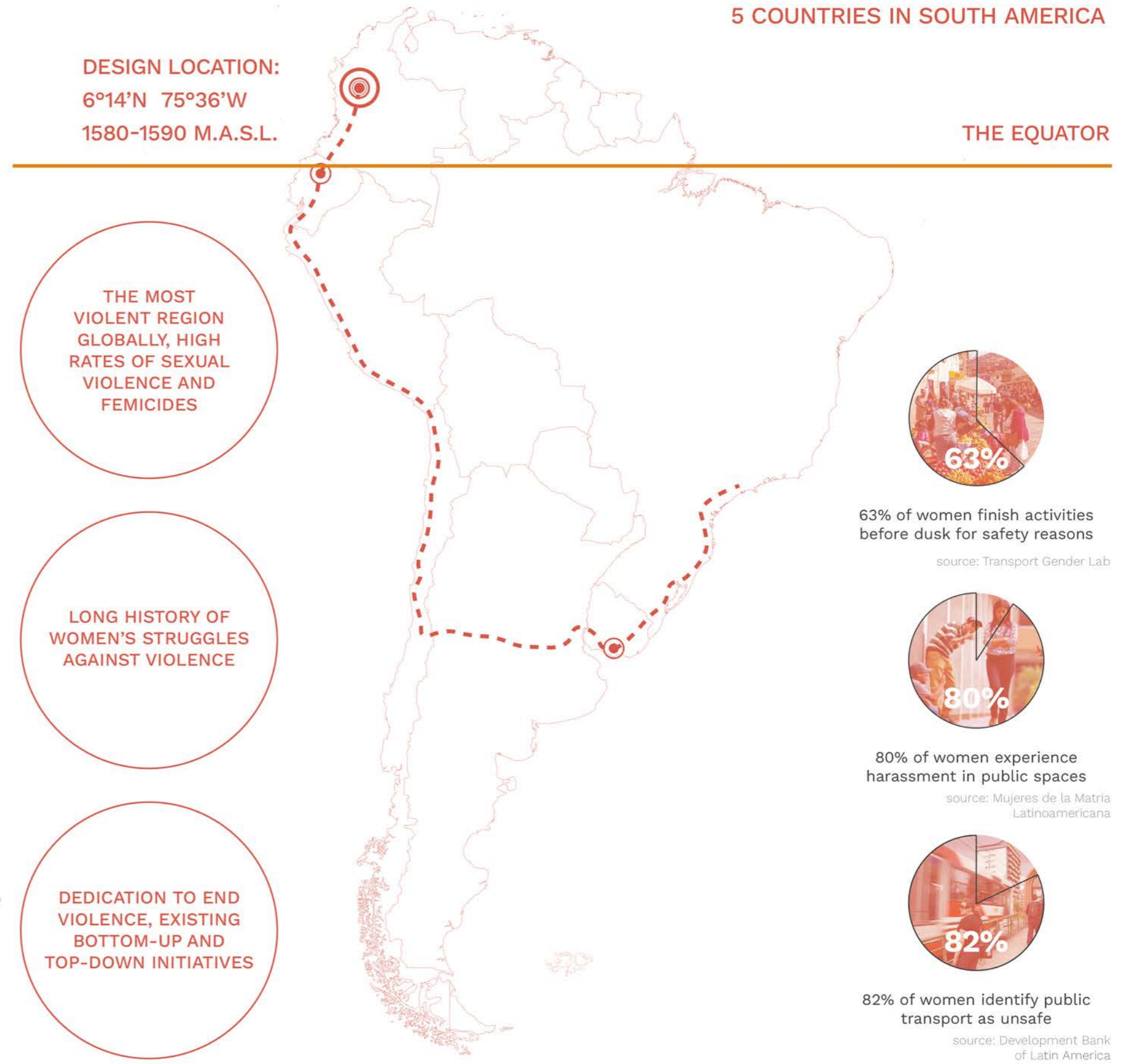
source: Mujeres de Matria Latinoamericana



4-MONTH TRAVEL ROUTE ACROSS 5 COUNTRIES IN SOUTH AMERICA

DESIGN LOCATION:
6°14'N 75°36'W
1580-1590 M.A.S.L.

THE EQUATOR



63% of women finish activities before dusk for safety reasons
source: Transport Gender Lab

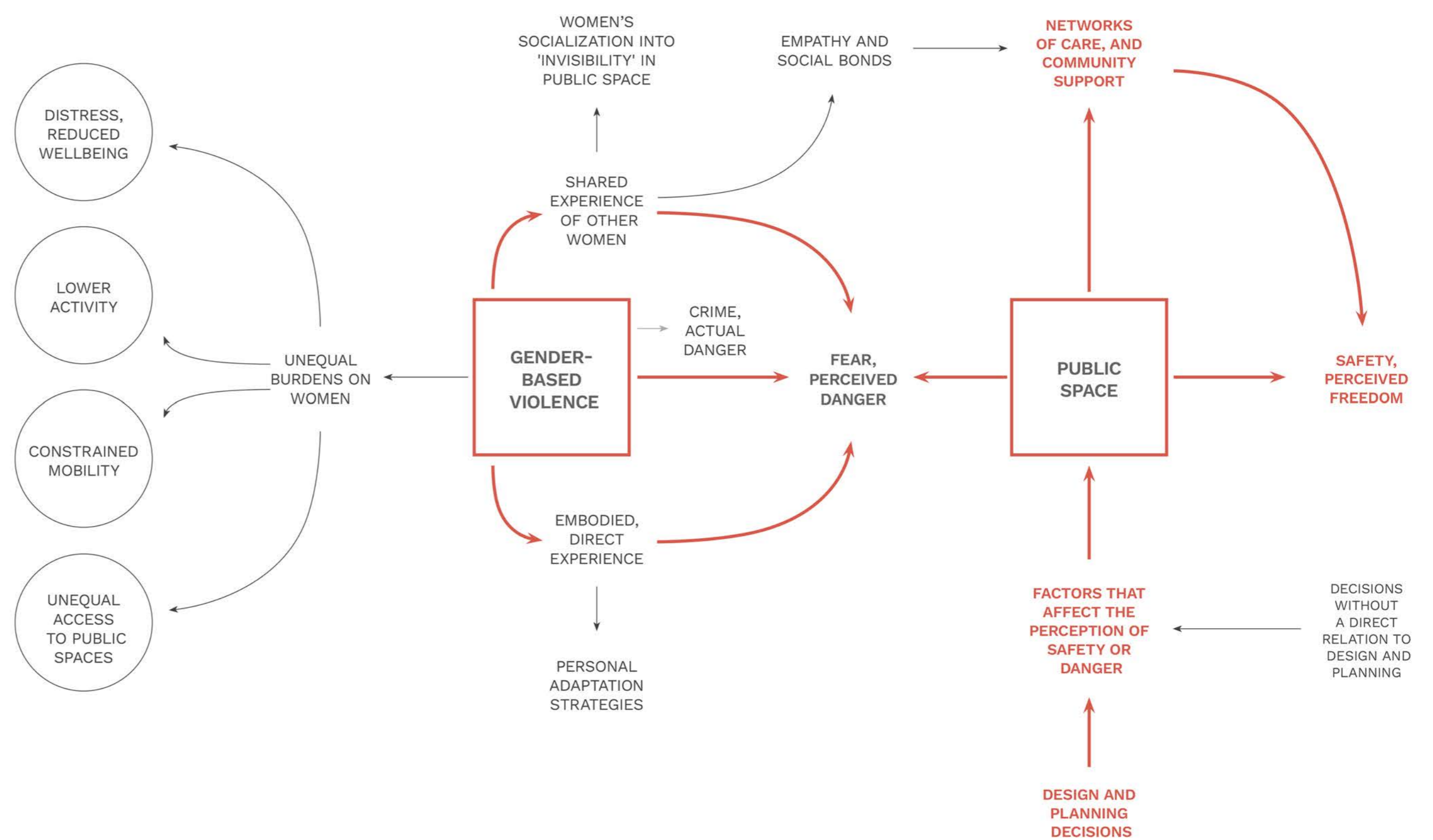


80% of women experience harassment in public spaces
source: Mujeres de la Matria Latinoamericana



82% of women identify public transport as unsafe
source: Development Bank of Latin America

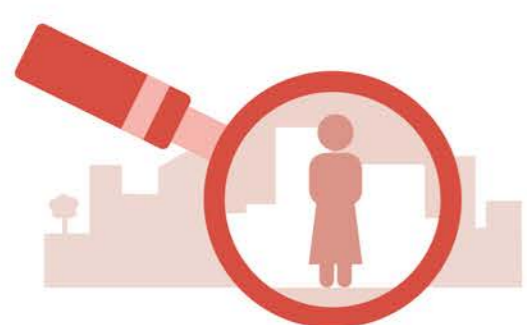
RESEARCH DIAGRAM



UN WOMEN'S 'SAFE CITIES AND SAFE PUBLIC SPACES FOR WOMEN AND GIRLS' PROGRAM

UN Women launched the "Safe Cities and Safe Public Spaces for Women and Girls" flagship program in 2010 with the goal to create "the first global initiative that aims to prevent and respond to sexual harassment and other forms of sexual violence that women and girls often experience and fear in public spaces".

The "Safe Cities" program includes actions in four areas:



EVIDENCE, SCOPING STUDIES



LAWS AND POLICIES



SAFETY OF PUBLIC SPACES



TRANSFORMING SOCIAL NORMS

QUITO, ECUADOR

In 2011, Quito joined the "Safe Cities" global initiative as one of the five pioneer cities. The first step undertaken by program partners was a **participatory scoping study**. Following the research, Quito adopted **new legislation** to prevent violence against women. The Action Protocol for victims of sexual harassment was developed and authorities were trained in its application. **Trolleybus stops** were replaced with new glazed structures, based on the rule "see and be seen, hear and be heard" and **five care services** were developed in the main stations. A **system to report sexual harassment** through text messages, "Lower the harassment" ("Bájale al acoso"), was also developed.



MEDELLÍN, COLOMBIA

Medellín followed as the first city in Colombia in 2015. The project began with a **baseline study**, through which data on women's experiences and perceptions of safety were collected. In the district of Manrique, a pilot project was developed. It included **informative actions** on 40 buses, with 429 graphics and videos created by women. Awareness-raising performances were carried out with the aim to transform cultural norms. A "will contract" was endorsed between the local government and **28 bars to create secure spaces** for women. The staff of the bars was trained and sensitized. The infrastructural changes included the **organization of space and maintenance of parks**.



MONTEVIDEO, URUGUAY

In Montevideo, the large-scale project within the framework of the program began in 2018. Two areas were chosen for the main points of intervention of the initiative, Parque Rodó and the Unión - Villa Española neighbourhoods. **Participatory scoping studies** were carried out. Data about women's safety and its perception were gathered and analysed. **Graphic signs and posters** informing about the problem of violence against women and ways of acting were installed in the parks. The Department of Transport was asked to **change the route of the bus**, which stopped inside the park, and create a larger pedestrian zone. The project included the **change of lighting and organization of greenery**.



RESEARCH HYPOTHESIS

The UN Women's '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 and analysis. **However, the interventions related to public spaces implemented within the initiative received less attention and often failed to incorporate indications proposed by feminist researchers.**

RESEARCH RESULTS

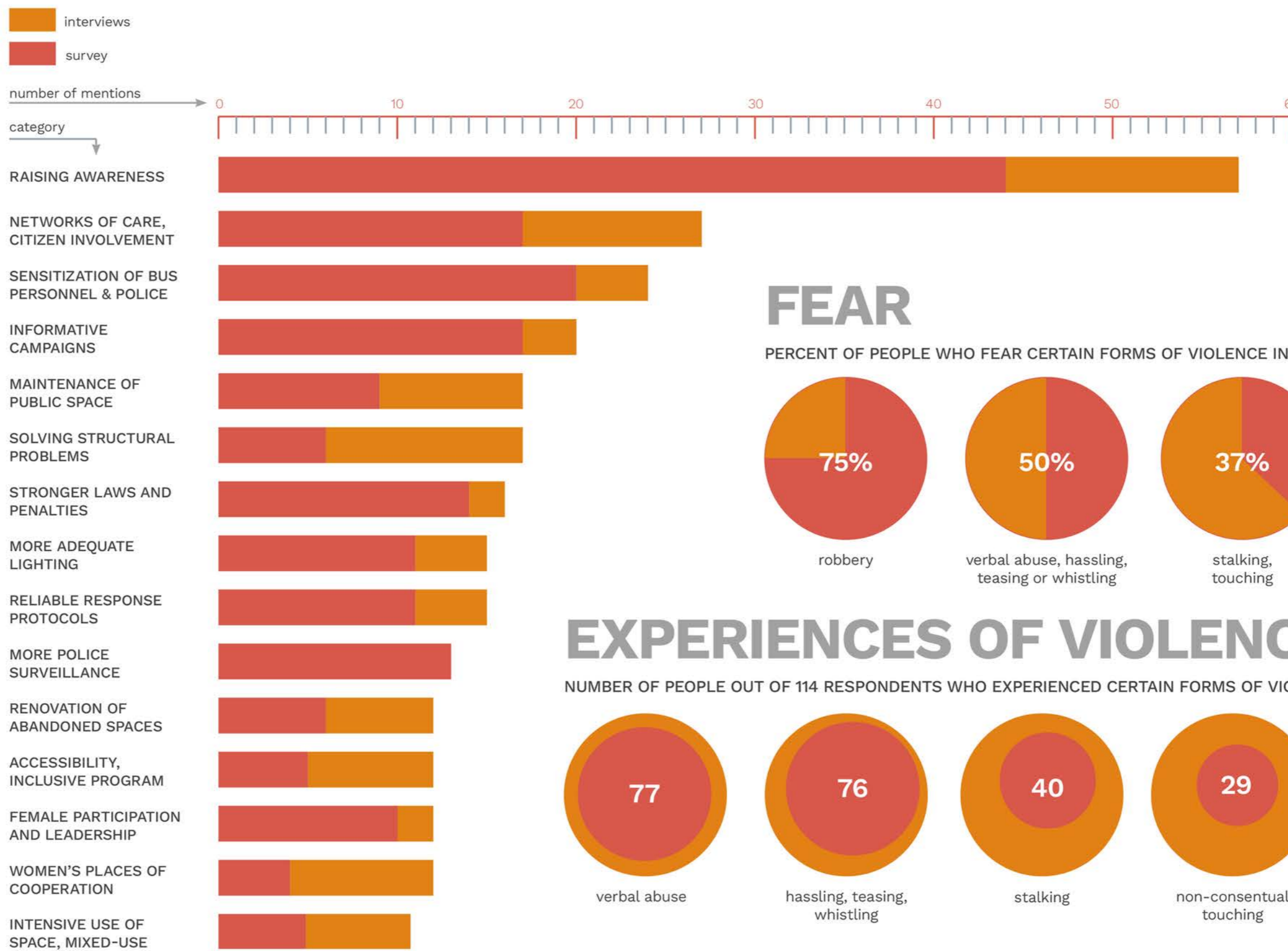
4 MONTHS OF ON-SITE ANALYSIS

30 INTERVIEWS WITH WOMEN

100 SURVEY RESPONSES

SOME OF THE SURVEY RESULTS

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?



RELEVANCE OF THE PROBLEM - INTERVIEW QUOTES

I lived with two female friends, and one of them has a dog. It was those two and the puppy and yet they asked me to go with them, because they felt safer if three of us and the dog went. If I couldn't, they wouldn't go to the park. To come to the park alone and walk anywhere with your dog... no, I wouldn't feel safe, I would never do it.

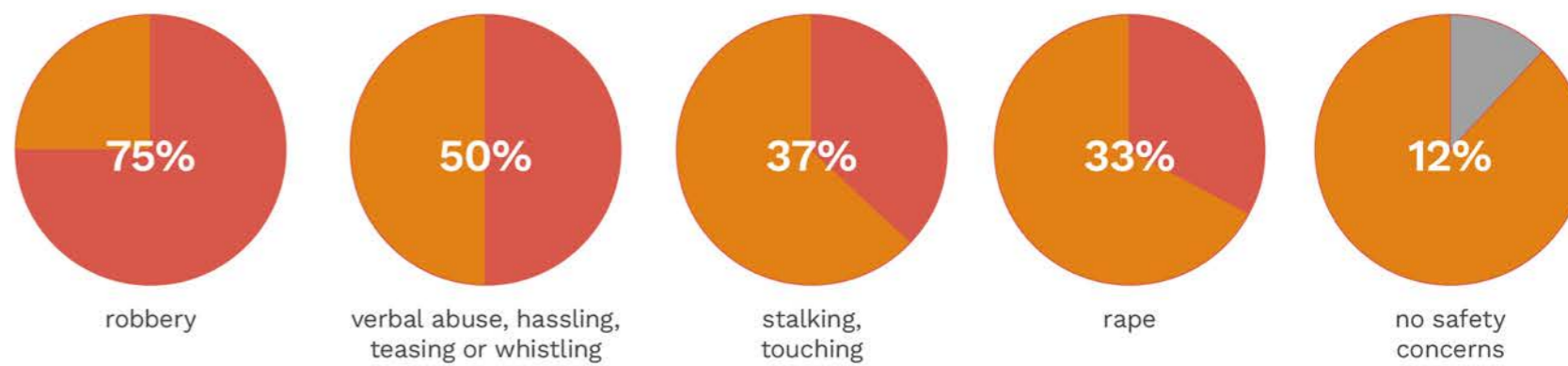
Women are not only robbed of their mobile phones, but we are also exposed to other forms of violence, such as rape, sexual aggression and harassment. And so, this means that we have been deprived of the public space. (...) And harassment is a constant in the city, not only in public transport, but in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

A woman walks down the street and anyone feels 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.

It's not enough if the metro car is safe but if I climb the stairs they grope me or rob me. Or if I walk one block and then the next block is very dark and unsafe. When I get home I have to ask my husband to go and pick me up at the bus stop. It is the whole journey, with many decisions that change based on experience. If I am constantly being touched on the metro, I probably won't get on it anymore.

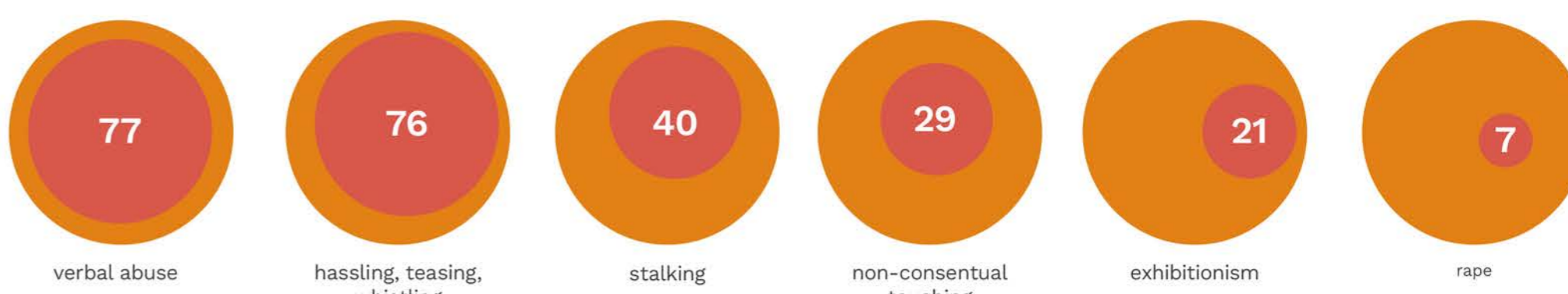
FEAR

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



SUCCESSFUL EXAMPLES

WOVEN GRAFFITI	GRAFFITI AND STREET ART	BALCONERAS (BALCONY FLAGS)	LAS PIONERAS	UVA WATER TANKS	SAFE PARKS	METRO EXIT SQUARES
VISUALIZING NETWORKS OF CARE, PROTEST, EDUCATION	PROTEST, VISUALIZING PROBLEMS, EDUCATION	VISUALIZING NETWORKS OF CARE, SYMBOLIC PRESENCE	SPACE FOR COOPERATION, DISCUSSION, AND ORGANIZING FOR WOMEN	RENOVATING UNDERUSED SPACES, DISTRIBUTED URBAN MODEL, PROXIMITY	ACTIVATING PARKS WITH FUNCTIONS - CULTURE, SPORT, FOOD, BARS	INCLUSIVE FUNCTIONAL PROGRAM, MIX OF FUNCTIONS, INTENSE USE
"We weave the community and protest against urban problems"	"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."	"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 neighbourhoods, it came up spontaneously."	"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."	"UVAs, the water tanks, were closed spaces and they decided to open them. And the success was that they filled it with so many different activities."	"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 to public space. I love bars, I would love them to be spaces that are more caring."	"These metro squares are always in movement, there are many people. There are small shops which means there is someone there, these watchful eyes that don't allow crime to happen. The squares feel secure."

SUPPORTING EXISTING NETWORKS OF CARE

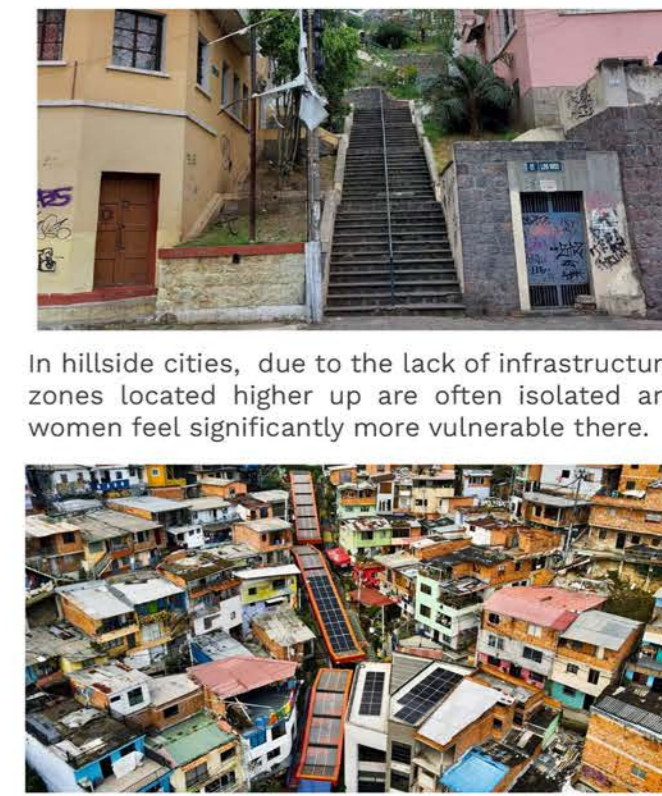


Flags on a balcony, or "balconeras" in Montevideo, - the idea of visualizing networks of care.

A graffiti in Quito saying "SISTER WAKE UP". Street art is an important means of expression and visual presence for women.

"We should first strengthen ties between the neighbourhoods. We should recognize each other as neighbours and see each other. And from there, I think that's where you start to fight the battle on the issue of safety. For me, the issue of security is very much based on community ties."

EQUAL ACCESS TO LOCALIZED, HIGH-QUALITY INFRASTRUCTURE



In hillside cities, due to the lack of infrastructure, zones located higher up are often isolated and women feel significantly more vulnerable there.

In Medellín, escalators were installed in one of the most disadvantaged neighbourhoods, improving safety and accessibility.

"I believe that public spaces... ensuring that they are of similar quality in all neighbourhoods is extremely important because the difference between one zone and another is very noticeable, and that obviously also contributes to the feeling of inequality. A large investment in standardizing or generating the equality of public space throughout the city would undoubtedly help."

INCLUSIVE FUNCTIONAL PROGRAM



Abandoned "Pocket square" at Av. Einstein in the middle-class area of Santiago de Chile, used as a temporary living space by a person in homelessness crisis.

"The circular process of abandonment and insecurity... If you don't break it with a good material programme, but also with a good management programme, it doesn't stop. If you see rubbish, you see abandonment, you immediately realize that there is no neighbourhood coexistence.

On the other hand, if you go to places that are very poor and also have many deficiencies, but you see plants, you see people, with benches outside, a minimum in which you don't need so many resources - it generates something else."

a woman from Quito, student

a woman from Santiago de Chile, architect

"All of us who are feminists in Montevideo love it and find it incredible that there is a space of Las Pioneras. I wish there were eighty Las Pioneras in the whole city, it would be great!"



A former metro station in Santiago de Chile at Plaza Dignidad (Plaza Italia) appropriated as a protest scene, including by the feminist movement.



Las Pioneras (The Pioneers) Square in Montevideo - a public space managed by feminist collectives, where women meet, exchange knowledge, and organize.

SPACES FOR ORGANIZING AND COLLECTIVE ACTION

TEMPORALITY AND SUSTAINABILITY



Battle park in Montevideo after dark. Although well-lit, the park is deserted in the evening and all service points are closed.

"I believe that any plan, any project, and any program that can be established to reduce insecurity is valid. The problem is if it is sustained over time. The problem is if the population gives these projects the importance they require. I think these projects, as time goes by, are forgotten."



Trolleybus in Quito. State of maintenance of the graphic about the system for reporting sexual violence "Lower the harassment".

a woman from Santiago de Chile, researcher

a woman from Montevideo, sociologist

PLANNING TRAJECTORIES AND AREAS OF INFLUENCE

"At first it was just the metro system, and then the institution understood the impact that its infrastructure had on urban development, and has also evolved into an urban operator. A metro line, a tram line or a metro cable has all this impact on the nearby community, and this can be used to the advantage or disadvantage of the territory. If it is handled well and taken into account, not just a metro line, but all that impact on the area, it can work very well."



In Medellín the metro company provides public spaces next to the metro exits with diverse functions, which improves safety.



A concept of designing "trajectories of light" or continuous illuminated paths instead of light points in Parque Rodó, Montevideo.

a woman from Quito, anthropologist

a woman from Medellín, transport expert

URBAN CONCEPT AND DESIGN LOCATION

PROJECT LOCATION

COLOMBIA IN SOUTH AMERICA



MEDELLÍN'S COMUNAS

- North East Zone**
 - 1. Popular
 - 2. Santa Cruz
 - 3. Manrique
 - 4. Aranjuez
- Central East Zone**
 - 8. Hermosa
 - 9. Bunoos Aires
 - 10. La Candelaria
- South East Zone**
 - 14. El Poblado
- North West Zone**
 - 5. Doce de Octubre
 - 6. Castilla
 - 7. Robledo
- Central West Zone**
 - 11. Laureles
 - 12. La América
 - 13. San Javier
- South West Zone**
 - 15. Guayabal
 - 16. Belén

UVA - UNITS FOR THE ARTICULATION OF LIFE

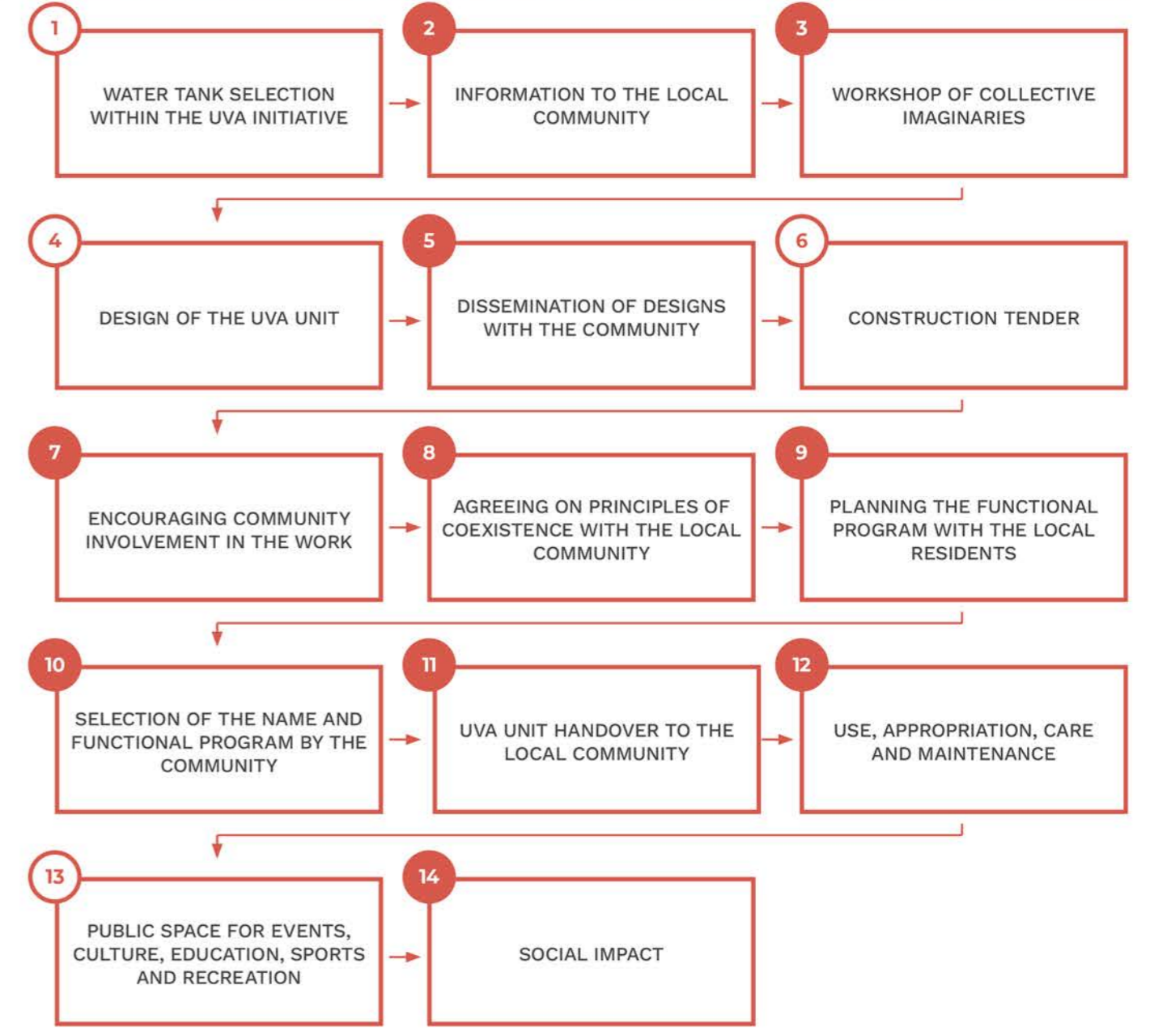
In 2010, while developing an urban lighting master plan for Medellín, the analysis of the state-owned company EPM (Empresas Públicas de Medellín) revealed islands of darkness in the middle of the urban fabric, corresponding to 144 water tanks that were once built on the periphery of the city. They realized 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.

The aim of my project is to add new structures on these lots with the aim of expanding the functioning of the UVA program to meet women's needs related to safety.



source: Valencia, N. (2020, June 16). The Story of How Medellín Turned Its Water Reservoirs into Public Parks. Archdaily.

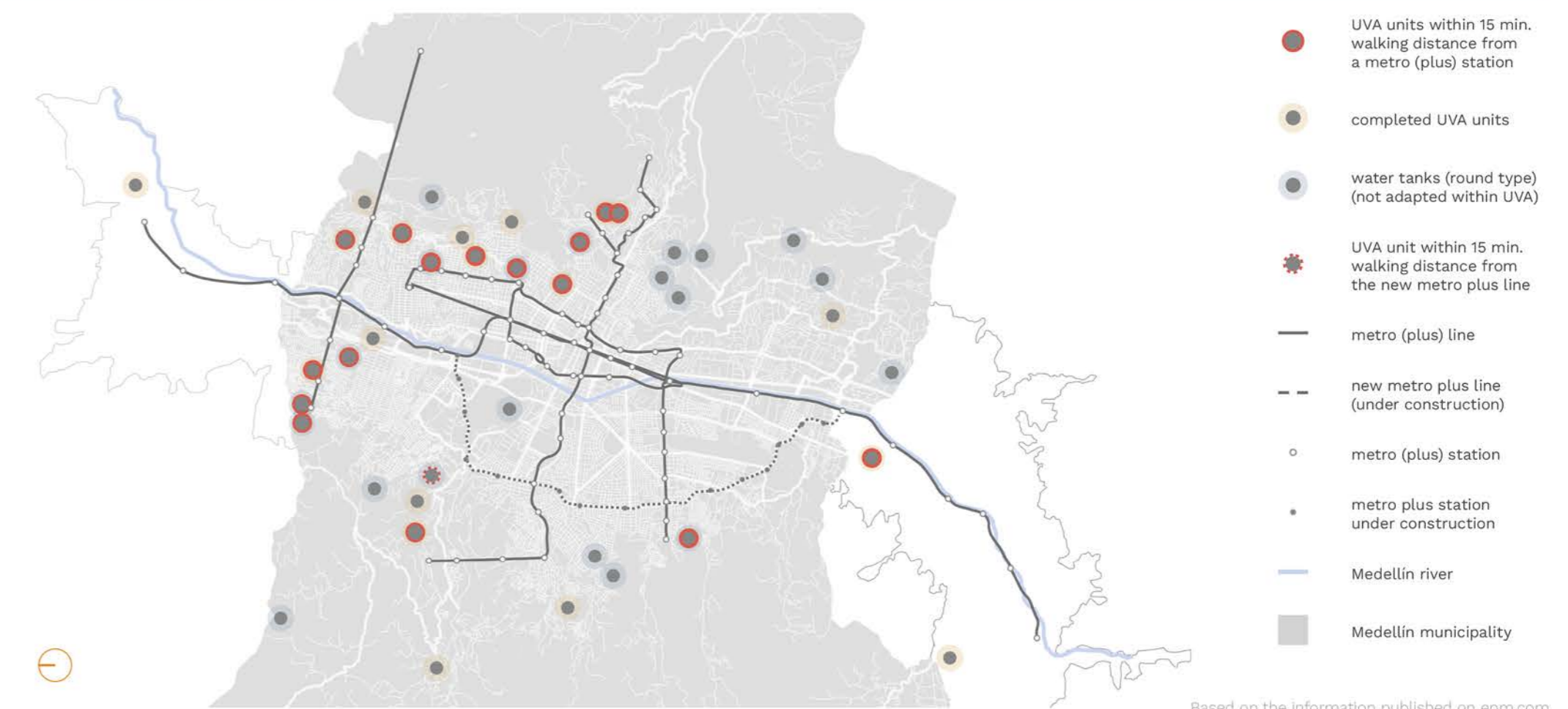
PARTICIPATORY PROCESS OF CREATION OF THE UVA COMMUNITY



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



CURRENT DEVELOPMENT OF THE UVA PROGRAM

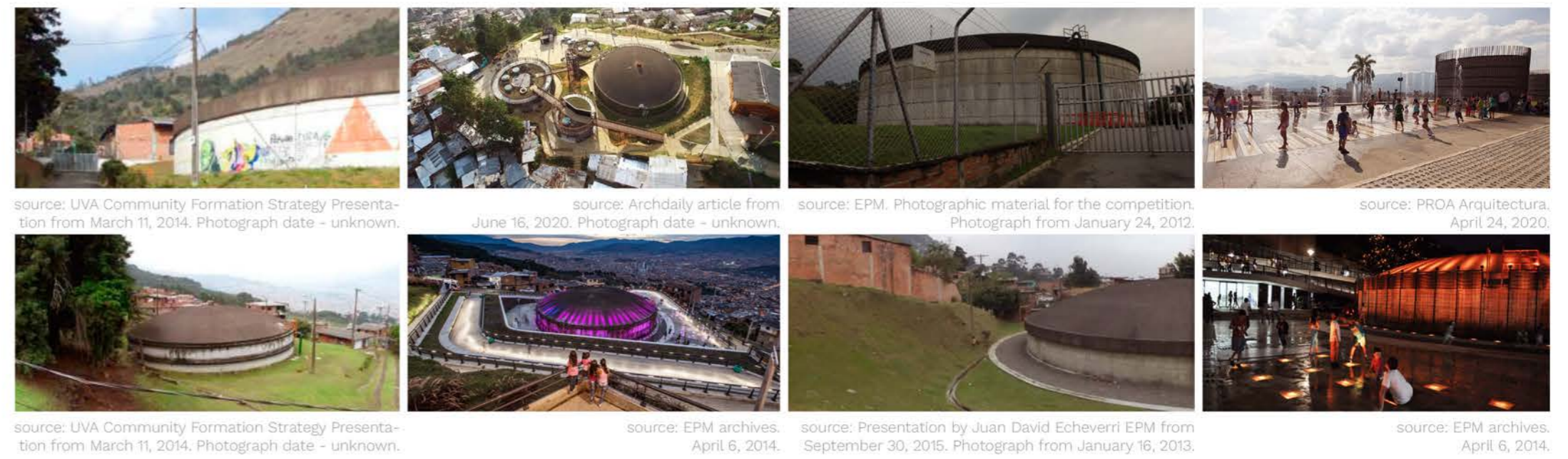


Based on the information published on epm.com

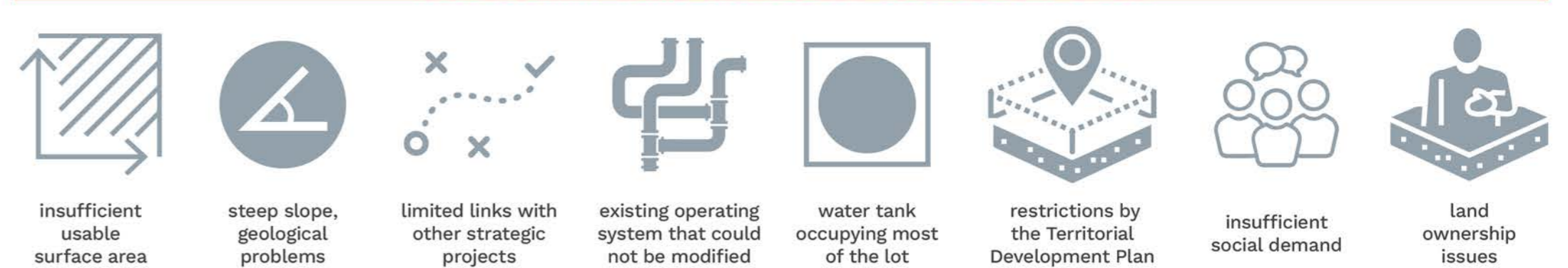
COMPLETED UVA UNITS - FUNCTIONAL PROGRAM



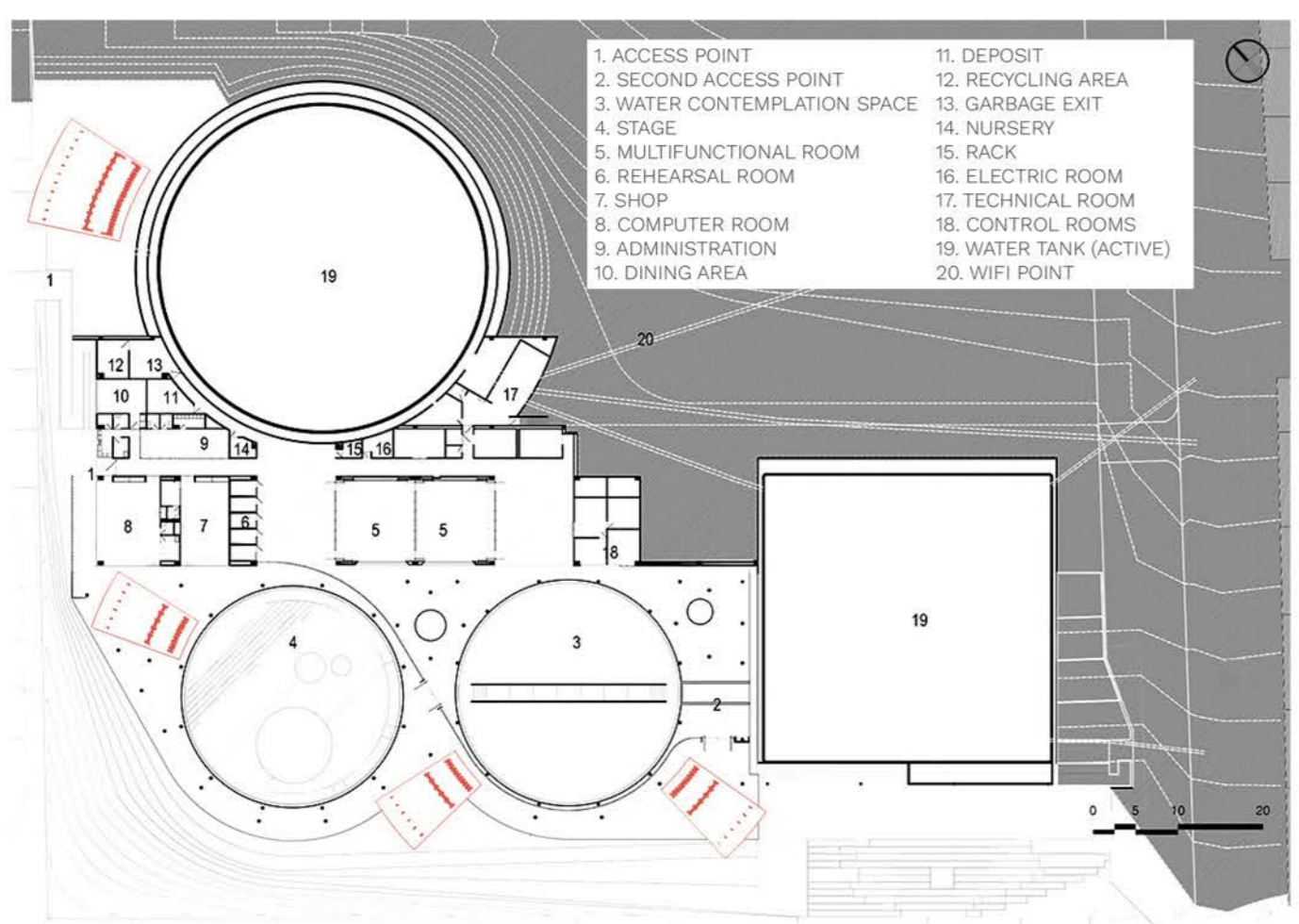
WATER-RELATED FEATURES: WATER CURTAIN, FOUNTAIN, JETS OF WATER, WATER SCREEN, WATERFALL, CANALS, POND, WATER MIRROR, POND, CONTEMPLATION AREA



REASONS WHY SOME UVAS COULD NOT BE COMPLETED

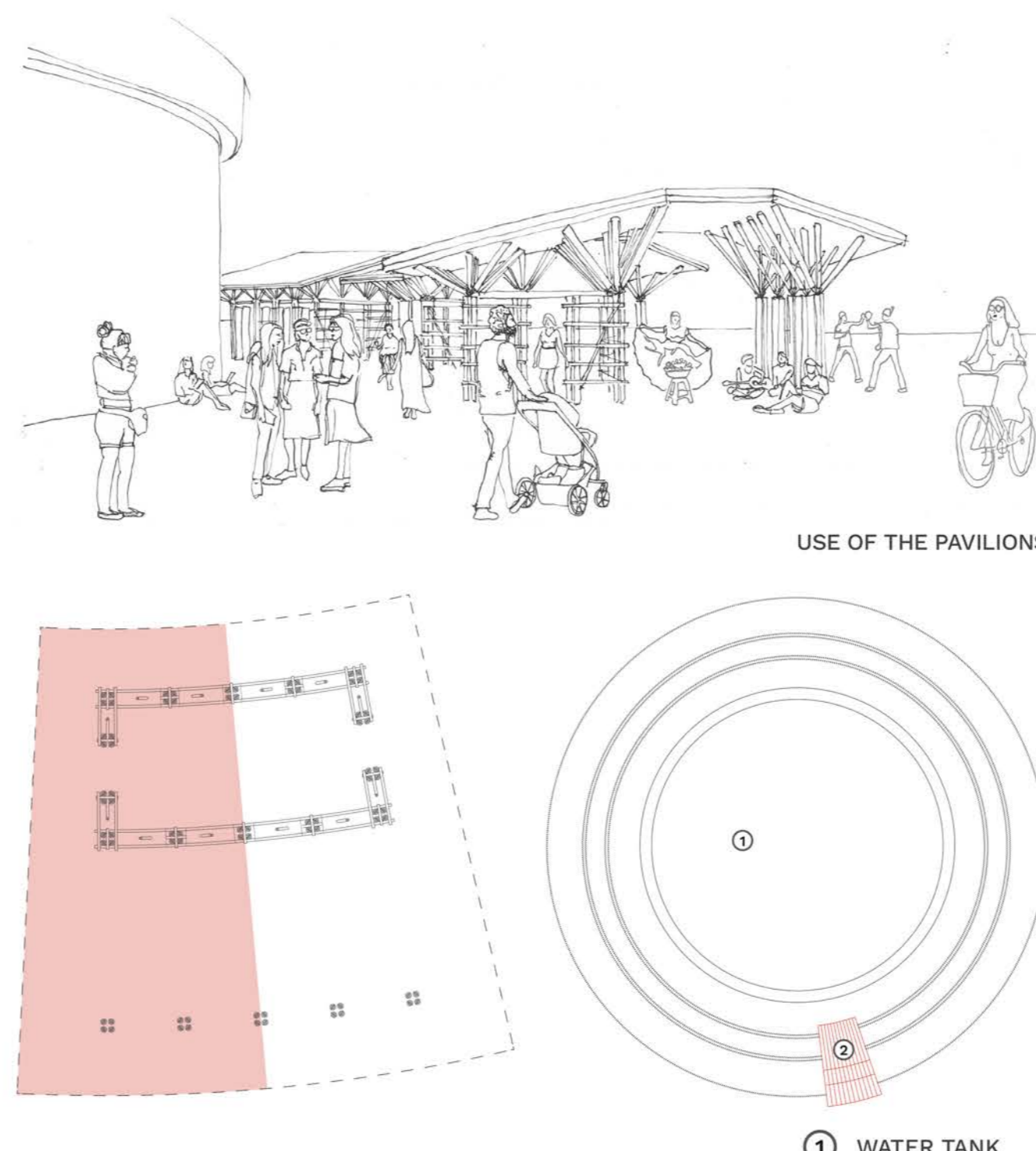


EXPANDING THE UVA PROGRAM WITH A GENDER PERSPECTIVE



Based on a plan of UVA La Imaginación. Source: Arquine.

EXEMPLARY SITE PLAN



MODULAR CONSTRUCTION

1 WATER TANK
2 THE PAVILION

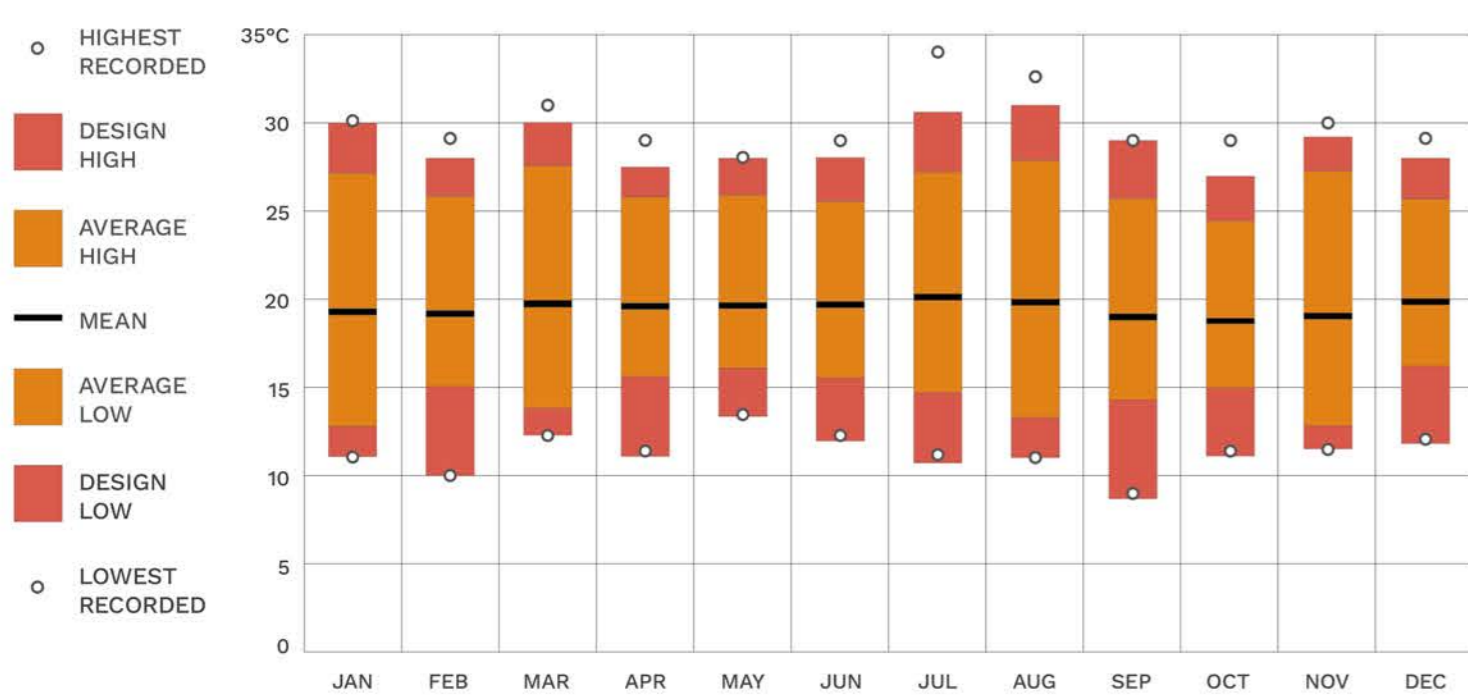


PAVILION MADE OF TWO MODULES IN RELATION TO THE WATER TANK

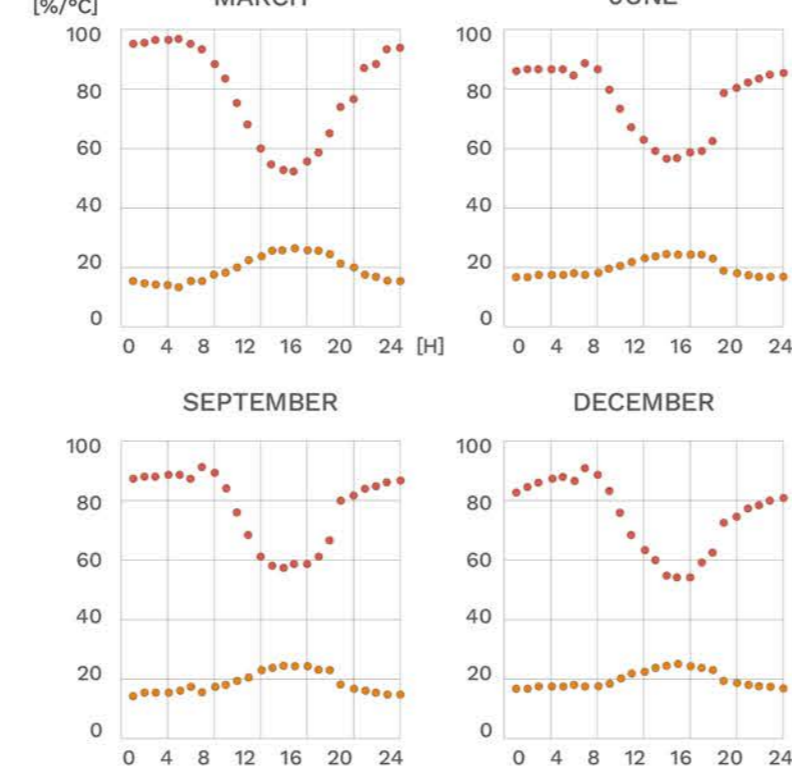
CLIMATE AND MATERIALITY

CLIMATE IN MEDELLÍN, COLOMBIA

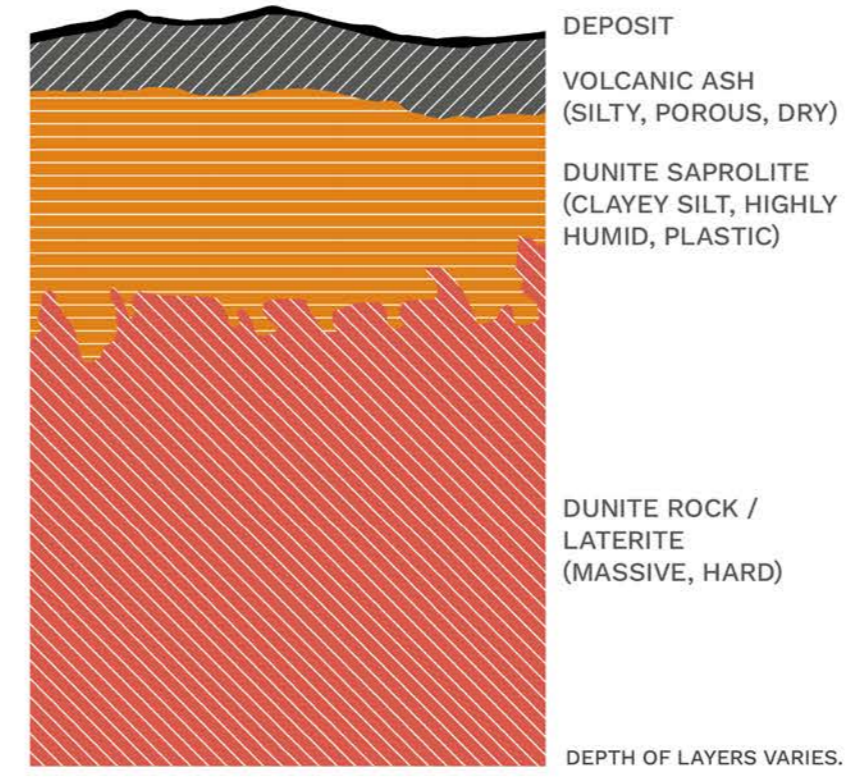
DRY BULB TEMPERATURE



TEMPERATURE X HUMIDITY



SIMPLIFIED SOIL PROFILE



LOW PITCHED, LIGHT COLORED, VENTILATED ROOF WITH OVERHANGS



SHADE TO PREVENT OVERHEATING (ALSO SHADED OPEN SPACE)



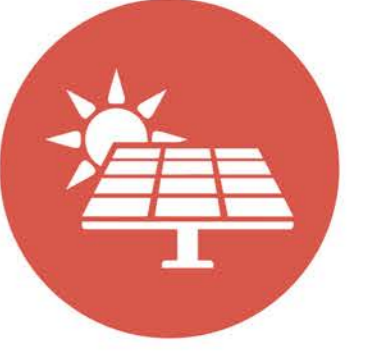
EARTHQUAKE RESISTANCE



OPERABLE WALLS, WINDOWS, SUNSHADES

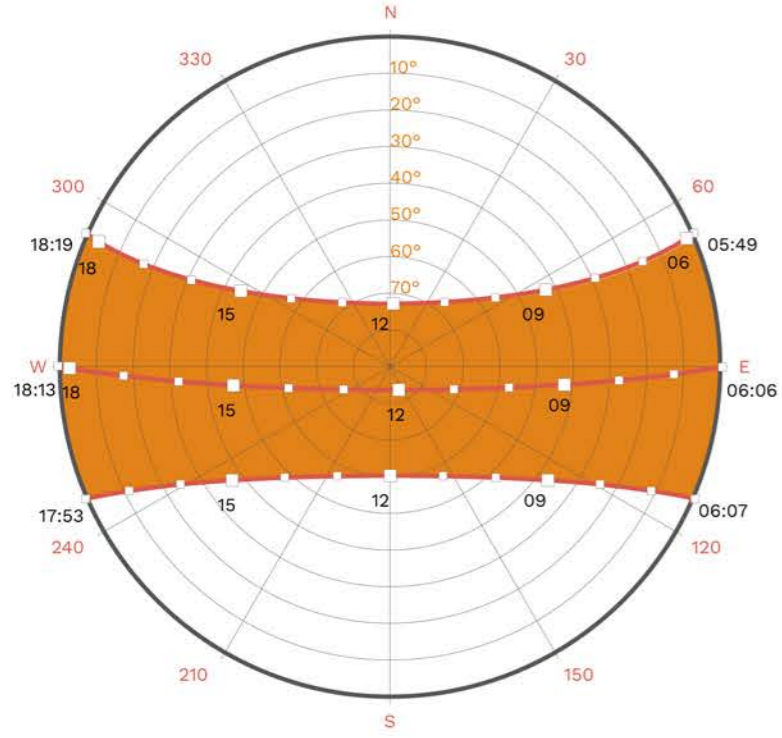


LONG NARROW FLOOR PLAN TO MAXIMIZE VENTILATION

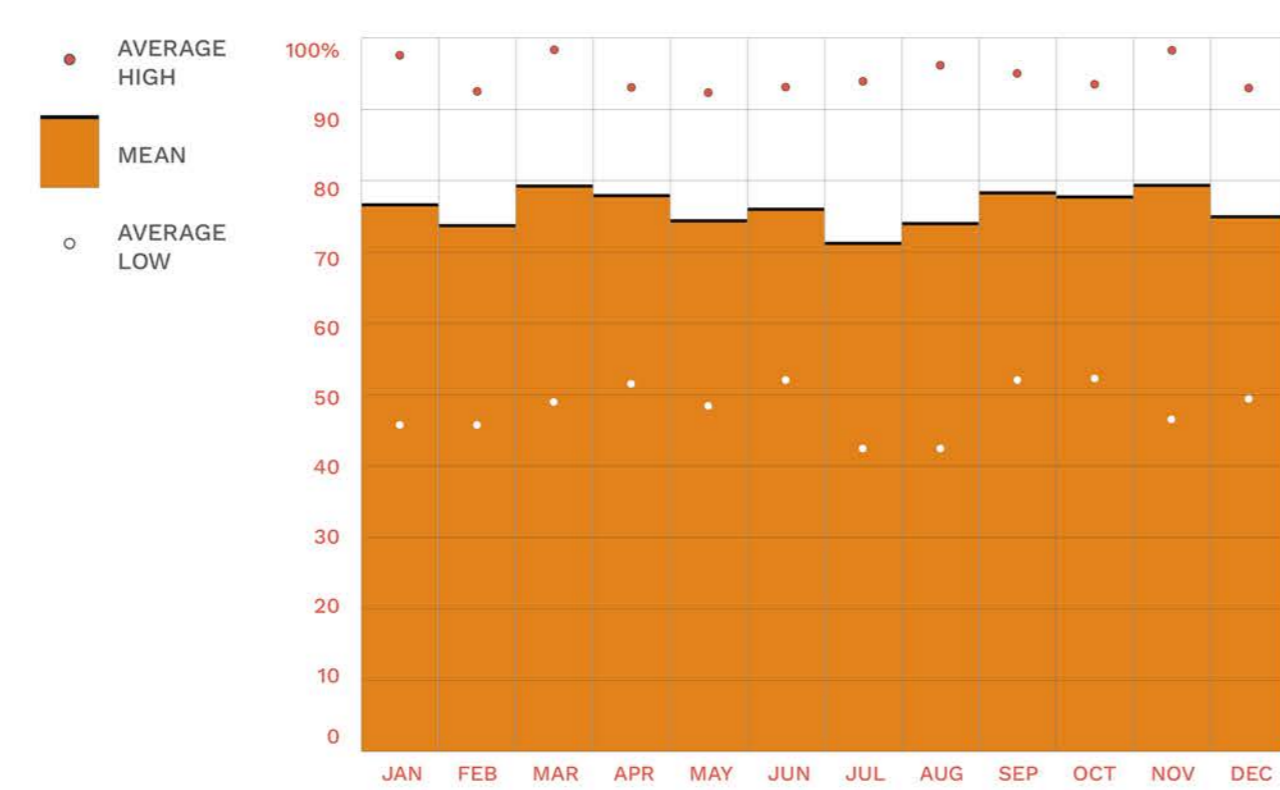


USE OF SOLAR PANELS

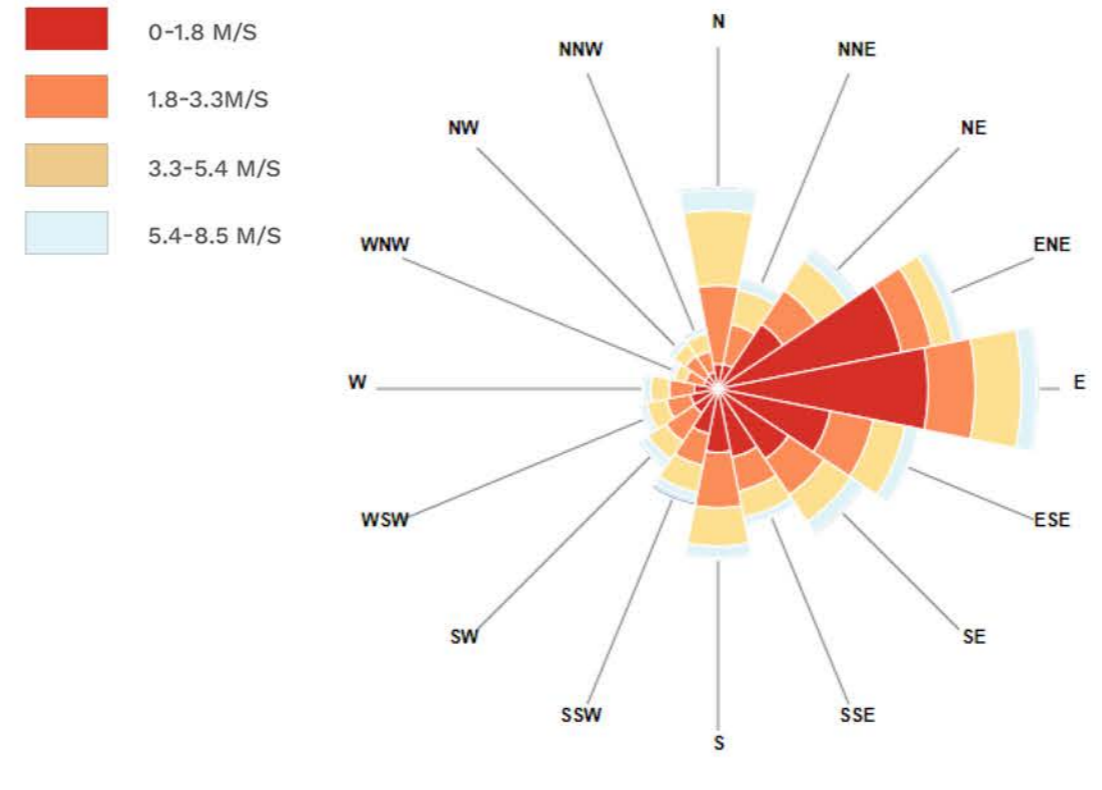
SUN PATH DIAGRAM



RELATIVE HUMIDITY



WIND ROSE

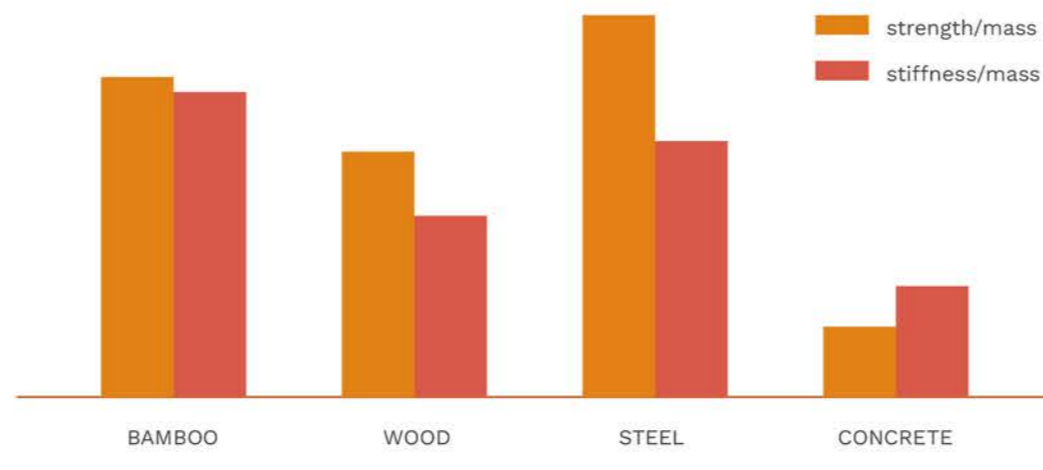


REASONS FOR THE CHOICE OF BAMBOO AS THE MAIN BUILDING MATERIAL

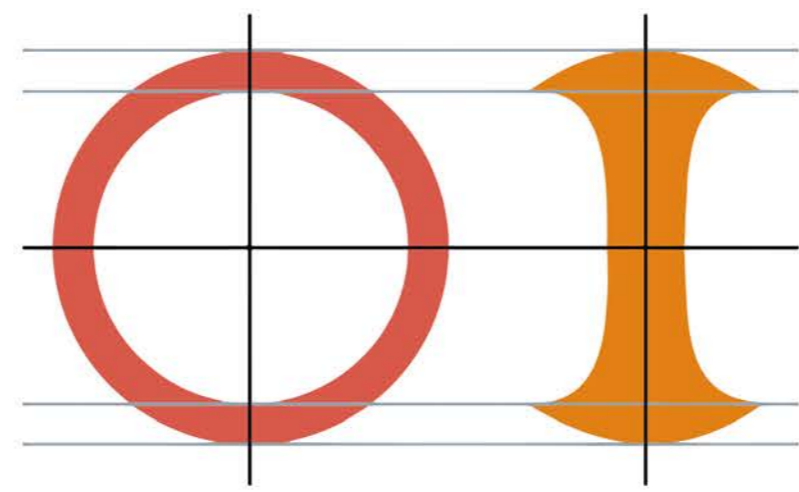
- RAPIDLY RENEWABLE, HIGH ANNUAL YIELD
- CARBON SEQUESTRATION CAPACITY (CARBON SINK)
- RECYCLING OPPORTUNITIES BIODEGRADABLE



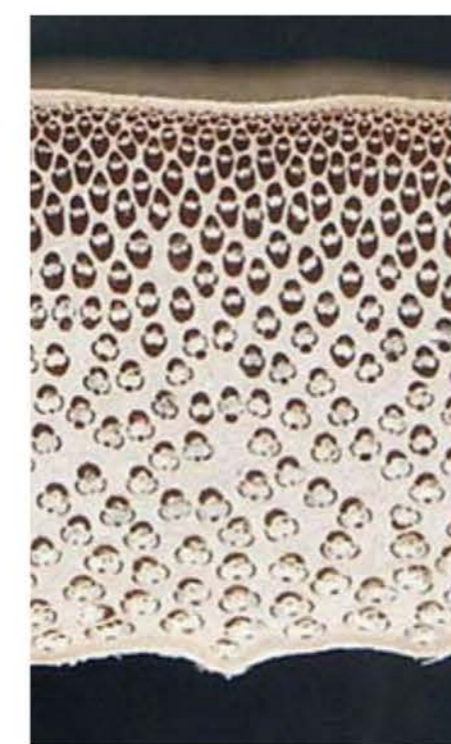
- AVAILABLE LOCALLY, HISTORICALLY SIGNIFICANT
- EMPOWERING WOMEN IN CONSTRUCTION
- EMPOWERING FEMALE FARMERS



source: Janssen, J.J.A. (2003). Designing and Building with Bamboo.



The material distribution through a cross section of a bamboo culm is very efficient from a mechanical point of view. It is similar to engineered materials such as steel tubes or I-beams.

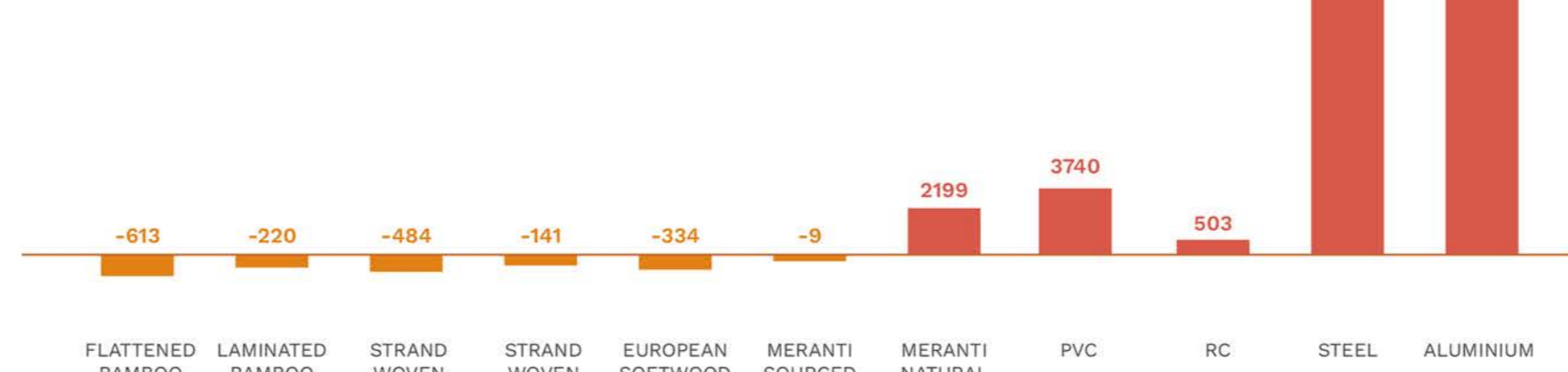


Efficient material distribution - the cross-section of the Guadua bamboo shows increasing amount of fibers from inside to outside, resulting in higher stiffness and the ability to absorb moments of force caused by loads.

source: guaduaibamboo.com

source: van der Lugt, P., & King, C. (2019). Bamboo in the Circular Economy: The potential of bamboo in a zero waste, low-carbon future. (Policy Synthesis Report; Vol. 6). International Bamboo and Rattan Organisation (INBAR).

CARBON FOOTPRINT OVER LIFE CYCLE PER VOLUME UNIT (KG CO2/M3 BUILDING MATERIAL)



source: van der Lugt, P., & King, C. (2019). Bamboo in the Circular Economy: The potential of bamboo in a zero waste, low-carbon future. (Policy Synthesis Report; Vol. 6). International Bamboo and Rattan Organisation (INBAR).

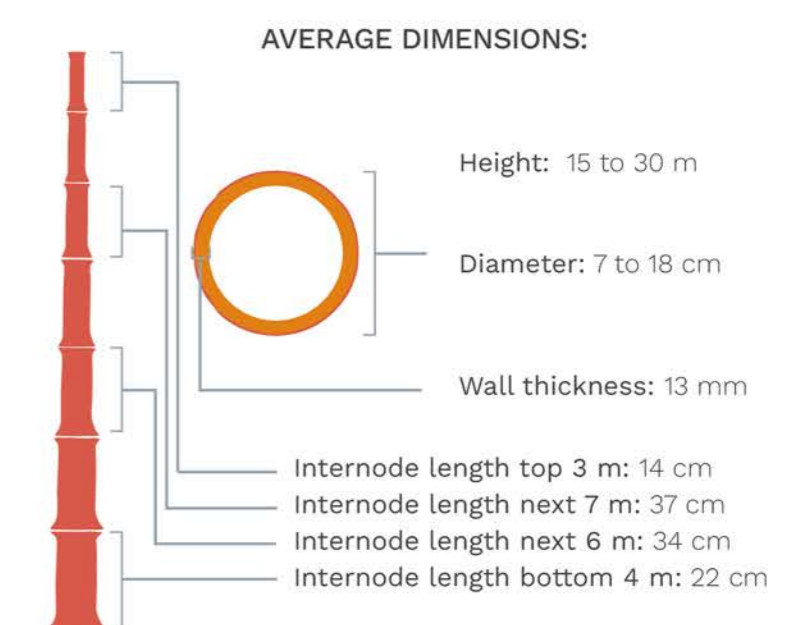


GUADUA ANGUSTIFOLIA

Large and fast-growing, one of the most widely used species for construction in Latin America.

Mix-podial bamboo (running and clumping) of quite regular, straight and strong poles.

Used for construction and for laminated lumber, as well as furniture and details.



SELECTION OF MATERIALS

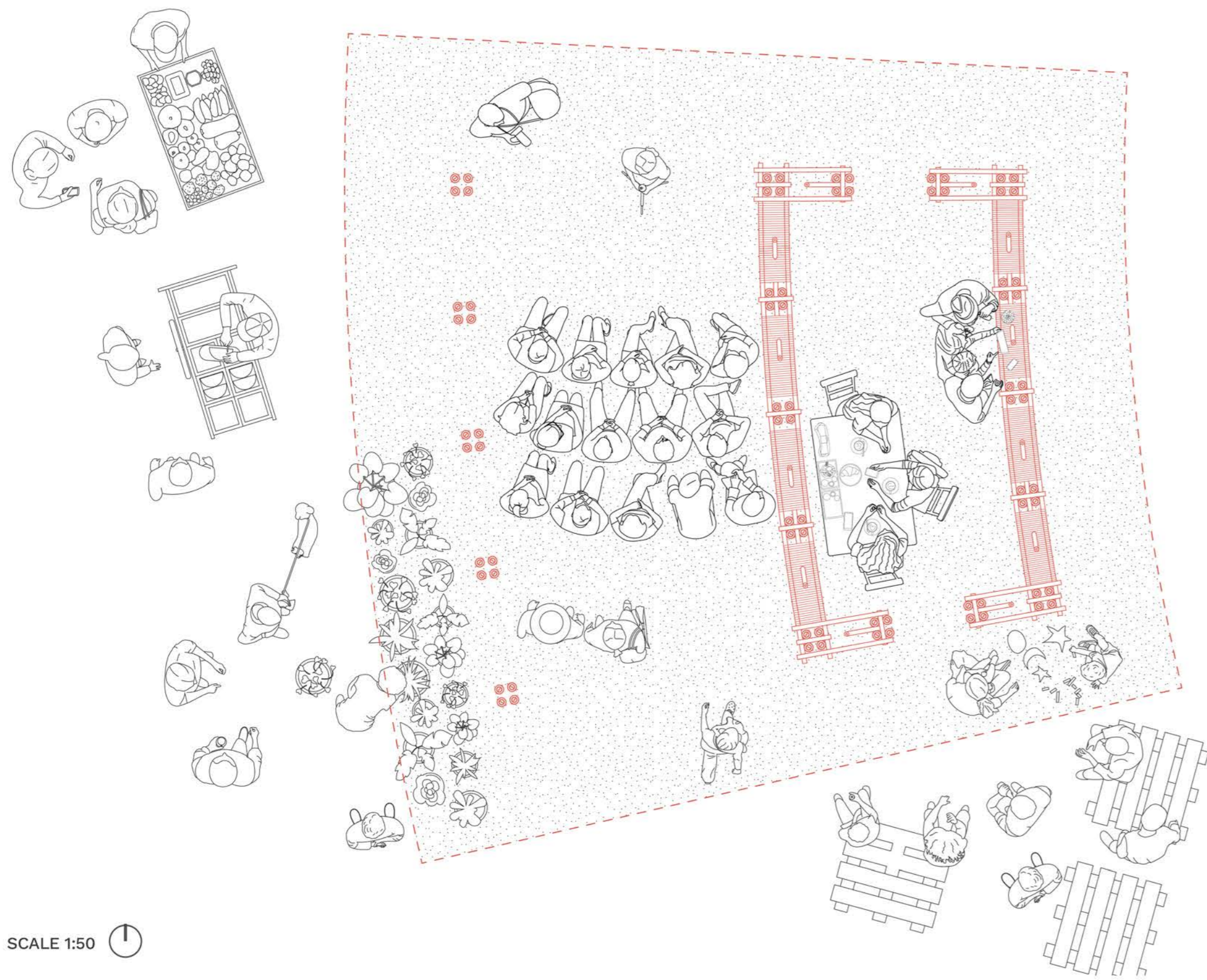
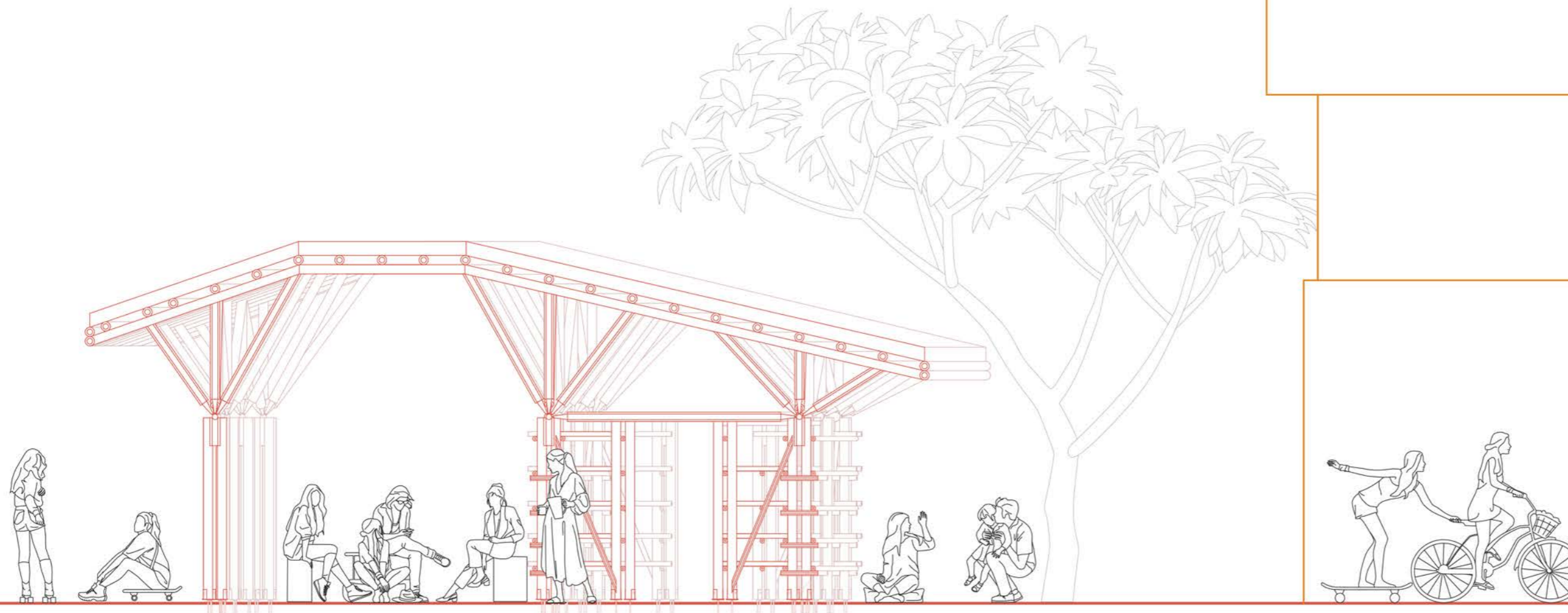
- GUADUA BAMBOO POLES AND SPLITS
- HARD WOOD INSERTS
- NATURAL HEMP MANILA ROPE
- LOW, NATIVE VEGETATION
- RECYCLED EXPANDED CORK
- RECYCLED JUTE FROM COFFEE BAGS
- PEACH STONES (PEACH PITS)
- SUBSTRATE WITH RECYCLED BRICK
- TEXTILES
- GALVANIZED STEEL, THREADED RODS



ARCHITECTURE

FLOOR PLAN AND SECTION

SCALE 1:50



SCALE 1:50

3D VIEWS



REFERENCE PROJECTS



Source: Morag Myerscough



Source: ArchDaily



Source: Bamboo Import Europe



Source: ArchDaily



Source: Chiangmai Life Architects



Source: Torjans



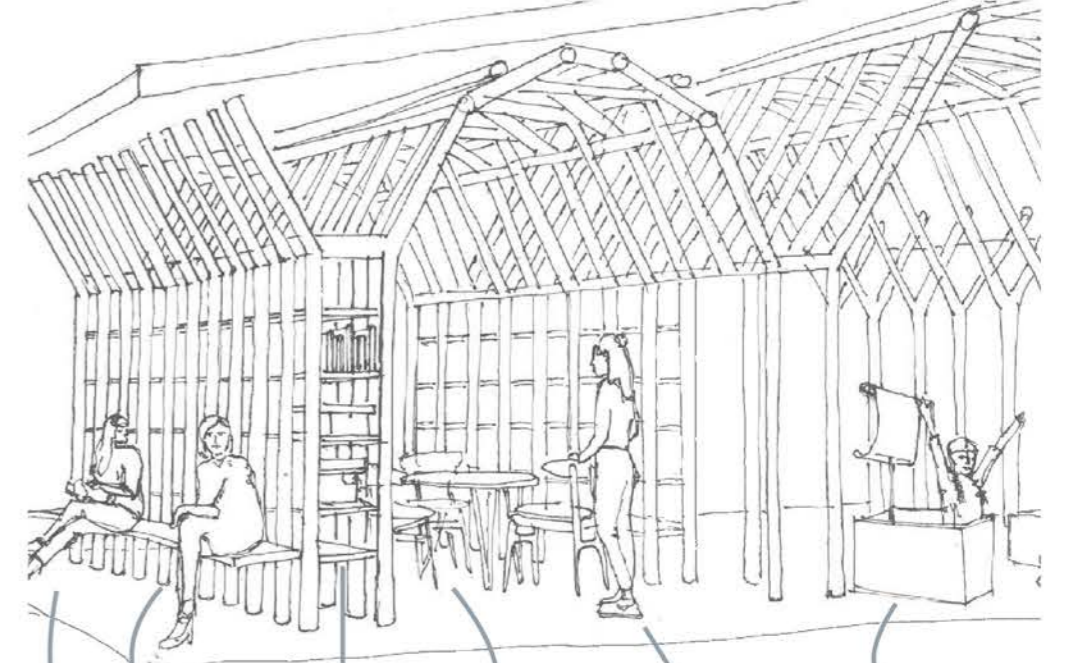
Source: Eleena Jamil Architect



Source: AArchitecture

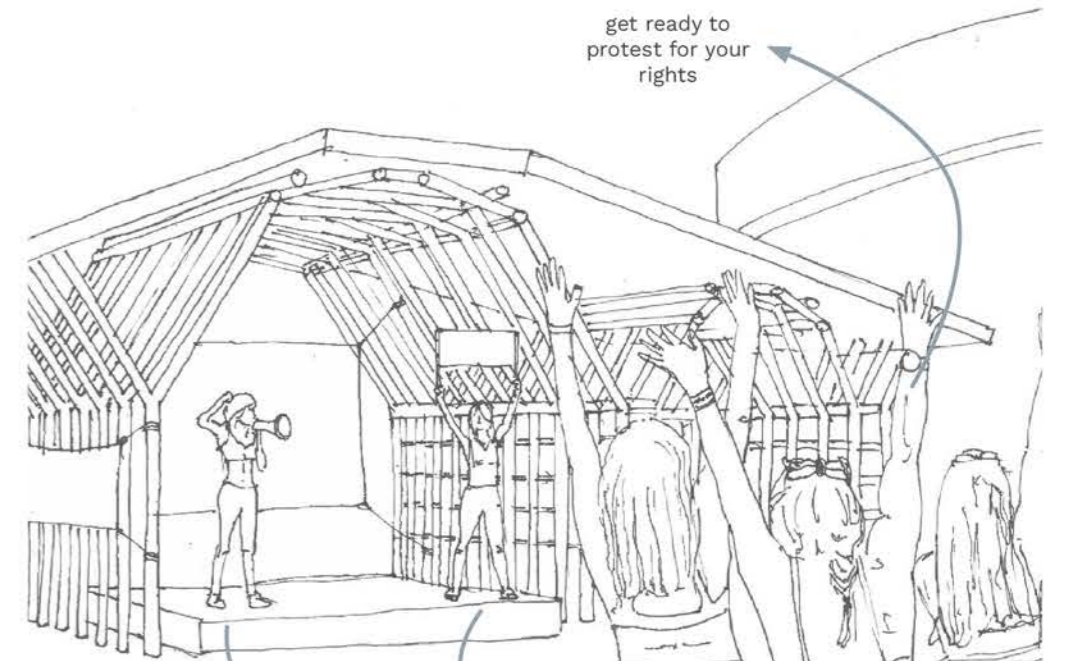
PROJECT VISION

THIS COULD BE ONE DAY...



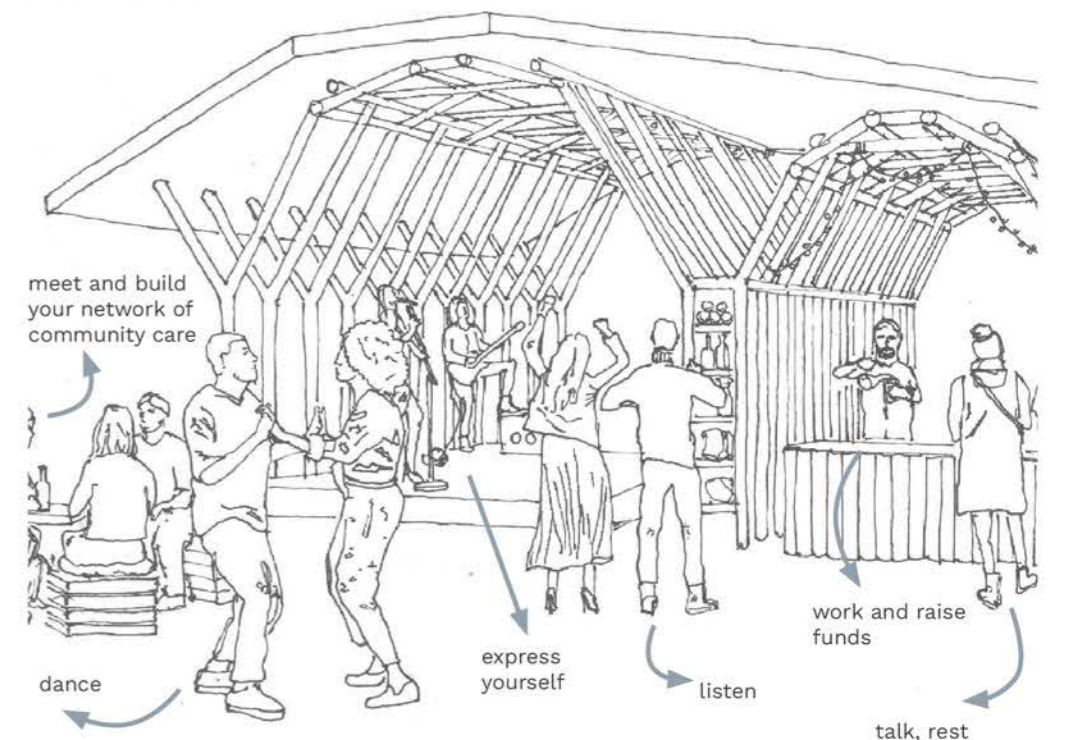
- rest
- look inside (be seen and be heard)
- easily store or exhibit your things
- work, cooperate, participate, learn
- have time for yourself
- be sure your kids are nearby and safe

AFTERNOON...



- inspire and educate
- fight for a political, systemic change
- coordinate with others
- get ready to protest for your rights

AND NIGHT.



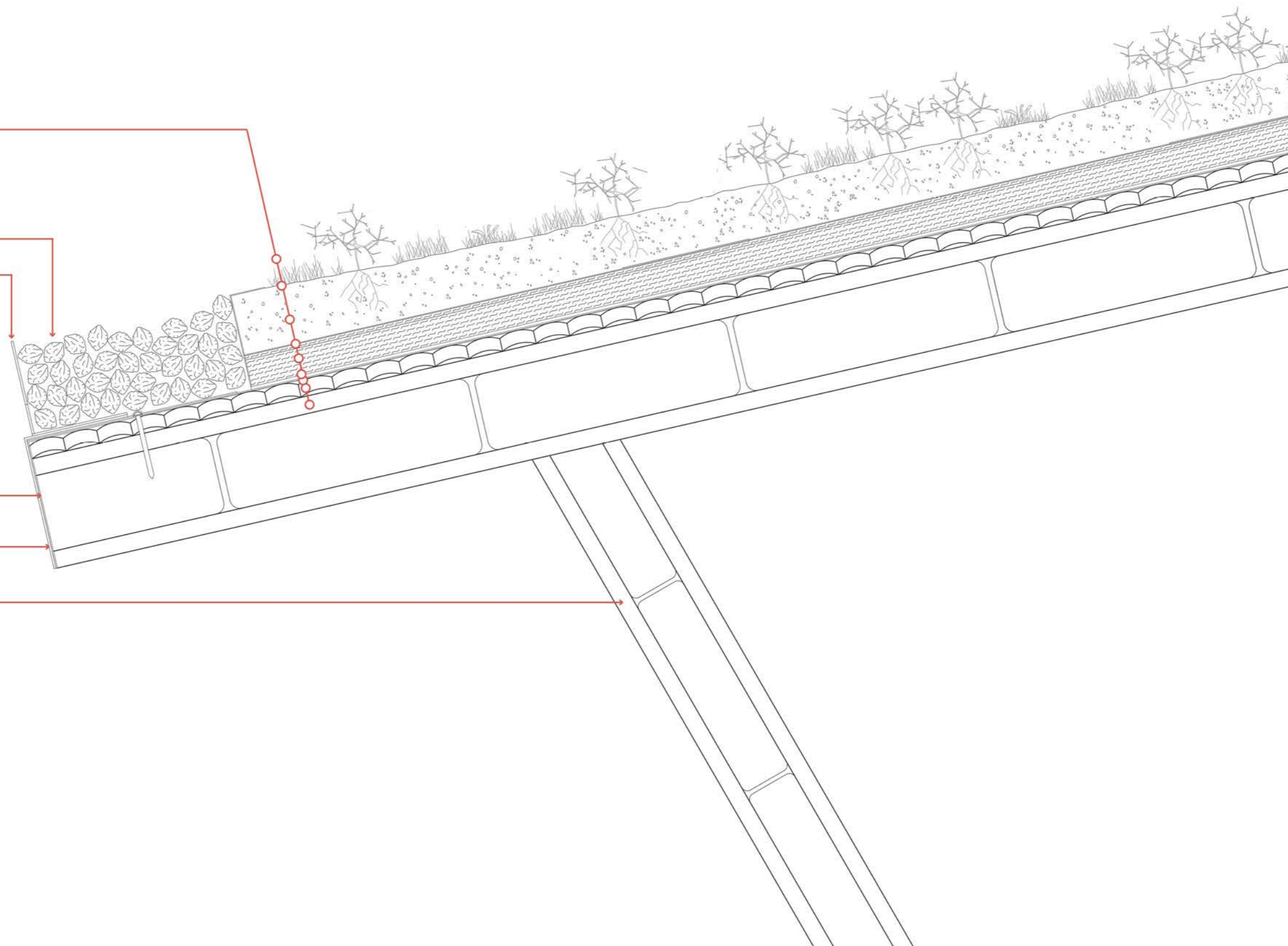
- meet and build your network of community care
- dance
- express yourself
- listen
- work and raise funds
- talk, rest

DETAILS - MAXIMIZING BAMBOO'S SUSTAINABILITY BENEFITS THROUGH CIRCULAR DESIGN

BIOBASED GREEN ROOF

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)

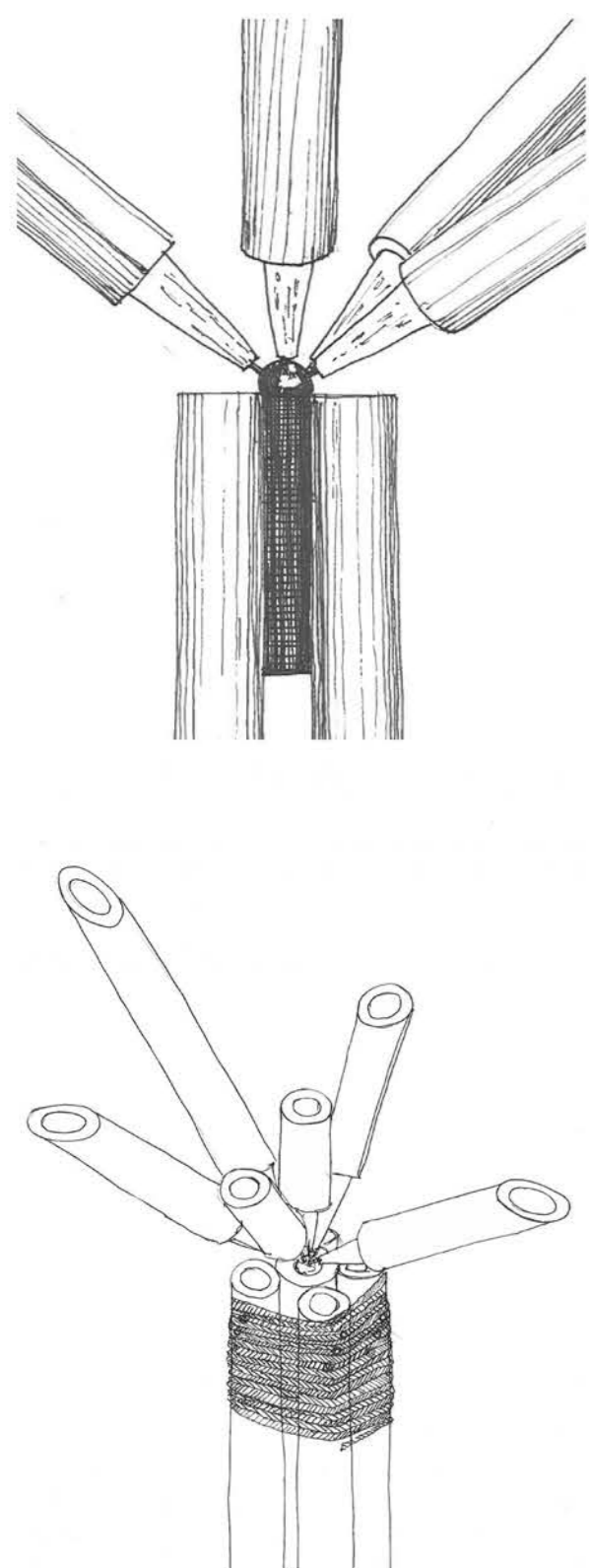


SECTION - DETAIL OF GREEN ROOF LAYERS
 SCALE 1:5

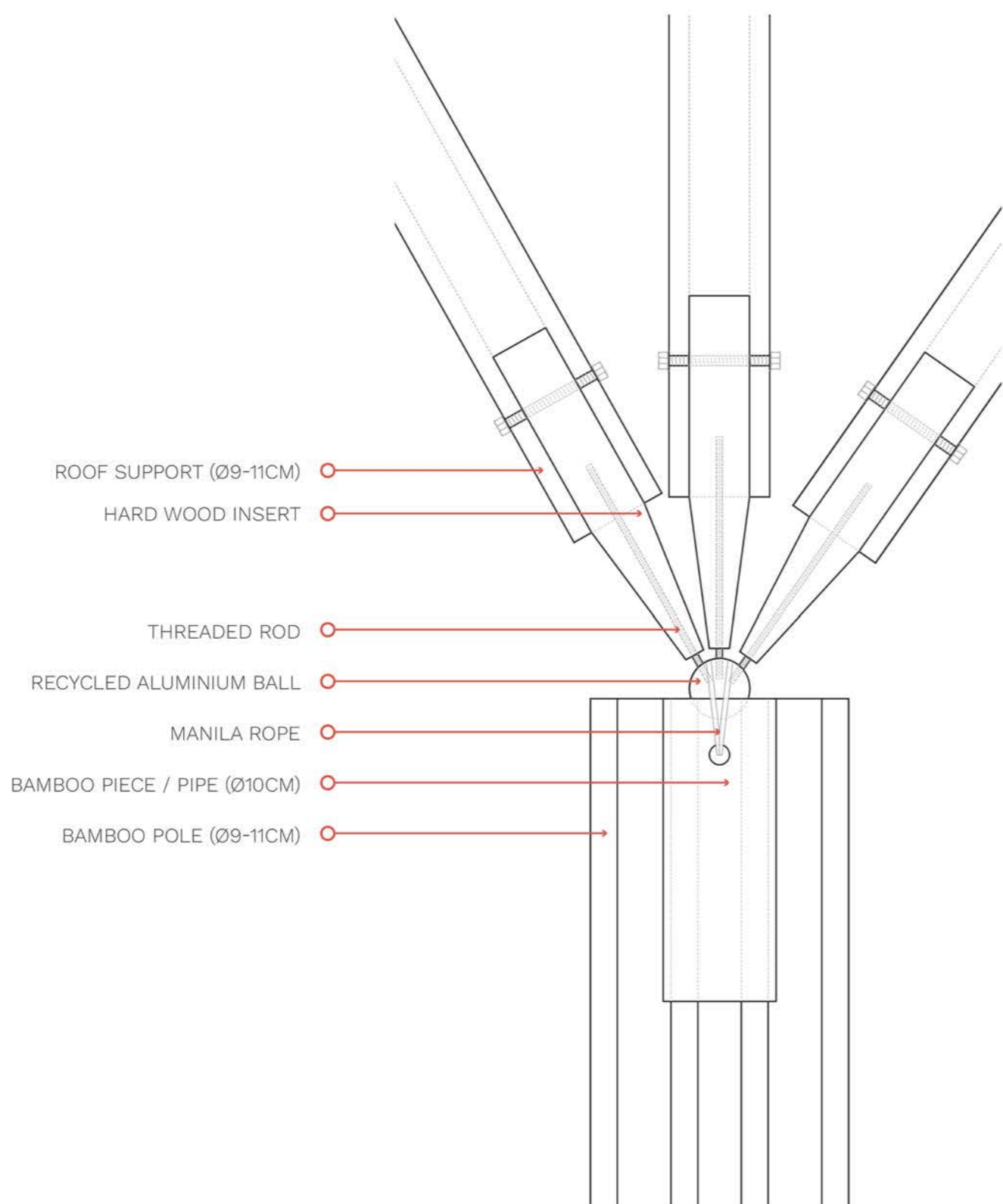


REFERENCE IMAGES OF A GREEN
 ROOF ON BAMBOO STRUCTURES

DEMOUNTABLE PREFABRICATED JOINT

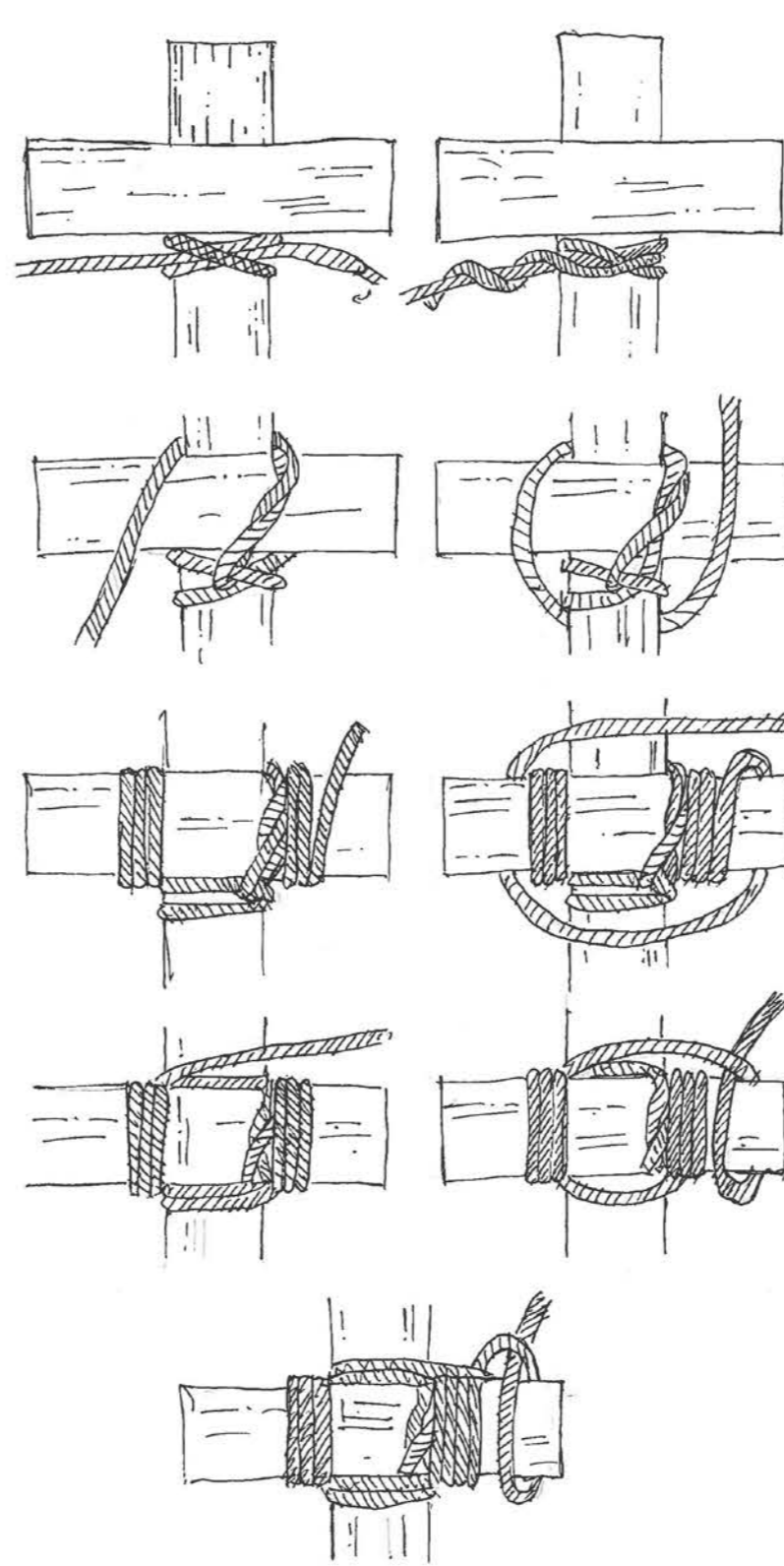


WALL TO ROOF SUPPORT CONNECTION

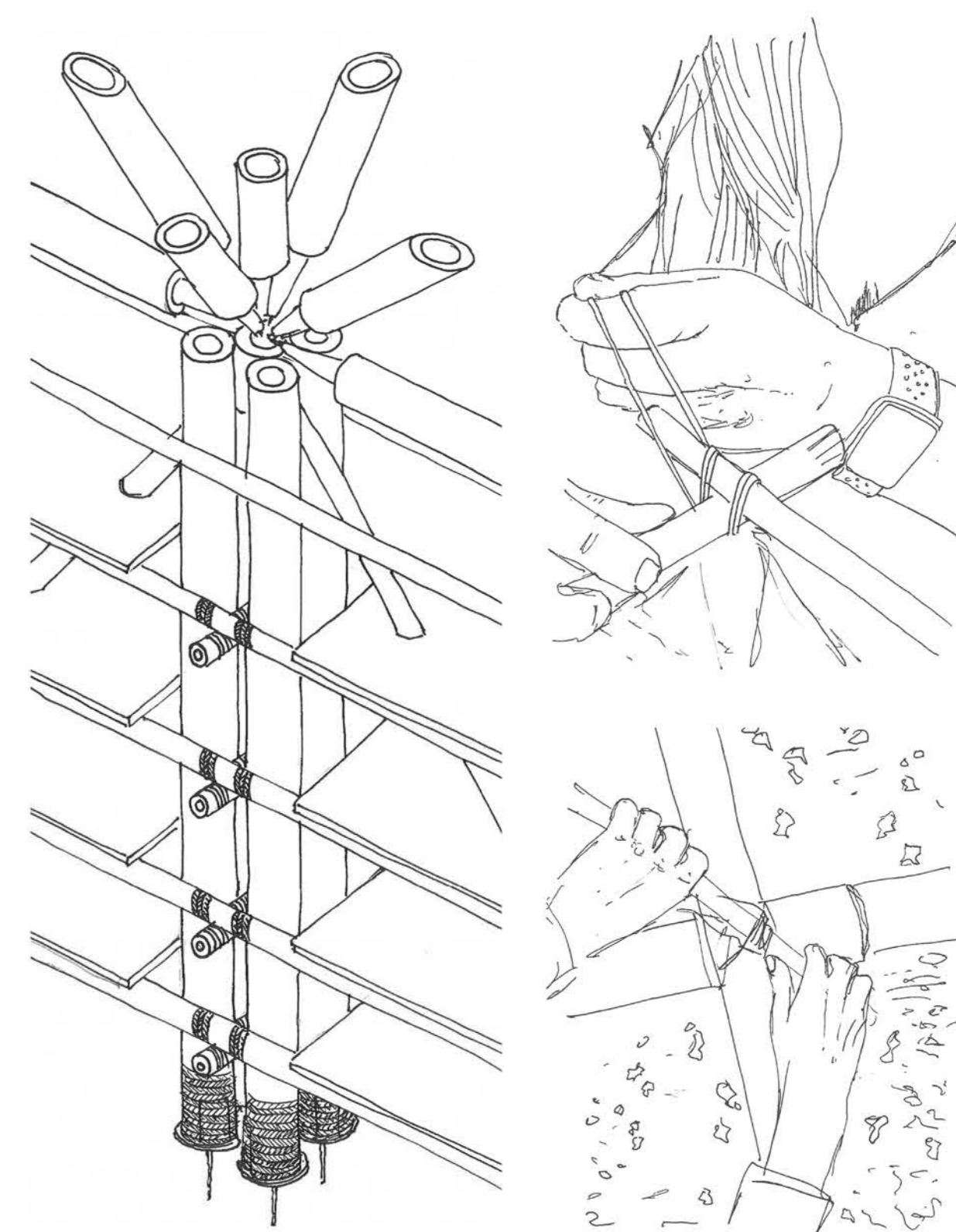


SECTION - WALL TO ROOF SUPPORT DETAIL
 SCALE 1:5

LASHING JOINTS

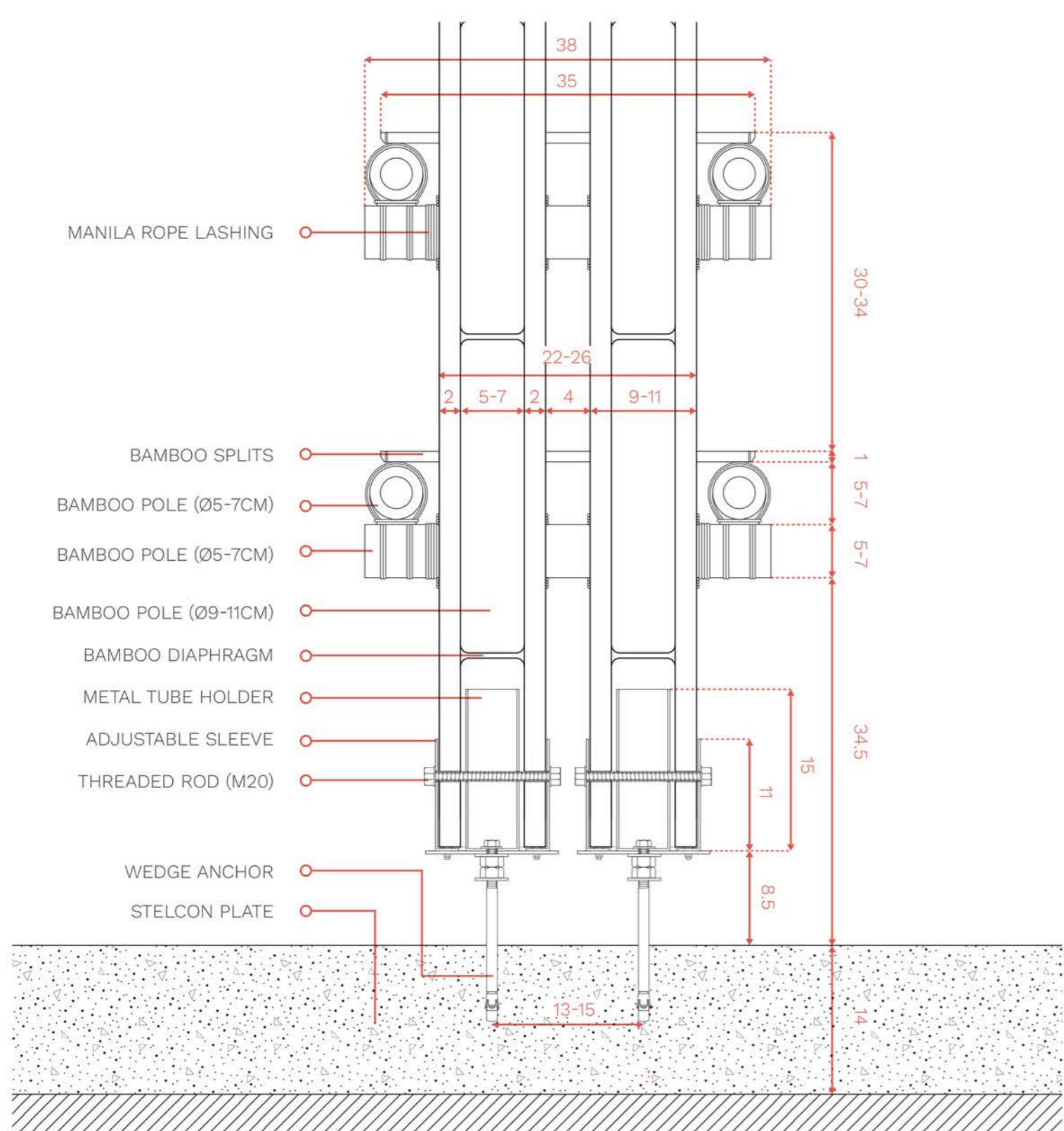


SQUARE LASHING AND THE PROCESS OF TYING THE KNOT

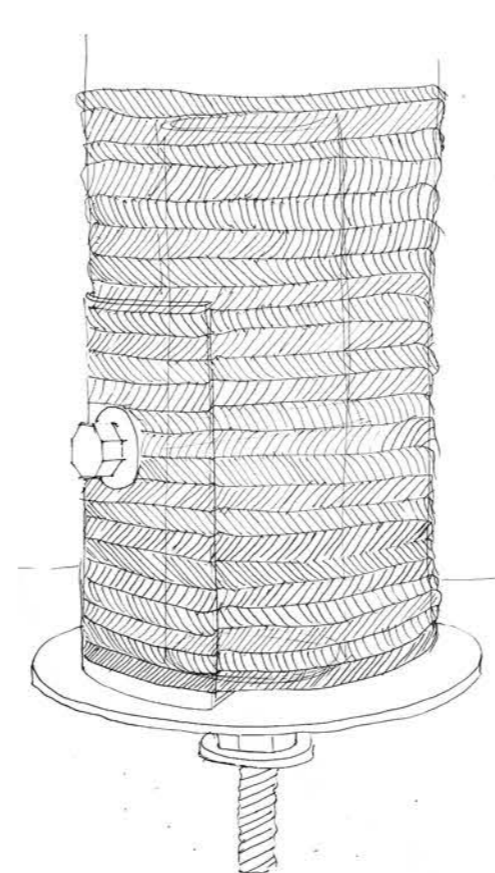


COMMUNITY BUILDING OF A SHELF-WALL SYSTEM WITH LASHING JOINTS

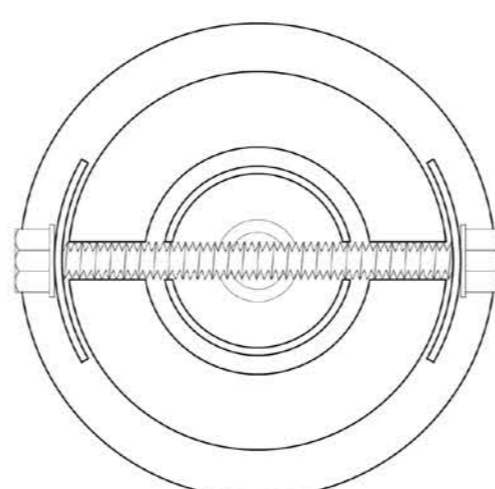
REVERSIBLE FOUNDATION



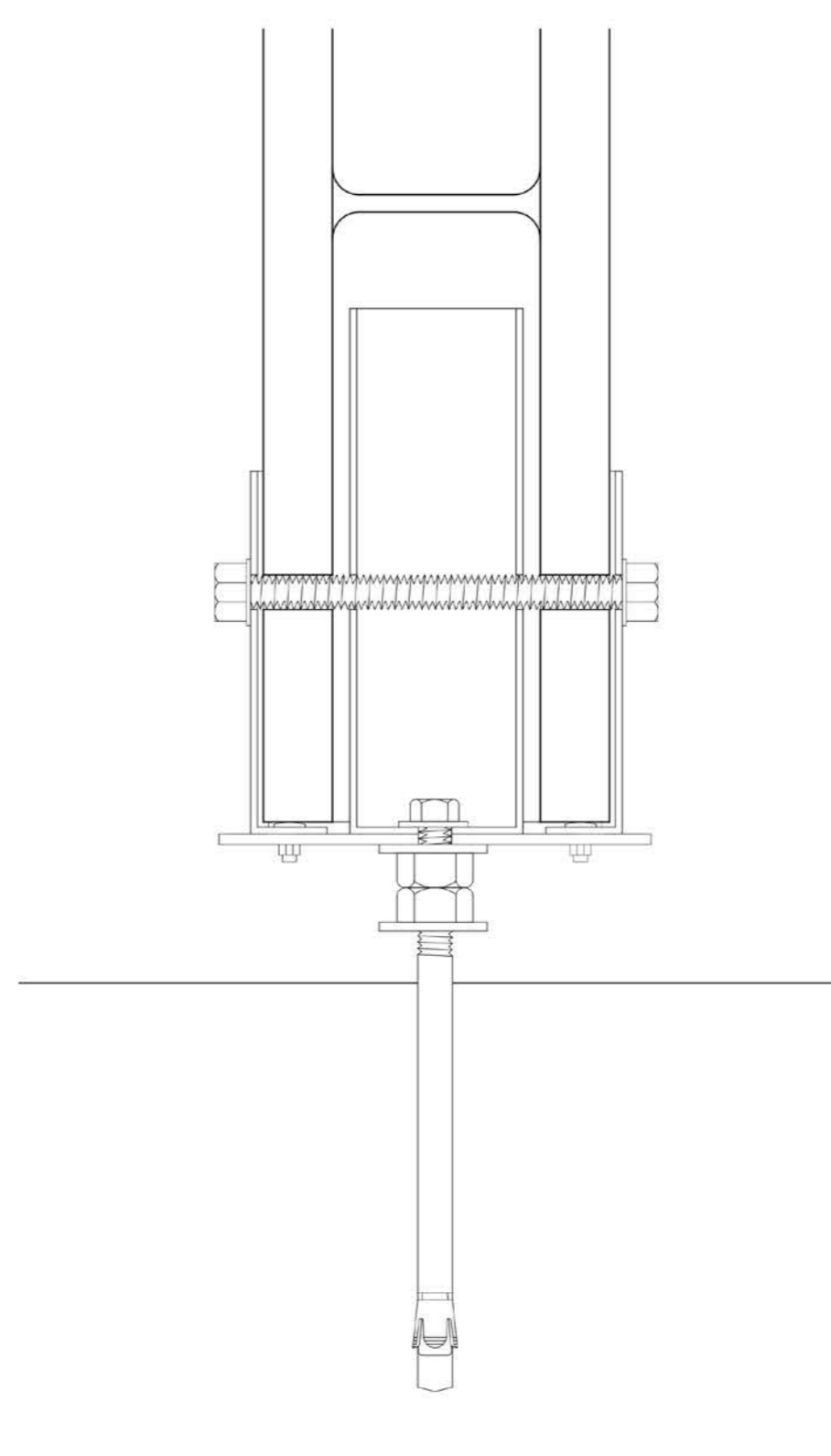
SECTION - PAVILION'S BASE DETAIL
 SCALE 1:5



COLUMN BASE FINISHED WITH
 WAXED NATURAL ROPE



PLAN - FOUNDATION DETAIL
 SCALE 1:2



SECTION - FOUNDATION DETAIL
 SCALE 1:2



REFERENCE IMAGES OF
 FOUNDATION ELEMENTS

DESIGN PROCESS

