Bartlett Design Research Folios

Izaskun Chinchilla Architects

Organic Growth Pavilion

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Organic Growth Pavilion: The Architecture of Circular Economy

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1 (previous) View of the finished pavilion.

2 View of the pavilion through the principal dome.

Project Details

Author	Izaskun Chinchilla
Title	Organic Growth Pavilion: The Architecture of Circular Economy
Output Type	Building
Function	Pop-up Pavilion
Location	Governors Island, New York
Research Period	January to September 2015
Installation	June to September 2015
Commissioners	FIGMENT NYC, Emerging New York Architects (ENYA), Structural Engineers Association of New York
Selection Committee	Marc Bailly (AIA, architect at Bailly & Bailly); Kathy Creutzburg (multimedia artist and sculptor); Jason Klimoski (AIA, co-founder at STUDIOKCA); Alexander Levi (AIA, principal at SLO Architecture); Nat Oppenheimer (executive vice president at Robert Silman Associates); Eva Perez de Vega (partner at e+i studio); Lori Zimmer (writer for Inhabitat)
Practice Team	Alfonso Aracil (visual artist); Adriana Cabello (media manager); Alejandro Espallargas (project manager); Paula Mena Albarrán (media manager); Pedro Pitarch (independent visualiser)
Research Assistants	Marcos Anton, Maria Bernardos, José Luis Fernandez, Sally Hart, Irene Hernández, Cristina Martínez, Esther Prieto
Structural Consultant	Roberto Marin
New York Representative	Rafael Álvarez-Rementería
Prototype Fabrication	Talleres Antonio Abellán
ENYA Volunteers Coordinator	Rubén Ramales

Volunteers	Laura Abad, Pauline Barkin, Jilian Tristam Cummings, Pablo Gualde, Caroline Hadilaksona, Nina Ippolito, Verena Koenig, Adriana Kosican, Nicholas Liong, Rony Menéndez, Irene Navarro Cascón, Lawrence J. Pascual, Michael Pryor, Lervelle Regís, Sergio Reyes, Curisa Smith, Corina Tuna, Camila Varon Jaramillo, Marcus Wilford, Kevin Wong, Patrick Yang
Budget	$20,832
Funders	$20,613 was raised through a crowdfunding campaign, with funders including PICE Acción Cultural Española (Spanish Embassy) and The Bartlett School of Architecture, UCL, as well as 472 crowdfunding individuals

Statement about the Research Content and Process

Description

Organic Growth Pavilion by Izaskun Chinchilla explores the circular economy model in relation to architectural practice. Chinchilla employed found objects, such as broken umbrellas, photographic tripods and bicycle wheels, to create an inventive temporary structure on Governors Island, New York in the summer of 2015. The individual elements were assembled and disassembled by a team of novice builders from the local community, and are intended to be reconfigured for use in the future.

Questions

1. How can architectural design be transformed in line with the main principles of the circular economy to achieve more holistic modes of production?

2. What kind of structural engineering approach is appropriate for the challenge of creating a coherent construction using different types of found objects as primary building materials?

3. How does waste-less production affect the building process in terms of materials and social capital?

Methodology

1. Create a systematic collection and classification of leftover objects and unused materials for the purpose of building;

2. Experimental and iterative prototyping, including testing and analysing the structural behaviour of joints;

3. Guide a group of volunteers, many with no prior experience in building, through a construction manual and training workshops.

Dissemination

The pavilion was visited by more than 500,000 people from June to September 2015. To date, there have been over 19,000 online, press and television references to the project, including bottom-up social media dissemination. It has featured in more than 20 printed magazines and has been the subject of two international group exhibitions (SCI-Arc, Los Angeles, 2018 and La Cité de l'Architecture et du Patrimoine, Paris, 2020). It has been presented as a case study at an international symposium (Delft University of Technology) and in lectures (Harvard University, Pratt Institute, etc.)

Project Highlights

Organic Growth Pavilion was one of two winning entries in the inaugural 'City of Dreams Pavilion' architectural design competition in 2015. For its realisation, 472 individual donors contributed to the online crowdfunding campaign run by Izaskun Chinchilla. Two working models of the project are now part of the permanent collections of the Centre Pompidou in Paris and the National Gallery of Modern Art in Rome. In February 2016, Organic Growth Pavilion was presented as a keynote project in *Architecture Timed: Designing with Time in Mind* for *Architectural Design* (Franck 2016).

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3 Volunteers at work.

4 Models produced for the Centre Pompidou, Paris, permanent collection, and exhibited at Cité de l'Architecture et du Patrimoine, Paris.

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Introduction

Governors Island is a 172-acre island in New York Harbor, between lower Manhattan and Brooklyn. In 2015, an annual international architectural competition was launched by FIGMENT NYC – a New York-based cultural organisation who run an annual arts event – as part of an ongoing campaign to keep the island open to the public throughout the year; at the time it was only open from June to September, despite being only three minutes away from Lower Manhattan by boat. Izaskun Chinchilla Architects' Organic Growth Pavilion was one of two winning entries, and formed an integral part of the campaign by New York residents to use the island as a park year round while also raising awareness around sustainability in the architecture and design industries.

Organic Growth Pavilion invites visitors to use the space under a tree-like structure of mophead flowers, covering an area of around 100 m^2. Owing to the strong community engagement and civic character of the project, Chinchilla employed a circular economy principle to highlight waste-less production in architectural practice. As such, Organic Growth Pavilion is entirely made of recycled materials, including 350 broken umbrellas, 120 photograpy tripods and 550 damaged bicycle wheels. It gives these commonly found objects a new lease of life after they have become unfit for their original purpose. The pavilion is easily dismantled, with the individual elements intended to be reused in different capacities in the future.

Chinchilla conducted a preliminary investigation, for which 250 interviewees described their reactions to landscape images and natural elements. From the results, she chose to produce a structure that looked like a bouquet of flowers, made from discarded materials.

Industrial production uses existing resources to make things that usually become obsolete in less than two decades. When this mode of production prevails as the main driver of economic growth, resources eventually deplete and waste becomes excessive. The circular economy model aims to redress these wide-reaching negative environmental and sociopolitical implications by supporting a transition to renewable energy sources and reappraising waste as matter that can be appropriated and reused through collaborative processes of sharing and making (Gallaud and Laperche 2016; Crocker 2018). Keeping materials in use for the production of more than one object is an ecological stance that drives waste out of the design process and lessens its long-term environmental impact.

Organic Growth Pavilion became an ideal testbed for the implications of the circular economy and waste-less production in architectural practice. To address the challenges of reusing damaged objects as primary materials, the project was studied and analysed at an advanced structural level using iterative prototyping. Further to this, lectures and instruction manuals aided Chinchilla in communicating elements of the project and engaging the community, including guiding a group of volunteers with no prior experience in construction.

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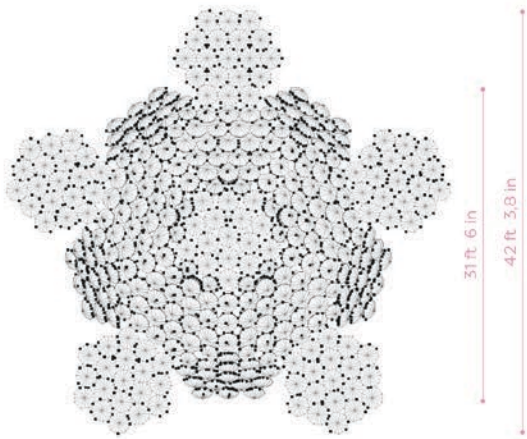
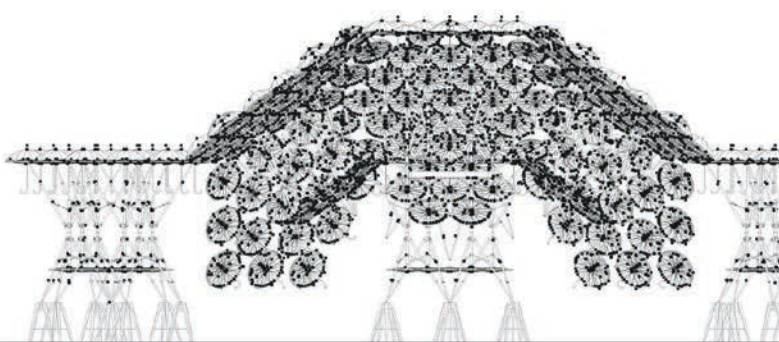
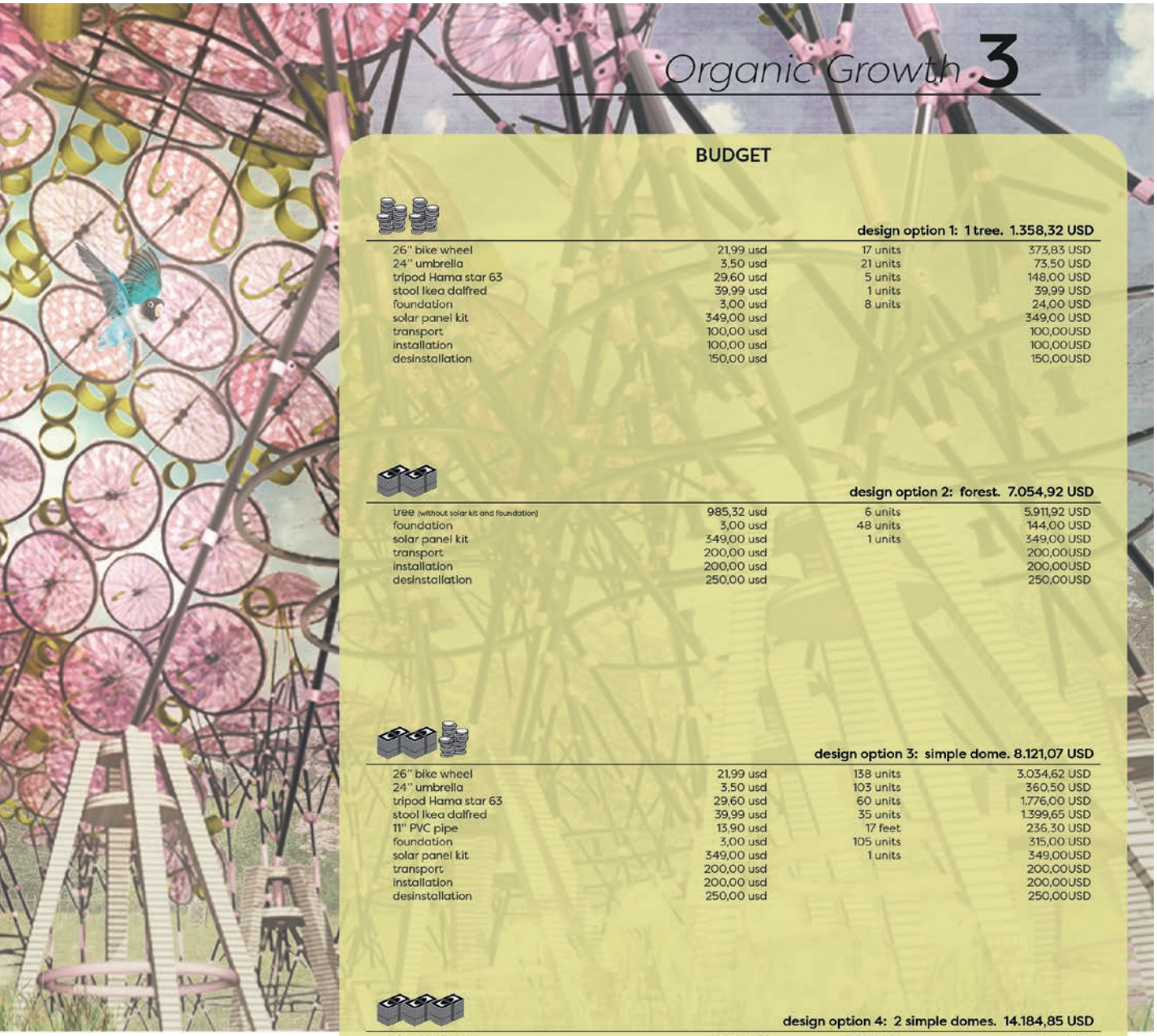
5–6 (overleaf) Organic Growth Pavilion, competition entry drawings.

DOBLE DOME. 1159,5 ft²

plan. scale 1/200 | section. scale 1/100







Organic Growth 3

BUDGET

design option 1: 1 tree. 1.358,32 USD

26" bike wheel	21,99 usd	17 units	373,83 USD
24" umbrella	3,50 usd	21 units	73,50 USD
tripod Hama star 63	29,60 usd	5 units	148,00 USD
stool Ikea dalfred	39,99 usd	1 units	39,99 USD
foundation	3,00 usd	8 units	24,00 USD
solar panel kit	349,00 usd		349,00 USD
transport	100,00 usd		100,00USD
installation	100,00 usd		100,00USD
desinstallation	150,00 usd		150,00USD

design option 2: forest. 7.054,92 USD

tree (without solar kit and foundation)	985,32 usd	6 units	5.911,92 USD
foundation	3,00 usd	48 units	144,00 USD
solar panel kit	349,00 usd	1 units	349,00 USD
transport	200,00 usd		200,00USD
installation	200,00 usd		200,00USD
desinstallation	250,00 usd		250,00USD

design option 3: simple dome. 8.121,07 USD

26" bike wheel	21,99 usd	138 units	3.034,62 USD
24" umbrella	3,50 usd	103 units	360,50 USD
tripod Hama star 63	29,60 usd	60 units	1.776,00 USD
stool Ikea dalfred	39,99 usd	35 units	1.399,65 USD
11" PVC pipe	13,90 usd	17 feet	236,30 USD
foundation	3,00 usd	105 units	315,00 USD
solar panel kit	349,00 usd	1 units	349,00USD
transport	200,00 usd		200,00USD
installation	200,00 usd		200,00USD
desinstallation	250,00 usd		250,00USD

design option 4: 2 simple domes. 14.184,85 USD

26" bike wheel	21,99 usd	262 units	5.761,38 USD
24" umbrella	3,50 usd	199 units	696,50 USD
tripod Hama star 63	29,60 usd	108 units	3.196,80 USD
stool Ikea dalfred	39,99 usd	63 units	2.519,37 USD
11" PVC pipe	13,90 usd	32 feet	444,80 USD
foundation	3,00 usd	189 units	567,00 USD
solar panel kit	349,00 usd	1 units	349,00 USD
transport	200,00 usd		200,00USD
installation	200,00 usd		200,00USD
desinstallation	250,00 usd		250,00USD

design option 5: doble dome. 14.198,68 USD

26" bike wheel	21,99 usd	367 units	8.070,33 USD
24" umbrella	3,50 usd	297 units	1.039,50 USD
tripod Hama star 63	23,60 usd	120 units	2.832,00 USD
stool Ikea dalfred	39,99 usd	35 units	1.399,65 USD
foundation	3,00 usd	140 units	420,00 USD
solar panel kit	349,00 usd	1 units	349,00 USD
transport	200,00 usd		200,00USD
installation	200,00 usd		200,00USD
desinstallation	250,00 usd		250,00USD

Aims and Objectives

Architects rarely have the opportunity to work on a new holistic model of production from initial design to community engagement. Rather, they tend to follow approaches to design that use industrial building standards of an extractive economy, which favour the creation of new objects without considering the reuse of existing local resources in material and human capital. Following the alternative principles of the circular economy, Izaskun Chinchilla aimed to:

1. Produce an architectural structure out of reused and recycled objects and materials;

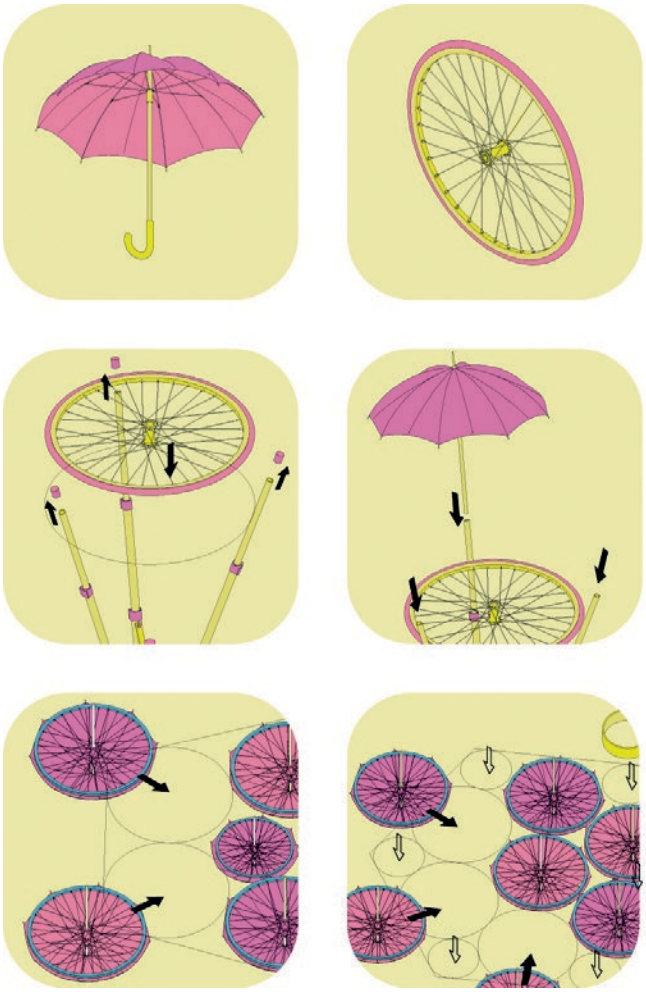
2. Deploy a visual strategy that makes the structure appear welcoming and respectful of its natural surroundings while avoiding a 'Mad Max' style often associated with found materials;

3. Develop an appropriate structural strategy to keep these objects and materials in use;

4. Ensure the proposal is not only effective in terms of communicating the NGO campaign but can also be achieved within the restricted setting of the island;

5. Develop architectural strategies for community engagement and training;

6. Create an architecture of parts that can be disassembled and partly reassembled in new configurations in the future.



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7 (previous) Organic Growth Pavilion, installed onsite.

8 Drawings studying the upcycling of different materials for the first stage of the competition.

Questions

1. How can architectural design be transformed in line with the main principles of the circular economy to achieve more holistic modes of production?

The circular economy is not only a material change but also conceptual. Architects begin design processes with undefined sketches; in the circular economy, however, they start with defined objects. The circular economy requires the architect to take a proactive attitude in negotiating rental of parts and donating them after demolition. In doing so, it challenges insurance systems as recycled materials forego guarantees of the contractor and fabricator. If the building is structurally compromised, it is unclear who the responsibility sits with.

Adopting the main principles of circular economy implies a shift in architectural design practice from creating *ex nihilo* to working with what is already available. This shift is reflected on multiple levels, from the reuse of existing objects as primary materials to the participatory construction process and reversible lifecycle of the structure. Organic Growth Pavilion proposes that this adaptability should become a model for New York's dynamic urban pace.

2. What kind of structural engineering approach is appropriate for the challenge of creating a coherent construction using different types of found objects as primary building materials?

Reusing found objects as primary building materials presents problems for structural analysis, as engineers cannot predict the extent to which the objects they're working with may be damaged. To address this, Chinchilla and the project's engineering consultants developed a 'modes of failure' approach to materiality, which assumed that the materials would fail. Assuming this degree of failure enabled Chinchilla to optimise the design, to address such latent contingencies and preserve the general stability and performance of the overall structure by reinforcing its redundancy. Iterative prototyping proved to be thoroughly instructive and became an integral part of this approach. Chinchilla also worked with 'capacity design', whereby a system of structures provides rigidity to the overall construction by assuming a lack of support between components.

9 Organic Growth Pavilion, Governors Island, New York.

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3. How does waste-less production affect the building process in terms of materials and social capital?

Waste-less production encourages architects to think of ways they can reuse what is locally available in terms of materials and human capital. Organic Growth Pavilion was crowdfunded by a community of 472 donors. 22 volunteers with no prior experience in construction assembled and eventually dismantled the project onsite. The prototyping process was used to produce a construction manual for these volunteer builders. Parts of the structure can be reassembled as smaller units and installed elsewhere in the future with the help of the manual. Some of the volunteers who worked on the construction of the project were also active members of the local community fighting to establish public access to Governors Island year round. Organic Growth Pavilion was designed to be installed in the months that the island opened to the public and its celebrated reception became a significant argument in support of the local community's cause.

10 Volunteers on the opening day.

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Context

As a discipline, architecture has not yet fully contributed to the further development and implementation of the circular economy model. While specialists in sustainability of the built environment have discussed possible applications, such as David Cheshire in his book *Building Revolutions: Applying the Circular Economy to the Built Environment* (2016), examples from actual design practices are still rather limited. Cheshire foregrounds architectural projects that are exemplary of design principles that could stem from the circular economy framework: the White Collar Factory in London by Allford Hall Monaghan Morris (2017) is an exemplar of designing in layers within existing building envelopes; Stanton Williams' Central Saint Martins' Granary Square building in London (2011) exemplifies the principle of design for adaptability; while the Children's Hall of Art in Rotterdam by Jouke Post (2002), which was dismantled, converted into a school and reconverted for use by a television company, showcases design for disassembly.

The methodology followed by Izaskun Chinchilla Architects in the design and production of the Organic Growth Pavilion directly addresses the full spectrum of these challenges from the standpoint of the practicing architect. These range from the project's original conception to its eventual disassembly and re-installation elsewhere. Architectural projects that are currently discussed as exemplars of circular economy follow established models of professional practice, and focus on the use of existing structures and materials but do not address implications on social capital and community engagement. Organic Growth Pavilion engages with these questions by combining them with the longer history of self-building practices in architecture.

Architectural practices of self-building have a strong presence in the history of the discipline, as documented by archaeological findings from ancient civilisations to the improvised architectures and cities of contemporary Peru (Gyger 2019). In the 1960s and 70s, ideas around self-building and do-it-yourself craftsmanship informed participatory design practices, such as Ralph Erskine's Byker Wall housing project in Newcastle upon Tyne (1968–82), Walter Segal's self-build houses in London (c.1980s) and Dennis K. Ruth and Samuel Mockbee's Rural Studio design-build programme in Hale County, Alabama (1993, ongoing). In the recent history of the discipline, these self-build practices have mostly led to the production of residential and housing projects or other communal spaces for activist groups. Organic Growth Pavilion builds on this disciplinary experience of community engagement and self-building, extending it further to include a community-built project that works as an assemblage and has a broader public purpose beyond the immediate interests of the parties involved in its construction.

Another important aspect of the design of the pavilion was to promote reused materials as both aesthetically pleasing and welcoming. In doing so, it aimed to avoid association with an environment produced from salvaged materials that is only inhabited when there is no other option, usually as a consequence of a catastrophe as seen in the films *Mad Max* and *Blade Runner*.

Organic Growth works with two visual traditions: still life representations and the readymade. The still life painters Ambrosius Bosschaert and Juan Sánchez Cotán were of particular interest. Bosschaert's detailed drawings are exceptional in foregrounding the forms and colours of his objects of study. Cotán's are simpler in comparison, his fruit and vegetables relate to the interior space

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11 Juan Sánchez Cotán,
Still Life with Game, Vegetables and Fruit, 1602.

around them by hanging from the ceiling or finding their place on a window. The forms stand out with an almost geometric clarity against a dark background. On the other hand Marcel Duchamp's readymades use generic and anonymous industrial products, presenting them as artworks by removing them from their original context and giving them unexpected titles. Chinchilla was also influenced by the work of Spanish photographer Chema Madoz. Madoz's obsessively detailed artworks are delusional versions of generic objects of everyday life.

Chinchilla's design takes inspiration from nature directly, in particular from the flowering plant *Hydrangea macrophylla*, to provide stability for an extremely light architectural body. The natural reference and its transformation into a geometrical model follows a tradition initiated by D'Arcy Wentworth Thompson, who published his studies of morphology in *On Growth and Form* (1917). Using a wide range of animals and plants as his case studies, Thompson focused his research on the evolution of their forms as these living organisms grew over time. He argued that these transformations followed clear rules that could be geometrically defined. Later studies by Norman Crowe (1995) and George Hersey (1999) associated similar examples from the flora and fauna of the natural world with architectural forms built by humans.

Drawing from these earlier twentieth-century references, Chinchilla used digital models to generate the form and study the structural capacity of the project. In doing so, she connected with a longer chain of research in computer-generated architectural form that originated in the late 1990s. John Frazer's pioneering work in the field, which has today developed into 'biodigital architecture' and 'biophilic design', aimed to digitally produce what he called 'an evolutionary architecture'. Working almost like a digital Thompson, Frazer used advanced computer software to create architectural forms that followed the formal transformations of living organisms over time. In this vein, Greg Lynn and Haresh Lalvani's experiments into complex geometric transformations of digitally produced architectural forms were also influential precedents.

12

13

12 Chema Madoz,
Escurreplatos, c.1990s.

13 Marcel Duchamp,
Bicycle Wheel, 1951.

14 (overleaf)
The finished pavilion.

Methodology

1. Create a systematic collection and classification of leftover objects and unused materials for the purpose of building

All the necessary primary materials for constructing the pavilion were gathered locally. Chinchilla and a team of collaborators and volunteers drove a van around Manhattan to retrieve damaged bikes, while umbrellas were donated by airport security services and broken wheels were found at local car depots.

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15–7 Volunteers in New York gathered recycled materials in a van over a period of three months.


Top $ Paid For Your Scrap Metals
★WIRES ★ELECTRONICS ★BRASS
★STEEL ★BATTERIES ★A.C.
★STAINLESS STEEL
516-779-9314
SCRAP IT UP
METAL RECYCLING
516-779-9314
★ALUMINUM ★COPPER ★MOTORS
★IRON ★BATTERIES ★A.C.
★RADIATORS
187
IT UP
METAL RECYCLING
646-879-0957
STOP HERE

17

2. Experimental and iterative prototyping, including testing and analysing the structural behaviour of joints

To test the structure, Chinchilla conducted iterative prototyping in Murcia, Spain, with Talleres Antonio Abellán. The overall structure was designed as a self-supporting series of column core and dome roof elements. The tree-shaped column cores and dome roofs are distributed to form two rings (inner and outer). The inner ring occupies the central space and features a large dome, while the outer ring ties the structure together and supports the horizontal forces.

Three column cores and one dome roof were constructed at a 1:1 scale to test their structural behaviour. The unconventional structural layout was comprised of different manufactured elements, such as wheels and tripods, and their varying joints, screws, plastic parts, mobile elements and material finishes all had to be addressed. These 'hybrid' elements introduced behavioural uncertainties that had to be balanced with appropriate safety measures.
A reinforced redundancy principle became the guiding structural rule to improve safety standards, as well as ensuring the pavilion's resistance to vertical and horizontal wind forces.

18–20 (overleaf) A 1:1 prototype of the structure made in Murcia, Spain.

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Structural redundancy works on both a micro- and macro-scale. On the macro-scale, dome roof parts do not lean on just two column core elements; they are also variously connected to vertical elements so that the possible failure of one of the column cores does not result in the collapse of the structure. In the case of collapse, the structure can redistribute the transmission of loads across an alternative path. In addition, the horizontal structure works against wind forces over several column core rings. This creates a multiple-layered bracing structure that joins the individual elements together. On the micro-scale, the photographic tripods form the basic shape of the column core elements. Extra metal bars introduced into the general layout reinforce their load-bearing capacity to withstand not only vertical but also horizontal forces, so that failure of several bars of column cores will not cause the entire structure to collapse.

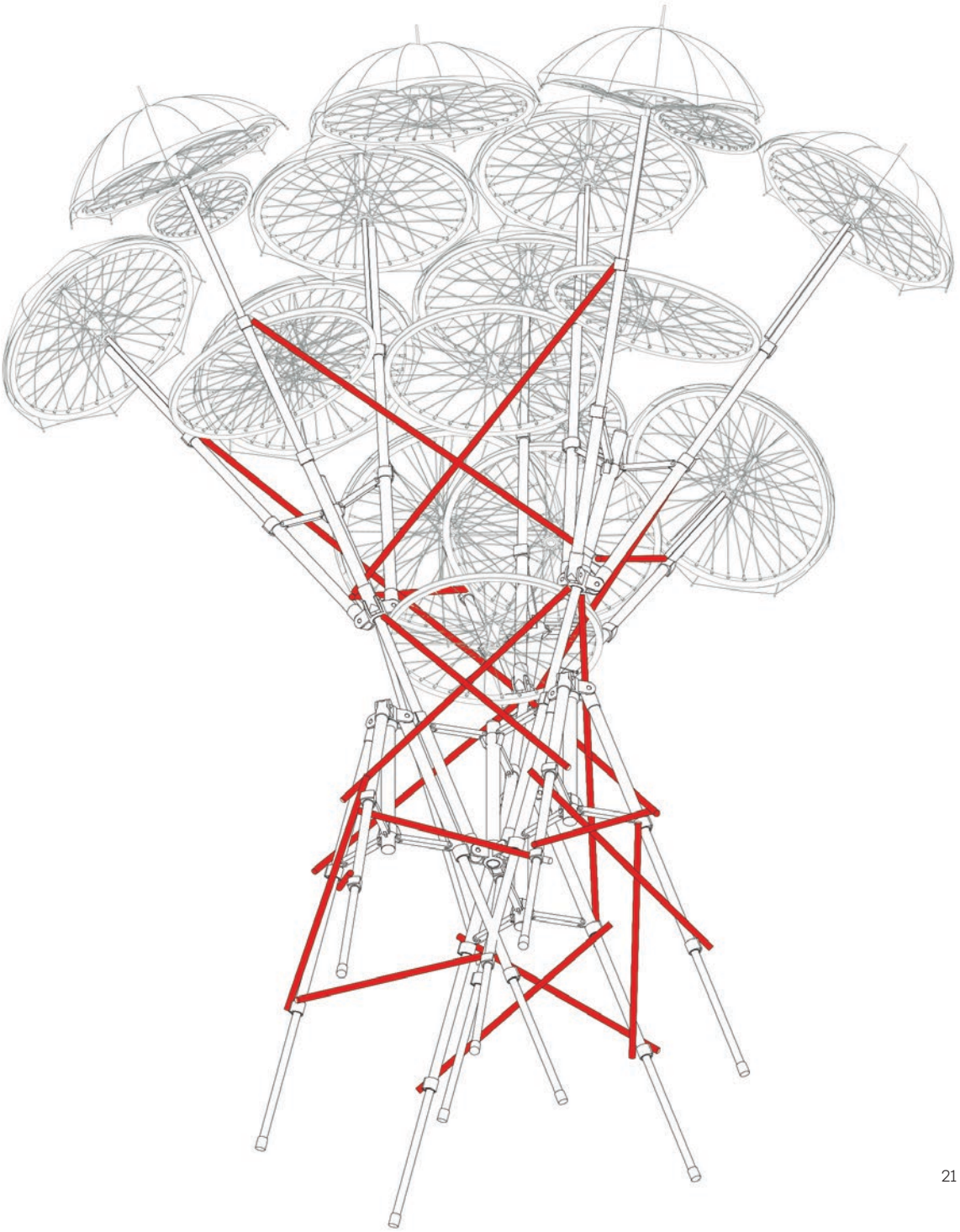
The joints between the manufactured and extra bars are designed to facilitate the structure to work to its liminal strength. Stronger materials are used for the joints, and the design combines several strategies such as screwing and wire wrapping to ensure a 'ductile' behaviour.

The 1:1 prototype was mainly used to test the structure's behaviour outdoors, particularly in relation to wind forces. The wind pressure was studied, not only as vertical and uplifting but also as a horizontal overturning force. The concrete volume necessary to balance the uplifting and overturning forces was another design problem. The nature of the project meant that the foundations couldn't go deep into the ground. As the concrete volume had to be symmetrically distributed around the pavilion, a solution was found whereby concrete was poured into broken car wheels. Additional tension capacity was introduced by injecting anchors into the ground.

The construction of the 1:1 prototype was a formative experience for the team. From uncertain beginnings to the sophisticated use of bracing and redundancy strategies, the opportunity arose to experience the structural response and to physically evaluate design decisions. Initial concerns about unpleasant vibrations were disproved as the structure behaved without visible dynamic phenomena. The pavilion's design was further improved by blending physical testing with simple mathematical models.

21 Micro-scale redundancy strategy drawing.

22 (overleaf) General section drawing, showing how the supports are wider at the base than above. The loads generated from the top are divided.



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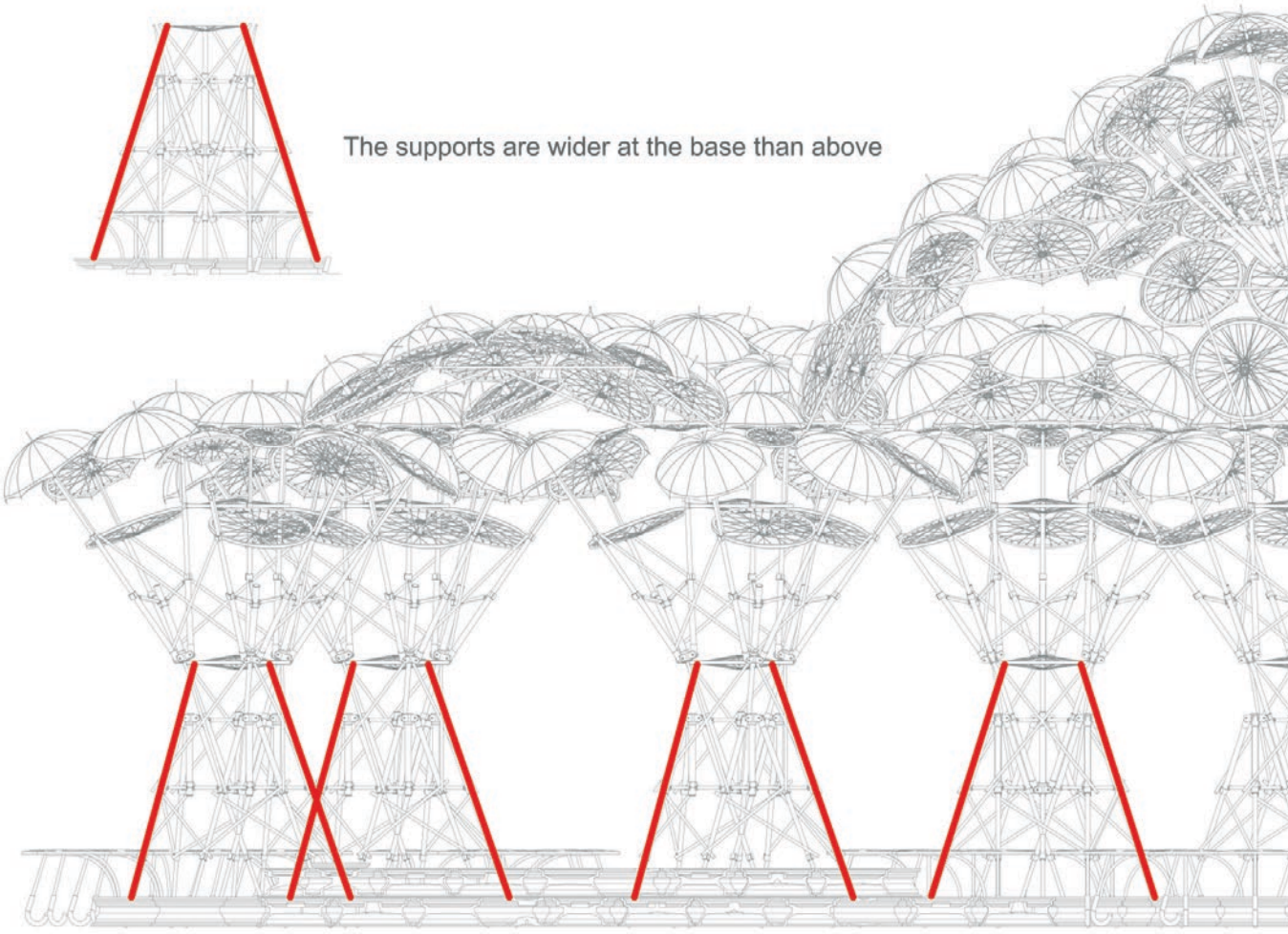
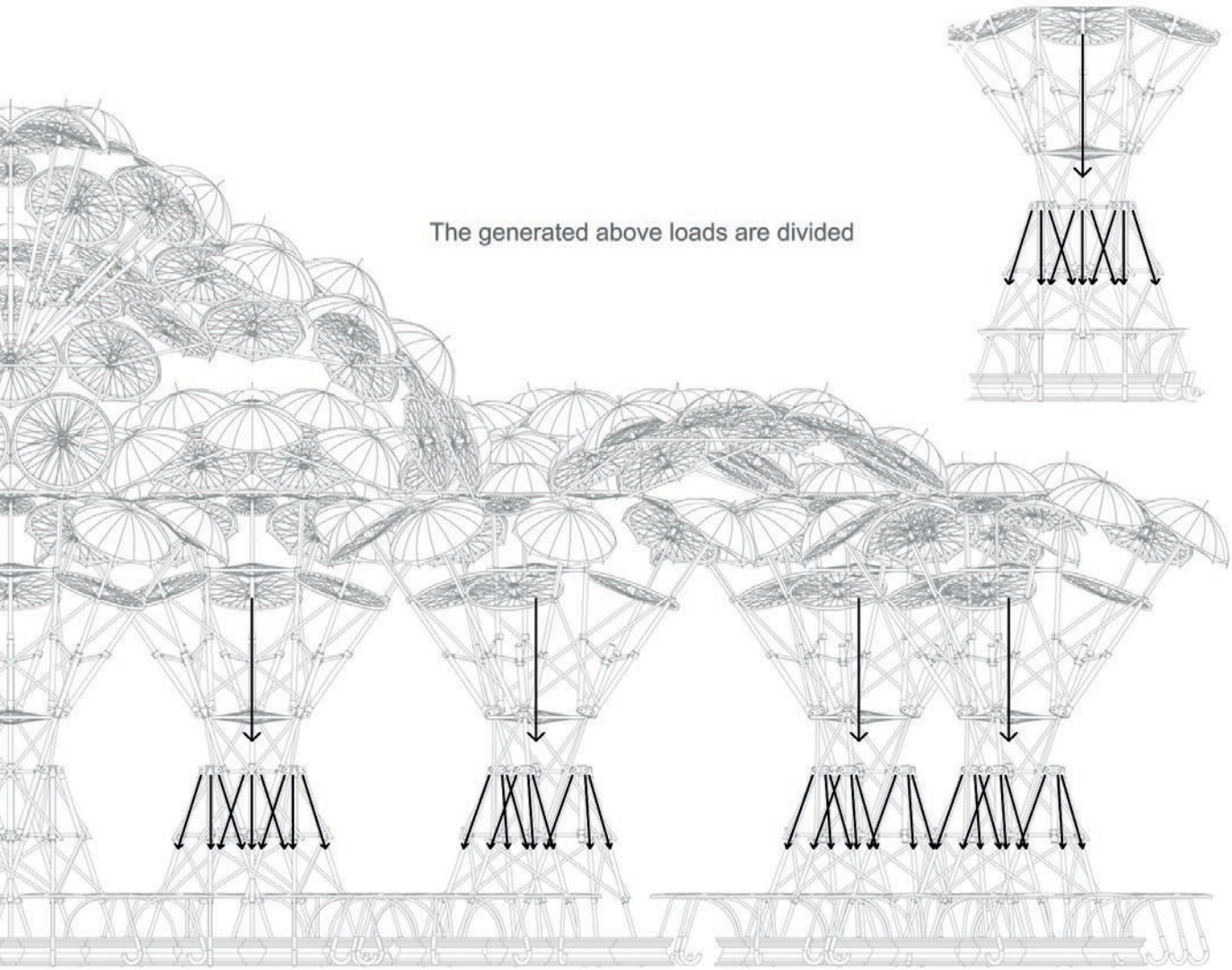
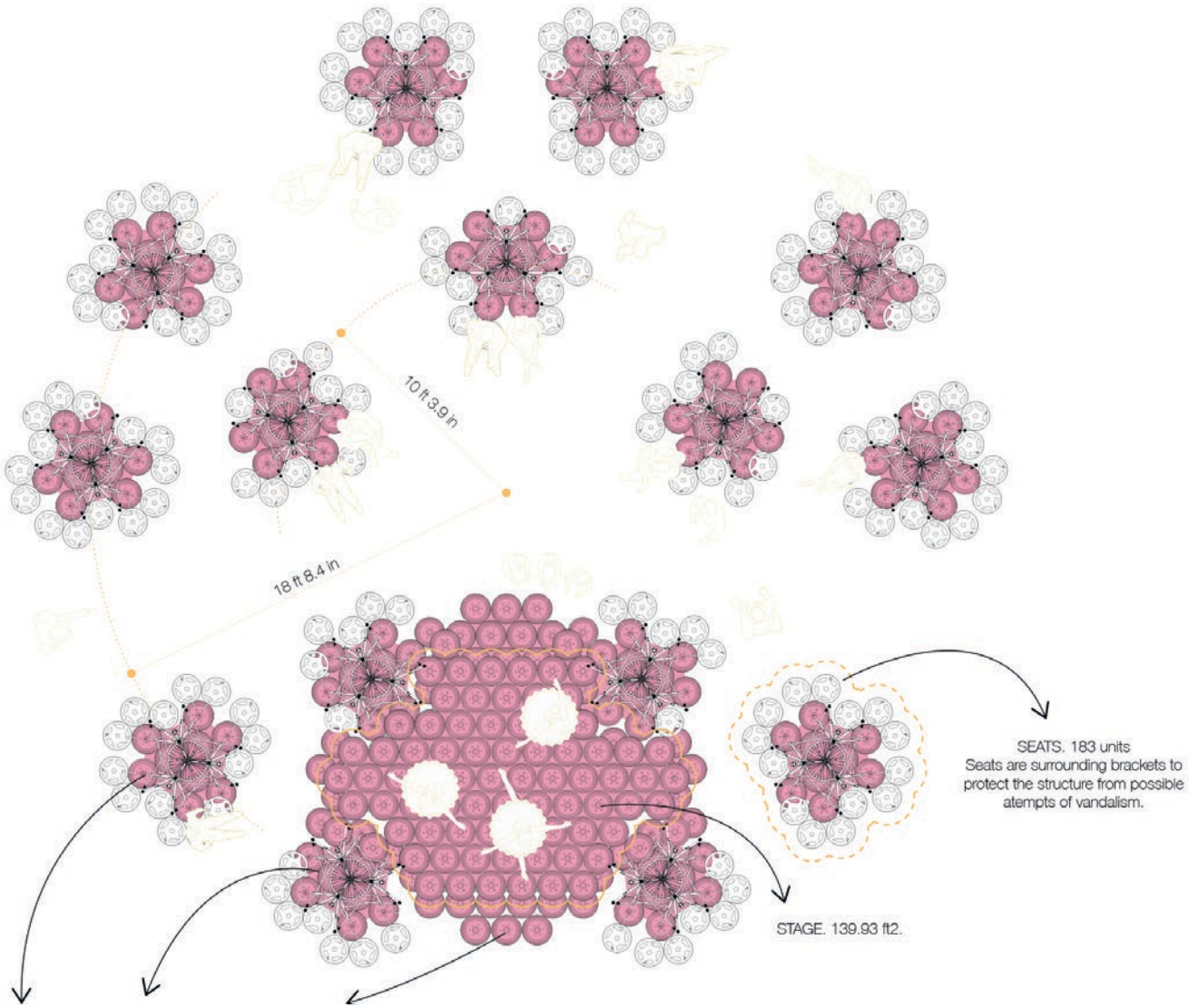

The supports are wider at the base than above



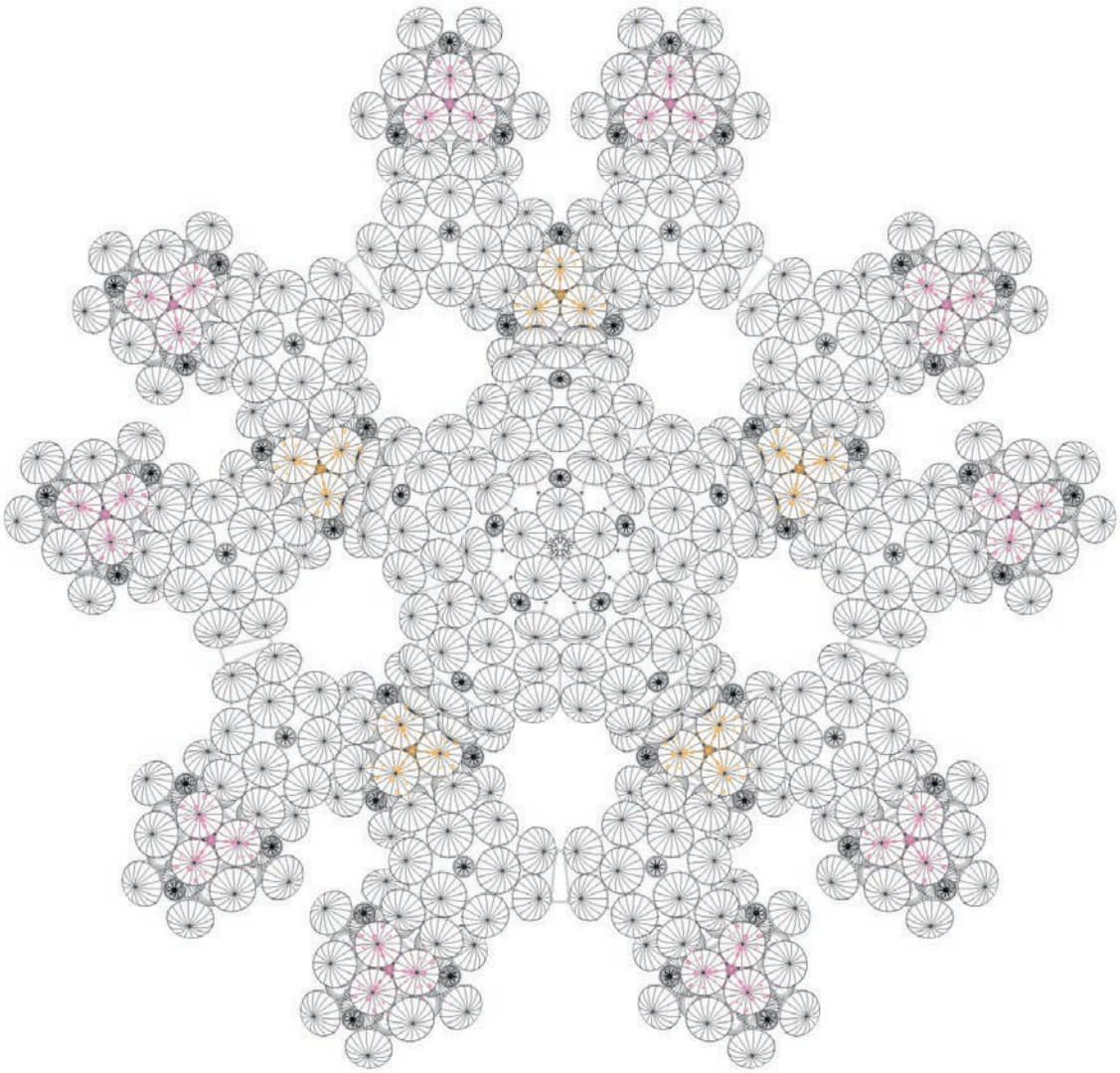
22

Floor plan. 995.66 ft^2.



23 Floor and roof plan.

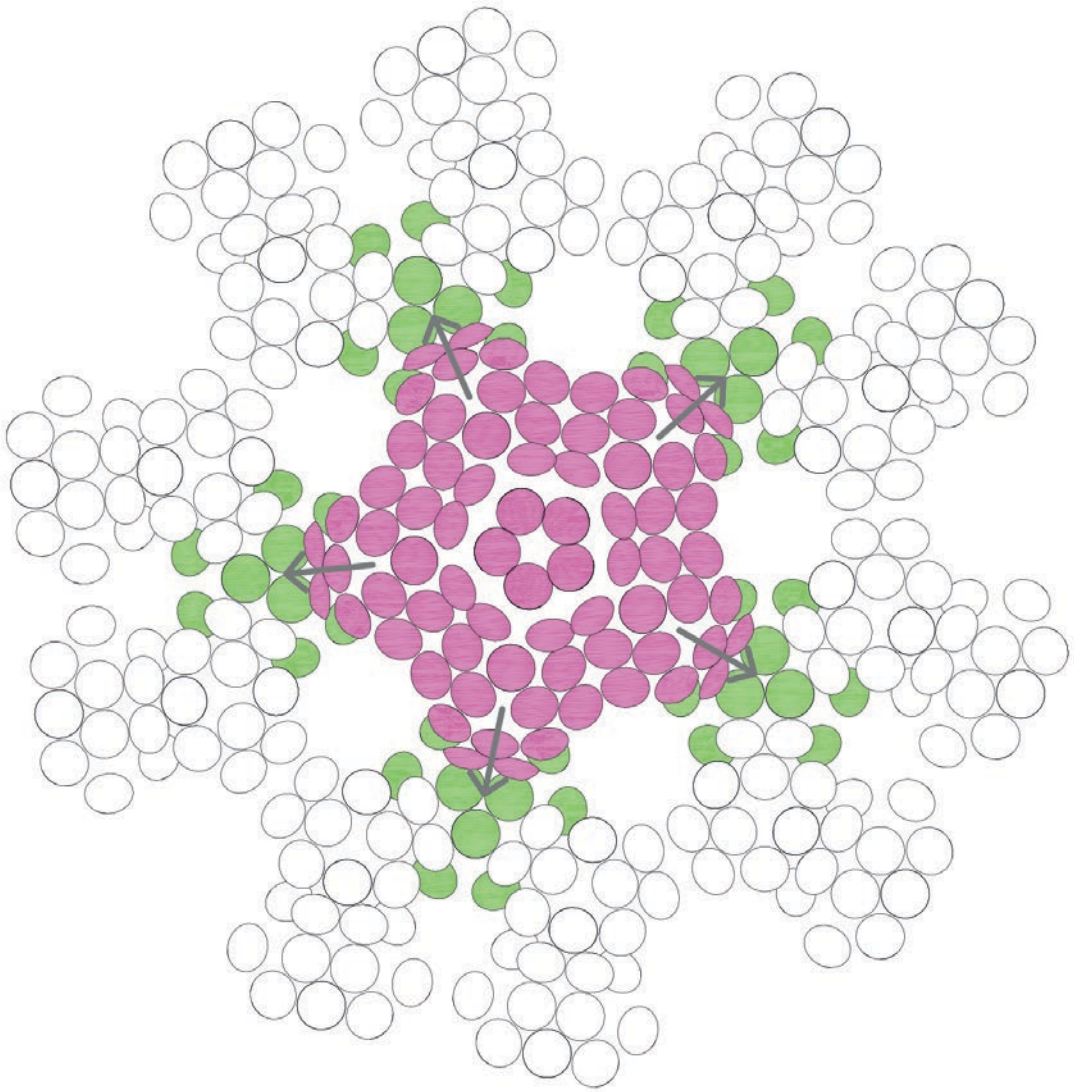
Roof plan. 350 umbrellas.



23

Redundancy scheme
Supports of the central dome

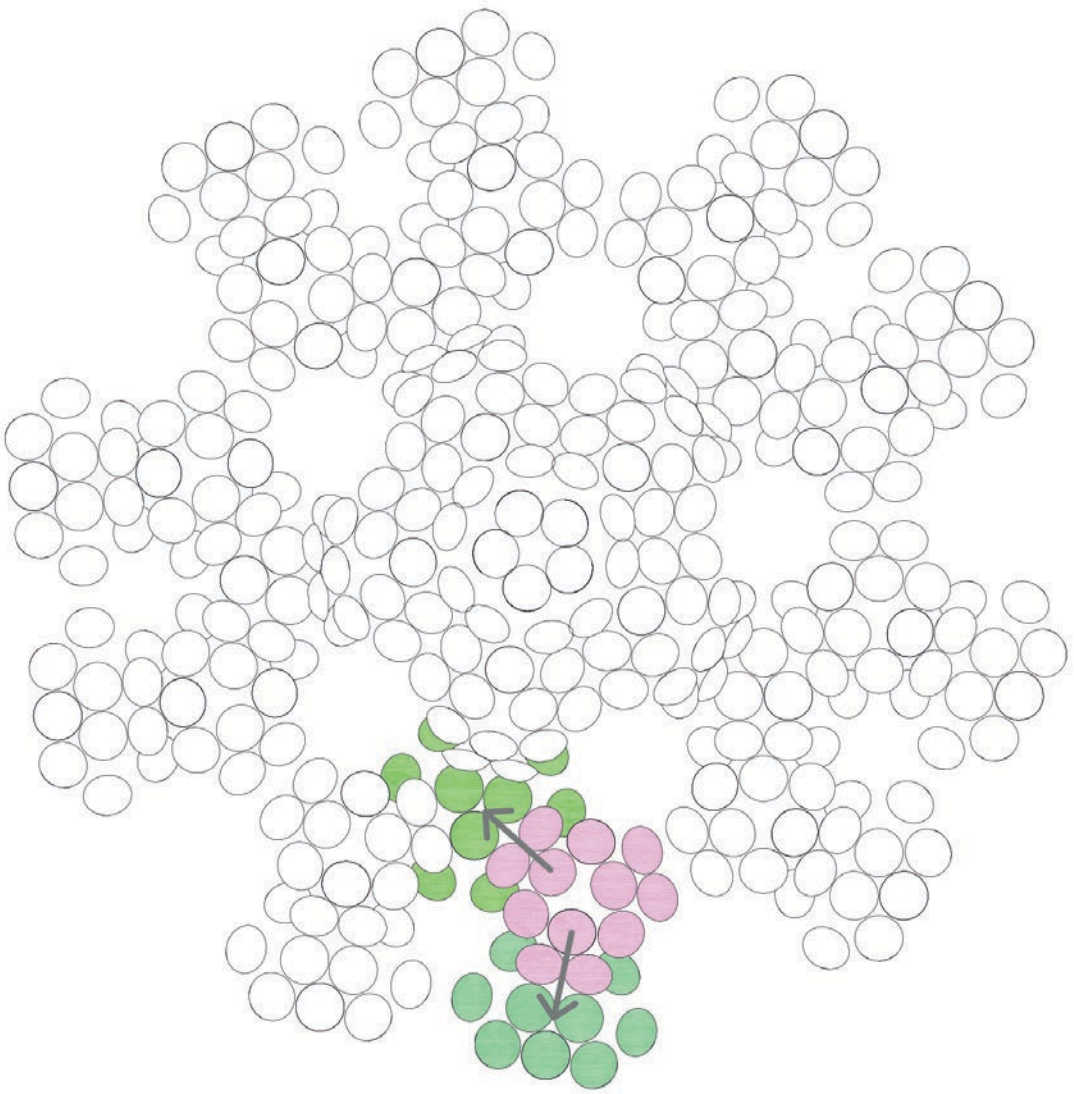
Central dome
Supports
Fastening of the central dome by the supports



24 Structural redundancy strategy drawing.

Redundancy scheme
Supports of a perimeter dome

Perimeter dome
Supports
Fastening of the central dome by the supports



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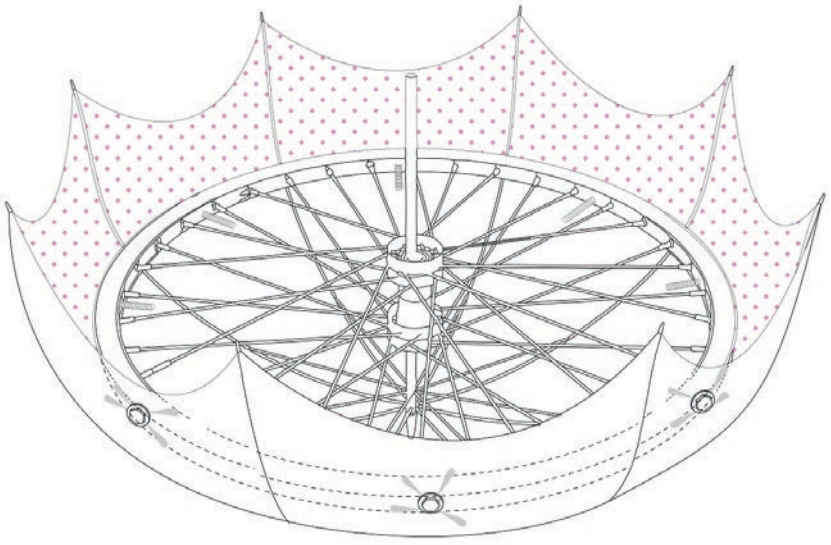
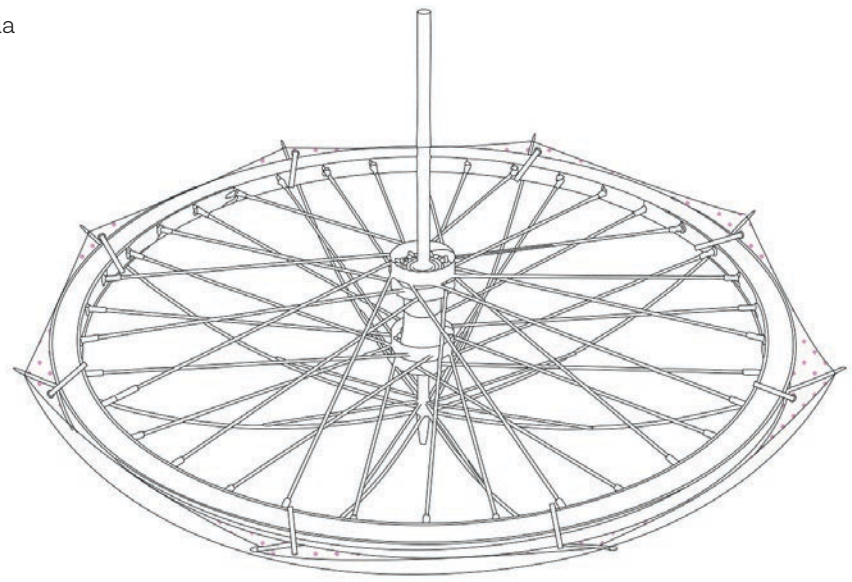
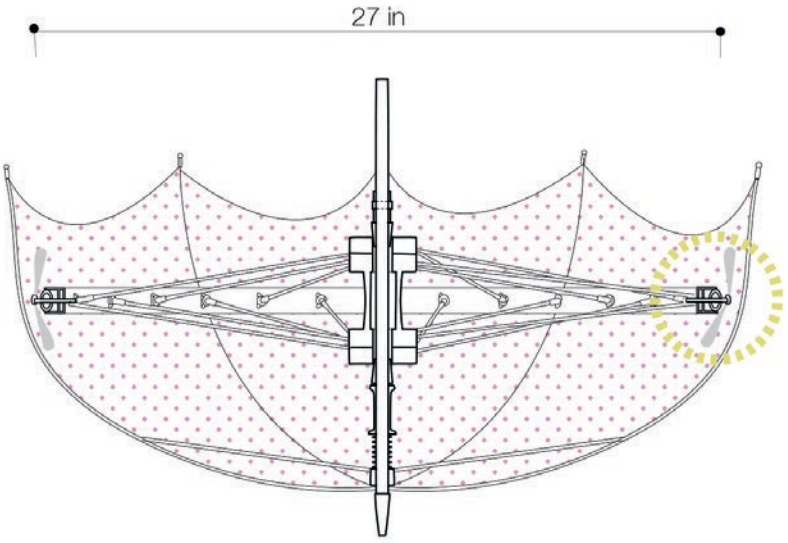
Big umbrella



Small umbrella



25 Umbrella and wheel joint drawing.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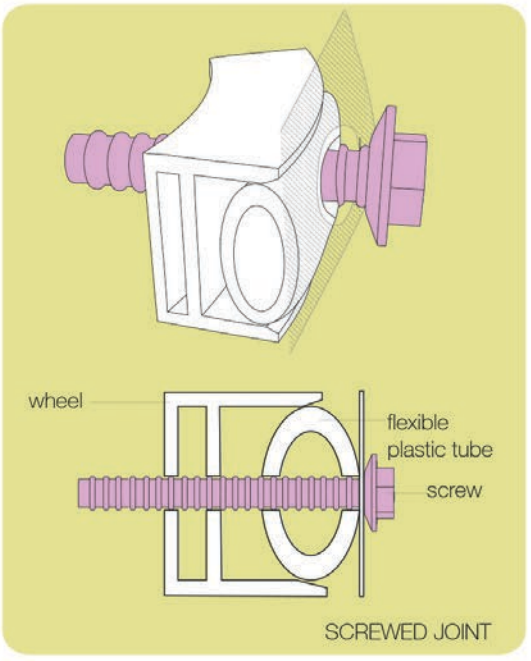
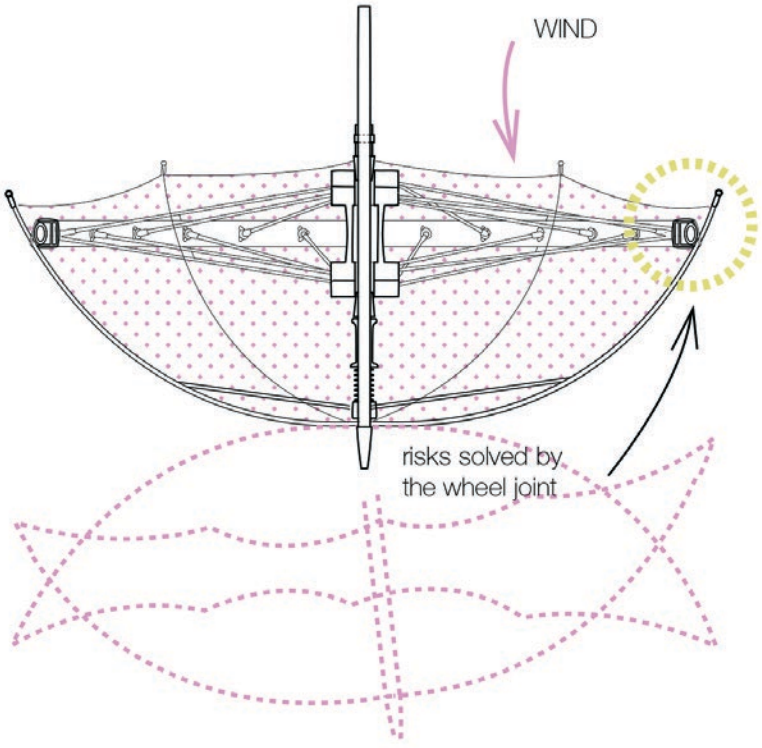
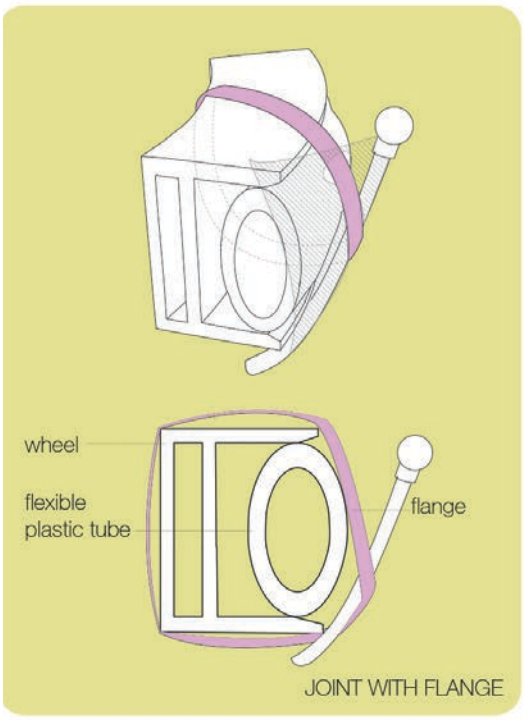
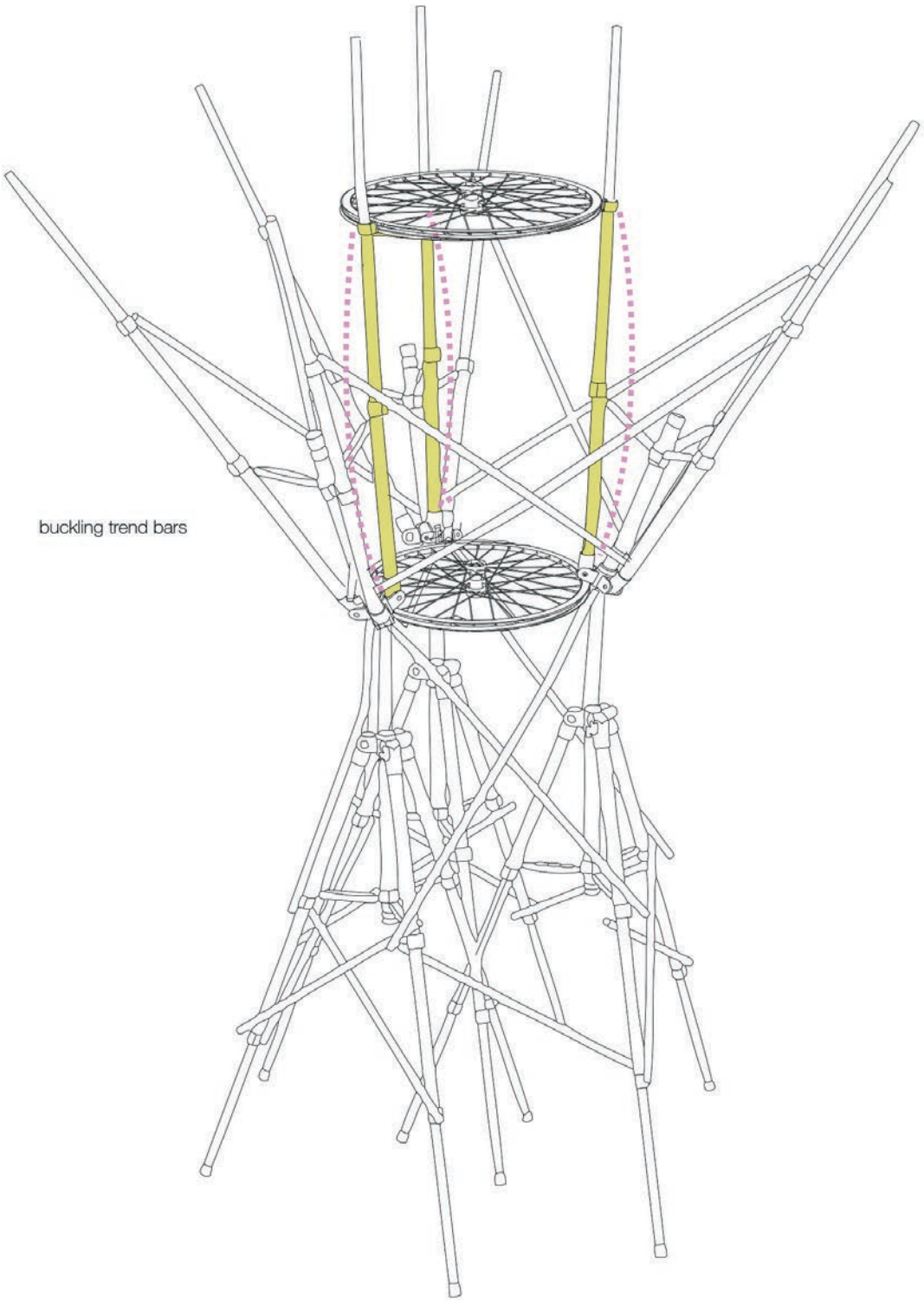

wheel
flexible
plastic tube
screw
SCREWED JOINT

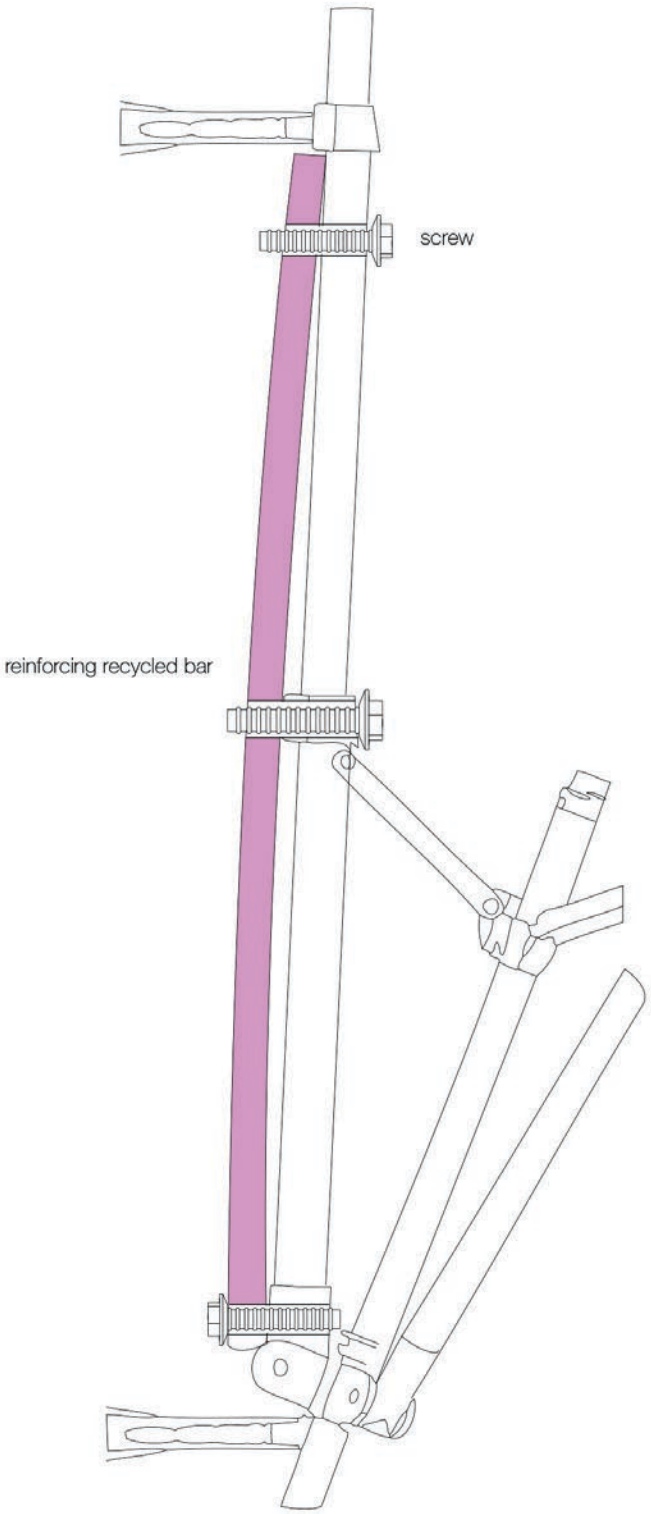

WIND
risks solved by
the wheel joint


wheel
flexible
plastic tube
flange
JOINT WITH FLANGE

25



26 Reinforced bars drawing.



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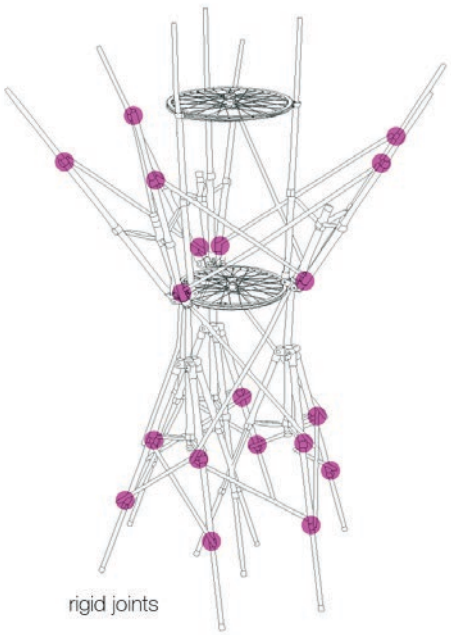
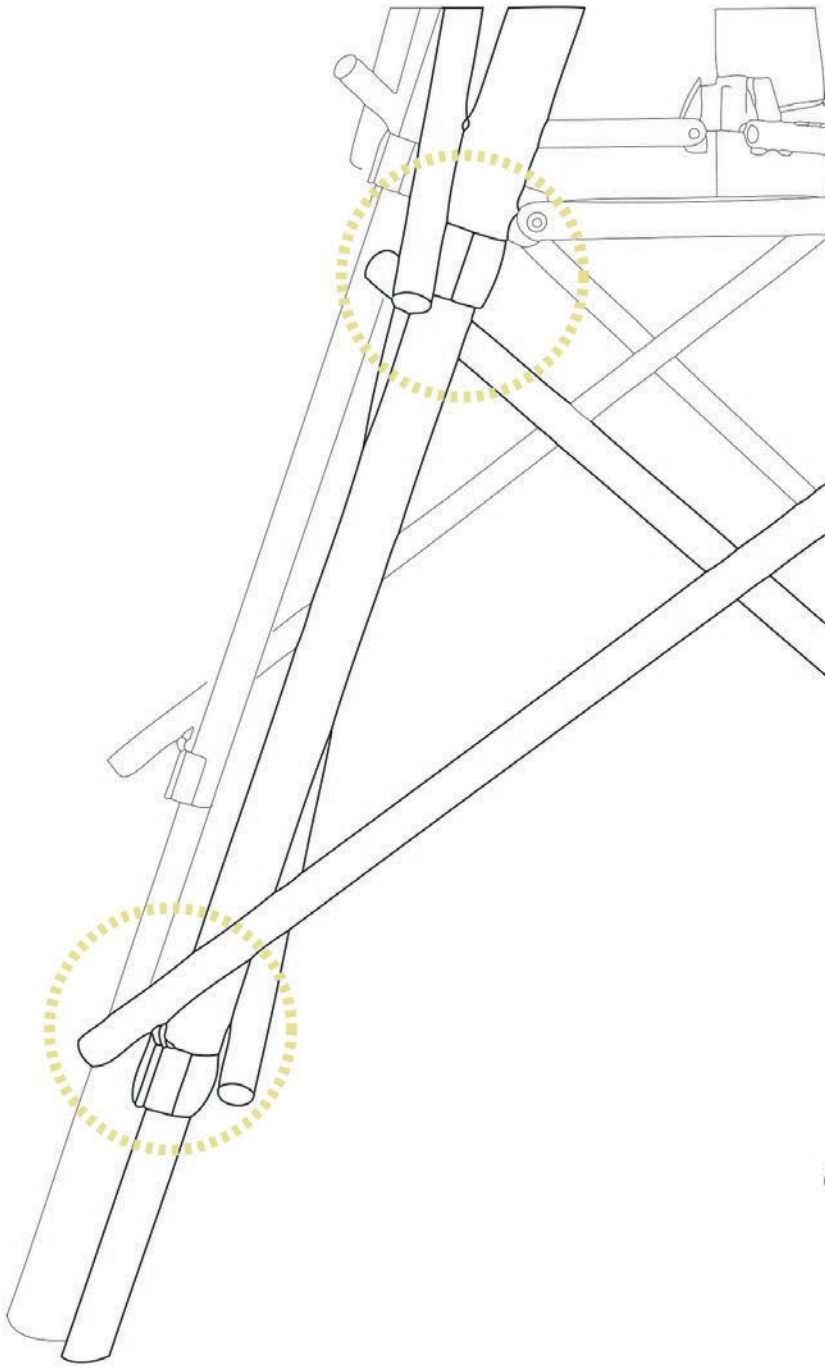
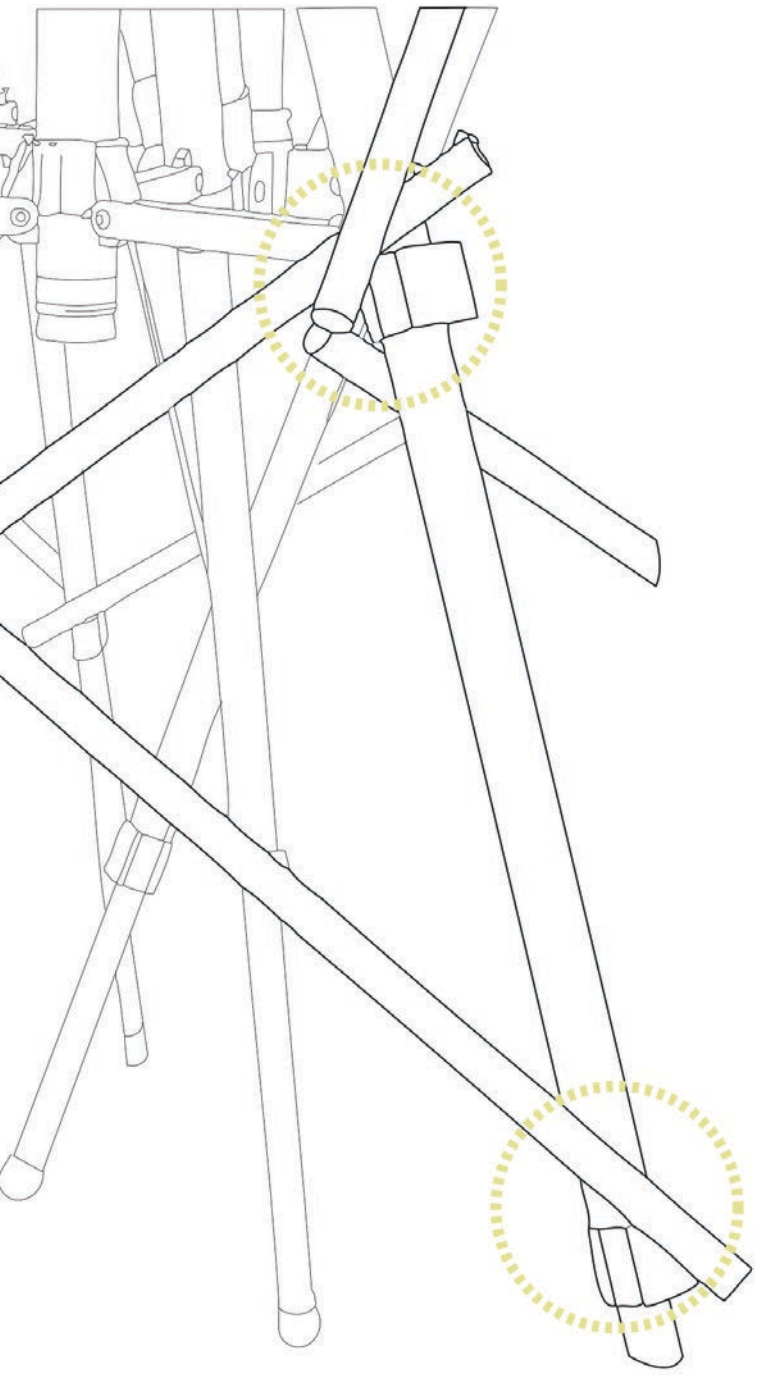
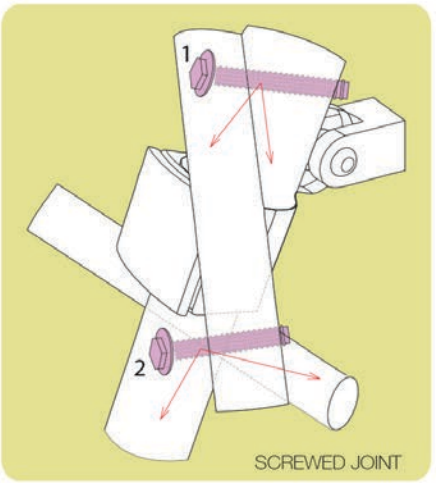
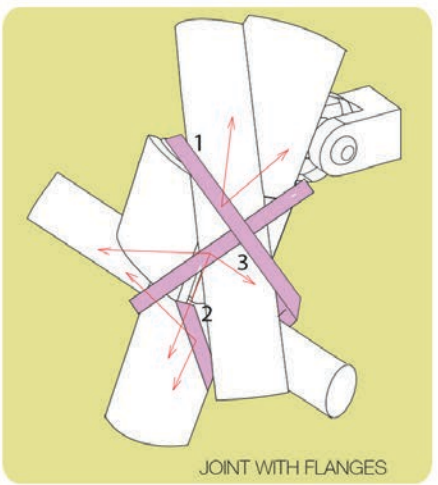


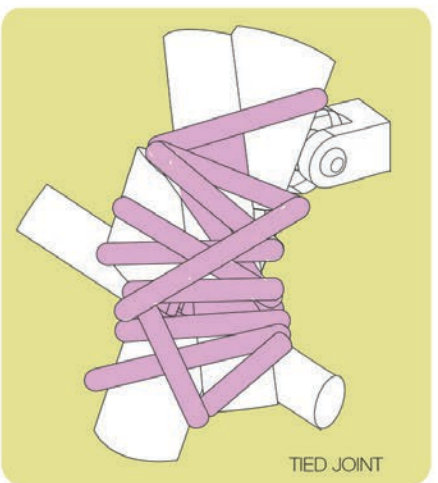


27 Triangulation joints drawing.









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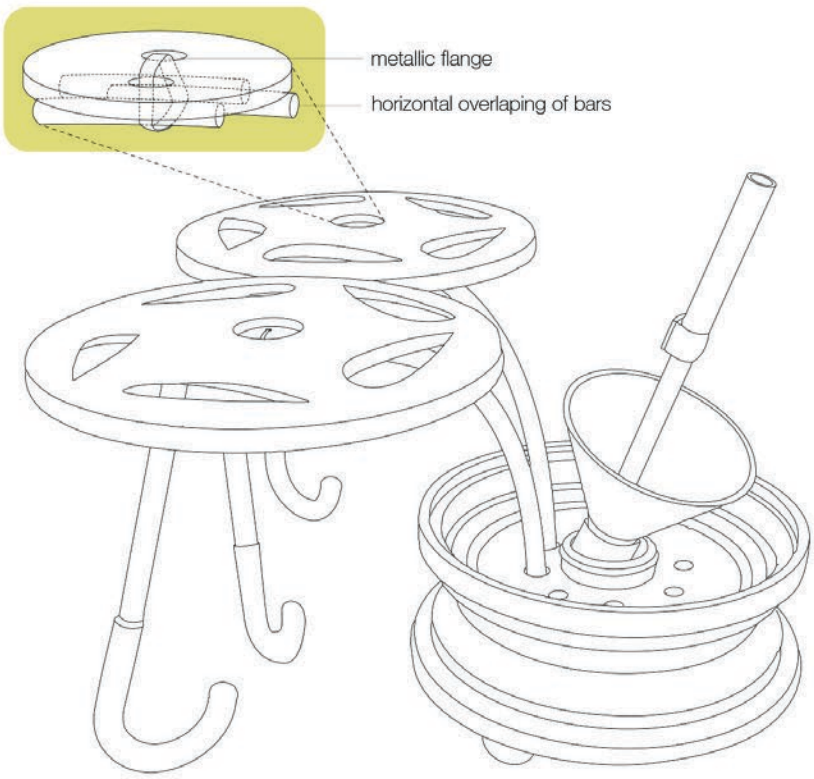
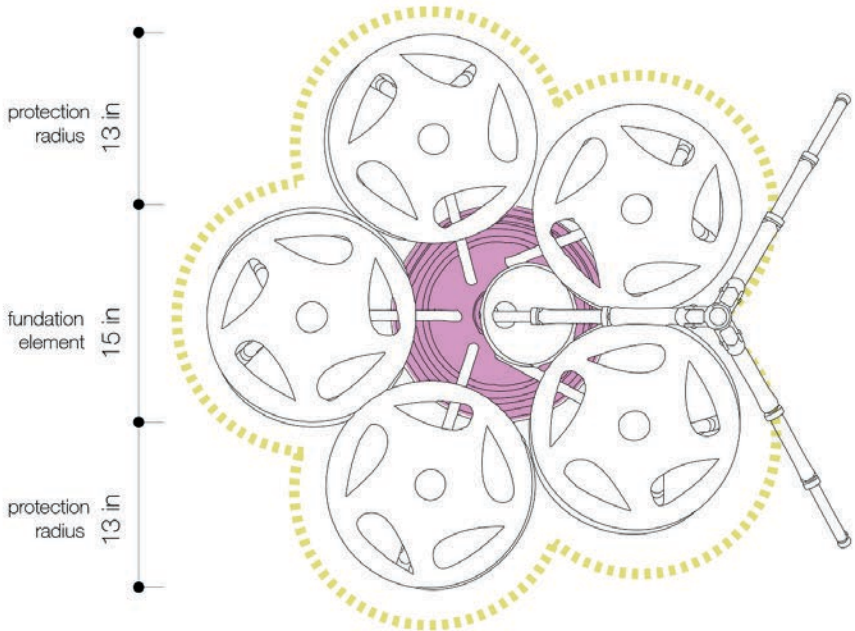
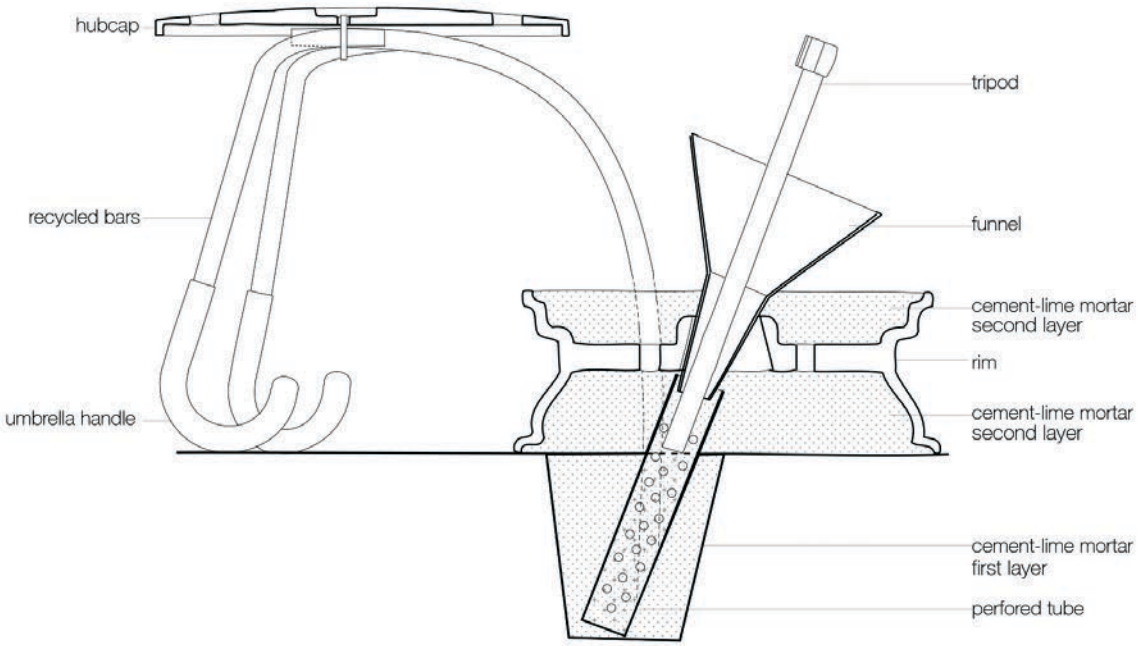
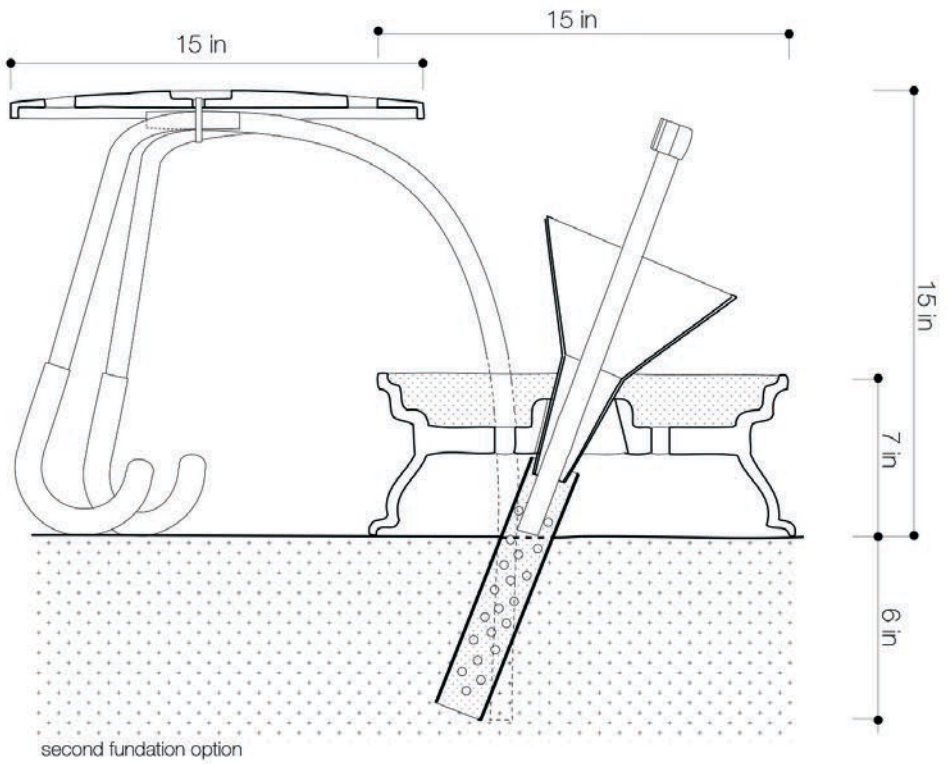




28 Foundation drawings.





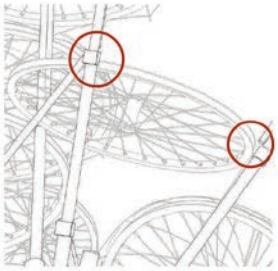
second fundation option

28

3. Guide a group of volunteers, many with no prior experience in building, through a construction manual and training workshops

The volunteers ended up being a varied group, comprised of students from New York's architecture schools (50%), individuals associated with the arts organisation FIGMENT (25%) and the American Institute of Architects (25%). Thus, a flexible and reliable method was required to train these volunteers with their differing levels of skill and experience in building techniques. Anticipating this need, the prototyping process in Murcia was photographed and documented in detail to produce an accessible and richly illustrated manual that covered all stages of the construction process. This ranged from transforming a bicycle wheel into a structural part to assembling photographic tripods to form a column core element. The manual followed rigorous health and safety protocols. It included detailed instructions on how each found object had to be washed, disassembled and reconstructed to work as part of the pavilion structure. Practical advice for efficient manual craftsmanship was also included to ensure the overall construction quality. Finally, the prototyping process informed the dismantling and reassembling process that concluded the construction manual.

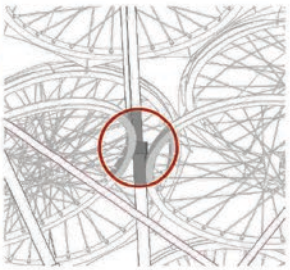
29 Sample pages from the volunteer manual based on the prototyping process in Murcia.



In order to create a connection so the strcuture becomes stronger and straighter:

- Hold firmly the branches while this task is processing (more than three people are needed for this task).

- Make sure nothing is being bended or damaged.



Once the structure is being hold firmly:

- Make a first weak connection with plastic flanges between the wheels of the branches.

- Place more than one flange on each junction.

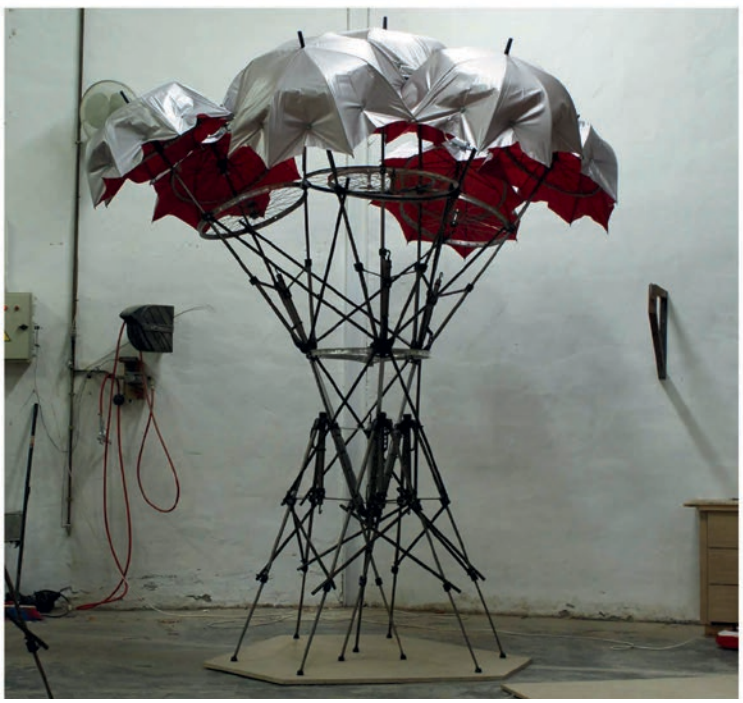
- Make sure nothing is being damaged.

After connecting all the branches together:

- Bring two different size wheels and place them in between the structure (as seen in the picture).

- Place different plastic flanges on each connection.

- Make sure nothing is being damaged.



Finally, when all the hoints and connections have been reinforced:

- Make sure the structure is string enough.

- Make sure nothing gets damaged or bended.

- The final structural tree should look like the one in the picture.

29

The manual was tested in six preparatory workshops in New York. There were two key objectives to the workshops:

- Test the construction manual and see if the methodology was adequate for the project's realisation in New York (different workspace, tools, etc.);
- Get as much pre-assembly completed before construction onsite.

The workshops were organised as follows:

11–12, 18–19 April
Tasks: Bike wheels and car-rim cleaning; classification of the elements according to origin and predictable structural damage.

25–26 April
Task: Tripod assembly.

2–3, 9–10 May
Task: Assembly of umbrellas, bike wheels and the structurally continuous dome.

16–17 May
Task: Create column branches by assembling tripods with groups of three reinforced umbrellas.

30

31

30 Classification of bicycle wheels and car rims.

31 Tripod assembly.

32

32 Volunteers cleaning recycled wheels.

33

34

33 Volunteers classifying recycled wheels.

34 First assembly of tripod supports onsite.

35

36

35–6 Volunteers building the foundations using recycled car tyres.

37

38

39

40

41

37–8 Filling in supports with concrete.

39–40 Connecting the wheels and umbrellas.

41 Izaskun Chinchilla adjusting the geometry of a dome.

42-4 (overleaf) Organic Growth Pavilion, Governors Island, New York.

42

43

Dissemination

The making of Organic Growth Pavilion engaged a group of 22 volunteers. It was visited by more than 500,000 people from June to September 2015. In 2017, it was presented as a case study in the international Rotor Symposium at Delft University of Technology. The author has written about this work in Spanish and English (see pp. 75–125). The pavilion has featured in more than 20 printed articles and over 300 online magazines including *Designboom*, *Dezeen* and *The Architect's Newspaper*. To date there have been over 19,000 media references to the project, including bottom-up social media dissemination.

Exhibitions

- *Plateforme de la création architecturale 2020*, Cité de l'Architecture et du Patrimoine, Paris (2020)
- *Environment[al]*, SCI-Arc, Los Angeles (2018)

Permanent Collections

- Centre Pompidou, Paris
- The National Gallery of Modern Art, Rome

Selected Lectures

- SCI-Arc, Los Angeles (2019)
- CENDEAC, Murcia (2017)
- Delft University of Technology (2017)
- Royal Academy of Arts, London (2017)
- Sveriges Arkitekter, Stockholm (2017)
- American Institute of Architects, New York (2015)
- Columbia University, New York (2015)
- Harvard University, Cambridge, Mass. (2015)
- Institute for Advanced Architecture of Catalonia, Barcelona (2015)
- New York Institute of Technology (2015)
- Parsons School of Design, New York (2015)
- Pratt Institute, New York (2015)
- Storefront for Art and Architecture, New York (2015)
- Universidad CEU San Pablo, Madrid (2015)

Project Highlights

Organic Growth Pavilion was one of two winning entries in the inaugural 'City of Dreams Pavilion' architectural design competition in 2015. 472 individual donors contributed to a crowdfunding campaign for the realisation of the project in New York. The pavilion was visited by more than 500,000 people from June to September 2015. Two working models of the project are now part of the permanent collections of the Centre Pompidou in Paris and the National Gallery of Modern Art in Rome. In February 2016, Organic Growth Pavilion was presented as a keynote project in *Architecture Timed: Designing with Time in Mind* for *Architectural Design* (Franck 2016).

45

46

45–6 Models of the pavilion at Cité de l'Architecture et du Patrimoine in Paris.

47

47 The team from Izaskun Chinchilla Architects on the opening day.

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