





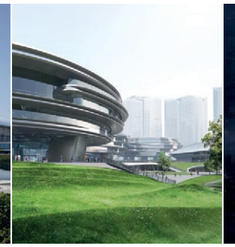


ALAN RODRÍGUEZ CARRILLO

SELECTED ARCHITECTURE WORKS

MEXICO CITY STUTTGART TOKYO BEIJING DUBAI

"Like a living system, the architecture unfolds - parametric in logic, organic in soul - where structure becomes poetry, and multicomplexity resolves into beauty shaped by place and topological precision."

Alan Roo

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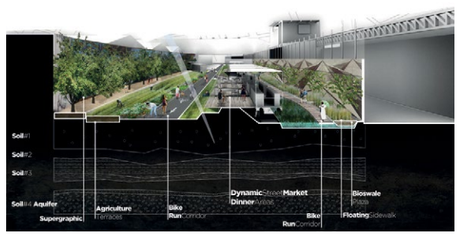
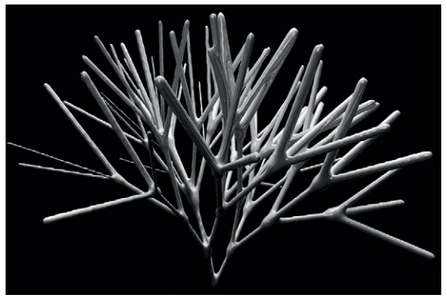
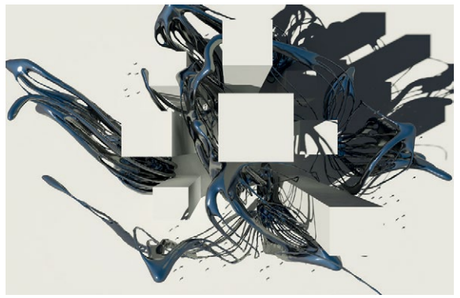
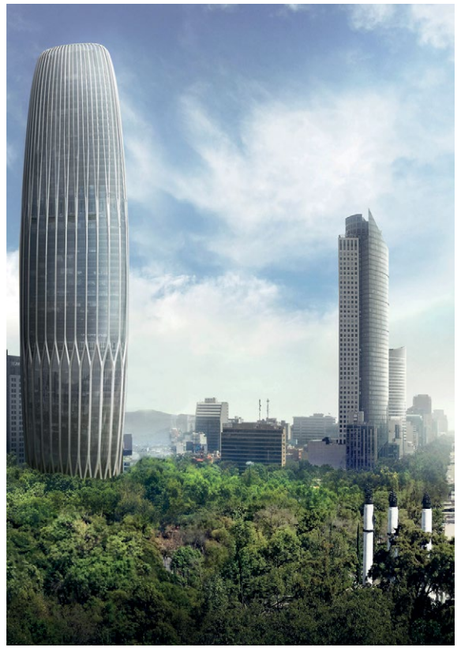
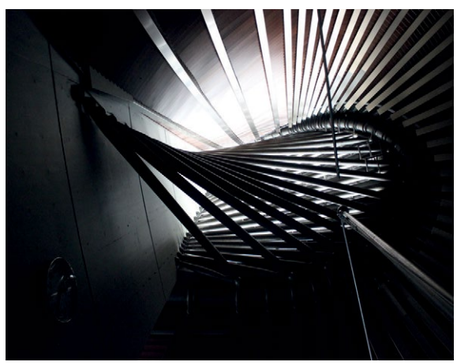

Soil #1
Soil #2
Soil #3
Soil #4 Aquifer
Supergraphic
Agriculture
Bike
Run Corridor
Dynamic Street Market
Dinner Area
Bike
Run Corridor
Bioswale
Floating Sidewalk









INDEX

[BIO]COMPUTATIONAL DESIGN PROCESS B
Stuttgart, Germany + Tokyo, Japan + Mexico City
Concept - 2016

School: Fakültät für Architektur und Stadtplanung, Universität Stuttgart + University of Tokyo + UNAM.
Advisory: Prof. Achim Menges, Prof. Ehsan Baharlou, Prof. Makoto Sei Watanabe and Dr. en Arq. Ronan Bolanos Linares.
Responsabilities: concept, design, 3D modeling, parametric modelling, scripting, diagrams, plans, renderings, physical and 3D printed model and fabrication.

[BIO]COMPUTATIONAL DESIGN PROCESS A
Stuttgart, Germany + Tokyo, Japan + Mexico City
Concept - 2016

School: Fakültät für Architektur und Stadtplanung, Universität Stuttgart + University of Tokyo + UNAM.
Advisory: Prof. Achim Menges, Prof. Ehsan Baharlou, Prof. Makoto Sei Watanabe and Dr. en Arq. Ronan Bolanos Linares.
Responsabilities: concept, design, 3D modeling, parametric modelling, scripting, diagrams, plans, renderings, physical and 3D printed model and fabrication.

FORSCHUNGSPAVILION 2014 - 15
Stuttgart, Germany
Concept, Design, Fabrication - 2014

School: ICD + ITKE - Fakültät für Architektur und Stadtplanung, Universität Stuttgart
Advisory: Prof. Achim Menges + Prof. Ing. Jan Knippers
Responsabilities: concept, design, programming, parametric design, digital fabrication and presentation.
Credits: Hassan Abbasi, Yassmin Al-Khasawneh, Yuliya Baranovskaya, Marta Besalu, Giulio Brugnaro, Elena Chiridnik, Tobias Grun, Mark Hageman, Matthias Helmreich, Julian Höll, Jessica Jorge, Yohei Kanzaki, Shim Karmin, Georgi Kazlachev, Vangel Kukov, Kantaro Makanae, Amanda Moore, Paul Poinet, Alan Rodriguez Carrillo, Emily Scoones, Andrei Stoiculescu, Kenryo Takahashi and Maria Yablonina

SARAJEVO HOCHHAUS II
Sarajevo, Bosnia and Herzegovina
Architecture Competition (1st place) - 2014

School: Fakültät für Architektur und Stadtplanung, Universität Stuttgart, Germany
Advisory: Professor Dipl.-Ing. José Luis Moro
Responsabilities: Concept design, modeling, diagrams, plans, renderings, physical model and presentation.
Credits: Alan Rodríguez Carrillo

FERROCARRIL CUERNAVACA TRAIN-SCAPES
Mexico City, Mexico
Architecture Competition (Entry) - 2015

Client: Mexico City Government
Firm: Arroyo Solis Agraz Architects
Responsabilities: concept, 3D modeling, renderings, plans and presentation.
Credits: Alan Rodríguez Carrillo, Elmedhi Bellasmine.
Collaboration: Mia Lehrer and Associates

HAIKOU WORMHOLE LIBRARY
Haikou Hainan, China
Facade & Interior Design - Completed

Client: Haikou Tourism & Culture Investment Holding Group
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and 3D printed objects.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Fu Changrui, Qiang Siyang, Sun Feifei, Dayie Wu, Shang Li, Alan Rodríguez Carrillo, Xie Qilin

JIAXING TRAIN STATION
Jiaxing, China
North Plaza & Interior Design - Completed

Client: Jiaxing modern service industry development & investment (group) co., ltd.
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and 3D printed objects.
Credits: cao chen, reinier simons, yao ran, fu xiaoyi, yu lin, cheng xiangju, sun mingze, huang zhiyu, zhang kai, li zhengdong, dayie wu, huai wei, claudia hertrich, liu zifan, xie qilin, alan rodríguez carrillo, qiang siyang, etc.

PUERTA REFORMA TOWER
Mexico City, Mexico
Facade Design, Parametric Geometric Control & Construction documentation - Under Construction

Client: Confidential
Firm: Fernando Romero EnterpreisE
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting and 3D printed objects.
Credits: Fernando Romero, Mauricio Ceballos, Unai Artetxe, Liliana Viveros, Luis Vicente Flores Suárez, Alan Rodríguez Carrillo, Eduardo Watanabe, Nicolle Hazard, Luis Vicente Flores Suárez, Libia Castilla.
Collaboration: Thornton Tomasetti and ARUP.

MEXICO'S CITY NEW INTERNATIONAL AIRPORT
Mexico City, Mexico
Facade & Envelope Design, Parametric Geometric Control, Geometric Databases & Construction Documentation - 2018 - Under Construction

Client: Federal Government of Mexico
Firm: Fernando Romero EnterpreisE & Foster and Partners
Responsabilities: 3D modeling, parametric modelling, geometric control, scripting, construction and geometric databases, diagrams, plans, 3D printed objects a.nd Mockups
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

ZHENGZHOU RESIDENTIAL 24 / 25
Beijing, China
Facade Design, Geometry optimization and Smart Clustering adaptation - Completed

Client: Confidential
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations
Credits: MAD Architects

SCIENCE AND TECHNOLOGY MUSEUM
Haikou Hainan, China
Facade & Interior Design - Completed

Client: Hainan Association for Science and Technology
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and LDI / CCDI Coordination
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Kin Li, Fu Changrui, Tiffany Dahlen, Wang Yiding, Reem Mosleh, Sun Feifei, Alan Rodríguez Carrillo, Rozita Kashirtseva, Wu Qiaoling, Edgar Navarrete, Zhu Yuhao, Zheng Chengwen, Zhang Yaohui, Li Hui, Yang Xuebing, Dayie Wu, Zhou Haimeng, Lim Zi Han, Yin Jianfeng.

TENCENT DACHANWAN - COMPETITION
Shenzhen, China
Concept development (1st place) - 2021

Client: Tencent Holdings Ltd.
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, charts, diagrams, renderings and presentations.
Credits: MAD Architects

SHANSHUI CITY INNOVATION CENTER - COMPETITION
Shenzhen, China
Concept development & Facade design - 2020

Client: Confidential
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: MAD Architects & ARUP

ARCHITECTURE PHOTOGRAPHY
Mexico, Germany, Spain, Bosnia and Herzegovina, Italy, Switzerland, South Korea, Tokyo, China and United Arab Emirates

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo

DGDA GRAND MOSQUE
Riyadh, Saudi Arabia
Architectural & Facade design, BIM, coordination, geometry control and rationalization - Under construction

Client: DGDA
Firm: X - Architects
Responsabilities: Facade coordination & design, 3D modeling, parametric modelling & geometric control, scripting, databases, diagrams, QAQC, BIM, sub-consultants coordination and ACC comunication.
Credits: X-Architects, Werner Sobek, Ramboll, Waho, KCA, Neolight, TNB, DZT, RBA, ZFP, DGJ, KBR, and AQUASHI

TENCENT DACHANWAN PROJECT
Shenzhen, China
Exterior & Interior Facade design & Geometry optimization, Podium rationalization - Completed

Client: Tencent Holdings Ltd.
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, databases diagrams, renderings, presentations and LDI / SUP Coordination
Credits: MAD Architects, SUP, LDI, WB and Lanscape consultants

LISHUI AIRPORT
Zhejiang Lishui, China
Interior Design & Geometry optimization & Contractor coordination - Completed

Client: Lishui Airport Construction Headquarters
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Liu Huiying, Li Jian, Sun Shouquan, Zhang Xiaomei, Lei Lei, Yang Xuebing, Sun Mingze, Yin Jianfeng, Punnin Sukkasem, Zhu Yuhao, Zhang Yaohui, Alan Rodríguez Carrillo, Pittayapa Suriyapee, Wang Xiny

Jiaxing Cultural & Civic Center
Jiaxing, China
Facade Design & Geometry optimization - Completed

Client: Jiaxing Highway Investment Co. Ltd.
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: Alessandro fisalli, fu xiaoyi, chen-hsiang chao, he yiming, thoufeeq ahmed, chen hao, he xiaowen, zhang yaohui, guo xuan, edgar navarrete, claudia hertrich, deng wei, zhang xiaomei, chen nianhai, li cunhao, alan rodriguez carrillo, sun feifei, punnin sukkasem, manchi yeung, li yingzhou

RESUME

Alan Rodríguez Carrillo

PERSONAL DATA

current city	Dubai, United Arab Emirates
age	33 years old
phone	+971 050 358 4220
e-mail	alanroca05@gmail.com

EDUCATION

2016 - 2017	Master of Science - University of Tokyo - Department of Architecture. Tokyo, Japan.
2011 - 2016	Bachelor of Architecture - School of Architecture - National Autonomous University of Mexico. Mexico.
2014 - 2015	Academic Exchange - Universität Stuttgart - Fakultät für Architektur und Stadtplanung, Germany.
02/05/2015 - 03/01/2015	Academic Exchange - University of Tokyo - Department of Architecture Research. Tokyo, Japan.

ADDITIONAL EDUCATION

2016	Kengo Kuma Laboratory - Department of Architecture. University of Tokyo. Tokyo, Japan.
2015	ICD + ITKE Forschungspavilion 2015 - 2. Universität Stuttgart - Fakultät für Architektur und Stadtplanung. Germany.
2015	ICD + ITKE Forschungspavilion 2015 - 1. Universität Stuttgart - Fakultät für Architektur und Stadtplanung. Germany.
2015	Makoto Sei Watanabe Architect - ALGODEX Experimental Computational Workshop - Tokyo, Japan.
2013	Ayala Studio Workshop - Adyacencias - School of Architecture - UNAM - Mexico City, Mexico / Paris, France.
2012	Cosmic Rays Pavilion Workshop Danish Royal Academy of Fine Arts and UNAM - Mexico / Copenhagen, Denmark.
2011	7th High Technology International Congress of Architecture - School of Architecture - UNAM - Mexico City, Mexico.
2010	6th High Technology International Congress of Architecture - School of Architecture - UNAM - Mexico City, Mexico.

PROFESSIONAL FULL TIME EXPERIENCE

07/05/2024 - 09/05/2025	**X-Architects** - Senior Architect II - Architectural Design, BIM & Sub-consultants coordination, Full-time. Dubai, United Arab Emirates.
03/01/2023 - 30/04/2024	**[NA]rchitects** - Senior Architect I & Consultant - Computational & Design consulting services for architecture, Full-time. Beijing, China.
11/11/2019 - 01/20/2023	**MAD Architects Ltd.** - Intermediate Architect - Architecture Computational Design, Coordination & BIM, Full-time. Beijing, China.
12/2018 - 06/2019	**Fernando Romero EnterprisE** - Junior Architect - Architectural design & BIM, Full-time. Mexico City, Mexico.
02/2017 - 12/2018	**Foster & Partners + Fernando Romero EnterprisE** - Junior Architect - Computational design & BIM, Full-time. Mexico & England.
11/01/2018 - 12/17/2018	**Nikken Sekkei Ltd. + University of Tokyo** - Junior Architect - Software development for architecture, Full-time. Tokyo, Japan.
01/2016 - 03/2016	**BIM Architects** - Junior Architect - BIM architectural design & modelling, Full-time. Mexico City, Mexico.
09/2015 - 12/2015	**Cooperación Comunitaria NGO** - Social Service - Architectural design for disadvantaged communities, Full-time. Guerrero, Mexico.
07/2015 - 09/2015	**Teikoku Databank Ltd.** - Visual Programmer volunter - RESAS prototype Project Tokyo, Full-time. Tokyo, Japan.

CONSULTANCY PART-TIME SERVICES

10/01/2018 - current	**ParametriK Studio S. A. de C. V.** - Founder & Partner - Architecture Design & Consultancy Services, Part-time. Mexico City & Miami, USA.
09/01/2017 - 21/03/2022	**Dezignator** - Computational Designer - Computational visual programming for design & 3D printing, Part-time. Los Angeles, USA.
06/2017 - 07/2019	**ShapeDiver GmbH** - Computational Designer Collaboration - Computational visual online programming, Part-time. Vienna, Austria.
01/28/2017 - 02/01/2017	**Arroyo Solís Agraz Architects** - Architecture Internship - Architecture design and CGI, Part-time. Mexico City, Mexico.
04/2016 - 09/2016	**Nikken Sekkei Ltd. Tokyo** - Architecture Intership - Architectural Design & Documentation, Part-time. Tokyo, Japan.
06/2016 - 09/2016	**Kengo Kuma Laboratory** - Architecture Intership - Architecture Drafting & Documentation, Part-time. Tokyo, Japan.
10/2014 - 05/2015	**Benisch Architekten Stuttgart GmbH** - Architecture student practicant - 3D modeller assistant, Part-time. Stuttgart, Germany.
06/2013 - 11/2013	**Moyao Arquitectos S. A. de C. V.** - Architecture student practicant - 3D Architectural modelling, Part-time. Mexico City, Mexico.
10/2012 - 01/2013	**WEDO** - Architecture student practicant - 3D modeler and render assistant for Architecture, Part-time. Mexico City, Mexico.
07/2009 - 09/2012	**SAT Human Adminsitration & Social Services** - Technical drafter - Architectural technical drafting, Part-time. Mexico City, Mexico.

PROFESSIONAL WORKSHOPS

08/01/2017 - current	**Iberoamerican University** - Online Tutor & Lecturer - Computational Design Professor, Part-time. Mexico City, Mexico.
05/18/2018 - 06/01/2018	**Karlsruher Institut für Technologie** - Speaker - Architektur und Roboter Werkstatt - HAL Robotics, Part-time. Karlsruhe, Germany.
05/22/2017 - 06/05/2017	**UNAM School of Architecture** - 3rd Workshop lecturer - Teaching of Python language in architecture, Part-time. Mexico City, Mexico.
08/07/2016 - 08/12/2016	**Mia Leher & Associates** - Workshop lecturer - Teaching Grasshoper + Python for landscape design, Part-time. Los Angeles, USA.
08/03/2016 - 08/06/2016	**Ingenieros Civiles de Mexicali S. A. de C. V.** - Workshop lecturer - Revit Structural BIM training, Part-time. Baja California, Mexico.
04/2016 - 05/2016	**UNAM School of Architecture** - 2nd Workshop lecturer - Teaching of Python language in architecture, Part-time. Mexico City, Mexico.
06/2012 - 06/2012	**UNAM Institute of Mathematical and Physical Research** - Speaker - Linux for Astronomy Workshop, Part-time. Mexico City, Mexico.

ARCHITECTURE COMPETITIONS

08/2019	**KLAF First Colony on Mars** - International Competition. Kuala Lumpur, Malaysia. [Finalist].
09/2018	**Seduction Pavilion** - International Competition. Bologna, Italy. [Entry].
10/2016	**Cuernavaca Lineal Park** - International Competition. Mexico City, Mexico. [Entry].
03/2015	**Sarajevo Highrise II** - International Competition. Sarajevo, Bosnia and Herzegovina. [1st place].
02/2014	**MEX-USA Border Space Frontier** - International Competition Arquine, Mexico City, Mexico. [Entry].
10/2013	**Pedemonte Museum** - International Students Competititon. Buenos Aires, Argentina. [Entry].
07/2013	**Library + Park** - Architecture Student Competititon. UNAM. Mexico City, Mexico. [1st place].
03/2013	**ATRIUM** - Architecture Student Competititon. Universidad la Salle, Mexico City, Mexico. [Entry].
02/2012	**Capdeville Architecture Competititon** - UNAM Facultad de Arquitectura. Mexico City, Mexico. [2nd place].
09/2011	**ENTRE Forum & 1018 Colective** - Architecture Competition. Universidad Iberoamericana. Mexico City, Mexico. [Entry].

SOFTWARE

●●●●●	Microsoft Office & Outlook [Word, Excel, PowerPoint & Access]
●●●●●	Autodesk AutoCAD 2D + 3D
●●●●●	Autodesk 3ds max
●●●●●	Autodesk Maya
●●●●●	Autodesk Revit + Rhino.Inside
●●●●○	Graphisoft ArchiCAD
●●●○○	Nemetschek Allplan + Python Visual scripting
●●●●●	Adobe Creative Suite [Photoshop, Illustrator, InDesign, Premiere & After Effects]
●●●●○	V - Ray for Rhinoceros & 3ds max
●●●●●	Enscape for Rhinoceros & Revit
●●●●●	D5 Render for Rhinoceros
●●●●●	Rhinoceros 3D
●●●●●	Grasshopper
●●●●○	Python & C# script for Rhinoceros 3D
●●●●○	Bentley Microstation
●●●●●	Autodesk Construction Cloud
●●●●●	AI - ChatGPT, Deepseek, Midjourney, Stabe Diffusion, Leonardo.AI & Comfy model engines
●●●○○	GNU/Linux - Ubuntu, Debian, OpenSUSE y Fedora distributions

LANGUAGES

●●●●●	Spanish
●●●●●	English
●●●●○	German
●●○○○	Chinese
●○○○○	Russian
●○○○○	Japanese

AWARDS

2017 - Mexico	“Dr. Gustavo Baz Prada” Excellence Prize - School of Architecture, UNAM. Mexico City, Mexico.
2017 - Japan	Excellence Prize - Global 30. Faculty of Engineering, Department of Architecture. University of Tokyo. Japan.
2016 - Mexico	University Honor Diploma - School of Architecture, UNAM. Mexico City, Mexico.
2016 - Mexico	Social Service Excellence Diploma - School of Architecture, UNAM. Mexico City, Mexico.
2015 - Japan	RESAS + ALGODEX + Python Diploma - Makoto Sei Watanabe Architect. Tokyo, Japan.
2015 - Germany	Academic Excellence Award - Deutscher Akademischer Austauschdienst - Universität Stuttgart. Germany.

CONFERENCES & JURY

07/06/2022 - Mexico	**SEED Studio [Jury]** - Más allá del Diseño Algorítmico. Mexico City & Barcelona. Mexico & Spain.
04/25/2022 - Mexico	**ATRICA & LINEA [Conference]** - Parametric Design in the Architecture vol. 2. Mexico City, Mexico.
03/12/2022 - Peru	**SHADI Design [Jury]** - International Design Workshop. Lima, Peru.
12/08/2021 - Germany	**Karlsruher Institut für Technologie [Conference]** - Parametric Design Workflow. Karlsruhe, Germany.
09/08/2021 - Mexico	**ATRICA & LINEA [Conference]** - Parametric Design in the Architecture vol. 1. Mexico City, Mexico.
07/28/2020 - China	**DAYUAN Construction Industry Group [Conference]** - Parametric Design & BIM Interconection in the Architecture. Changzhou, Jiangsu, China.

INTERNET

LinkedIn	www.linkedin.com/in/msc-arch-alan-rodríguez-carrillo-21b9258a
Archinect	archinect.com/alanroo5
Academia	https://tpypd.wordpress.com
Blog	alanroca05.wordpress.com
YouTube	www.youtube.com/@AlanRoo05

SELECTED ARCHITECTURE WORKS

TRAIN - SCAPES

Cuernavaca, Mexico City. Mexico
Architecture Competition (Entry) - 2015

Client: Mexico City Government
Firm: Arroyo Solis Agraz Architects
Responsabilities: concept, 3D modeling, renderings, plans and presentation.
Credits: Alan Rodríguez Carrillo, El Medhi Beyasmine.
Collaboration: Mia Lehrer and Associates, Los Angeles, USA.

As a ground plane canvas, the landscape throughout the site also serve as a platform to curate programs and experiences, the physical attributes of it would remain consistent bolstering the connection between the site at large including **IDENTITY.**

ENVIRONMENT/SUSTAINABLE PRACTICES - Implement a wide range of natural treatment technologies supporting a new pathway and enhanced visitor experience highlighting biological systems that help purify water in a controlled environment which include bioswales, ponds, land treatment and wetlands.

BIOSWALES/FILTER STRIPS - ALONG ENTIRE LENGTH OF SITE BY PATH Water Filtration, Retention & Detention and Infiltration.

HOLDING PONDS/TREATMENT CELLS - AT LARGER SWATHS OF LANDS throughout site can include sports fields and meadows for the productive landscape.

CONSTRUCTED & FLOATING WETLANDS - PRODUCTIVE LANDSCAPE:

These are designed to take advantage of many of the same processes that occur in nature, but do so within a more controlled environment. Floating wetlands enhance contaminant removal processes while cover provided by the floating structure promotes conditions conducive to settling.

FERROCARRIL DE CUERNAVACA TRAIN-SCAPES

DYNAMIC LANDSCAPE

The line will be an educational path, a way to confront people with new ways of living the city.

People will be trained on urban agriculture, make them conscious of the water systems and general environment.

The motion in society, development and change is certain to be a part of the environment for some time to come creating adaptable, modular, multi-benefit places that can be configured in different ways over the space.

What better to reflect this then the connection to train to site, the physicality of tracks building in identity for the entire path.

The ability to adapt to signals of change from people's needs, external environment and weather, creating social resilience.

The ability to experiment with a lot of configurations in different locations.

CULTURAL LANDSCAPE

Landscape that reveals aspects of Mexico City´s origins and development through the features and the ways they are used - the integration of arts and cultural resources with civic programs = museums, art and sculpture gardens.

Places to learn, gather, educate about local cultural practices and identity of neighborhood, city and country.

This linear landscape can enhance the transitions between indoor and outdoor exhibitions by creating a reciprocal foreground and background to frame art spaces.

Areas could also host exhibits of the many complex and interdependent cultural manifestations of native customs, spiritual practices, oral traditions and festivities.

PRODUCTIVE LANDSCAPE

Creating agricultural fields, garden plots, groves, building on history of floating chinampas.

More efficient land use, allowing food production while sparing land for wild nature - increasing biodiversity.

Food security - providing food for local neighborhoods.

Many benefits to a community, including closer neighborhood ties, reduced crime, education and job and health opportunities.

COMMUNITY LANDSCAPE

Balancing of the nature of past, present, and future social values.

Bolstering the community through programming and engagement; creating profound impact - can building social networks, encouraging new leaders, increasing the quality of life, connecting people to nature and increasing the overall vibrancy.

Outdoor classrooms, botanical gardens and nature walk.

Places for civic and social interaction including community boards, platforms, plazas, squares, lending libraries, farmers markets, botanical gardens, outdoor classrooms, participatory art-making, informal activities such as food in the street markets.

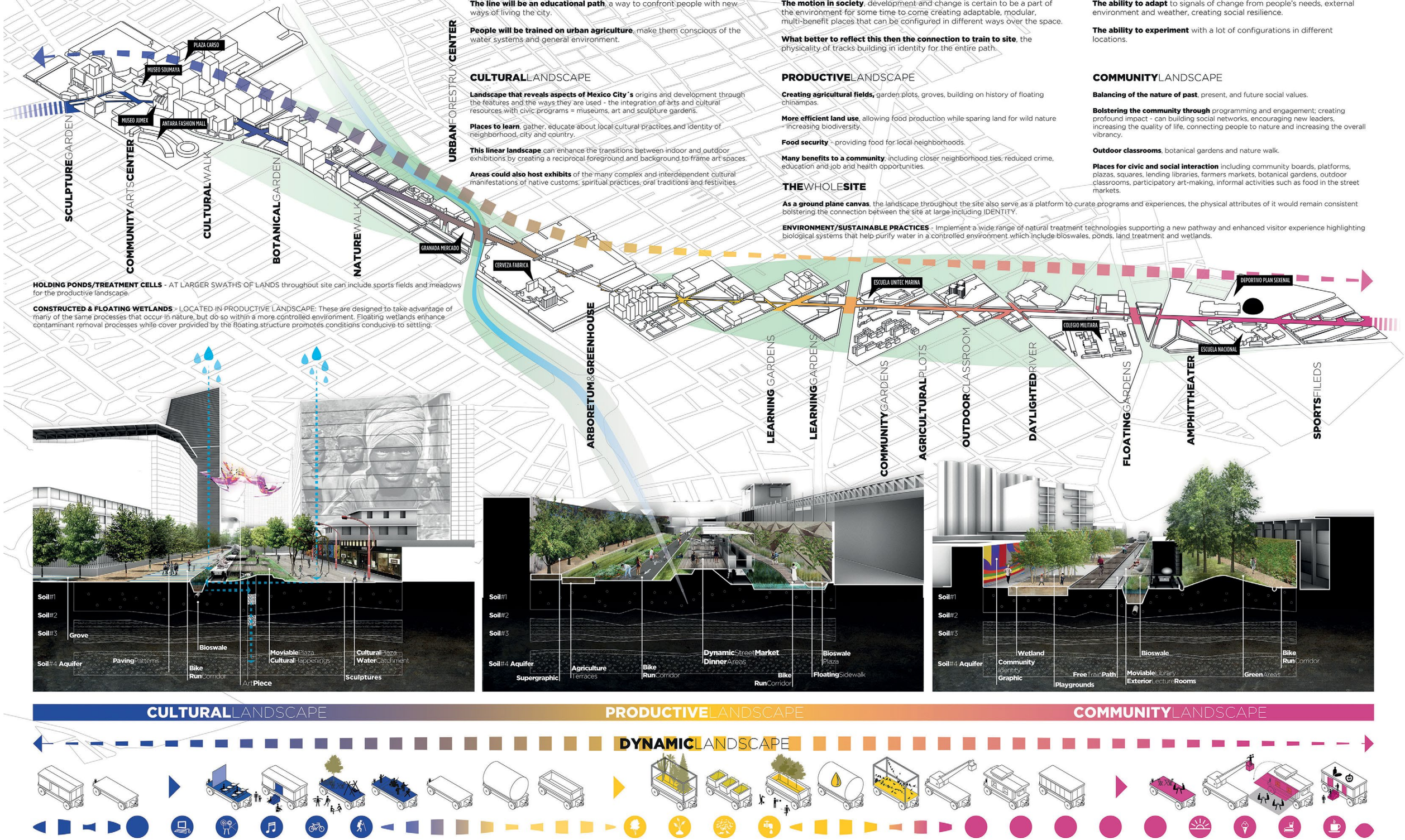
THE WHOLE SITE

As a ground plane canvas, the landscape throughout the site also serve as a platform to curate programs and experiences, the physical attributes of it would remain consistent bolstering the connection between the site at large including IDENTITY.

ENVIRONMENT/SUSTAINABLE PRACTICES - Implement a wide range of natural treatment technologies supporting a new pathway and enhanced visitor experience highlighting biological systems that help purify water in a controlled environment which include bioswales, ponds, land treatment and wetlands.

HOLDING PONDS/TREATMENT CELLS - AT LARGER SWATHS OF LANDS throughout site can include sports fields and meadows for the productive landscape.

CONSTRUCTED & FLOATING WETLANDS - LOCATED IN PRODUCTIVE LANDSCAPE: These are designed to take advantage of many of the same processes that occur in nature, but do so within a more controlled environment. Floating wetlands enhance contaminant removal processes while cover provided by the floating structure promotes conditions conducive to settling.



CULTURAL LANDSCAPE — PRODUCTIVE LANDSCAPE — COMMUNITY LANDSCAPE

DYNAMIC LANDSCAPE

SARAJEVO HOCHHAUS II

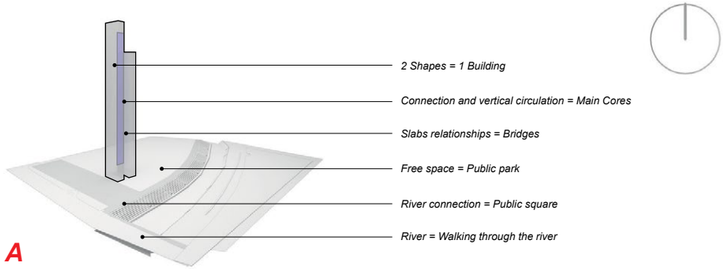
Sarajevo, Bosnia and Herzegovina
Architecture Competition (1st place) - 2014

School: IEK - Fakültät für Architektur und Stadtplanung, Universität Stuttgart
Advisory: Professor Dipl.-Ing. José Luis Moro
Responsabilities: Concept design development, modeling, diagrams, plans, renderings, physical model and presentation.
Credits: Alan Rodríguez Carrillo

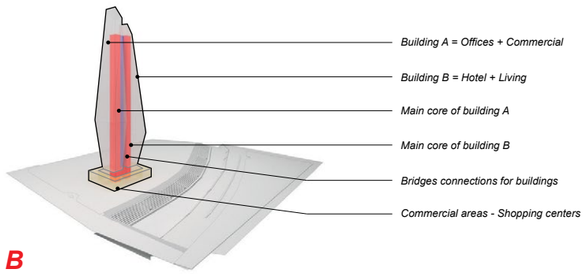
The unprecedented population growth of the cities around the world requires the sustained increase of urban density. Over the past century the pressure from population growth was relieved with the vertical expansion of the city. The constant increase of building heights has pushes today's skyscrapers to a point where less and less value is found in height alone. To fulfill the population demands of tomorrow, growth in building density will be forced to expand in all axes [X+Y+Z].

Situated above the existing urban fabric, this building occupies the space between Smaja od Bosne street and Vrbanja streeth in Sarajevo City, the capital of Bosnia and Herzegovina. The size of the structure creates an interdependecy and allows for the formation of new high communities within the already low-medium dense housing grid. Woven into the residential, govermental and commercial fabric of the grid. Large office tower provide a workplace for the residents of the structure.

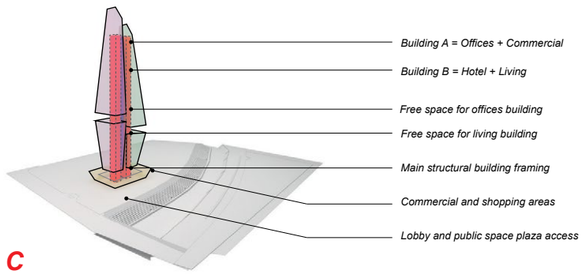
These two-one tower unfold to allow for a large public park cut high bottom to the city, mantaining the necessary public access to nature. Far removed from the intensity of urban life, the park provides residents and visitors and scape to nature while still maintaining a unique visual link with the city. The building is interconnected with tha main streets of the city and the main river. The collection of these parts reaches a critical mass allowing the structures to exist as an autonomous entity within the city, a new building prototype for the Sarajevo City.



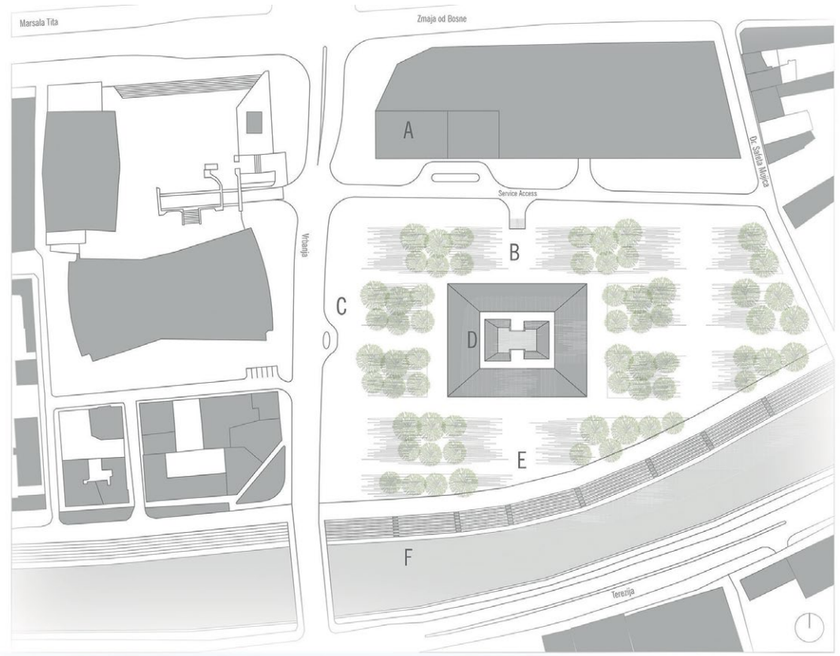
A



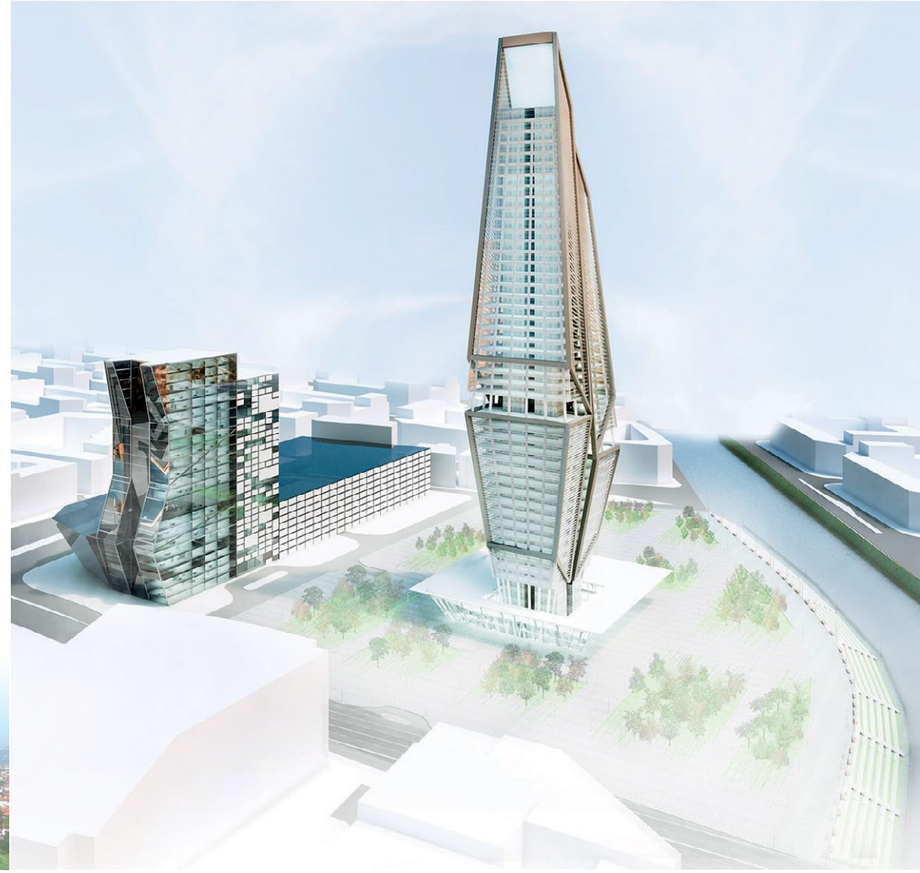
B



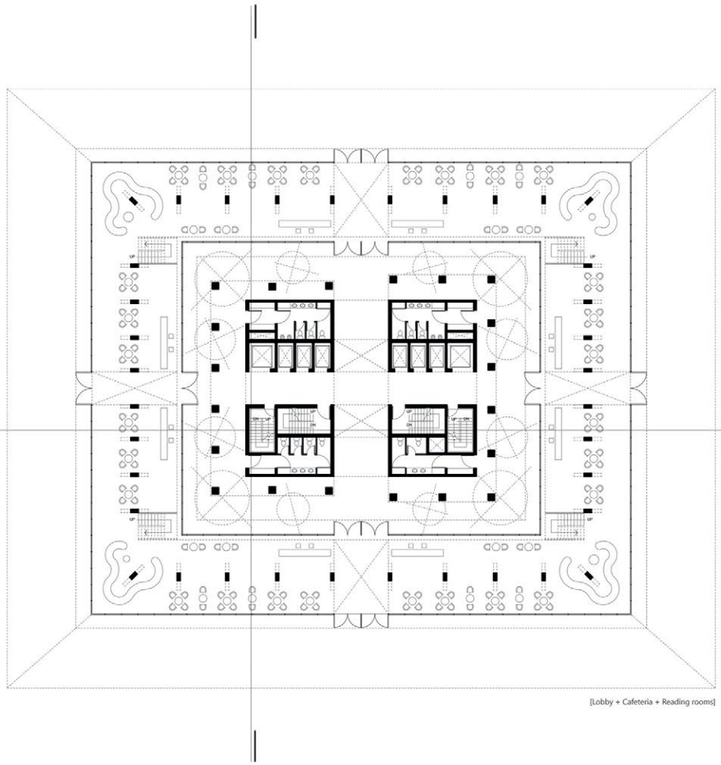
C



A - Sarajevo City Center (Existing)
B - Public Park
C - Main Square with river conection
D - Sarajevo Highrise
E - River Walk
F - Dock

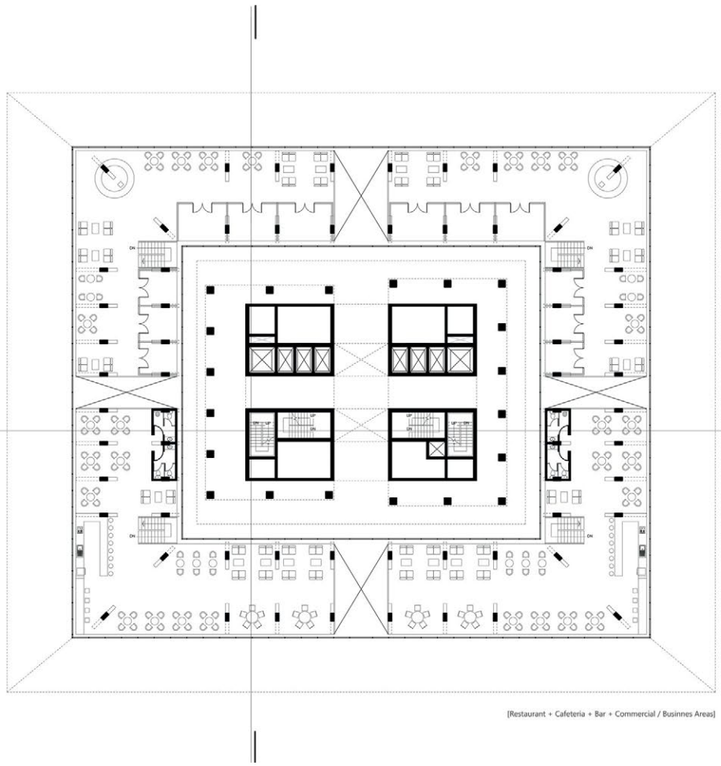


Ground Floor
1: 200



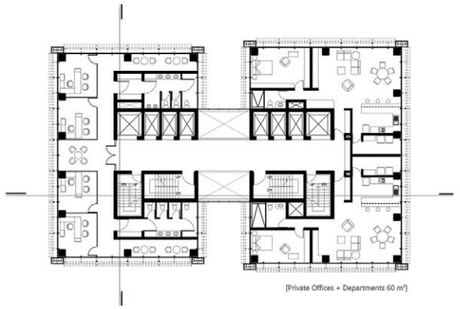
[Lobby + Cafeteria + Reading rooms]

Level 01
1: 200



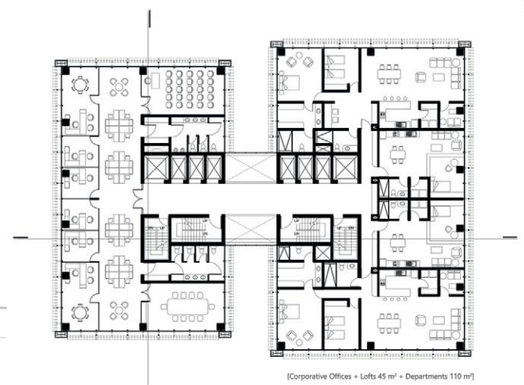
[Restaurant + Cafeteria + Bar + Commercial / Businnes Areas]

Level 5 - 14
1: 200



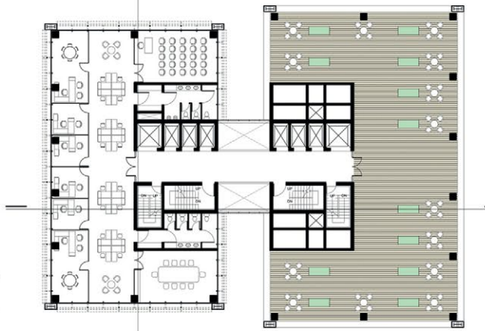
[Private Offices + Departments 60 m²]

Level 15
1: 200



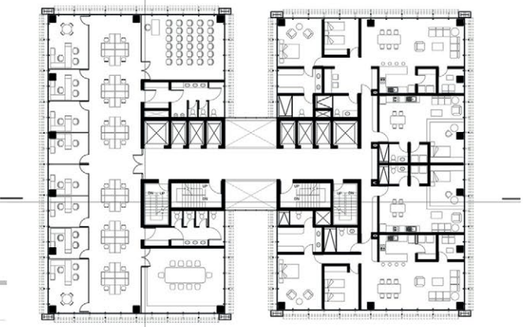
[Corporative Offices + Lofts 45 m² + Departments 110 m²]

Level 16
1: 200



[Corporative Offices + Free Area for Offices]

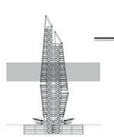
Level 17 - 19
1: 200



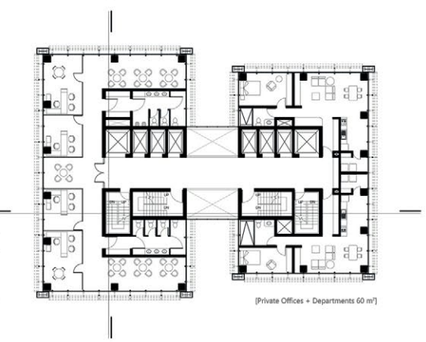
[Corporative Offices + Lofts 45 m² + Departments 110 m²]

Level 20
1: 200

[Lofts 45 m² + Departments 110 m² + Free Area for Departments]

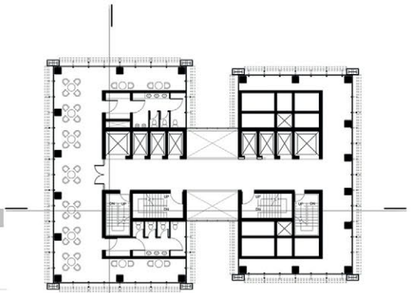


Level 21 - 34
1: 200



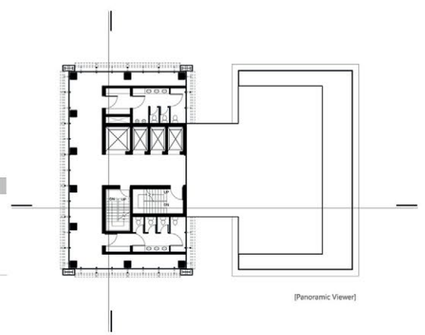
[Private Offices + Departments 60 m²]

Level 35 - 39
1: 200

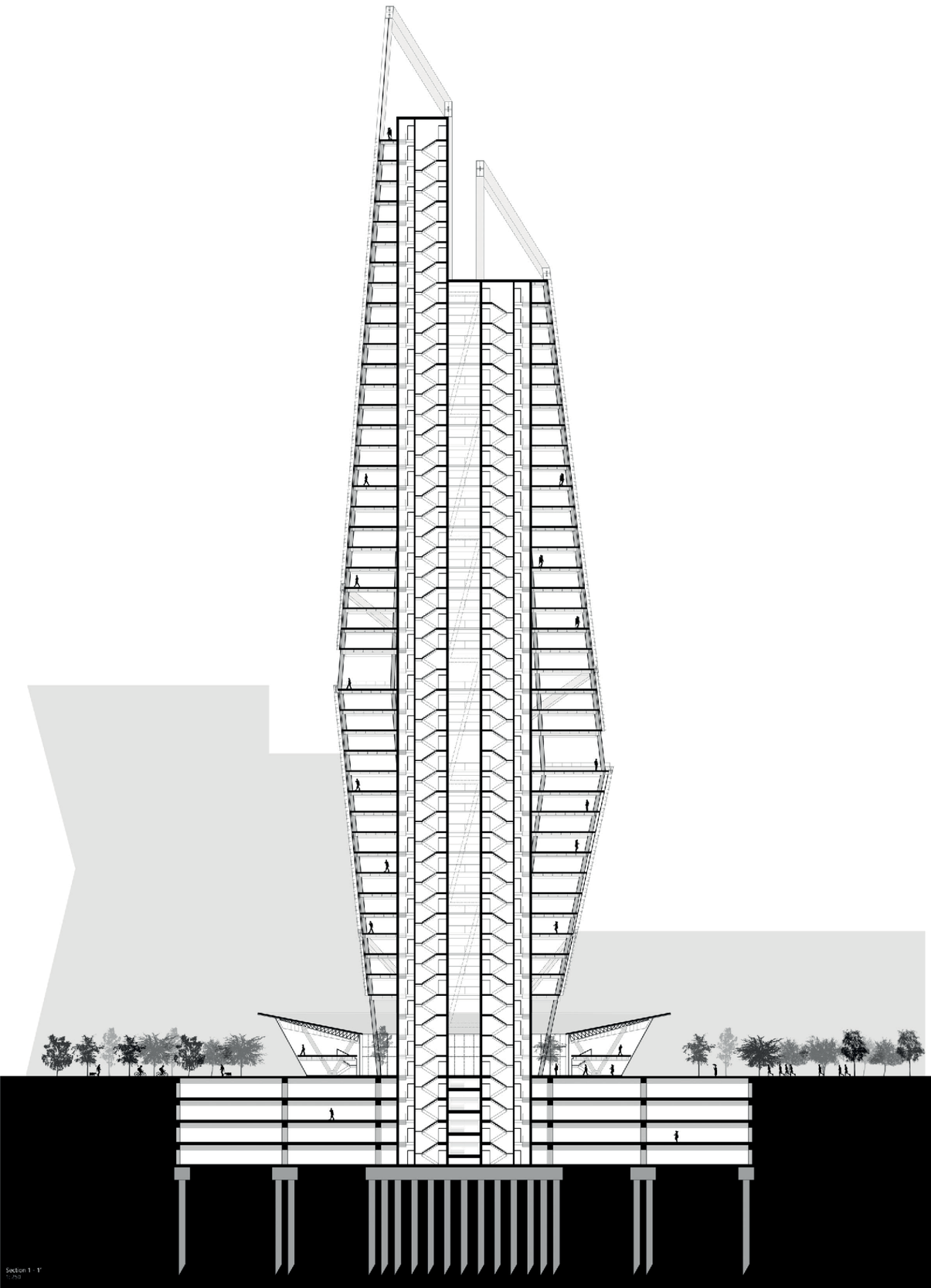


[Restaurant + Panoramic Viewer]

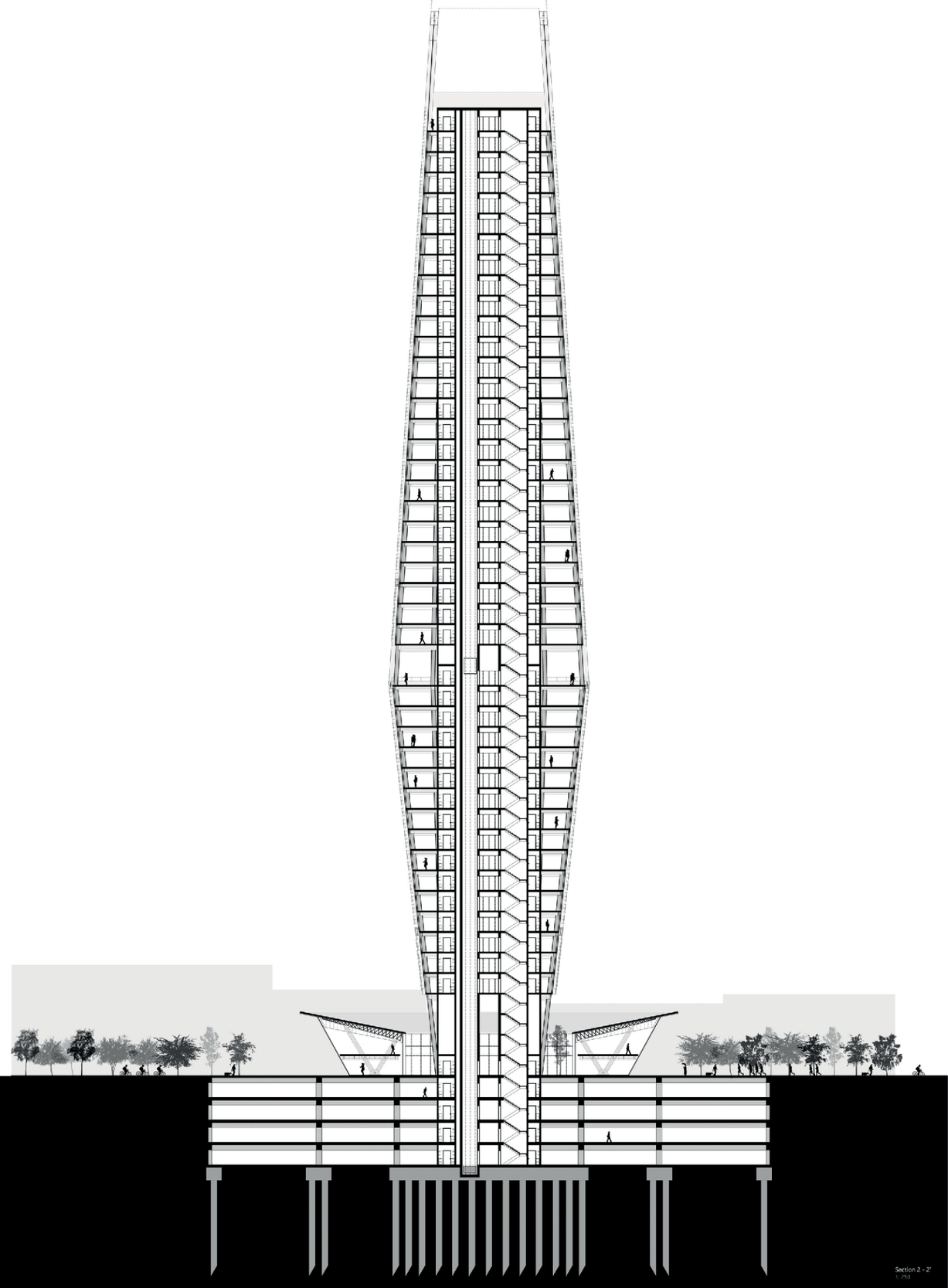
Level 40 - 44
1: 200



[Panoramic Viewer]



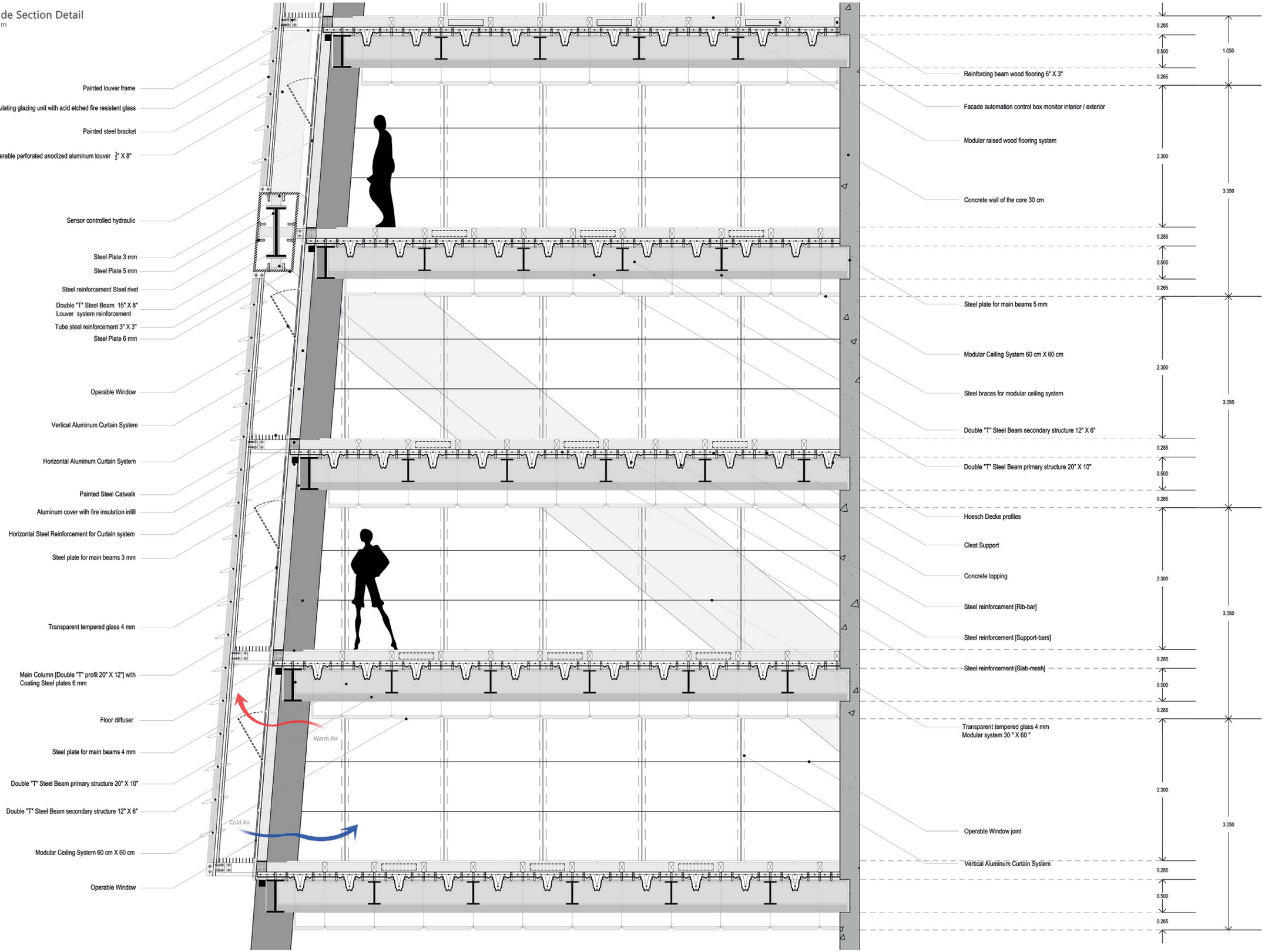
Section 1 - 1'
1:250



Section 2 - 2'
1:250

Facade Section Detail

1: 25 / m

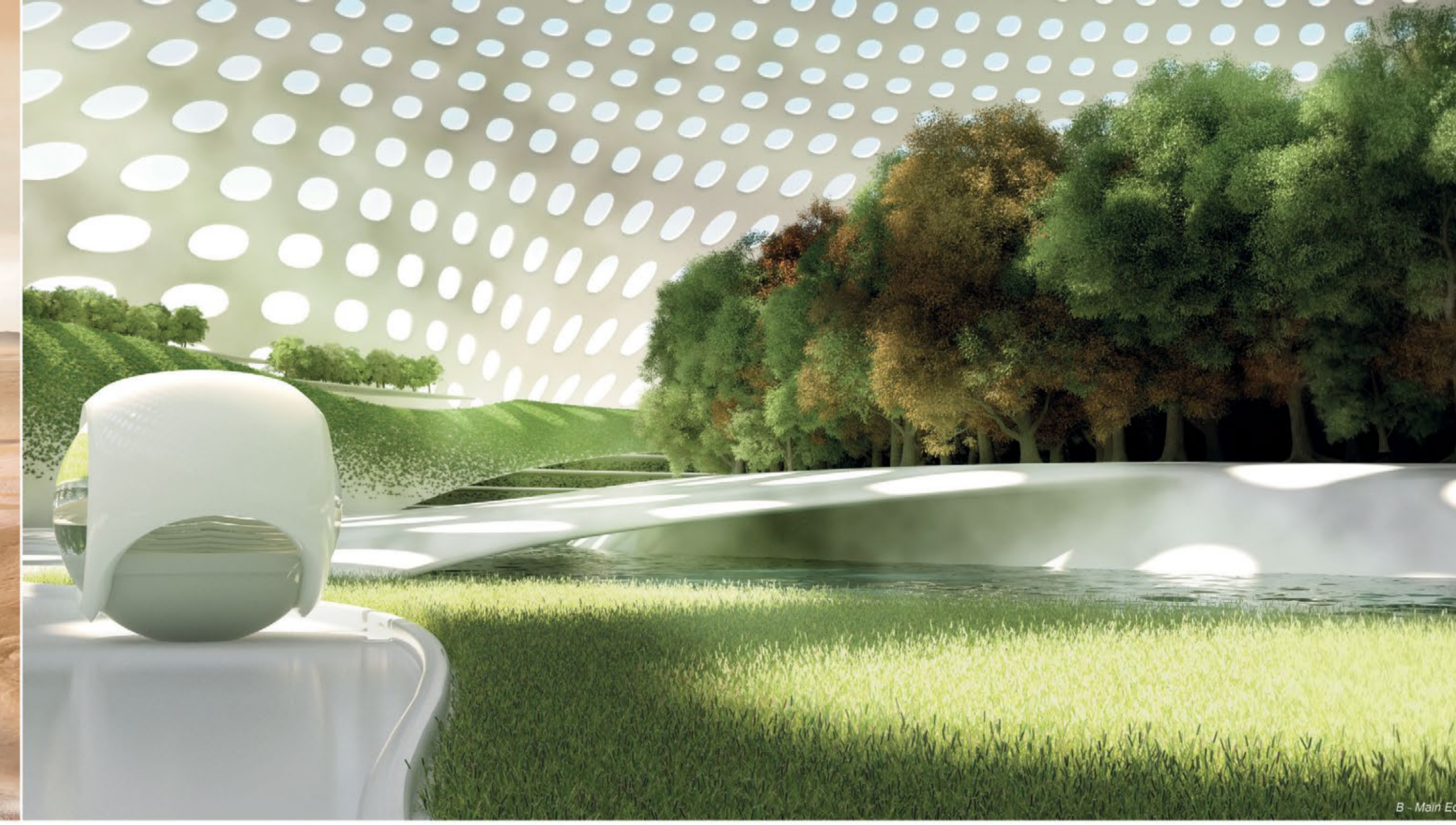


FIRST HUMAN MARS COLONY

Kuala Lumpur, Malaysia
Architecture Competition - Finalist - 2015

Client: KLAF Architecture International Competition
Firm: ParametriK Studio S. A. C. V.
Responsabilities: Concept, 3D modeling, renderings, plans and presentation.
Credits: Alan Rodríguez Carrillo, Guillermo Rage Musi and Roberto Athie.

A - Mars Eden



B - Main Eden

Mars Eden

First outter space human colony

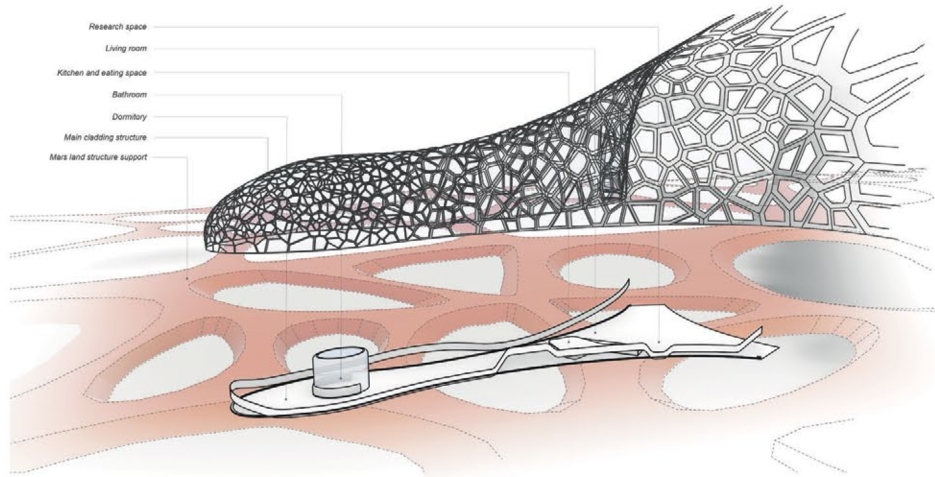
Mars Eden was conceptualized from a hexagon because it gives a sequence provided for an ordered and controlled growth from the requested premise of the number of initial inhabitants for the colony. In each of its final vertices, a living and research space was proposed for a couple where these houses share, respond and have access to the main core, the hexagon.

For the modulation distance, the area and the size of these hexagons the proportion of the so-called "metallic numbers" was used. The use of this proportion with the hexagonal geometry allowed us to generate an expansion of the colony in a sequential, orderly and above all functional way. The expansion consists in that the first hexagonal core can join and respond to a larger core and that from its vertices more colonies are annexed and at the moment of following the expansion that "primary" core becomes "secondary" giving entrance to a much larger one thus generating an entire expansion system. As such, speaking of hard data, the system consists of the main nucleus that branches into five secondary nuclei and in each of these five, there are branched out five living clusters, wherein each of these going to host a couple of people, resulting in a colony of fifty people.

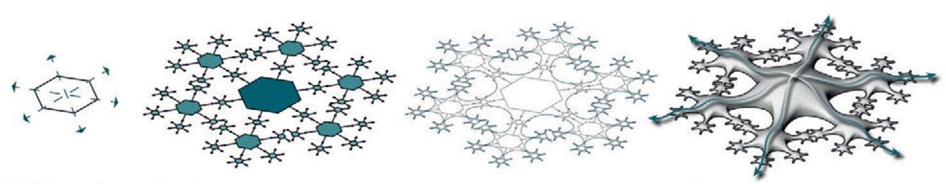
A general geometry was proposed, based on the hexagonal grid, to be conceptualized as a whole. Through this, the result obtained was a fluid and elastic geometry thinking as a primary structure that branches off. For its construction, it is thought to send a ship that contains spherical drones that at the moment of arriving at the *Elysium Planitia*, they settle in strategic places and at the moment they reach their location robotic arms comes out from the inside and start to build the main structure of the proposed geometry with the help of other smaller drones, using the land of Mars and a liquid polymer brought from the Earth as material.

At the boundaries of the geometry the living clusters are located, where each one has basic services, food preparation, and research area; continuing to the center is the nucleus where the living clusters converge, and their use is designated for the cultivation and processing of food. Already as part of the expansion, the next nucleus that will become a larger green area that works by generating oxygen and has control points for transportation. At the center, a larger nucleus is proposed, the main Eden, where apart from being a green lung for the whole system, it has all the services for public use such as libraries, schools, health centers, main headquarters, and transport centers, as well as areas for leisure, entertainment, and exercise. Also, this Eden, thinking for the future, has the characteristic to be able to function as an element that can be connected to other future colonies to give rise to the first city on Mars.

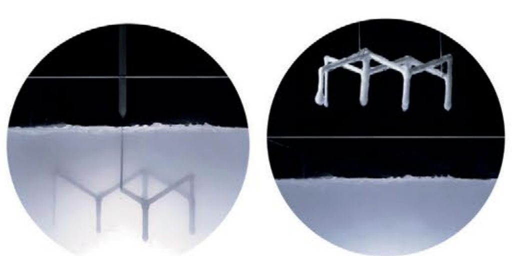
A new transportation system is proposed and consists of spherical glass capsules where its external glass can rotate, moving without affecting their interior, and likewise the interior can rotate in its own vertical axis without affecting the displacement of the capsule. The movement of the capsules within the system is a radial route that covers all the geometry and has control stations allowing entrance and exit of the main system. A space exploration and researching center was also proposed because the capsules have the characteristics to leave the system and travel outside the red planet for research purposes, however, as a safety measure, each of the capsules have in their back with health team in case of human health emergencies and safety tools for natural disasters events.



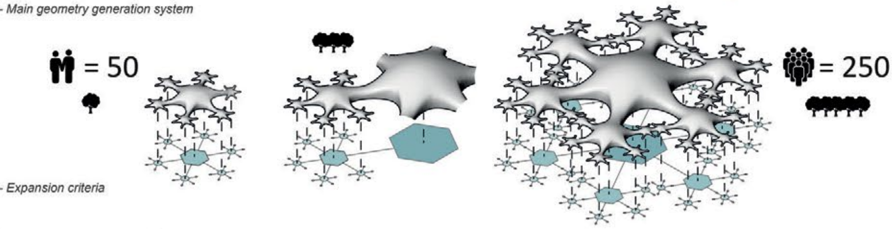
01 - Building station components



02 - Main geometry generation system



Inside liquid 3D print generation
Outside final 3D print generation

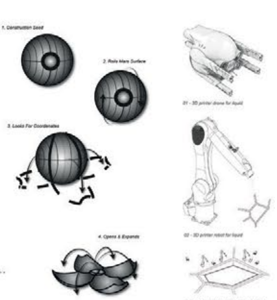


03 - Expansion criteria

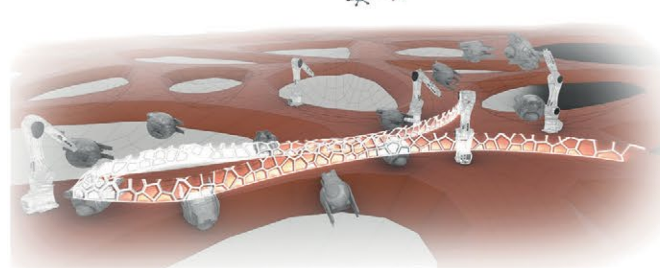
The short-term plan is to have a core oxygen generator, where five secondary cores store and generate food, are annexed into it, and from the secondary nuclei five living spaces are branched out for the first fifty people. At the same time of completing the short-term objectives, the drones will continue building the next phase of the system to make way for a larger core, which would be the medium-term goal, where this new core is an oxygen generator and transport points are implemented throughout the system because the scale of this is increasing, all with the aim of continuing the expansion. As a long-term goal we have the next phase of expansion, which would be the core of Eden, where all public services are located, and generate a city environment with a large green lung that generates oxygen for the entire system and with the characteristic that this nuclei can join in the future to other colonies for an expansion.

The architectural aesthetics and constructive methods of this system allows to generate a pleasant, fluid, comfortable and above all functional space, where each core of the system has its own characteristics and generates its own environment but always in correlation and coexistence with other nuclei, all responding and working together generating an orderly and sequential system to achieve the future of a large city on Mars.

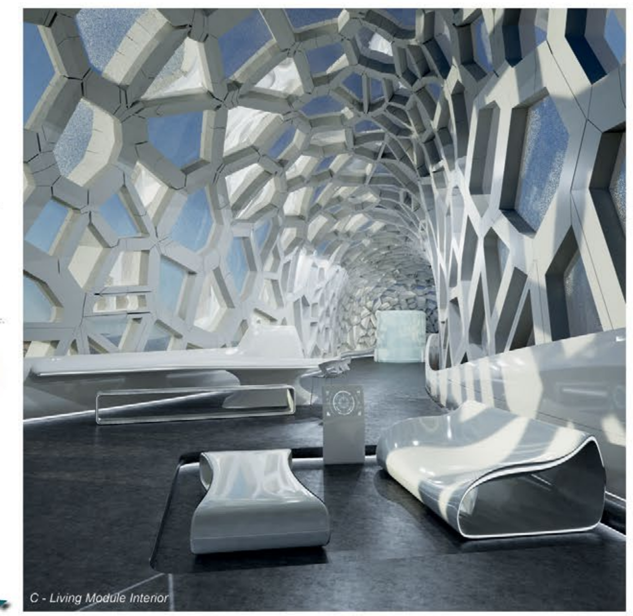
It is difficult to imagine how a whole habitable system could be generated for the human being on another planet, not having a historical record of this, however the way to carry this out is to propose, thinking out of the box about the next step for humanity, a concept becoming reality, without losing sight of the fact that this initiative to live off Earth is getting closer and closer to what we expect. Let's be prepared for the unknown…



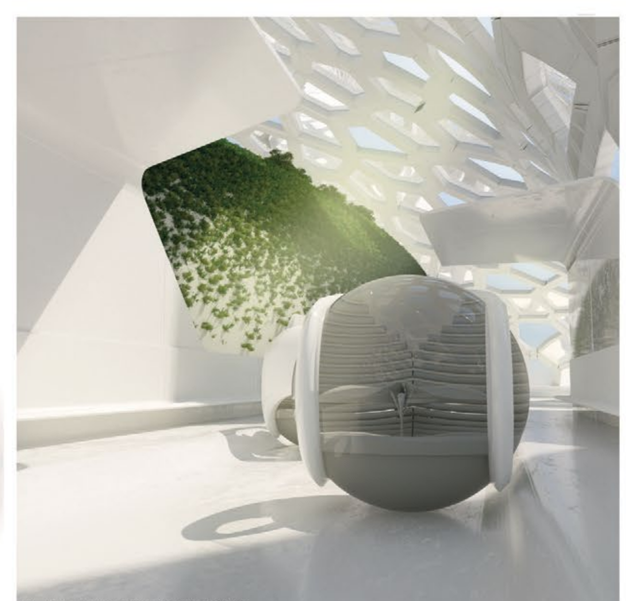
04 - Main capsule transportation system



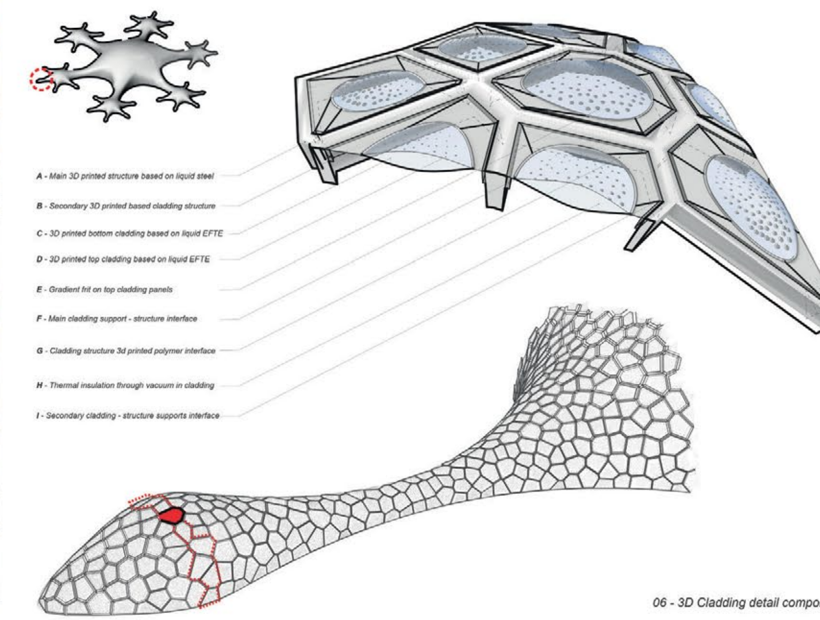
05 - 3D liquid polymers printed construction by robots and flying drones



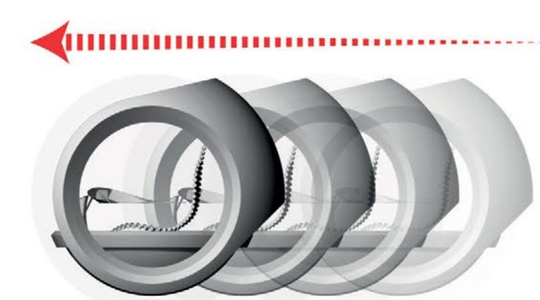
C - Living Module Interior



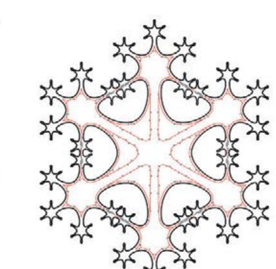
D - Main Transportation Capsules Station



06 - 3D Cladding detail components



07 - Main capsule transportation system



08 - Transportation capsule flow's diagram

31349667

FORSCHUNGSPAVILION 2014 - 15

Stuttgart, Germany
Concept & Design Development and Fabrication - 2014

School: ICD + ITKE - Fakültät für Architektur und Stadtplanung, Universität Stuttgart
Advisory: Prof. Achim Menges + Prof. Ing. Jan Knippers
Responsabilities: concept, design, scripting, geometry control, digital fabrication and presentation.
Credits: Hassan Abbasi, Yassmin Al-Khasawneh, Yuliya Baranovskaya, Marta Besalu, Giulio Brugnaro, Elena Chiridnik, Tobias Grun, Mark Hageman, Matthias Helmreich, Julian Holl, Jessica Jorge, Yohei Kanzaki, Shim Karmin, Georgi Kazlachev, Vangel Kukov, David Leon, Kantaro Makanae, Amanda Moore, Paul Poinet, Alan Rodríguez, Emily Scoones, Djordje Stanojevic, Andrei Stoiculescu, Kenryo Takahashi and Maria Yablonina.

The ICD/ITKE Research Pavilion 2014-15 demonstrates the architectural potential of a novel building method inspired by the underwater nest construction of the water spider. Through a novel robotic fabrication process an initially flexible pneumatic formwork is gradually stiffened by reinforcing it with carbon fibers from the inside. The resulting lightweight fiber composite shell forms a pavilion with unique architectural qualities, while at the same time being a highly material-efficient structure.

The Institute for Computational Design (ICD) and the Institute of Building Structures and Structural Design (ITKE) continue their series of research pavilions with the new ICD/ITKE Research Pavilion 2014-15 at the University of Stuttgart. These building prototypes explore application potentials of novel computational design, simulation and fabrication processes in architecture. The pavilion was developed at the intersection of the two institute's research fields and their collaborative teaching in the context of the interdisciplinary and international ITECH MSc program. This prototypical project is the result of one and a half years of development by researchers and students of architecture, engineering and natural sciences.

The design concept is based on the study of biological construction processes for fiber-reinforced structures. These processes are relevant for applications in architecture, as they do not require complex formwork and are capable of adapting to the varying demands of the individual constructions. The biological processes form customized fiber-reinforced structures in a highly material-effective and functionally integrated way. In this respect the web building process of the diving bell water spider, (Agyroneda Aquatica) proved to be of particular interest. Thus the web construction process of water spiders was examined and the underlying behavioral patterns and design rules were analyzed, abstracted and transferred into a technological fabrication process.

The water spider spends most of its life under water, for which it constructs a reinforced air bubble to survive. First, the spider builds a horizontal sheet web, under which the air bubble is placed. In a further step the air bubble is sequentially reinforced by laying a hierarchical arrangement of fibers from within. The result is a stable construct that can withstand mechanical stresses, such as changing water currents, to provide a safe and stable habitat for the spider. This natural production process shows how adaptive fabrication strategies can be utilized to create efficient fiber-reinforced structures.

For the transfer of this biological formation sequence into a building construction application, a process was developed in which an industrial robot is placed within an air supported membrane envelope made of ETFE. This inflated soft shell is initially supported by air pressure, though, by robotically reinforcing the inside with carbon fiber, it is gradually stiffened into a self-supporting monocoque structure. The carbon fibers are only selectively applied where they are required for structural reinforcement, and the pneumatic formwork is simultaneously used as a functionally integrated building skin. This results in a resource efficient construction process.

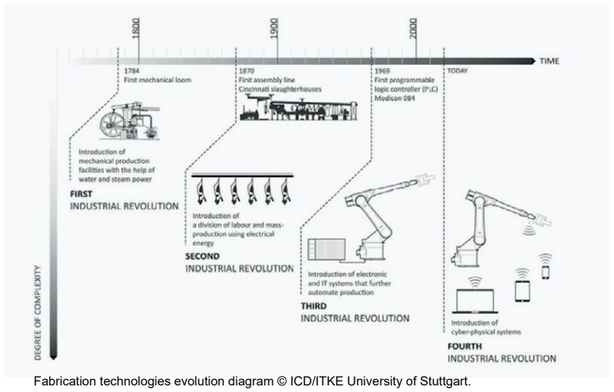
The prototypical character of the fabrication process required the development of a custom made robot tool that allows placement of carbon fibers based on integrated sensor data. The technical development of this tool became an integral part of the architectural design process. This process also posed special challenges for the material system. ETFE was identified as a suitable material for the pneumatic formwork and integrated building envelope, since it is a durable facade material and its mechanical properties minimize plastic deformation during the fiber placement. A high degree of functional integration is achieved through the use of the ETFE film as pneumatic formwork and building envelope. This saves the material consumption of conventional formwork techniques as well as an additional façade installation. A composite adhesive provided a proper bond between the ETFE film and the carbon fibers. During production nine pre-impregnated carbon fiber rovings are placed in parallel. 45km of carbon roving were laid at an average speed of 0.6 m min on 5km of robot path. This additive process not only allows stress-oriented placement of the fiber composite material, but it also minimizes the construction waste associated with typically subtractive construction processes. The ICD / ITKE Research Pavilion 2014-15 covers an area of about 40m² and an internal volume of approximately 130m³ with a span of 7.5m and a height of 4.1m. The total construction weight is just 260kg, which corresponds to a weight of 6.5kg / m².

The ICD / ITKE Research Pavilion 2014-15 serves as a demonstrator for advanced computational design, simulation and manufacturing techniques and shows the innovative potential of interdisciplinary research and teaching. The prototypical building articulates the anisotropic character of the fiber composite material as an architectural quality and reflects the underlying processes in a novel texture and structure. The result is not only a particularly material-effective construction, but also an innovative and expressive architectural demonstrator.

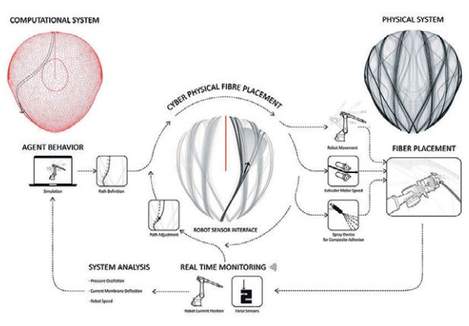
The research for the ICD/ITKE Research Pavilion 2014 – 151 extended the brecomposite processes of the 2012 and 2013 – 14 pavilions through the integration of a weatherproof skin based on a biological investigation of the diving bell water spider (Argyroneta aquatica). Contrary to the insights on morphological principles for brous structures gained from the biological role models used for the previous two pavilions, the water spider investigation focused on the process-based biomimetics utilised in the construction of its subaquatic nest.

Stable fibrous nest construction of the Diving Bell Water Spider (Agyroneda aquatica) © ICD/ITKE University of Stuttgart.

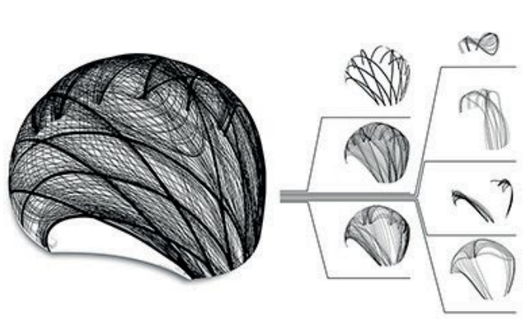
Diving Bell Water Spider (Agyroneda aquatica) reinforcing an air bubble from the inside © ICD/ITKE University of Stuttgart.



Fabrication technologies evolution diagram © ICD/ITKE University of Stuttgart.

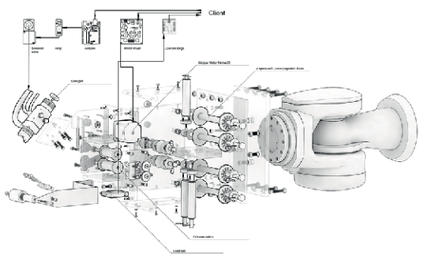


Diving Bell Water Spider (Agyroneda aquatica) reinforcing an air bubble from the inside © ICD/ITKE University of Stuttgart.

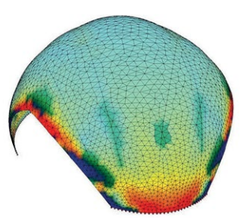


Comparison of various fiber reinforcement strategies © ICD/ITKE University of Stuttgart.

Conceptual Fabrication Strategy: 1. Inflated pneumatic membrane 2. Robotically reinforce membrane with carbon fiber from inside 3. Stable composite shell © ICD/ITKE University of Stuttgart.



Exploded diagram of fiber extruding end effector developed for the adaptive fabrication strategy © ICD/ITKE University of Stuttgart.



Finite element analysis of composite shell © ICD/ITKE University of Stuttgart.

Agent-based design tool which negotiates multiple design parameters to determine fiber laying paths © ICD/ITKE University of Stuttgart.

[BIO]COMPUTATIONAL DESIGN PROCESS A + B

Stuttgart, Germany + Tokyo, Japan + Mexico City
Research - 2016

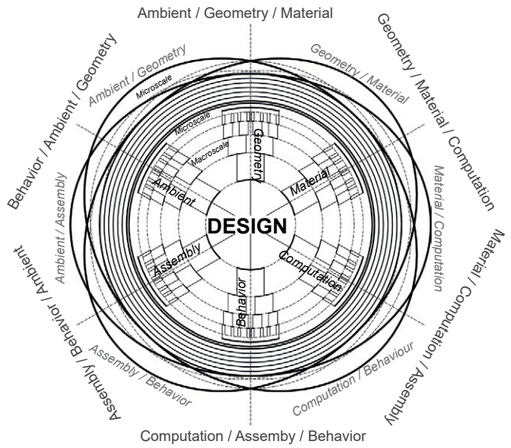
School: Fakültät für Architektur und Stadtplanung, Universität Stuttgart + University of Tokyo, Japan + School of Architecture, UNAM. Mexico City, Mexico.
Advisory: Prof. Achim Menges + Ehsan Baharlou + Dr. en Arq. Ronan Bolanos Linares.
Responsabilities: concept, design, 3D modeling, parametric modelling, scripting, diagrams, plans, renderings, physical and 3D printed model fabrication.
Credits: Alan Rodríguez Carrillo

How can we achieve the computational simulation of matter and energy, linked to the production of form, without first making the form itself?

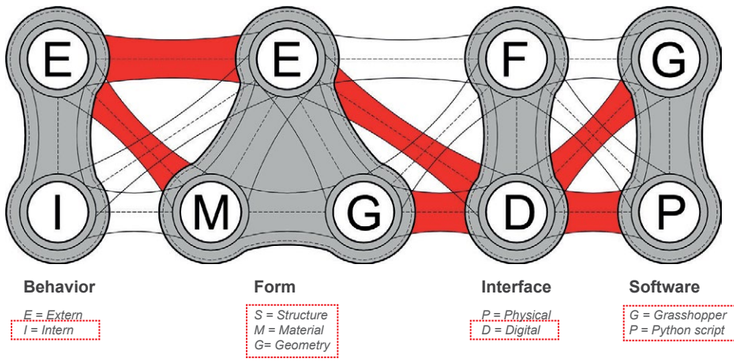
This is the generative design scheme, which contemplates the computational, mathematical, biological and physical simulation stages, with the aim of imitating and representing through a graphic programming algorithm and geometry, a branched natural fractal growth system, from the physiological and behavioral analogy of a coral of the genus Acropora.

This formal system of flows, was generated from the incorporation of the "Agent-based modeling", a type of approach to architectural design contemporary that implies concepts of integration and final geometric materialization of The relationship of entities. The main aspect, however, was to link to each of these individual entities in a system capable of providing a generation-based synthesis in the way as a consequence and in response to qualitative external variables through quantitative control variables.

The research developed from this method can allow constant feedback, integration and model building complexes in a particular computational design process, by allowing to



A - Design approaching diagram

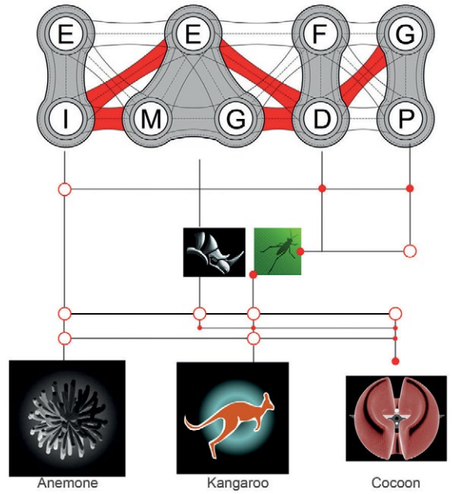


B - System relationship for the biological geometry generation

Acropora Cervicornis
[Coral Cuerno de Ciervo]

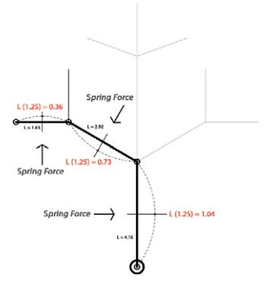
Kingdom:	Anima-
Phylum:	Crida-
Class:	Anthozoa
Subclass:	Hexacorallia
Order:	Scleractinia
Family:	Acroporidae
Gender:	Acropora
Species:	A. Cervicornis
	LAMARCK, 1816

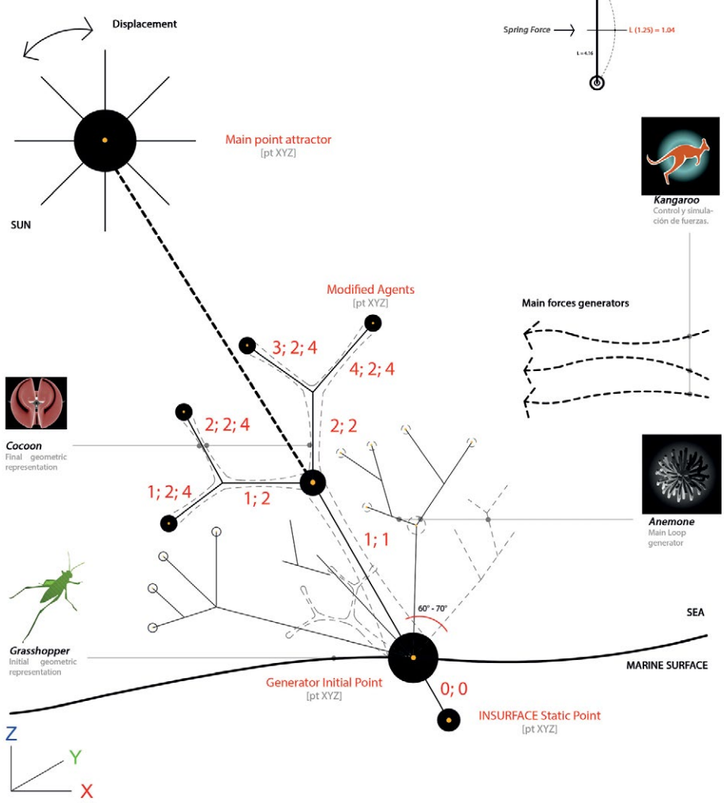
In danger of extinction



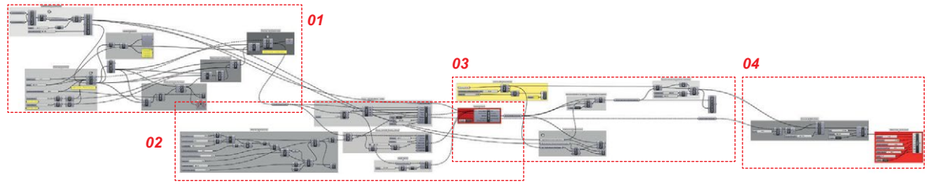
C - Case of Study and computational simulation using an algorithmic design approach

D - Geometry and physical problem thesis diagram





E - Geometry generation and simulation approach initial diagram



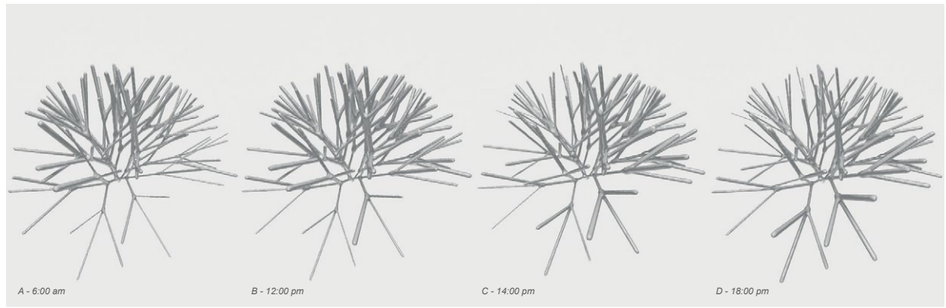
F - Grasshopper DAG Approach & Development

01 *Main loop geometry generation*

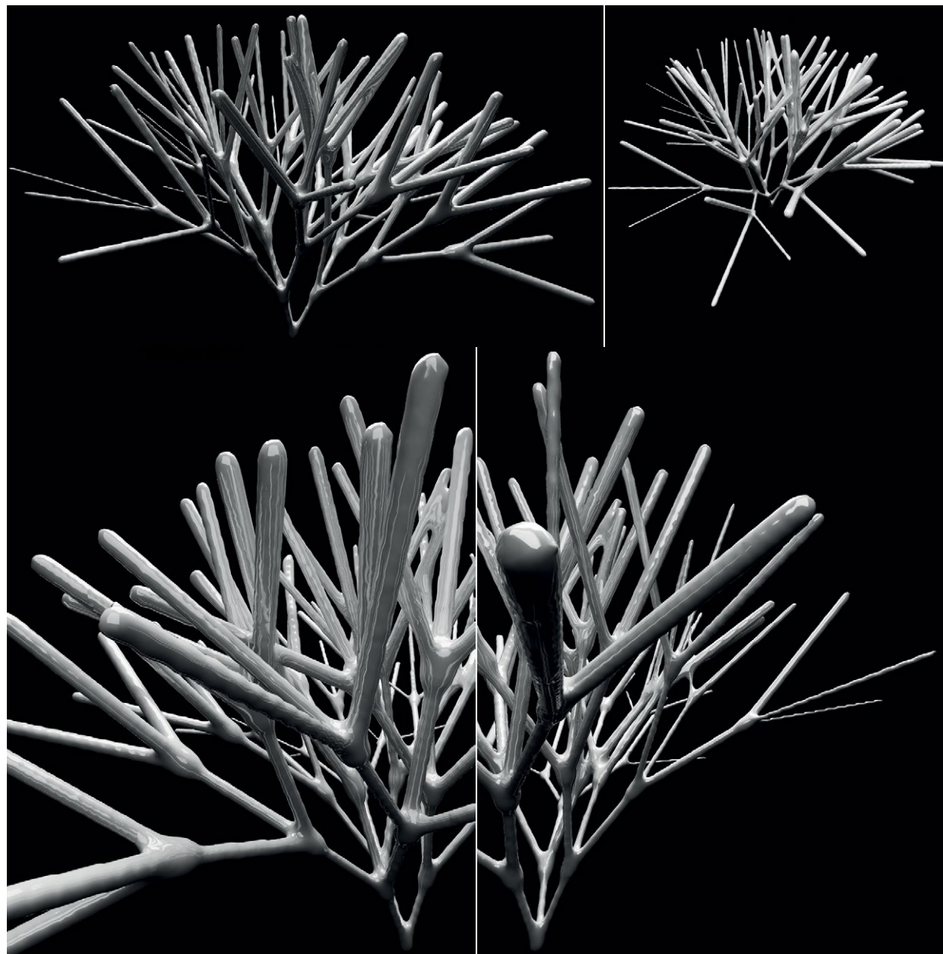
03 *Firts test geometry generation based on solar energy*

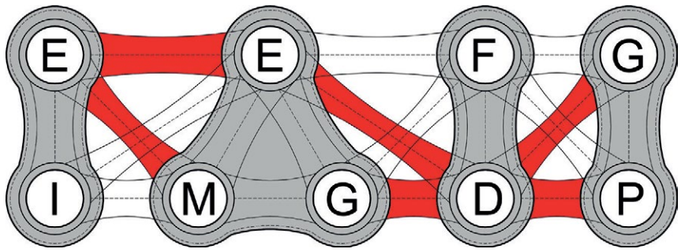
02 *Ocean physical simulation*

04 *Final geometry and energy simulation based on time*



G - Geometry & Material simlation and representation throught the daytime





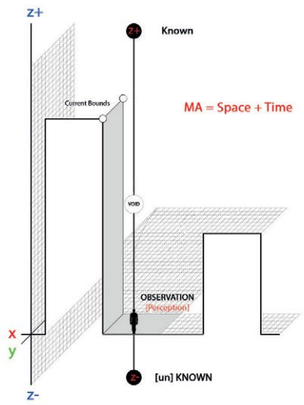
Behavior
E = Extern
I = Intern

Form
S = Structure
M = Material
G= Geometry

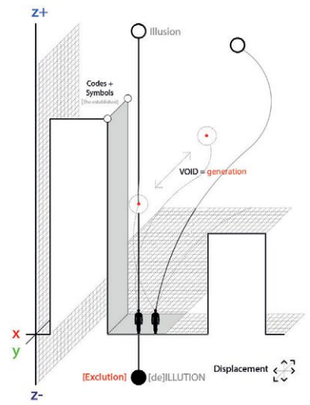
Interface
P = Physical
D = Digital

Software
G = Grasshopper
P = Python script

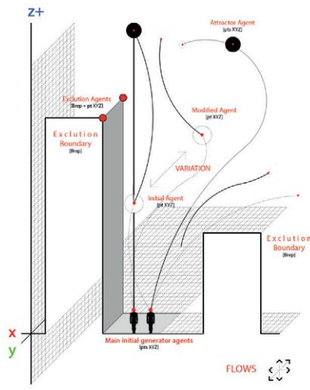
A - Selected approach for system B



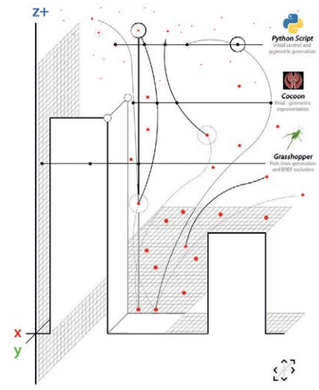
A - Approach 01 [Combination] + 02 [Abstraction]



B - Approach 03 [Analogy]

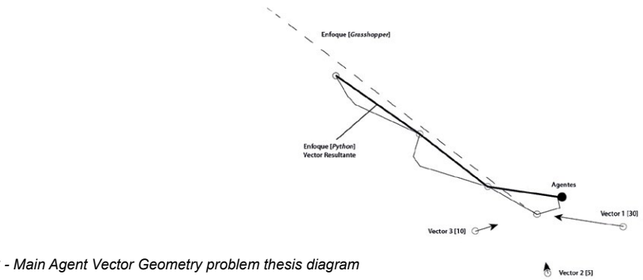


C - Approach 04 [Variation]

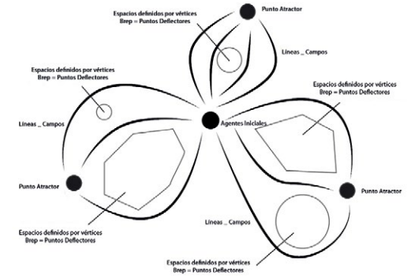


D - Final [MA] system

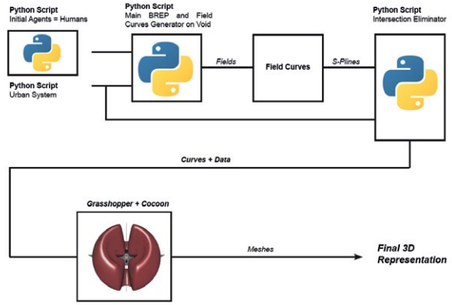
B - MA (Time & Space) concept to urban geometric generation system on void



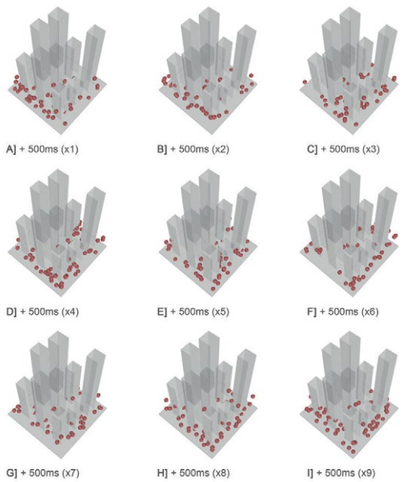
C - Main Agent Vector Geometry problem thesis diagram



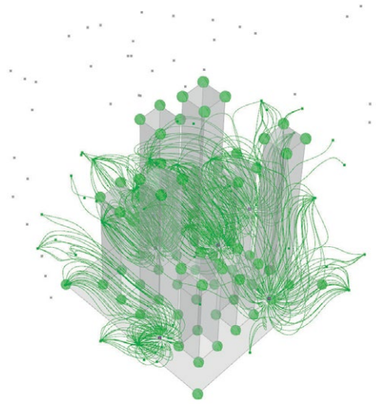
D - Agents Geometric problem thesis diagram



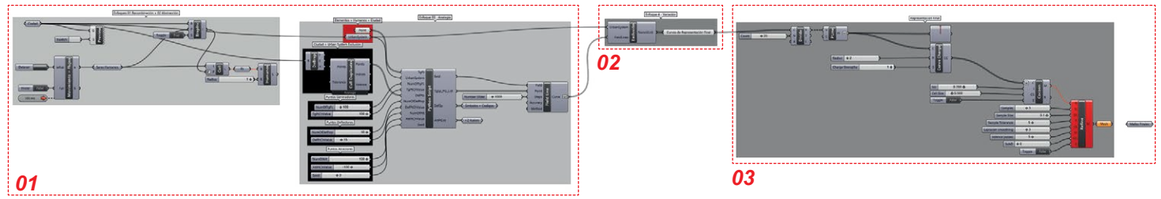
D - Visual and Textual programming approaches for geometry generation

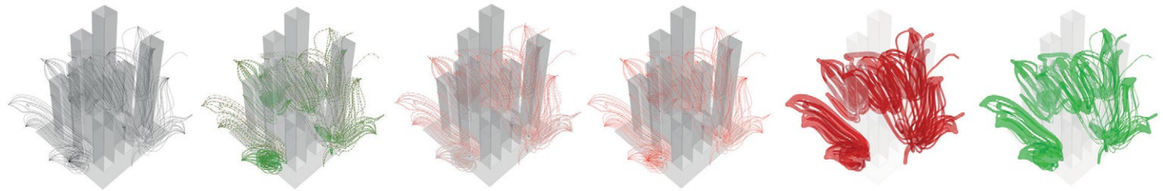


E - Final agents iterations on urban system



F - Main field lines generation in void based on time changing agents

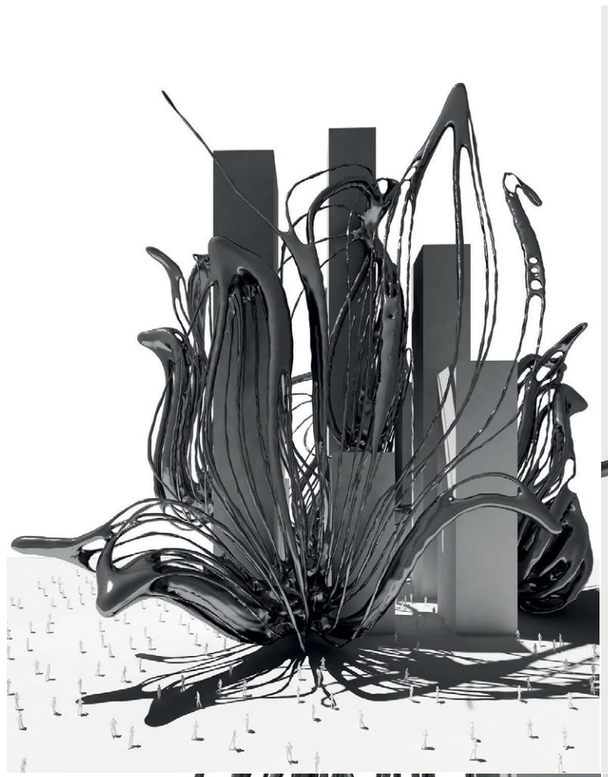




01 *Agents on urban system generation*

02 *Field lines on void from agents*

03 *Final cellular meshes based on field lines*



MEXICO CITY NEW INTERNATIONAL AIPORT

Mexico City, Mexico

Architectural and envelope - facade design, Parametric Geometric Control, Geometric Databases and Construction Coodination & Documentation - 2018 - DD, CD & CD+ - Under Construction

Client: Federal Government of Mexico
Firm: Fernando Romero EnterpreisE & Foster and Partners
Responsabilities: 3D modeling, parametric modelling, geometric control, scripting, construction and geometric databases, diagrams, plans, 3D printed objects and 3D Mockups
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

In response to the needs of the largest infrastructure development in Latin America, the collaborative team designed Mexico's New International Airport Terminal with the aim to revolutionize airport design and the experience of traveling. Upon the completion, the building and infrastructure will not only perform for the duration of the 21st Century, but also evolve into an icon for Mexico.

The “Airport of the Future” is designed with inspiration from the past; the shape, the symbolism, the shear monumentality of the building are all drawn from Mexican art and architecture. Designed to be the most sustainable airport in the world, the first with the LEED certification, the single terminal is being strategized to minimize costs and maximize experience.

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Main Envelope Setup - Geometry + Data

BASE DE DATOS DE LA ENVOLVENTE *CLADDING _DATABASE_DATA*

1. La base de datos de la envolvente está estructurada en three bases de datos. *The cladding database is divided into three different databases*

1.1_Base de Datos de los puntos de trazo de la envolvente._Ésta base de datos relaciona los puntos de trazo de la envolvente con los puntos de trazo estructurales de la base de datos de ARUP y establece los puntos de trabajo para los diferentes paneles./*Cladding Setting Out Point Database_This database links the cladding setting out points to the structural setting out points database by ARUP and sets the workpoint for diferent panels*

1.2_Base de datos de tipo de panel de la Envolvente_Ésta base de datos relaciona los puntos de trazo de la envolvente con los distintos paneles que la componen. Los atributos de cada panel son mostrados en esta base de datos. / *Cladding Panel Database_ the panel id database is linked to the cladding setting out points database and reflects the external wall type system for each panel. This database allows to compile panels and nodes per zones and components of the cladding roof * Refer to drawing 02 in this sheet and drawing 01 in sheet A-11-199-XX-1002*

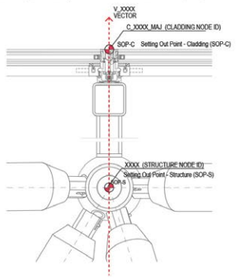
1.3_Base de datos de la cubierta metálica de junta alzada. Ésta base de datos establece los puntos de trazo de las curvas que generan los paneles que componen la cubierta metálica de junta alzada. La base de datos identifica con un ID único cada panel./ *Standing Seam Panel Database_identifies the setting out curves that generate the standing seam roof panellisation. This database identifies with a unique ID each panel.*

1_1_1. Cladding Setting Out Point Database.

CAMPO/*FIELD*	UNIDAD/*UNIT*	NOTAS	*NOTES*
sop_id	-	Identificador único para cada nodo de la base de datos de fachada (C_XXXX)	Unique Integer identifier for each node for the facade database (C_XXXX)
Tipo/*Type*	-	Tipo de nodos. Se subdviden en mayores y menores.	Node types. They are divided into two categories: Major and minor.
X_Coord	mm	Coordenada del nodo en X	Coordinate of the node in X
Y_Coord	mm	Coordenada del nodo en Y	Coordinate of the node in Y
Z_Coord	mm	Coordenada del nodo en Z	Coordinate of the node in Z
Vector	-	Identificador único para el vector creado entre el nodo estructural y el nodo de fachada. (V_XXXX)	Unique integer identifier for the vector resultant of the structural node and the cladding node (V_XXXX)
Zona/*Zone*	-	Zona de la terminal identificada para fines de coordinación. (A,B,C,D,E,F)	Terminal zone identified for coordination purposes. (A,B,C,D,E,F)
Componente/*Component*	-	Identificador del componente de la cubierta para fines de ubicacion.	Indetifier for the roof component for location purposes.

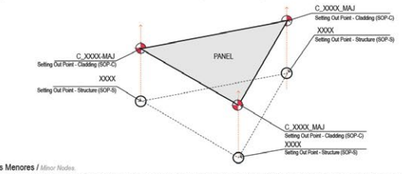
Structural Database**	Base de Datos de los puntos de trazo de la envolvente// Cladding Setting Out Points Database							
Structural setting out point (SOP-S)	sop_id	type	sop_X	sop_Y	sop_Z	Vector	Zone	Component
1001	C_1001_Maj	Major	382091	54634	58912	V_1001	D	FNL-01
1002	C_1002_Maj	Major	302563	54728	59640	V_1002	D	FNL-01
1003	C_1003_Maj	Major	332565	55280	59091	V_1003	D	FNL-01
1004	C_1004_Maj	Major	325347	55092	59242	V_1004	D	FNL-01
1005	C_1005_Maj	Major	328769	55864	59943	V_1005	D	FNL-01
1006	C_1006_Maj	Major	335941	55637	59274	V_1006	D	FNL-01
1007	C_1007_Maj	Major	333345	55800	59095	V_1007	D	FNL-01
1008	C_1008_Maj	Major	335306	56035	59246	V_1008	D	FNL-01

2. Un nodo es un punto en el espacio 3D donde conectan múltiples elementos. *A node is a point in 3d space where multiple elements connect*
3. Un panel es el sistema de fachada que se forma a patir de la unión de los nodos mayores y/o menores y que forman una superficie. *A panel is the facade system which is formed by the conection of the major and/or minor nodes and that create a surface.*
4. Nomenclatura: / *nomenclature*
   4.1_C_XXXX_MAJ (Nodo mayor de Envolvente) / *Major cladding node*
   4.2_C_YYYY_MIN (Nodo menor de Envolvente) / *Minor cladding node*
   4.3_V_XXXX (Vector entre envolvente y estructura) / *Resultant vector between structural setting out point and cladding setting out point.*



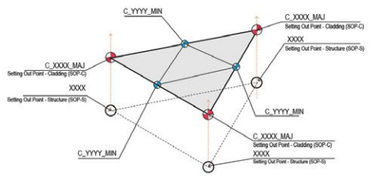
Nodos Mayores / *Major Nodes.*

Los nodos de la base de datos de los puntos de trazo que están relacionados con los nodos de la base de datos estructural son identificados como Nodos Mayores./ *The cladding database nodes that are related to the structural nodes are identified as mayor nodes. Those mayor nodes bound one panel. Major and Minor nodes are not exclusive to a single panel.*



Nodos Menores / *Minor Nodes.*

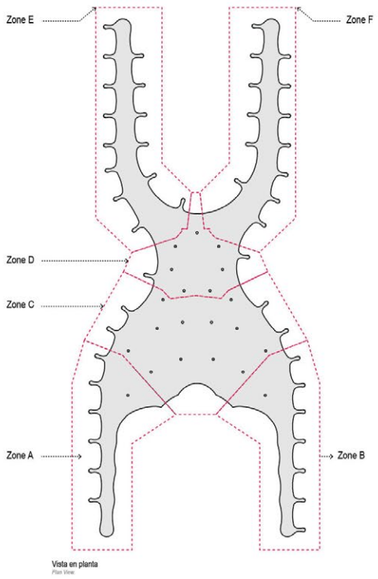
Los nodos de la base de datos de los puntos de trazo de la envolvente que NO están relacionados con la estructura son identificados como Nodos Menores. / *Cladding data base nodes that are NOT related to the structural database are identified as Minor Nodes.*

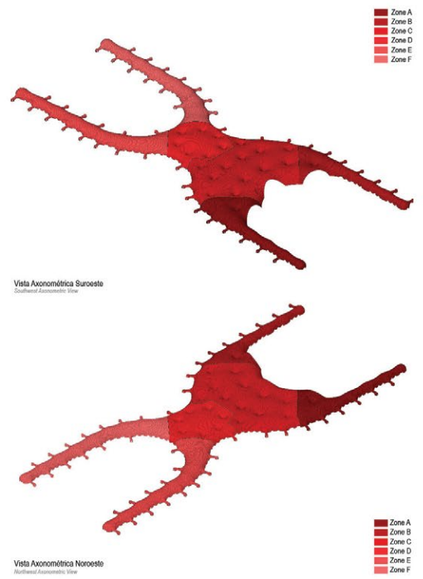


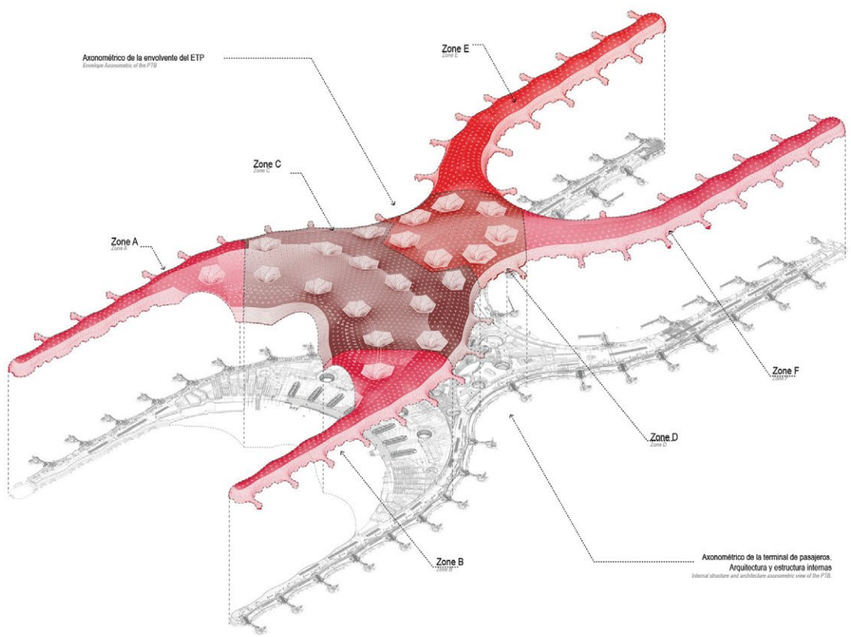
Zonificación de la base de datos de la Envolvente/ *Envelope cladding databasedata zoning organization*

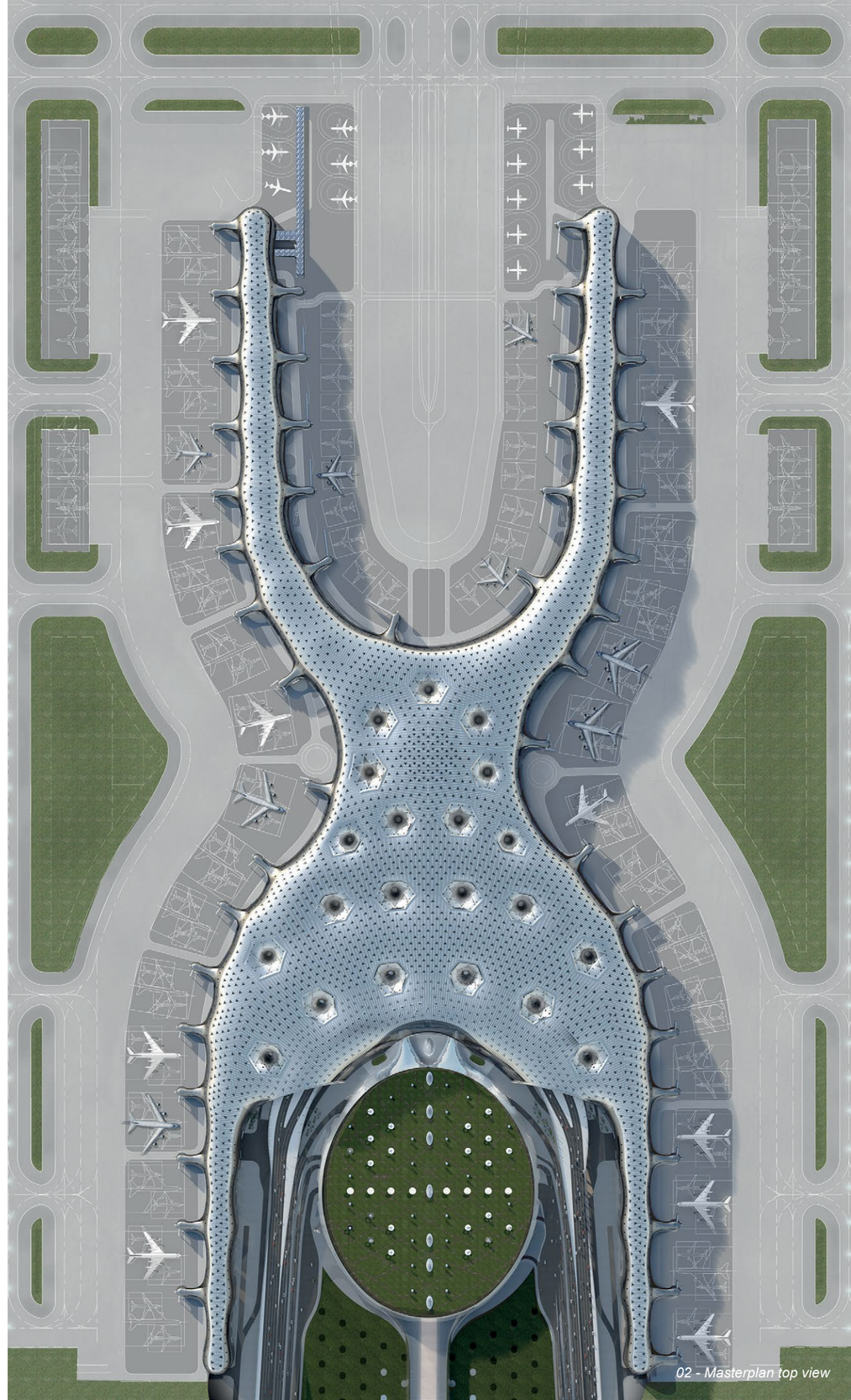
El edificio Terminal de Pasajeros (ETP) está dividido en seis (A,B,C,D,E,F) zonas diferentes para fines de coordinación y referencia. Éste sistema se implementó en la base de datos para localizar y organizar la información de los nodos y los paneles que la componen. *The passenger terminal building is divided into six different zones (a,b,c,d,e,f) for coordination and reference purposes. This system has being implemented as well to locate and group nodes into these same zoning areas.*

Structural Database**	Base de Datos de los puntos de trazo de la envolvente// Cladding Setting Out Points Database							
Structural setting out point (SOP-S)	sop_id	type	sop_X	sop_Y	sop_Z	Vector	Zone	Component
XXXX	C_1001_Maj	Major	382091	54634	58912	V_1001	A	FNL-01









02 - Masterplan top view

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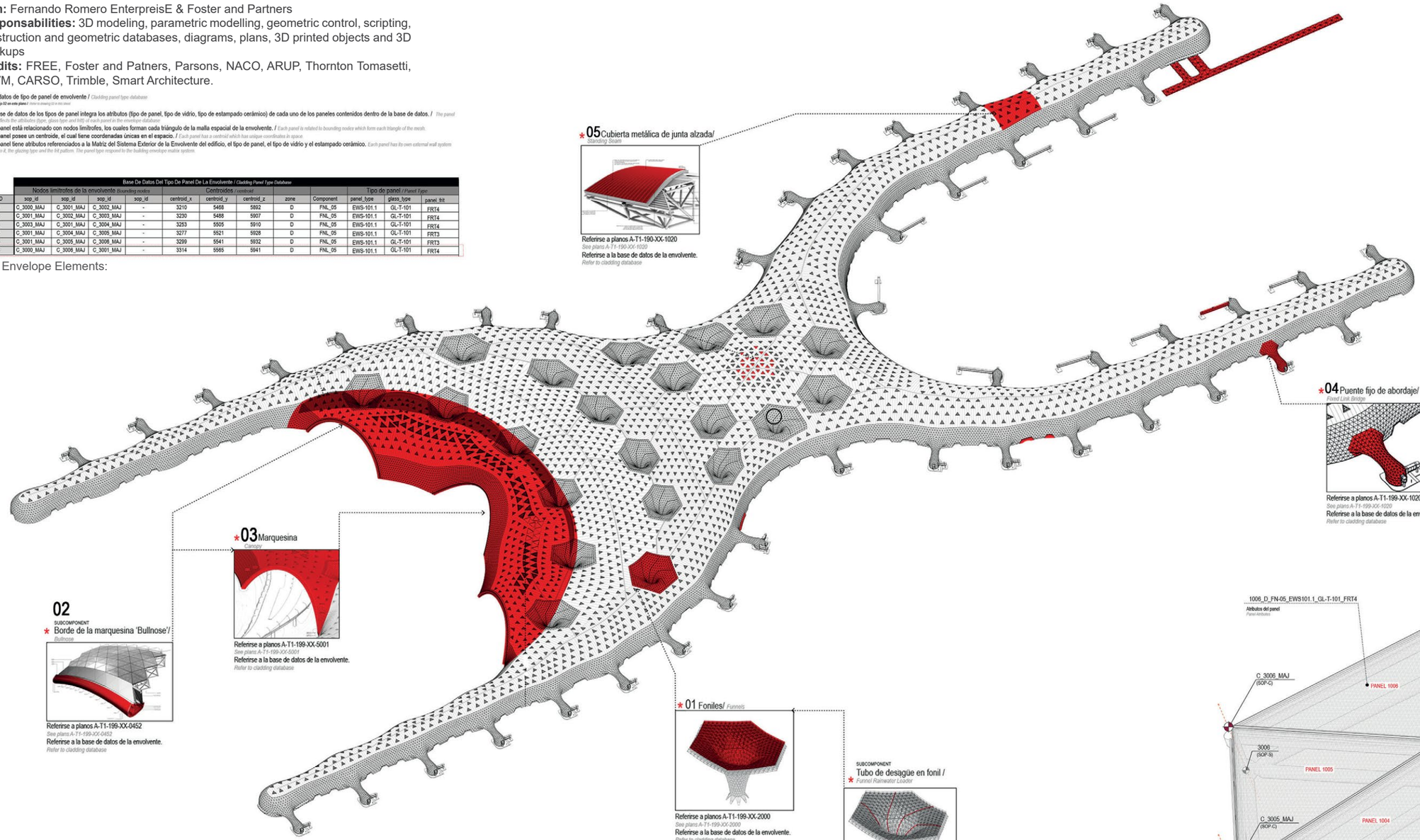
Base de datos de tipo de panel de envolvente / *Cladding panel type database*
Referirse al dibujo 02 en este plano / refer to drawing 02 in this sheet

La base de datos de los tipos de panel integra los atributos (tipo de panel, tipo de vidrio, tipo de estampado cerámico) de cada uno de los paneles contenidos dentro de la base de datos. / *The panel database reflects the attributes (type, glass type and frit) of each panel in the envelope database.*

1_Cada panel está relacionado con nodos limítrofes, los cuales forman cada triángulo de la malla espacial de la envolvente. / *Each panel is related to bounding nodes which form each triangle of the mesh.*
2_Cada panel posee un centroide, el cual tiene coordenadas únicas en el espacio. / *Each panel has a centroid which has unique coordinates in space.*
3_Cada panel tiene atributos referenciados a la Matriz del Sistema Exterior de la Envolvente del edificio, el tipo de panel, el tipo de vidrio y el estampado cerámico. *Each panel has its own external wall system referenced to it, the glazing type and the frit pattern. The panel type respond to the building envelope matrix system.*

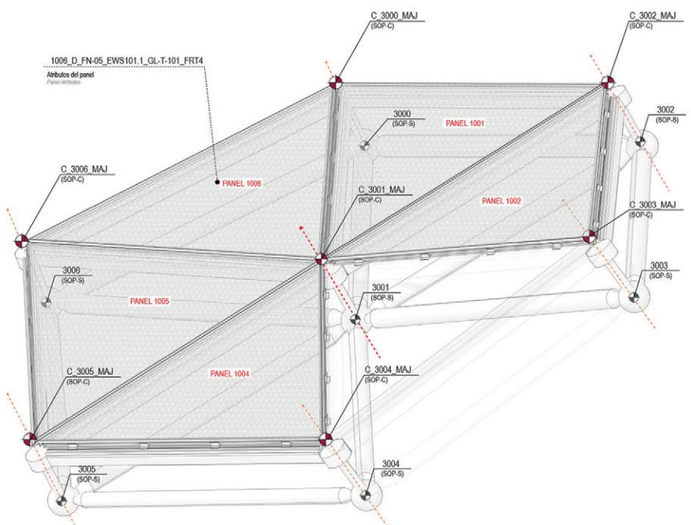
Base De Datos Del Tipo De Panel De La Envolvente / *Cladding Panel Type Database*												
	Nodos limítrofes de la envolvente *Bounding nodes*				Centroides / *centroid*					Tipo de panel / *Panel Type*		
Panel ID	sop_id	sop_id	sop_id	sop_id	centroid_x	centroid_y	centroid_z	zone	Component	panel_type	glass_type	panel_frit
1001	C_3000_MAJ	C_3001_MAJ	C_3002_MAJ	-	3210	5468	5892	D	FNL_05	EWS-101.1	GL-T-101	FRT4
1002	C_3001_MAJ	C_3002_MAJ	C_3003_MAJ	-	3230	5488	5907	D	FNL_05	EWS-101.1	GL-T-101	FRT4
1003	C_3003_MAJ	C_3001_MAJ	C_3004_MAJ	-	3253	5505	5910	D	FNL_05	EWS-101.1	GL-T-101	FRT4
1004	C_3001_MAJ	C_3004_MAJ	C_3005_MAJ	-	3277	5521	5928	D	FNL_05	EWS-101.1	GL-T-101	FRT3
1005	C_3001_MAJ	C_3005_MAJ	C_3006_MAJ	-	3299	5541	5932	D	FNL_05	EWS-101.1	GL-T-101	FRT3
1006	C_3000_MAJ	C_3006_MAJ	C_3001_MAJ	-	3314	5565	5941	D	FNL_05	EWS-101.1	GL-T-101	FRT4

Main Envelope Elements:



01 Axonométrico. Componentes de la envolvente
S/E *Axonometric. Envelope components*

Nota: El dibujo mostrado arriba es sólo demostrativo. Para información real de los paneles del Fonil 05 referirse a la base de datos de la envolvente y a los dibujos arquitectónicos de la envolvente.
Note: The drawing shown above is only demonstrative. Refer to cladding database and the envelope drawing set to revise information regarding Funnel 05 panels.



02 Axonométrico. Atributos del panel.
S/E *Axonometric. Panel Attributes*

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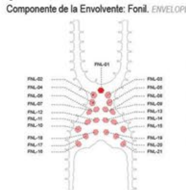
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

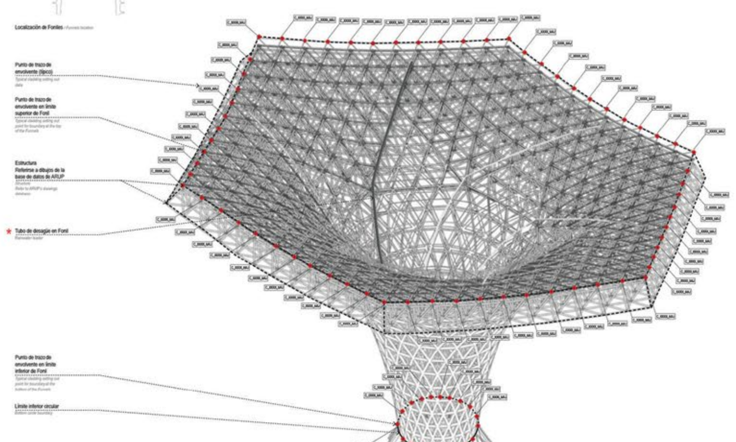
01 - Funnels

Componente de la Envolvente: Fonil. *ENVELOPE COMPONENT: FUNNEL*

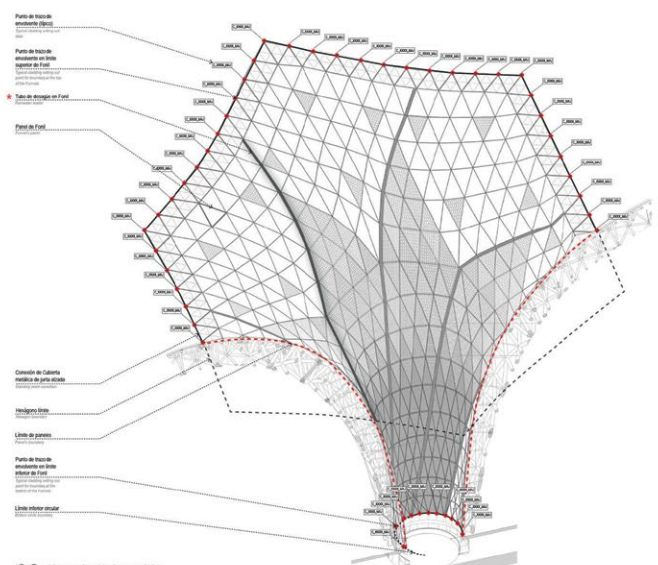


Localización de Foniles / Funnels location

1.0 Un Fonil es un componente que soporta la cubierta principal del aeropuerto / *A Funnel is a component that supports the main envelope of the airport.*
2.0 Cada Fonil tiene un ID / *Each Funnel has an ID.*
  2.1 Este ID es utilizado para la coordinación, referencia y proceso de construcción / *This ID is used for coordination, reference and construction process.*
  2.2 Los ID's fueron introducidos con el objetivo de organizar información en una base de datos / *These ID's were introduced in order to organize the database information.*
3.0 Los Foniles están limitados por una forma hexagonal, la cual es generada dentro de la geometría de la superficie de la cubierta / *The Funnels are bounded by an hexagon shape, which is generated within the envelope geometry surface.*
4.0 La información geométrica dentro de las formas poseen sus propios atributos almacenados en la base de datos - Referirse a la base de datos de la envolvente / *The geometry information within the boundaries have their attributes documented in the database - Refer to the cladding database.*
5.0 Los Foniles contienen tubos de desagüe para agua pluvial, los cuáles pueden ser encontrados en la base de datos de la envolvente - RWL es un subcomponente. / *The Funnels contains a rainwater leaders which can be found in the cladding database - RWL is a subcomponent.*



01 Componente Fonil
S/E *Funnel component*



02 Vista en Sección Axonométrica
S/E *Axonometric Section View*

Notas generales:

La base de datos de la envolvente contiene información de los siguientes componentes: Foniles, Puente tip, Paneles de nivel, paneles de cubierta, paneles de visión, paneles compuestos y tragaluces.
La base de datos de la envolvente no contiene información relacionada con la fachada sur y paneles de nivel
* Para información geométrica y de paneles en la envolvente, referirse a la base de datos de la envolvente
Para información estructural, referirse a la base de datos de ARUP
Referirse a la descripción del tubo de desgüe en Fonil para agua pluvial en el dibujo de la base de datos A-T1-190-XX-1602

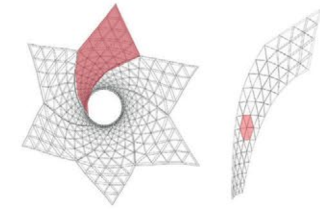
Base de datos de salida de la envolvente - Fonil
/ Cladding setting out database - Funnel

Structural Database	Base de Datos de los puntos de trazo de la envolvente / Cladding Setting Out Points Database						
Node_id	Sop_id	Type	X	Y	Z	Zone	Component
1001	C_1001	Mayor	321	546	589	D	FNL-01
1002	C_1002	Mayor	323	548	590	D	FNL-01
1003	C_1003	Mayor	325	550	591	D	FNL-01
1004	C_1004	Mayor	327	552	592	D	FNL-01
1005	C_1005	Mayor	329	554	593	D	FNL-01
1006	C_1006	Mayor	331	556	594	D	FNL-01

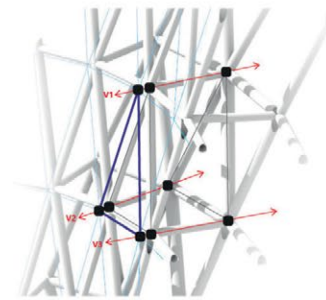
Base de datos de salida de la envolvente - Panel
/ Cladding setting out database - Panel

Structural Database	Base De Datos Del Tipo De Panel De La Envolvente / Cladding Panel Type Database											
Panel_id	Sop_id	Sop_id	Sop_id	Sop_id	Centroid_x	Centroid_y	Centroid_z	Zone	Component	Panel_type	Glass_type	Panel_fit
12345	C_1478_MAJ	C_30000_MIN	C_3498_MAJ		321	321	321	D	FNL-01	EWS-102.3	GL-T-101	FRT4
176519	C_30000_MIN	C_1478_MAJ	C_231158_MAJ		323	323	323	D	FNL-01	RFS-201.1	GL-T-104	FRT4
95125	C_231158_MAJ	C_300500_MIN	C_1478_MAJ	C_3498_MAJ	325	325	325	D	FNL-01	EWS-101.1	GL-T-101	FRT4
174476	C_300500_MIN	C_231158_MAJ	C_30000_MIN		327	327	327	D	FNL-01	EWS-502		
32165	C_3498_MAJ	C_1478_MAJ	C_300500_MIN		329	329	329	D	FNL-01	EWS-101.1	GL-T-104	FRT4
12345	C_1478_MAJ	C_3498_MAJ	C_231158_MAJ		331	331	331	D	FNL-01	EWS-104.1	GL-T-101	FRT3

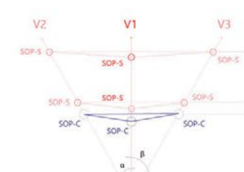
Nota: Las tablas mostradas en esta hoja son sólo demostrativas para mostrar los elementos que componen a la base de datos. Referirse a la base de datos de la envolvente y a los dibujos arquitectónicos de la envolvente.



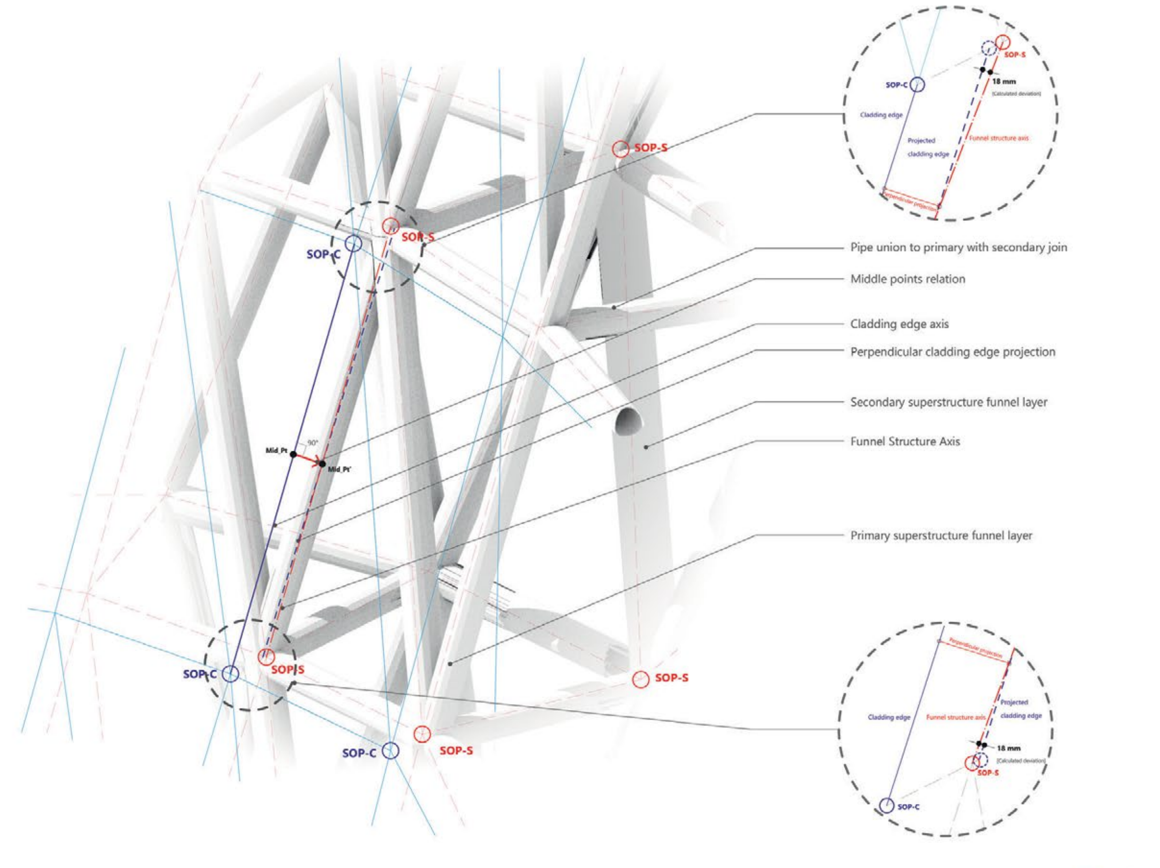
Example location in funnel
top and side views



Perpendicular vectors
cladding - structure

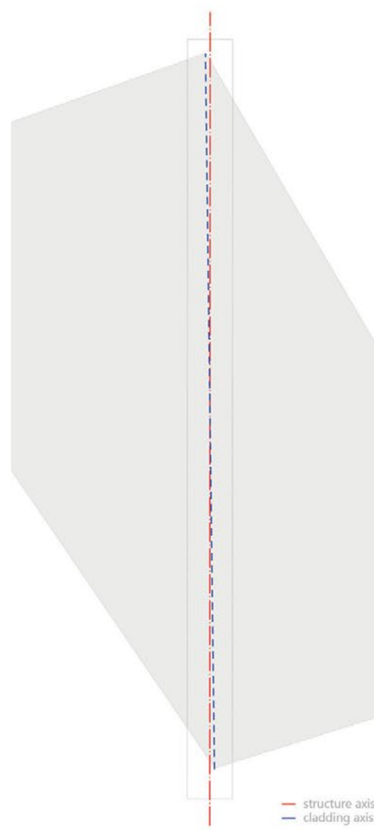


Angle relation
top view

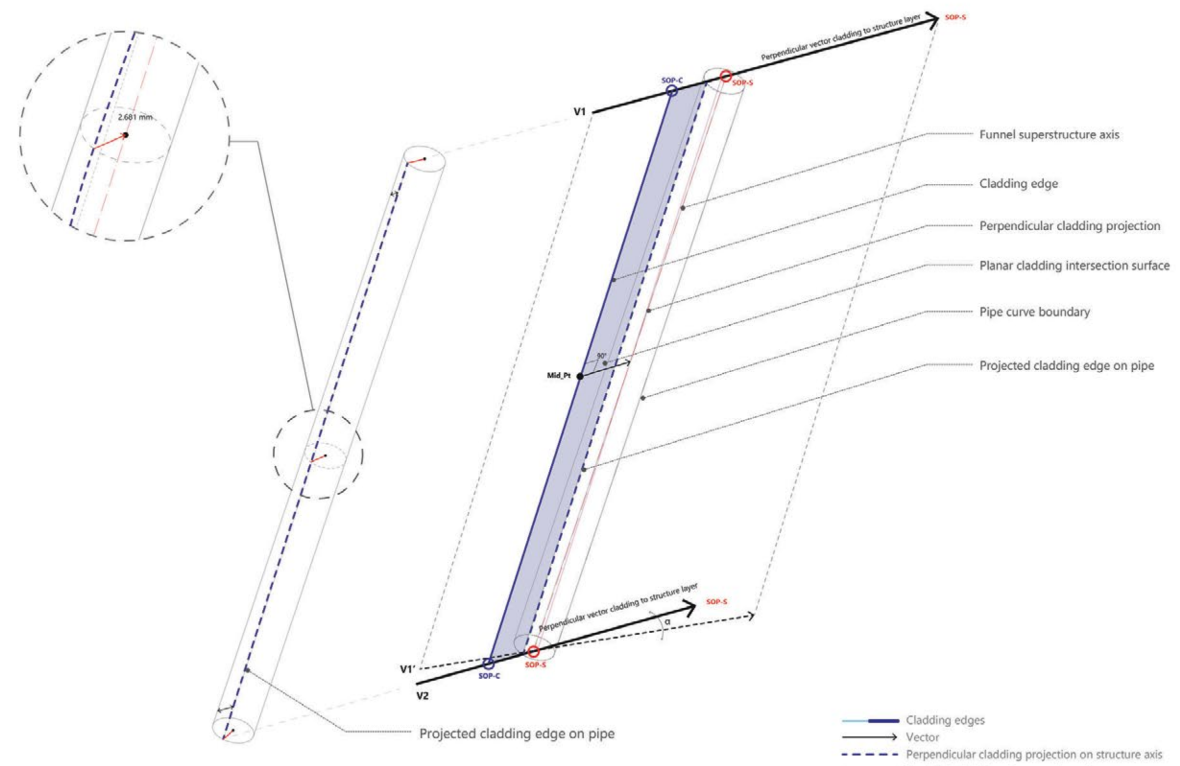


Top and bottom displacement
perspective

A - Funnel 08 - Vector Structure vs Cladding deviations

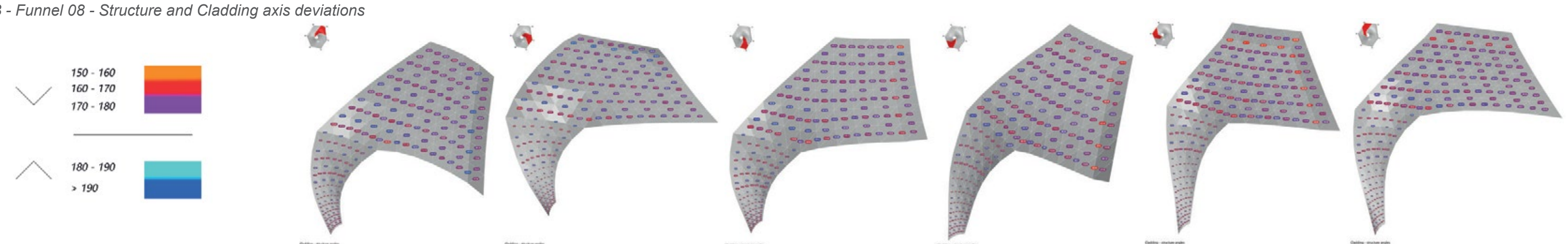


Axis displacement
front view



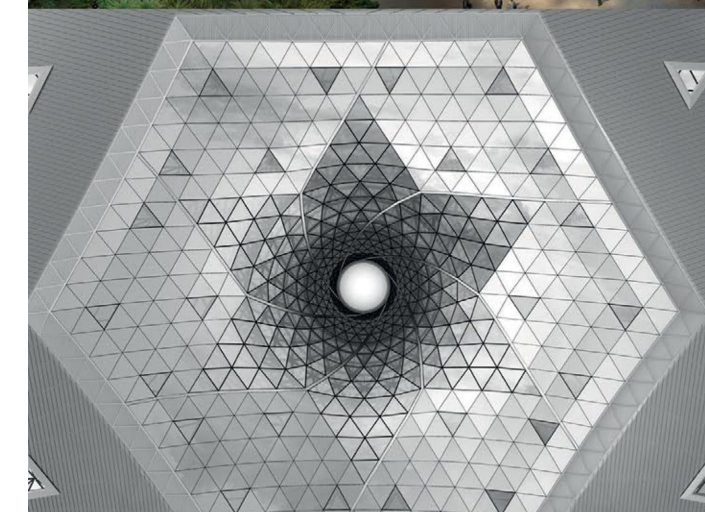
Perpendicular projection of cladding axis on structure pipe
perspective

B - Funnel 08 - Structure and Cladding axis deviations

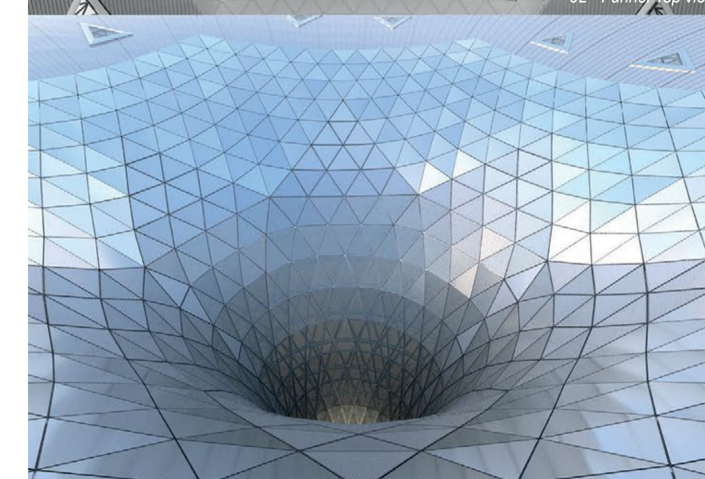


C - Funnel 08 - Cladding panels concave and convex angles

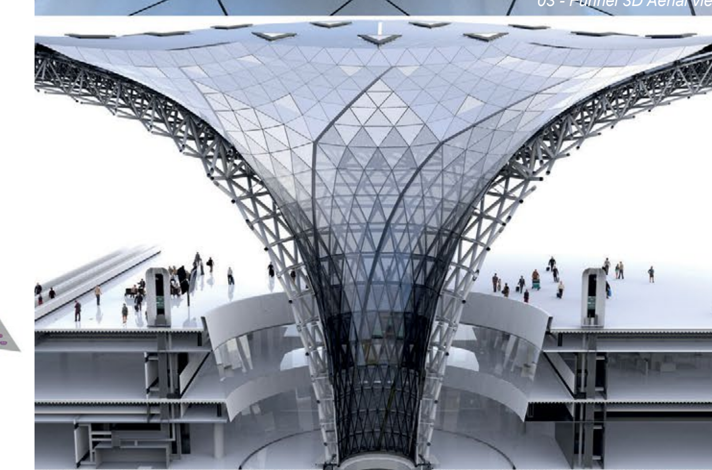
01 - Main Terminal Drop-Off Access view



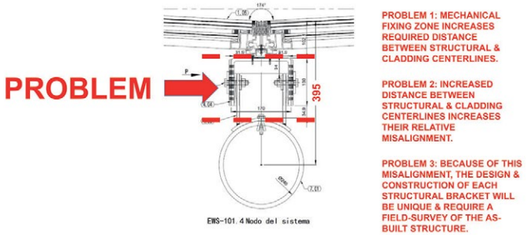
02 - Funnel Top view



03 - Funnel 3D Aerial view



04 - 3D Funnel Section

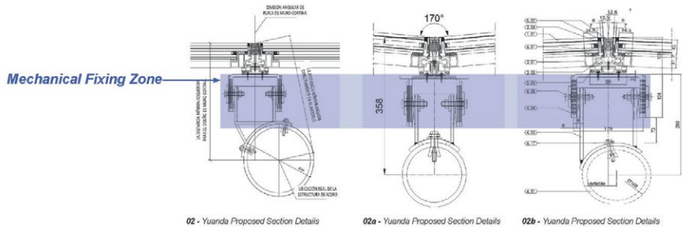


PROBLEM 1: MECHANICAL FIXING ZONE INCREASES REQUIRED DISTANCE BETWEEN STRUCTURAL & CLADDING CENTERLINES.

PROBLEM 2: INCREASED DISTANCE BETWEEN STRUCTURAL & CLADDING CENTERLINES INCREASES THEIR RELATIVE MISALIGNMENT.

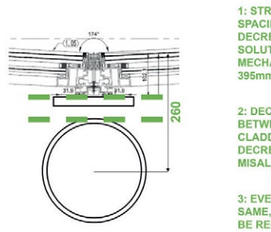
PROBLEM 3: BECAUSE OF THIS MISALIGNMENT, THE DESIGN & CONSTRUCTION OF EACH STRUCTURAL BRACKET WILL BE UNIQUE & REQUIRE A FIELD-SURVEY OF THE AS-BUILT STRUCTURE.

A - Main cladding on structure mounting system - Proposed by contractor



B - Mechanical 2D details proposed

SOLUTION

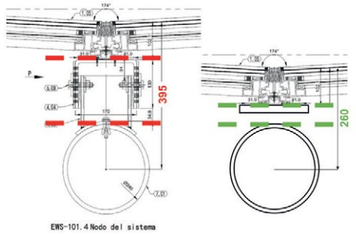


1: STRUCTURAL TO CLADDING SPACING DRASTICALLY DECREASED WITH THIS SOLUTION BY REMOVING MECHANICAL FIXING ZONE – 395mm TO 260mm

2: DECREASED DISTANCE BETWEEN STRUCTURAL & CLADDING CENTERLINES DECREASES THEIR RELATIVE MISALIGNMENT.

3: EVERY SHIM WILL BE THE SAME, NO FIELD SURVEY WILL BE REQUIRED.

C - Proposed Shim support - 2D Drawing

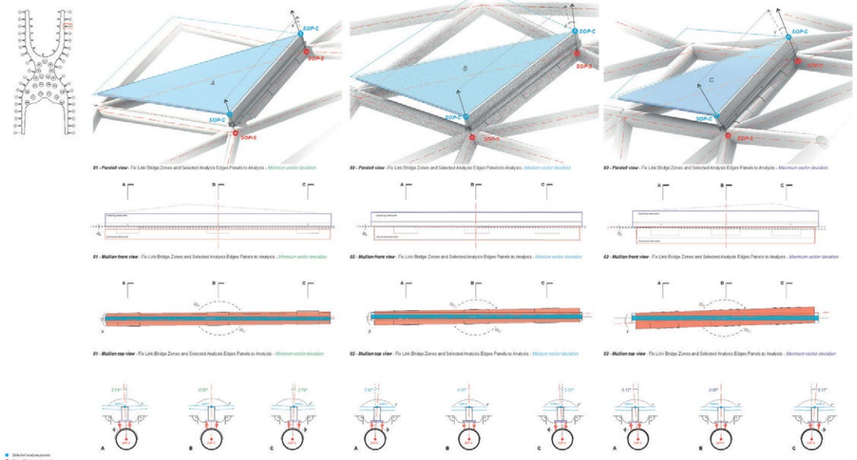


1: STRUCTURAL TO CLADDING SPACING DRASTICALLY DECREASED WITH THIS SOLUTION BY REMOVING MECHANICAL FIXING ZONE – 395mm TO 260mm

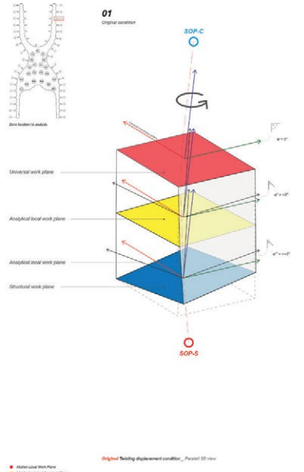
2: DECREASED DISTANCE BETWEEN STRUCTURAL & CLADDING CENTERLINES DECREASES THEIR RELATIVE MISALIGNMENT.

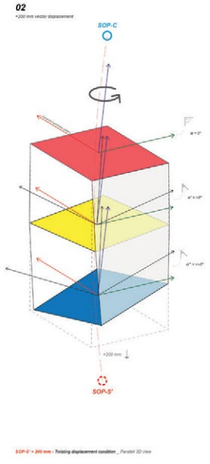
3: EVERY SHIM WILL BE THE SAME, NO FIELD SURVEY WILL BE REQUIRED.

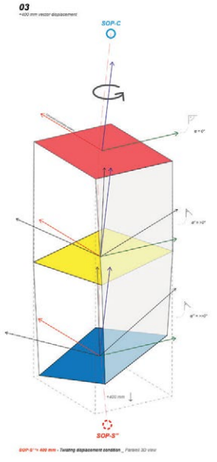
D - Proposed Shim support solution - 2D Drawing

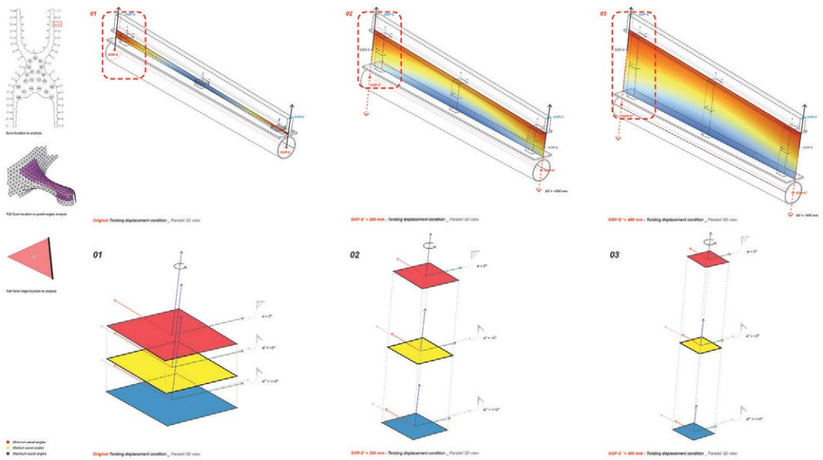


E - 3D testing models based on contractor mechanical proposed system to cladding support



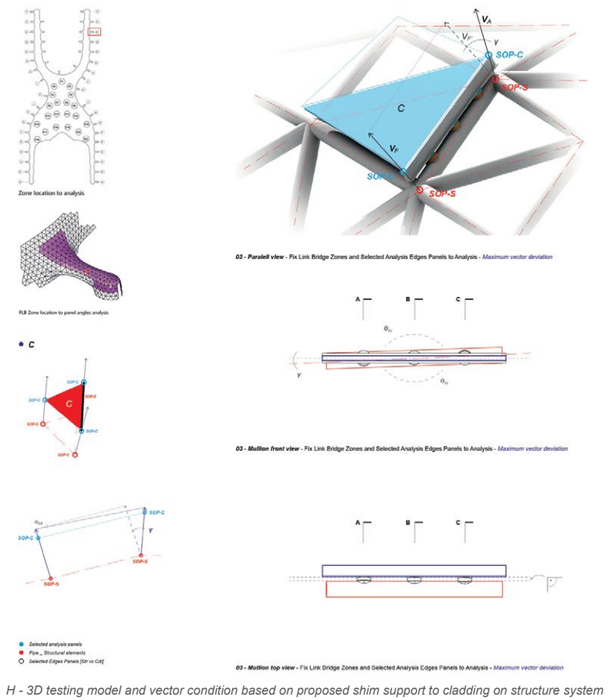




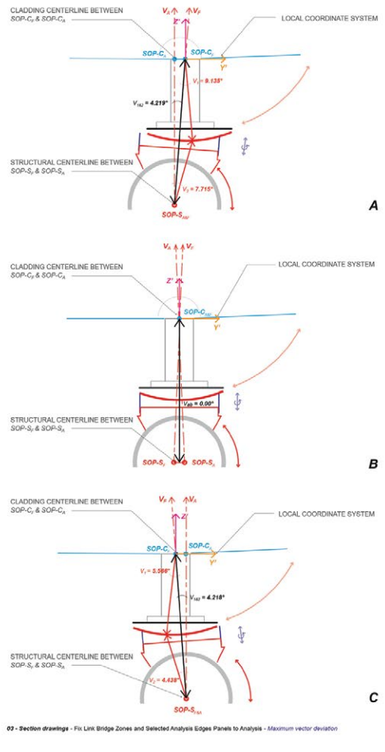


F - Real mechanical conditions on cladding vs structure relationship on Fix Link Bridge

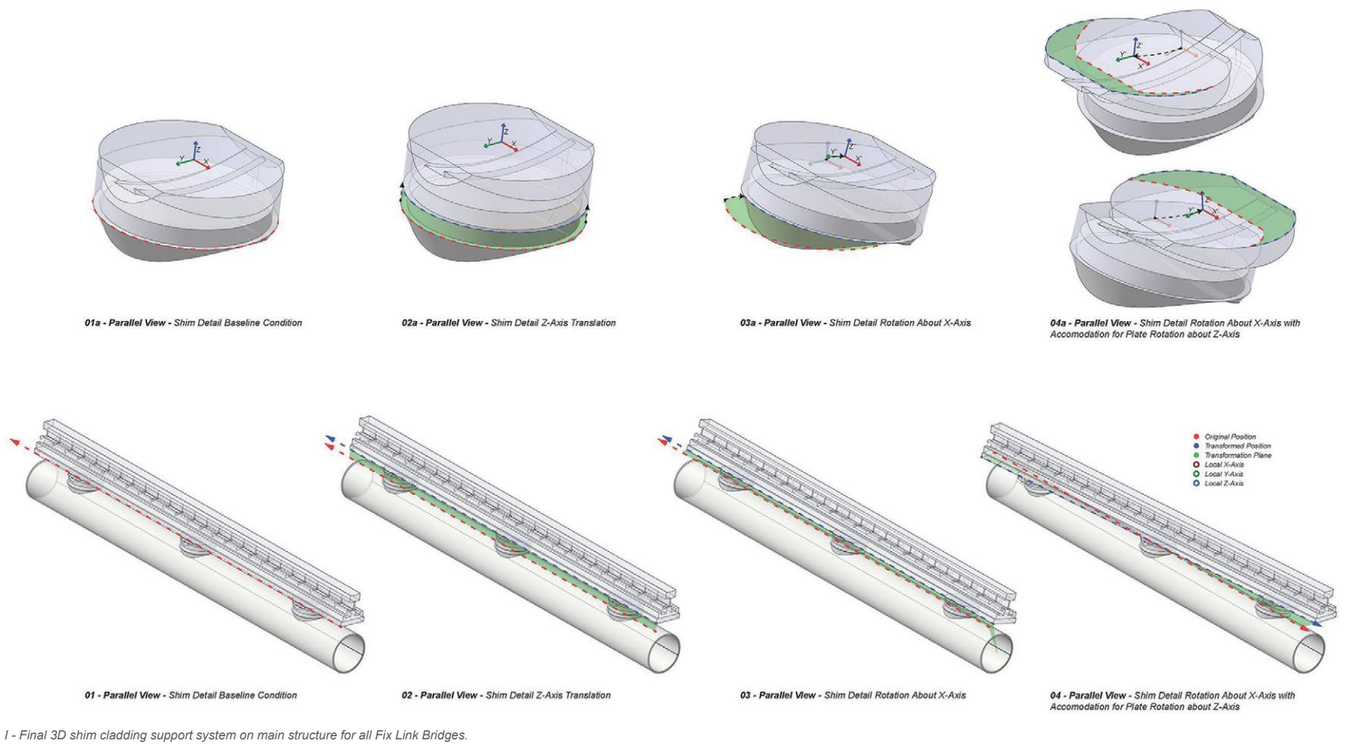
G - Indivudial mounting system mechanical conditions on Fix Link Bridge



H - 3D testing model and vector condition based on proposed shim support to cladding on structure system



I - Final 3D shim cladding support system on main structure for all Fix Link Bridges.



***01a - Parallel View -** Shim Detail Baseline Condition*

***02a - Parallel View -** Shim Detail Z-Axis Translation*

***03a - Parallel View -** Shim Detail Rotation About X-Axis*

***04a - Parallel View -** Shim Detail Rotation About X-Axis with Accomodation for Plate Rotation about Z-Axis*

***01 - Parallel View -** Shim Detail Baseline Condition*

***02 - Parallel View -** Shim Detail Z-Axis Translation*

***03 - Parallel View -** Shim Detail Rotation About X-Axis*

***04 - Parallel View -** Shim Detail Rotation About X-Axis with Accomodation for Plate Rotation about Z-Axis*

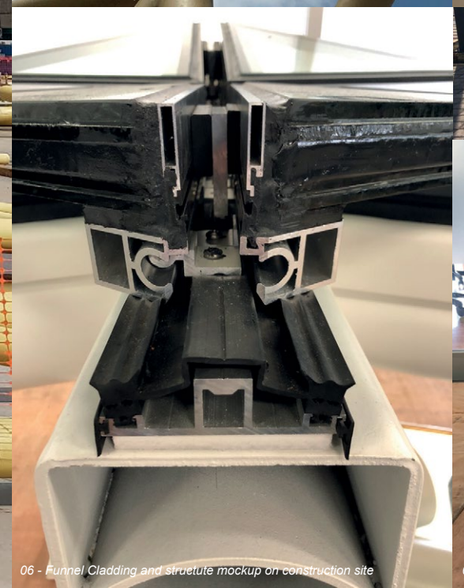
01 - First on Site built Funnel - Primary structure

02 - Eight on Site built Funnel with supports - Primary structure

03 - First on Site built Funnel with supports - Primary structure

04 - Funnel Primary structure weld union on site

05 - Funnel Cladding and structute mockup on construction site



06 - Funnel Cladding and structute mockup on construction site

07 - Funnel Cladding and structute mockup on construction site

08 - Built Funnel Structure - Primary and secondary structure

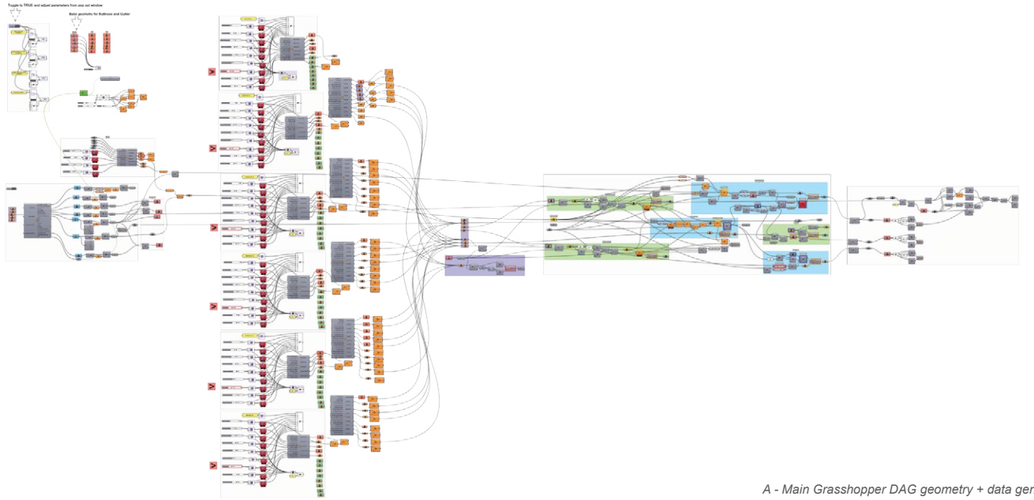
MEXICO CITY NEW INTERNATIONAL AIPORT

Mexico City, Mexico

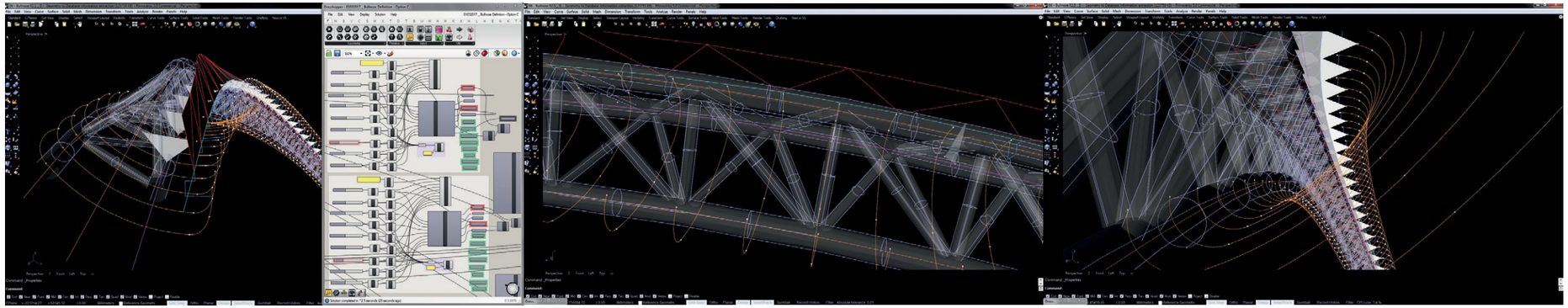
Architectural and envelope - facade design, Parametric Geometric Control, Geometric Databases and Construction Coodination & Documentation - 2018 - DD, CD & CD+ - Under Construction

Client: Federal Government of Mexico
Firm: Fernando Romero EnterpreisE & Foster and Partners
Responsabilities: 3D modeling, parametric modelling, geometric control, scripting, construction and geometric databases, diagrams, plans, 3D printed objects and 3D Mockups
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

02 - Bullnose Terminal



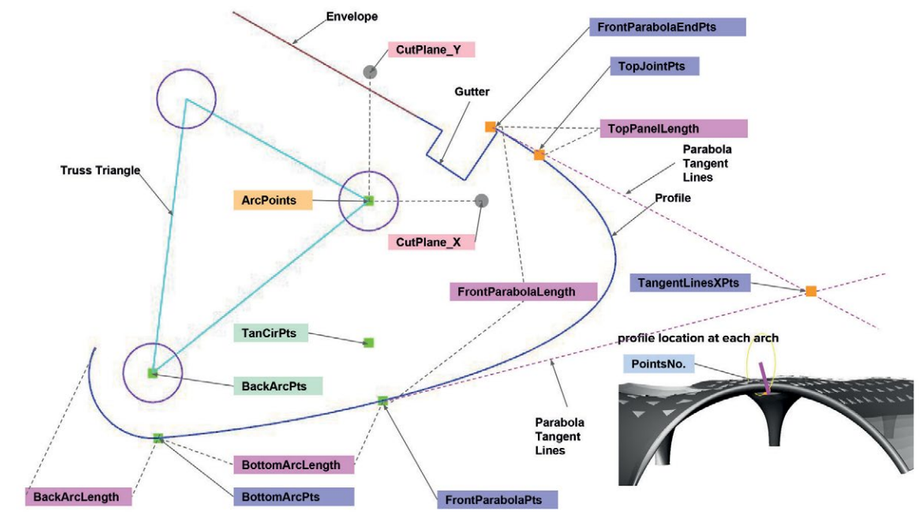
A - Main Grasshopper DAG geometry + data generator



B - Main Rhinoceros and Grasshopper interface to Bullnose Geometry and Data generation

database .csv

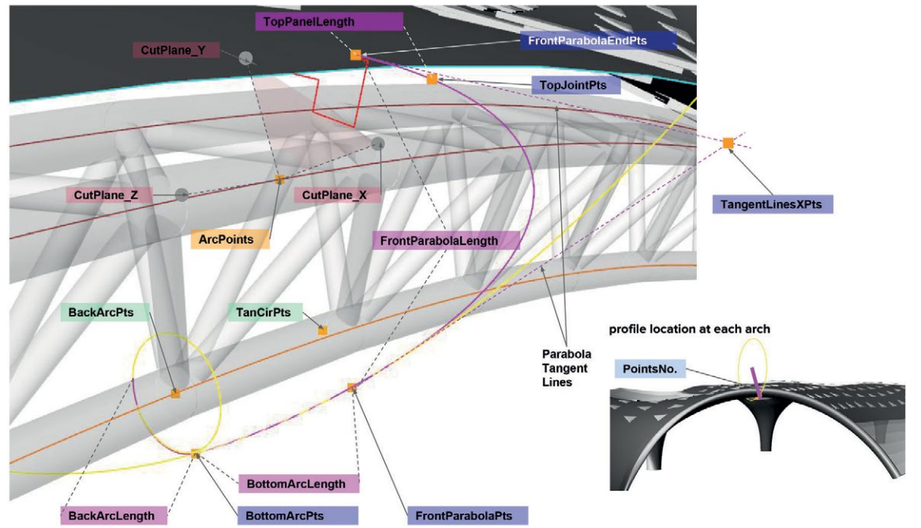
PointsNo.	ArchPoints	CutPlane_X	CutPlane_Y	CutPlane_Z	TanCirPts	BackArcPts	FrontParabolaEndPts	TangentLinesXPts	FrontParabolaPts	TopJointPts	BottomArcPts	FrontParabolaLer	TopPanelLength	BottomArcLeng	BackArcLength
W0	{-109403.0, 934	{-109141.0, 92	{-108583.0, 936	{-109911.0, 93	{-110405.0, 5	{-110260.0, 9	{-108924.0, 92245.0, 41	{-110648.0, 89822.0,	{-110835.0, 92876.0,	{-109433.0, 9165	{-110728.0, 95482	3772	800	2661	1152
W1	{-110092.0, 937	{-109830.0, 92	{-109271.0, 941	{-110599.0, 93	{-111106.0, 5	{-110937.0, 9	{-109638.0, 92492.0, 15	{-111380.0, 90306.0,	{-111536.0, 93134.0,	{-110159.0, 9191	{-111412.0, 95752	3711	800	2672	1152
W2	{-110801.0, 939	{-110539.0, 93	{-109991.0, 941	{-111325.0, 94	{-111791.0, 5	{-111624.0, 95	{-110348.0, 92738.0, 27	{-112063.0, 90435.0,	{-112216.0, 93385.0,	{-110869.0, 921	{-112085.0, 96018	3674	800	2683	1152
W3	{-111499.0, 941	{-111237.0, 93	{-110698.0, 945	{-112038.0, 94	{-112486.0, 5	{-112309.0, 96	{-111062.0, 92954.0, 32	{-112763.0, 90833.0,	{-112906.0, 93600.0,	{-111380.0, 923	{-112777.0, 96242	3652	800	2688	1152



C - Central Bullnose - Database Key

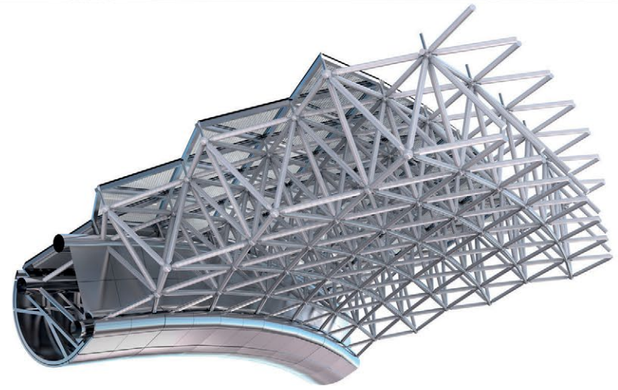
database .csv

PointsNo.	ArchPoints	CutPlane_X	CutPlane_Y	CutPlane_Z	TanCirPts	BackArcPts	FrontParabolaEndPts	TangentLinesXPts	FrontParabolaPts	TopJointPts	BottomArcPts	FrontParabolaLer	TopPanelLength	BottomArcLeng	BackArcLength
W0	{-109403.0, 934	{-109141.0, 92	{-108583.0, 936	{-109911.0, 93	{-110405.0, 5	{-110260.0, 9	{-108924.0, 92245.0, 41	{-110648.0, 89822.0,	{-110835.0, 92876.0,	{-109433.0, 9165	{-110728.0, 95482	3772	800	2661	1152
W1	{-110092.0, 937	{-109830.0, 92	{-109271.0, 941	{-110599.0, 93	{-111106.0, 5	{-110937.0, 9	{-109638.0, 92492.0, 15	{-111380.0, 90306.0,	{-111536.0, 93134.0,	{-110159.0, 9191	{-111412.0, 95752	3711	800	2672	1152
W2	{-110801.0, 939	{-110539.0, 93	{-109991.0, 941	{-111325.0, 94	{-111791.0, 5	{-111624.0, 95	{-110348.0, 92738.0, 27	{-112063.0, 90435.0,	{-112216.0, 93385.0,	{-110869.0, 921	{-112085.0, 96018	3674	800	2683	1152
W3	{-111499.0, 941	{-111237.0, 93	{-110698.0, 945	{-112038.0, 94	{-112486.0, 5	{-112309.0, 96	{-111062.0, 92954.0, 32	{-112763.0, 90833.0,	{-112906.0, 93600.0,	{-111380.0, 923	{-112777.0, 96242	3652	800	2688	1152

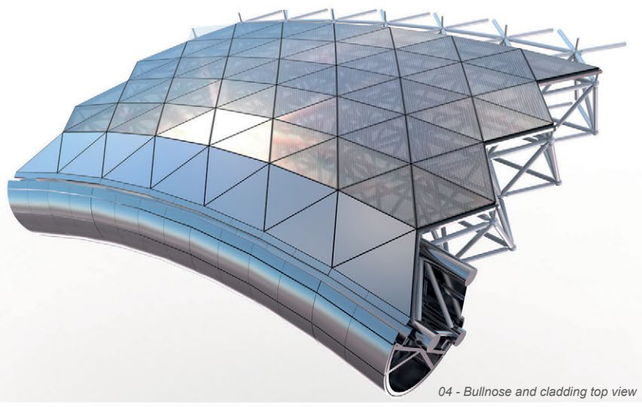


01 - Drop-Off east bullnose view

02 - Central bullnose front view



03 - Bullnose and spaceframe connection view



04 - Bullnose and cladding top view

MEXICO CITY NEW INTERNATIONAL AIPORT

Mexico City, Mexico

Architectural and envelope - facade design, Parametric Geometric Control, Geometric Databases and Construction Coodination & Documentation - 2018 - DD, CD & CD+ - Under Construction

Client: Federal Government of Mexico
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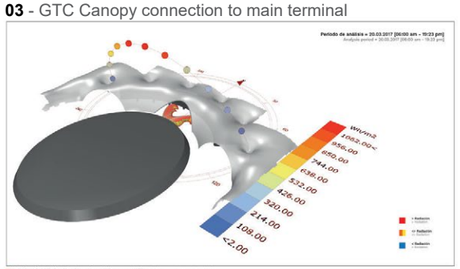
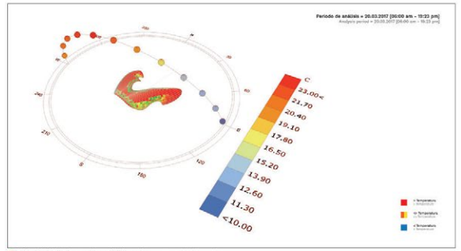
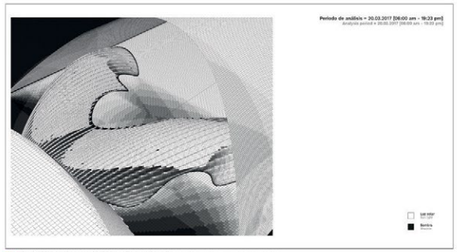
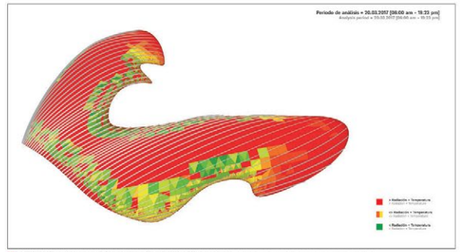
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

03 - GTC Canopy connection to main terminal

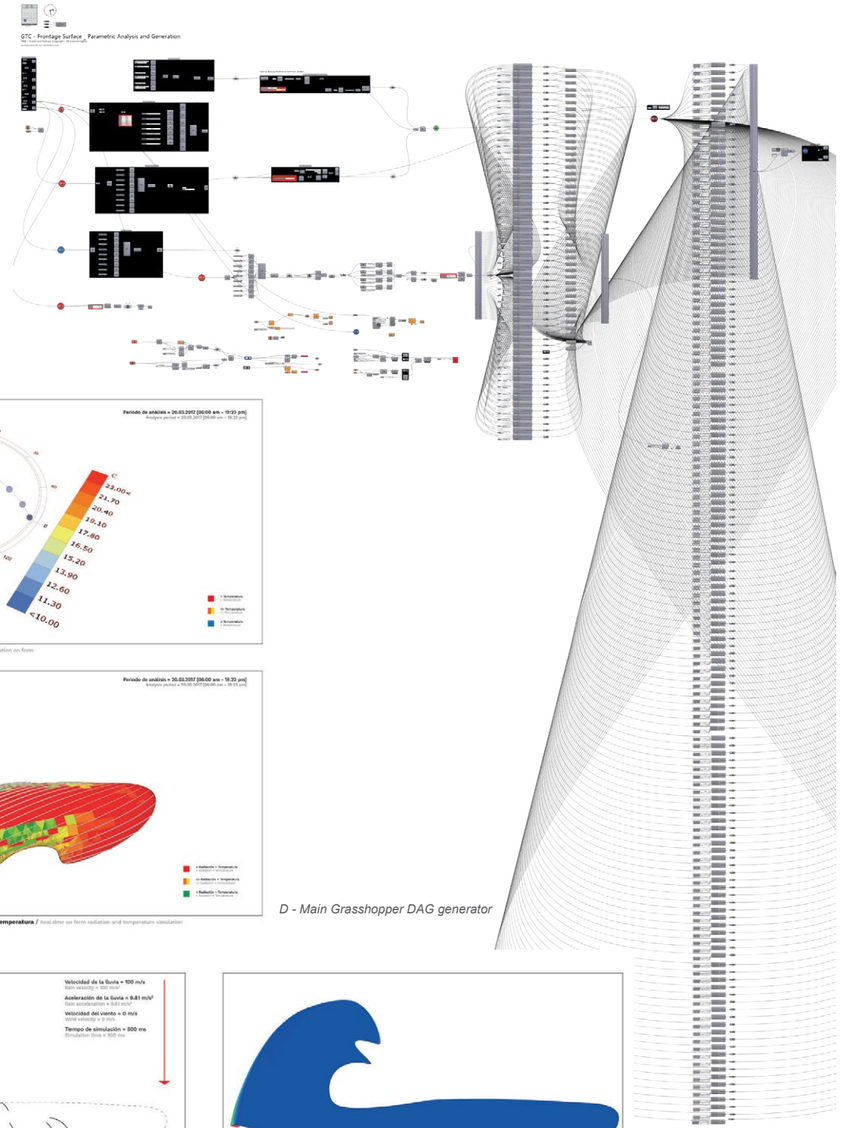




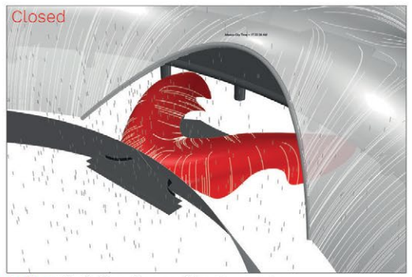




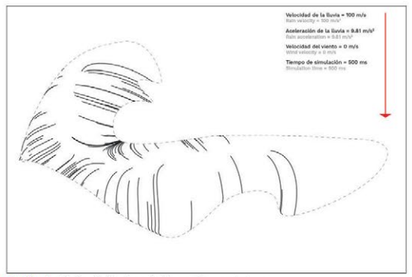
A - Initial solar analysis - Radiation + Temperature index



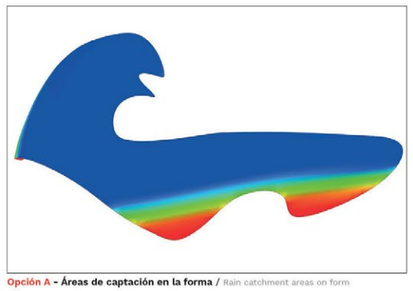
D - Main Grasshopper DAG generator



Opción A - **Simulación en tiempo real** / Real time simulation

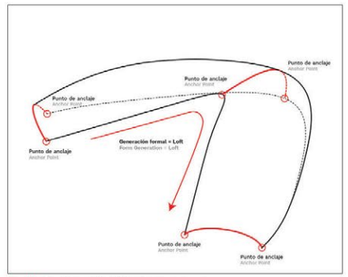


Opción A - **Flujos de lluvia en la forma** / Form rain flows

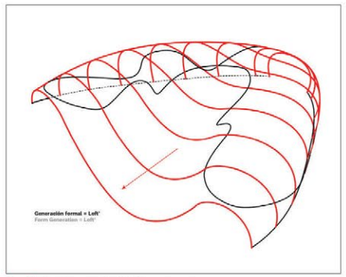


Opción A - **Áreas de captación en la forma** / Rain catchment areas on form

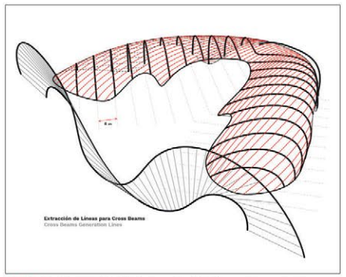
B - Rain analysis on canopy



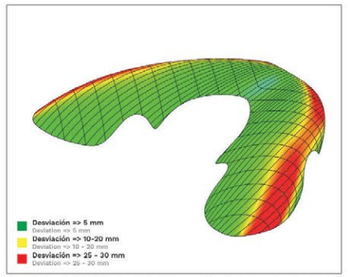
Opción A - **Trazo Inicial** / Initial path drawing



Opción A - **Generación 3D** / 3D Generation



Opción A - **Generación 3D de panelización** / 3D Panel Generation



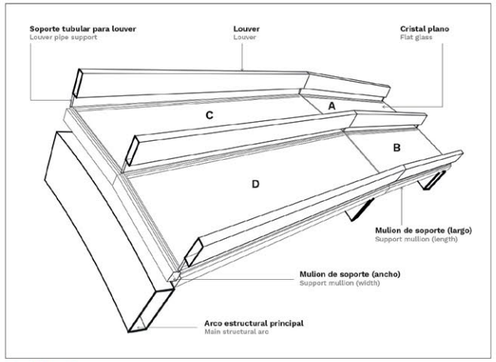
Opción A - **Análisis de curvatura en paneles** / Panels curvature analysis

C - Geometry analysis and generation

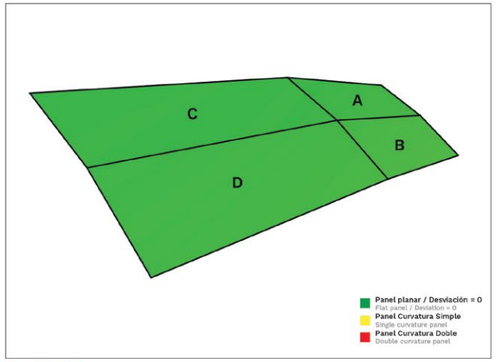
01 - Top view _ GTC and Main Terminal Canopy connection

02 - In front internal canopy view

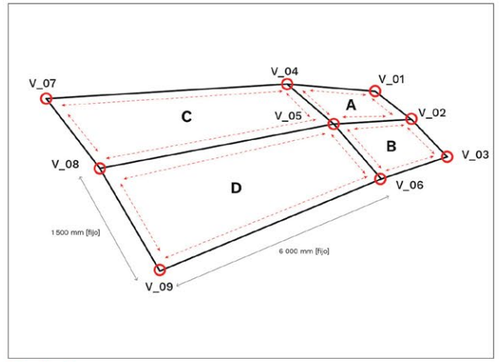
03 - Perspective front view



Opción B - Elementos de la cubierta / Envelope elements

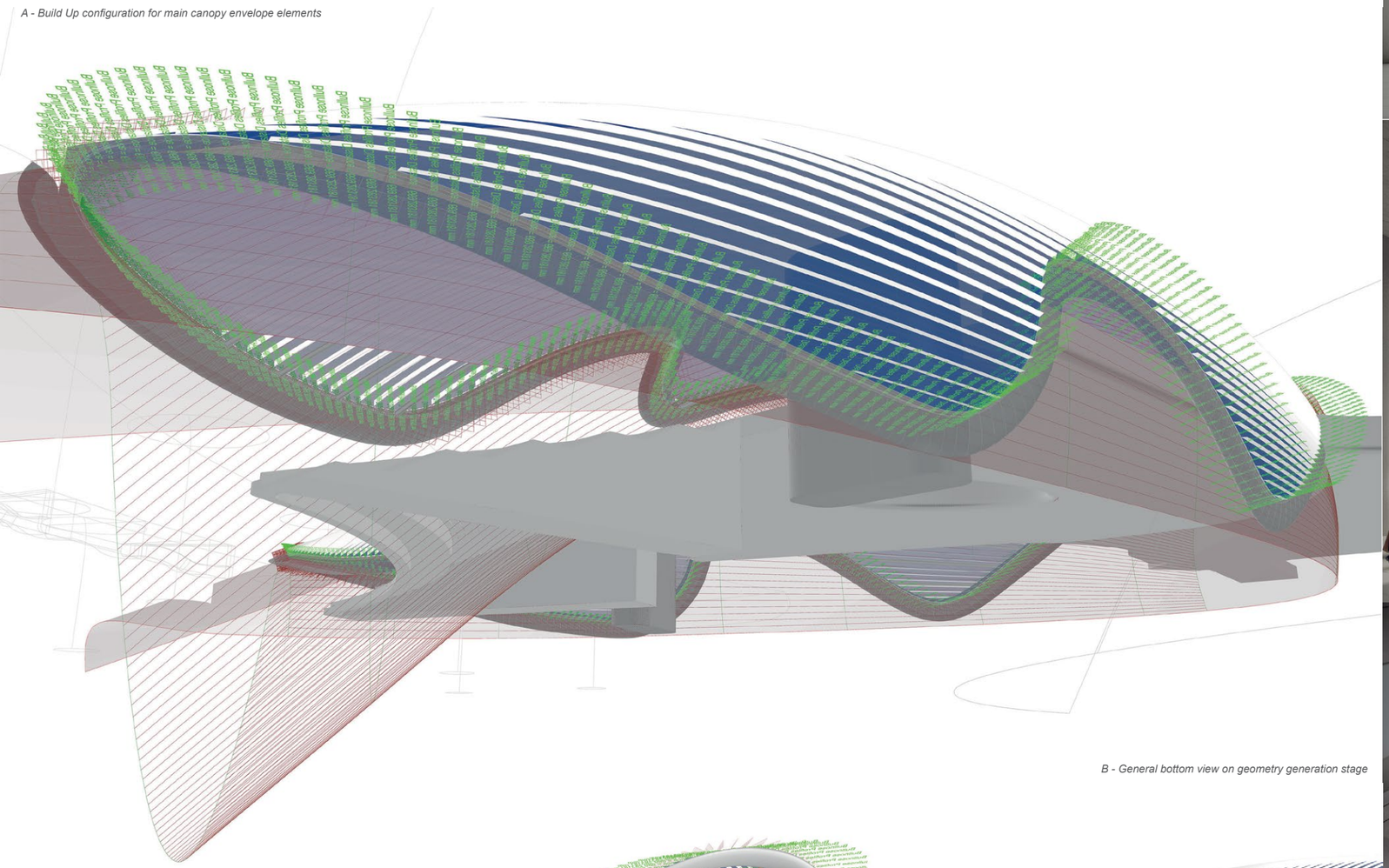


Opción B - Análisis particular planaridad / Individual flat analysis

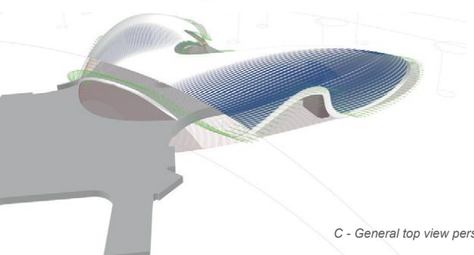


Opción B - Vértices coincidentes / Coincidental vertex

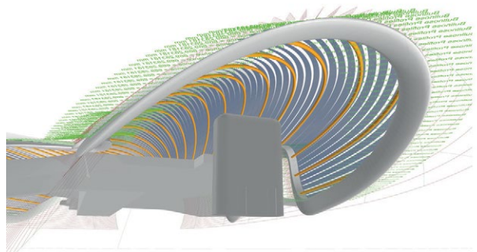
A - Build Up configuration for main canopy envelope elements



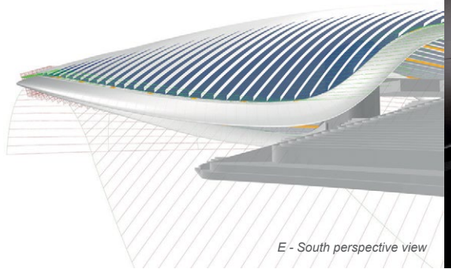
B - General bottom view on geometry generation stage



C - General top view perspective



D - Bottom perspective view



E - South perspective view

01 - Front perspective view - GTC + Canopy + Terminal Connections

02 - Front stairs + elevators perspective view

03 - Interior view - Stairs and Ramps inside the main canopy

MEXICO CITY NEW INTERNATIONAL AIPORT

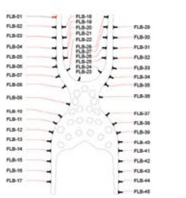
Mexico City, Mexico

Architectural and envelope - facade design, Parametric Geometric Control, Geometric Databases and Construction Coodination & Documentation - 2018 - DD, CD & CD+ - Under Construction

Client: Federal Government of Mexico
Firm: Fernando Romero EnterpreisE & Foster and Partners
Responsabilities: 3D modeling, parametric modelling, geometric control, scripting, construction and geometric databases, diagrams, plans, 3D printed objects and 3D Mockups
Credits: FREE, Foster and Patners, Parsons, NACO, ARUP, Thornton Tomasetti, CTVM, CARSO, Trimble, Smart Architecture.

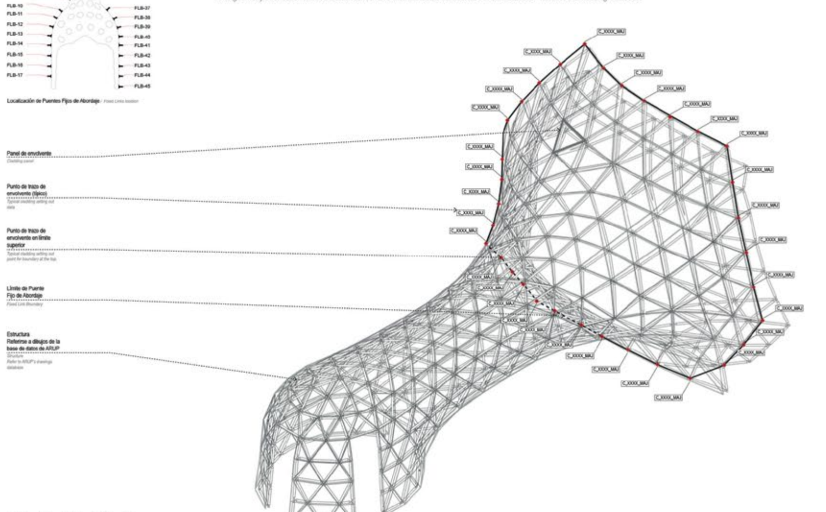
04 - Fix Link Bridges

Puente Fijo de Abordaje / *Fixed Link*

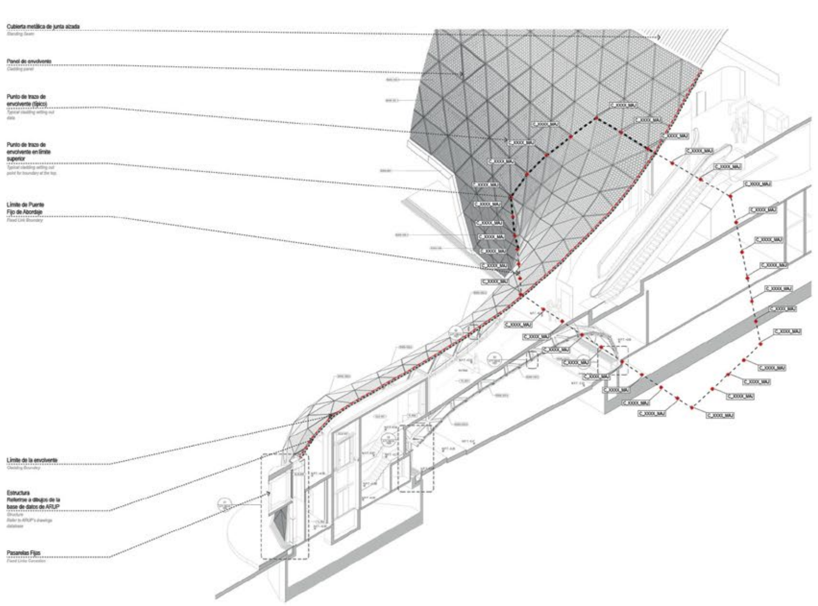


Localización de Puentes Fijos de Abordaje

1.0 Un Puente Fijo de Abordaje es un componente que conecta a la terminal principal con las pasarelas fijas / *A Fixed Link is a component that connects the main terminal with t*
2.0 Cada Puente Fijo de Abordaje tiene un ID / *Each Fixed link has an ID.*
2.1 Este ID es utilizado para la coordinación, referencia y proceso de construcción / *This ID is used for coordination, reference and construction process.*
2.2 Los ID's fueron introducidos con el objetivo de organizar información en una base de datos / *These ID's were introduced in order to organize the database information.*
3.0 Los Puente Fijos de Abordaje están delimitados por una forma hexagonal, la cual es generada dentro de la geometría de la superficie de la envolvente / *The Funnels are bounded by an hexagon shape, which is generated within the envelope geometry surface.*
4.0 La información geométrica dentro de las formas poseen sus propios atributos almacenados en la base de datos - Referirse a la base de datos de la envolvente / *The geometry information within the boundaries have their attributes documented in the database - Refer to the cladding database.*



01 Puente Fijo de Abordaje
S/E *Fixed Link*



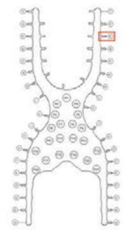
02 Vista en Sección Axonométrica
S/E *Axonometric Section View*

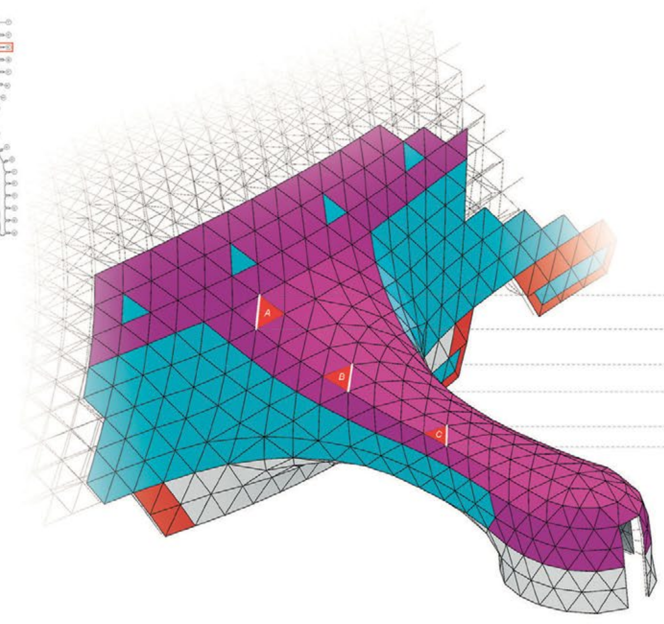
Base de datos de salida de la envolvente - Puente Fijo de Abordaje
/ Cladding setting out database - Fix Link Bridge

Structural Database	Fixed Links Nodes Database						
Node_id	Sop_id	Type	X	Y	Z	Zone	Component
1001	C1001	Mayor	321	546	589	D	FLB-01
1002	C1002	Mayor	323	548	590	D	FLB-01
1003	C1003	Mayor	325	550	591	D	FLB-01
1004	C1004	Mayor	327	552	592	D	FLB-01
1005	C1005	Mayor	329	554	593	D	FLB-01
1006	C1006	Mayor	331	556	594	D	FLB-01

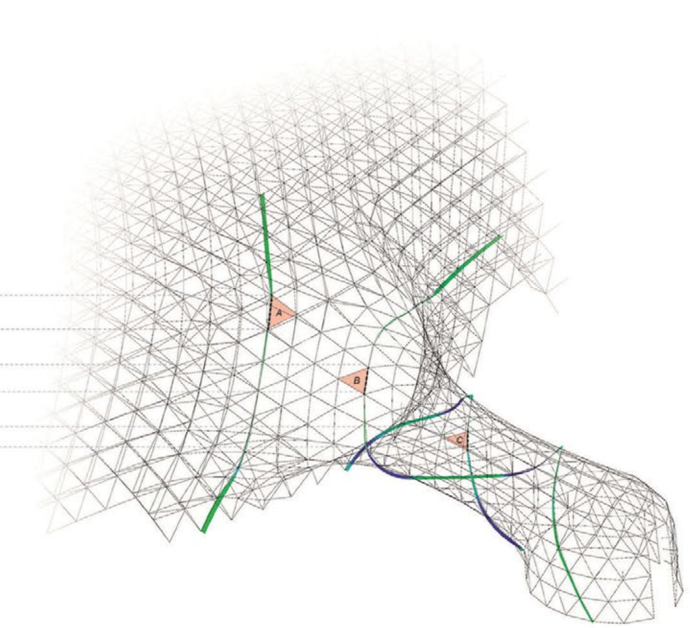
Base de datos de salida de la envolvente - Panel
/ Cladding setting out database - Panel

Structural Database	Panels Database											
Panel_id	Sop_id	Sop_id	Sop_id	Sop_id	Centroid_x	Centroid_y	Centroid_z	Zone	Component	Panel_type	Glass_type	Panel_[illegible]
12345	C_1478_MAJ	C_30000_MIN	C_3498_MAJ		321	321	321	A	FLB-01	EWS-102.3	GL-T-101	FRT4
176519	C_30000_MIN	C_1478_MAJ	C_231158_MAJ		323	323	323	A	FLB-01	EWS-102.3	GL-T-104	FRT3
95125	C_231158_MAJ	C_300500_MIN	C_1478_MAJ	C_3498_MAJ	325	325	325	A	FLB-01	EWS-105	GL-T-101	FRT5
174476	C_300500_MIN	C_231158_MAJ	C_30000_MIN		327	327	327	A	FLB-01	EWS-103.1	GL-T-101	FRT4
32165	C_3498_MAJ	C_1478_MAJ	C_300500_MIN		329	329	329	A	FLB-01	EWS-101.1	GL-T-104	FRT5
12345	C_1478_MAJ	C_3498_MAJ	C_231158_MAJ		331	331	331	A	FLB-01	EWS-103	GL-T-101	FRT3

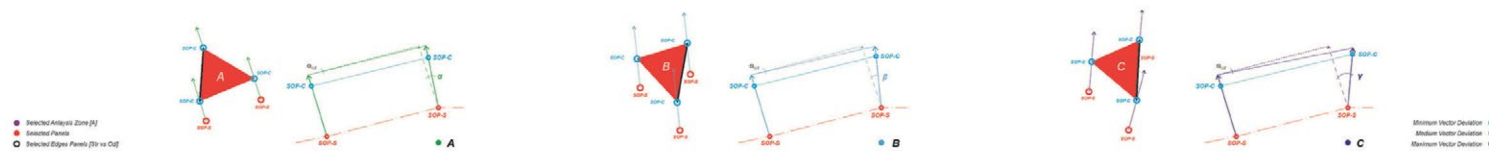




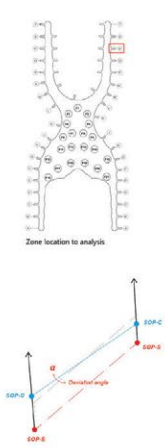
01 - Parallel view - Fix Link Bridge Zones and Selected Analysis Edges Panels to Analysis



02 - Parallel view - Trulated degree conditions on selected analysis panel

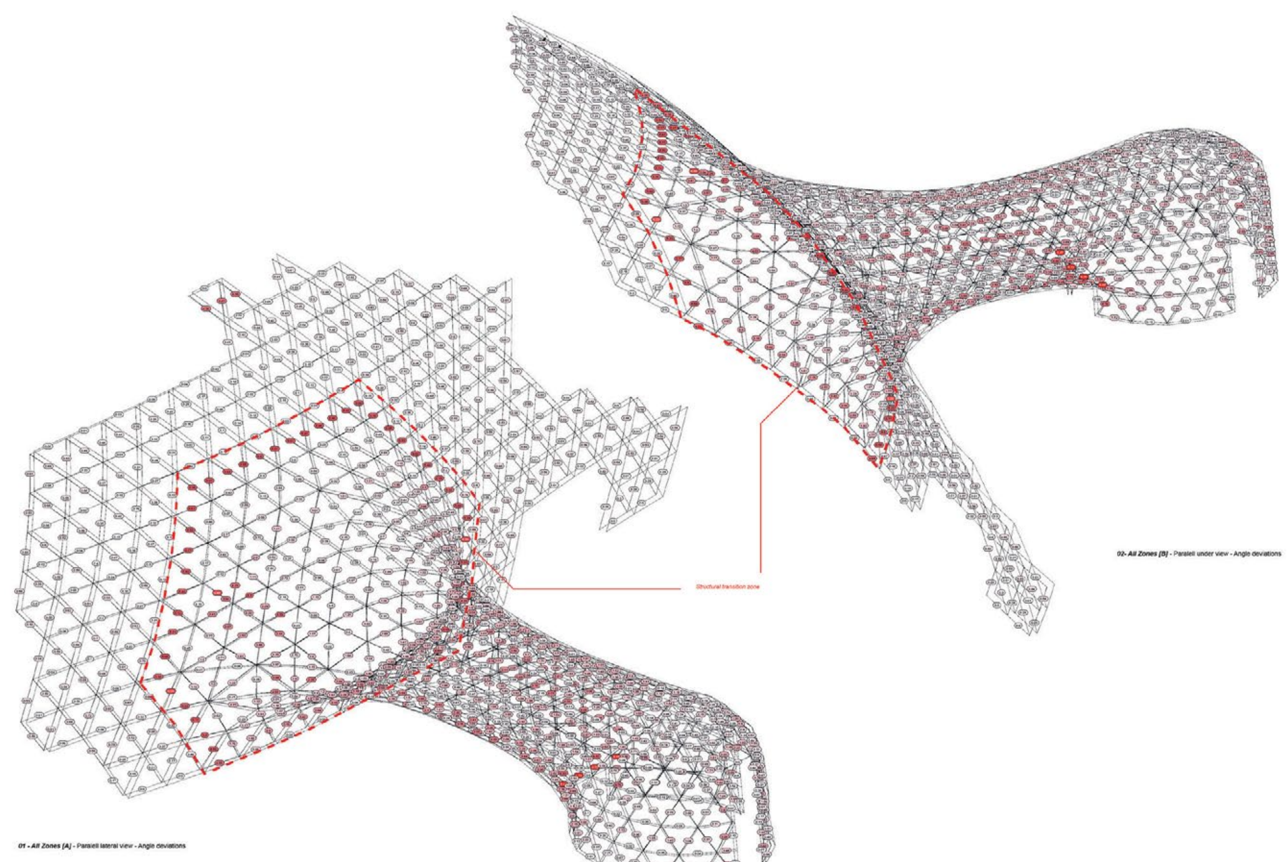


A - Fix Link Bridge 01 - Cladding & Structure elements - deviation analysis on FLB identified zones

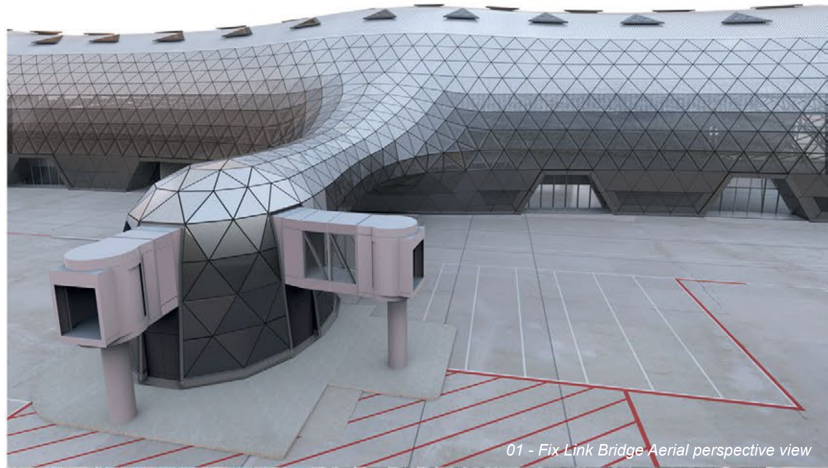


Zone location to analysis

Analysis deviation diagram



B - Fix Link Bridge 01 - Cladding & Structure elements - Concave + Convex cladding angles and maximun bisector deviations analysis



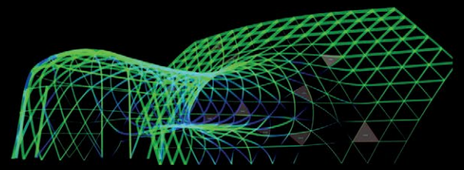
01 - Fix Link Bridge Aerial perspective view

02 - Fix Link Bridge and main terminal interior view

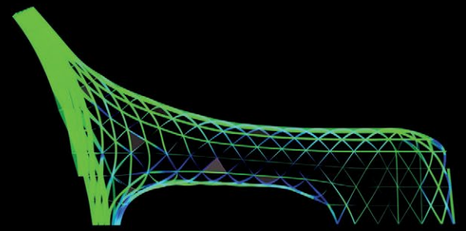
03 - Fix Link Bridge cladding zoom in view

04 - Fix Link Bridge exterior perspective view

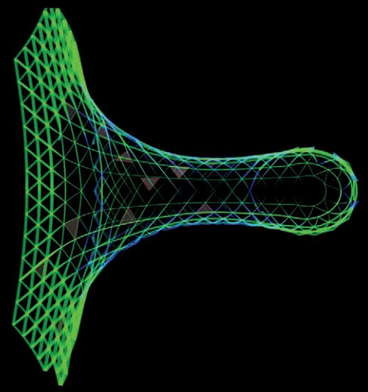
01 - Cladding edges vs Structure axis deviation analysis



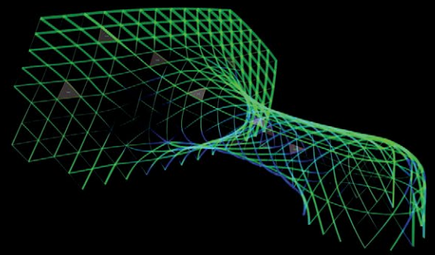
A – Lateral view



B – Left view

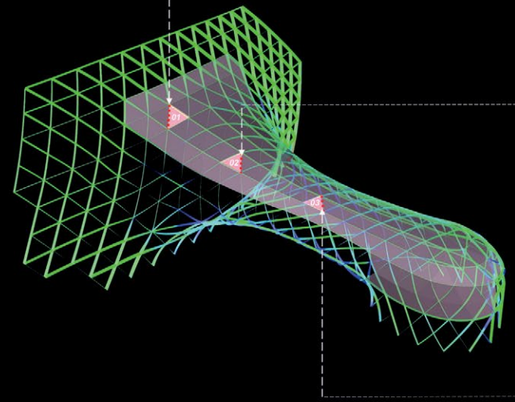


C – Top view

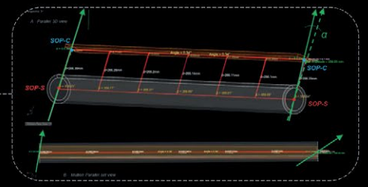


D – Top lateral view

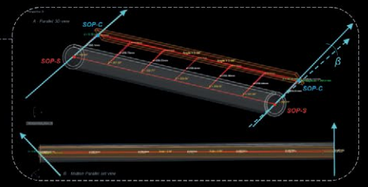
Selected panels
α - Minimum twisted degree
β - Medium twisted degree
γ - Maximum twisted degree



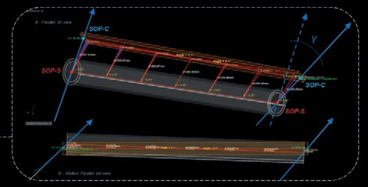
Zone A – *Analysis Area + Edge panels*



01

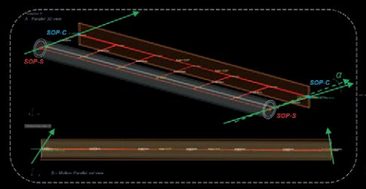


02

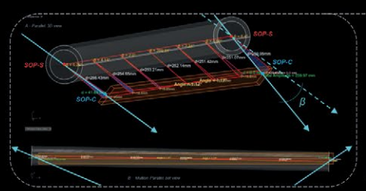


03

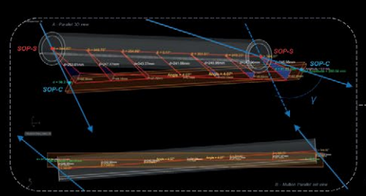
Selected Panel's edges
α - Minimum twisted degree
β - Medium twisted degree
γ - Maximum twisted degree



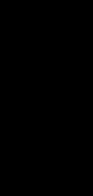
01

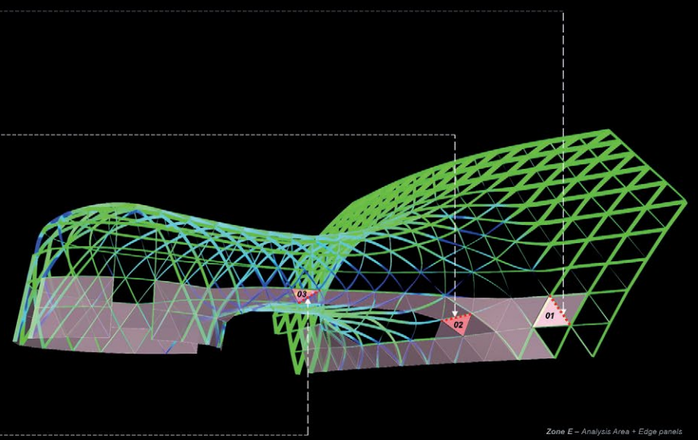


02



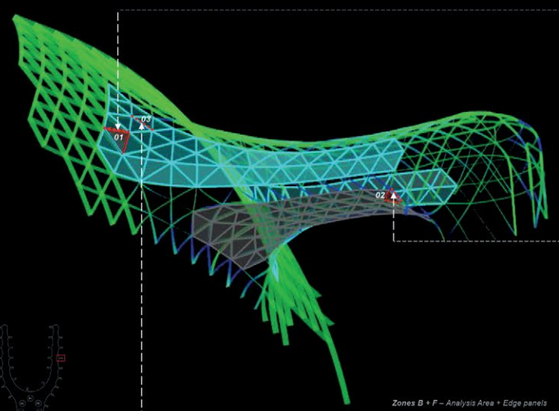
03



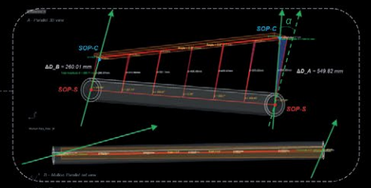


Zone E – Analysis Area + Edge panels

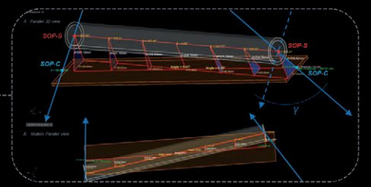
Selected Panel's edges
α - Minimum twisted degree
β - Medium twisted degree
γ - Maximum twisted degree



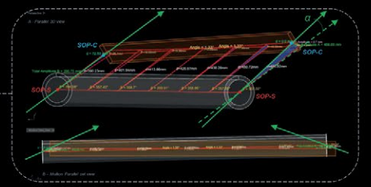
Zones B + F – Analysis Area + Edge panels



01 – Transition zone elements.



02 – Major twisted elements.



03 – No Cladding edge and Structure axis coincidental relations.


PRECAUTION

PUERTA REFORMA TOWER

Mexico City. Mexico

Facade Design, Parametric Geometric Control & Construction documentation - SD, DD - Under Construction

Client: Confidential
Firm: Fernando Romero EnterpreisE
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, plans and 3D printed objects.
Credits: Fernando Romero, Mauricio Ceballos, Unai Artetxe, Liliana Viveros, Alan Rodríguez Carrillo, Eduardo Watanabe, Nicolle Hazard, Luis Vicente Flores Suárez, Libia Castilla.

Torre Puerta Reforma will be a skyscraper located on Avenida Mariano Escobedo and Melchor Ocampo, Colonia Nueva Anzures, in Miguel Hidalgo Delegation in Mexico City. It will have 18 high speed elevators (elevators) that will move at 6.6 meters per second. To be exact, it will become the tallest and most modern skyscraper in Mexico City. In addition, it will seek to become the tallest in Latin America, with a height of 335 meters.

The design will be carried out by Fernando Romero, and the property on which this tower will be built is owned by Carlos Slim. Since 2008, a tower that is iconic for the landscape of Mexico City has been planned. That is why this tower has gone through several designs and has been increasing its height. It is worth mentioning that its importance also lies in the fact that Torre Puerta Reforma will be the connection between Paseo de la Reforma and Polanco. Until now a building has been demolished, land that will occupy the new tower, and in February 2017 the parking lot that operated on this property was vacated.

The complex will include a restaurant, a shopping center and entertainment areas. The construction company will be 'Grupo Xtra´.

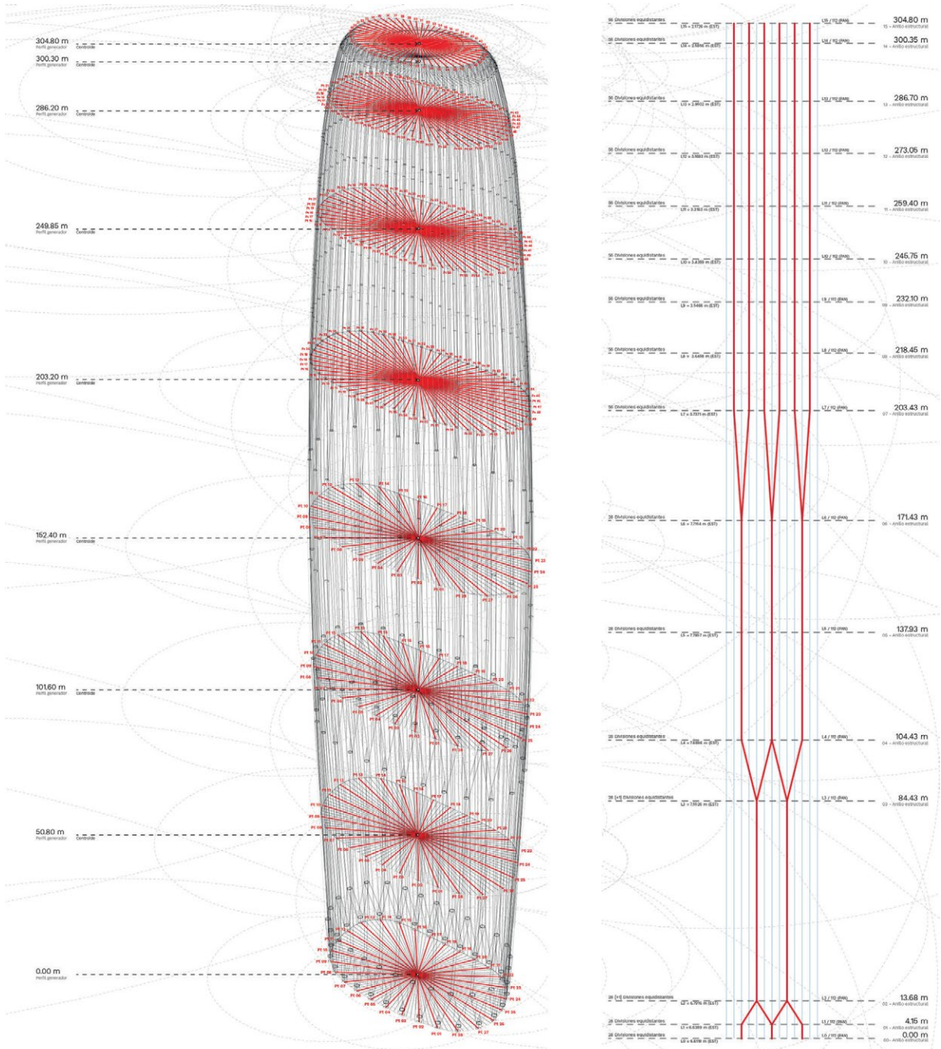
PUERTA REFORMA TOWER

Mexico City. Mexico
Design, Facade Parametric Geometric Control and Development - 2018 -
SD, DD - Under Construction

Client: Confidential
Firm: Fernando Romero EnterpreisE
Responsabilities: 3D modeling, parametric modelling,geometric control, scripting, diagrams, plans and 3D printed objects.
Credits: Fernando Romero, Mauricio Ceballos, Unai Artetxe, Liliana Viveros, Alan Rodríguez Carrillo, Eduardo Watanabe, Nicolle Hazard, Luis Vicente Flores Suárez, Libia Castilla.

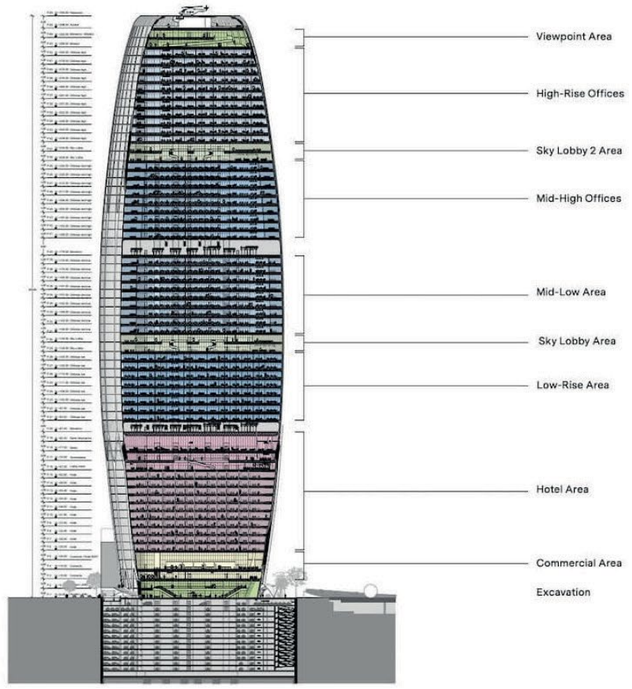
Initial parametric transformation, rationalization and geometric optimization

Geometry and data transformation from Autodesk Maya using Rhinoceros + Grasshopper + Visual + Python script

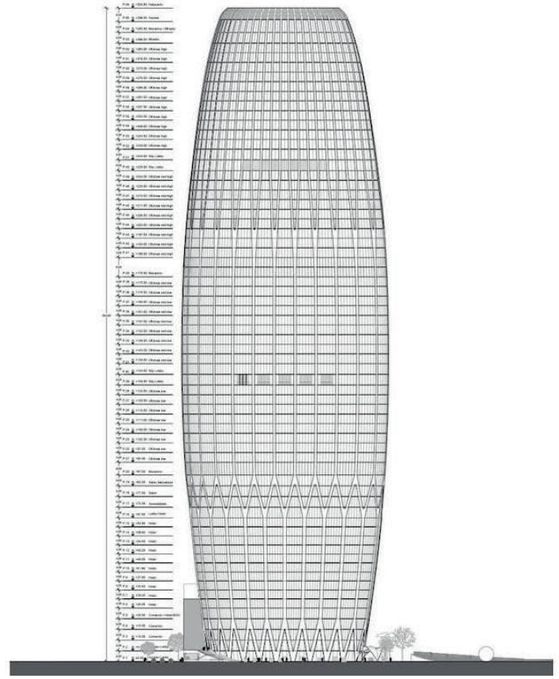


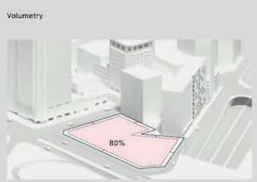
A - Form + Cladding + Structure parametric rationalization diagram.

Building Section



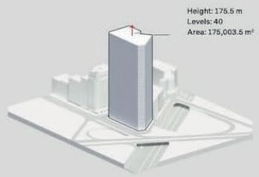
Building Facade





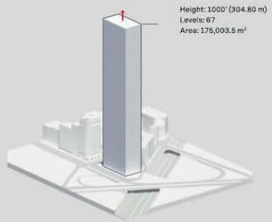
1 — Building Shift

Building footprint shifts slightly inwards from the property line.
Property Area: 5,468.86 m²
Maximum Offset Area: 4,375.08 m²



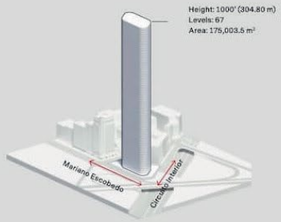
2 — Constructible Area

Constructible area is maximized with the building's first extrusion at forty levels.



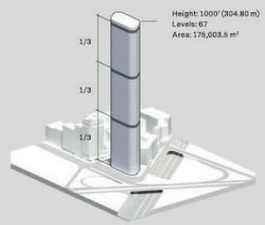
3 — Tower Height

Concept maximizes building height to differentiate itself from nearby towers on Reforma Avenue and become a landmark on the skyline.



4 — Plan Geometry

Building footprint is adapted to the site's geometry, becoming rhomboidal in plan and establishing a dialogue with the road axes converging at Paseo de la Reforma, Circuito Interior and Calz. Gral. Mariano Escobedo.

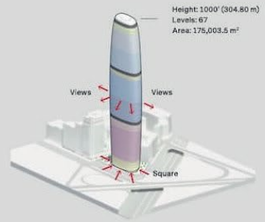


5 — Division into Three Zones

Tower is divided into three zones housing the mechanical plants as well as structural elements to alleviate horizontal stresses, an extremely efficient division for the installations as well as safeguarding against seismic events and gale-force winds.

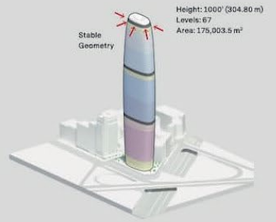
6 — Program

Program adapts well to the building's three zones, allowing for ideal placement of the lobby, commercial, hotel and amenities in the first zone, as well as four office typologies plus an observatory in the two upper zones.



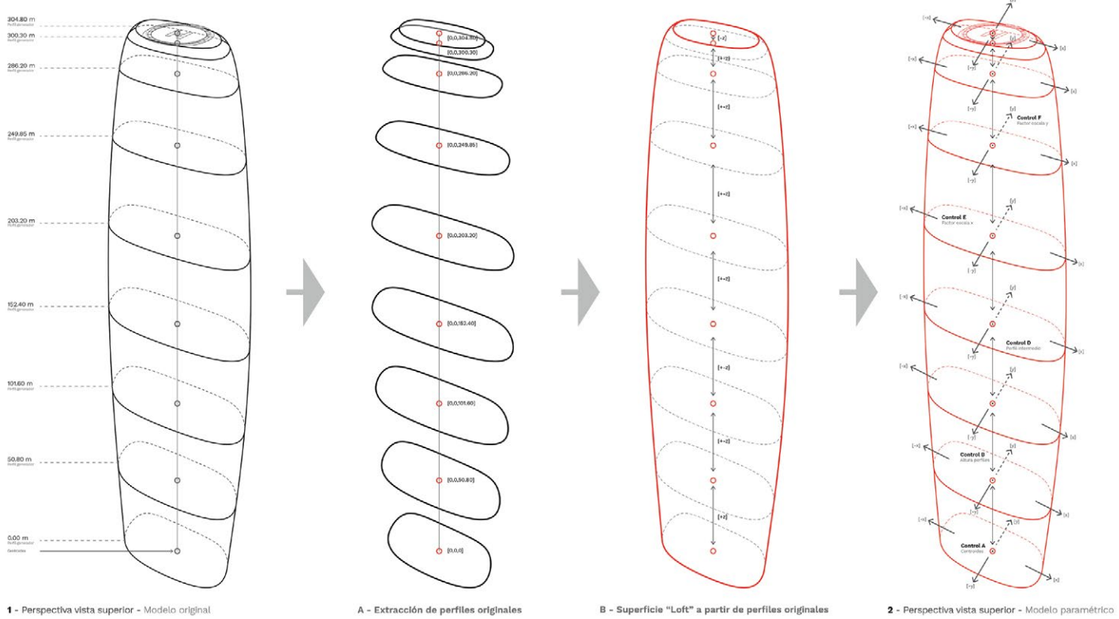
7 — Silhouette of the Tower

Tower's base narrows at the ground plane to create a public plaza while the building's central area widens to maximize office floor plates, views, and profit.



8 — Earthquake Stability

Tower's top also narrows to optimize structural systems and provide maximum stability during seismic events.

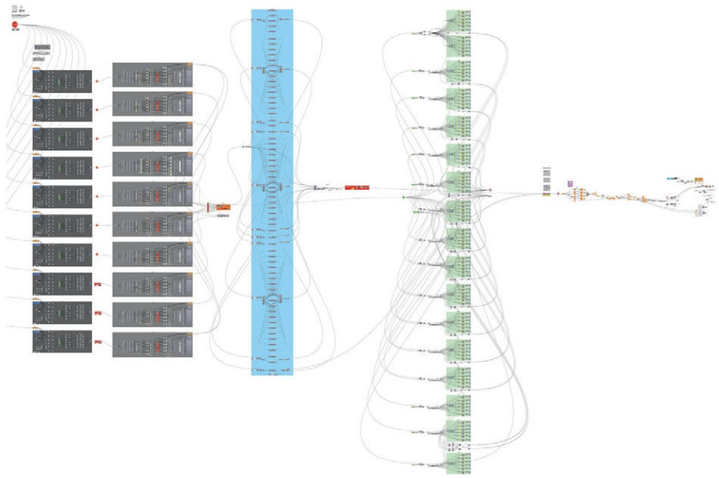


1 - Perspectiva vista superior **-** Modelo original

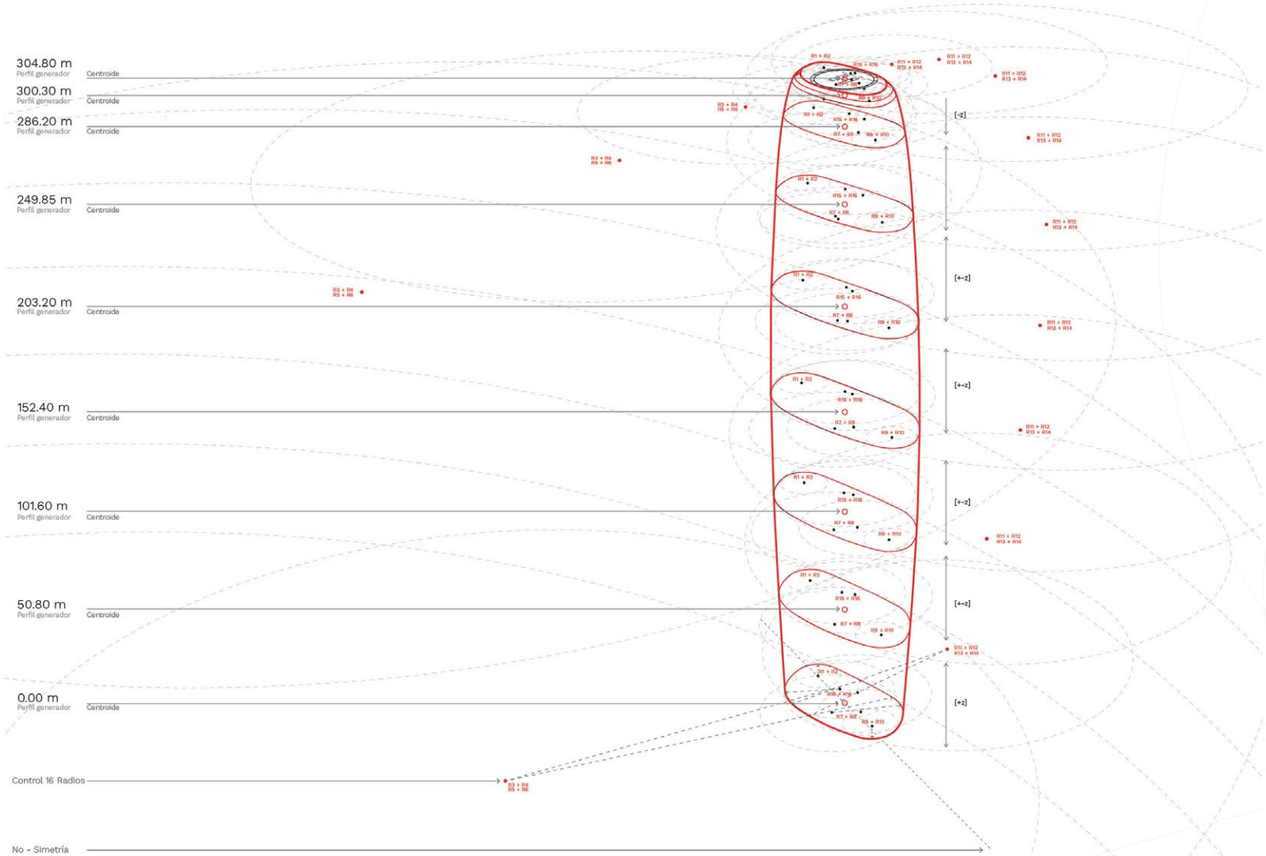
A - Extracción de perfiles originales

B - Superficie "Loft" a partir de perfiles originales

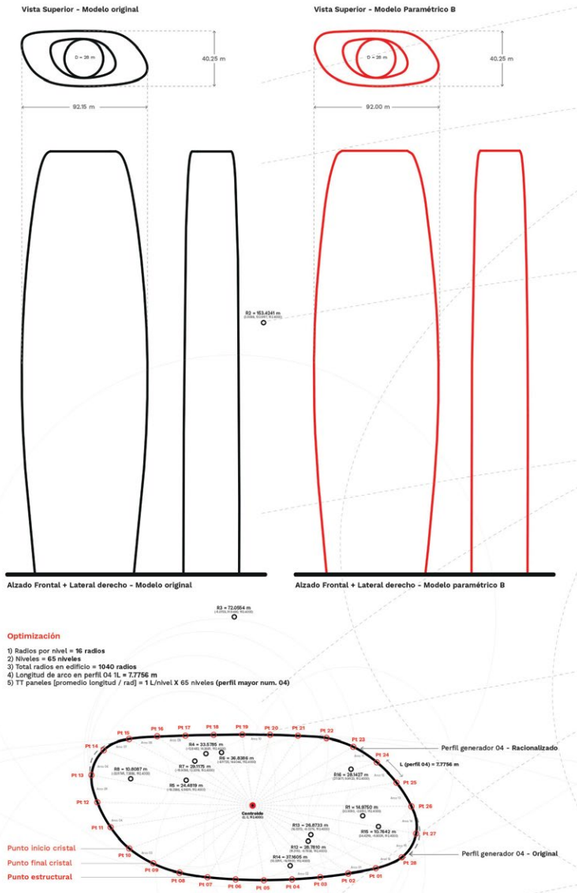
2 - Perspectiva vista superior **-** Modelo paramétrico



Main Grasshopper DAG Geometry and Data generator



B - Geometric control and rationalitation for structure and cladding elements generation



01 - Front perspective view

02 - Lateral perspective view

03 - Back perspective view

04 - Main entrance vehicles door and auxiliary bridge perspective view

JIAXING TRAIN STATION

Jiaxing, China
North Plaza & Interior Terminal North Design / DD + CD
2018 - 2022
Completed

Client: Jiaxing modern service industry development & investment (group) co., ltd.
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and 3D printed objects.
Credits: cao chen, reinier simons, yao ran, fu xiaoyi, yu lin, chen wei, he shunpeng, cheng xiangju, kaushik raghuraman, chen nianhai, deng wei, cao xi, sun mingze, huang zhiyu, zhang kai, li zhengdong, dayie wu, huai wei, claudia hertrich, liu zifan, xie qilin, alan rodriguez carrillo, qiang siyang, hou jinghui, li xinyun, yin jianfeng, mathias juul frost, lei lei, lu zihao.

The train station is situated in the center of Jiaxing, an interconnected city in southeast China close to Shanghai, Hangzhou, and Suzhou. A key city for several major industries, Jiaxing is referred to as the "home of silk" and the "land of milk and honey." In 1921, the First Party Congress of the Communist Party of China was held in Jiaxing, which led to the founding of the Party.

The project brief covers an area of 35.4 hectares, encompassing Jiaxing Train Station, the plazas to the north and south, and a renovation of the adjacent People's Park. Before the renovation, the existing station had reached its maximum capacity. In addition, the disorder of the surrounding transportation system and a deficient supporting infrastructure had led to a decline in the area surrounding the station.

Drawing inspiration from Jiaxing's historic and cultural contexts, MAD's proposal includes a 1:1 rebuilding of the historic station building derived from archival studies, while creating a new train station underground. The new station will be bright, efficient, and human-scaled, with a flood of natural light to create a friendly, comfortable environment. The main transportation and commercial functions are to be located in the basement level, allowing the ground-floor space to be given back to nature. A shared space between Jiaxing's citizens and travelers, this new green urban center will transform into a "train station in the forest."

MAD's proposal places the busy transportation junction underground, freeing the ground floor of obtrusive infrastructure, thus allowing the People's Park to radiate through the scheme into the city, and form an urban oasis. A careful consideration to landscape and massing has formed an axis with the reconstructed old station building at its core. In front of the station, a large collection of canopy shaped trees have been planted, creating comfortable, natural shades for the plaza.

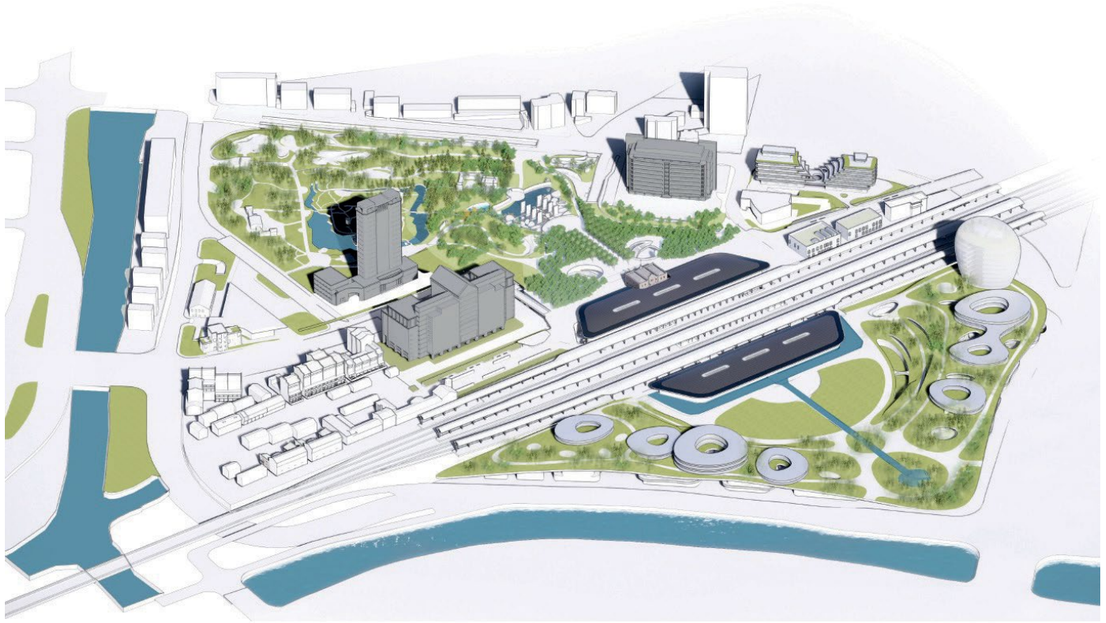
Looking south along the central axis, the rebuilt station building and the "floating" metal roof of the new station will blend with the forest trees. The station concourse, platforms, and waiting hall are hidden underground, while the building's single-story height above ground level humbly respects the scale of the old station building.

An abundance of natural light floods into the underground waiting hall through skylights and glass curtain walls on the ground floor, creating a subterranean space which is both open and bright. The internal atmosphere and tone are centered on the human scale, with the aim of creating a pleasant, comfortable experience for travelers. As people move from the waiting hall to the platforms via a futuristic underground tunnel, they observe the rebuilt old station building overhead. Here, a moment is created where old meets new, and a sharp yet composed contrast is showcased between the past and future.

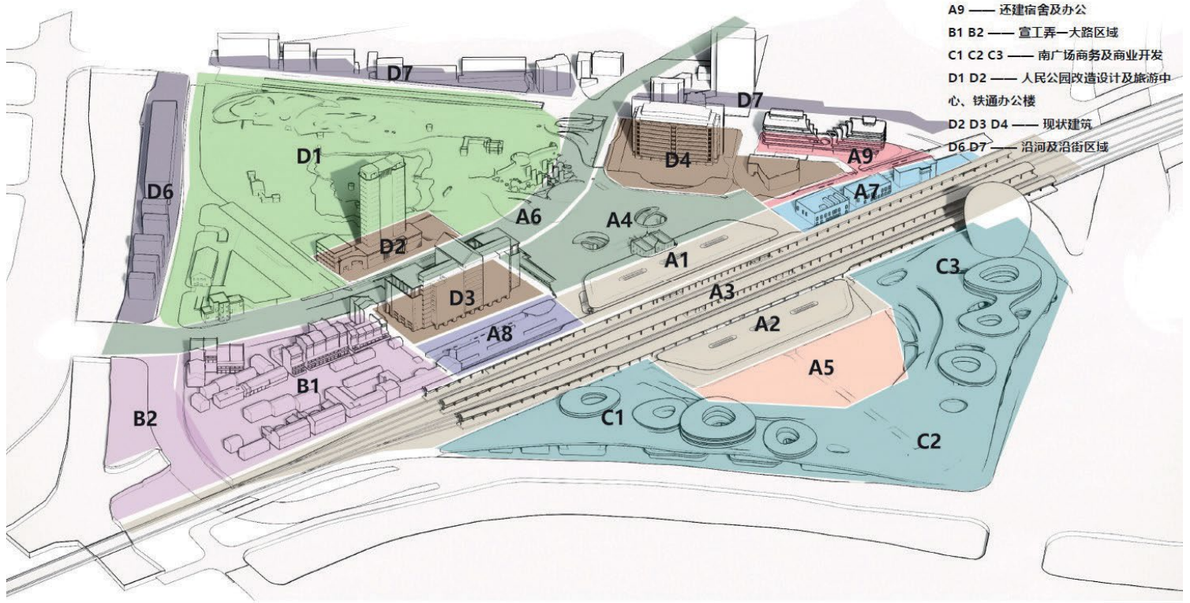
MAD's scheme also places the station's commercial functions underground, linking the train station with the city's transportation hub. In addition, sunken courtyards connect the underground commercial space with the parkland above. To the south of the station, a new above-ground commercial area is created, enclosed by landscaped public lawns that can host a variety of events, festivals, concerts, or markets.

Through careful transportation planning and vertical use of the space, MAD's scheme accommodates the existing passenger demands for the station, while also allowing for future sustainable development and expansion. The scheme's emphasis on connecting with its surroundings will also serve to increase human activity and visitors to the area, enhance its commercial offering, and ultimately rejuvenate the old city center with a new vitality.

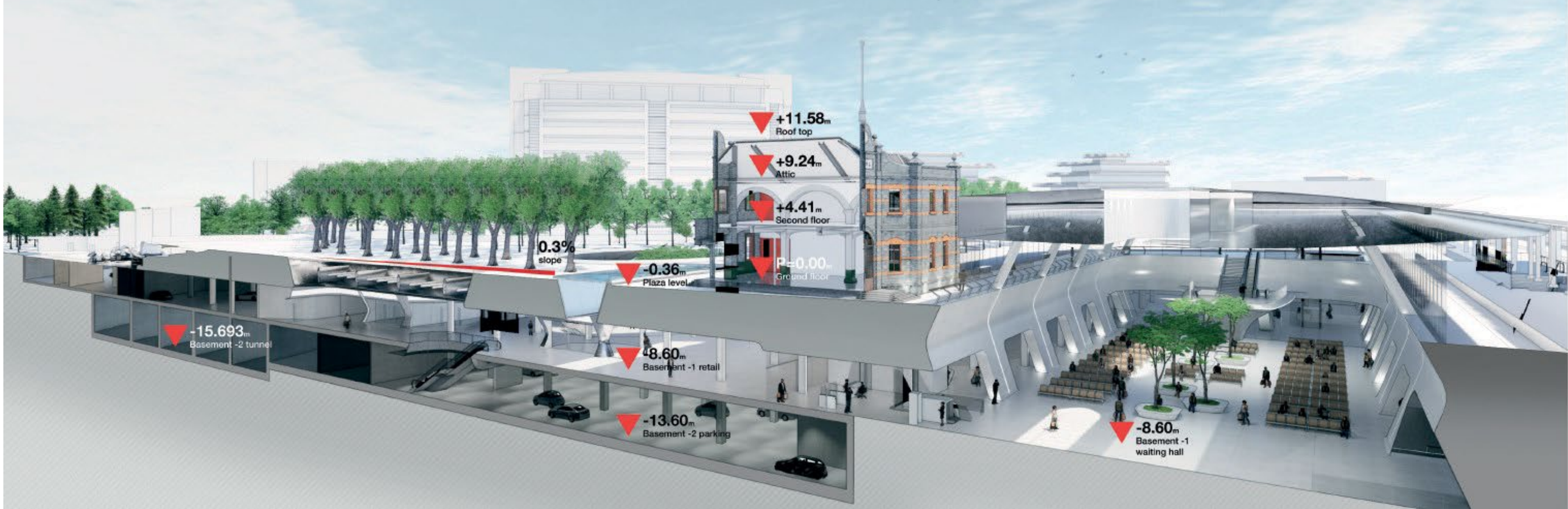
LANDSCAPE / 景观布置

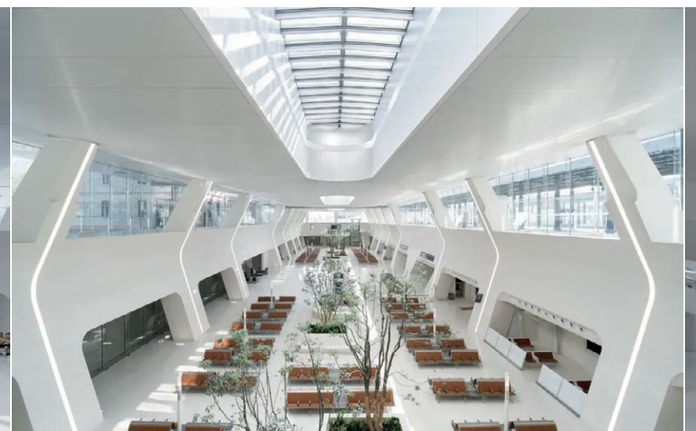


ZONE / 项目地块分区



A1 A2 A3 —— 站房及站台
A4 A6 —— 北广场景观及地下空间
A5 —— 南广场景观及地下空间
A7 —— 行包房及信号楼
A8 —— 一大路街接区
A9 —— 还建宿舍及办公
B1 B2 —— 宣工弄—大路区域
C1 C2 C3 —— 南广场商务及商业开发
D1 D2 —— 人民公园改造设计及旅游中心、铁通办公楼
D2 D3 D4 —— 现状建筑
D6 D7 —— 沿河及沿街区域





WORMHOLE LIBRARY

Haikou Hainan, China
Facade & Interior Design / DD + CD
2019 - 2021
Completed

Client: Haikou Tourism & Culture Investment Holding Group
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and 3D printed objects.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Fu Changrui, Qiang Siyang, Sun Feifei, Dayie Wu, Shang Li, Alan Rodríguez Carrillo, Xie Qilin

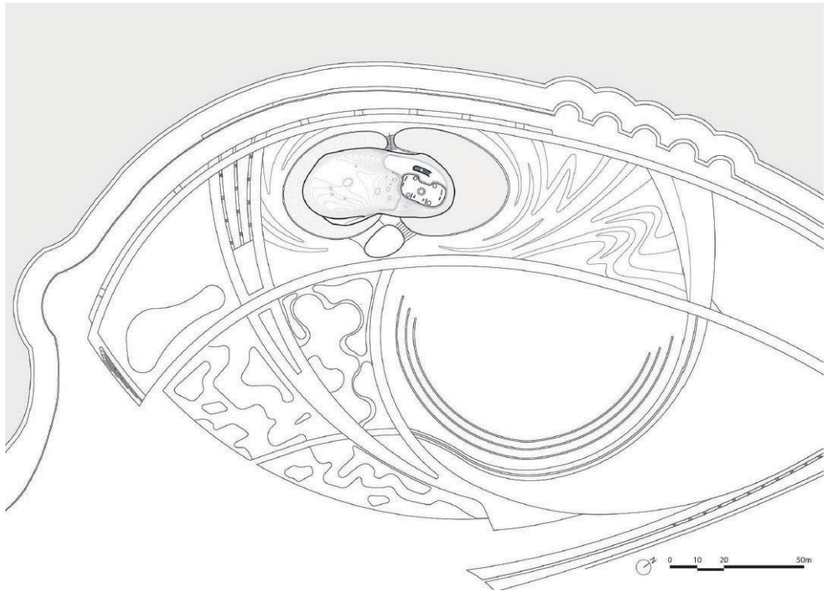
The sensuously curved pavilion appears to be a “wormhole” that transcends time and space. It serves as a multi-functional building that allows visitors to read, enjoy views of the sea, and attend open-air performances, temporarily removing themselves from the hustle and bustle of everyday life. The building is now under construction and will be completed in 2021.

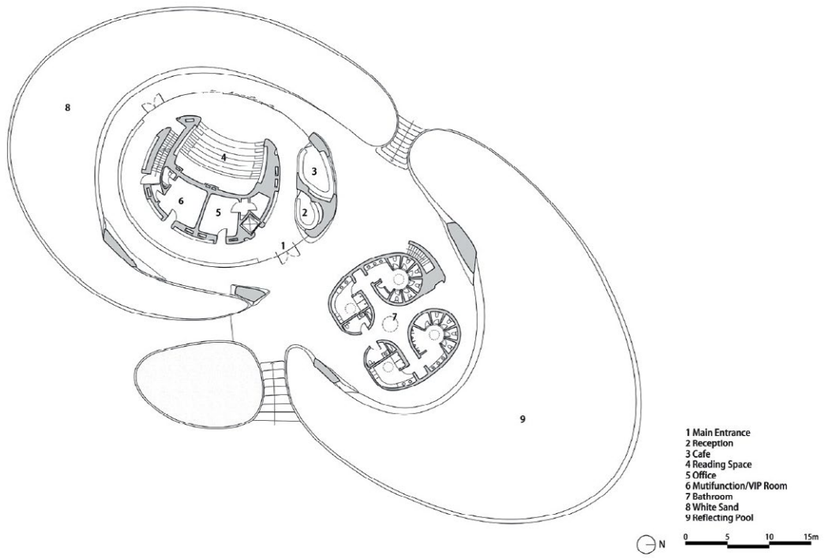
Located in southeast China, Haikou is the capital of Hainan province. It once served as an important port along the Maritime Silk Road, and today has become a key area of the Hainan free-trade island initiative.
In 2019, the local government launched the Haikou Bay rejuvenation plan in an effort to enhance the use of public space along the Haikou coastline. A series of pavilions by both domestic and international architects is under planning and the Wormhole Library will be the first one to be completed.

Facing the South China Sea, the Wormhole Library is located in Century Park along the Haikou Bay coastline. The intimately scaled structure is cast of white concrete as a unit. The curved concrete walls not only serve as organic architectural structure, but also connect the ceiling, the ground and the walls together. Holes of varying sizes allow the architecture to breathe and meanwhile let natural light flood the interior. The grey spaces of the exterior corridors provide shady spots for passers-by to stop and rest.

The interior is composed of two parts: a 690-square-meter (7,430-square-foot) reading space that can store approximately 10,000 books, a café and a terrace; and a 300-square-meter (3,230-square-foot) public rest area that is equipped with a bicycle parking system, public bathrooms, and shower areas.

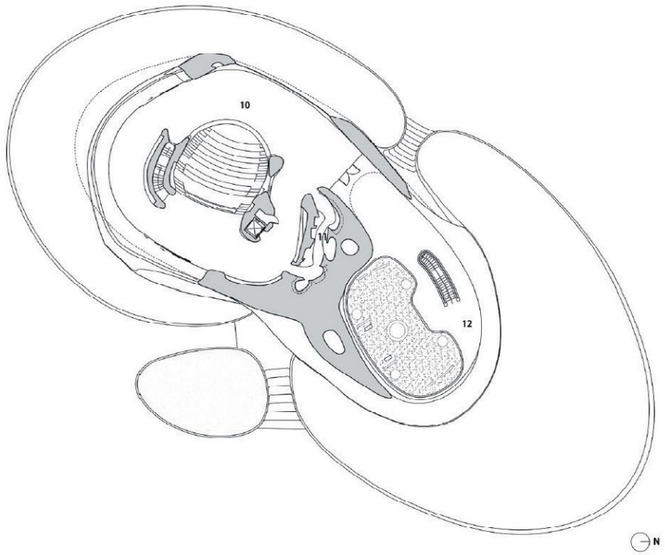
To ensure accuracy and seamlessness across the curved surfaces, the building is being cast using both a CNC and 3D printed model. All MEP has been designed to be hidden within the concrete cavity to minimize its appearance and create visual consistency. Curved sliding doors and retractable glass curtain walls not only provide views of the sea, but also enhance overall airflow and ventilation. In response to local weather conditions, the roof on the sunny side is cantilevered to achieve comfortable temperatures, realizing a sustainable and energy-saving building.





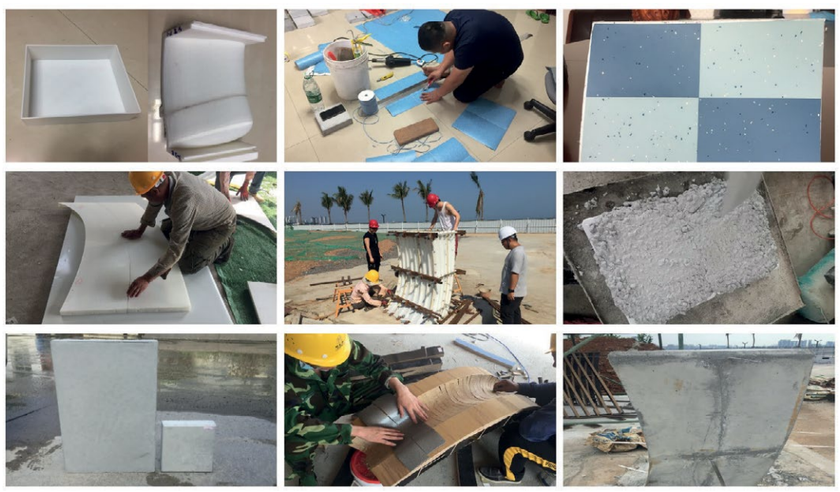
1 Main Entrance
2 Reception
3 Cafe
4 Reading Space
5 Office
6 Mutifunction/VIP Room
7 Bathroom
8 White Sand
9 Reflecting Pool

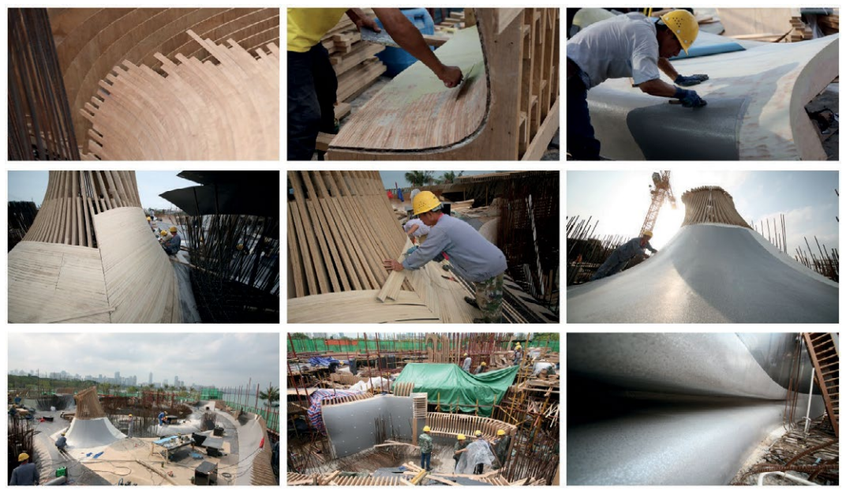
N 0 5 10 15m

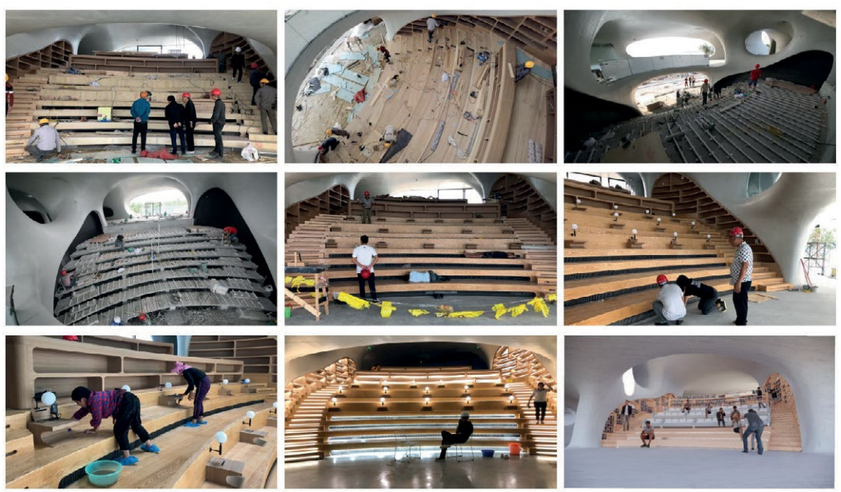


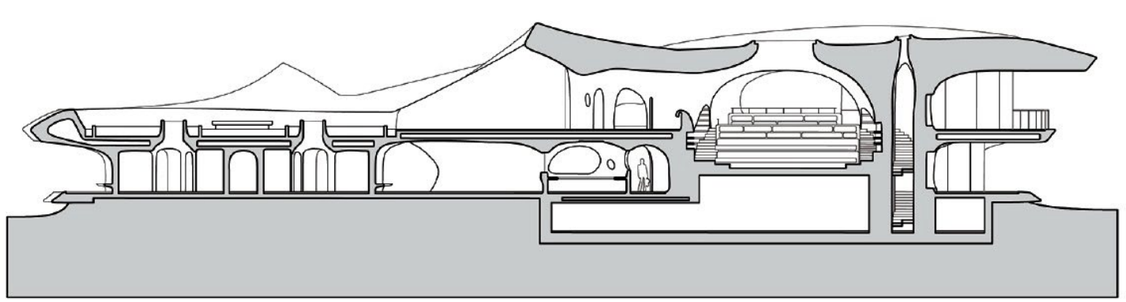
10 Sea View Reading Space
11 Kids Reading Space
12 Terrace

N 0 5 10 15m









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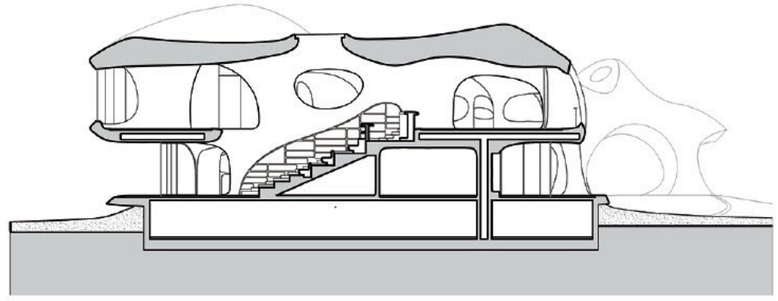

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20191213

20191213

20200511

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SHANSHUI CITY INNOVATION CENTER

Shenzhen, China
Concept development & Tower Facade design / SD
2020
Competition

Client: Confidential
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: MAD Architects & ARUP

The project site is in an important ecological and landscape environment. It is backed by the Central District of Futian and directly faces the landscape of Hong Kong. It is a natural intersection of city and landscape. All these provide the environmental basis for creating a unique Shanshui city.
As China's youngest landmark City, Shenzhen has a multi-cultural convergence, the spirit of the city is inclusive and enterprising, full of innovative power. Therefore, it is of great significance to upgrade the relationship between city and nature from adaptation and coordination to integration, so as to realize a park like future innovation park with high technology and sustainable development in the world. Its high standard and foresight make it very important.

In the painting of Fuchun Shanju, the magnificent scenery flowing is constantly unfolding. However, this is not a realistic Fuchun River landscape painting, but a combination of the ideal shanshui in the painter's mind, which realizes the resonance between people and nature.
[illegible] and memory enable people to have a natural feeling of resonance with the ideal shanshui without deliberate study. The further development of resonance is the sense of belonging, and the link between them is artistic conception and emotion.

Today, cities are facing the same challenges, rapid development and how to maintain a good environment. The elements of an ideal city are defined by rational analysis. However, such a city with the principle of unity is still difficult to bring a sense of belonging to people. What is missing is the emotion and resonance point of the people in this region. Looking for them is the essence of a Shanshui city.

The goal of the design is to upgrade the relationship between city and nature from adaptation, coordination and integration to the realm of Shanshui city. The second goal is to realize the park oriented future science and technology innovation center. It's high standard and forward-looking make it have an unusual new concept all over the world.

The planning mixed use of plots is conducive to the mutual supplement of functions. Huanggang port is a comprehensive urban area with the port as the center to realize the composite utilization of spatial functions, perfect urban functions and Integrated Station City. Science and technology innovation park takes the park environment as the ecological prospect of the rear comprehensive urban area, fully demonstrating the beautiful blend of city and nature.

Creating a park environment in the science and technology innovation park is an ecological compensation for construction activities, and provides a green ecological prospect for the city. It is also the basis for building the future science and technology innovation park.
Put all the traffic underground to make the ground a park, so that more space can be released to serve people and provide a good environment for ecological travel.

From the city to the Shenzhen River, the wave shape is gradually reduced, and three green corridors are added. Multi level in the building, multi-level three-dimensional greening, so that the building fully integrated in the park landscape.

The new Huanggang port building is a highly complex transportation hub, which brings a lot of people to this area. With the port as the center of the surrounding buildings, several pieces of land are woven into an interconnected comprehensive area by means of three-dimensional interconnection. Form a three-dimensional city including office, hotel, residential, retail and cultural functions. Efficient, natural and artistic, all of which make it an outstanding urban environment.

02

规划总图 比例 1：3500
MASTER PLAN

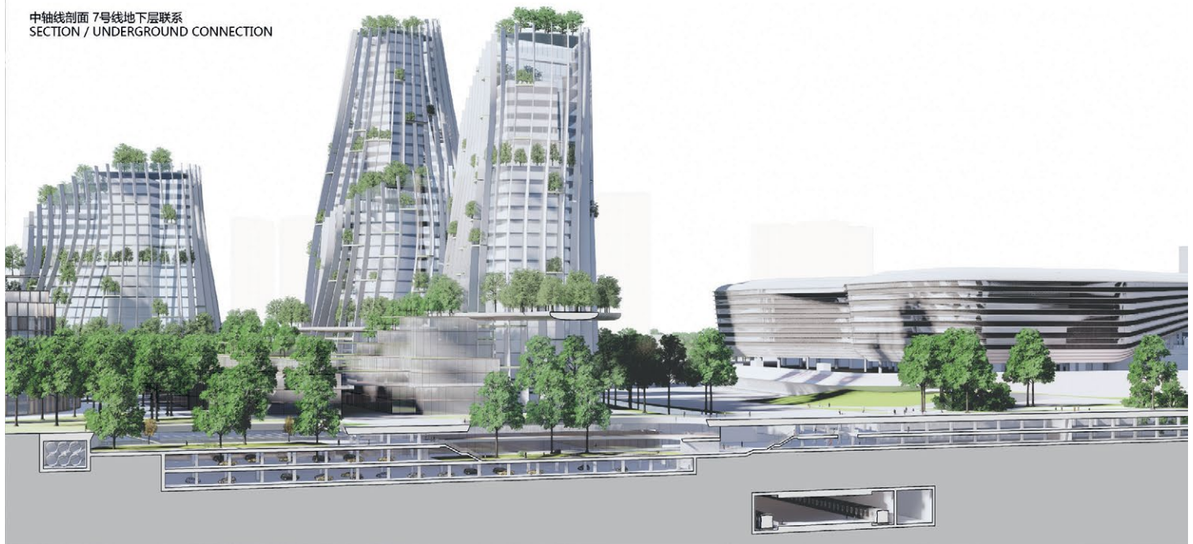
03

城市中的U形天际线
THE SMILING CITY SKYLINE

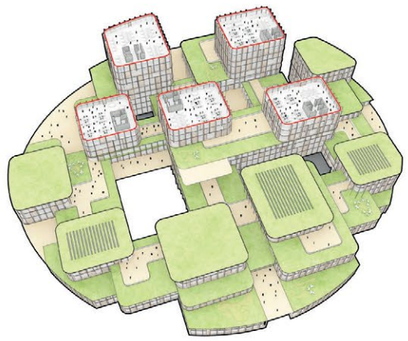
整体的立体公园
MULTI- LAYER URBAN PARK

呼应香港的中央绿轴
GREEN AXIS CONNECTS TO HONGKONG

中轴线剖面 7号线地下层联系
SECTION / UNDERGROUND CONNECTION



相对独立的中小型 实验室单元
SMALL MID-SCALE LAB UNITS



中大型实验室单元 可适应需求灵活组合
BIGGER SCALE LAB UNITS AND FLEXIBLE ARRANGEMENT

1 实验室单元
LAB UNITS
2 互动交流空间
COMMUNAL SPACE
3 服务 试验辅助
SERVISE LAB SUPPORT
4 办公室
OFFICE

TENCENT DACHANWAN

Shenzhen, China
Concept development & Towers and Cloud Facade Design / SD + DD
2020 - 2025
Competition entry - (1st place)

Client: Confidential
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, charts, diagrams, renderings and presentations.

As the most cutting-edge leader in the global Internet industry, Tencent regards talent and technological innovation as its important assets.

Tencent's business model that connects you and me and is full of social responsibility meets everyone's needs. And accompany family, friends, and colleagues to experience all aspects of the digital age.

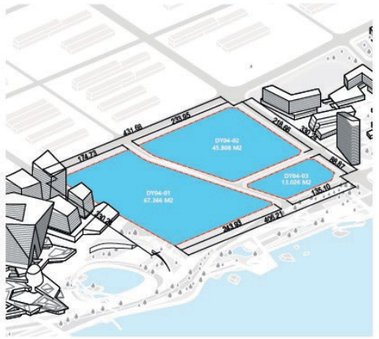
User value constitutes Tencent's corporate philosophy. It has also become the next important strategic plan for Tencencent. The core demand for the environment of Shenzhen Dachan Bay area improve the comprehensive service functions of the entire city from the urban scale to provide individuals with inclusive and vibrant work, leisure and living spaces the entire vibrant new urban area.

All are conveying Tencent's values of integrity, positivity, tolerance and collaboration. Based on the characteristics of the Bay Area itself, the way we design results in design products that face the future and will last forever, to easily cope with different work and leisure situations.

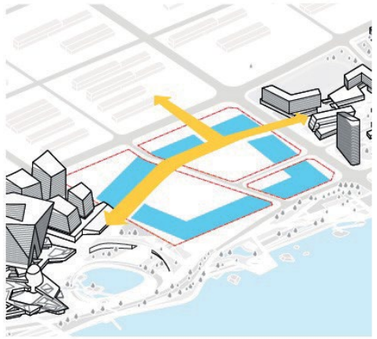
An open, interoperable and collaborative working environment will support innovative talents to continue to forge ahead, promote technological breakthroughs and explore the possibilities of the future.

MAD believes in the potential value of contemporary design should be found in designs with vision, fluidity, flexibility and a sense of technology. These designs open up the dialogue between human beings and nature, the earth and the sky and ultimately affect our perception and understanding of the space around us.

By balancing people, cities and the environment, we discover how nature and humans can create a spiritual and emotional connection. We will work together to create a new chapter in the Tencent story a unique space that emerges from its experiential qualities. This is a higher-level planning and development pattern flexible, self-adaptive and non-hierarchical, all-in-one connected community, a people-oriented and sustainable an immersive space at its core.

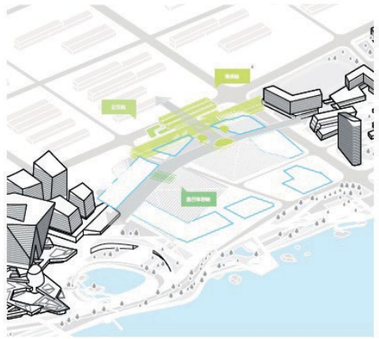


01. 场地尺寸

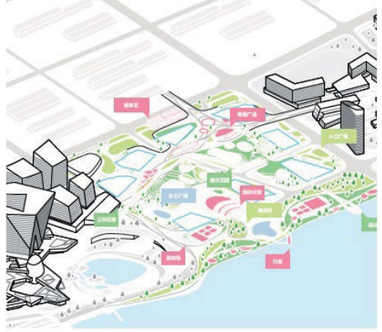


02. 以中心景观轴连接

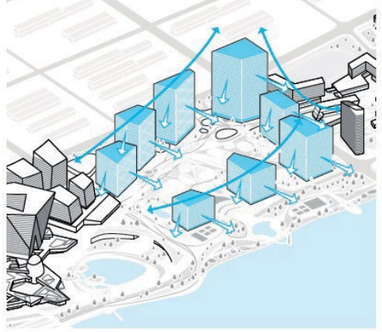
03. 海景视觉通廊



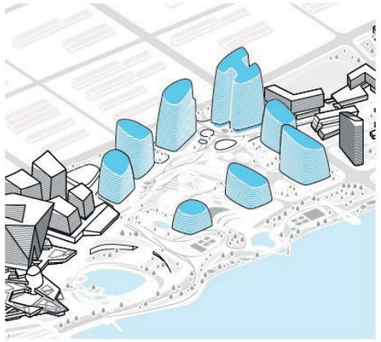
04. 交通枢纽



05. 丰富多样的公共空间

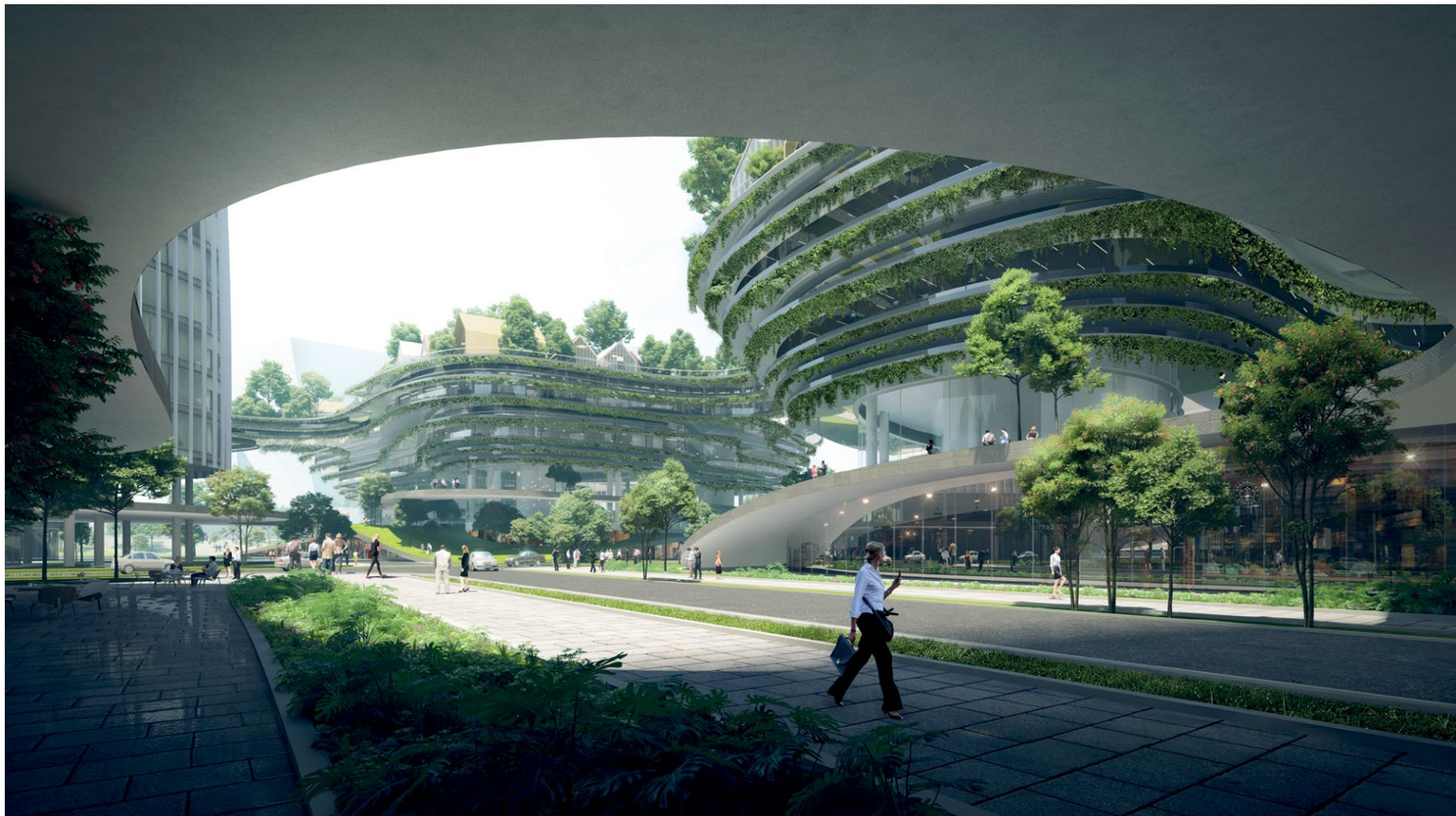


06. 重塑天际线



07. 优化建筑形体

08. 云端村落



HAINAN SCIENCE AND TECHNOLOGY MUSEUM

Hainan, China
Facade & Interior Design - SD + DD + CD
2019 - 2024
Completed

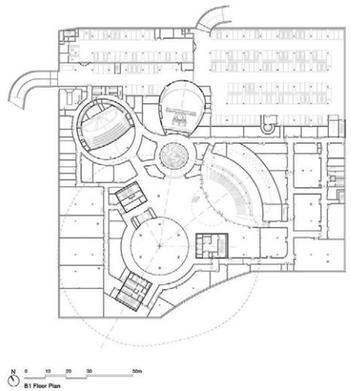
Client: Hainan Association for Science and Technology
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and LDI / CCDI coordination.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Kin Li, Fu Changrui, Tiffany Dahlen, Wang Yiding, Reem Mosleh, Sun Feifei, Alan Rodríguez Carrillo, Rozita Kashirtseva, Wu Qiaoling, Edgar Navarrete, Zhu Yuhao, Zheng Chengwen, Zhang Yaohui, Li Hui, Yang Xuebing, Dayie Wu, Zhou Haimeng, Lim Zi Han, Yin Jianfeng.

The new Hainan Science and Technology Museum will be located facing the South China Sea on the west coast of Haikou in China's Hainan province. The project was recently unveiled by architectural firm MAD, led by architect Ma Yansong. It is the second major public project that the firm has built in Hainan province, the first being the famous Cloudscape library, due to be completed in spring 2021.

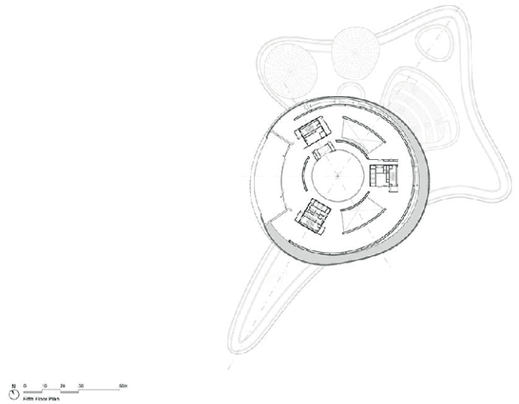
The area chosen for the Hainan Science and Technology Museum has an important public vocation. The new museum complex will be surrounded by Haikou city's sports stadium and the National Wetland Park. The museum, as the architects say, was conceived as a meeting point between the nature of the lush tropical forest and the city with its advanced technologies. The project is scheduled for completion in 2024, when the Hainan Science and Technology Museum will become a scientific landmark for the whole of Hainan province, as well as a major tourist attraction for the city of Haikou.

A place where "a primeval rainforest and technology of the future meet", in the words of architect Ma Yansong to describe the design of this futuristic building which creates a rapport with the surrounding nature, evoking it through its cloud-like shape. The attraction will be particularly linked to the nearby lush tropical forest, which will be mirrored in the building's silver façade made of fibre-reinforced plastic. In addition to a permanent exhibition space, the complex will also include a planetarium and two cinemas for the latest generation of 3D and dynamic viewing. The public will have direct access to the central atrium, a bright and transparent space flooded with natural light from the skylight located in the roof. For the exhibition space, drawing on the lessons of Wright and the Guggenheim Museum, the architects designed a spiral and sloping layout, connecting all five floors of the museum. The tour will begin on the fifth floor, which can be accessed via a lift that also provides access to the panoramic terrace for 360° views of the sea and the city. The landscape will be a constant presence, visible throughout the exhibition. The museum will comprise more than 27 thousand square metres of above-ground facilities on a total area of over 46 thousand square metres. For the outdoor space, the architects have designed pathways covered by canopies that run in different directions from the main pavilion, to welcome the public and shelter them from the wet and rainy climate of Haikou city. The pathways will connect the building with outdoor public spaces such as the square and rest/relaxation areas. The lush nature of the tropical rainforest will offer visitors a pleasant environment to freely enjoy and experience nature.

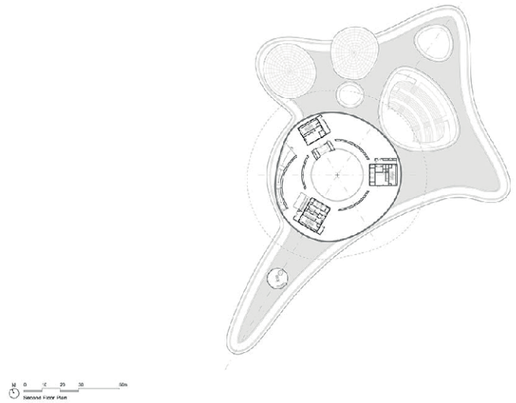
Ground Floor Plan



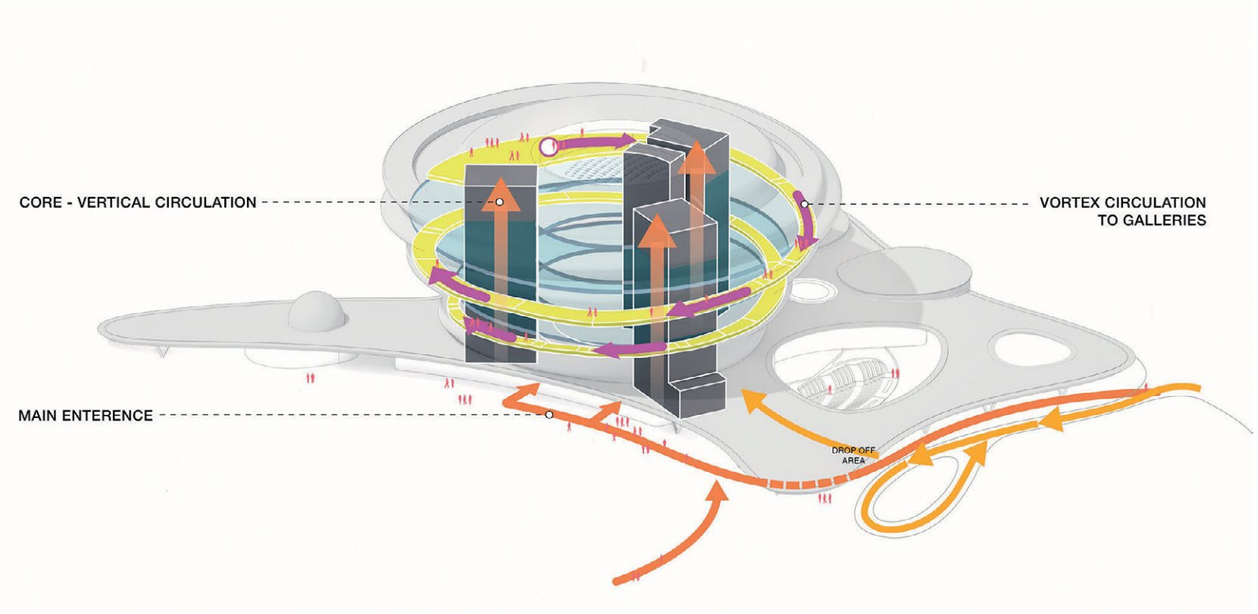
Basement Floor Plan

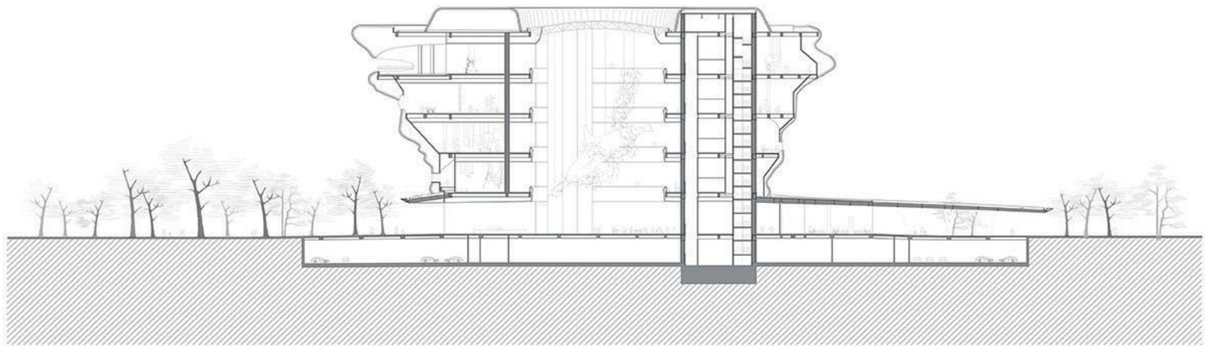


First Floor Plan

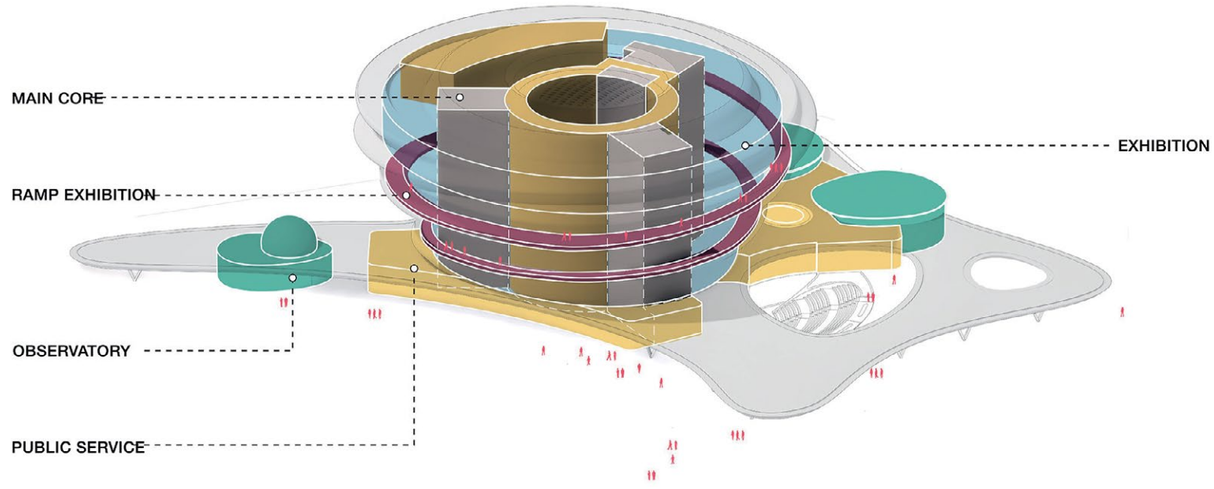


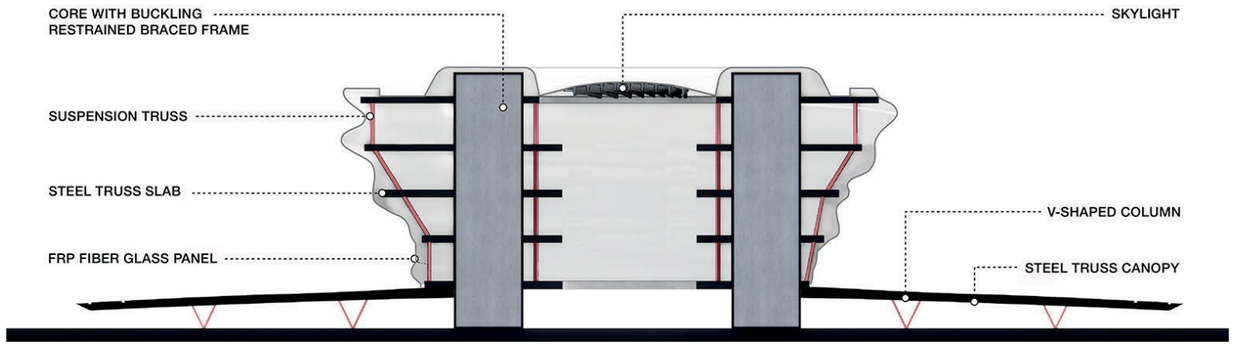
Second Floor Plan



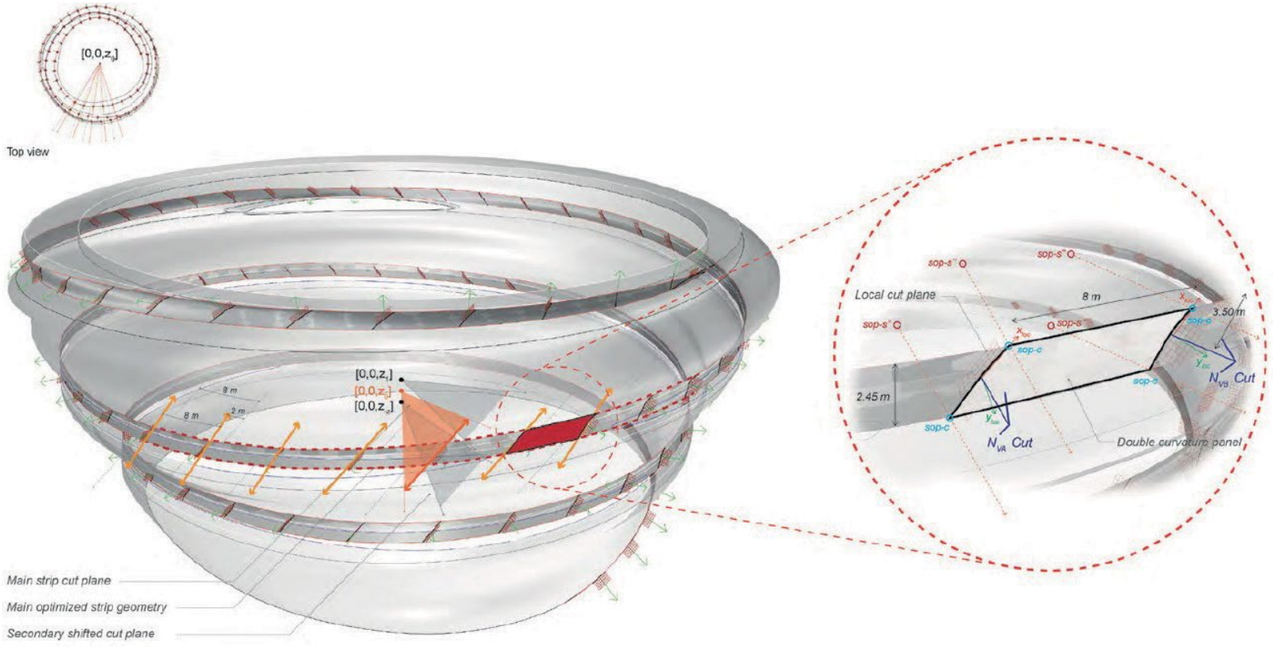


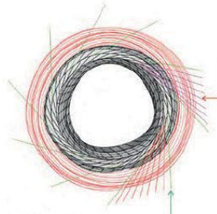
Section A - A'



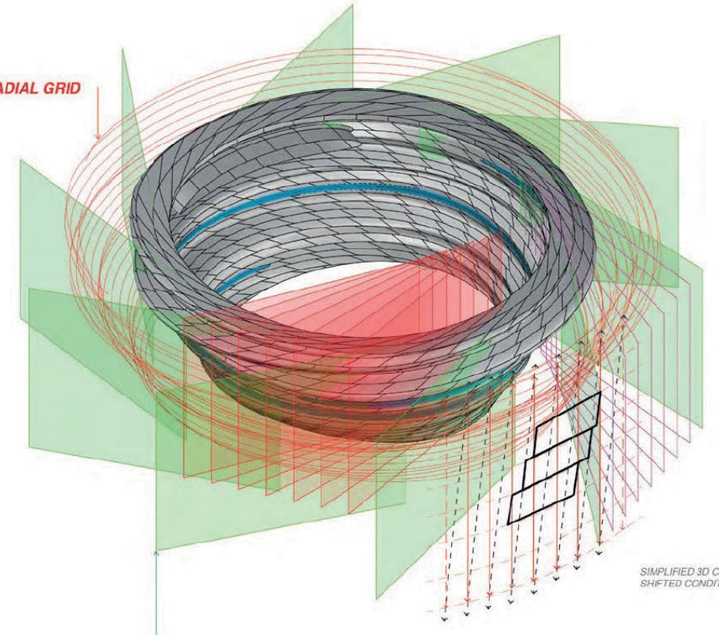


Main building componenets



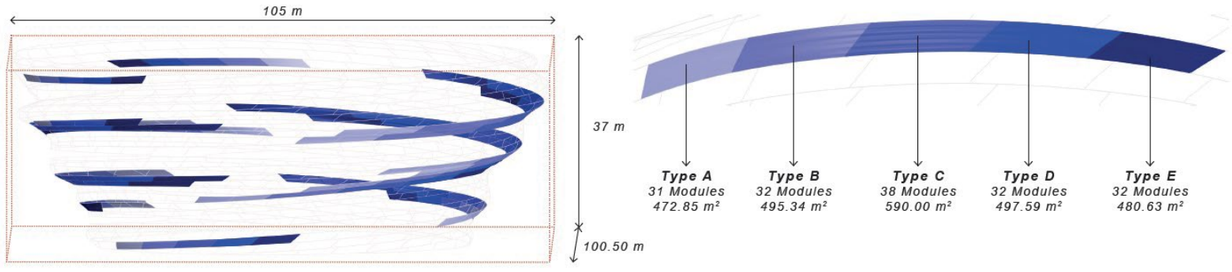


MOEBIUS RADIAL GRID

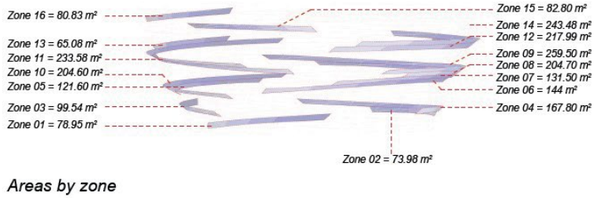


Shifted vertical plane intersections

PANELIZATION GRID LAYOUT
ISOMETRIC VIEW



Overall dimensions



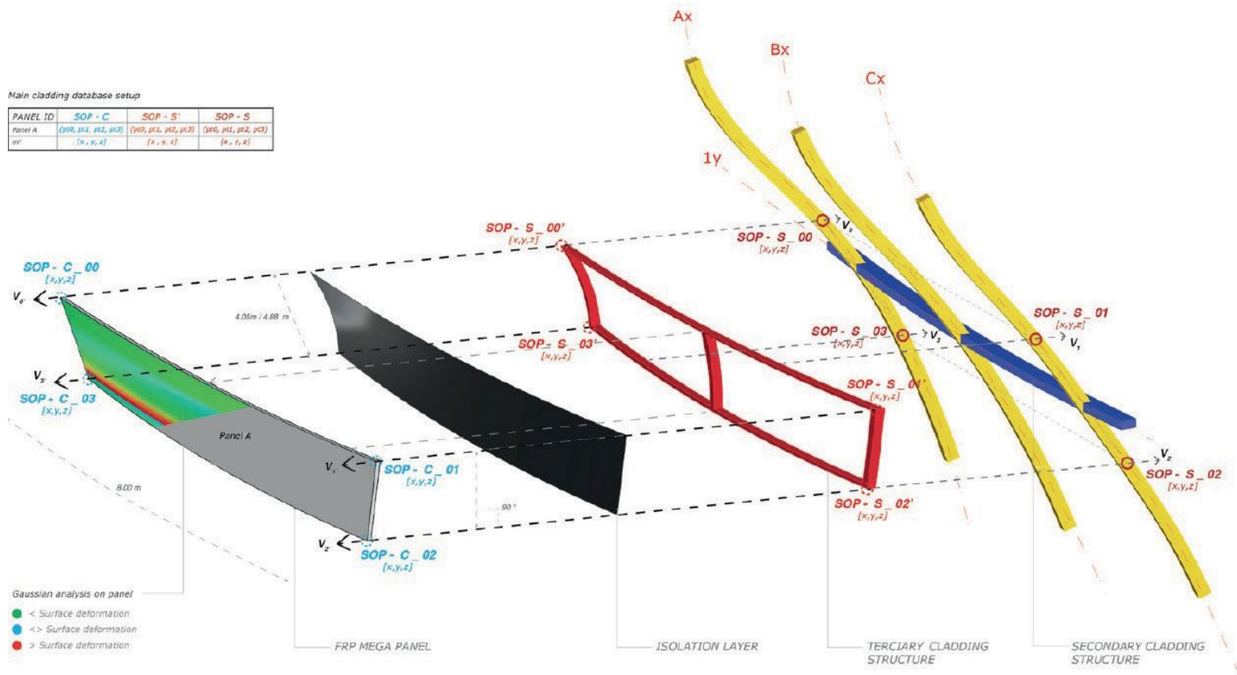
Areas by zone

Panel types - 3D overview

Total GFPR skin panels area = 12 067 m² (100%)
Total rippled panels area = 2 537 m² (21.03 %)

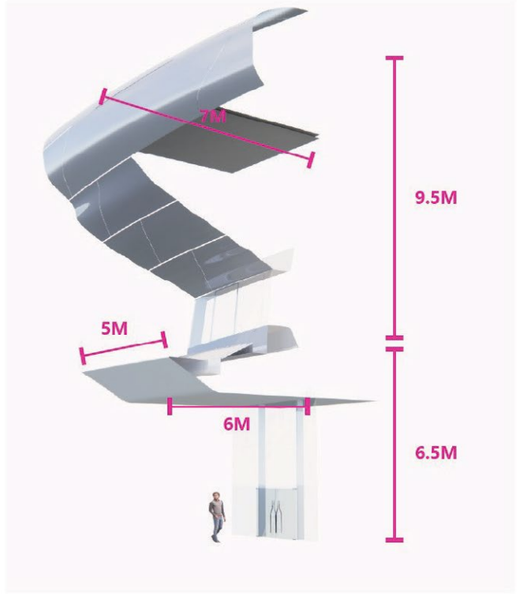
Main cladding database setup

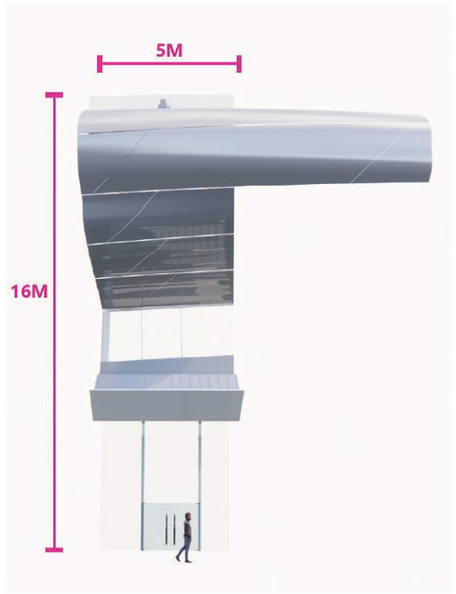
PANEL ID	SOP - C	SOP - S'	SOP - S
Panel A	([V00, pc1, pc2, pc3])	([pc0, pc1, pc2, pc3])	([pt0, pt1, pt2, pc3])
m²	[x, y, z]	[x, y, z]	[x, y, z]

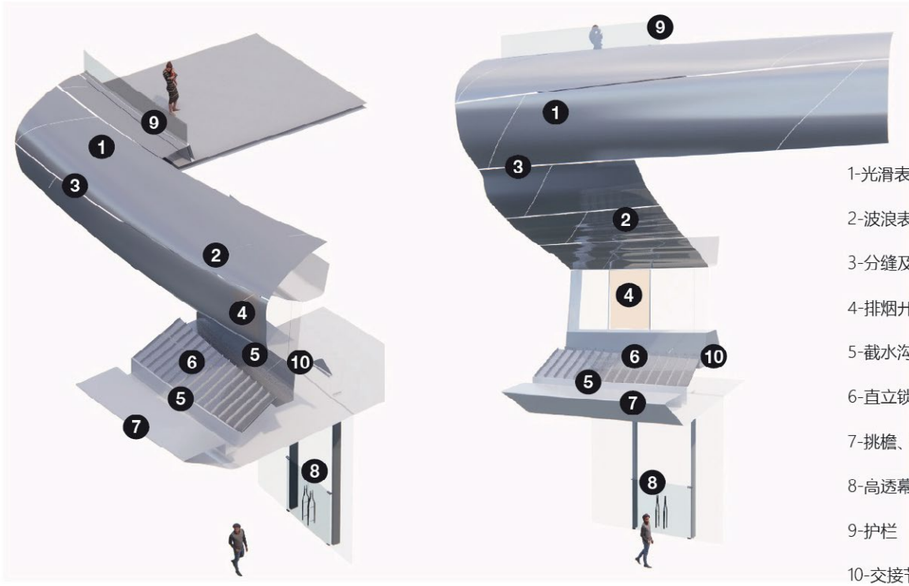


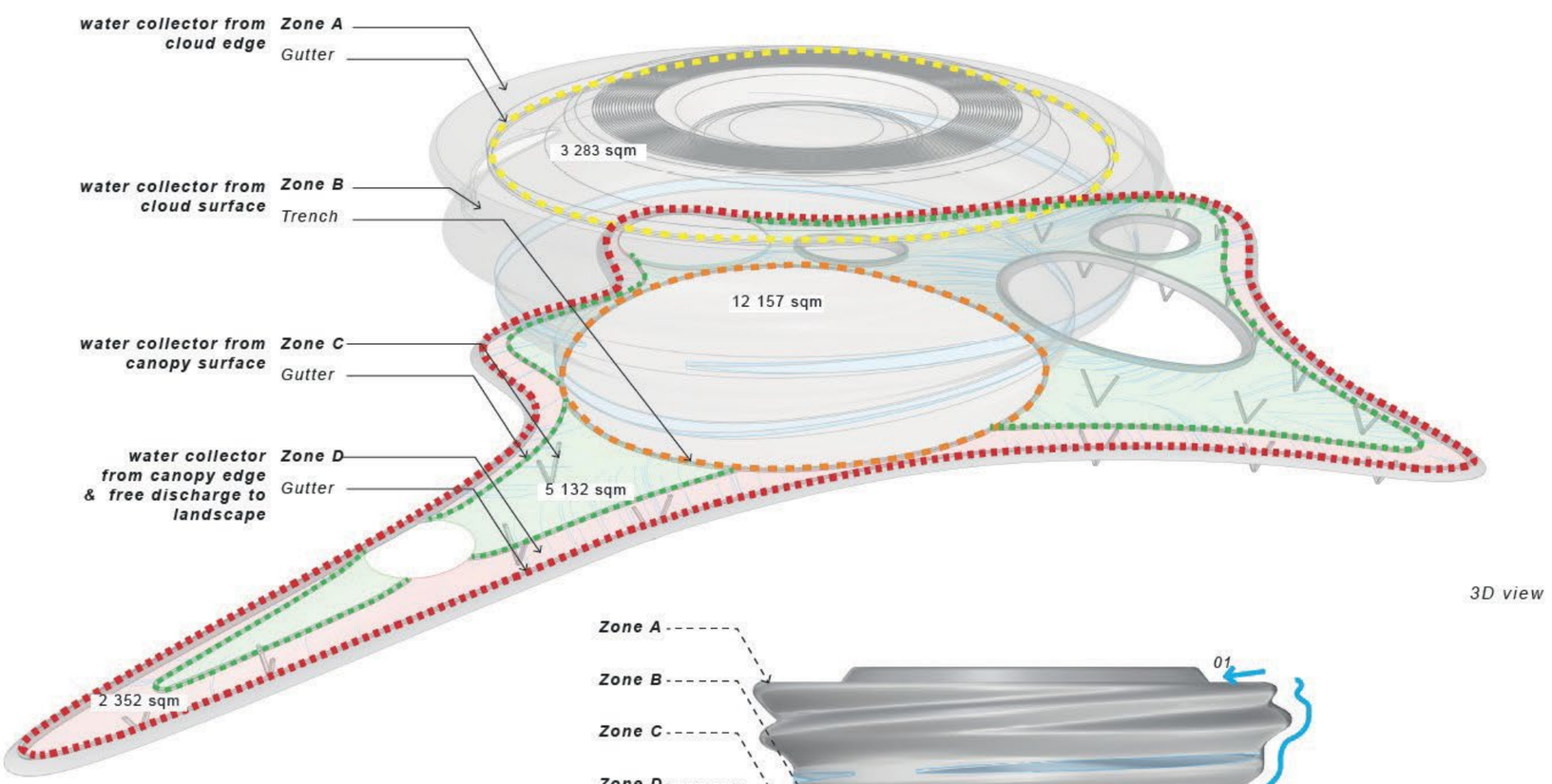
PROPOSED PANEL BUILD UP ELEMENTS
Schematic Diagram + Database setup

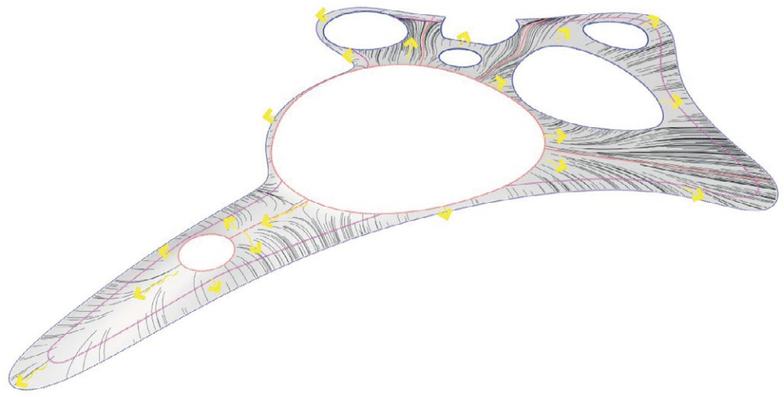
MOCK-UP



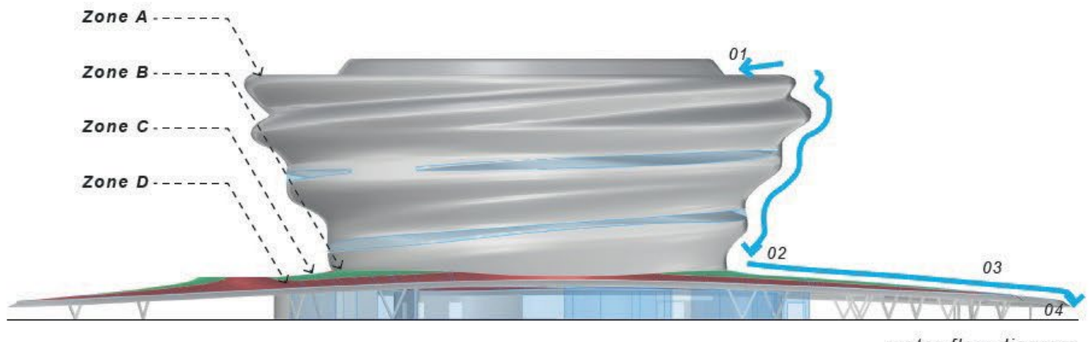




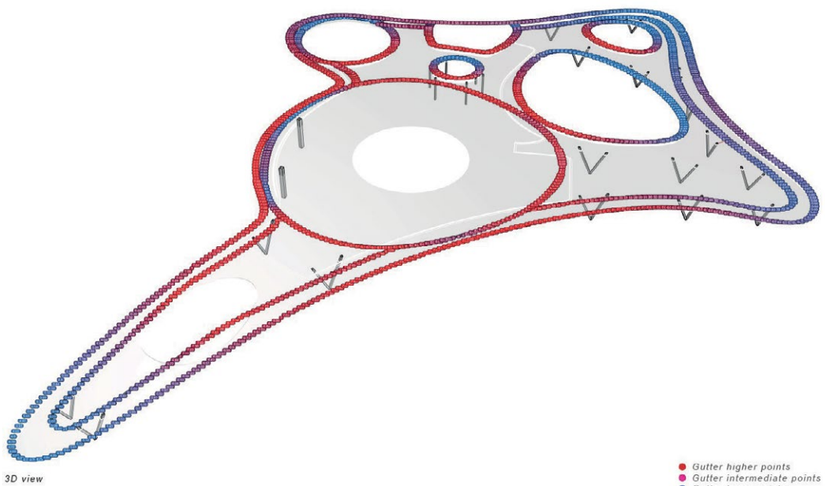




3D view



water flow diagram



3D view

ZHENGZHOU RESIDENTIAL # 25

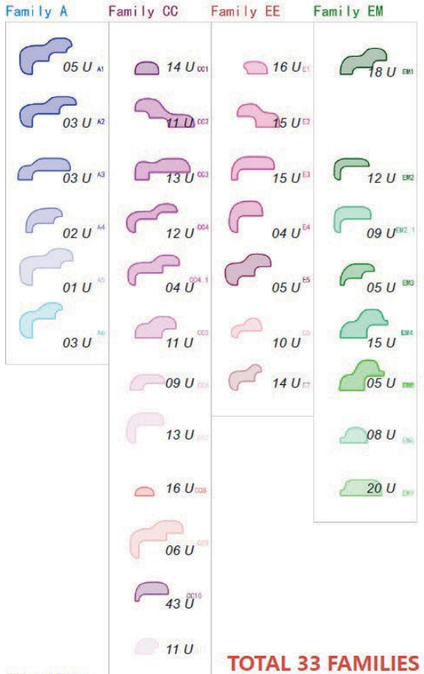
Beijing, China
Facade design, Geometry optimization and Smart clustering adaptation - DD + CD
2020 - 2024
Completed

Client: Haikou Tourism & Culture Investment Holding Group
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, presentations and 3D printed objects.
Credits: MAD Architects

MODULIZATION PRINCIPLE

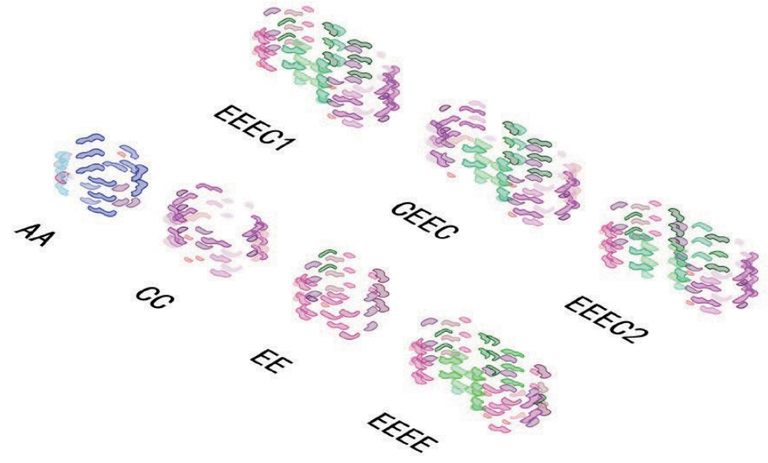
MAIN ORGANIZATION AND DISTRIBUTION APPROACH = K-MEANS CLUSTERING

Balcony family types shared to seven main buildings



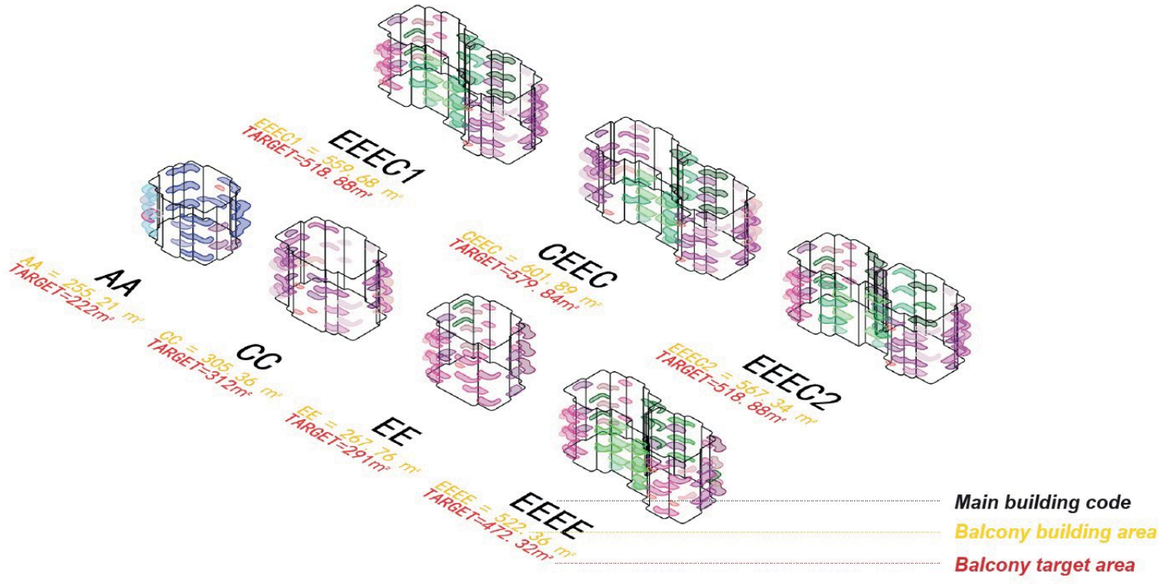
TOTAL 33 FAMILIES

*U = Units



Total balcony items shared to 7 core buildings = 351 Units

TOTAL UNITS + BALCONY AREA CHART



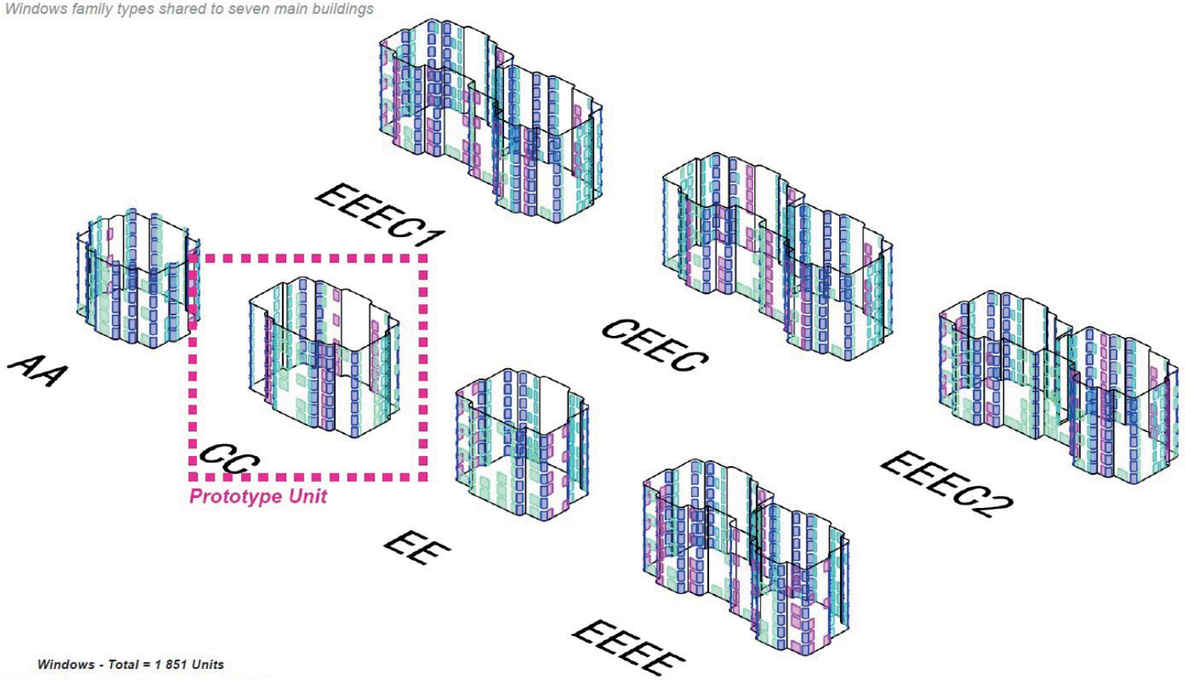
ALL UNIT BALCONY

户型名称	阳台面积（实际）	阳台目标	阳台种类（含模板）		阳台数量	总个数	
A	255.21	222.00	7	所有阳台类型共30种	26 X 2栋	所有阳台个数约923个(共18栋)	7573.24
CC	395.36	312.00	12		39 X 6栋		
EE	267.76	291.00	11		43 X 1栋		
EEEC1	555.68	518.88	19		66 X 3栋		
EEEC2	563.30	518.88	19		66 X 2栋		
EEEE	493.56	472.32	18		67 X 2栋		
CEEC	591.00	579.84	25		65 X 2栋		

OVERALL WINDOWS TYPE MAPPING

MAIN ORGANIZATION AND INDEXING

Windows family types shared to seven main buildings



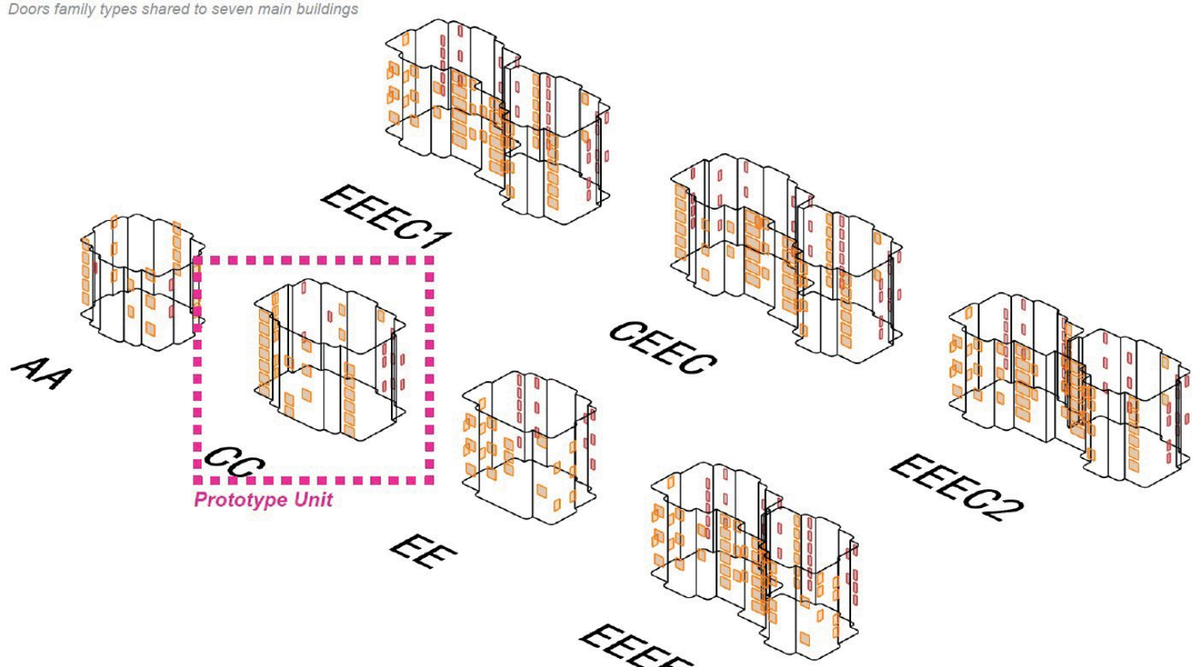
Windows - Total = 1 851 Units

- *Single curved window panel = 800 Units*
- *Full height sliding window panel = 296 Units*
- *Mid height sliding window panel = 241 Units*
- *Inverted-In / Swing window panel = 514 Units*

OVERALL DOORS TYPES MAPPING

MAIN ORGANIZATION AND INDEXING

Doors family types shared to seven main buildings



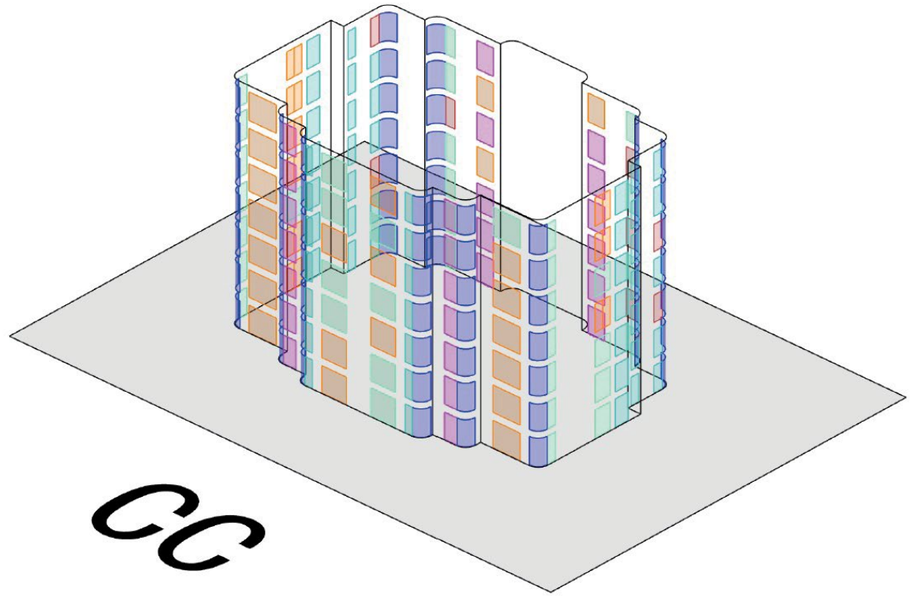
Doors - Total = 423 Units

- *Flat sliding door = 277 Units*
- *Folding door = 146 Units*

DOORS + WINDOWS TYPE MAPPING

MAIN ORGANIZATION AND INDEXING ON PROTOTYPE CC BUILDING UNIT

Doors + Windows family types on CC Building



CC

Doors - Total = 48 Units

- *Flat sliding door = 40 Units*
- *Folding door = 8 Units*

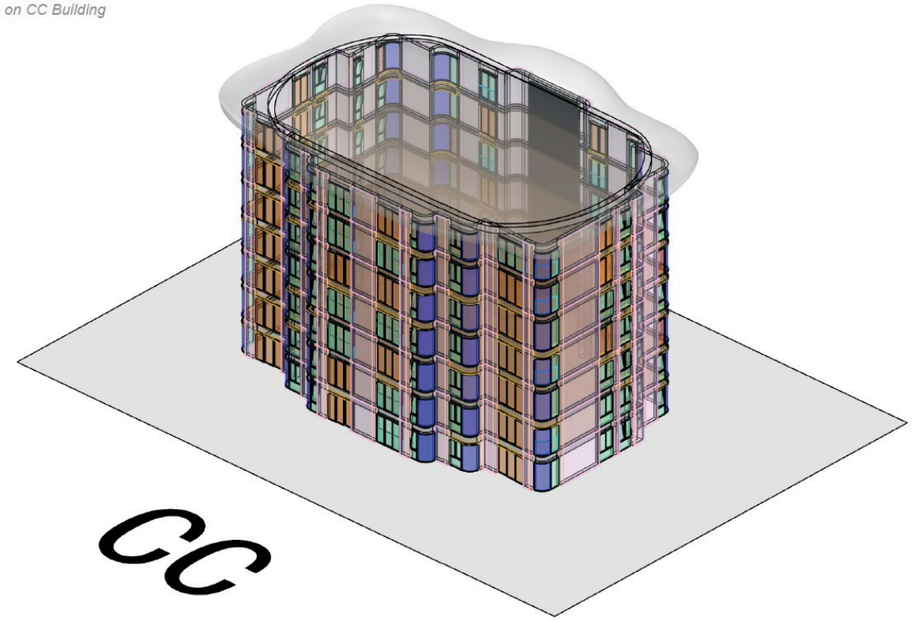
Windows - Total = 185 Units

- *Single curved window panel = 70 Units*
- *Full height sliding window panel = 38 Units*
- *Mid height sliding window panel = 25 Units*
- *Inverted-In / Swing window panel = 52 Units*

DOORS + WINDOWS TYPE ARCHITECTURAL MAPPING

MAIN ORGANIZATION AND INDEXING ON PROTOTYPE CC BUILDING UNIT

Doors + Windows family types on CC Building



CC

Doors - Total = 48 Units

- *Flat sliding door = 40 Units*
- *Folding door = 8 Units*

Windows - Total = 185 Units

- *Single curved window panel = 70 Units*
- *Full height sliding window panel = 38 Units*
- *Mid height sliding window panel = 25 Units*
- *Inverted-In / Swing window panel = 52 Units*

LISHUI AIRPORT

Zhejiang Lishui, China
Interior design & Geometry optimization, Consultans and contractors coordination - DD + CD
2016 - 2025
Completed

Client: Lishui Airport Construction Headquarters
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Liu Huiying, Li Jian, Sun Shouquan, Zhang Xiaomei, Lei Lei, Yang Xuebing, Sun Mingze, Yin Jianfeng, Punnin Sukkasem, Zhu Yuhao, Zhang Yaohui, Alan Rodriguez Carrillo, Pittayapa Suriyapee and Wang Xiny.

"Birds in the mountains": Ma Yansong MAD released the design of Zhejiang Lishui Airport

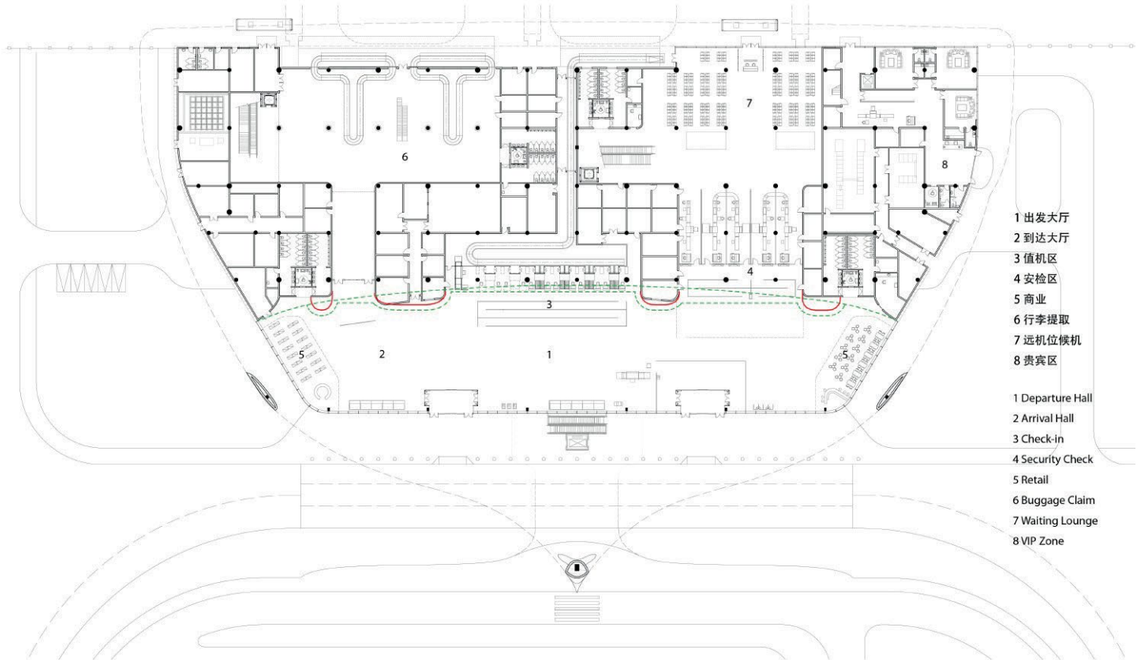
MAD Architects has unveiled the design for the upcoming Lishui Airport in Zhejiang.

The airport is located in the hilly landform in the southwest of Lishui City, and the terrain of the base varies greatly. MAD's planning and design of the airport terminal area respects the original site as much as possible while ensuring convenient and smooth airport traffic, and highlights the characteristics of the mountain airport, creating an artistic conception of "flying birds, clouds, and hills".

The design of the terminal building draws inspiration from the green water and green mountains of Lishui. It adopts a large silver-white cantilevered roof partially covered by aluminum plates, resembling a white-feathered bird that lives in the mountains and forests, ready to soar in the sky.

Entering the interior of the terminal building, the warm wood-toned hall has a flexible and smooth space shape and a comfortable and pleasant scale.

Lishui Airport is expected to start construction at the end of this year and be completed and put into use at the end of 2024.

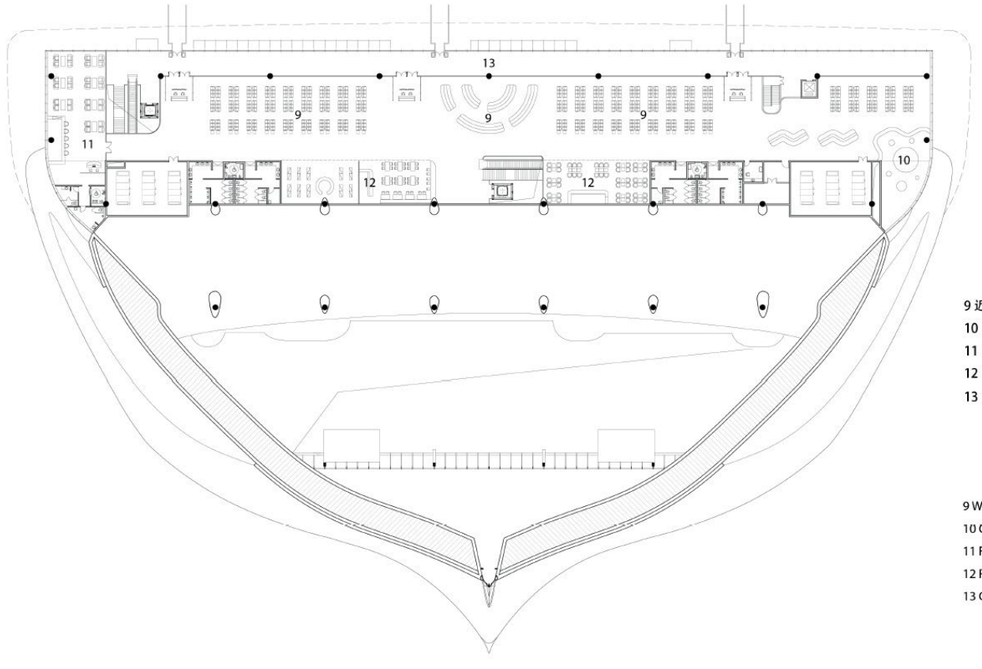


1 出发大厅
2 到达大厅
3 值机区
4 安检区
5 商业
6 行李提取
7 远机位候机
8 贵宾区

1 Departure Hall
2 Arrival Hall
3 Check-in
4 Security Check
5 Retail
6 Buggage Claim
7 Waiting Lounge
8 VIP Zone

Ground Floor Plan
Scale 1:500 Paper Size: A3
0 10 20m
5

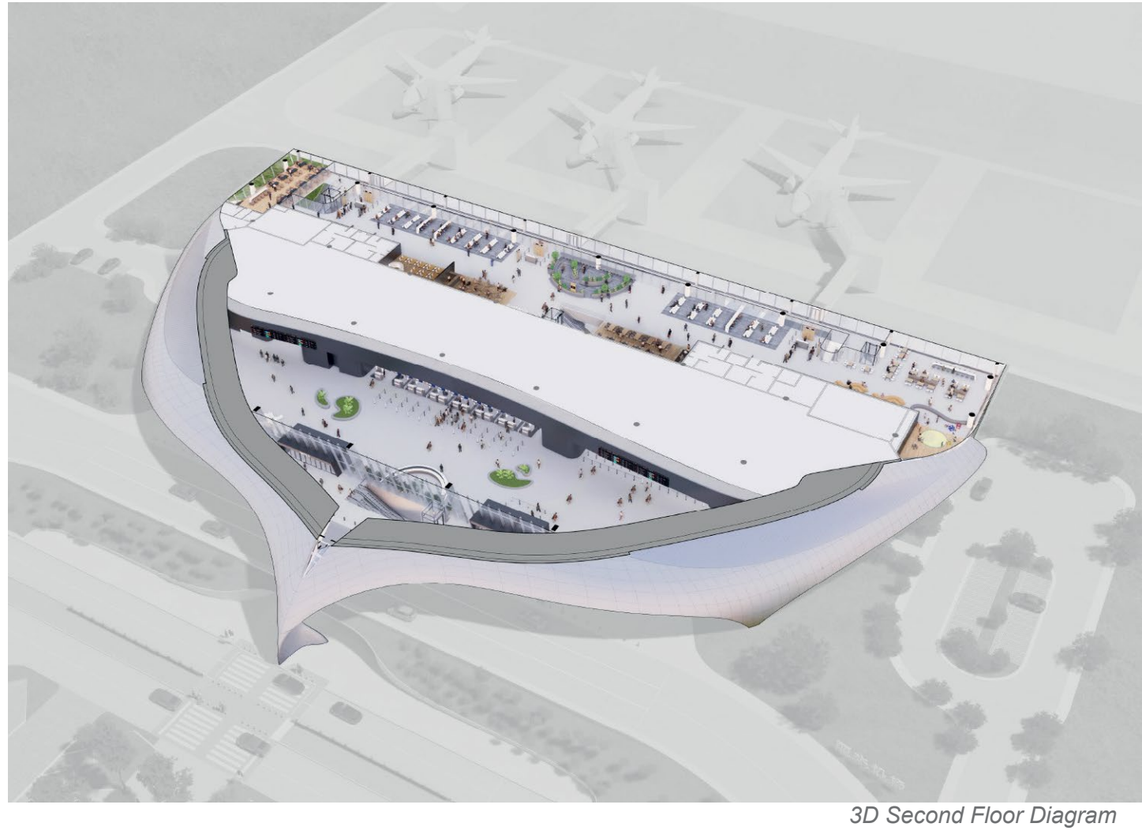
3D Ground Floor Diagram



9 近机位候机
10 儿童游乐区
11 头等舱候机室
12 商业
13 出发到达廊

9 Waiting Lounge
10 Children's Zone
11 First Class Lounge
12 Retail
13 Corridor

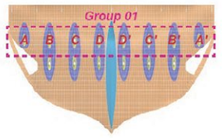
Second Floor Plan
Scale 1:500 Paper Size: A3
0 10 20m
5



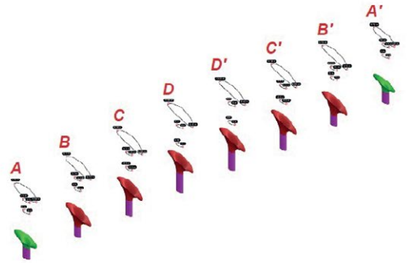
3D Second Floor Diagram

02 - COLUMNS CLADDING CONFIGURATION

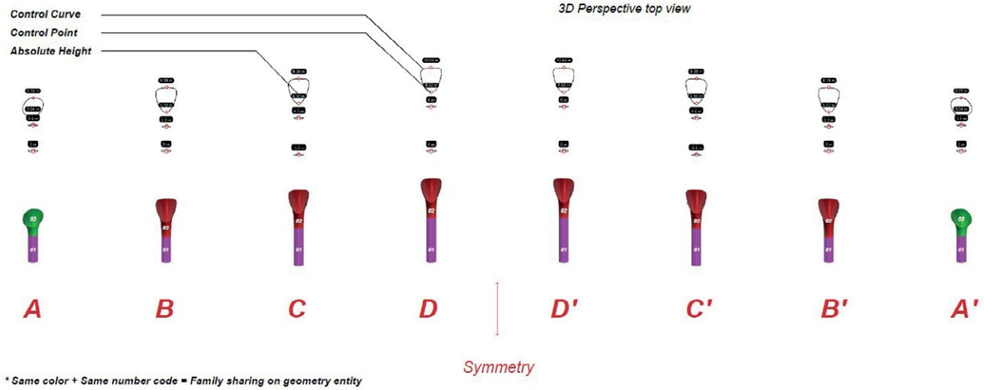
Main primitive geometry surfaces optimization - Group 01



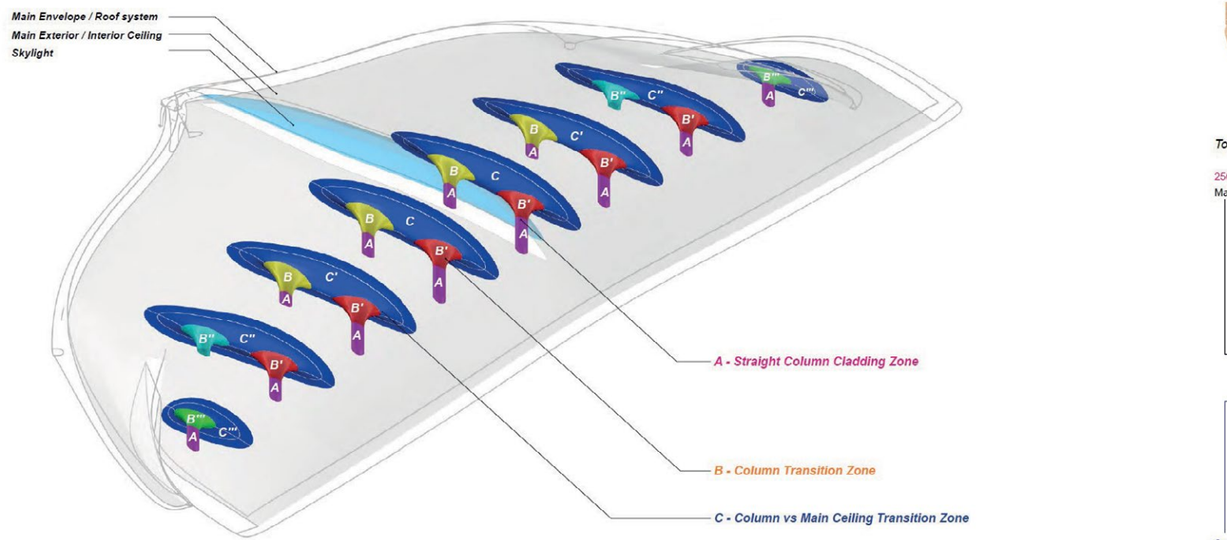
Columns group location

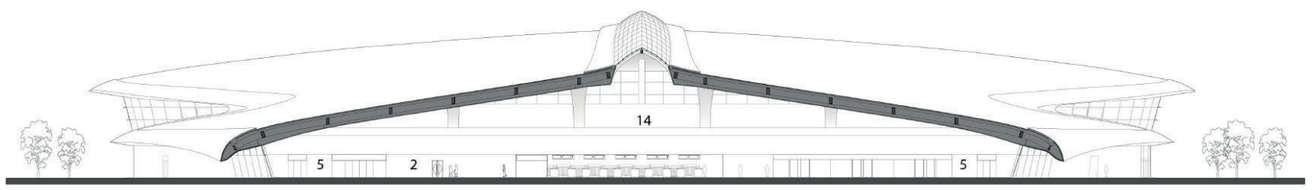


3D Perspective top view

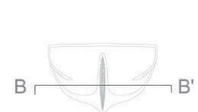


** Same color + Same number code = Family sharing on geometry entity*





1 出发大厅	1 Departure Hall
2 到达大厅	2 Arrival Hall
5 商业	5 Retail
14 预留扩建区	14 Reserve Zone



Section B-B'

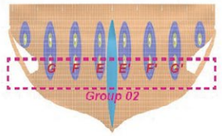
Scale 1:500 Paper Size: A3

0 10 20m

5

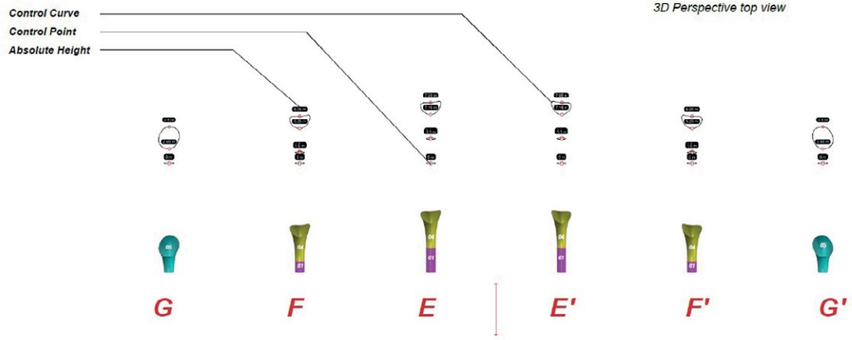
02 - COLUMNS CLADDING CONFIGURATION

Main primitive geometry surfaces optimization - Group 02

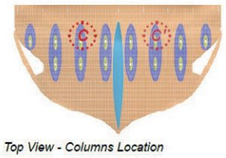


Columns group location

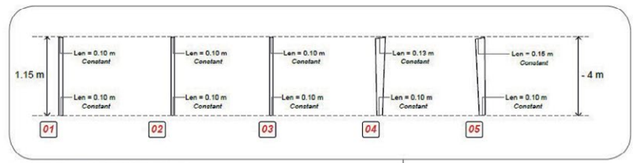
3D Perspective top view



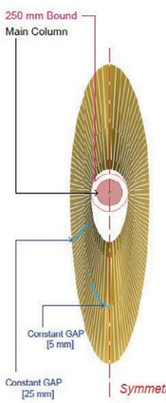
** Same color + Same number code = Family sharing on geometry entity*



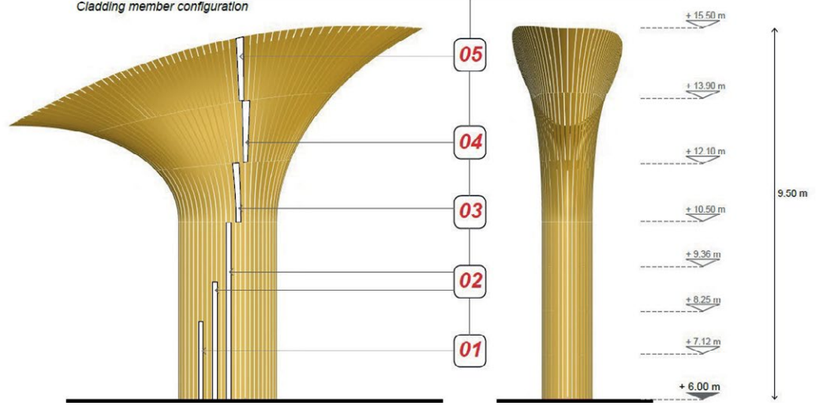
Top View - Columns Location

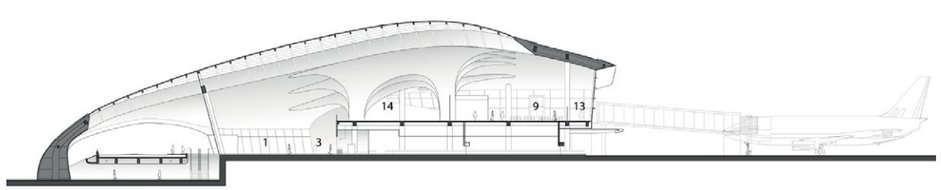


Cladding member configuration



View





1 出发大厅	1 Departure Hall
3 值机区	3 Check-in
9 近机位候机区	9 Waiting Lounge
13 出发到达廊	13 Corridor
14 预留扩建区	14 Reserve Zone

Section A-A'

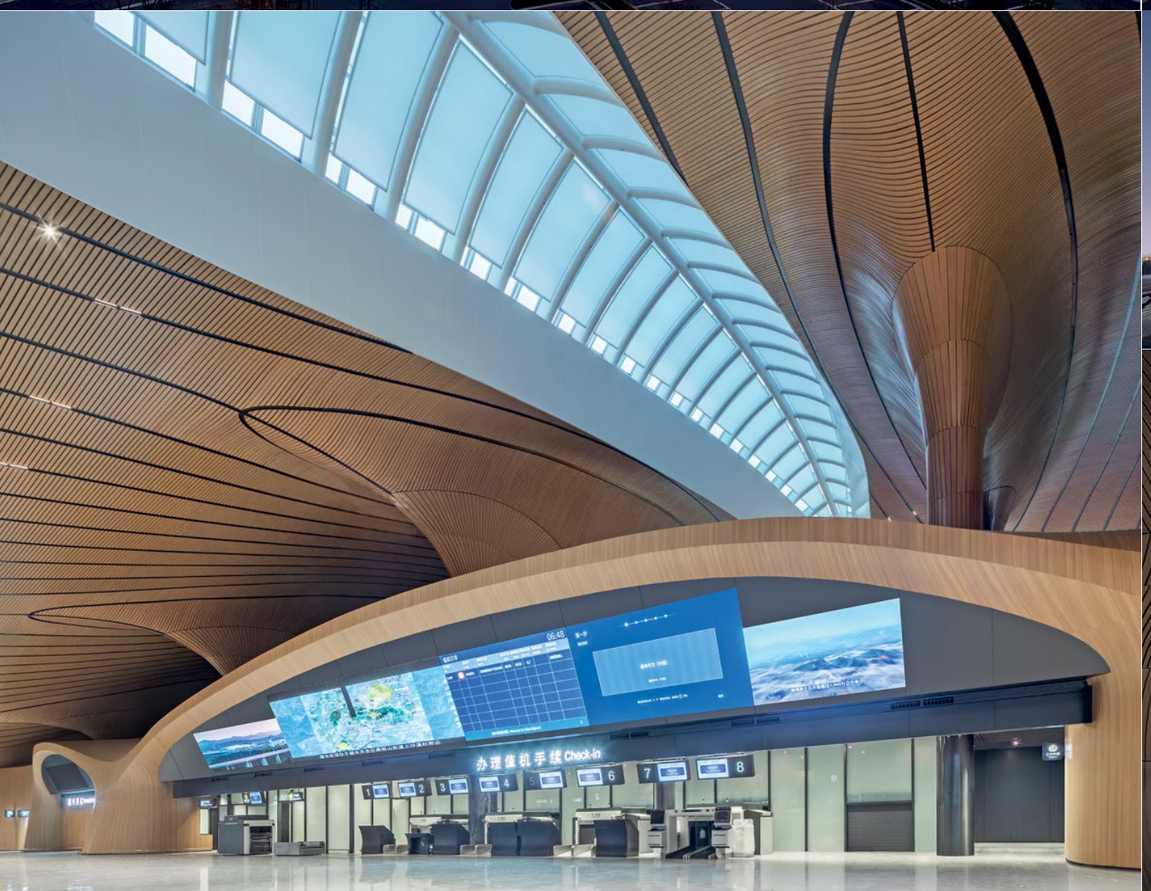
Scale 1:500 Paper Size: A3

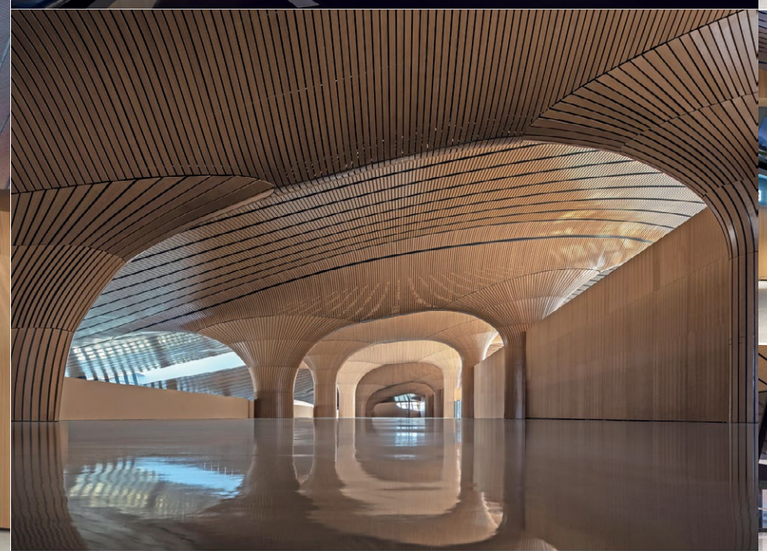
0 10 20m

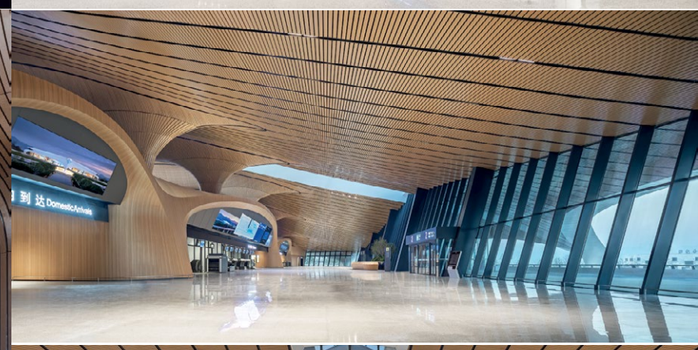
5


丽水机场


03
02
01


办理值机手续 Check-in




到 达 Domestic Arrivals

JIAXING CIVIC & CULTURAL CENTER

Jiaxing, China
Facade & Interior Design, Consultants and suppliers coordination - DD + CD
2021 - 2026
Under construction

Client: Jiaxing Highway Investment Co., Ltd.
Firm: MAD Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings and presentations.
Credits: Ma Yansong, Dang Qun, Yosuke Hayano, Liu Huiying, yin jianfeng, alessandro fisalli, fu xiaoyi, chen-hsiang chao, he yiming, thoufeeq ahmed, chen hao, he xiaowen, zhang yaohui, guo xuan, edgar navarrete, claudia hertrich, deng wei, zhang xiaomei, chen nianhai, li cunhao, alan rodriguez carrillo, sun feifei, punnin sukkasem, manchi yeung, li yingzhou

The center's three organic-shaped venues are enclosed together by a circular roof to form one unified entity, inspired by the shape of the historic canal towns of the Yangtze River. These floating roofs form one continuous skyline, bringing a sense of uniformity to the structures. Regardless of where visitors are standing, the project's dynamic forms change the scenery with every movement.

To maintain the cohesiveness of the structures in the interior, all three venues, which serve different functions, are coherently organized under the curvy roof. The spaces for exhibition, theater, education, entertainment, and other facilities compliment each other organically. The center's first floor serves as a semi-public-semi-private space, connecting the facilities to the surrounding environment on all sides, either by bordering the municipal traffic, or connecting the central lawn with the parklands. This blurred space can be used for daily activities, or as an open-air plaza.

The terrace on the second floor creates a 350-meter-long landscape corridor, which the public can climb to as a walk or exercise, or visit the amphitheater and sunken plaza on the east side. The cascading terrace facing the central lawn in the building's interior interlocks and overlaps into multiple semi-outdoor spaces, separated by minimalist floor-to-ceiling glass.

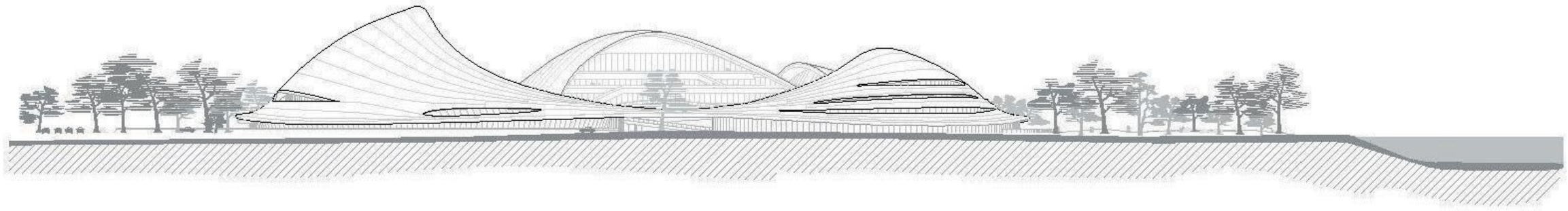
The waterfront building, which sits adjacent to the South lake, is covered with locally produced white ceramic panels. The choice of material responds to the traditional barrel tile roofs of the local village, and enhances the project's economic and energy efficiency. The original trees on the site are preserved as much as possible, complimenting the design of the landscape and forming a new natural park.

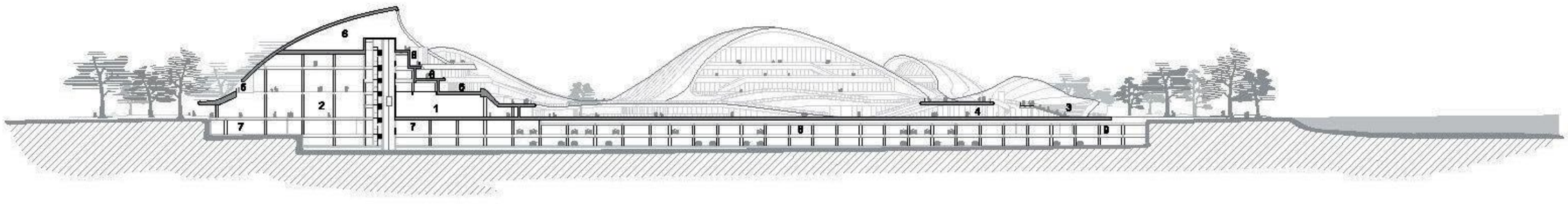

① Science and Technology Museum
② Youth Center
③ Women and Kids Center
N
0 20 40 60 100


0 20 40 60 100m
首层平面
Ground Floor Plan


0 20 40 60 100m
二层平面
Second Floor Plan


0 20 40 60 100m
三层平面
Third Floor Plan
Lobby
Theater
Multi-function Hall
Interaction Room
Administration
Study Room
Activity Room
Special Reserved Office Space
Permanent Exhibition Hall
Special Exhibition Hall
Temporary Exhibition Hall

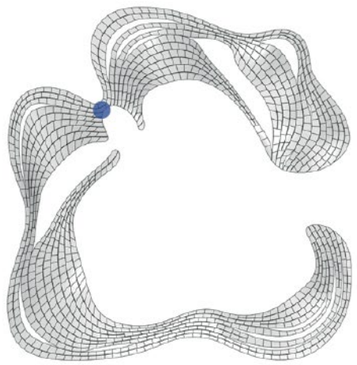




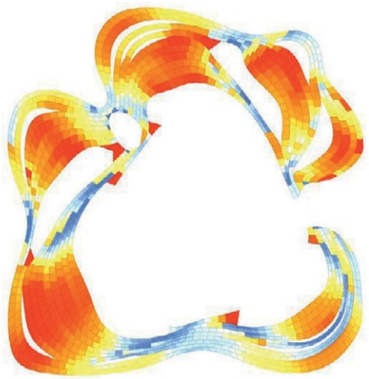
0 20 40 60 100m

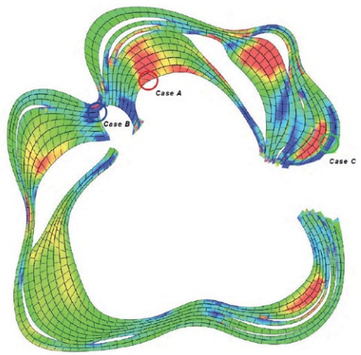
剖面图A-A'
Sections A-A'

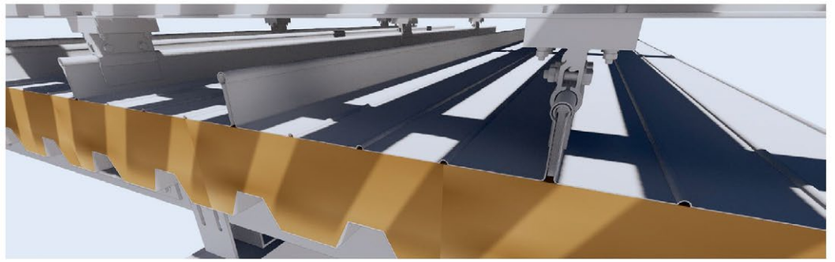
1.大厅 Lobby
2.展览区 Exhibition
3.圆形剧场 Amphitheater
4.电梯提升候房 Podium
5.文化艺术展区 Exhibition Area
6.雷台 Terrace
7.机电 MEP
8.停车场 Parking
9.装卸区 Loading Area

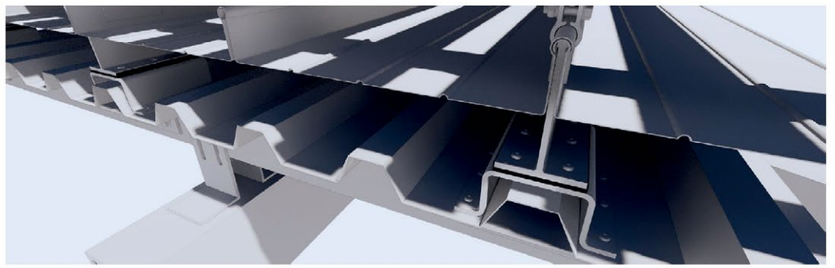


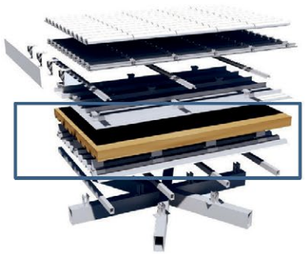
Top view location

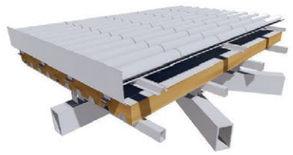








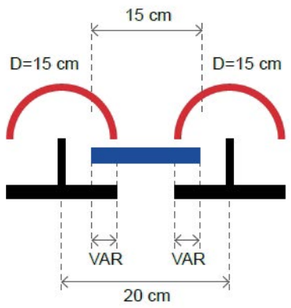




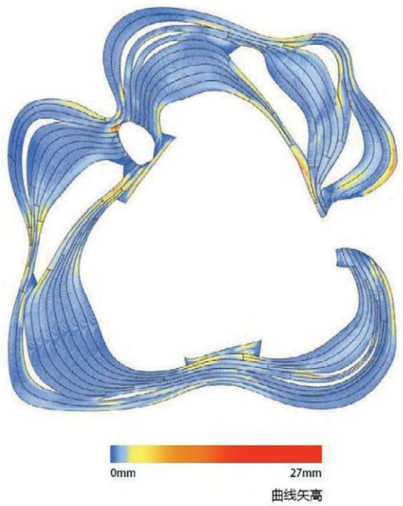
Total tiles

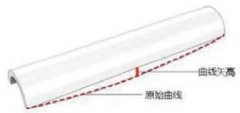
Arc tiles = 170 (21.57 m²)

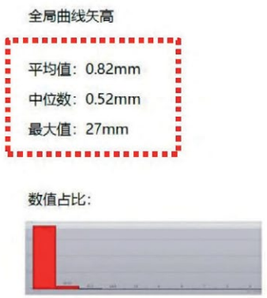
Flat tiles = 175 (13.73 m²)

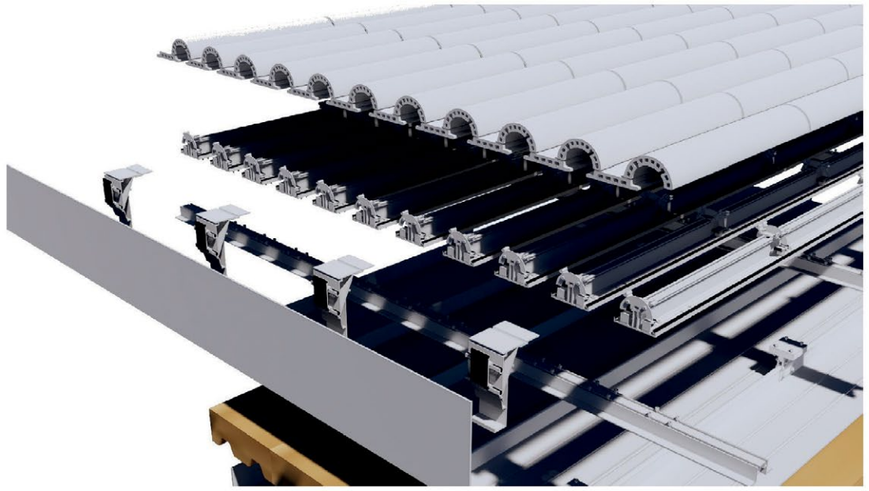


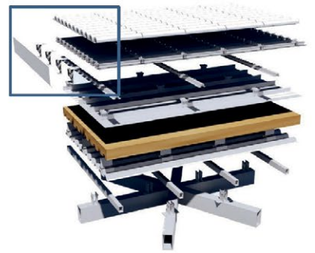
2D typical tile section setting out

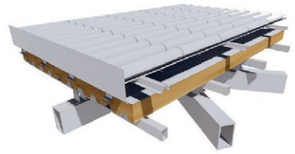


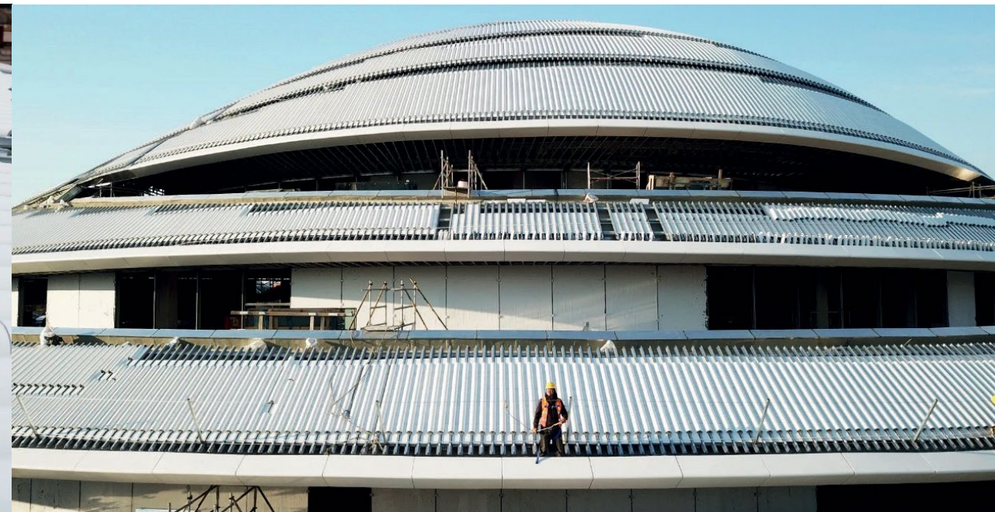












PLOT 04 TENCENT DACHANWAN PROJECT

Shenzhen, China

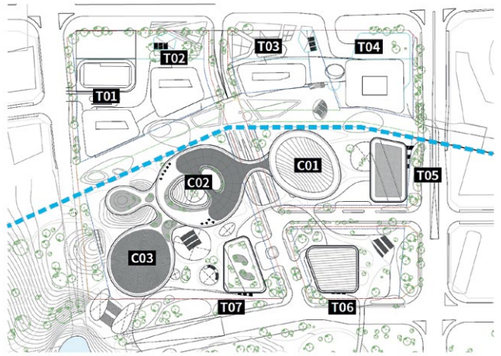
Exterior & Interior Facade design & Geometry optimization. Podium rationalization. Consultants and suppliers coordination.- SD + DD + CD

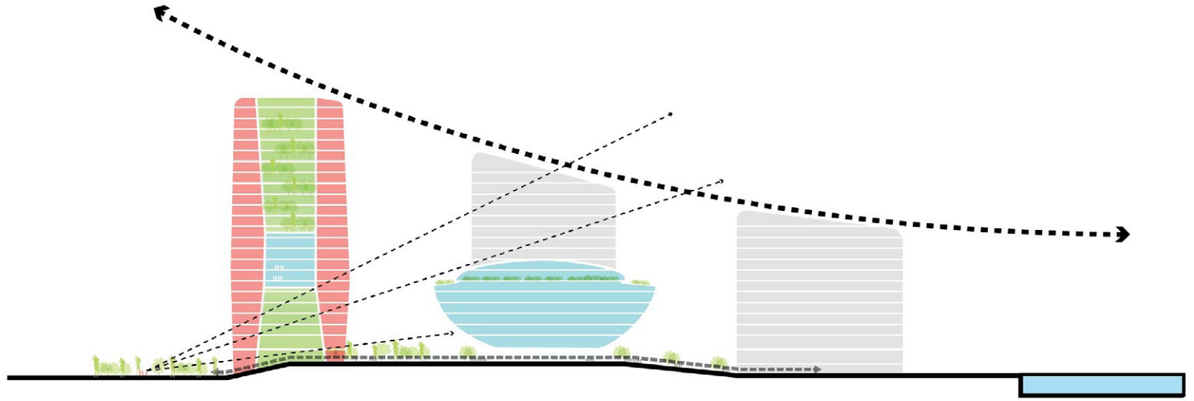
2020 - 2025

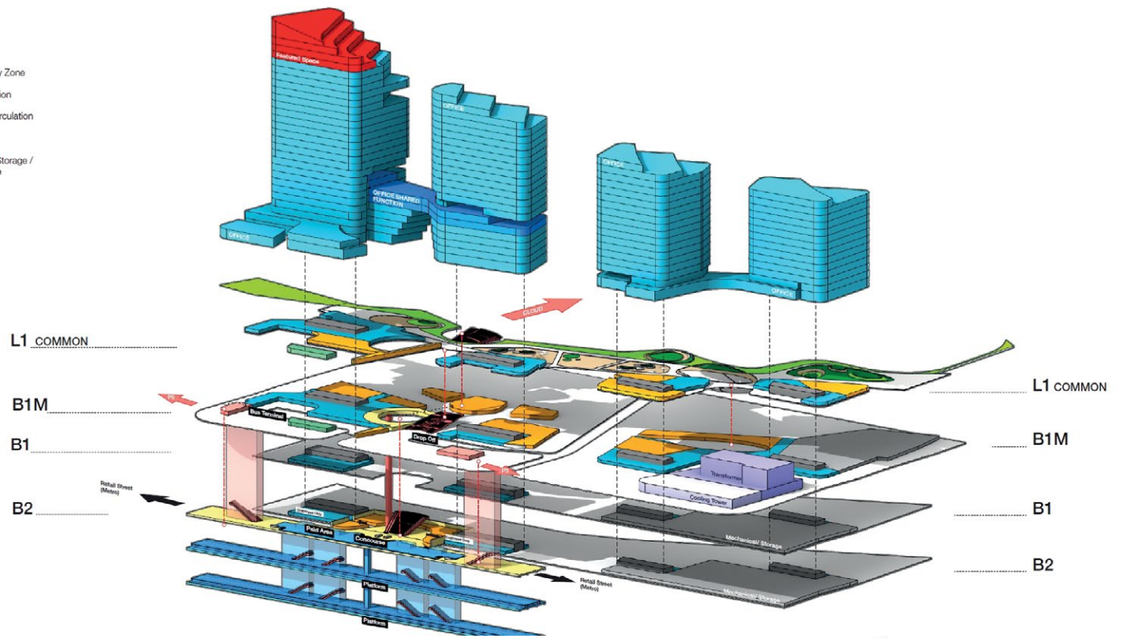
1st Phase Completed - 2nd Phase Under Construction

Client: Tencent Holdings Ltd.
Firm: MAD Architects
Responsabilities: 2D drawing, 3D modeling, parametric modelling & geometric control, scripting, databases diagrams, renderings, presentations and LDI / SUP coordination
Credits: MAD Architects, SUP, LDI, NBBJ & WB

As the most cutting-edge leader in the global Internet industry. Tencent regards talent and technological innovation as its important assets.
Tencent's business model that connects you and me and is full of social responsibility
meets everyone's needs. And accompany family, friends, and colleagues to experience all aspects of the digital age.
User value constitutes Tencent's corporate philosophy, it has also become the next important strategic plan for Tencencent. The core demand for the environment
of Shenzhen Dachan Bay area improve the comprehensive service functions of the entire city from the urban scale to provide individuals with inclusive and vibrant work, leisure and living spaces the entire vibrant new urban area.
All are conveying Tencent's values of integrity, positivity, tolerance and collaboration.
Based on the characteristics of the Bay Area itself, the way we design results in design products that face the future and will last forever, to easily cope with different work and leisure situations.
An open, interoperable and collaborative working environment will support innovative talents to continue to forge ahead, promote technological breakthroughs and explore the possibilities of the future.
MAD believes in the potential value of contemporary design should be found in designs with vision, fluidity, flexibility and a sense of technology. These designs open up the dialogue between human beings and nature, the earth and the sky, and ultimately affect our perception and understanding of the space around us. By balancing people, cities and the environment, we discover how nature and humans can create a spiritual and emotional connection. We will work together to
create a new chapter in the Tencent story a unique space that emerges from its experiential qualities. This is a higher-level planning and development pattern flexible, self-adaptive and non-hierarchical, all-in-one connected community, a people-oriented and sustainable an immersive space at its core.







T01
T02
T03
T04
T05
T06
T07
C01
C02
C03
WEST AREA
西区
EAST AREA
东区

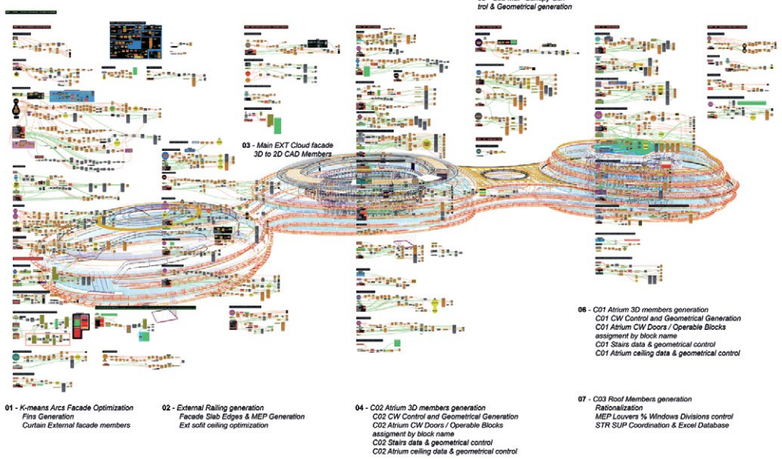
WEST AREA
西区
EAST AREA
东区
JING ER ROAD

办公大厦
办公大厦
办公大厦
咖啡厅
办公大厦
健身房 / 食堂
食堂
客人会议室
腾讯客厅
食堂
冷却泵站
变电站
商业
地铁站
办公存储
办公室
停车

Retail
Employee Only Zone
Public Circulation
Paid Zone / Circulation
Core
Mechanical / Storage / Back of House
L1 COMMON
B1M
B1
B2
L1 COMMON
B1M
B1
B2

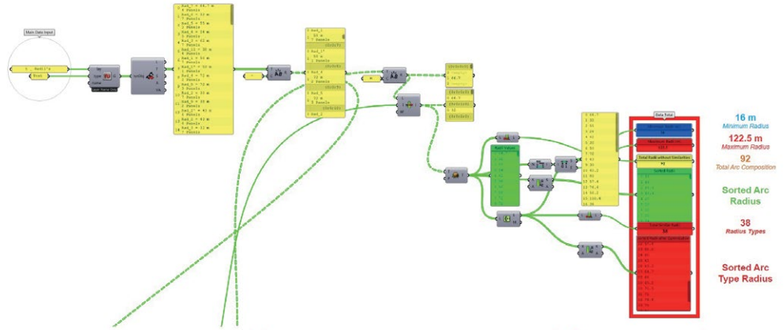
WEST AREA
西区
EAST AREA
东区
JING ER ROAD

+45.50 F08
+41.50 F07
+36.70 F06
+31.90 F05
+27.10 F04
+22.30 F03
+17.50 F02
+11.50 F01M2
+05.50 B1M = GROUND
+00.00 B1
- 04.00 B2
-11.00 B3 = SUBWAY LINE 15
-17.00 B4 = SUBWAY LINE 9
4000
4800
4800
4800
4800
4800
6000
6000
5500
4000
7000
6000
40000

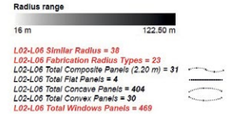


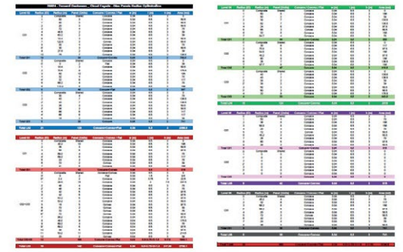
CLOUD 半径优化细分
CLOUD RADII OPTIMIZE

Grasshopper Similarities Algorithm

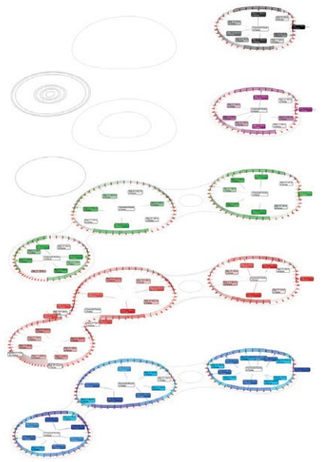


CLOUD F01 - F06 平面
C01 + C02 + C03 - 3D ISO VIEW



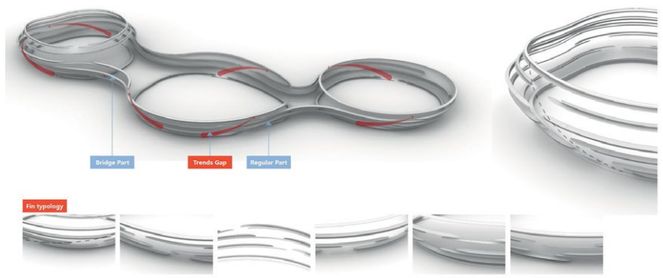


Excel Chart for all the levels of the Cloud Building

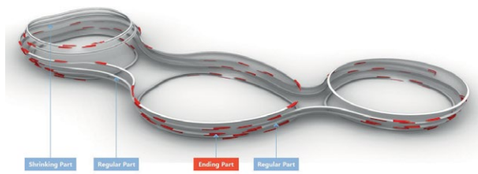


云楼挑檐设计
CLOUD FIN DESIGN

飞檐排列遵循体型之势，盘旋往复，开合有度。在追型丰富转换的连接段避免过多变化。



云楼挑檐设计
CLOUD FIN DESIGN



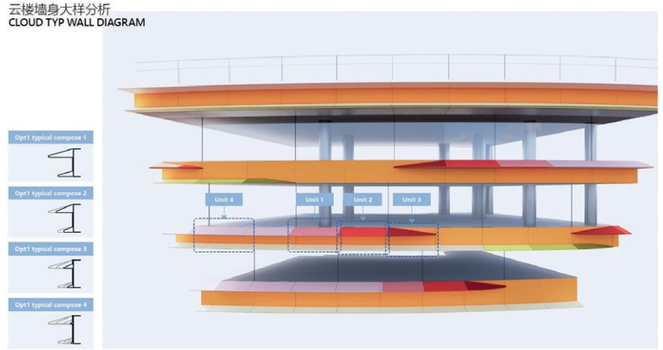
Ending Part 飞檐末端依托板边有理化条件进行定位，在满足造型需求条件下尽可能减少不同半径类型，共19种半径

Regular Part 飞檐标准段随板边有理化条件定位，截面不变，覆盖墙身大部分区域

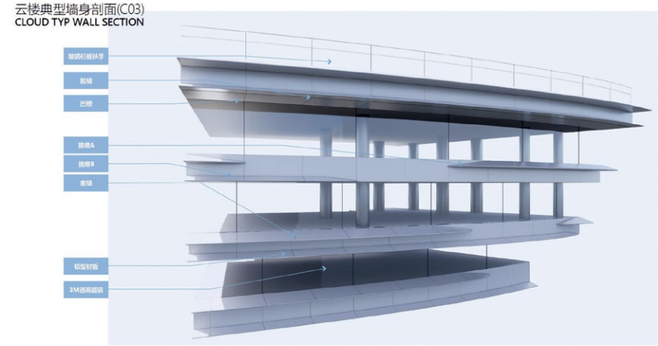
Fin A:	Fin B
24	32 (31)(31.7)
31	40.2
32 (31.7)	42 (42.7)
40.2 (39.5)	48
42 (42.7)	53.2
43.5 (43)	54.5 (54.7)
53.2	55
54.5 (54.7)(55)	58.8
58.8	62 (62.8)
62	70 (69.2)(70.5)
63.2 (62.8)	72
69.2	76
70.5	97.7
72	-54
76	
96.2	
97.7	
-54	

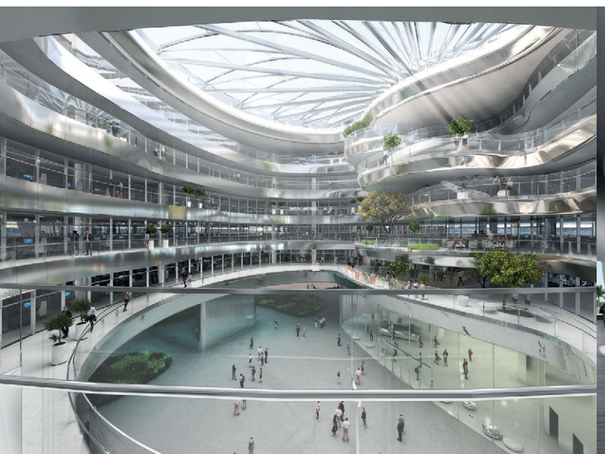
Radius control (unit:M)

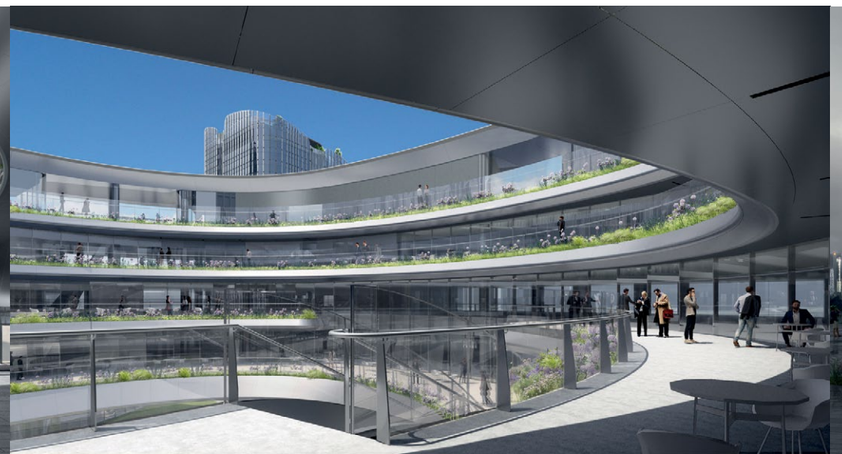
云楼墙身大样分析
CLOUD TYP WALL DIAGRAM



云楼典型墙身剖面(C03)
CLOUD TYP WALL SECTION

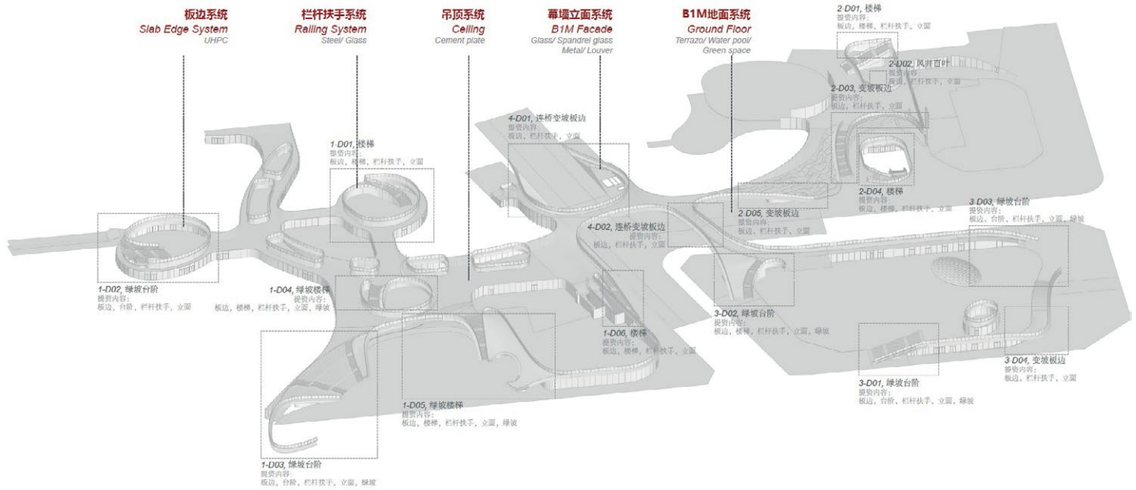






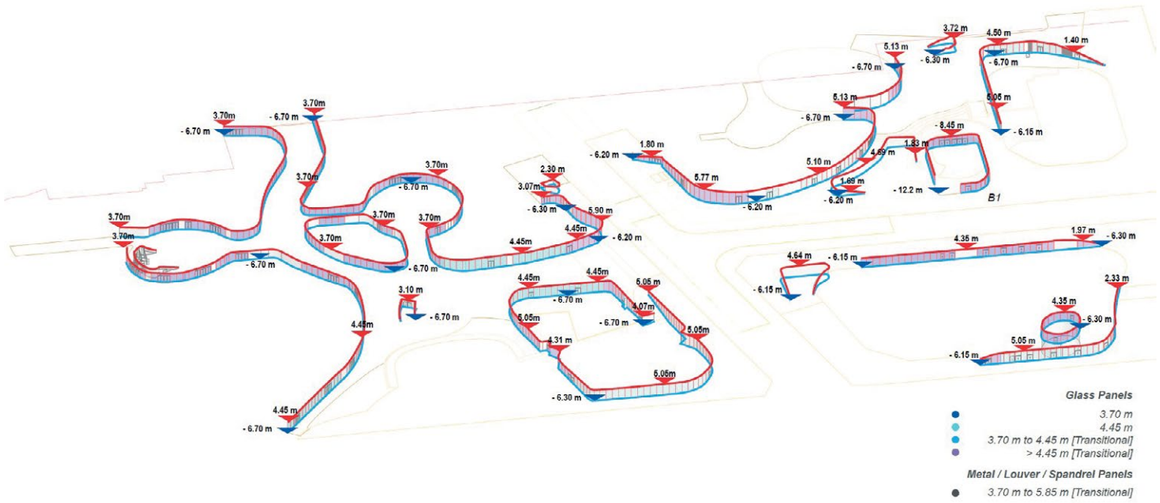
系统总览
02 - B1M MAIN SYSTEM CONFIGURATION

General Overview



B1M 幕墙立面系统-高度分区与控制
06 - B1M STOREFRONT FACADE CONFIGURATION-height division and control

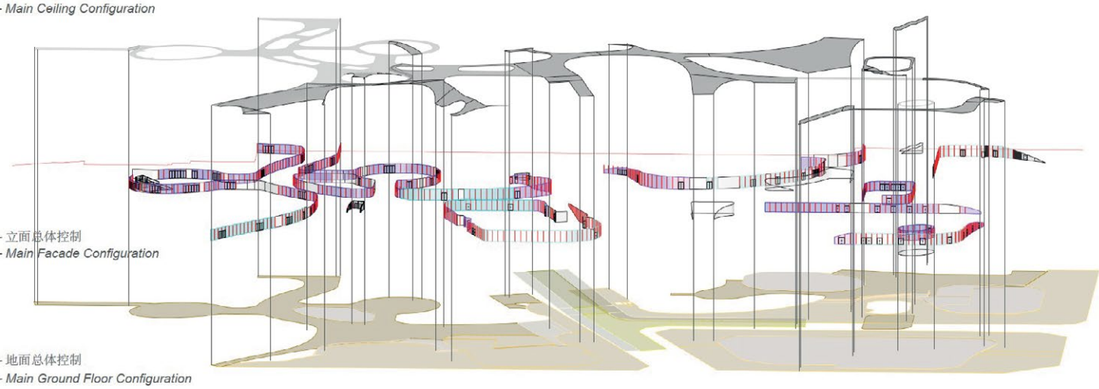
Storefront Facade Panel Types + Setting Out



体系总结
08 - MAIN MEMBERS CONFIGURATION

B1M Main Ceiling + Facade Control Setting Out

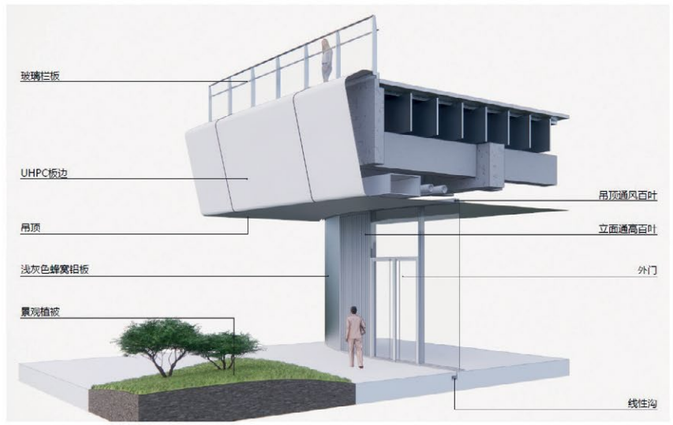
A - 吊顶总体控制
A - *Main Ceiling Configuration*



B - 立面总体控制
B - *Main Facade Configuration*

C - 地面总体控制
C - *Main Ground Floor Configuration*

样板段模型分析
细部条件



DGDA GRAND MOSQUE

Riyadh, Saudi Arabia
Architectural & Facade Design & Coordination - DD + IFT + IFC
2023 - 2030
Under Construction

Client: DGDA
Firm: X - Architects
Responsabilities: 3D modeling, parametric modelling & geometric control, scripting, diagrams, renderings, discipline coordination and presentations.
Credits: X-Architects, Werner Sobek, Ramboll, Waho, KCA, Neolight, TNB, DZT, RBA, ZFP, DGJ, KBR, and AQUASHI

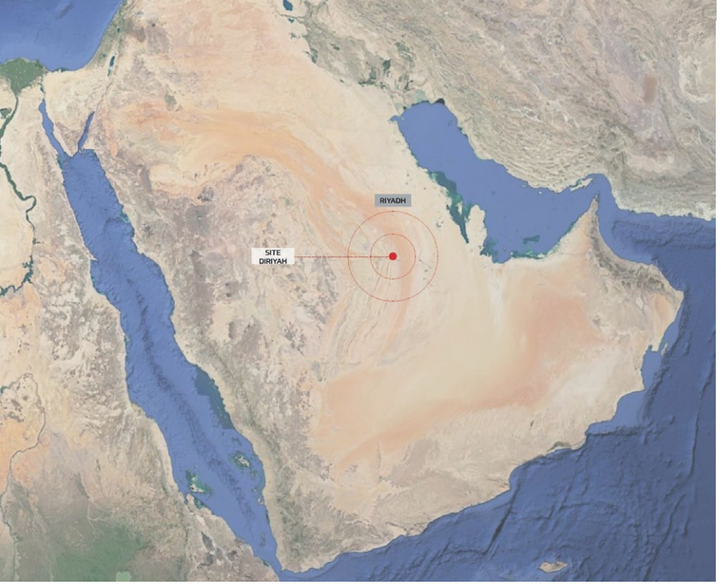
The plot is nestled alongside the existing wadi, presenting a remarkable opportunity to harmoniously merge a spiritual place of worship with the surrounding nature. This unique juxtaposition creates an awe-inspiring setting where the essence of spirituality converges effortlessly with the serene beauty of the environment.

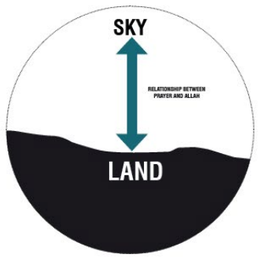
In the past, the mosque played a central role in the communal life and essence of the neighborhood. However, over time, the mosque became more isolated as a prayer space without the social activities. Our proposal aims to revive the lost connection by introducing dedicated urban spaces, ultimately creating a mosque that will serve as a unifying force for the community.

How can we design a mosque that effectively combines spirituality, community, and cultural education into one space? Instead of seeing these aspects as separate, how can we visualize them as interconnected parts that together form a strong and unified whole?

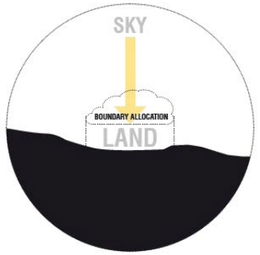
We see the mosque as a threshold between the sky and the land where the light descends ambiguously through the layered mesh to form a spiritual place. While at night, the inverse happens, the mosque becomes the source of light and the beacon on the boulevard.

The traditional Najdi architecture is all about pure geometries, simplicity and forcefulness. This inspired our approach of the two triangular figures, in their two and three-dimensional form. To bridge the gap between the old and the new, we grasped the embedded meanings of the architectural elements and reinterpreted it into a contemporary visual expression of a Najdi Silhouette.

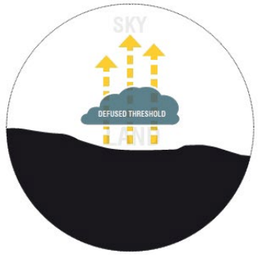




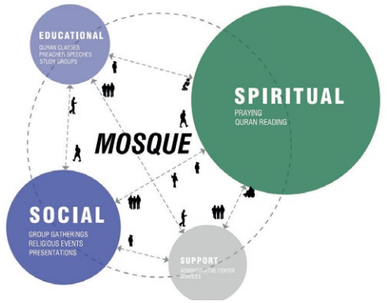
LAND TO SKY

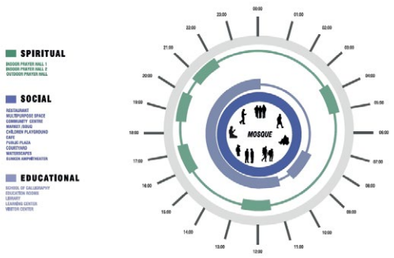


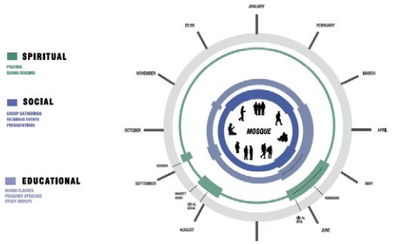
CLOUD AS THRESHOLD

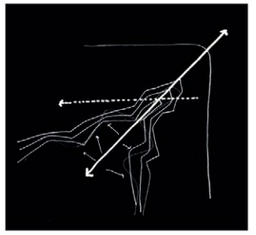


DEFUSED ROOF FORMATION

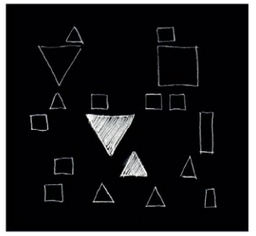




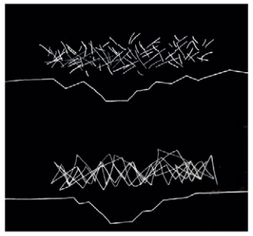




SITE FORCES

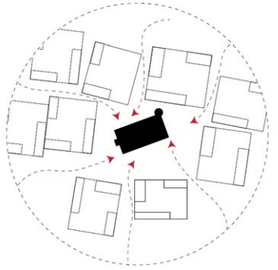


HERITAGE

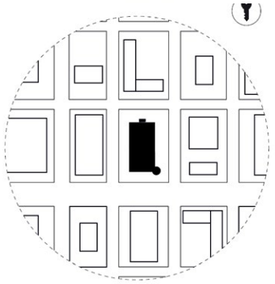


CLOUD

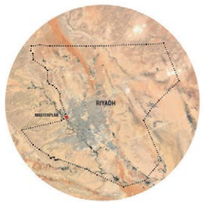
CONNECTION SEEMS INEVITABLE



PAST
MOSQUE AS AN URBAN HUB

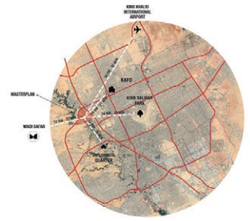


PRESENT
MOSQUE AS AN OBJECT



DIRIYAH GATE II LOCATION

MAIN ACCESS ROADS



DISTANCES

Gateway

Minaret

Mihrab

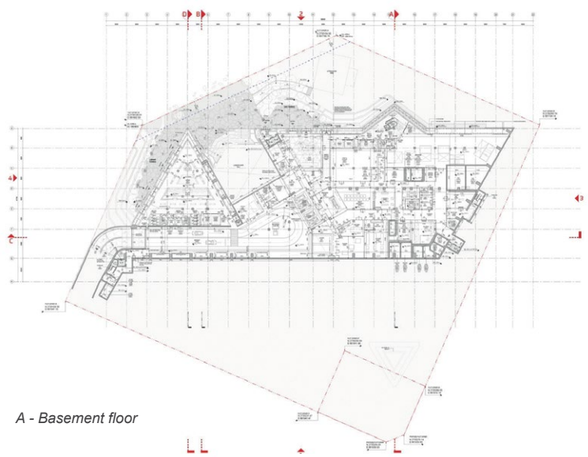
VIP Entry

Openings

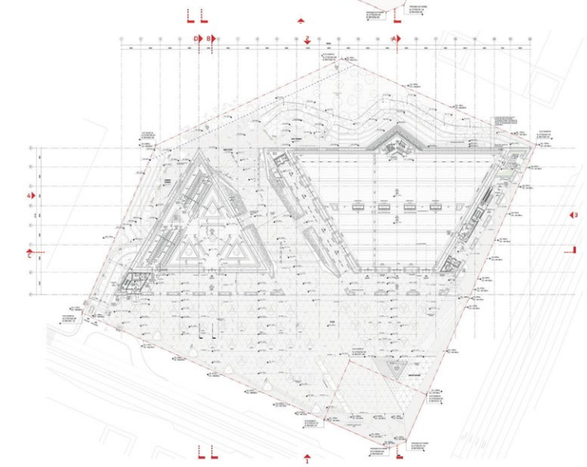
Location *Concept* *Building elements*

Main north plaza view

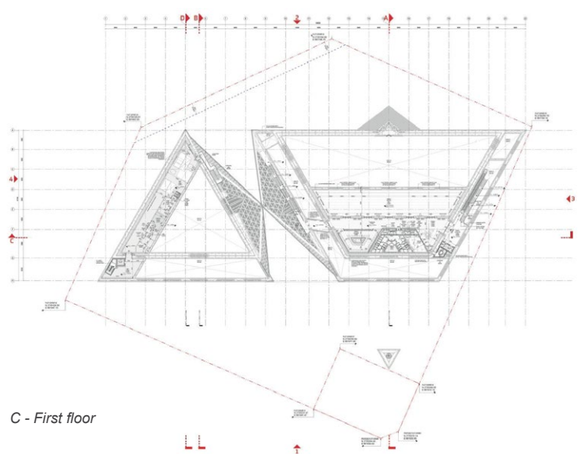
Gateway wadi side view



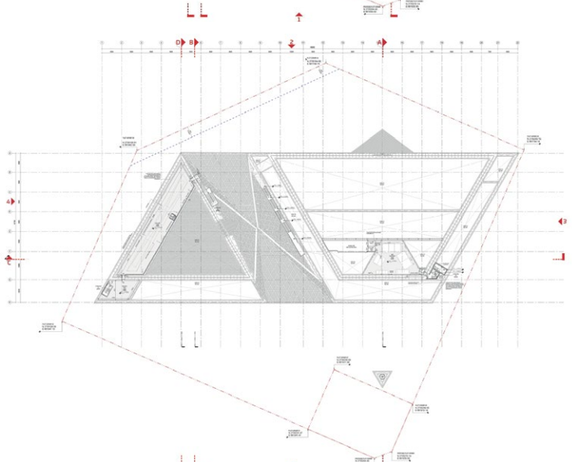
A - Basement floor



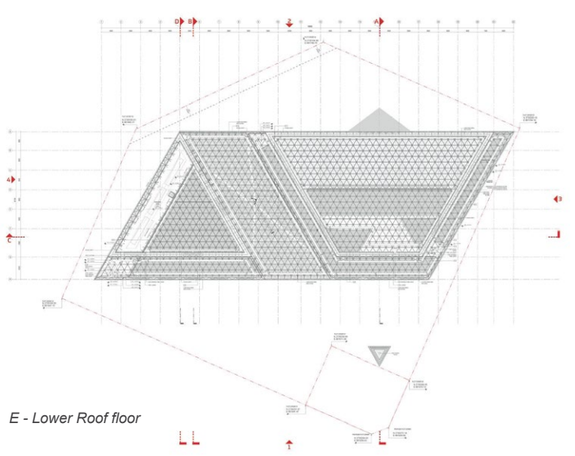
B - Ground floor



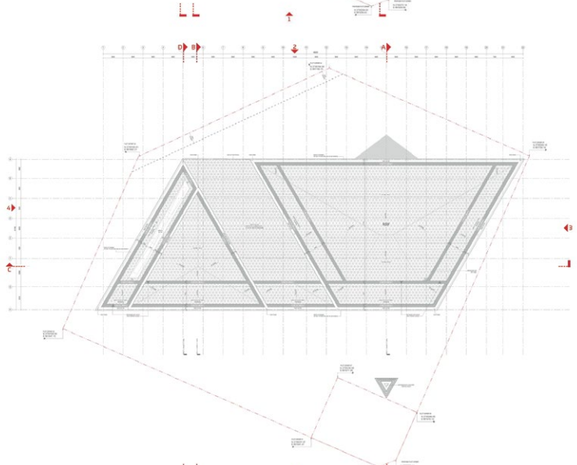
C - First floor



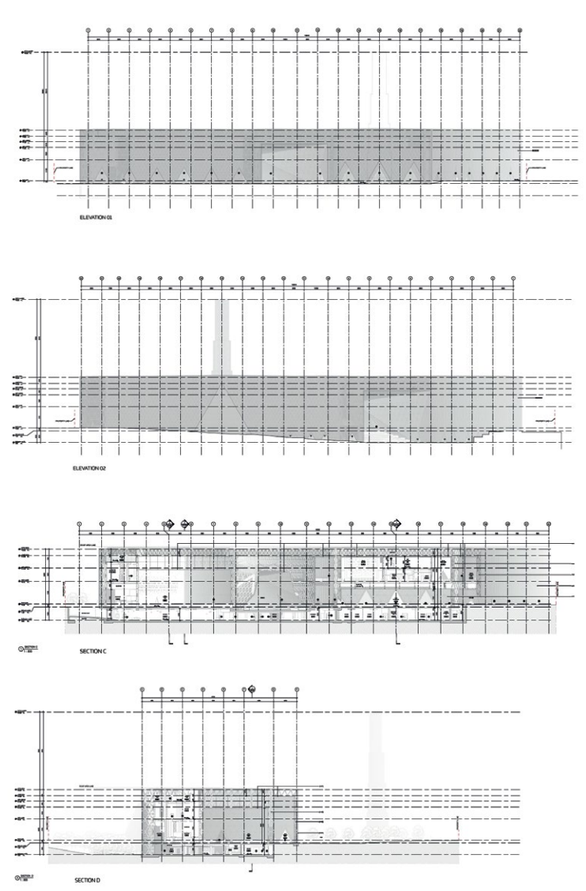
D - MEP floor



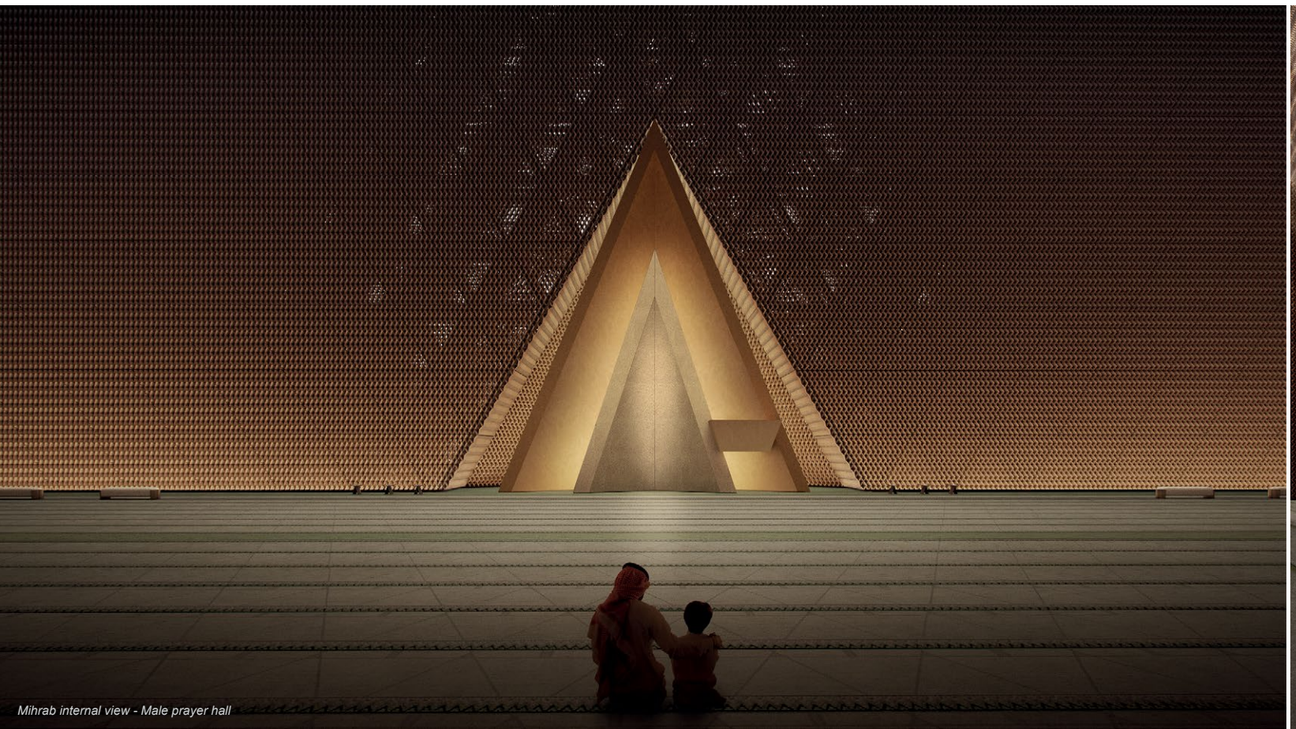
E - Lower Roof floor



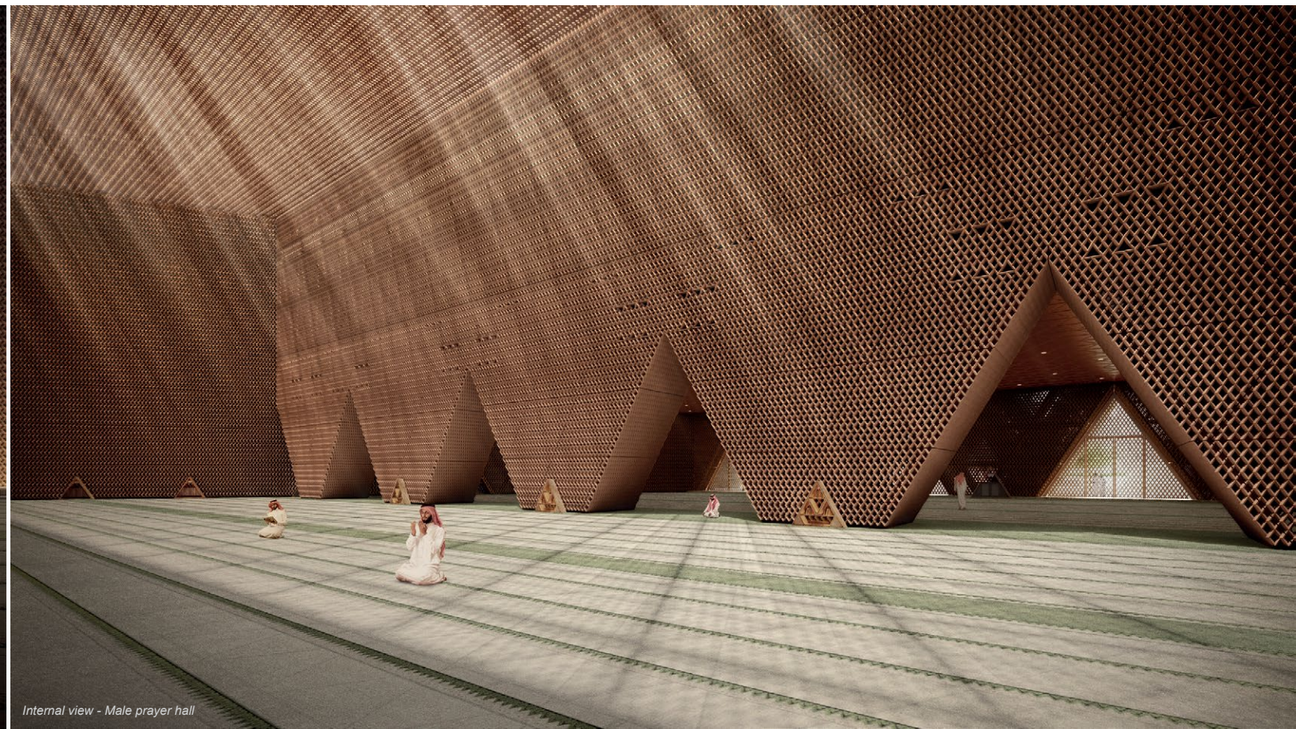
F - Roof floor plan



G - Building elevations & sections



Mihrab internal view - Male prayer hall



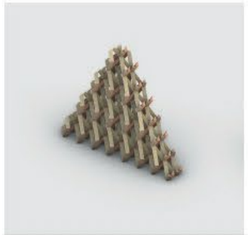
Internal view - Male prayer hall

Building Envelope

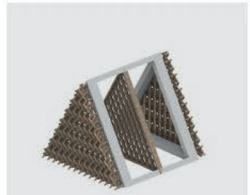
Facade

Building Envelope

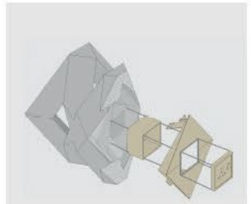
Roof



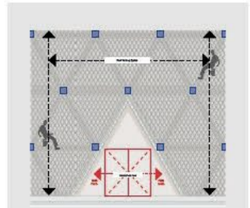
Design Intent



Facade Types



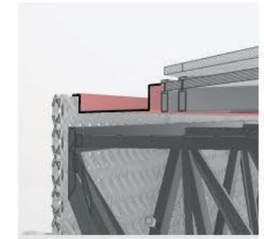
Facade Details



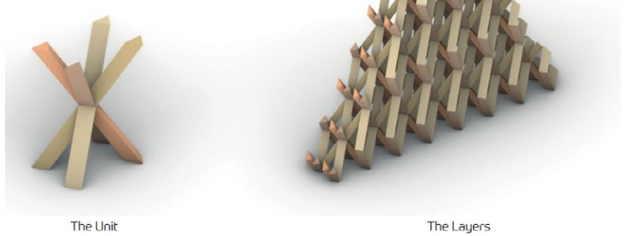
Facade Maintenance

Roof Types & Zoning

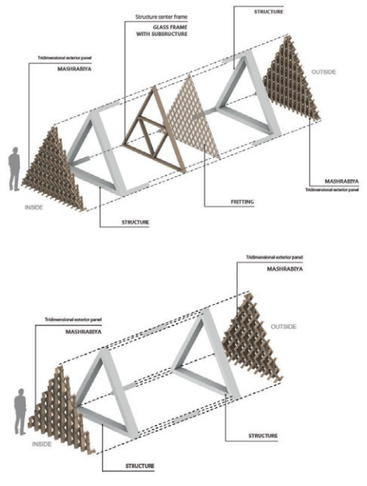
Roof Maintenance



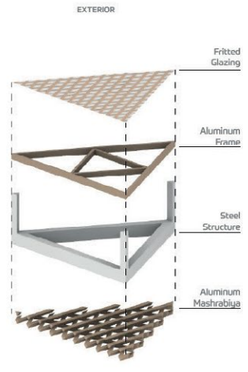
Roof Drainage

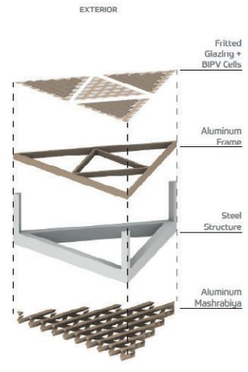


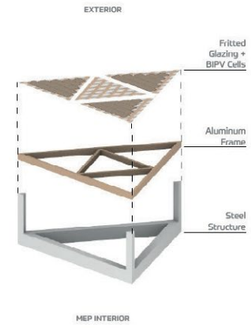
01 - GRC Mashrabiya design module principle



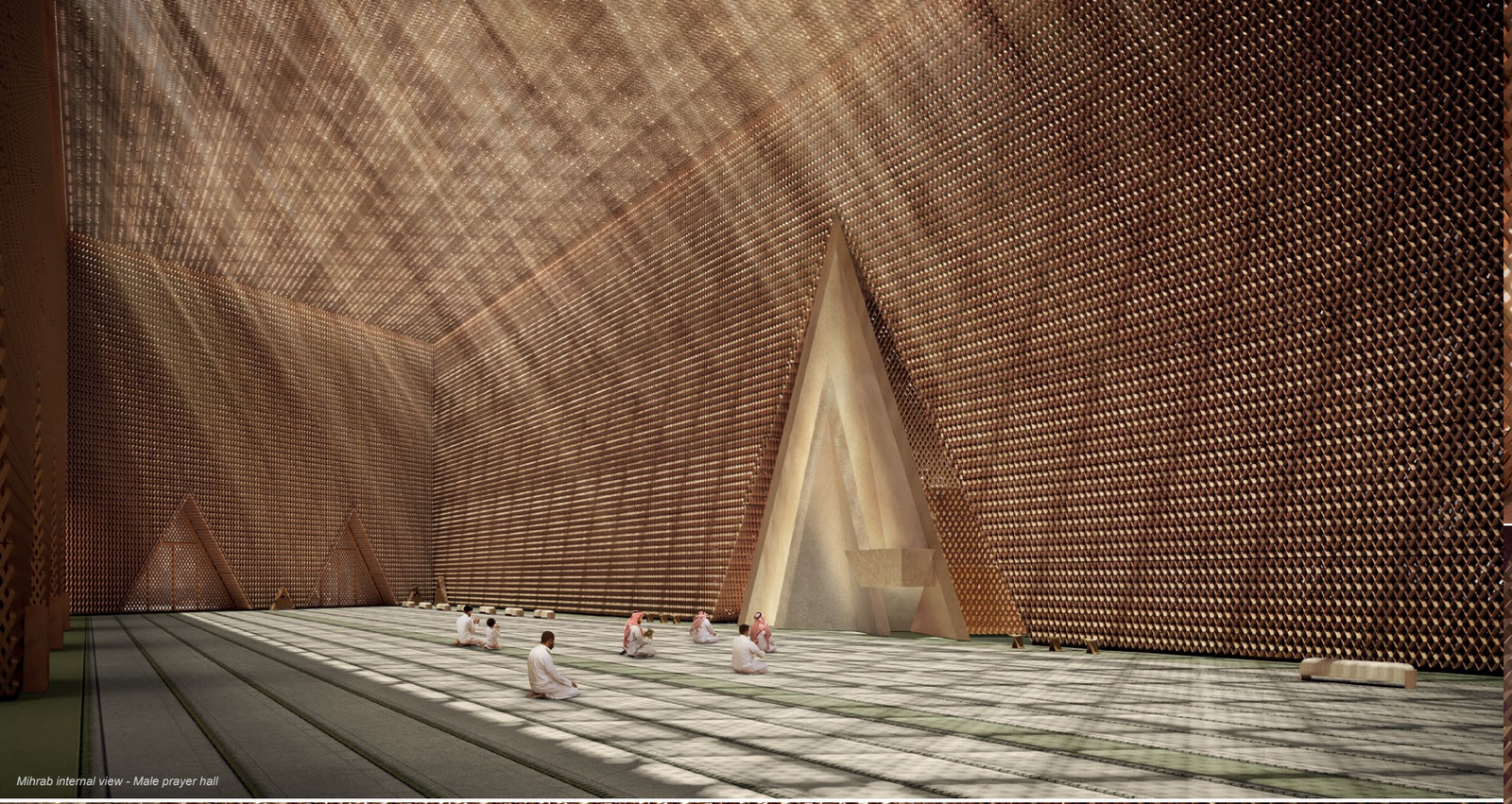
02 - GRC Mashrabiya facade types





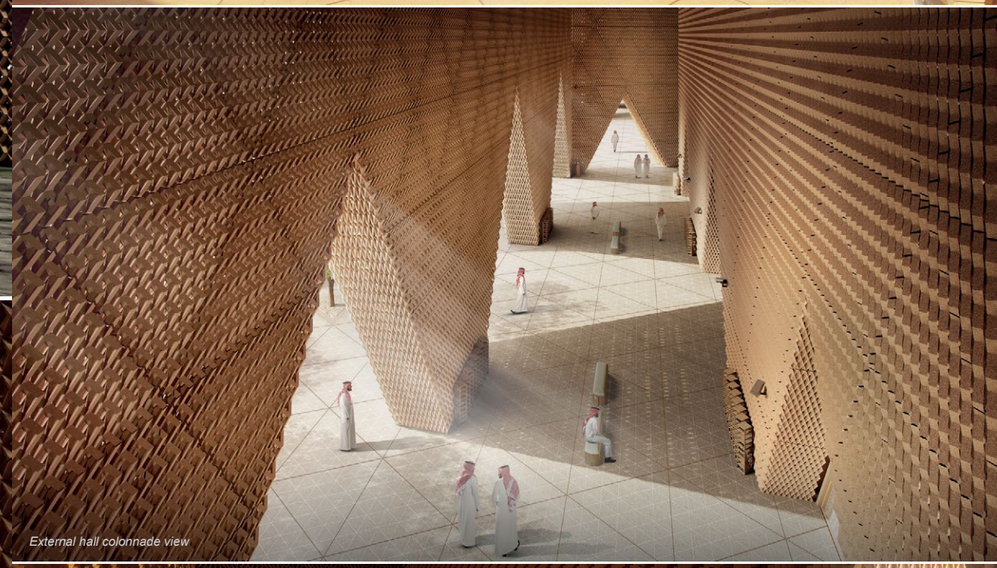


03 - Envelope skylight roof system & types

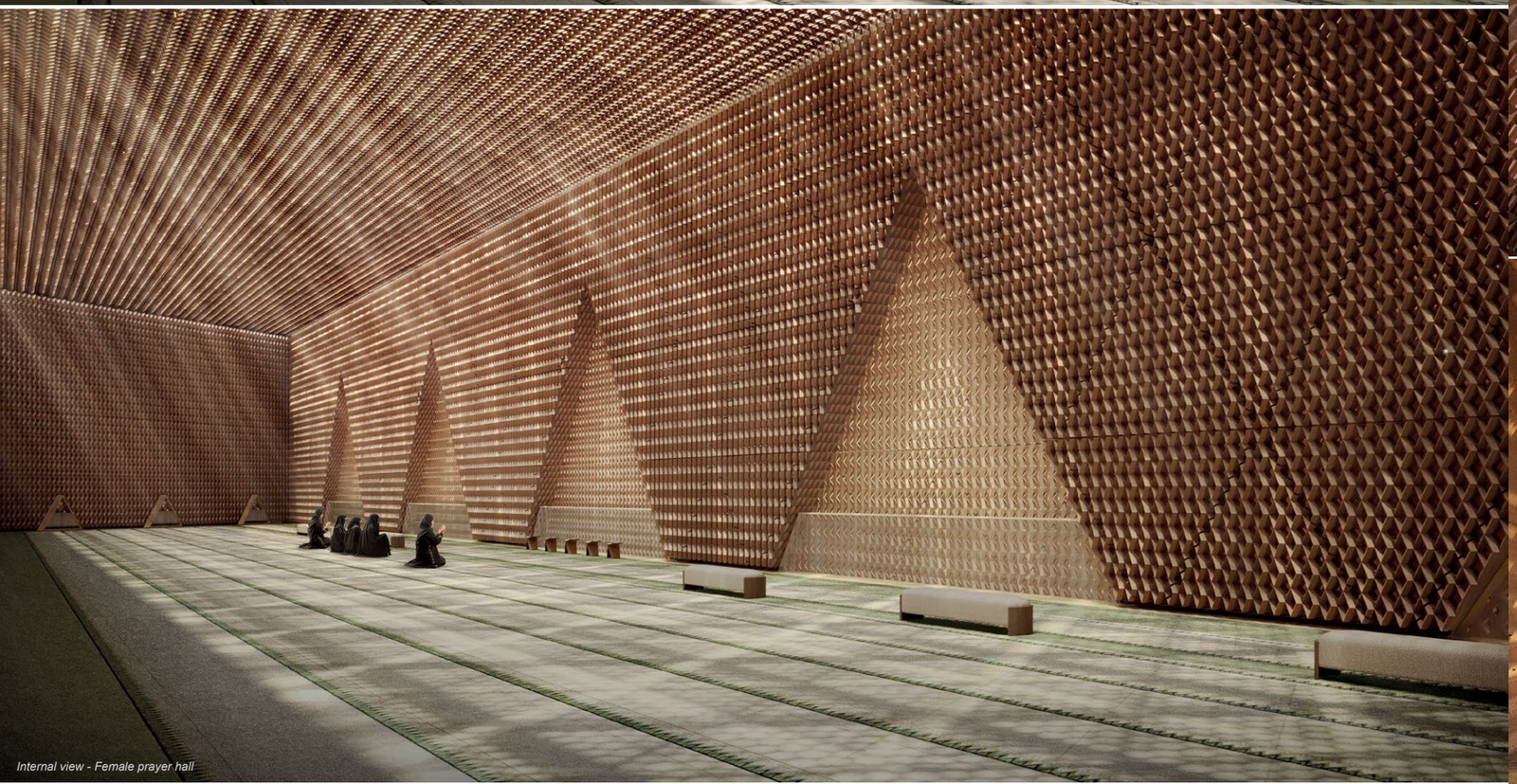


Mihrab internal view - Male prayer hall

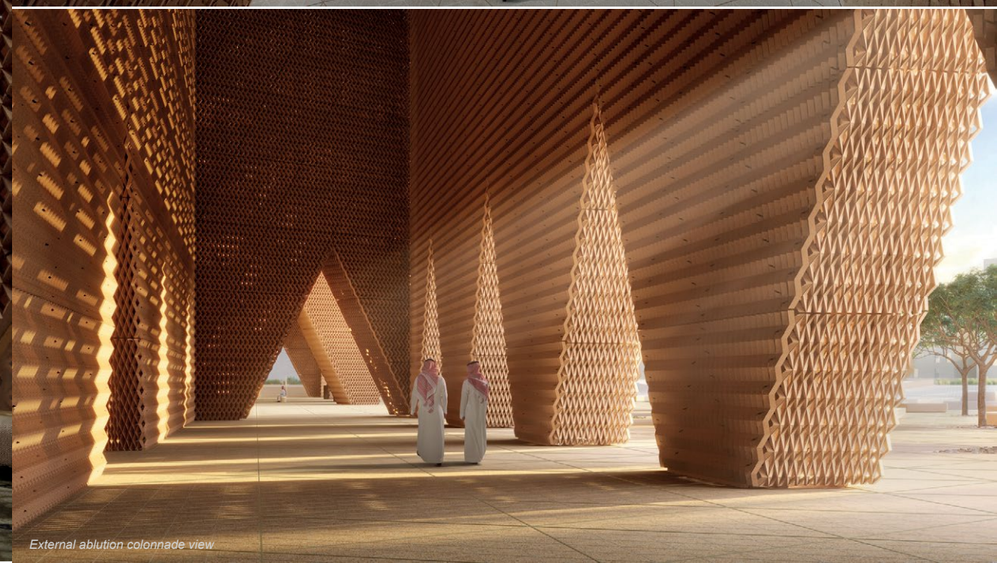
External minaret colonnade view



External hall colonnade view



Internal view - Female prayer hall



External ablution colonnade view

[AI] ARCHITECTURAL DESIGN RESEARCH IMPLEMENTATION

Midjourney + Stable Diffusion & Comfy + ChatGPT AI Engine Models
Design prompting engineering for architectural image concept generation

Firm: [NA] Architects Ltd.
Department: Computational Design & Machine Leaning + AI Research
Responsabilities: Concept design ideas & Prompting Engineering
Credits: Alan Rodriguez Carrillo & Na Wang, ChatGPT 4.0 AI model. Midjouney server on Discord

Artificial Intelligence (AI) is a broad and interdisciplinary field that aims to create machines capable of intelligent behavior. The mid-journey for AI architecture and design involves a deep exploration of both the theoretical and practical aspects of creating intelligent systems.

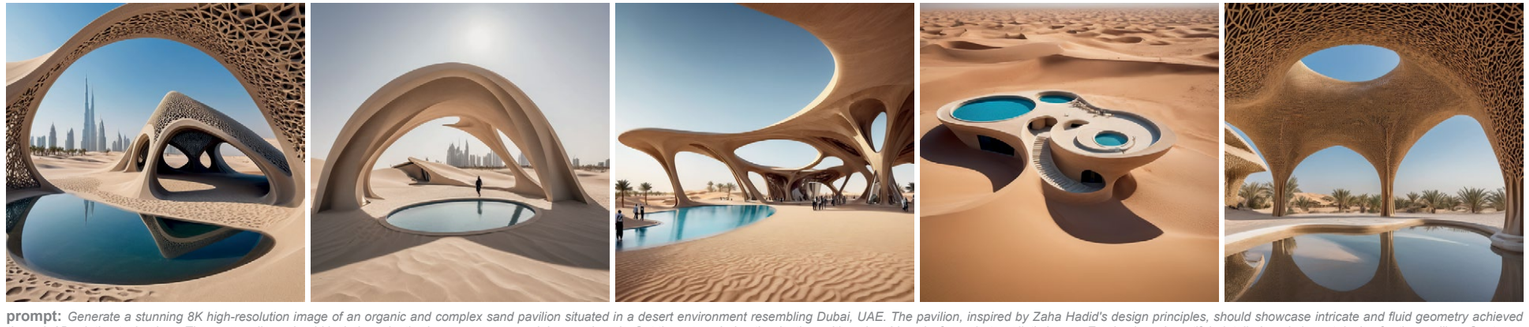
Mid-journey involves creating smart computers capable of tasks requiring human-like intelligence. This includes learning from data, solving problems, and understanding language. The architecture comprises machine learning models, neural networks, and natural language processing. Design considerations focus on making AI systems transparent, fair, scalable, and secure, promoting collaboration with humans and enabling continuous learning. Challenges include addressing bias and ensuring data quality. The future sees AI working on limited devices, being more understandable to users, and combining various data types for powerful applications, shaping industries and fostering creativity and innovation. In essence, mid-journey AI is refining models, addressing ethical concerns, and exploring new frontiers in technology.

prompt: *Create an awe-inspiring 8K resolution night vista, skillfully portraying the harmonious interplay of two soaring skyscrapers. Channel the intricate design essence reminiscent of Zaha Hadid, employing a fusion of glass, metal, and reflective white materials for a striking visual impact. Illuminate the building interiors with a warm, captivating radiance, capturing the vibrant life within. Envelop the surroundings with verdant green spaces and a mirror-like lake, enhancing the photorealistic allure under a pristine, starlit sky. Elevate the viewer's experience by crafting a scene that seamlessly blends architectural prowess with natural beauty.*

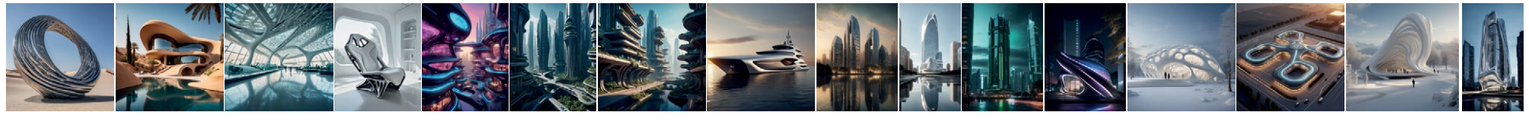
prompt: *Create a captivating 8K high-resolution image of a Martian colony, featuring 3D-printed structures using reflective earth materials. Infuse the design with organic and intricate geometries inspired by Zaha Hadid. Show astronauts seamlessly navigating both indoor and outdoor spaces, blending laboratories, and advanced mechanical installations. Render the scene during the Martian night, highlighting detailed interior lighting. Deliver a photorealistic masterpiece capturing the essence of a futuristic human settlement on Mars.*

prompt: *Generate a high-resolution 8K image of a vacation home situated on a beach. The house should be designed using 3D printing technology, inspired by the organic design of Zaha Hadid's architecture. The structure should comfortably accommodate a family of 5 members. The exterior should feature a pool for swimming. Include lush vegetation with tropical plants and trees. Ensure the design incorporates complex geometry and intricate details. Set a daytime with a clear sky and the rendering style should be photo-realistic.*

prompt: *Generate a stunning 8K high-resolution image featuring a reflective full human-shaped body merged and intricately linked with a machine interface, displaying organic branching interconnections inspired by the design aesthetics of Zaha Hadid. The scene should be set in an interior mechanical environment, showcasing complex, organic, and fluid geometry in the connection between the machine and human body. Capture the ambiance of a cyber computer approach with code programming displays and interior neon lights, creating a captivating nighttime atmosphere. Surround the main structure with humanoid robots admiring the intricate interaction. Ensure the image is photo-realistic, emphasizing the detailed beauty of the machine and human body connection within this futuristic setting.*



prompt: *Generate a stunning 8K high-resolution image of an organic and complex sand pavilion situated in a desert environment resembling Dubai, UAE. The pavilion, inspired by Zaha Hadid's design principles, should showcase intricate and fluid geometry achieved through 3D printing technology. The surroundings should include majestic skyscrapers, serene lakes, and pools. Set the scene during the daytime with a clear blue sky for a photorealistic image. Emphasize a beautiful, detailed, and elegant design for the pavilion. Capture a street full zoom perspective, providing a stunning view of the pavilion in its desertic landscape relationship.*



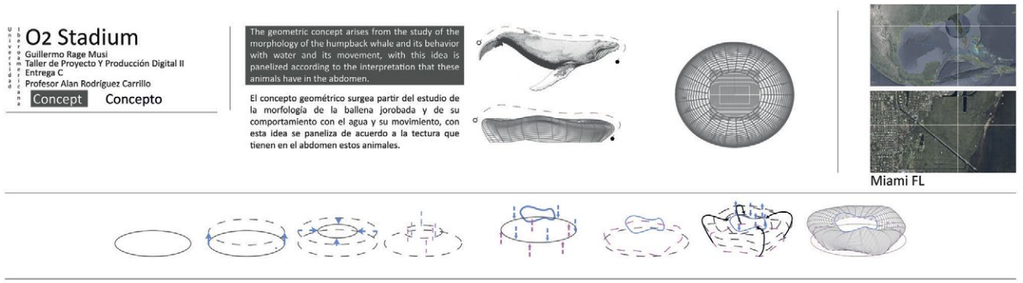
SELECTED STUDENTS ARCHITECTURE WORKS

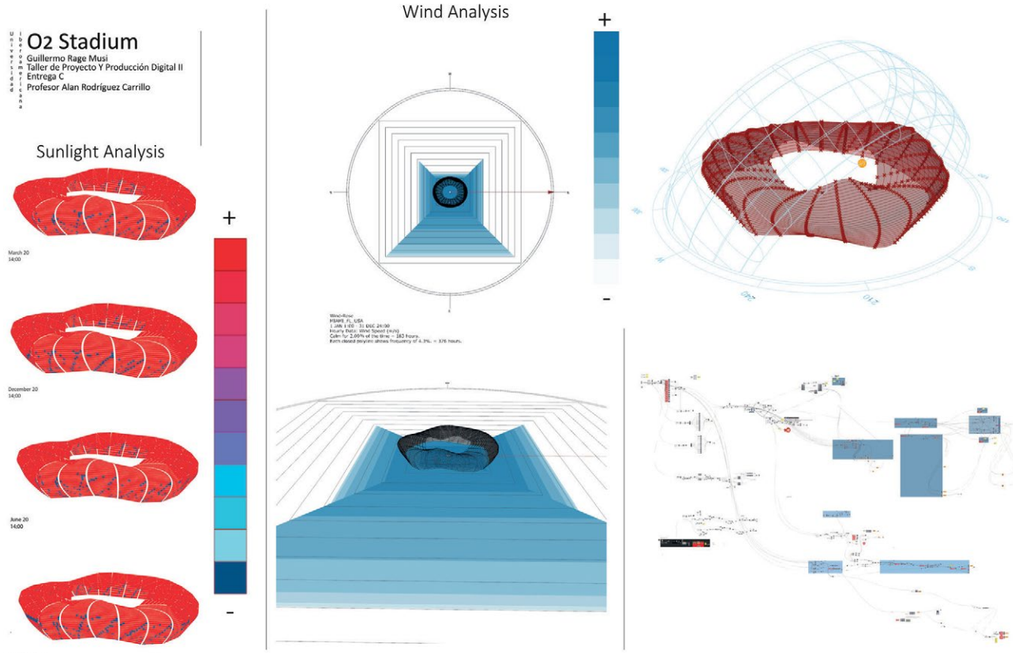
O2 STADIUM

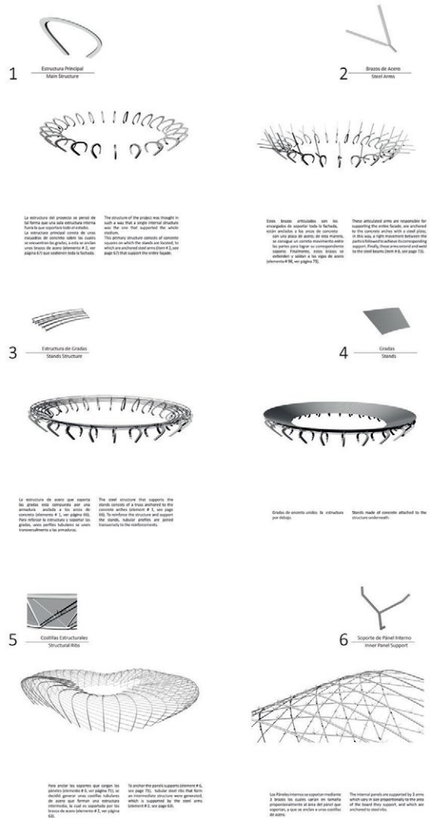
Miami, USA

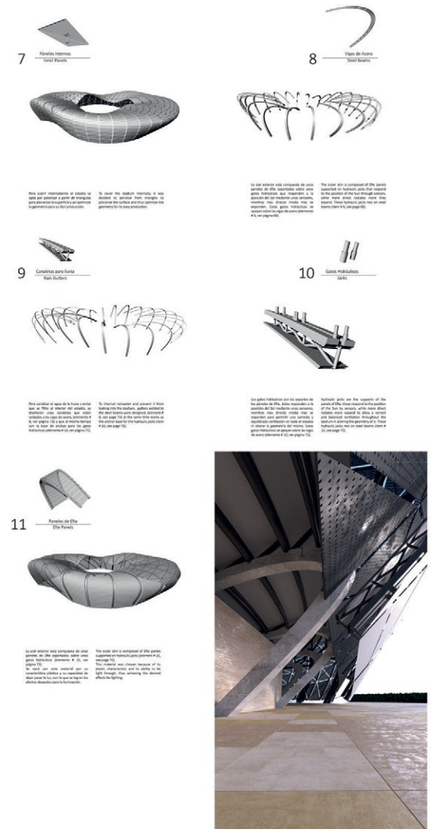
Subject Faculty Professor - 2018 / 2019

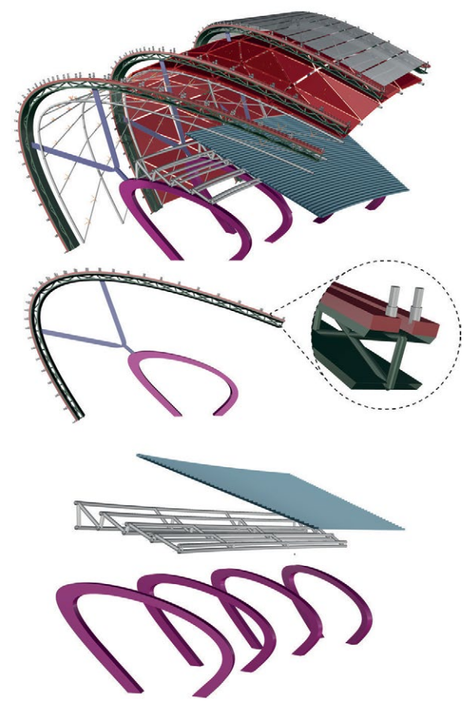
Client: Iberoamerican University
Department: Computational Design and Fabrication
Responsabilities: Teaching of parametric modeling tools, parametric design, advice and tutoring of computational design matters, 3D print and Digital fabrication.
Credits: Arq. Guillermo Rage Musi

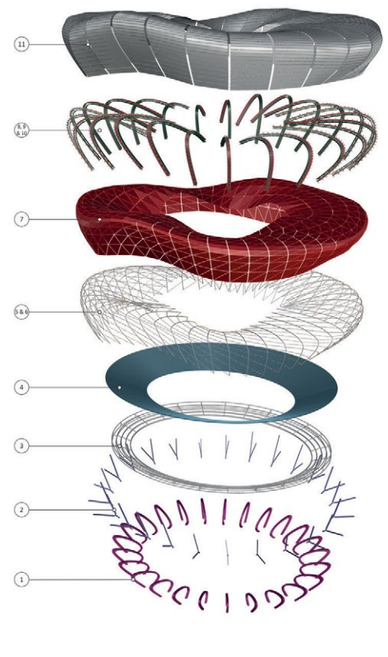








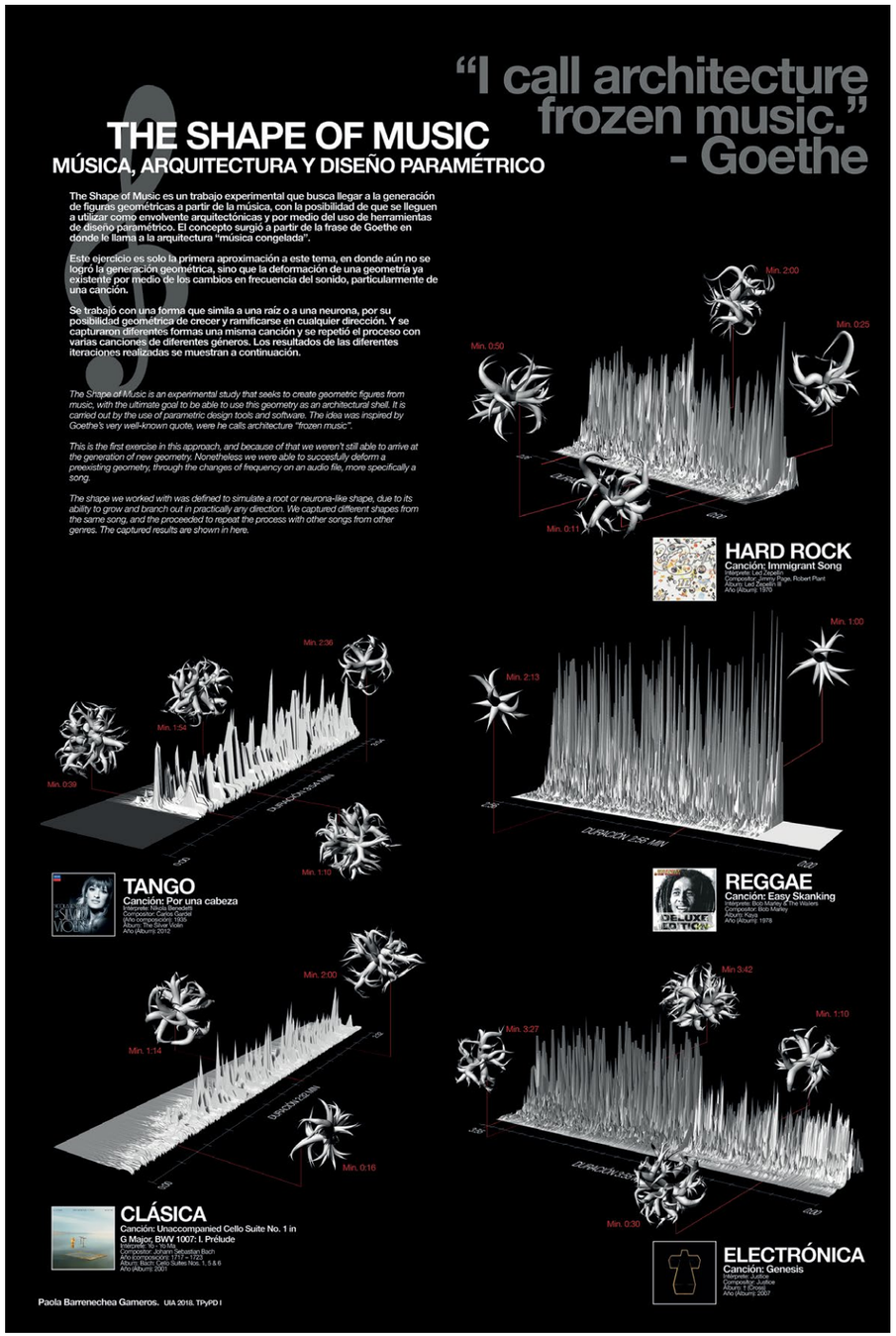




THE SHAPE OF MUSIC

Mexico City, Mexico
Subject Faculty Professor - 2018 / 2019

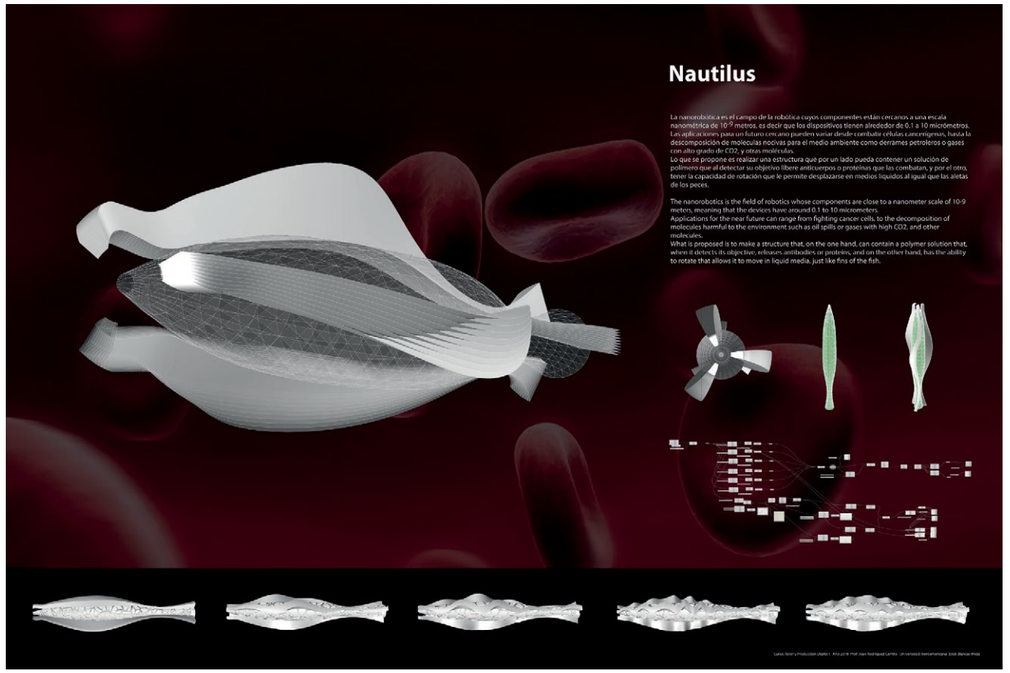
Client: Iberoamerican University
Department: Computational Design and Fabrication
Responsabilities: Teaching of parametric modeling tools, parametric design, advice and tutoring of computational design matters, 3D print and Digital fabrication.
Credits: Arq. Paola Barrenechea Gameros

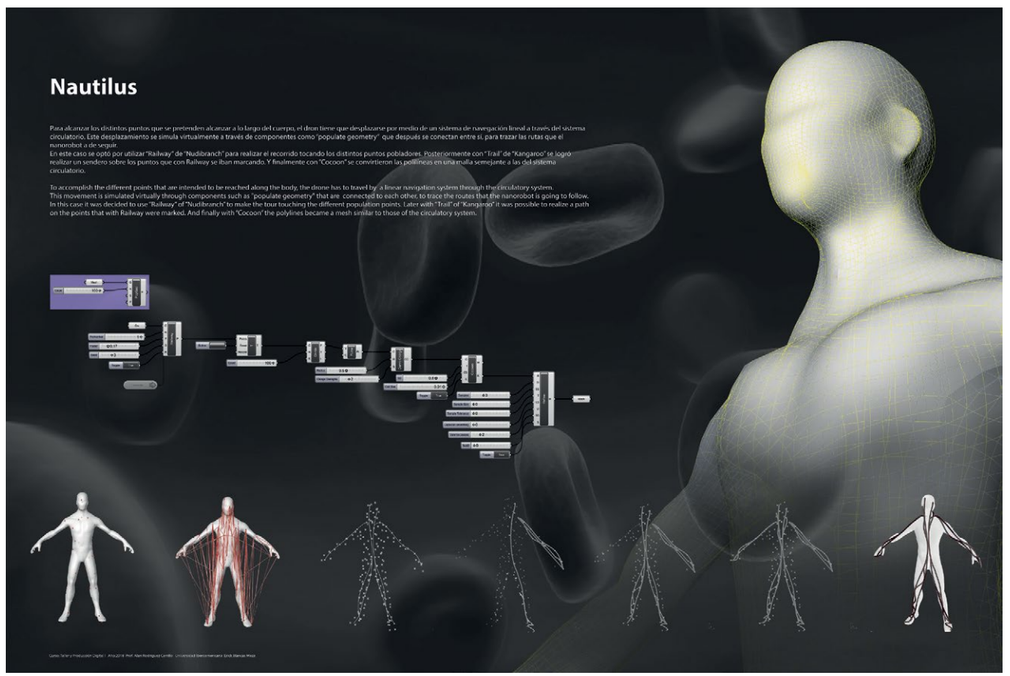


NAUTILUS

Mexico City, Mexico
Subject Faculty Professor - 2018 / 2019

Client: Iberoamerican University
Department: Computational Design and Fabrication
Responsabilities: Teaching of parametric modeling tools, parametric design, advice and tutoring of computational design matters, 3D print and Digital fabrication.
Credits: Arq. Erik Blancas Meza

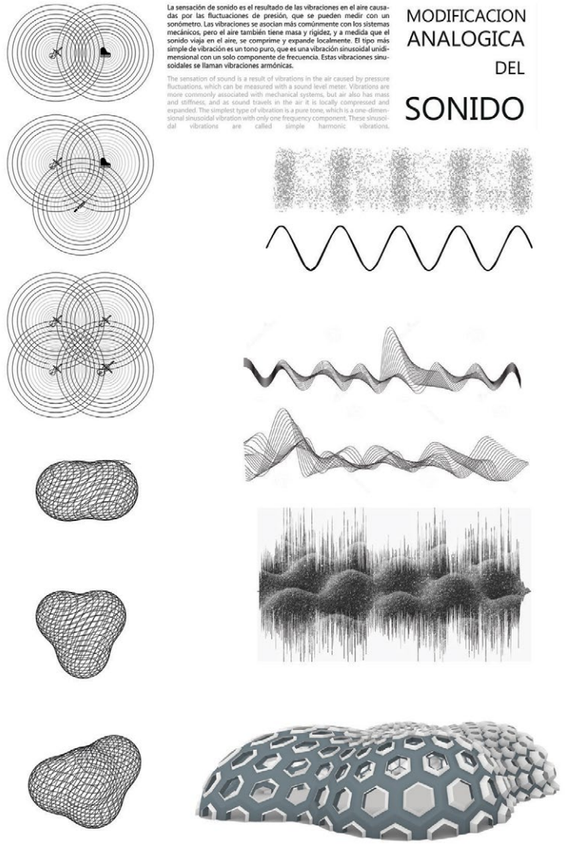


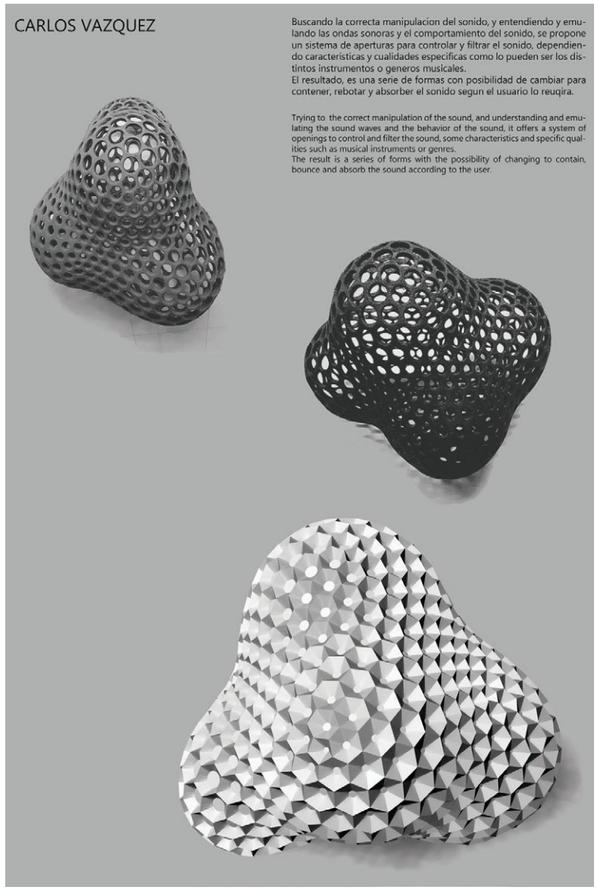


SOUND PAVILION

Mexico City, Mexico
Subject Faculty Professor - 2018 / 2019

Client: Iberoamerican University
Department: Computational Design and Fabrication
Responsabilities: Teaching of parametric modeling tools, parametric design, advice and tutoring of computational design matters, 3D print and Digital fabrication.
Credits: Arq. Carlos Vázquez González

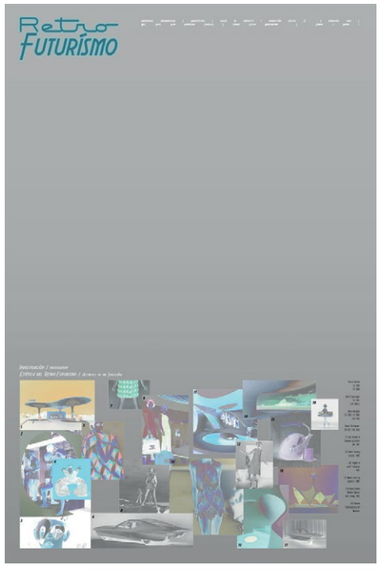


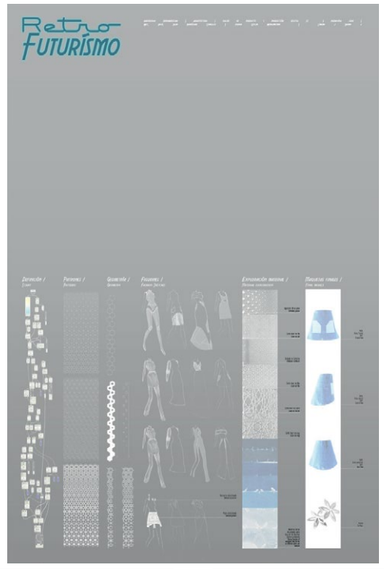


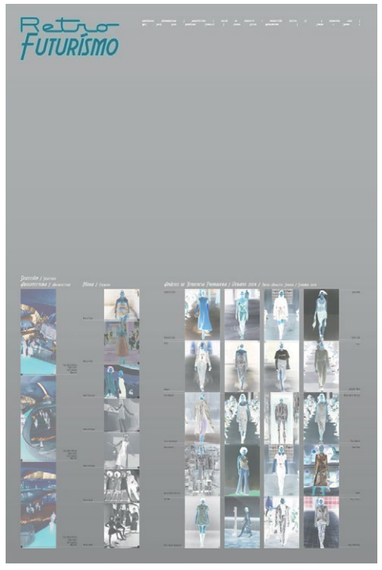
RETRO FUTURE

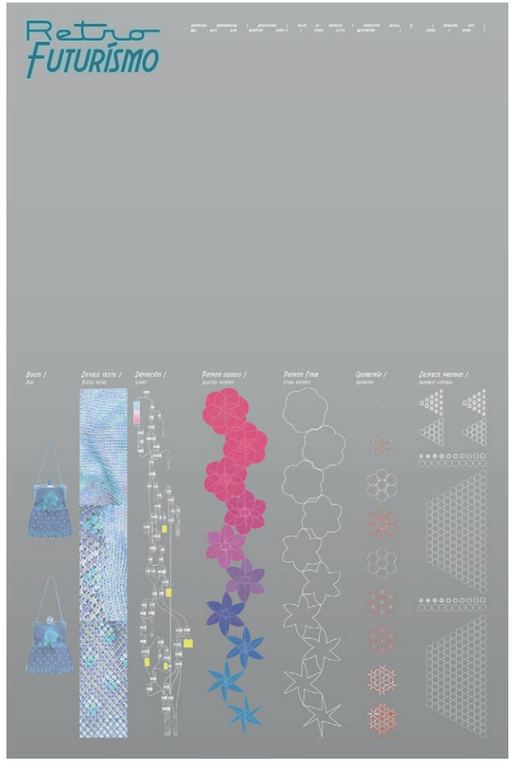
Mexico City, Mexico
Subject Faculty Professor - 2018 / 2019

Client: Iberoamerican University
Department: Computational Design and Fabrication
Responsabilities: Teaching of parametric modeling tools, parametric design, advice and tutoring of computational design matters, 3D print and Digital fabrication.
Credits: Arq. Yoshua Gitlin Morgenstern









SELECTED PHOTOGRAPHY

MEXICO

Mexico City, Guadalajara, Guanajuato & Acapulco
Photography 2013 - 2014

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo



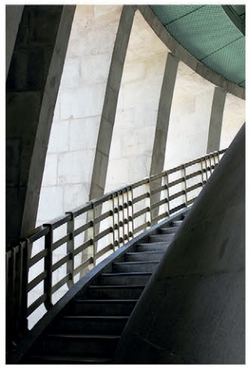


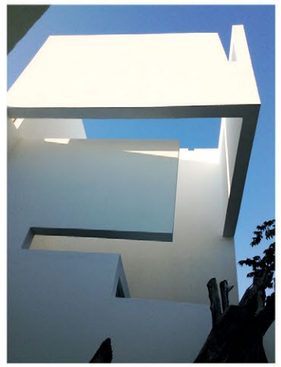








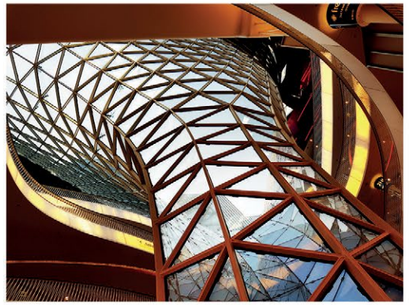
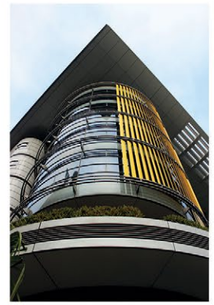
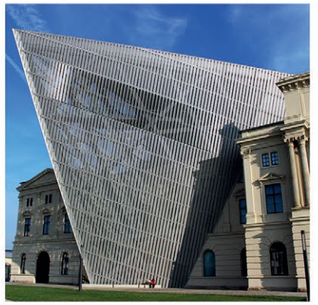


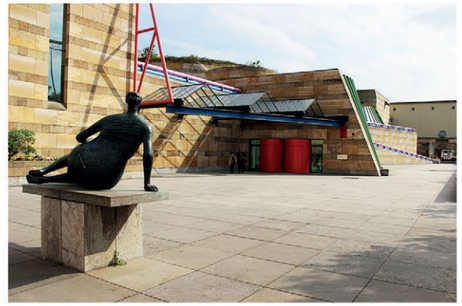


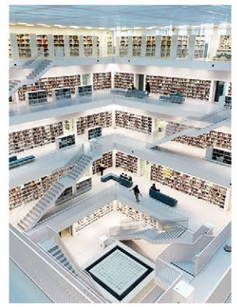
GERMANY

Stuttgart, Munchen, Berlin, Frankfurt, Cologne & Dresden
Photography 2014 - 2015 - 2016

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo

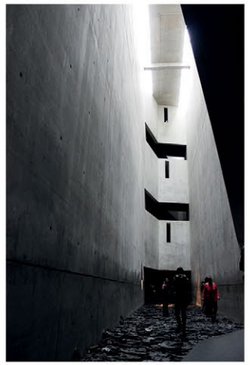









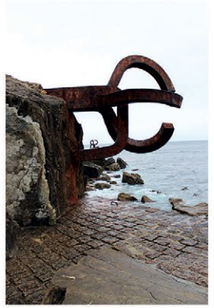


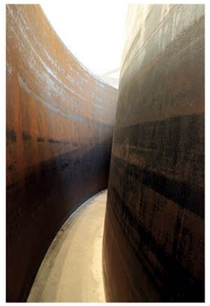


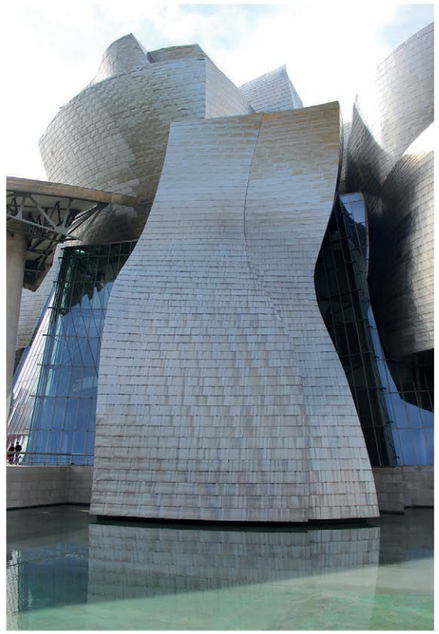
SPAIN

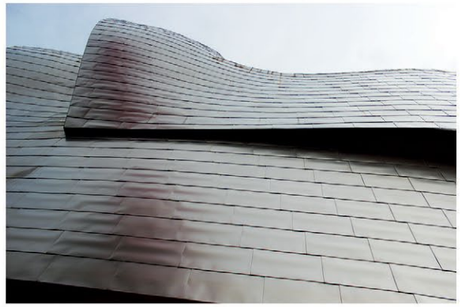
Bilbao, San Sebastian, Pamplona & Vitoria Gasteiz
Photography 2016

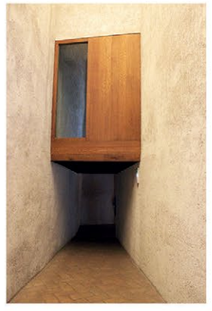
Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo

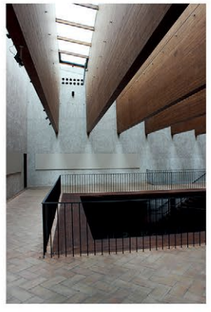


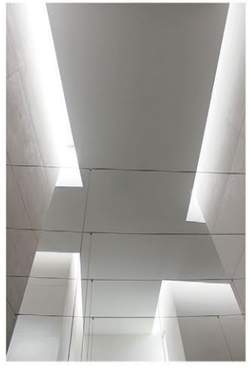








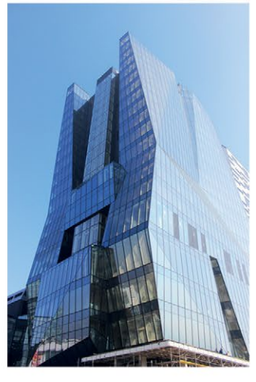




BOSNIA and HERZEGOVINA

Sarajevo, Prijedor & Mostar
Photography 2016

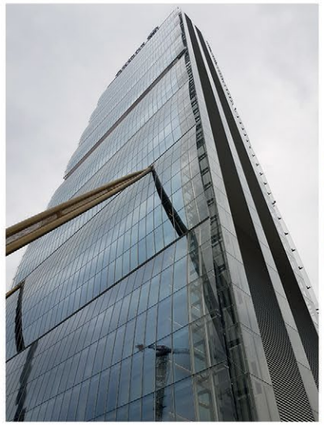
Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo



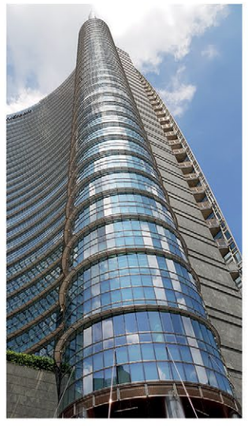
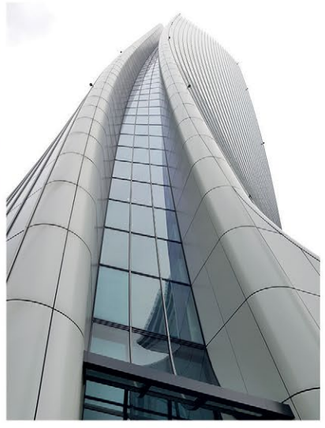
ITALY

Milan
Photography 2018

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo





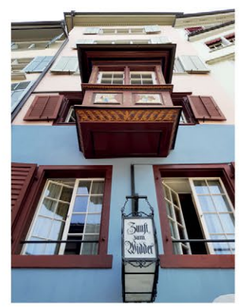
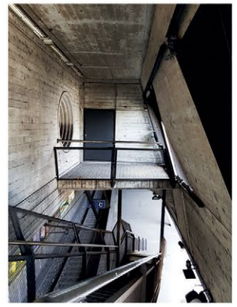





SWITZERLAND

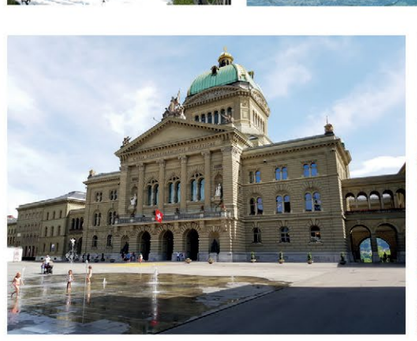
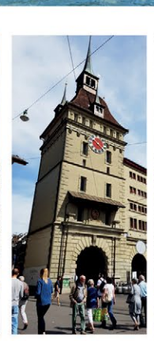
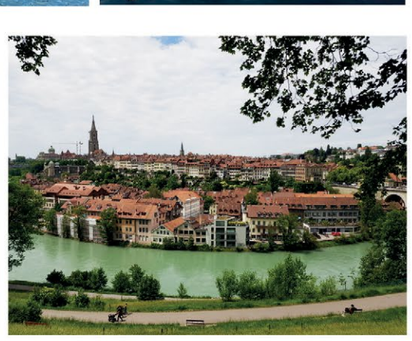
Zürich & Bern
Photography 2018

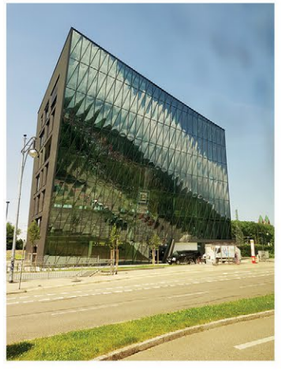
Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo





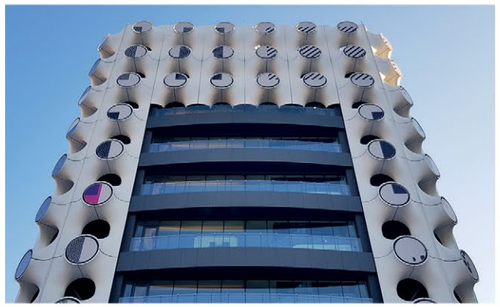


SOUTH KOREA

Seoul & Busan
Photography 2018

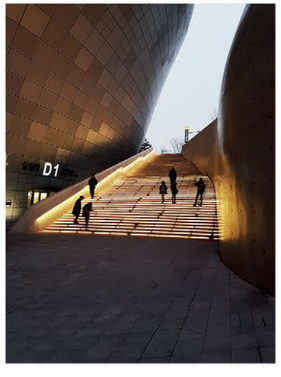
Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo












JAPAN

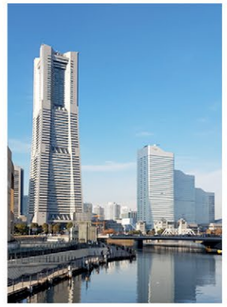
Tokyo, Osaka, Kyoto, Aomori, Nagoya, Okayma, Naoshima, Nagasaki & Kobe
Photography 2016 - 2017 - 2018 - 2019

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo

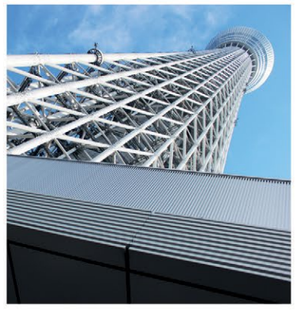




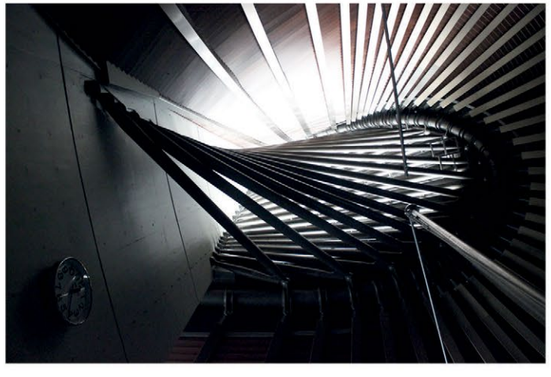










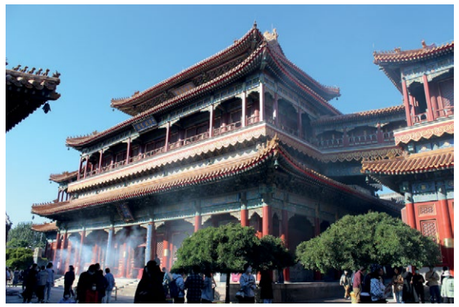



CHINA

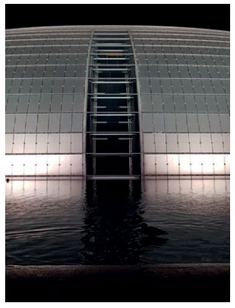
Beijing, Datong, Shanghai, Suzhou, Jiaxing, Wuzhen, Xian, Tulou, Hainan & Fuzhou
Photography 2019 - 2023

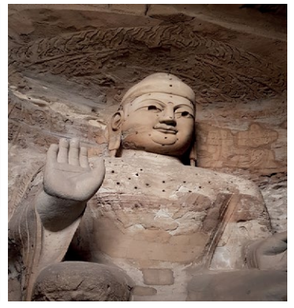
Responsabilities: Physical captures and postprocessing
Credits: Alan Rodríguez Carrillo



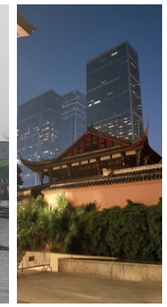


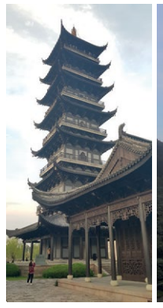










UNITED ARAB EMIRATES

Dubai & Abu Dhabi
Photography 2024 - 2025

Responsabilities: Physical captures and postproduction
Credits: Alan Rodríguez Carrillo