ALISON BROOKS
WORKSHOP 07.20

TORRES DE COLON: THE POST-PANDEMIC TOWER AS RE-USABLE URBAN ECOSYSTEM

MASTER IN COLLECTIVE HOUSING

Alison Brooks Workshop

Director: Jose María de Lapuerta Montoya
Workshop Leader: Alison Brooks
Assistant teacher: Alejandro de Miguel Solano

The Master of Architecture in Collective Housing, MCH, is a postgraduate full-time international professional program of advanced architecture design in cities and housing presented by Universidad Politécnica of Madrid (UPM) and Swiss Federal Institute of Technology (ETH). After eleven editions, it is rated as one of the best architecture master's programs by architects and experts.

The program consists of 600 hours (60 ETCS). Each credit is associated to 25 personal studying - working hours.

Participants will develop their design skills through an intensive series of one week workshops and complete their theoretical knowledge in specialty seminars.

Alison Brooks Workshop, summarized in this document was held in Madrid, from Monday 27th of July to Friday 31th of July 2020.

Alison Brooks

Alison Brooks, Principal and Creative Director of Alison Brooks Architects, is recognised as one of the leading architects of her generation. She has developed an international reputation since founding her practice in London in 1996. Her architecture has attracted international acclaim for its conceptual rigour, sculptural quality and ingenious detailing.

Her approach, based on research into the specific social, cultural and physical contexts of each project, has led to a portfolio of award-winning architecture encompassing urban design, housing, education and buildings for the arts. She continues to produce architecture of distinct identity, sensitivity to its users and relevance to its place.

Named by Debrett's/The Sunday Times as one of 'Britain's 500 Most Influential', Alison Brooks is the only UK architect to have won all three of the UK's most prestigious awards for architecture: the RIBA Stephen Lawrence Prize, the RIBA Manser Medal and the RIBA Stirling Prize.

In 2012 Alison Brooks and her team were awarded Architect of the Year and Housing Architect of the Year. She was awarded 2013 Woman Architect of the Year by the Architect's Journal in recognition of her work in housing, regeneration and education.

Alison Brooks' belief in the transformative social role of architecture underlies a commitment to new models for housing and urban design. With over 2000 homes under construction across the UK, her groundbreaking live-work development at Newhall, Essex was shortlisted for the 2013 Stirling Prize and was Supreme Winner of the Housing Design Awards.

Alison Brooks was a member of Government Advisory Panel, the Farrell Review of Architecture and the Built Environment, is a CABE / Design Council National Design Review Chair and Trustee of Open-City and has recently been selected to join the Mayor of London's Design Advocacy Panel. Currently a member of the RIBA Awards Group, she was juror for the 2011 Stirling Prize and the 2010 Lubetkin Prize. Alison Brooks has taught at the Architectural Association as Diploma Unit Master and served as External Examiner at the Universities of Bath and Lincoln. She is currently External Examiner at the Architectural Association and the Bartlett School of Architecture, UCL. Her work has been twice featured in the Phaidon Atlas of Contemporary Architecture.

Alejandro de Miguel

Architect (B.Arch) (M.Arch, hons) (ARB) and Urban Designer (Master in City Sciences).

Alejandro has developed his activity as an Architect and Urban Designer in award-winning offices in China, Madrid and London. His experience in architectural and urban projects ranges from bespoke single-family dwellings to neighbourhood-wide masterplans and city strategy.

In his research activity, he has coordinated several research projects for the Ministry of Development of Spain (Ministerio de Fomento) on topics as diverse as European energy strategies, performance of city services and quality of life indicators.

TORRES DE COLON: THE POST-PANDEMIC TOWER AS RE-USABLE URBAN ECOSYSTEM

Torres de Colón: The Post-Pandemic Tower as Re-usable Urban Ecosystem

The Torres de Colón is an 110 meters and 23 floors high office skyscraper located in the very central Plaza de Colón in Madrid. Although it was originally conceived as two twin towers that shared the same base, after the refurbishment carried out in the early 1990s, these were joined by a fire escape that hangs from a greenish socket-shaped finish.

It is the 11th tallest building in the Spanish capital and was the tallest office building in Madrid until the Picasso Tower was completed in 1989. The towers were built between 1967 and 1976 by the Madrid architect Antonio Lamela and the engineers Leonardo Fernández Troyano, Javier Manterola and Carlos Fernández Casado.

The towers are built by means of a suspended structure: the building is made up of two large pylons joined at the top by a 6m deep platform from which hang a total of pre-stressed concrete columns that hold each floor. During construction, the concrete foundations supporting both central cores and the top upper platform were completed first. Later, the towers were built from top to bottom, from the upper platform level by level to the base of the construction. At the ground floor, the building was finished with a three-story basement body plus six basement floors for parking.

The project was conceived for residential use from the beginning. A multitude of designs and compositions of three, two and one house per floor were considered, including large flown outdoor terraces that were in high demand at the time.The business case even considered tourist apartments managed by a hotel chain, an innovative concept that had been successful across Spain. Finally, the most risky option was chosen: one house per floor of circa 400m with the best possible finishes and luxuries.

However, in August 1970, the City Council gave the order to “demolish the abusive works”, claiming the project had exceeded two floors and had to be cut by nine meters. The developer won the subsequent lawsuit. Instead of enduring a very excruciating compensation, the Council allowed the forecasted residential use to be converted into office, and that is how the building became one of the most iconic, and lucrative, office spaces in the capital.

The building was refurbished in the 90s, when stairs were added between the towers to comply with new fire regulations ending in a plug-shaped top. In December 2019, the current owner, Mutua Madrileña, announced a deep remodeling of the towers, to be carried out between 2020 and 2022, which will eliminate the ground floor overhangs and the socket-shaped finish, which will be replaced by two new four-storey structures, an intervention that is being carried out by the Spanish architect Luis Vidal.

This project is about re-imagining Madrid’s most iconic towers, the Torres de Colon, as a radically sustainable, inclusive and uplifting place to live in the context of two current global crises: the Climate Crisis and the Covid-19 pandemic.

These two crises have forced us to re-think the nature of how we live, how we consume, how we relate and how we work. Homes have become not only our personal sanctuaries associated with leisure and ‘domesticity’, but in many cases, have revived the pre-industrial revolution norm of the home as workplace. Lockdowns and limits on our mobility have brought the neighbourhoods immediately around our homes into renewed focus. We see our neighbours more often, we are more dependent on our local services. We consume less and as a result we produce less waste. Our reduced mobility has allowed us to discover surprising new places locally; their details and qualities speak to us of the layered social, political and architectural history of cities. We’ve also seen with fresh eyes the ‘nature’ that is a fundamental

part of our localities – plants, animals, insects, weather. All these discoveries are life-enhancing. They point toward our collective potential to formulate a new and better urban reality. They are also a catalyst for architects to reinvent the organisational, spatial and material conventions of urban housing.

At the same time architects must reduce the carbon footprint of the new housing projects we design including the embodied energy of construction materials, construction methodologies and operational energy in use. The vacant Torres de Colon towers provide a perfect opportunity to re-use an existing building demonstrating a low-carbon approach that enhances quality of life for its inhabitants and the environmental quality of the city. Ironically the Torres de Colon were originally designed as a residential project. So this Studio's project will restore the Torres' original function and spirit while adapting the tower typology to new life-and-work-styles. Key to this renewed functionality are the towers' relationship to the street. How can these buildings present welcoming, active and inclusive spaces at ground level for its residents, for the street and for the city?

Finally, we acknowledge that the Torres de Colon have a symbolic role; they are cultural artifacts. They act as icons of the city of Madrid but their role and meaning have been confused and compromised over time. This project presents an opportunity to renew the Torres' reading as urban landmarks, as silhouettes in an urban tableau.

Tall buildings have a responsibility to the city. They command air space physically and psychologically, they increase density, they consume energy, they are high maintenance. Towers therefore have an added responsibility to deliver generosity and beauty to the city and its broader public. The ambition and challenge of this project is thus threefold:

1. To re-conceive the format of the high-density, post-pandemic urban home
2. To produce a demonstration project utilising low-carbon material and energy strategies
3. To renew the symbolic and iconographic role of Torres de Colon so they can be understood and appreciated as a new form of living, meaningful urban art.

1960s - Residential project

1970s - Built as offices

1990s - Staircase and top

2020s - Proposed extension

?

TORRES DE COLON:
THE POST-PANDEMIC TOWER
AS RE-USABLE URBAN ECOSYSTEM

July 2020

sulas que se establecen en prolongación de las pare-
) de 60 cm y un canto variable entre 5 m en su unión
g. 9).

ıs de borde, que se apoyan sobre las ménsulas y sir-
ıcuentran distribuidos en el contorno cada 3,6 m. Las
ın espesor de 50 cm. Existe además una losa aligera-
ırvirá para la instalación de la maquinaria del edifi-

ın un trazado correspondiente a la ley de momentos

8 Deslizamiento de los núcleos de hormigón.

13 Levantamiento de la cimbra por medio de barras y gatos trepadores.

16 Vista inferior con los tirantes colocados.

17 Unión entre sí de dos tirantes prefabricados.

Tirantes

Los tirantes de las Torres Colón tienen forma aproximadamente rectangular de 42 × 42 cm. En su interior se dispuso un orificio de 27 × 10 cm que sirviera de paso y alojamiento a los cables de pretensado (fig. 15).

Los tirantes se prefabricaron fuera de la obra, en longitudes de 5,9 m, correspondiente a la altura de dos plantas. Unicamente el primer tramo del tirante, el que se une a la cabeza, tiene 6,15 m de longitud. Los tirantes se levantaron a su posición definitiva por medio de un gato de pretensado unifilar, de largo recorrido de émbolo, que se colocó sobre la parte superior de

El anclaje interior de los cables se realizó por medio de placas metálicas colocadas en posición transversal a la caja que los aloja. De esta manera constituimos un elemento comprimido al cual se unieron las plantas tipo.

Los cables de los tirantes se ponían en carga desde la parte superior de la cabeza y se procedía en dos etapas, con el fin de que no se sobrepasasen las tensiones admisibles en el hormigón. Una vez terminadas de colgar todas las plantas se inyectaba la cavidad interna para la protección del acero.

Plantas tipo

La planta tipo de cada una de las dos torres colgadas está constituida por una losa de hormigón de 25 cm de espesor, aligerada con casetones de plástico. Esta losa es continua en toda su superficie y se apoya en el núcleo por medio de unas ménsulas metálicas, situadas en las esquinas y en los puntos medios. Las ménsulas metálicas se soldaron a las chapas metálicas dejadas en el núcleo durante su deslizamiento (fig. 18).

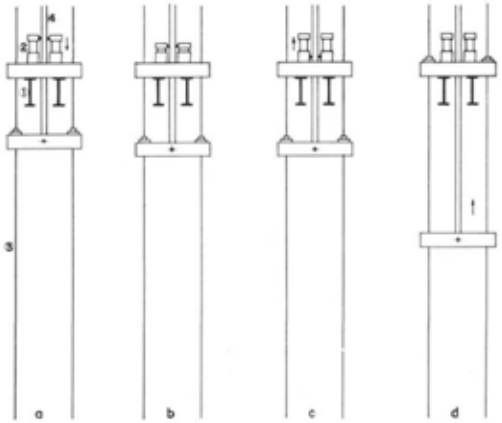
La armadura de la losa varía en función de su posición en la torre. Esto se debe a que en las plantas bajas se producen momentos flectores más importantes en las zonas próximas al nú-

Movimientos de la cimbra

La cimbra metálica estaba formada por cuatro vigas en celosía que circundaban al núcleo y por otras cuatro vigas perimetrales, también en celosía. Su dimensión en planta es un poco mayor que la planta tipo 21,72 × 23,74 m, y su canto, de 2,2 m. Sobre estas vigas se dispuso un forjado metálico y el entarimado que iba a soportar el encofrado. Dicho entarimado tenía una forma contraria a la deformada de la cimbra durante el hormigonado de la planta tipo (fig. 25).

Las operaciones de levantamiento y descenso de la cimbra se realizaron por medio de gatos trepadores de doble mordaza que se apoyaban sobre barras cuadradas de acero de alto límite elástico, colgadas de la parte superior del núcleo por medio de pequeñas ménsulas metálicas.

26 Detalle de barras de cuelgue de la cimbra.



1) VIGAS METALICAS DE SUJECION DE NUCLEO
2) GATOS DE DOBLE MORDAZA
3) BARRAS DIVIDAS
4) BARRA CUADRADA

a) y b) DESCENSO DEL GATO 2 Y CON EL, LA BARRA CUADRADA Y LAS BARRAS DIVIDAS

c) RECUPERACION DEL GATO Y VUELTA A LA FASE a) -b) HASTA QUE LA CIMBRA METALICA HA DESCENDIDO DE PLANTA

d) ANCLAJE DE LAS BARRAS DIVIDAS EN LA PARTE SUPERIOR DURANTE EL HORMIGONADO DE LA PLANTA Y RECUPERACION DE LA BARRA CUADRADA

27 Fases de descenso de la cimbra.

28 Construcción de una planta tipo.

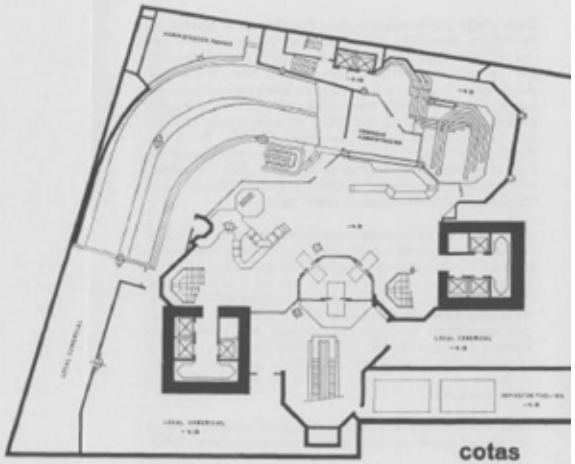
Construcción de la planta inferior. **29**

datos técnicos

Torres Colón se erigen en un solar enclavado en la confluencia de cuatro importantes vías de tráfico madrileñas, frente a los recién inaugurados Jardines del Descubrimiento, popularmente conocidos como Plaza de Colón. Con sus 24 plantas sobre rasante —que alcanzan una altura cercana a los 86 m—, y su peculiar proceso constructivo, nos encontramos ante una de las obras de arquitectura más comentadas de la ciudad.

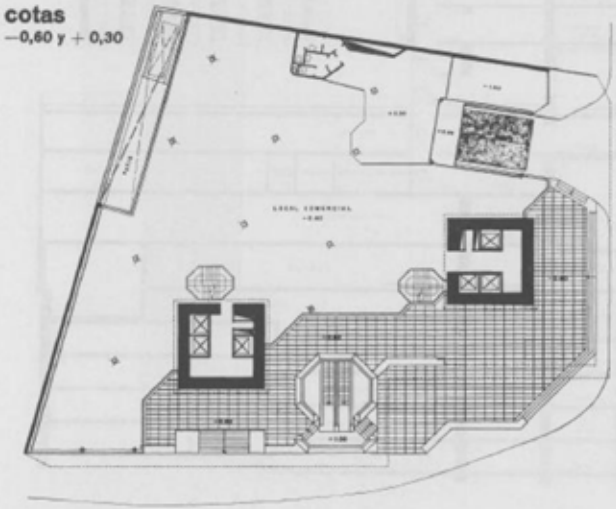
Rara vez las características específicamente técnicas y estructurales de un edificio llegan a provocar la atención del público no especializado; sin embargo, la «estructura colgante» de Torres Colón atrajo poderosamente la atención no ya de los técnicos, sino del hombre de la calle, que observaba este par de torres gemelas, esbeltas y altas, que se construían al revés, «de arriba para abajo».

En efecto, una vez levantados los dos núcleos de ascensores mediante un sistema de encofrados deslizantes, las 20 plantas de las torres comenzaron a descender, suspendidas de una estructura de cabeza, situada en la coronación del edificio, que conducía las cargas al núcleo central de hormigón, el cual, a su vez, las transmitía a los cimientos. La novedad en el proceso estructural era notoria en nes horizontales. En segundo lugar, los elementos de soporte vertical acogen funciones que en el modelo tradicional deben ser resueltos por medio de elementos auxiliares añadidos, ajenos a la estructura; en estas torres, cada uno de los dos núcleos centrales de hormigón, que actúan como únicos «superpilares» con apoyo en tierra, albergan tres ascensores, una escalera, conducciones verticales y el distribuidor de acceso a las oficinas; por su parte, los péndulos de hormigón postensados perimetrales, dispuestos a distancias regulares en fachada, permiten la fijación cómoda del cerramiento exterior de aluminio anodizado, que alberga a su vez los conductos primarios para el suministro del aire acondicionado. En tercer lugar, en el caso de una estructura tradicional, con numerosos pilares de importante dimensión proyectados sobre el terreno a través de las tres plantas inferiores sobre rasante, y de las cinco plantas subterráneas —destinadas la primera a uso comercial, la siguiente a instalaciones, y las tres restantes a aparcamiento— hubiese imposibilitado la ubicación de las rampas de acceso vehicular a los sótanos —dadas las reducidas e irregulares dimensiones del solar—, reducida la diafanidad y, por tanto, la utilidad de las plantas comerciales y de aparcamiento. La estructura tradicional empleada en los 8 niveles inferiores, resuelta con pilares y forjados planos, fue estudiada de acuerdo con las necesidades del funcionamiento específico de las plantas en cuestión, libres de la normal e incómoda «herencia» estructural de las torres, a excepción, naturalmente, del núcleo central de hormigón, necesario además para los enlaces verticales entre éstas, las torres y la planta de acceso.

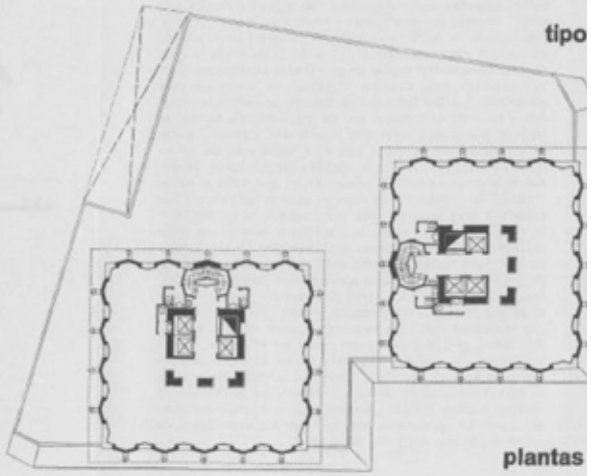


cotas
— 4,15 y — 2,8

cotas
—0,60 y + 0,30



tipo



plantas

more info at:

General links:

https://es.wikipedia.org/wiki/Torres_de_Col%C3%B3n
https://blog.ferrovial.com/en/2017/11/antonio-lamela-architect-torres-colon/

Informes de la Construccion:

http://informesdelaconstruccion.revistas.csic.es/index.php/informesdelaconstruccion/article/view/2643/2955
http://informesdelaconstruccion.revistas.csic.es/index.php/informesdelaconstruccion/article/view/2644/2956

Book:

Esteban, Concha (2017). Antonio Lamela y Torres Colón. Valencia: General de Ediciones de Arquitectura. ISBN 978-84-946397-9-1.

Videos:

https://www.youtube.com/watch?v=jq91xeV8onw&feature=emb_logo
https://www.youtube.com/watch?v=sD7njtbdOxY&feature=emb_logo

BRIEF

SITE & BRIEF

Site area
1,732 m2 (cadastral area)

GEA
27.074 m2

Units

Residential:
50-200 residential units

The residential unit mix must be composed of units for older citizens, units for younger professionals and for families. All units can be individual or shared, and the size and specific share of each unit type must be defined by each group.

Residential ancilliary uses:
Communal spaces, canteen, leisure spaces

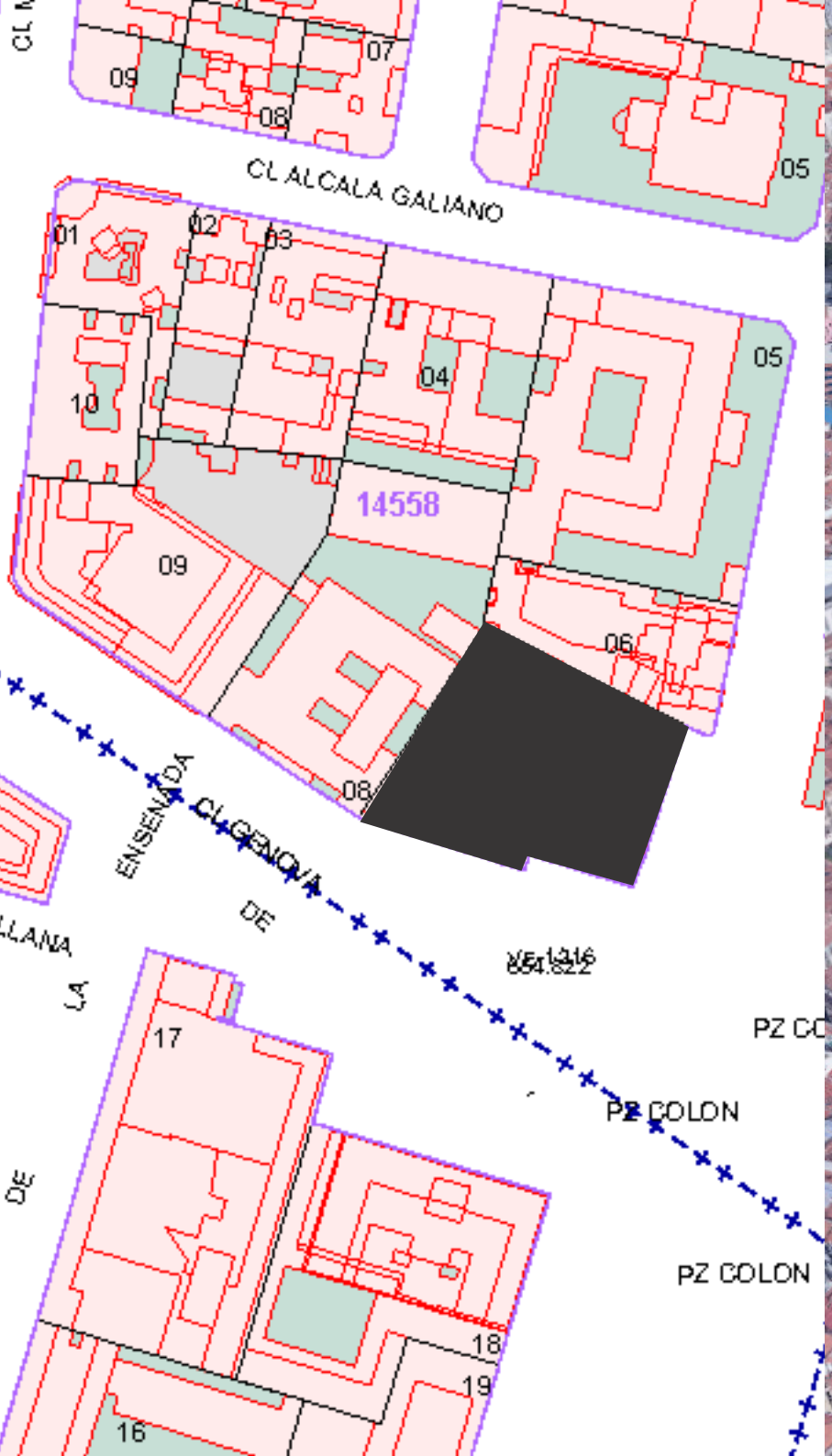
A set of ancilliary uses must be included to support the residential use, the specific content of this use provision must be defined by each group to be aligned with their proposal.

Public Institution:
2,000 GEA

A public institution, accessible to all citizens and providing a service to the city, must be included in the project. The specific functionality of this institution must be defined by each group.

Typology, materials

There will be no specific conditions on the choice of unit type or materials. These have to be sensitive to the conditions and location of the site, and the specific functionality of each space.


CL ALCALA GALIANO
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PZ COLON
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PROGRAM

prior to [27.07.2020]

objectives:
become familiar with the site and develop a critical position on the brief

tasks:
students must have visited the site & documented it with photographs and other forms of cultural research to provide a basis for their approach

each group must have drawn the perimeter and context of the plot and printed it in A3 format

each group must have explored and agreed a cultural story/narrative about the brief & site that they want to build on.

[27.07.2020] MONDAY

objectives:
understand the conditions of the site and develop a Public Institution Proposal to be included in the building.

morning:
critical session with tutors

presentation: Alison Brooks Architects
presentation: brief + groups + objectives of the day
critical session: 10min presentation / group

-social/cultural ideal driving the project

[28.07.2020] TUESDAY

objectives:
develop your ideal dwelling units and distribute them within the building

afternoon:
critical session with tutors
10' presentation / group
-ground floor plan e 1:200
-site secion e 1:200
-preliminary massing

deliverable:
-ground floor plan e 1:200
this layout must include the following:
-building outline, position of cores, accesses vehicular servicing from street, public institution proposal

-site section e 1:200

-typical floor plan e 1:200
this layout must include the following:
-cores, circulations, accesses
-outline of units and unit mix
-internal distribution of units

[29.07.2020] WEDNESDAY

objectives:
understand the role of the facade

afternoon:
critical session with tutors
10' presentation / group
-typical floor plan & section e 1:200
-3D + facade development

deliverable:

-3D + facade development

[30.07.2020] THURSDAY

objectives:
detail the unit plans and define materiality

afternoon:
critical session with tutors
10' presentation/group
-ground floor plan / typical floor plan / apartment layouts / 3 key views

deliverable:
-ground floor plan e 1:100
this layout must include the following:
-building outline, position of cores, accesses vehicular servicing from street

-typical floor plan e 1:100
this layout must include the following:
-cores, circulations, accesses, shafts
-internal distribution of units

-apartment layouts e 1:50
each different unit layout must be drawn independently and include the following:
-windows, doors, furniture, fixtures

-physical model e 1:20
this model should detail one level of the building and must suggest the finished materiality, both for the interior and the exterior (facade)

-3 key views
aerial view, street / ground floor view, 'Public Institution' space.

[31.07.2020] FRIDAY

objectives:
complete and present your project

afternoon:
final jury
10' presentation/group

deliverable:
-3 A1 boards
this layout must include the following:
-ground floor plan e 1:100, typical floor plan e 1100, site section 1:200, section 1:100, apartment layouts e1:50, physical model e 1:20, 3 key views.

-project title, concept & written statement must be included in the boards

-200 words texts (each) description of the project on: urban scale, building scale and domestic scale

-physical model e 1:20

-indesign and pdf format as per the provided layout

all of the above must follow the formatting specified at the beginning of the week