Politecnico di Torino

UNIVERSIDAD POLITÉCNICA DE MADRID

Dipartimento di Architettura e Design
Laurea Magistrale in Architettura Costruzione Città
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PROPOSAL FOR THE RESTORATION AND RE-USE OF CLESA DAIRY PLANT IN MADRID (SPAIN)

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Student: Sabatina Cannone

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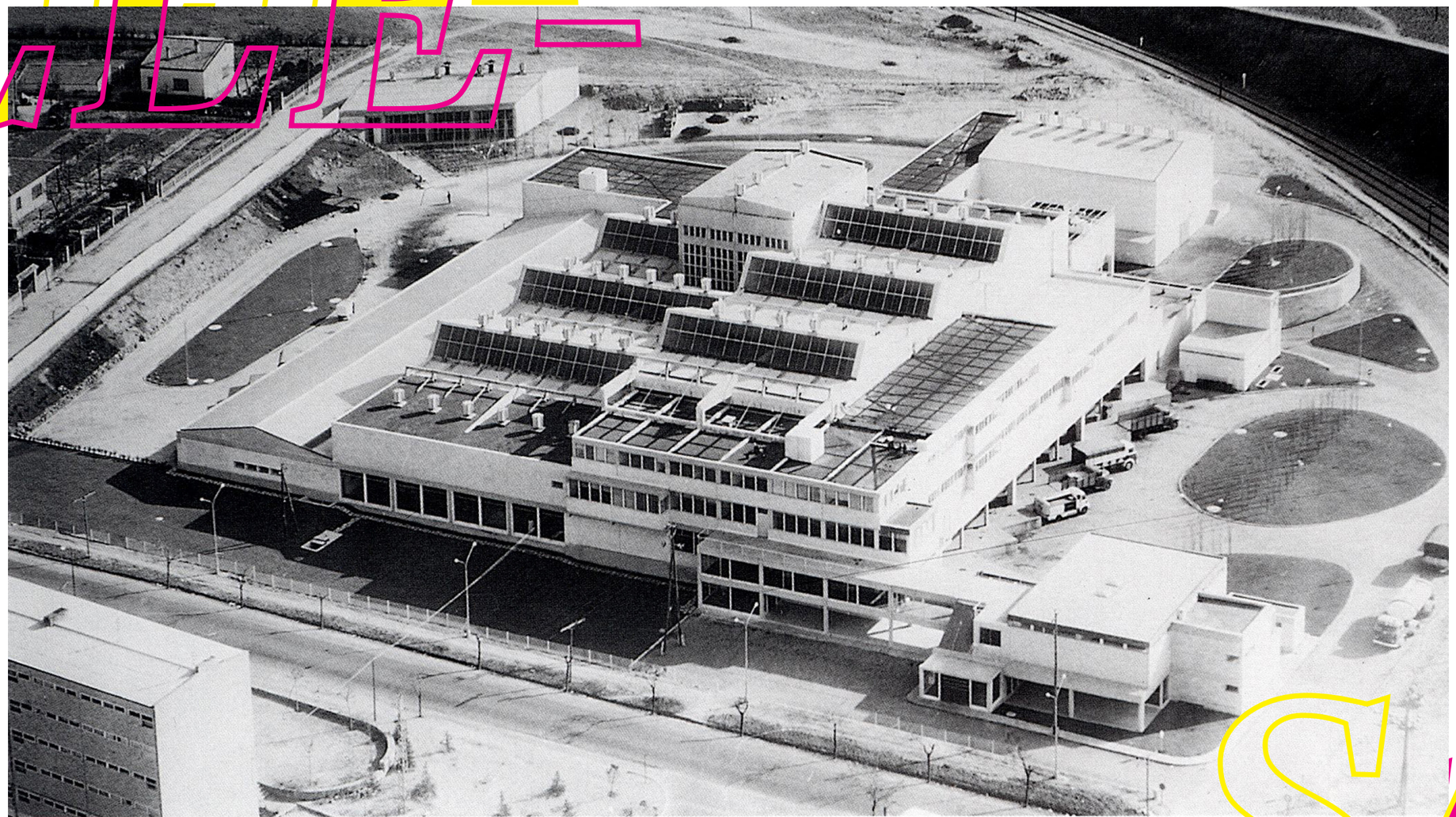

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CONTENTS

INTRODUCTION

The subject of the following thesis is the restoration and reuse project of the Central Lechera CLESA located in the Fuencarral neighborhood in the capital of Spain, Madrid.
For this research, an in-depth analysis of the area and the needs of its inhabitants was carried out, also describing the project originally conceived and designed by architect Alejandro de la Sota up to the present day, where the complex, partially demolished, is in a state of abandonment and uncertainty.
It was essential to trace the history of the industrial heritage and analyze some similar case studies.
The analysis of the building, its structure, and its state of preservation, led to the final elaboration of the restoration and reuse project.
The interest in this research also stems from the great debate in Madrid City Hall on the matter and the various organizations and associations that are fighting every day to be able to save this complex.

01
CLESA
dairy
plant

01
CLESA
dairy
plant


1956

Fuencarral - El Pardo district

The origins of the Northern Zone of Madrid

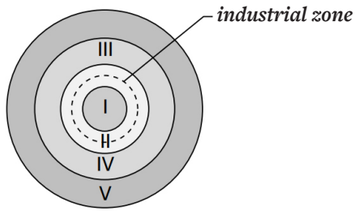
In order to understand the area in which the Clesa dairy plant is located, one has to go back to its origins, when its rural area was ***urbanised*** in the 1950s.

Until then it was occupied only by fields and roads, which gave way to all kinds of industrial and residential uses.

It is not a coincidence that this area experienced the emergence of typical uses of modern colonies. Here the needs of new industries converged, which no longer needed proximity to basic energy sources such as coal or fields for the extraction of raw materials.

These second-generation industries found near Fuencarral the optimal ecosystem for their development. The old centre of Fuencarral provided ***labour*** in the surroundings; the ***railway*** a more or less integrated communication system, which allowed the transport of their goods; and a ***large town*** a few kilometres away - Madrid - where the manufactured products could be sold.

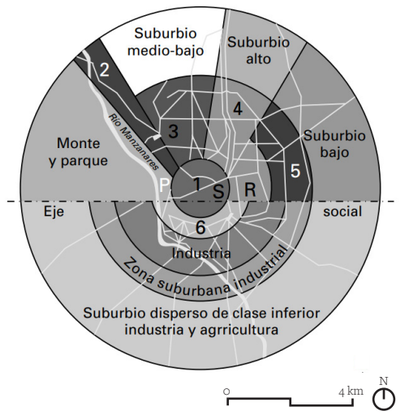
Although most of the industrial structure developed in the south of Madrid, some industries were established in this area, giving rise to the ***Fuencarral industrial zone***, which in turn led to the construction of settlements to the West of the City Centre due to its industrial appeal, which is very common in almost all large cities in Spain.



from the left:
//Geometric diagrams of the concentric theory of the urban structure, according to Burgess (1925) and Chueca Goitia (1970)

1.1

I. lood
II.transition area
III. workers residence area
VI. bourgeois residence area
V. area of pendular displacements



1. City centre
2. Upper class housing
3. Middle class housing
4. Low class housing
5. Middle class housing
6. Low-income housing

https://www.ign.es/web/catalogo-cartoteca/search-in-map.html

opposite page, from top:
//historical aerial map of the fuencarral district in 1961
//photo and sketches of planned housing in the fuencarral district

1.2

https://www.ign.es/web/catalogo-cartoteca/search-in-map.html

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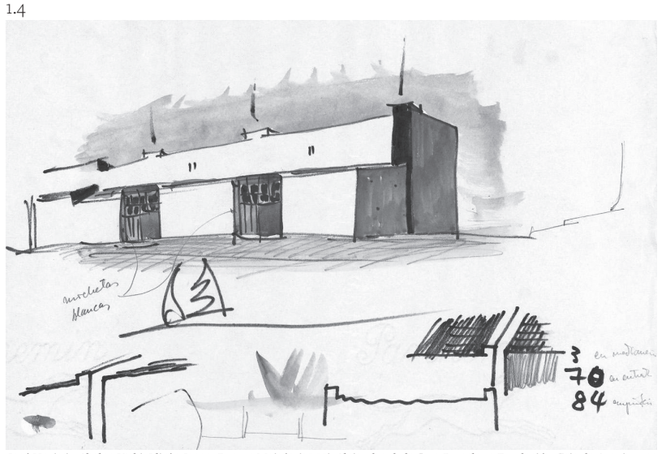
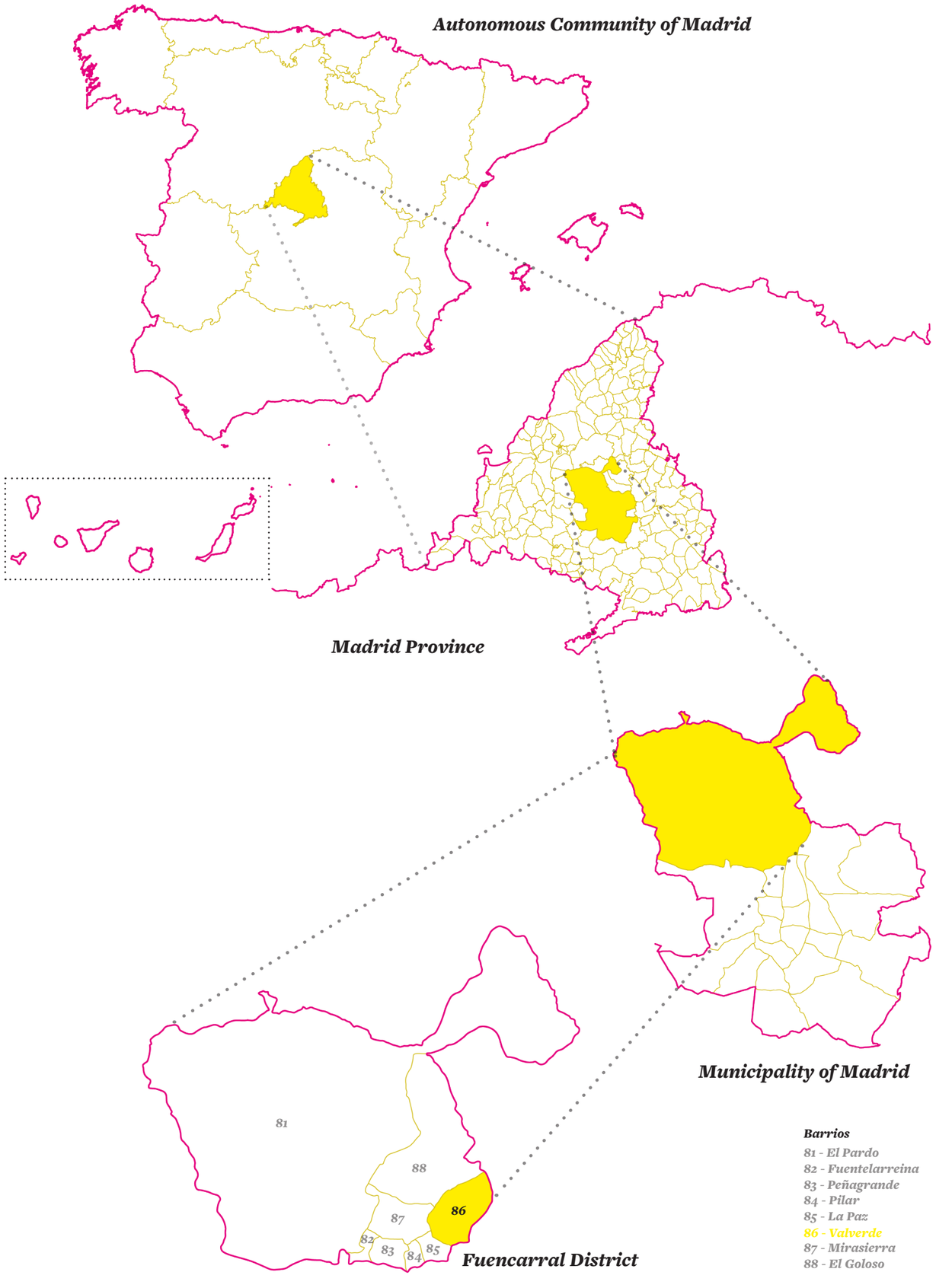


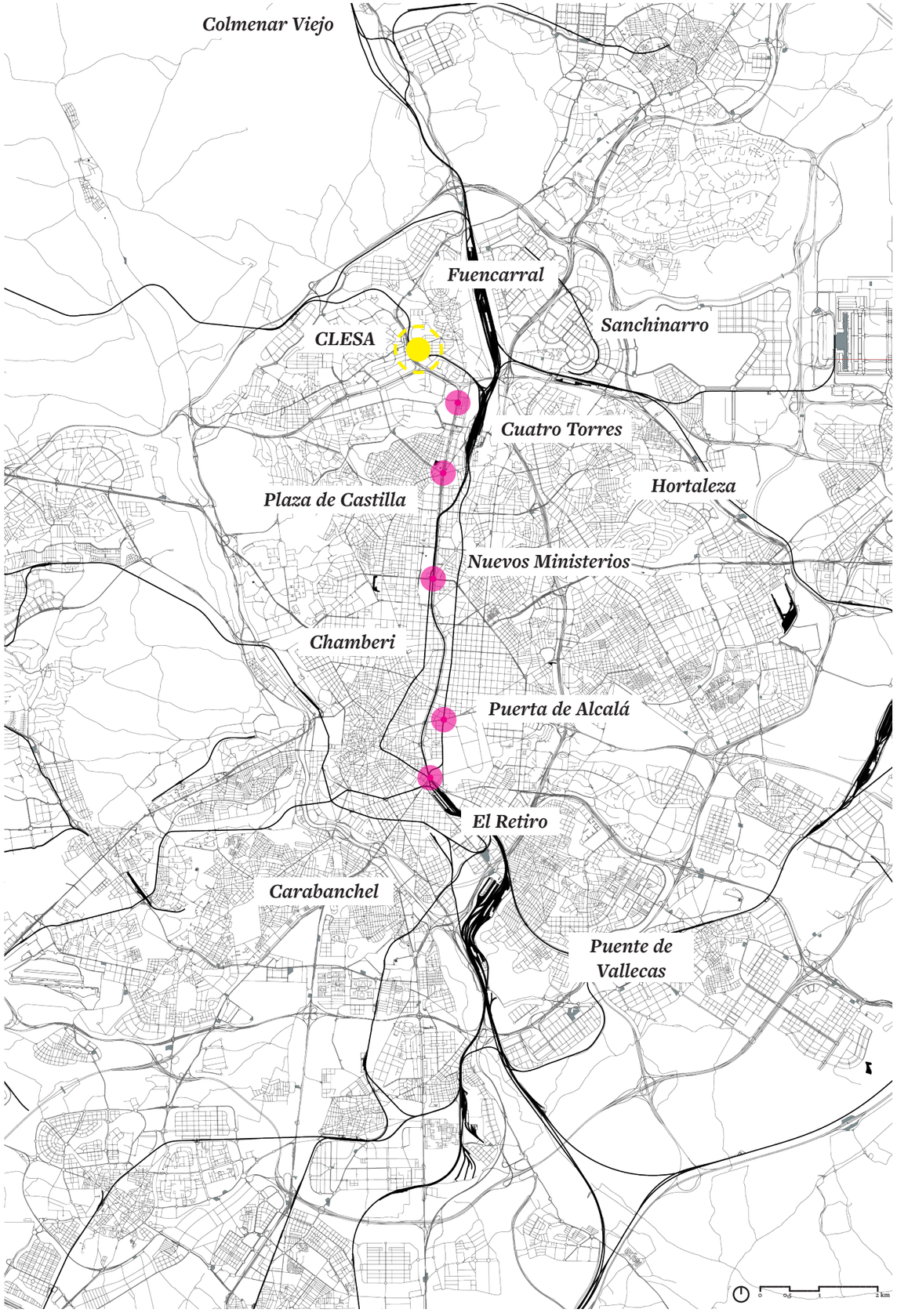
José Hevia in Abalos Iñaki, Llinàs Josep, Puente Moisés (2009) Alejandro de la Sota Barcelona Fundación Caja de Arquitectos



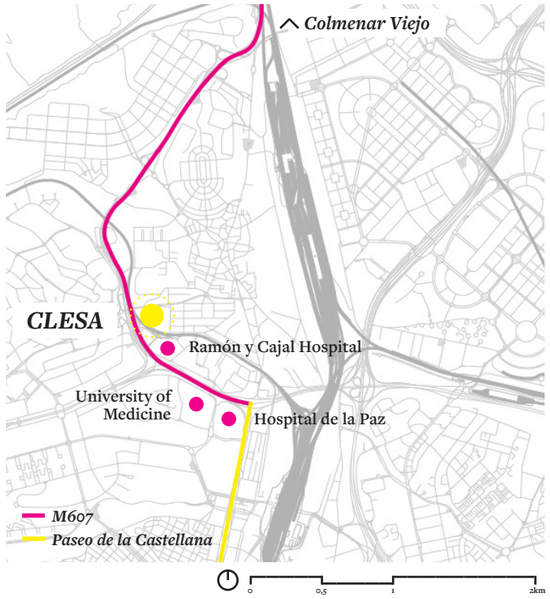
The setting up of new neighbourhoods

The area was consolidated in the 1960s.
The ***influx of rural populations*** from all over the plateau to the capital's industries and various services facilitated the creation of numerous self-sufficient housing estates.
In addition, new transport routes were developed in response to the boom in the automobile industry.
This led to the creation of the ***M607 axis*** that connects the factory area, from Madrid's Paseo de la Castellana, to the Autonomous University and on to the town of Colmenar Viejo.
The intersection of this axis with the railway line attracts a large population seeking affordable housing away from the city centre and the more polluted southern areas.
But not only that, the traffic structure and the "natural" barriers of the area lead to the arrival of high society on the other side of the highway. This was the beginning of the Miraflores community.
All the new residential complexes, regardless of their level of purchasing power, share ***common characteristics*** that differ from the established structures in the centre of Madrid or other historical districts. On the one hand, the building types and their spatial distribution are homogeneously arranged in each intervention according to the plan.
Small tower houses for workers, detached houses with gardens for the upper classes, but each was subordinate to the overall scheme, creating the repetitive network typical of this form of town planning.

Homogeneity is not limited to building types, social distribution is also organised in similar groups, closely related to building quality. Another aspect to note is that the rapid construction of these urbanisations and their rapid occupation led to a marked lack of public and private services, which makes them even more labelled as ***dormitory cities***.
This has been the focus of infrastructure forecasts from the 1980s onwards.
Furthermore, in the decade of the 1960s, with the M607 as the backbone, a series of ***hospital complexes*** of metropolitan dimension emerged, favoured by the quick connection to the centre of Madrid and the possibility of being built on land that was not in demand at the time. The Hospital de la Paz was inaugurated in 1964, the Autonomous University of Medicine in 1969 and the Ramón y Cajal Hospital in 1977, today a technological-university centre for health sciences.
All these large settlements, together with the pressure of housing and increasing infrastructure, were gradually transforming the few industries present in northern Madrid from a sign of expansion into one of retreat. Although these sites were the main source of work for the residents of the neighbouring area, the ***process of decentralisation***, increased specialisation and the strength of the tertiary sector were beginning to make these old complexes obsolete and in need of renovation.



(Madrid, 1975) https://idem.madrid.org/visor/?v=CartoMadrid&ZONE=441682.1515749024 7.4482855.166863112,12



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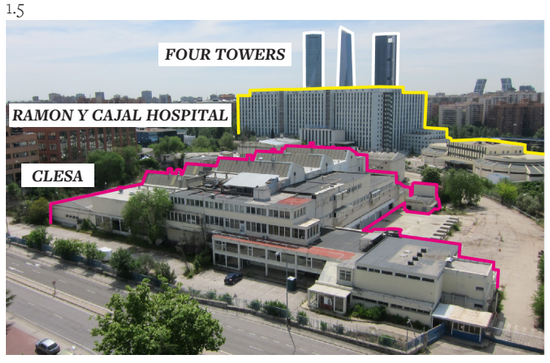


https://diario.madrid.es/wp-content/uploads/2020/07/clesa1-768x576.jpg

The sprawl of Madrid

It was not only industry that came under pressure from the modernisation of the new era and Madrid's uncontrolled urban expansion. Residential areas also started to require changes to adapt to the ***quality of life*** of their citizens. Although these neighbourhoods have changed little architecturally, the urban context in which they are located is entirely new; whereas previously these dormitory towns were strategic areas due to their proximity to industry, this has now ***changed or shifted***, and the roles of its inhabitants are changing.

The use of public transport, as well as private transport, has extended the range and brought the entire metropolitan area closer together. On the other hand, these historically underdeveloped areas are able (and need) to demand the same services and privileges as the city centre: educational, health and infrastructure centres on par with those on the banks of the Manzanares River.

The ***initial lack of tertiary services***, gradually mitigated by small shops, was still great and continued to cause this satellite effect compared to the centre of Madrid.

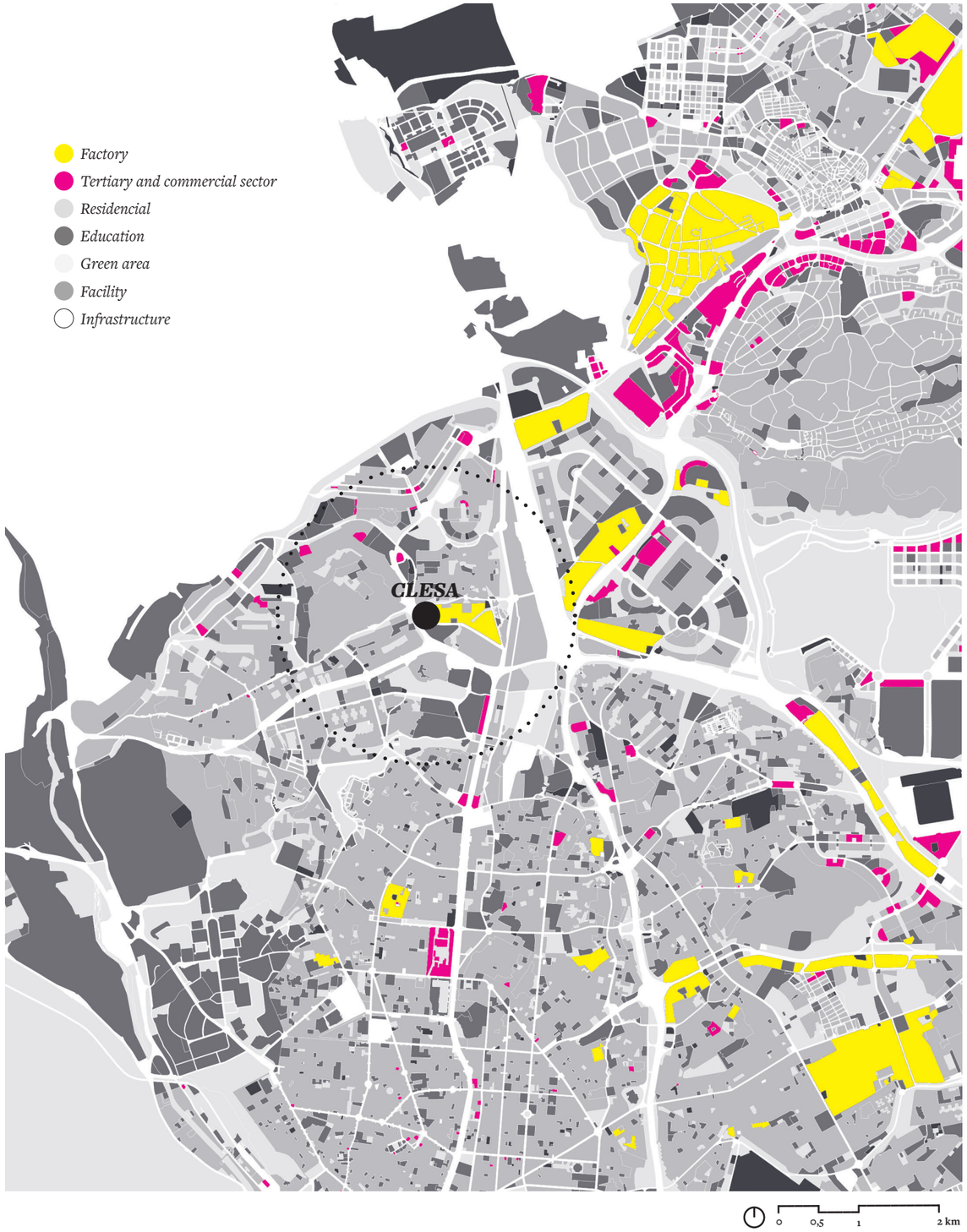
However, and not only by coincidence, a new factor appeared that would help to fill this lack. In search of large plots of land on which to locate their entire programme, the ***shopping centres*** moved away from the dense and overcrowded centre in search of good connections and, just as industry did in another era but in the opposite direction, sought out population centres to which they could offer their services. In this sense, we cannot ignore the virtues of these shopping centres which, in a relatively small and overcrowded area, manage to integrate leisure, entertainment and general consumer uses in areas that historically lacked them and required long journeys to use them.

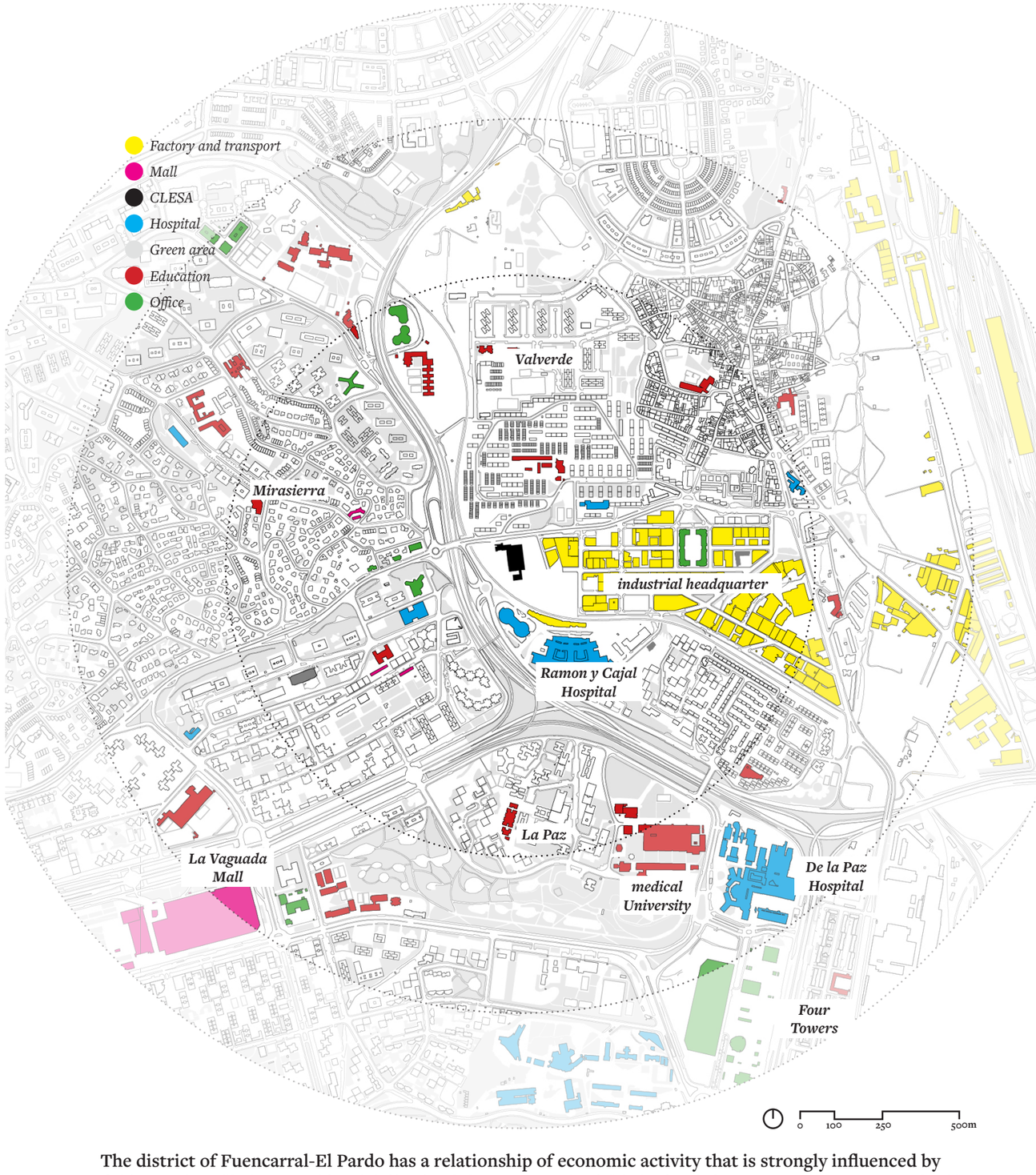
The century of research and development

The 20th century saw Madrid develop, thicken and find a new frontier north of the M40. Residential areas gradually ***lost their social homogeneity*** and industry was integrated into the urban fabric. The city's economic activity is no longer based on industry, but has shifted towards ***finance***, ***research*** and ***innovation***. Whereas in the past factory locations sought proximity to workers' housing and transport infrastructure, the new economy seeks installations close to research, university and technology centres. In this perspective, the M607 can be interpreted in this area as an axis connecting a series of urban-scale facilities from the M30 to the Autonomous University, making it an attractive hub for new business. In order to renew and give new value to the area, transforming it into a development engine in line with the new century, ***four skyscrapers*** were designed and built, the Torre Cepsa, the Torre PwC, the Torre de Cristal and the Torre Espacio in the neighbouring district of Chamartin.

This transition is to be seen as the inevitable result of the passage of time, and not all its influences are to be considered positive. Real estate pressures and expected changes in the use of existing residential areas (towards high-end housing or for new non-residential uses) have led to problems of ***gentrification*** and ***mobbing*** that once peripheral neighbourhoods suffer with the arrival of centrality. In this sense, to achieve fusion and avoid exclusion, past lives must be actively considered, always proceeding with caution, through the use and procedures that bridge the two realities.

Land use



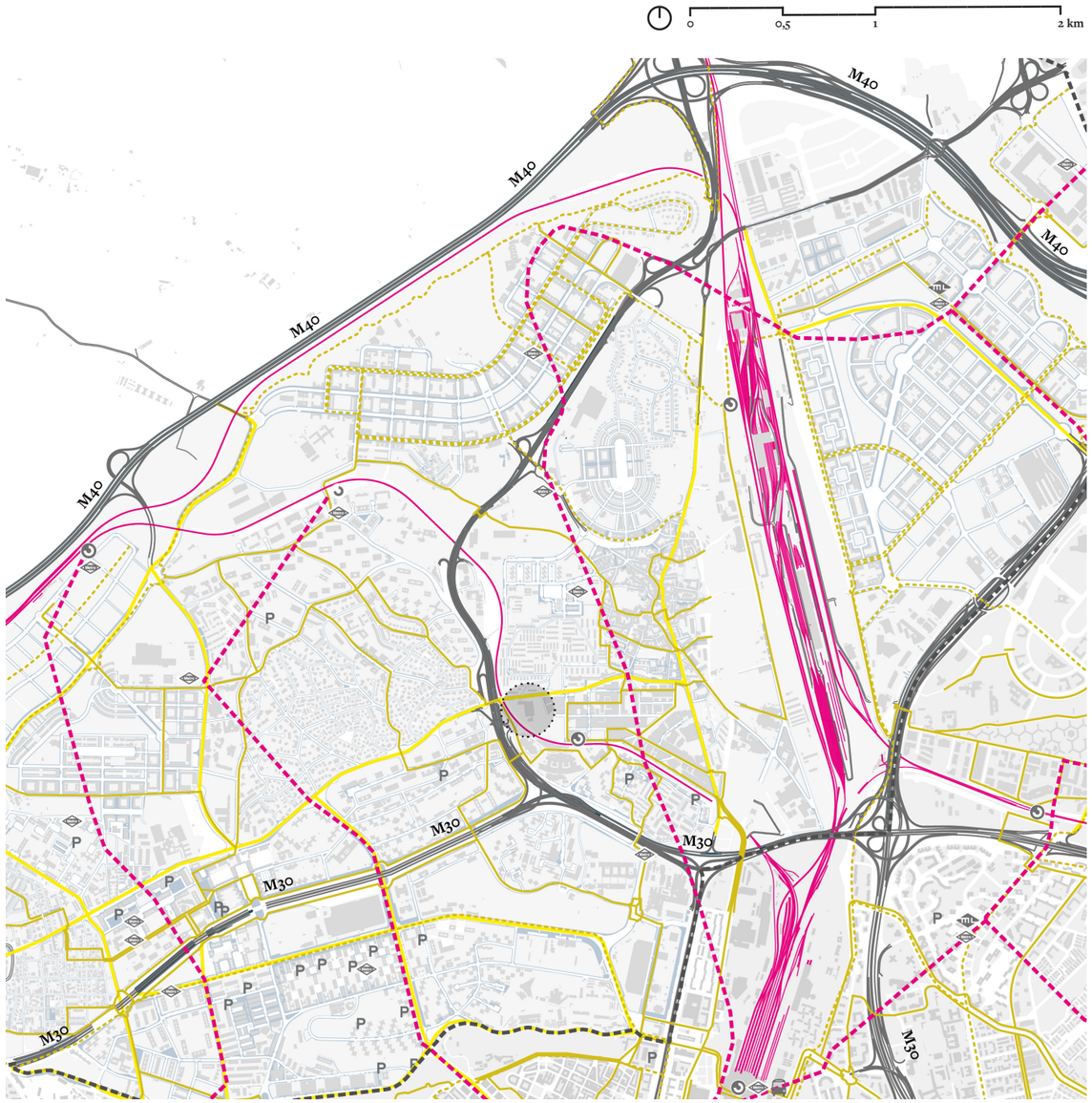


The district of Fuencarral-El Pardo has a relationship of economic activity that is strongly influenced by Madrid. In spite of being a residential district, it has a very mixed fabric that is home to an important and self-sufficient commerce and hospitality industry. Some of the areas of the district function as central employment and office areas for the city as a whole, with the implications that this generates. From a cultural and leisure point of view, the district is totally dependent on Madrid.

Mobility and infrastructures

- *main roads*
- *highways*
- P *parking spaces*
- *metro*
- *train*
- *cycle paths*
- *quiet streets*
- *CLESA*

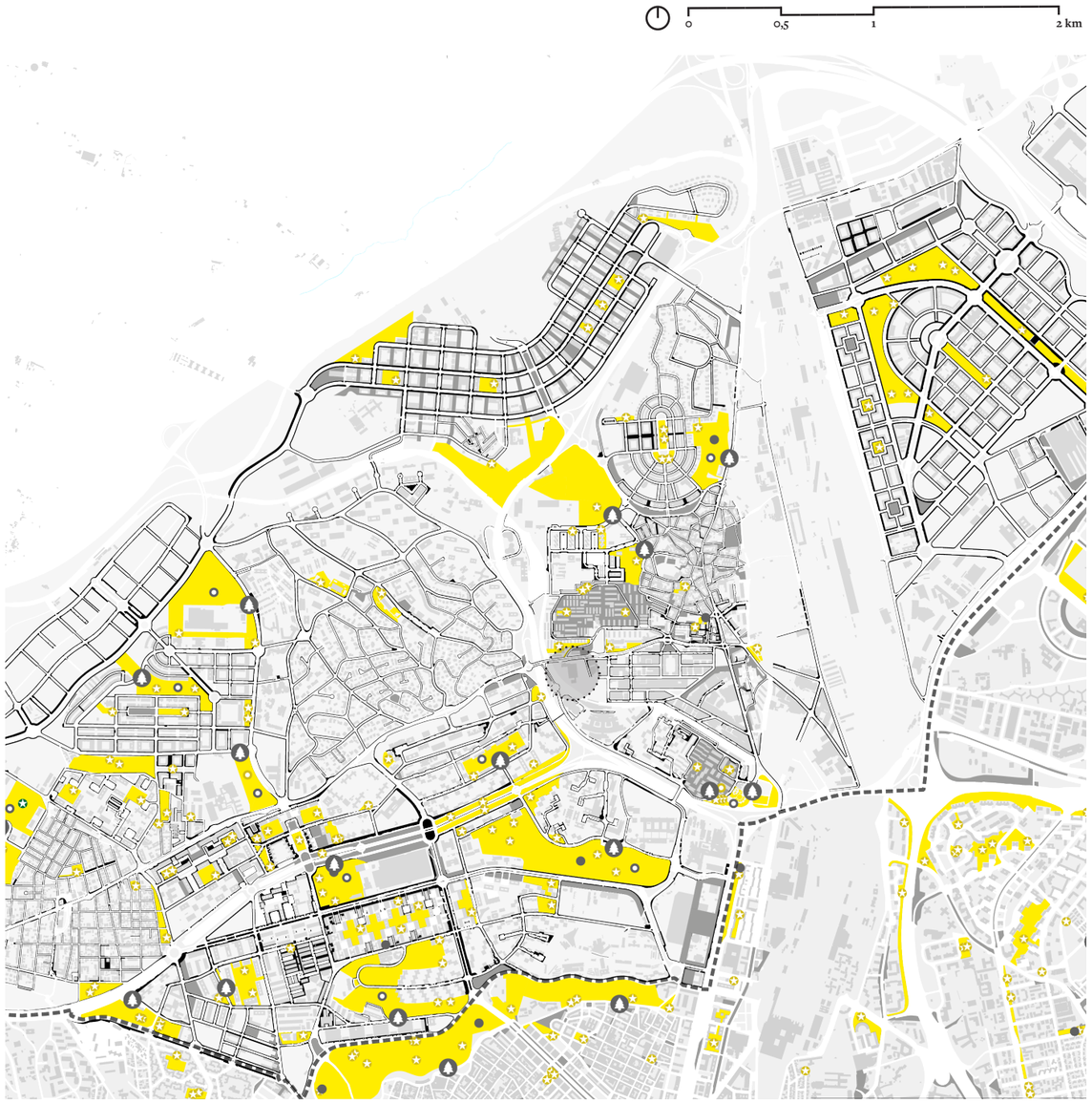
The district is well integrated into the city's mobility network, both private and public. Its position in a seamless relationship with the city of Madrid, between the M30 and the M40 and at the end of several Metro lines, connects it with the rest of the city.



Public space facilities

- *parks and gardens*
- *senior citizens' area*
- *children's area*
- *dogs' area*
- *sitting area*
- *sports area*
- *parks and gardens delimitation*
- *sidewalk*
- *squares and recreational areas*
- *CLESA*

Public open space is scarce, degraded due to its age, or excessive and banal, as in the new neighbourhoods. As far as green areas are concerned, the open space in the district is well distributed and spread out, but with some exceptions, some areas are not well maintained or developed.
There are urban development projects in the neighborhood, but they currently create vacant and in most cases degraded spaces.

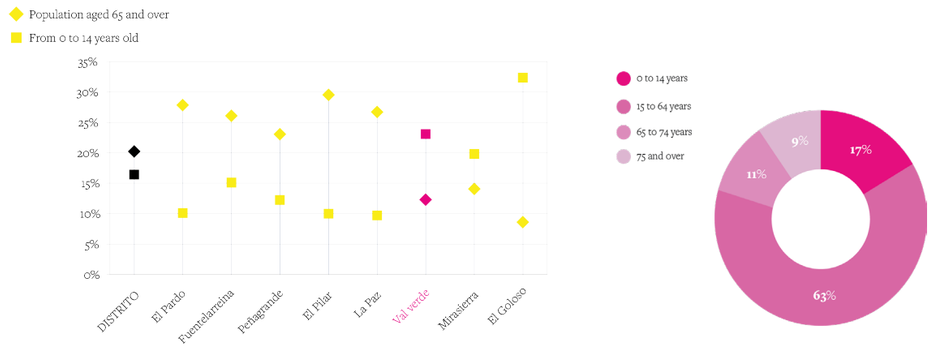


The Fuencarral - El Pardo District has just over 232,000 inhabitants, 7.4% of the total population of the City of Madrid. The neighbourhoods of Valverde, El Pilar, Peñagrande and La Paz account for almost 78% of the population, while Fuentelarreina and El Pardo have the fewest inhabitants.

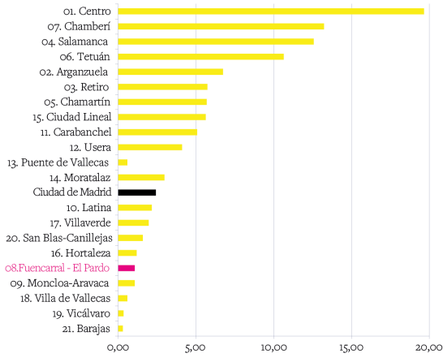
The population of the District has grown steadily in recent years, at different rates depending on the period, to reach a population figure that is 18.7% higher than in 1986.

The distribution is unequal between neighbourhoods. There is a great disparity in the number of people per household and the number of people in the extreme age brackets; El Pilar is the neighbourhood with the most elderly people, and El Goloso with the youngest. But what is most unique is that the neighbourhoods of Valverde, Mirasierra and El Goloso behave differently from the rest in the sense that the percentage of people under 15 years of age is higher than the percentage of people over 64; this means that there is a very high youth index.

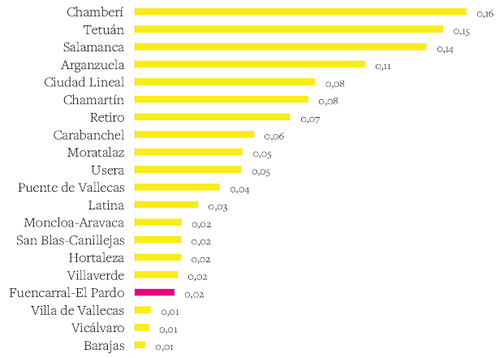
POPULATION BY AGE GROUP



NUMBER OF PREMISES PER HECTARE

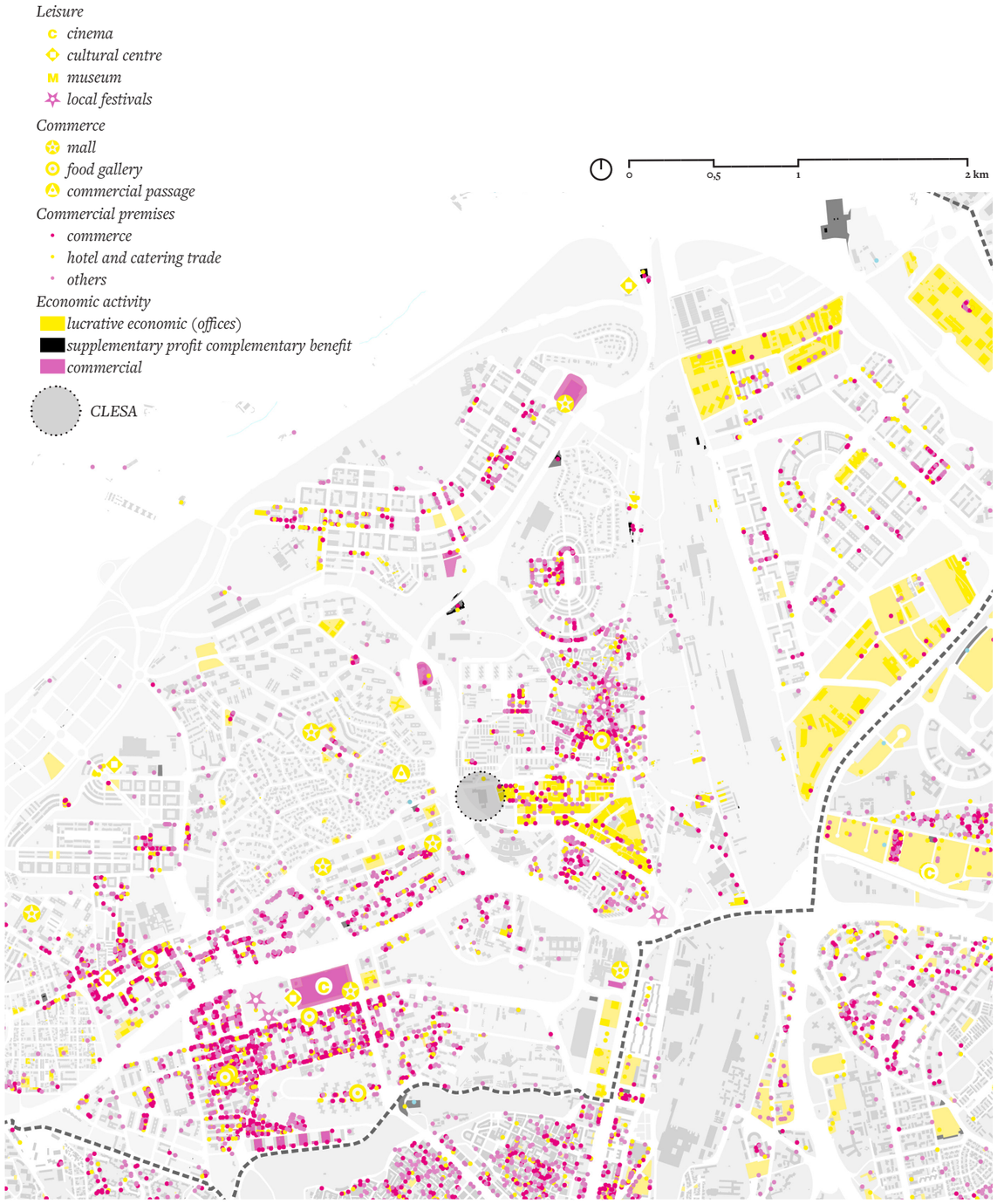


LEISURE PREMISES BY HECTARE



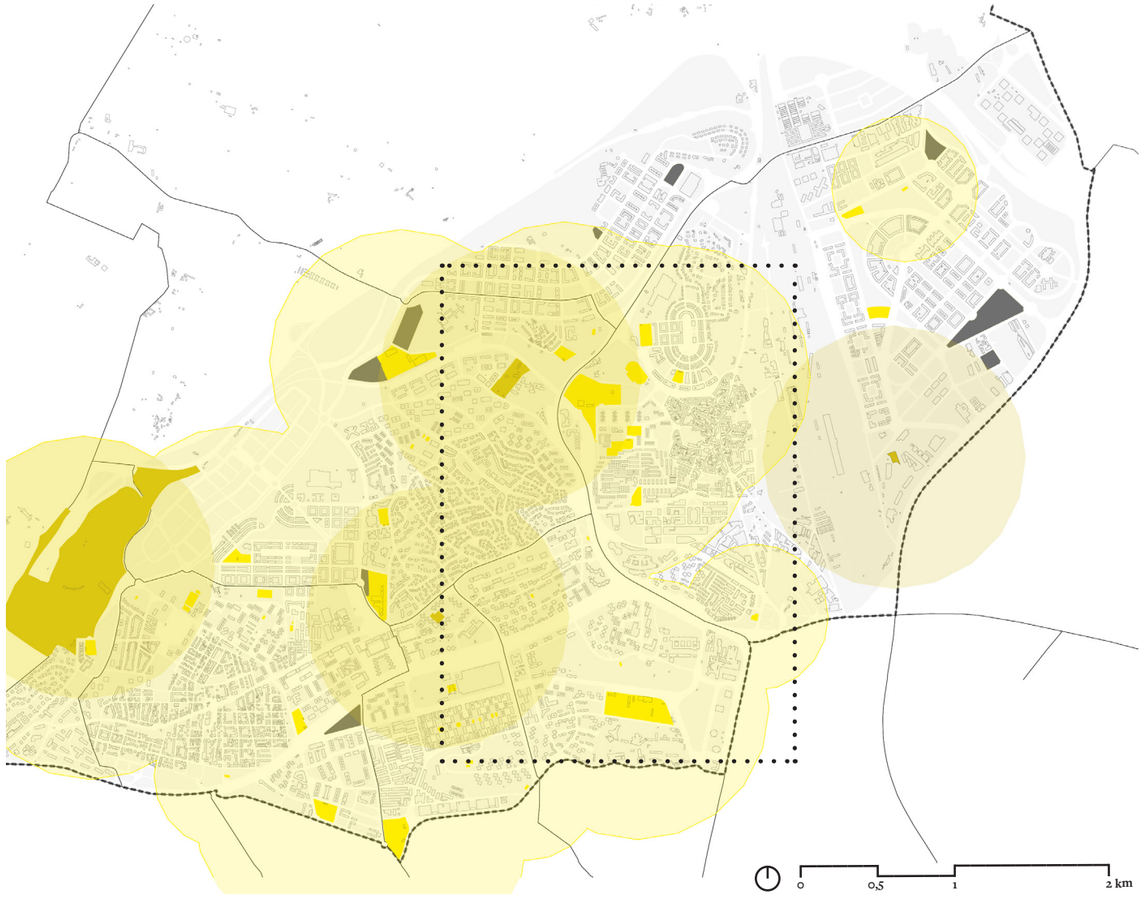
https://www.madrid.es/portales/munimadrid/es/Inicio/El-Ayuntamiento/Estadistica?vgnextchannel=8156e39873674210VgnVCM1000000b205a0aRCRD

Production and socio-economic activity

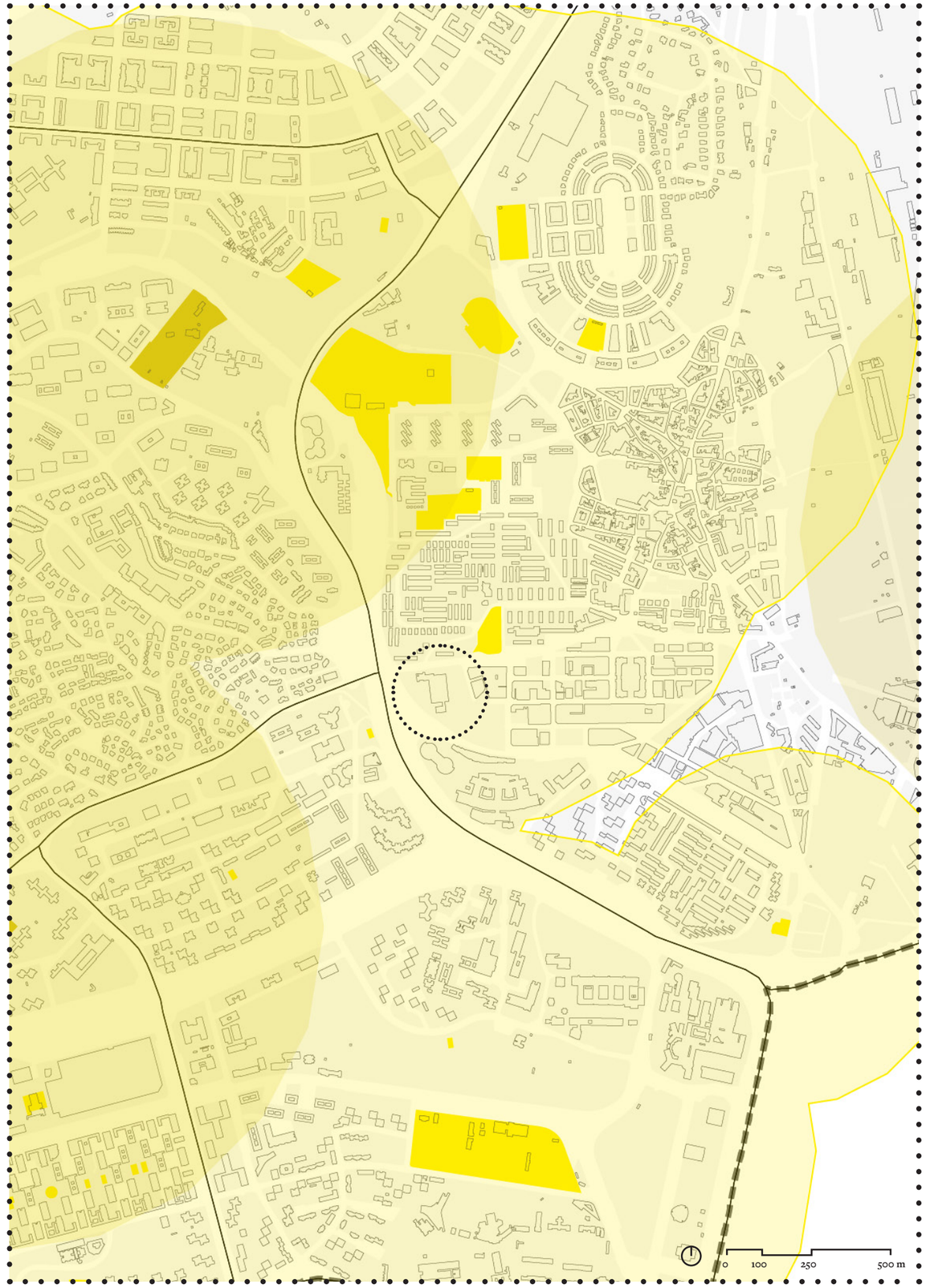


Sports facilities - Fuencarral district

private
public
undeveloped
Radius of influence (500 - 900m)
public
private
CLESA



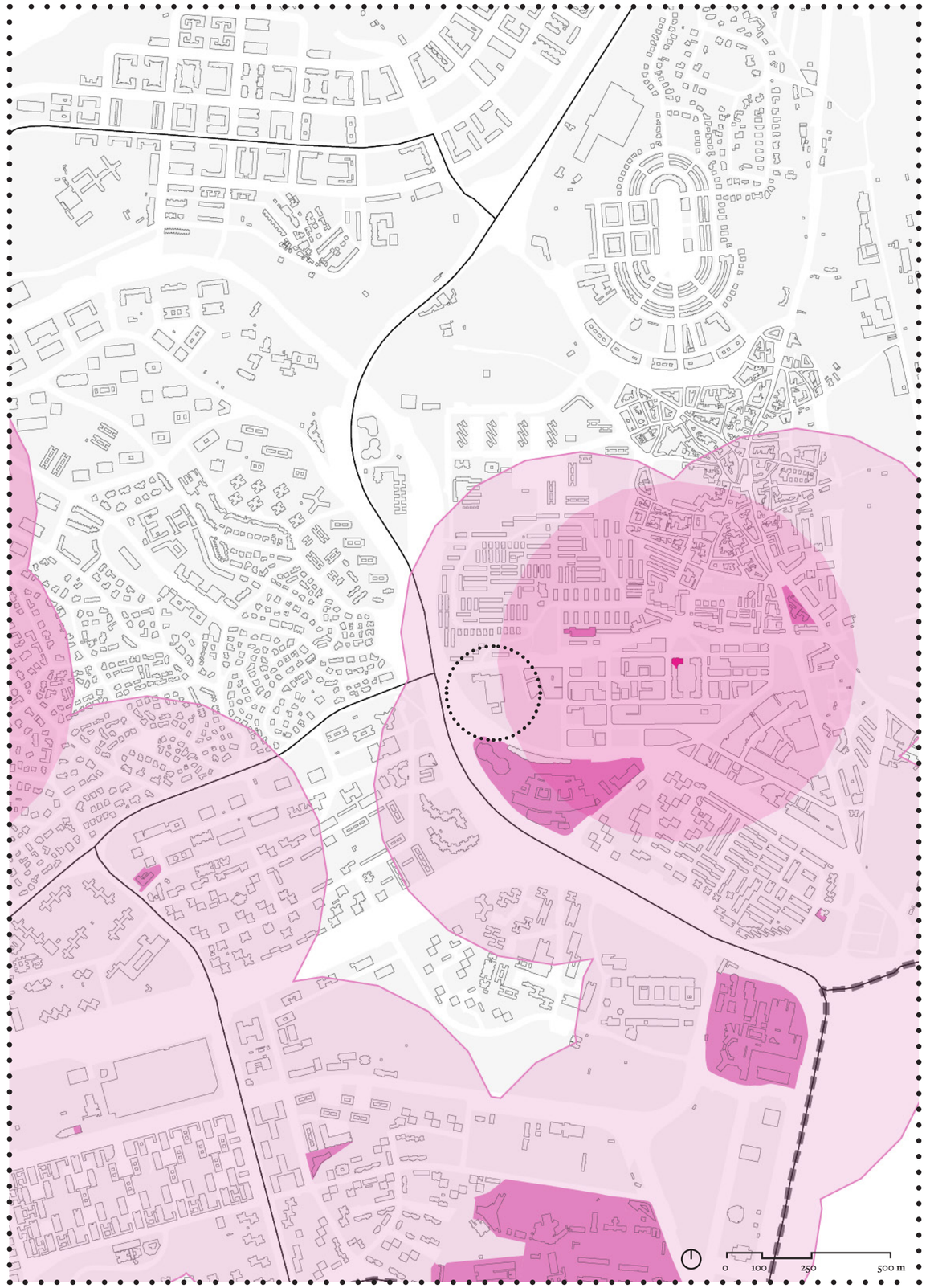
Sports facilities - Zoom



Sanitary facilities - Fuencarral district

private
public
undeveloped
Radius of influence (500m)
public
private
CLESA

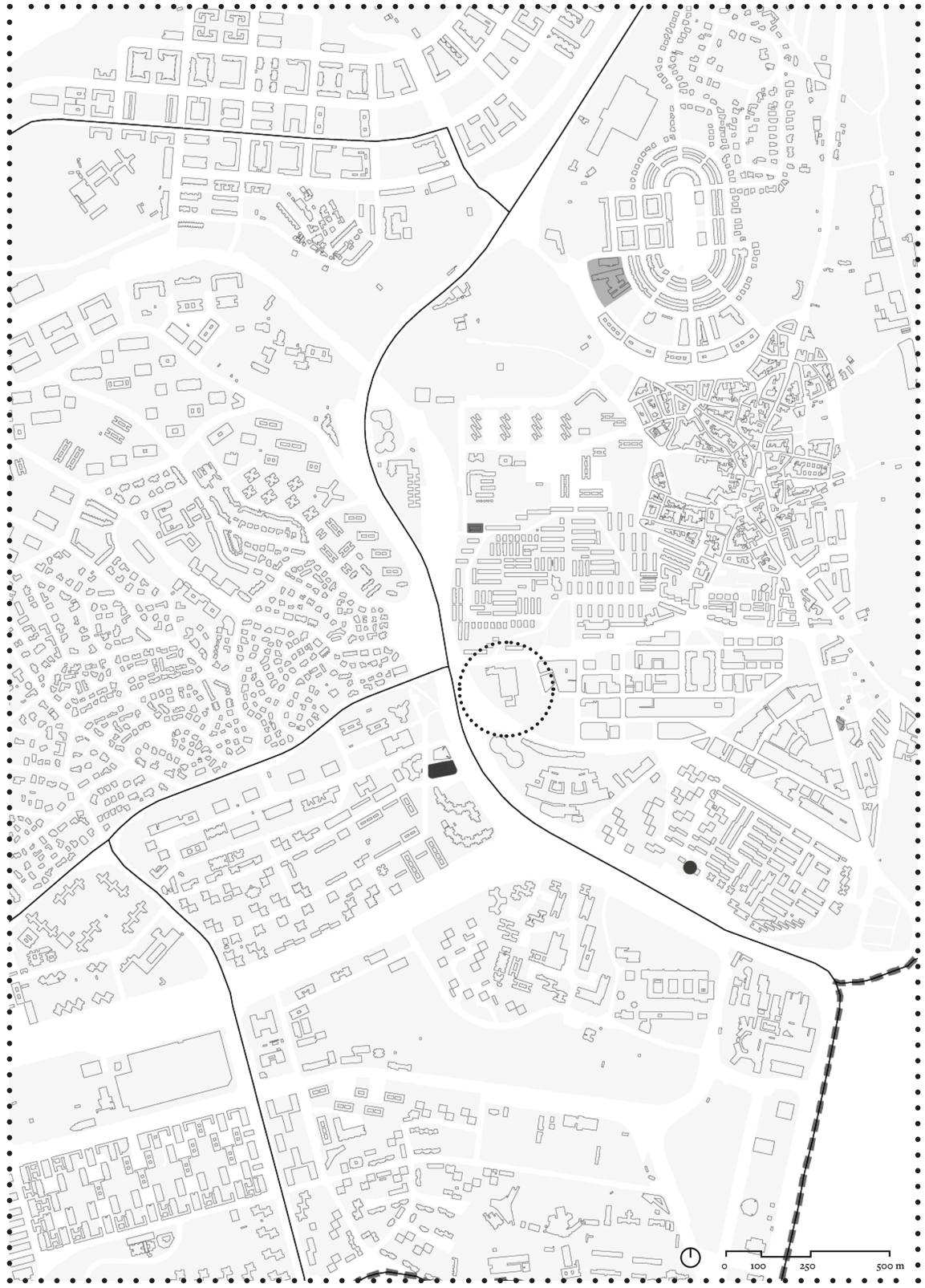
Sanitary facilities - Zoom



Social Facilities - Fuencarral district

private
public
undeveloped
CLESA

Social Facilities - Zoom



TIMELINE CLESA

1957-1961

CLESA factory design and construction

1998

The Italian food speciality company Parmalat buys the company

2001

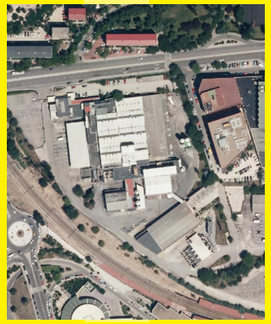
The Madrid City Council undertakes to include this building and 370 others in the Catalogue of Protected Elements

2007

Creation Nueva Rumasa. Ruiz Mateos takes over Parmalat in Spain and also CLESA

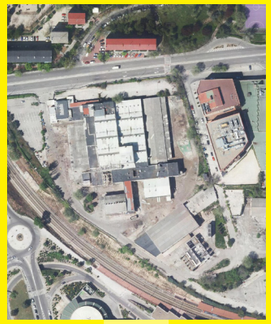
2010

Demolition for the construction of new housing is assumed. The property was in the process of being listed as a modern building and being listed as protected



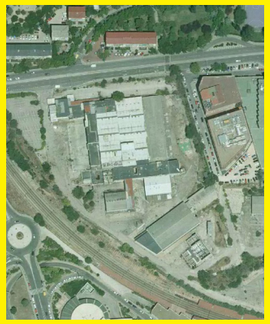
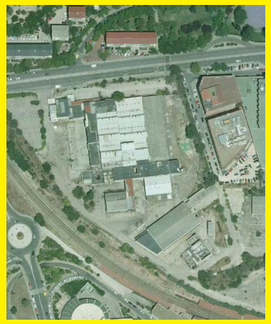
2011

Protests by workers and labourers

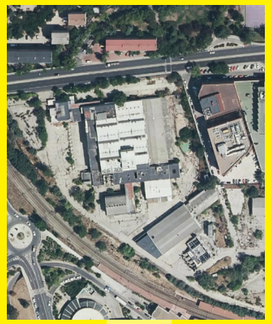


2012

Definitive closure of the plant






2013

The liquidation was approved in September. A few months after the eviction it was already in a degrading state

2014

Metrovacesa is the new owner of the building and urges demolition at City Hall
Despite requests to protect the building this is not catalogued, it is only pre-catalysed

2015

The municipal government paralyses the demolition application and pushes for a one-off amendment of PGOUM 97 to include the complex in the catalogue of Grade 3 listed buildings
In June, the first competition of ideas for the re-functionalisation of the main ship of the CLESA dairy plant takes place

2018

New request for modification of PGOUM 97 to protect the entire original complex and allocate it to the public by handing it over to the municipality

2019

The new municipal government presents the rehabilitation of the Clesa factory in the international competition Reinventing Cities

2020

The winner of the competition for the CLESA rehabilitation project announced by the jury is Metrovacesa

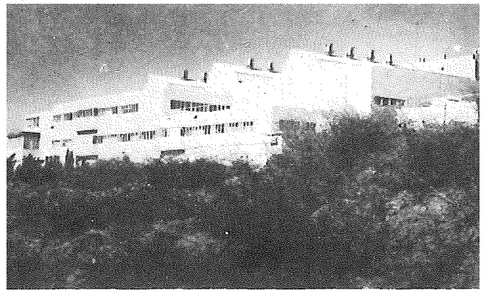
2022

Some parts of the building that were not under protection have been demolished. Pending the start of any works that should bring this area back to life, the building is continuously guarded by a 24/7 caretaker

The project of Alejandro de la Sota

It was in 1958 that architect Alejandro de la Sota was commissioned to design the CLESA milk factory in the north of Madrid.
The project and its construction, in collaboration with the agronomist engineer Manuel Ramos, lasted until 1963, coinciding with the design and construction of two other significant works: the Civil Government of Tarragona (1956-1963) and the Maravillas School Gymnasium (1960-1962).
From 1955, when Alejandro de la Sota designed the milk dairy plant in Pamplona and San Sebastian, until 1969 when he realised the project for UNACO, fourteen years passed in which the ***evolution of his idea*** over time can be appreciated. During this time he designs and constructs industrial buildings in which ***simplicity*** towards greater ***abstraction*** is always present, emphasising the importance of technique. Of the six projects for dairy plants conceived during these years, only the CLESA will be realised. In these projects he expresses what will later be the main ideas realised in the Madrid factory, a clear desire to create ***anonymous and flexible containers*** that come together to form a harmonious whole in which each part does not lose its individuality. Each different ***volume*** of the complex contains an ***activity*** and the whole is configured by the juxtaposition of these spaces.

1.6



1975 Baldellou, Miguel Angel *Alejandro de la Sota*

1.7

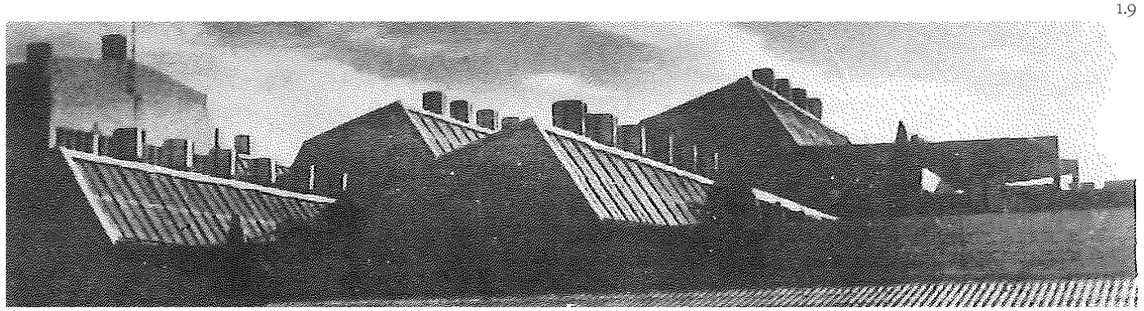
https://archivo.alejandrodelasota.org/es/original/project/82

1.8

https://www.elconfidencial.com/espana/madrid/2022-07-10/40-entidades-antigua-fabrica-c sa-desarrollo-industrial_3457948/

photos taken shortly after the construction of the project was completed and showing visits by citizens inside the factory

1.9



1975 Baldellou, Miguel Angel *Alejandro de la Sota*

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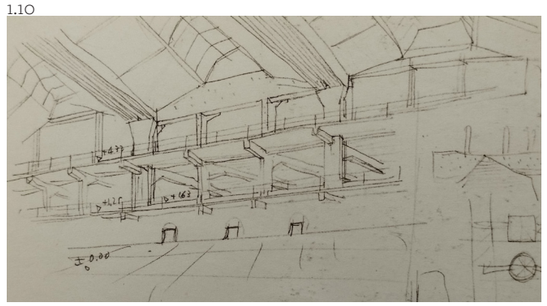

2009 Abalos Iñaki, Llinàs Josep, Puente Moisés *Alejandro de la Sota*

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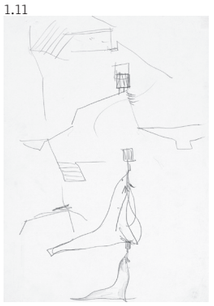


https://archivo.alejandrodelasota.org/es/original/project/82

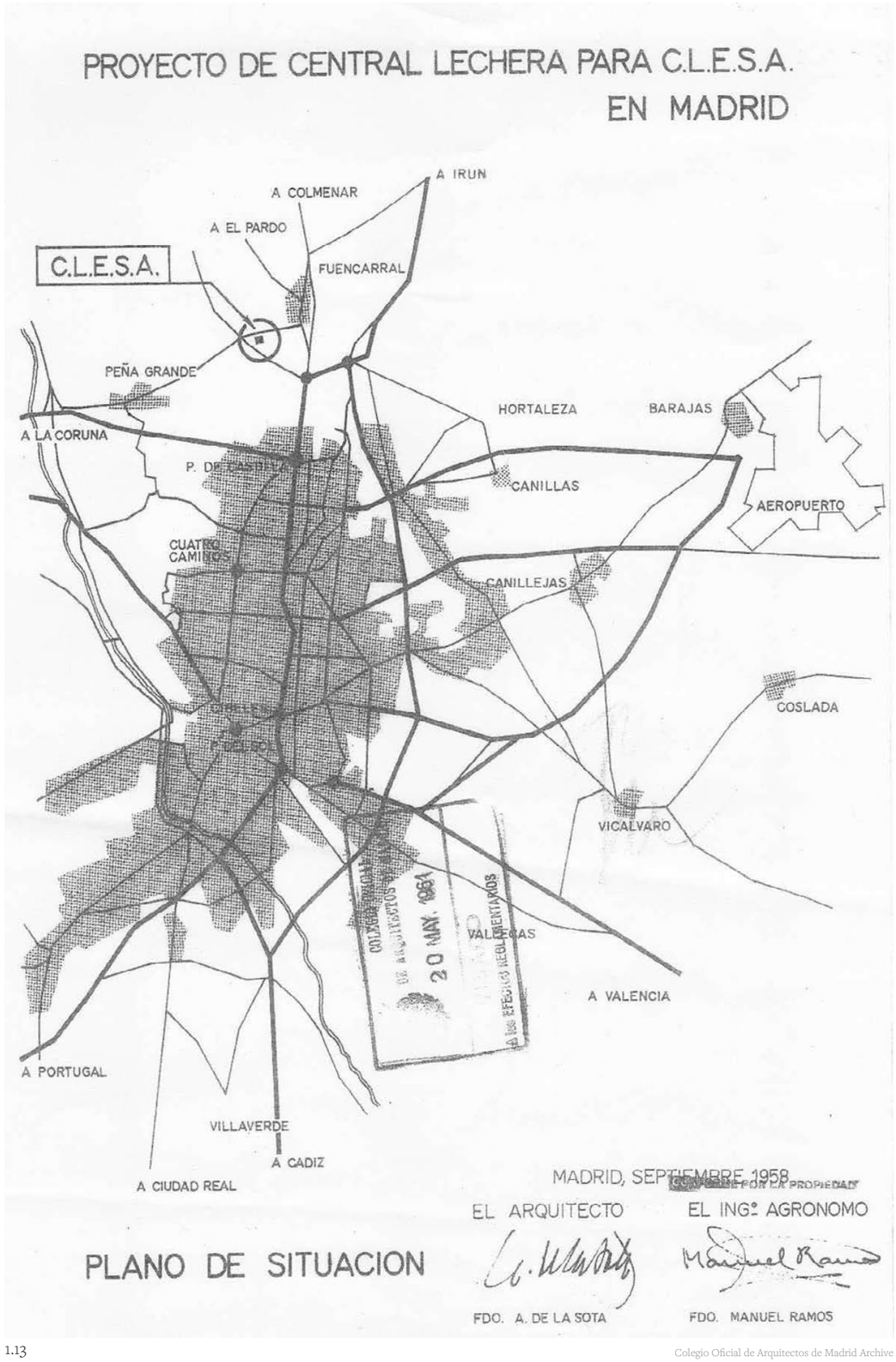
1.12

https://archivo.alejandrodelasota.org/es/original/project/82

from the left
//design sketches by alejandro de la sota
//caricature of seal-shaped skylights
//Kyodo dairy factory project

Each operation thus becomes the machine that determines the ***position*** and ***relationship*** of the different spaces, from the reception of the raw material to the exit of the finished and packaged product. The large warehouses are flooded with natural light thanks to the overhead lighting from the large ***skylights*** designed by the architect, crowned by a sequence of fans, which give the work an image of great industrial identity. In one of his caricatures, de la Sota illustrates these skylights with a metamorphic section, taking the form of a seal. The silhouette of these broken sawtooth skylights take centre stage in relation to the serenity of the intervention and mark a ***precise rhythm***.
Inside, these beams of light divide the large production space into two different areas, but despite this it is perceived as a continuous whole. The archive images of the project also include a design for a milk factory in Kyodo, Japan, included in an architectural magazine of the time. This project was taken as a reference by Alejandro de la Sota, for the use of walkways connecting the volumes. In the CLESA, the ***passe-relle*** have a ***dual function***: to connect the two prisms that separate from the main body (the milk entrance area and the restaurant) and to connect the building with the landscape of northern Madrid, then perceived as a remote place.

The building was also used for ***public tours*** and walkways were used to create routes for visitors. The bottled milk production process requires a location free of other industries and pollutants, with optimal conditions for water saving, sewage and electricity connection, thus optimising the proper functioning of the plant. For this reason, the building was constructed on a large plot of land in the industrial area of Fuencarral, which was uninhabited at that time, paying attention to both ***orientation*** and ***volumetric layout***.
Two main entrances were created by the studio in the determination and proper functioning of the routes, the main one connecting with the road in front, and another secondary one, for collection and distribution with goods vehicles. The central aisle, flanked by the docks for receiving empty containers and shipping products, included the seven production lines for bottling milk, leaving the rest of the programme distributed in other secondary buildings, such as the cold stores, the by-products warehouse and the butter warehouse. In this fragmentation of the indipendent, yet interconnected volumes, the functionality of the project and the architect′s characteristic reductive spirit are reflected: the use of ′containers′, the use of materials as a direct and ***brutalist imprint***, with a language based on the interpretation of the Modern Movement.



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Colegio Oficial de Arquitectos de Madrid Archive

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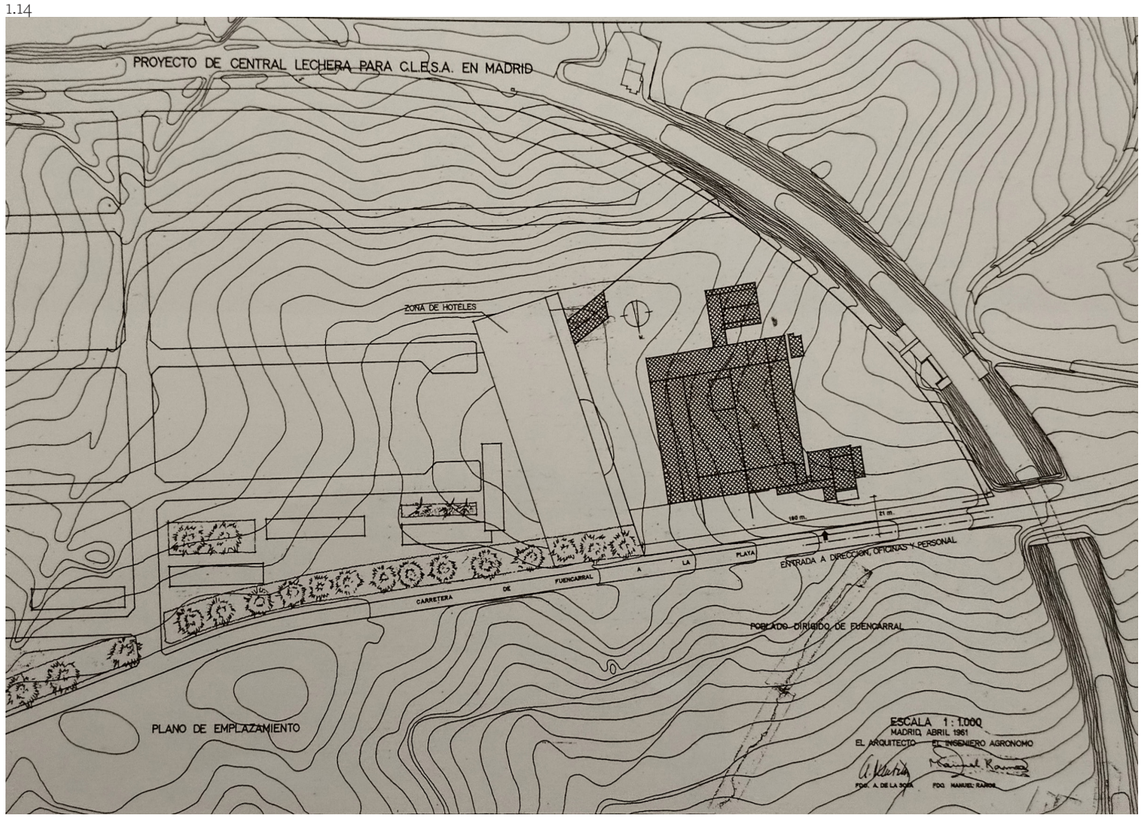

drawing of the topography of the project plot signed by architect Alejandro de la Sota and agronomic engineer Manuel Ramos

from the left:
//photograph of the model published in the abc newspaper on 2 february 1962
// aerial photograph

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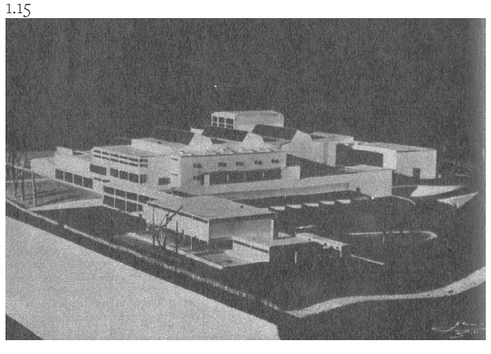

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2009 Abalos Iñaki, Llinàs Josep, Puente Moisés *Alejandro de la Sota*

Alejandro de la Sota CLESA program

entry and exit of trucks

garage

milk reception

steam and water service

laboratories

refrigeration and skimming

milk storage depot

thermal treatment

warehouses

concentration and casein

creamery

reception of empty bottles

washing, filling and closing

storage

shipment of full bottles and butter

changing rooms, canteen-kitchen

office entrance, management, visitors

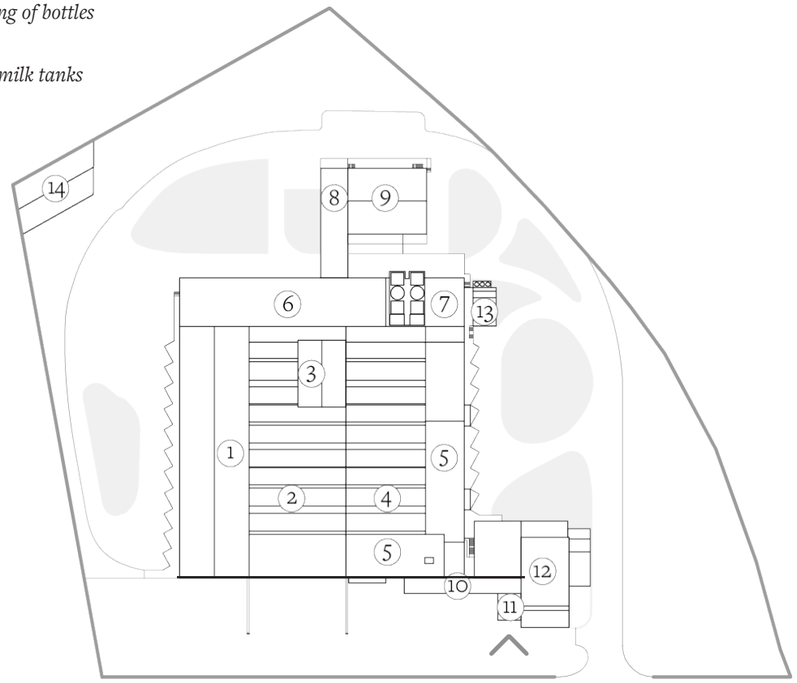
workers entrance

access for management, visitors, office staff and workers

Cardenal Herrera Oria Avenue

General plan diagram with original functions

1. *empty bottle reception hall*
2. *production hall: washing and filling of bottles*
3. *sterilisation tower*
4. *production hall: raw and treated milk tanks*
5. *offices*
6. *general stores*
7. *water cooling tower*
8. *lab*
9. *milk reception hall*
10. *connection gateway*
11. *workers' access and first aid kit*
12. *canteens and dressing rooms*
13. *transformation centre*
14. *boiler house*



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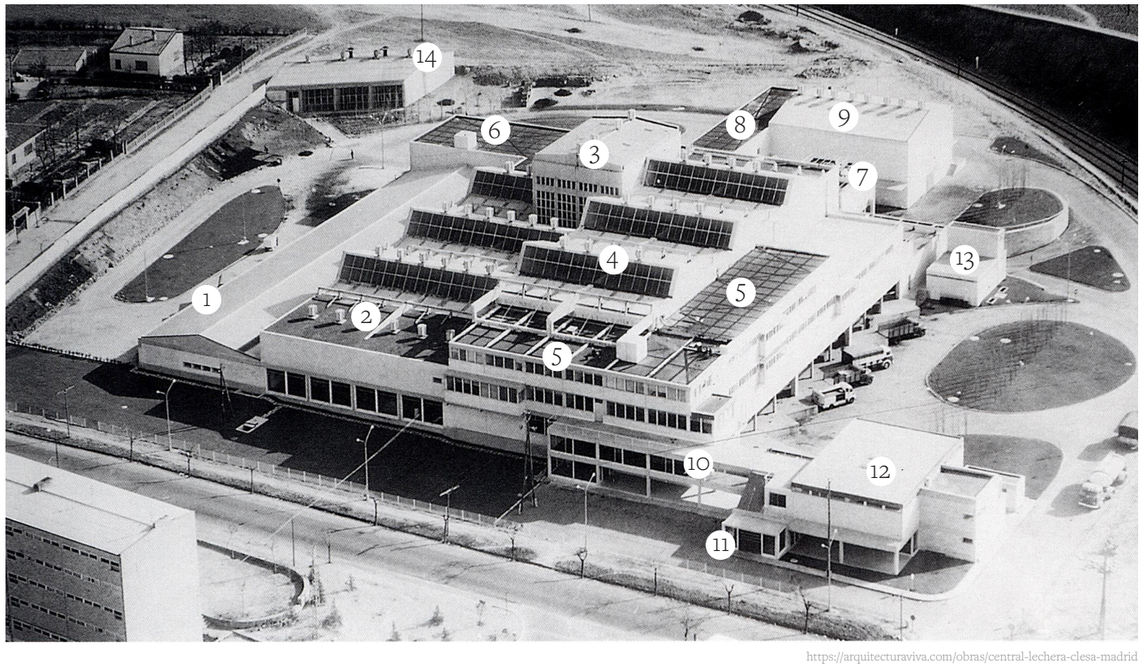
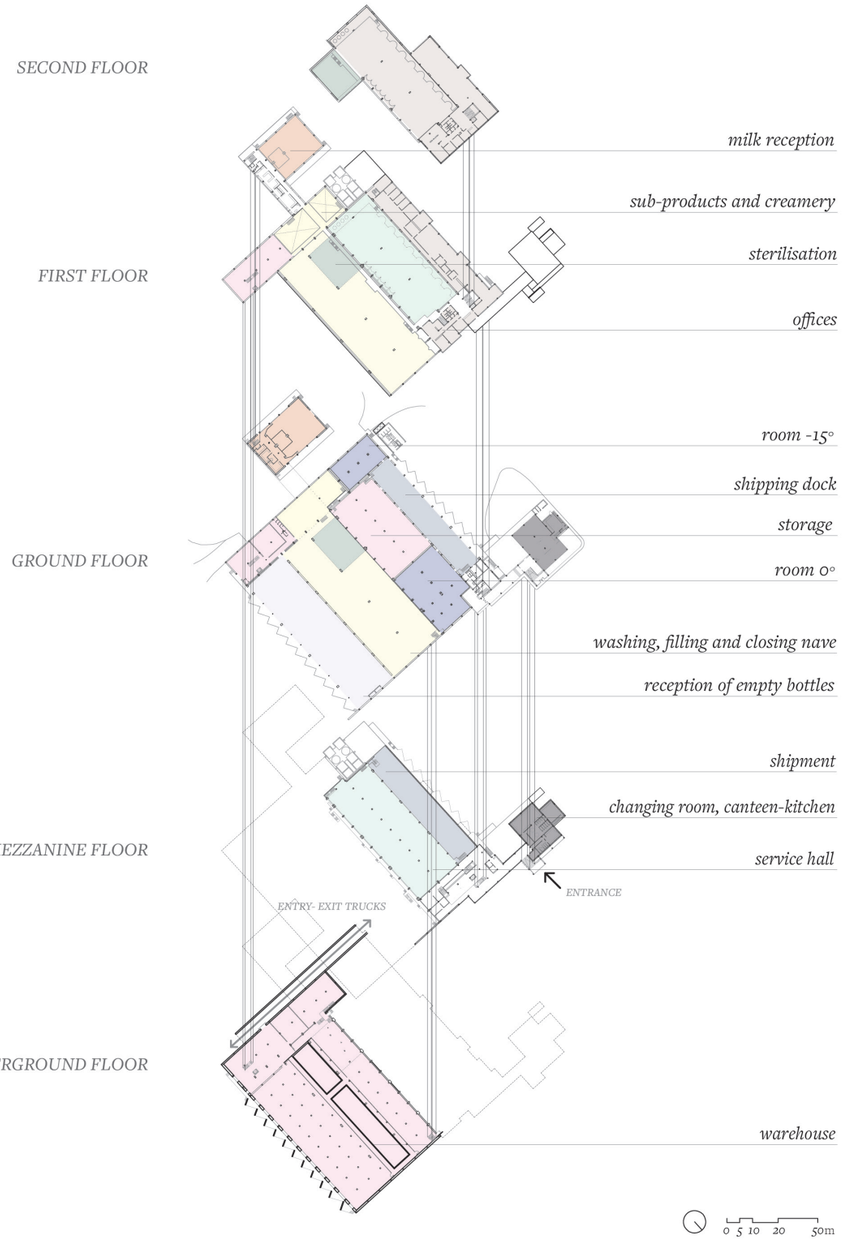


https://arquitecturaviva.com/obras/central-lechera-clesa-madrid



design elevation drawing

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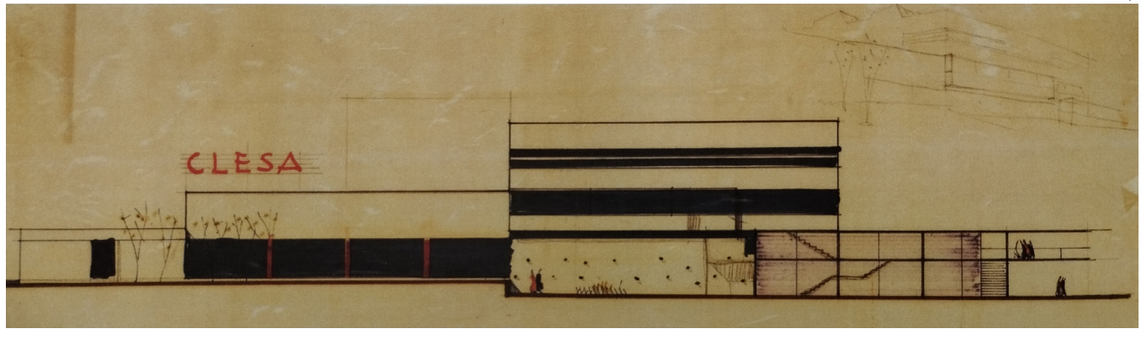
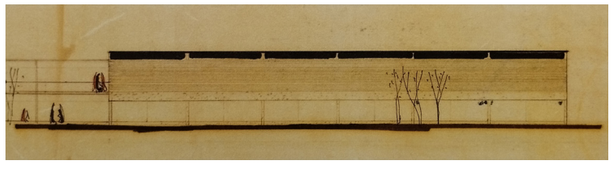


This set of volumes consists of ***two large central naves***, on different levels. Surrounding these two naves are ***three prismatic volumes*** and one with a pitched roof. This set of volumes with different sections, together with the cantilevered windows on the facades, mitigate the negative effect of the proximity of the street on the north façade of the building.
The envelope is made of ***concrete*** blocks in situ giving an image of "poor architecture", softened by the white paint covering the entire perimeter. The structure also consists of reinforced and prestressed concrete, used for economic reasons as steel was in short supply. The concrete used as the dominant material, conditioned a ***massive construction***, whose limestone appearance further enhances its simplicity. The justification for the construction system indicates a desire to achieve maximum diaphanousness for two purposes: ***visibility*** and ***flexibility*** of spaces. These spaces thus respond to two key issues, namely the intrinsic functions of the factory and the possibility of being visited by the public. The internal flooring is asphalt to allow the circulation of machinery for the transport of goods and also ceramic tiles with anti-acid treatment.



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photos of the exterior and interior of the CLESA in operation

2009 Abalos Iñaki, Llinàs Josep, Puente Moisés *Alejandro de la Sota*

Decline, abandonment and recovery competitions

From 2010 onwards, protests by CLESA workers advanced and in the same year there were suggestions that the factory would be ***demolished*** to build housing, as had already happened with other works by Alejandro de la Sota such as the Poblado de Fuencarral and the Arvesù house.
In March 2010, the Alejandro de la Sota Foundation obtained a commitment from the Madrid City Hall to safeguard the installations, and the Councillor for Urbanism confirmed that the building was in the process of being included in the list of modern buildings to be listed as protected, offering it high or very high protection.

As early as 2001, the municipality committed to listing this building and 370 others in the Catalogue of Protected Elements, in order to fill the gaps in the protection of modern architecture that allowed the demolition of Miguel Fisac's La Pagoda in 1999, which had been promised protection in 1993.
Since its final closure in 2012, the state of the factory has been degenerating.
In 2014, the current owner, the construction company Metrovacesa, applied for a municipal licence to demolish the building. To avoid this, the Madrid Association of Architects proposed to have the municipality open a protection file, to temporarily block the demolition.

Demolition of the unprotected buildings of the CLESA dairy plant, Madrid.

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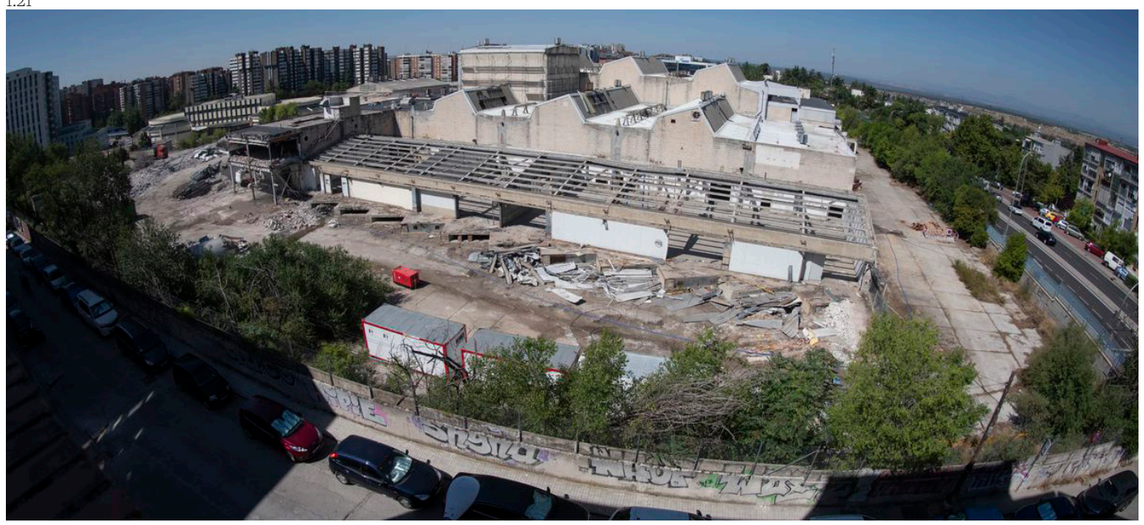

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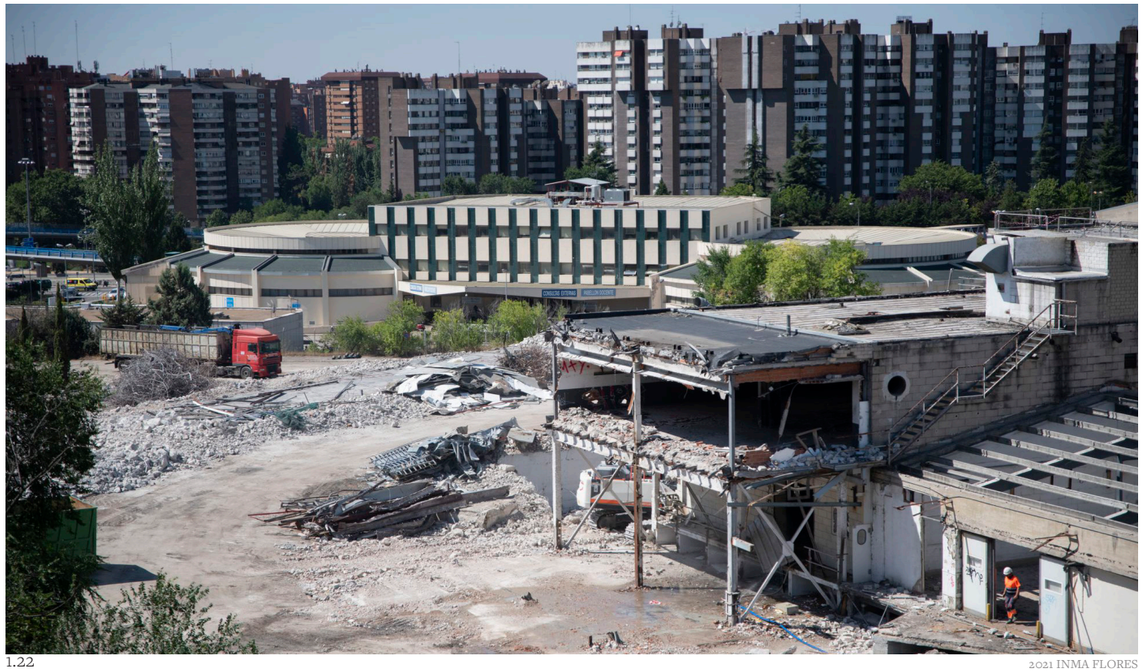

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2021 INMA FLORES

The Municipal Department of Urban Planning has undertaken to study this initiative.
In 2015, as part of the process of drafting an amendment to the 1997 General Urban Plan of Madrid (PGOUM 97), a detailed examination of 17,000 buildings was carried out to determine whether and to what extent they could be protected for their historical and artistic value.
For the CLESA factory, a ***protection level*** of ***partial grade 3*** was requested, which allows the preservation of its volumetry and the most relevant architectural elements: the two main buildings, with their vertical and horizontal concrete structure (pillars and beams), the floor slabs, the roof volume and the main facade facing Cardenal Herrera Oria Avenue, as well as the facades and volume of the access module and changing rooms.
In the same year, the General Directorate of Historical Heritage of the Community of Madrid also sent a letter to the Department of Urban Planning requesting the building's protection. However, regional protection was not granted, as the factory is less than 50 years old and has no industrial machinery inside. Moreover, according to the Community, this protection should allow the building to be put to a new use.


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PROHIBIDO EL PASO
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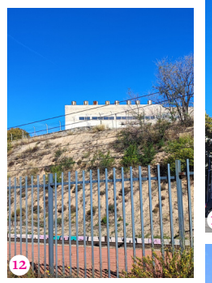
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MEETING POINT
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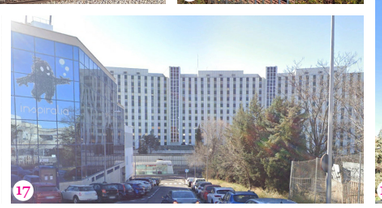
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Ramón y Cajal
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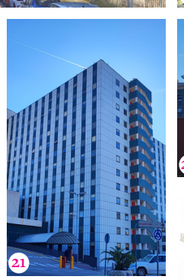
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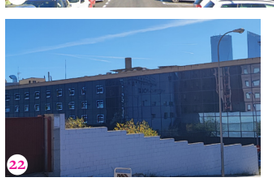
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Competition 2015

Almost at the same time, a first 'ideas competition' - more theoretical than real - was launched in June 2015, promoted by COAM and Metrovacesa itself, with the aim of defining ***possible future uses*** for the main building of the former CLESA factory compatible with the planning promoted by the municipality.
Up to eighty proposals were submitted to the competition, with ***three first prizes awarded ex aequo*** to Pedro Pitarch Alonso for *"La Fábrica Cultural"*, to Patricia Fernández García and Rubén Conde Gómez for *"Mil reflejos"* and Adrián Martínez Muñoz and Pablo Izaga González for *"Factory Garden"*. A special mention was awarded separately to 'Dar liebre por gato' by Alfredo Baladrón Carrizo. The Jury awarded this prize ex aequo with the intention that the three teams would initiate a collaborative process for the drafting of a common project that would meet the needs of both the competition promoters and collaborating organisations, as well as the city itself. This first non-binding proposal served to demonstrate the ***building's potential*** as a container for new functions, which led the Sustainable Urban Development Area in 2018 to promote a new specific amendment to PGOUM 97 to protect the entire original building and use it as a public facility by transferring it to the City, which in return would redevelop the remaining 40.000 m2 of the plot, maintaining the building area originally planned, but changing its use from ***residential*** to ***tertiary***, as a hotel, rented accommodation for staff and users of the Ramón y Cajal Hospital, and a commercial area.

1.23 https://www.aeppas20.org/concurso-rehabilitacion-clesa-de-alejandro-de-la-sota/


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1.25 https://www.revistaad.es/arquitectura/galerias/clesa/7811?image=601514

Competition 2020

In 2018, the Madrid City Council, through the Department of Sustainable Urban Development, made a specific amendment to the General Urban Plan to allow the former Clesa factory to be used as a ***public facility***.
The proposal to catalogue the Clesa building, designed in 1959 by architect Alejandro de la Sota and the only example of contemporary industrial architecture in the city of Madrid, was studied by the Institutional Commission for the Protection of Historical, Artistic and Natural Heritage (CPPHAN). This opinion initiates the specific modification of the General Regulatory Plan to protect the old factory, closed since 2012, and to guarantee its use as a public facility, in addition to generating a new area of activity, ***a pole of dynamism for the city***.
The aforementioned protection proposal proposes the retention of level 3 with a partial degree of cataloguing, already reported by the commission in 2015, and its transfer to the Madrid City Council so that it can become part of the municipal heritage as a new space for public facilities. This new proposal adds the transversal building located to the south of the central buildings, as well as the Laboratories module located to the south.
For the rest of the 40,000 m2 plot on which the building stands, new development conditions are proposed for the transformation of this industrial space into an urban space for tertiary use.

In April 2019, the City Council announced its decision to rehabilitate the old factory to house the ***"Matadero del Norte"***, a large cultural and social centre open to all citizens, who - however - denounced the lack of precision of the announced plans, which conflicted with the concessions made to Metrovacesa itself, for which they presented more than five hundred charges to the project, managing to obtain the extension of the green areas by 10. 379 m2 and that the height of the planned towers be reduced from 32 to 25 storeys, although without any loss of building area.
In December 2019, the new municipal government team changed its criteria and submitted the rehabilitation of the CLESA factory to the ***international competition Reinventing Cities***, organised by the C40 group, which brings together more than fifty cities committed to reducing emissions, with the aim of rehabilitating the site and adapting it to environmental requirements to accommodate ***cultural uses***; envisaging its future private management through an operating agreement in which the building is to be rented for 75 years. The same owner Metrovacesa submitted a project and won, although it did not have the support of the Alejandro de la Sota Foundation - present in the jury - because it considered that it did not respect the environment, values and spirit of the original work, according to the regulations.

In June 2022, the Regional Federation of Madrid Neighbourhood Associations (FRAVM) started a ***signature collection campaign*** to save the building.
The neighbourhood organisation called for the initiation of proceedings to declare it an asset of cultural interest. The debate began in May of that year in the Madrid City Council, after the city government had assured that it would convert the former Clesa factory into an innovation and research centre.

In October 2022, the City Council repossessed the CLESA, and the current plan is to transform it into a ***health science centre***.
Due to its characteristics and location, there is a high risk of "squatting", which is why it currently requires continuous on-site supervision until the processing of the concession file is completed.

The complex has not yet received the required protection.

https://www.revistaad.es/arquitectura/galerias/clesa/7811?image=601514


2022

02
The
Industrial
Heritage

02
The
Industrial
Heritage

Industrial heritage in Europe

Industrialisation has never been a purely national phenomenon. From the mid-18th century onwards, new technologies and production methods spread from England and spread throughout Europe. Manufacturers opened factories in several countries and thousands of workers moved from the countryside to the new industrial areas. As the industry developed, new towns sprang up around the production areas, and in other cases some towns saw rapid growth.
During the 1970s, as technology evolved, the Industrial Revolution began to lose momentum and many buildings were decommissioned.
As early as the 1950s, so-called ***industrial archaeology*** emerged, a branch of archaeology concerned with studying the culture of industrialisation and analysing material remains and historical evidence of production processes and their technologies.

The term was probably invented by Donald Dudley, director at the time at the University of Birmingham, who later became professor of Latin at the same university. Mr Dudley had become interested in archaeology through classical studies, and it was the city of Birmingham in the 19th century, somewhat battered by the bombings of the war, that made him think that perhaps industry, with its machines, was also entitled to archaeology.
One of his colleagues, Professor Michael Rix, in his article published in The Amateur Historian in 1955, first used this term, emphasising the need to preserve the remnants of the industrial age before they disappeared altogether.
Kenneth Hudson (1963), journalist, museologist, broadcaster and book author, later defined this discipline such as:

"discovering, cataloguing and studying the physical remains of the industrial past in order to learn about relevant aspects of working conditions, technical and production processes"

HUDSON, K. Industrial Archaeology. An Introduction, London, 1963

An industrial monument is "any building or other fixed structure, especially of the period of the Industrial Revolution, which either alone or in association with plant or equipement, illustrates or is significantly associated with the beginnings and evolution of industrial and technical processes. These may be concerned with either production or communication"

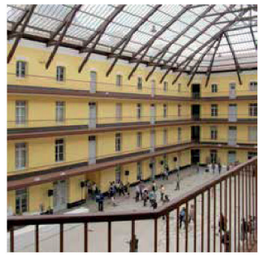
Definition of the Council for British Archaeology in HUDSON, K. Industrial Archaeology. An Introduction, London, 1963

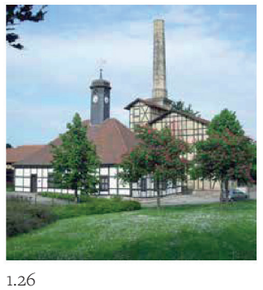
The first conference on industrial archaeology was organised by the ***Council for British Archaeology*** in 1959 and the first book published on the subject was inspired by this conference in 1963.
The following year a quarterly journal on industrial archaeology was published. From this time on, the number of activists and promoters supporting the cause began to grow.
Actually from this period onwards and for years to follow, industrial archaeology was always viewed with distrust or even hostility. There were mainly two reasons for this. On the one hand, archaeology was synonymous with excavations and therefore all material that was on the surface at that time was not seen as something to pay attention to from this point of view; on the other hand, everything that belonged to the 19th or 20th century was not considered old enough to contain any archaeological value in itself.
The research and advisory committees on industrial archaeology of the Council for British Archaeology played a decisive role in setting ***official policy*** and in developing an awareness among the public to consider industrial monuments on the same level as churches, castles and any other kind of historic building.

Industrial archaeology was born in close connection with the movement that dealt with the revaluation of ***industrial heritage***. Robert Angus Buchanan, during his lectures at the University of Bath (1989), emphasised preservation without neglecting analysis and interpretation, thus defining industrial archaeology as

"that study which deals with or aims at the discovery, analysis, recording and preservation of the industrial remains of the past, for which it is necessary to resort to fieldwork and, at times, the excavation techniques of archaeologists"

Since its origins, industrial archaeology has been concerned with the restoration of industrial elements, through consolidation, thus preventing their disappearance.
Their restoration or reuse for other purposes has been able to convert them into the memory of the industrial past, preserving both their historical and urban memory.
It was from the 1970s onwards that industrial heritage became part of the historical and cultural heritage, gaining greater acceptance thanks to the interest and social awareness that were decisive for the revaluation of this heritage.
In the last half century, new educational or leisure travel destinations have emerged. Magnificent palaces and elegant parks have been linked to ***mines***, ***steam railways*** and ***former textile factories*** that have been repurposed for concerts or exhibitions. No longer the interest of a few, industrial heritage has joined aristocratic mansions and breathtaking landscapes as something many aspire to experience, to get to know these places that are part of history and culture.





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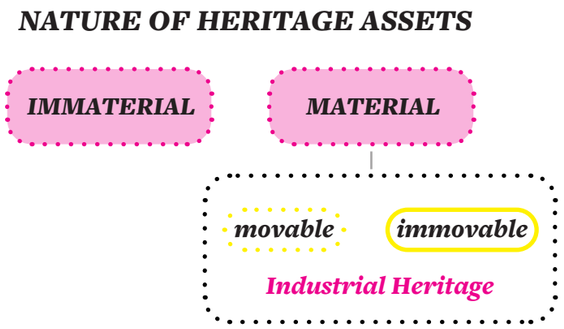
https://euagenda.eu/publications/european-industrial-heritage-the-international-story



Various ***institutions*** have preserved industrial buildings and created industrial museums: from former workers' groups, national and local government agencies, companies honouring their traditions and volunteer groups determined ***not to lose their community history***.

While industrial heritage has grown in popularity, Europe's relative position in the global mining and manufacturing landscape has declined. Industry has ancient origins, but it is since the 18th century that it has grown to dominate the economies of most European countries. Now we are witnessing the closure of huge industrial plants that seemed eternal.

Industrial architecture can be defined as that which has an industrial and exploitative purpose, is a living expression of commerce and is based on the socio-economic needs brought about by the industrial revolution.

This definition includes all buildings constructed or adapted for industrial production, regardless of the branch of production.

The industrial revolution gave rise to ***new vital*** and ***ideological concepts***, such as economy, interchangeability, compatibility, prefabrication and standardisation. Concepts that had already been assumed by the machine and industrialisation, a machine that is not just a concrete device, but a ***social machine***, a rational organisation of production.

Industrial heritage includes those assets that are understood as heritage, i.e. ***containing sufficient value*** and the capacity to transmit it, and that are industrial in nature, directly ***linked to a productive activity*** that justifies the existence of that asset.

These two concepts are inseparable and must work together for an industrial element to be included in this typology.

In the typology of heritage understood as industrial heritage, one can distinguish ***immaterial*** assets from ***material*** assets, within which we can find ***movable*** and ***immovable*** assets.

Tangible immovable remains can be factories, workshops, mills, mines, farms, places of energy transformation, buildings related to transport and infrastructure, as well as places where basic and complementary activities of people related to those sites take place, such as housing, education, trade and religion.

Within this heritage, one can also distinguish ***isolated elements*** due to the disappearance of the rest of the elements that made up the ensemble and that retain an architectural, historical or cultural value as evidence of industrial activity (such as the CLESA milk plant examined) or ***industrial complexes*** that retain all the original buildings and are complete evidence of a certain industrial activity.

Industrial landscapes are also included in this typology as they retain elements of industrial processes.

The relative position of former manufacturing areas within the city has changed dramatically with the major urban development of major cities in recent decades. ***Land uses are changing*** and industrial activity is migrating to new areas due to the presence of obsolete production facilities and the need to renovate them.

When observing the industrial heritage, the greatest possible chronological breadth must be taken into account. Pre-industrial elements are significant examples of the technological process. Not only abandoned buildings, but also activities currently in use can be considered as containers of industrial values and identified as such, before the cessation of activity, which would anticipate solutions to abandonment and its consequences.

The CLESA dairy plant, with the 2015 and 2020 competitions for ideas, shows the signs of change in social evaluation that this typology has undergone, which grows over the years thanks also to other examples that demonstrate adaptability.

The heritage function alone is not enough to protect and preserve this typology of assets given the large number and worrying situation of degradation in which they find themselves. This is why, in many cases, it is necessary to ***attribute a new function*** to assets of this type, as a conservation strategy, which can justify the efforts due to ***recovery*** and ***maintenance***.

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https://images.adsttc.com/media/images/5cbe/4165/284d/d14f/f500/0598/slideshow/04__Strakhov__Wikimedia_bajo_licencia_CC_BY-SA_4.0_.jpg?1555972444

Enhancement processes

Certainly a key project of industrial architecture is Les Halles in Paris, designed by Victor Baltard and built between 1852 and 1870. Its demolition between 1971 and 1973 made way for the construction of the Chatelet RER station and the Forum des Halles.
This event provoked a strong reaction from professionals and institutions who decided to start a ***cataloguing process***, recognising some not insignificant projects as ***World Heritage***.

Nowadays, in order to protect, preserve and reuse these vestiges of our industrial past, an important role is still played by various social actions, protests and local associations.
The economic crisis and the industrial transformation taking place since the 1960s have also impacted this way of thinking.
In cities there are vast industrial backwaters and this problem has led many management departments, both municipal and national, to consider the protection, use or in some cases the demolition of these industrial buildings.
Thus, inventories and catalogues were created, the protection of some industrial relics was proposed and some of them were turned into industrial museums. Today, the cultural and historical value of these buildings is indisputable as they represent a ***testimony*** of the ***industrial past***, of specific historical moments.
However, despite this growing interest, there is still a lack of public awareness. Furthermore, it is difficult to propose a comprehensive catalogue of these elements, where the evaluation criteria for each of these elements can be unified, to reconcile the conservation and preservation of this heritage with urban planning and social interests. What is clear is that to talk about the artistic value of the industrial heritage of the 19th and 20th centuries, the parameters used for an artistic monument of earlier periods such as the Gothic, Renaissance or Baroque are not worth.
Today, industrial heritage is internationally accepted as a type of heritage.
This is possible thanks to the consideration of industrial heritage in the ***UNESCO World Heritage List***, organisations dedicated to the study and protection of this heritage such as ***The International Committee for the Conservation of the Industrial Heritage (TICCIH)*** and also the proclamation of 2015 as the ***European Year of Industrial Heritage***.
The International Committee for the Conservation of Industrial Heritage is an international society. In 1973, the First International Conference for the Conservation of the Industrial Heritage was held and later in 1978, with the Third International Congress for the Conservation of the Industrial Heritage, the TICCIH was founded.
Its task is to disseminate the values of industrial heritage, study it, preserve it and protect it.
From a chronological point of view, it focuses on assets extending up to the present day and does not exclude those from earlier periods.
To this end, there are meetings, publications, communications, congresses and other activities related to industrial heritage.
The TICCIH is an advisor to ***ICOMOS (International Council on Monuments and Sites)*** in relation to industrial heritage, in view of the proposal of its assets as World Cultural Heritage by UNESCO.

1.28 https://www.italianipocket.com/wp-content/uploads/2012/02/halles_baltard_1.jpg

"Industrial heritage consists of the remains of industrial culture which are of historical, technological, social, architectural or scientific value. These remains consist of buildings and machinery, workshops, mills and factories, mines and sites for processing and refining, warehouses and stores, places where energy is generated, transmitted and used, transport and all its infrastructure, as well as places used for social activities related to industry such as housing, religious worship or education.

Industrial archaeology is an interdisciplinary method of studying all the evidence, material and immaterial, of documents, artefacts, stratigraphy and structures, human settlements and natural and urban landscapes, created for or by industrial processes. It makes use of those methods of investigation that are most suitable to increase understanding of the industrial past and present.

The historical period of principal interest extends forward from the beginning of the Industrial Revolution in the second half of the eighteenth century up to and including the present day, while also examining its earlier pre-industrial and protoindustrial roots. In addition it draws on the study of work and working techniques encompassed by the history of technology".

Definition of Industrial Heritage by the TICCIH
The Nizhny Tagil Charter for the Industrial Heritage
The International Committee for the Conservation of the Industrial Heritage (TICCIH)
17 July, 2003

INTERNATIONAL ORGANIZATIONS FOR THE PRESERVATION OF INDUSTRIAL HERITAGE

ALIAS	Organization Name	Country/Region	Established
AIA	*Association for Industrial Archaeology*	Great Britain	1973
AIPAI	*Associazione Italiana per il Patrimonio Archeologico Industriale*	Italy	1997
APPI	*Associação Portuguesa para o Património Industrial*	Portugal	1997
CILAC	*Comité d'information et de liaison pour l'archéologie, l'étude et la mise en valeur du patrimoine industriel*	France	1979
E-FAITH	*European Federation of Associations of Industrial and Technical Heritage*	Europe	
FIEN	*Federatie Industrieel Erfgoed Nederland*	Netherlands	1984
IHAI	*Industrial Heritage Association of Ireland*	Irelands	1996
IHTIA	*Institute for the History of Technology and Industrial Archaeology*	United States	1989
JIAS	*Japan Industrial Archaeology Society*	Japan	1977
LIMF	*Latvijas Industriālā mantojuma fonds*	Latvia	1992
AIR	*Romanian Association for Industrial Archaeology*	Romania	2007
PIWB	*Patrimoine Industriel Wallonie-Bruxelles*	Belgium	1984
SIA	*Society for Industrial Archeology*	United States/Canada	1971
SGTI/ASHT	*Swiss Society for the History of Technology and Industrial Heritage*	Switzerland	
SIM	*Svenska industriminnesföreningen*	Sweden	1989
TICCIH	*The International Committee for the Conservation of the Industrial Heritage*	International	1978
VVIA	*Vlaamse Vereniging voor Industriële Archeologie*	Flanders	1978

https://en.wikipedia.org/wiki/Industrial_archaeology

UNESCO (United Nations Educational, Scientific and Cultural Organisation) also plays an important role for this type of heritage, as it recognises its importance and considers the elements of industrial heritage as assets that materialise human ingenuity and are essential for understanding history.
According to UNESCO, industrial heritage is ***not limited*** to a ***specific period***, it does not establish chronological boundaries. The first industrial property to be included in the UNESCO World Heritage List is located in Poland, the Wieliczka and Bochnia salt mines, in 1978. Another site worth mentioning is the Völklinger Hütte ironworks in Germany. After more than 100 years of operation, the ironworks was closed in 1986 and in 1994 became the first industrial monument in the world to be recognized as a UNESCO World Heritage Site Certainly, the inclusion of an asset in this list represents an important recognition at international level for this typology.

Kopalnia soli Wieliczka

1.29 https://krakow.wiki/wp-content/uploads/2016/11/wieliczka10.jpg

Völklinger Hütte

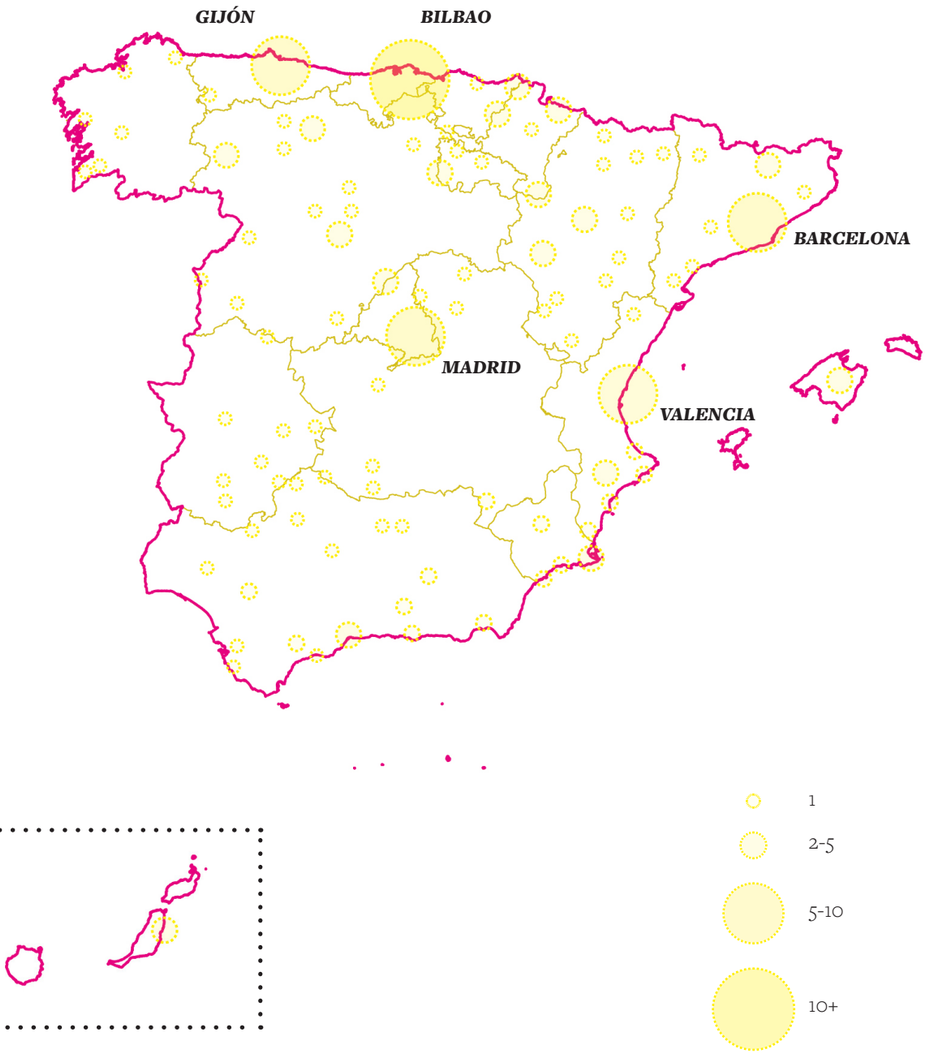
1.30 https://www.voelklingen.de/fileadmin/user_upload/Bildwelt/Tourismus/WKE_Gesamtansicht_Nacht_Totale.jpg

At the national level, Spain has the ***Plan Nacional de Patrimonio Industrial*** (***PNPI***) approved in 2001 to protect and preserve this type of heritage, also foreseeing the future use of industrial buildings or complexes. The plan promotes an increase in the number of protected and rehabilitated assets combined with an improvement in the quality of rehabilitation projects through the methodology used. The PNPI is carried out by the Spanish Heritage Institute (Ministry of Culture, General Directorate of Fine Arts and Cultural Heritage). The criteria approved by the Heritage Council can be divided into three sections:

a. Testimonial value, Singularity and/or typological representativeness, Authenticity and Integrity: these refer to the importance of the element in relation to other elements of the same typology or genre, and comparatively it is assessed and evaluated, either as a testimonial vestige in a more or less close environment, or for its singularity or for being the most representative model of a specific architectural genre, or for responding to the characteristics that define a type of building, or for preserving these characteristics without superimposed contamination from other periods. The criteria indicated in the second section

b. Historical-social, technological, artistic-architectural and territorial value: these refer to its historical and social value within a given period and society; to its technological value as a response to the development and evolution of technology, industry and the art of building; to the artistic value of the forms and ways of building that are representative of the paradigms of the mechanised era, i.e. functionality, rationality, transparency and sincerity; to its relationship with the built environment and its implications and derivations with other elements that contribute to defining an industrial landscape.

c. Possibility of integral restoration, state of conservation, viability plan and social viability, legal status: these refer to its possibilities for the future, its level of conservation, its possibility of integral restoration (real estate), its ownership or legal status and, lastly, the existence of studies or a strategic plan assessing its viability and social viability.



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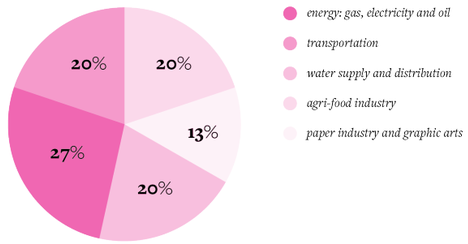
The knowledge and valorisation of this industrial heritage is promoted through the declaration of ***Bien de Interes Cultural*** (***BIC***). The declaration as BIC is regulated by Law 16/1985 of 25 June 1985 on Spanish Historical Heritage. The declaration of assets of cultural interest is the responsibility of the State only when the assets are assigned to public services managed by the State Administration or form part of the National Heritage.
As regards the city of Madrid, according to Law 3/2013, of 18 June, on the Historical Heritage of the Region of Madrid, these are those assets that:

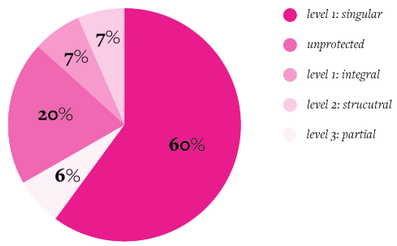
"being part of the historical heritage of the Region of Madrid, have an exceptional value and are expressly declared as such"

('Ley 3/2013, de 18 de junio, de Patrimonio Histórico de la Comunidad de Madrid'. Boletín Oficial de la Comunidad de Madrid (144): 14-38. 19 de junio de 2013)

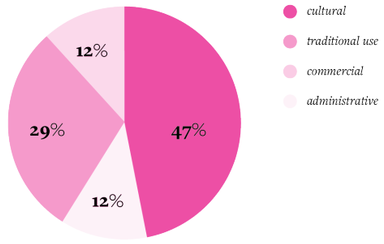
Division of BIC industrial heritage by sector



Protection granted by the PGOU (1997) to the industrial heritage BIC



Current uses of the industrial heritage BIC



ELEMENTS OF MADRID'S INDUSTRIAL HERITAGE DECLARED BIC

BIC denomination	*BIC declaration*		*PGOU 1997 protection*		*Actual use*
	category	*year*	*level*	*protection*	
Real Fábrica de Aguardientes y Napies	Monument	1977	Level 1	Singular	Cultural centre Tabacalera
Estación de Principe Pio	Monument	1977	Level 1	Singular	Mall
Edificio ABC (Blanco y Negro)	Monument	1977	Level 2	Structural	Mall
Estación de Atocha	Monument	1977	Level 1	Singular	Tropical garden
Actual estación de servicio Gesa, SL	Monument	1977	unprotected		Orginal use
Central térmica de la Ciudad Universitaria	Monument	1977	unprotected		Original use
Segundo depósito del Canal de Isabel II	Monument	1977	unprotected		Exhibition hall
Estación de Delicias	Monument	1981	Level 1	Singular	Railroad Museum
Mercado de San Miguel	Monument	1982	Level 1	Singular	Gastronomic market
Fábrica de cervezas El Águila	Monument	1990	Level 1	Singular	Library and regional archive
Fábrica OSRAM	Monument	1991	Level 1	Singular	Administrative use
Primer depósito del Canal de Isabel II	Monument	1993	Level 3	Partial	Exhibition hall
Central elevadora y primer deposito del Canal de Isabel II	Monument	1993	Level 1	Singular	Exhibition hall
Real Fábrica de Tapices	Monument	2006	Level 1	Integral	Museum
Antigua central eléctrica de pacifico	Monument	2012	Level 1	Singular	Museum

ELEMENTS OF MADRID'S INDUSTRIAL HERITAGE NOT DECLARED BIC

BIC denomination	*BIC declaration*	*PGOU 1997 protection*		*Actual use*
		level	*protection*	
Central eléctrica del Mediodía	unprotected	Level 3	Partial	Caixa Forum
Serrería de los Belgas	unprotected	Level 2	Structural	Medialab Prado
Fábrica de Hielo y cerveza hijos de Casimiro Mahou	unprotected	Level 3	Partial	ABC Museum
Depósito de aguas del Canal de Isabel II	unprotected	Level 3	Ambiental	Park
Fábrica de galletas Pacisa	unprotected	Level 3	Partial	Theater
Matadero Municipal y Mercado de ganados	unprotected	Level 2	Structural	Matadero Madrid
Talleres Renfe	unprotected	Level 1	Integral	The Neomudejar
CLESA	***unprotected***	***Level 3***	***Partial***	/

https://www.madrid.es/UnidadesDescentralizadas/UrbanismoyVivienda/Urbanismo/PGOUM/Publicaciones/DocTexto/AV_CATALOGO.pdf

The organisation ***DOCOMOMO (DOcumentation and COnservation of buildings, sites and neighbourhoods of the MOdern MOvement***) also plays an important role in the documentation and preservation of buildings, sites and neighbourhoods of the Modern Movement. Founded in 1988 by Hubert-Jan Henket, architect and professor, and Wessel de Jonge, architect and researcher, at the School of Architecture of the Technical University of Eindhoven (The Netherlands). As the situations in the participating countries differ, the various parts of the DOCOMOMO organisation operate according to local needs.
For Spain, the foundation is called ***DOCOMOMO Ibérico*** and is based in Barcelona. It has coordinated activities for Spain and Portugal since 1993 to document and study the modern heritage in the Iberian territories through online databases, publications, exhibitions, congresses, architectural itineraries and campaigns to protect buildings or complexes. Initially, 166 buildings considered representative of the period between 1925 and 1965 in the Iberian territories were catalogued. Subsequently, various themes of modern architecture such as industry, housing and structures were analysed. Today, the register includes 2423 works of modern architecture. Among the campaigns implemented, the CLESA dairy plant was also the subject of awareness-raising. The dairy factory was included in the Register of Industry made by the DOCOMOMO Foundation between 1999 and 2005. In addition, the complex was added to the Initial Catalogue of Buildings of the National Heritage Plan of the 20th Century, also elaborated by the Foundation at the request of the Cultural Heritage Institute of Spain. On 16 June 2022, the organisation supported the Alejandro de la Sota Foundation to urge the declaration of the CLESA factory as an asset of BIC Cultural Interest, as did COAM (Colegio Oficial de Arquitectos de Madrid) and the Real Academia de Bellas Artes of San Fernando. The building was included in the Initial Catalogue of Buildings of the National Plan for the Conservation of 20th Century Cultural Heritage that the foundation drew up for the Cultural Heritage Institute of Spain, dependent on the Ministry of Culture.
Although the situation of industrial heritage has improved considerably in recent decades, there is still a lot of work to be done in terms of research methods, level of social assessment, heritage status, protection and intervention measures. Therefore, although cataloguing schemes exist, they are considered insufficient, both in terms of the number of elements and the analytical criteria applied. Also for this reason, awareness and dissemination of such heritage examples in society is insufficient and limited to groups interested in the topic.
Conservation and ***operational strategies*** cannot respond with the ***speed required*** for these degraded and endangered assets.

DOCOMOMO Ibérico document to sollicitate the declaration of the CLESA dairy factory as BIC

do.co.mo.mo_ib

Iberian working party for
documentation and conservation
of buildings, sites and neighbourhoods of the
modern movement

Alejandro de la Sota Rius
Fundación Alejandro de la Sota

Barcelona, 16 de junio de 2022

DOCOMOMO (**DO**cumentation and **CO**nservation of buildings, sites and neighbourhoods of the **MO**dern **MO**vement) es una organización internacional creada en 1989 con el objetivo de inventariar, proteger y divulgar el patrimonio arquitectónico del siglo XX. En el marco geográfico de la Península Ibérica, la Fundación DOCOMOMO Ibérico, con sede en Barcelona, ha asumido la coordinación de la citada organización para los territorios de España y Portugal, habiendo impulsado programas de documentación y conservación de la arquitectura y del urbanismo de la modernidad, a partir de su colaboración con diversas entidades e instituciones públicas, entre las que se encuentran la mayoría de los Colegios de Arquitectos de España y Portugal, la Fundación Arquia, la Fundación Mies van der Rohe y el Instituto Andaluz del Patrimonio Histórico, así como numerosas escuelas de arquitectura.

Una de las principales labores de DOCOMOMO ha sido la de documentar las obras más significativas del siglo XX. Gracias a estos trabajos, se han destacado y documentado las obras de arquitectura modernas más relevantes del siglo XX. En estas labores de registro se ha contado con la participación del Colegio Oficial de Arquitectos de Madrid.

En base a su cometido, la Fundación DOCOMOMO Ibérico manifiesta su apoyo a las gestiones de la Fundación Alejandro de la Sota para solicitar la declaración BIC de la Fábrica Clesa, como y lo han hecho el Colegio Oficial de Arquitectos de Madrid y la Real Academia de Bellas Artes de San Fernando. Esta obra, realizada por Alejandro de la Sota entre 1958 y 1966, **constituye un conjunto de gran interés arquitectónico**, y como tal se ha incluido en Catalogo Inicial de Edificios del **Plan Nacional de Conservación del Patrimonio Cultural del Siglo XX**, que la Fundación ha elaborado por encargo del Instituto del Patrimonio Cultural de España, dependiente del Ministerio de Cultura.

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https://madridciudadaniaypatrimonio.org/sites/default/files/pdf-embed-blog/2022-07-05_solicitud_de_petic_ion_bic_de_la_fabrica_clesa_diaz_ayuso_bis.pdf

Case studies / comparables

The case studies described below deal with industrial buildings that have undergone adaptive reuse.
The cases taken into consideration are:

- Matadero in Madrid, included in the PGOUM catalogue of protected buildings in 1997 and subsequently transformed into a cultural space

- OGR complex in Turin, formerly a maintenance factory, purchased in 2013 by the Fondazione CRT with its subsequent structural and functional redevelopment into a high-tech and cultural space

- KB building, historically a former nylon factory, transformed into a unique office by HofmanDujardin and Schipper Bosch

https://media.traveler.es/photos/61376635652b2e41f8dce2d9/master/w_1600,c_limit/172480.jpg

https://building.it/wp-content/uploads/2019/09/DJI_0651-1110x585.jpg

https://static.dezeen.com/uploads/2020/09/kb-building-hofmandujardin-schipper-bosch-architecture-netherlands-adaptive-reuse_dezeen_2364_col_7.jpg

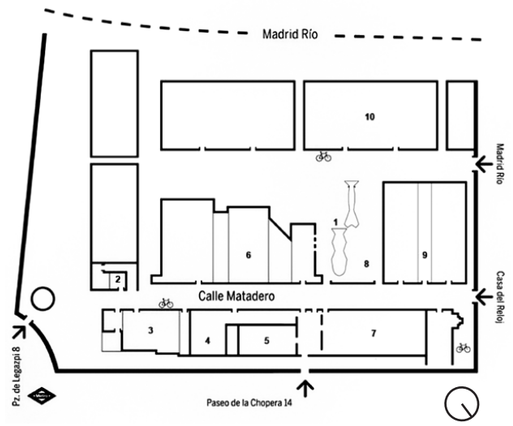
Case studies / comparables

01. MATADERO

City: Madrid
Year: 2005

The city's former slaughterhouse, a set of neo-Mudejar-style pavilions built in the early 20th century on the banks of the Manzanares River, has now become a small city dedicated to culture, where visitors can find a variety of spaces: The intervention is conceived as a totally multifunctional space, with the exception of the offices, which were specifically requested by Intermediae.
From the point of view of versatility, there was total freedom in the choice, as the clients proposed it more as an art installation than as a renovation of the slaughterhouse.

Following is the program that takes place within each volume:
1. Escaravox: A giant leisure installation equipped with screens, speakers, speaker's corner, that allow artists and the public to schedule their own activities so that they can interact freely, originally and creatively.
2. The laboratory and coordination office
3. Film library: this is the first and only room in the country dedicated almost exclusively to documentary film.
4. Extensión AVAM: a space run by Artistas Visuales Asociados of Madrid that offers artists the opportunity to present their projects in an environment open to new networking, becoming a platform for visibility and exchange for creators.
5. Nave 0: This old cold storage room has been converted into an area for the development of artistic practices.
Design Central: With the support of the Madrid City Council and DIMAD (Designer Madrid Association), it works to promote and disseminate design.
6. Naves del Español en Matadero: A stage space that welcomes all kinds of scenic and visual art, as well as literature, philosophy, music and various transmedia activities.
7. Intermediae: an initiative of the Madrid City Council's Area of the Arts, which aims to offer the city a space for the production of contemporary art, capable of acting as a catalyst between artists and citizens, with the objective of presenting alternative forms of expression, artistic creation and thought.
Medialab in Matadero: a city laboratory that serves as a meeting place for the production of open cultural projects.
8. Plaza e Calle Matadero: open-air multi-space, reserved for more oddball recreational and cultural activities.
9. Reader's House: the programming of this vast cultural center makes readers and reading its main protagonists.
10. MAD (Madrid Digital Arts) Center for Immersive Experiences: a space for creation, experimentation and exhibition.
Center for Artistic Residencies: a large exhibition space of more than 4,000 square meters, versatile and multipurpose, which can serve both as a large exhibition hall for exhibitions, installations or living arts activities, and as a set of independent spaces divided into up to three simultaneous rooms.
In addition, two catering spaces: La Cantina and Café Naves.



1. *Escaravox*
2. *El Taller y Oficina de Coordinación*
3. *Cineteca*
4. *Central de Diseño y AVAM*
5. *Abierto x Obras*
6. *Naves Matadero*
7. *Intermediœ y Vestíbulo*
8. *Plaza y Calle Matadero*
9. *Casa del Lector*
10. *Nave 16*

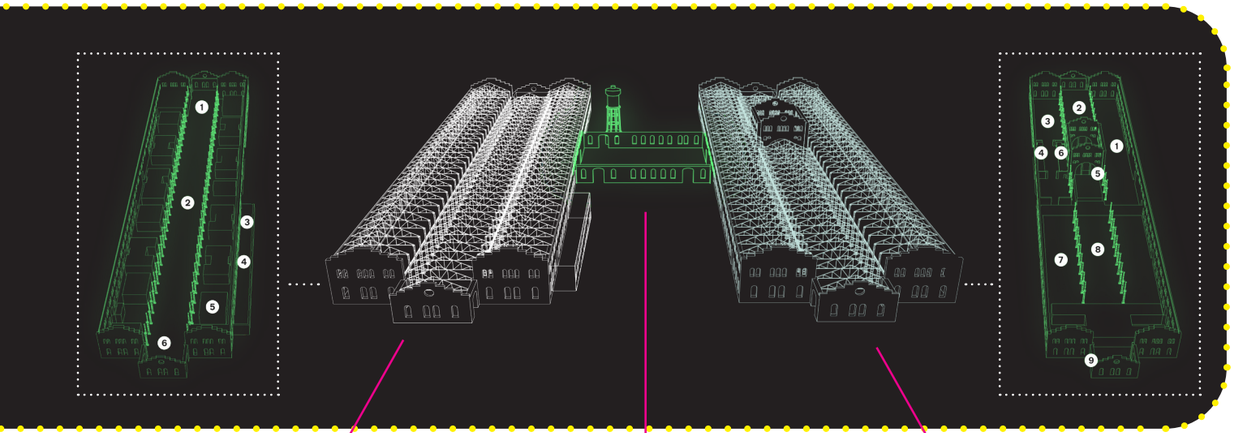

Vestíbulo e Intermediae
Lobby and Intermediae
El taller
The Workshop
Cineteca y archivo creadores
Film Library and Archive
Nave 16
Warehouse 16
Central de Instalaciones
Services Center
Red Bull Music Academy
Red Bull Music Academy
Casa del Lector
Reader's House
Escaravox
Escaravox

https://arquitecturaviva.com/assets/uploads/obras/39786/av_medium__av_113827.png?h=cccefba9


http://www.mataderomadrid.org/sites/default/files/styles/1070_x_930_square/public/media/image/2020/10/Centro%20de%20residencias%20art%C3%ADsticas%20Matadero%20Madrid.jpg?itok=OaDNkPLp

02. OGR

City: Turin
Year: 2017



https://ogrtorino.it/

OGR TECH
Speakers' corner
Boulevard
Refectory
Aula didattica
Startup village
Mezzanino

OGR TASTE
Pausa Caffè
Social Table
Officina del Gusto
Dopolavoro
Dehors

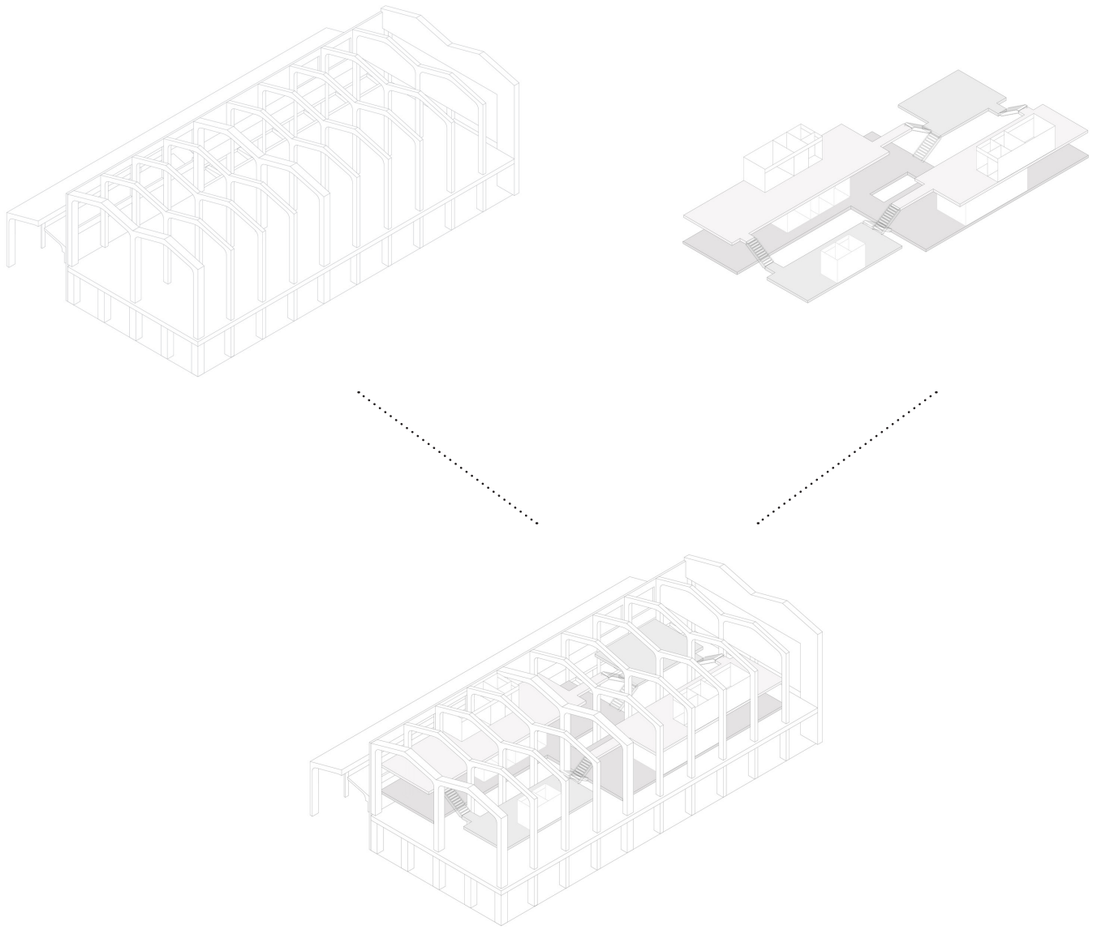
OGR CULT
1 Binario 1
2 Binario 2
3 Binario 3
4 Translitera shop + com'era com'è
5 Duomo
6 Guardaroba
7 Info & Ticket
8 Sala Fucine
9 Biglietteria concerti

The OGR - Officine Grandi Riparazioni di Torino is a cultural production center built in the area formerly used for train repair and maintenance. The exhibition space was opened in 2017 following a massive redevelopment and functional conversion of the spaces. The OGR aims to follow the dual intent of fostering contemporary art in its different declinations and promoting scientific, technological and industrial research with the goal of creating a unique district of contemporary culture.
The schedule of activities consists of a set of exhibitions, performing arts performances and workshops, and is enriched by events and happenings organized in collaboration with international artists and curators.
Spaces are divided into three areas according to the functions they occupy:
OGR Tech is a hub dedicated to innovation, business acceleration and scientific, technological and industrial research.
OGR Taste offers spaces for coffee breaks, social tables, dehors and cocktail bars
The multifunctional spaces of OGR Cult cover an area of about 9,000 square meters and host, in continuous rotation, exhibitions, shows, concerts - from classical to electronic music - theater events, dance.
The names of the areas reflect the history of the places: the 3 tracks located in the west area host the exhibitions and exhibition projects.
It retains its former name of "Sala Fucine" the area dedicated to concerts and performance events, while the heart of the OGR Cult spaces is the "Dome" now destined for symposia, workshops and conferences.
The restoration of the areas followed a rigorous recovery, adapting the building to its new destination and leaving intact the sedimentations of the past still visible on the walls.

https://www.fondazionecrt.it/fondazione/ogr-torino/

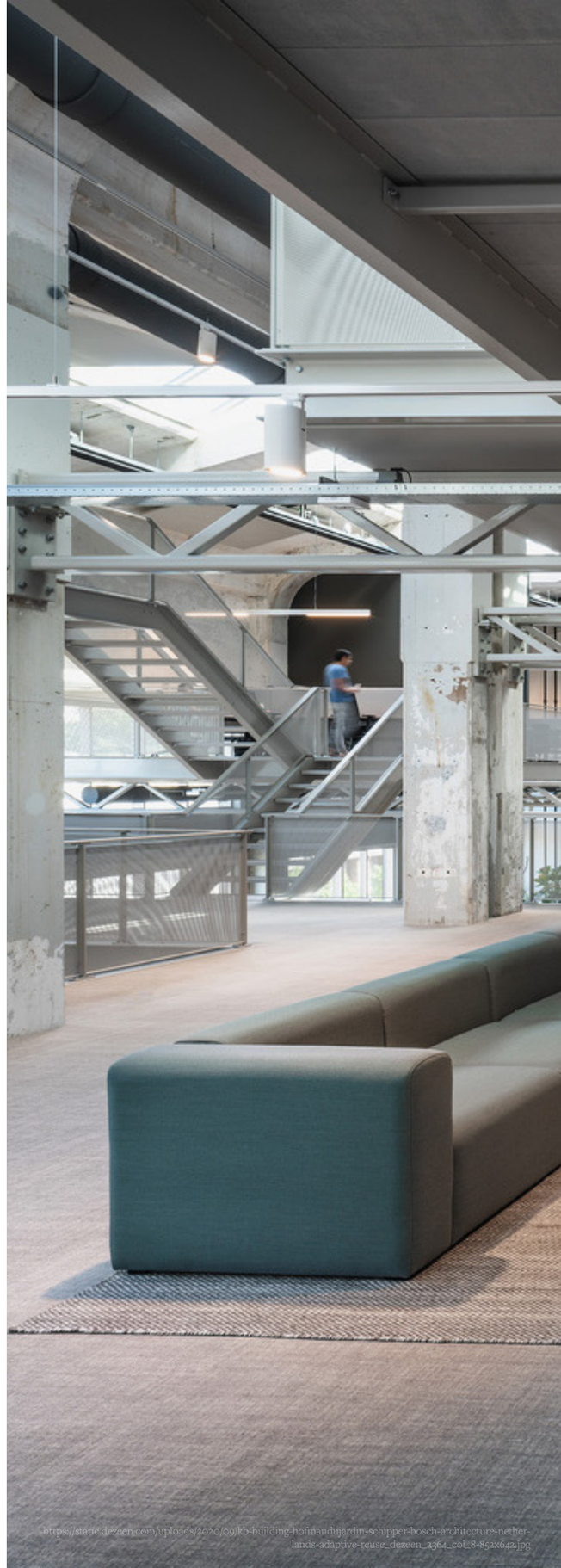
03. KB BUILDING

City: Arnhem, Netherlands
Year: 2020



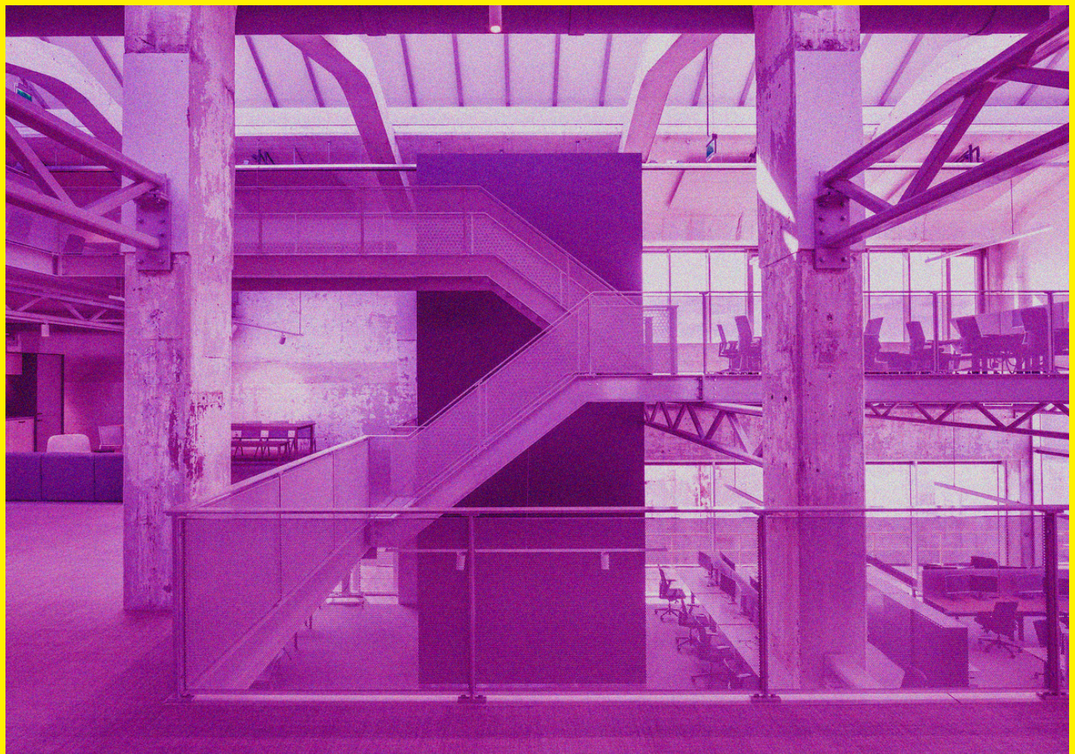
A former nylon factory is completely transformed into a unique office facility. A new steel platform structure is hung from the existing concrete structure. Vision and design complement each other in this creation located on the cleantech Industriepark Kleefse Waard campus in Arnhem, the Netherlands. The design builds on existing qualities and combines extra space with a clear path, transforming the KB building into a dynamic office space.
The new floors are suspended in the open space as an elaborate three-dimensional composition. These new platforms create different work spaces with specific qualities. Each place is connected to other spaces and at the same time provides a home base. By maintaining the central access free from construction, the openness of the building is maintained.
The new floors have been constructed as lightly as possible, with open latticed beams between the existing columns. Floor slabs were laid on top with panels integrated into the ceiling. As a consequence, the design not only keeps the visual spaciousness, but also allows the readaptation or even turning back in the future. This ensures the flexibility of the structure with respect to future needs.

https://architectenweb.nl/nieuws/artikel.aspx?ID=48206



https://static.dezeen.com/uploads/2020/09/kb-building-hofmandujardin-schipper-bosch-architecture-netherlands-adaptive-reuse_dezeen_2364_col_8-852x642.jpg


MATA-
DERO
MADRID



En la trama estructural de la fábrica Clesa se aprecia una llamativa irregularidad modular que contrasta con la mayor uniformidad de los otros proyectos coetáneos de Alejandro de la Sota. De su análisis se desprende que existen importantes variaciones dimensionales en sus modulaciones, lo que la aparta en gran medida de la regularidad esperable máxima

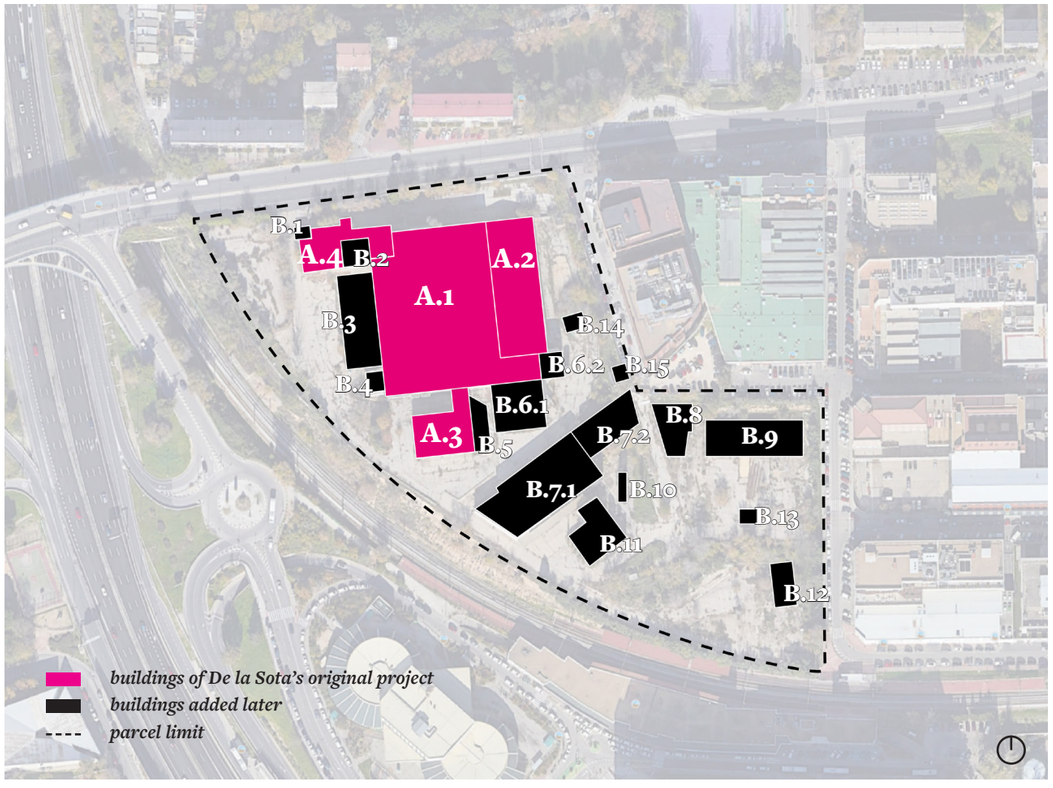
03
Industrial complex analysis

En la trama estructural de la fábrica Clesa se aprecia una llamativa irregularidad modular que contrasta con la mayor uniformidad de los otros proyectos coetáneos de Alejandro de la Sota. De su análisis se desprende que existen importantes variaciones dimensionales en sus modulaciones, lo que la aparta en gran medida de la regu-

03
Industrial complex analysis

Buildings making up the complex

The location of the parcel does not allow a general view of the group of buildings from a distance.
The main façade, facing North, does not have large light and shadow effects that are given by other façades that are on other exposures, thus allowing certain and effective impressions.
From this it can be inferred that the part of the building facing the street was designed in an ***austere*** and ***as flat as possible***. There is only a palpable play of the effect of the silhouettes, taken into consideration from the beginning of the project. Crossing the street, solids and voids follow one another, introducing a new element: a walkway that connects the main block with the dining and changing rooms and allows, thanks to its transparency, contemplation of the landscape in the distance, including the urban silhouette of Madrid.
The volumes are defined and sharp, each corresponding to the ***production process*** they accommodate. The simple layout creates a ***harmonious*** and ***balanced*** whole.
The factory complex consists of distinct buildings that in its time were used for reception, processing, production storage and distribution of dairy products.



An initial complex of grouped buildings consisting of:

Building A1 (partially demolished)
Central building where the main operations of the production process such as raw material handling, bottling and milk storage are concentrated.

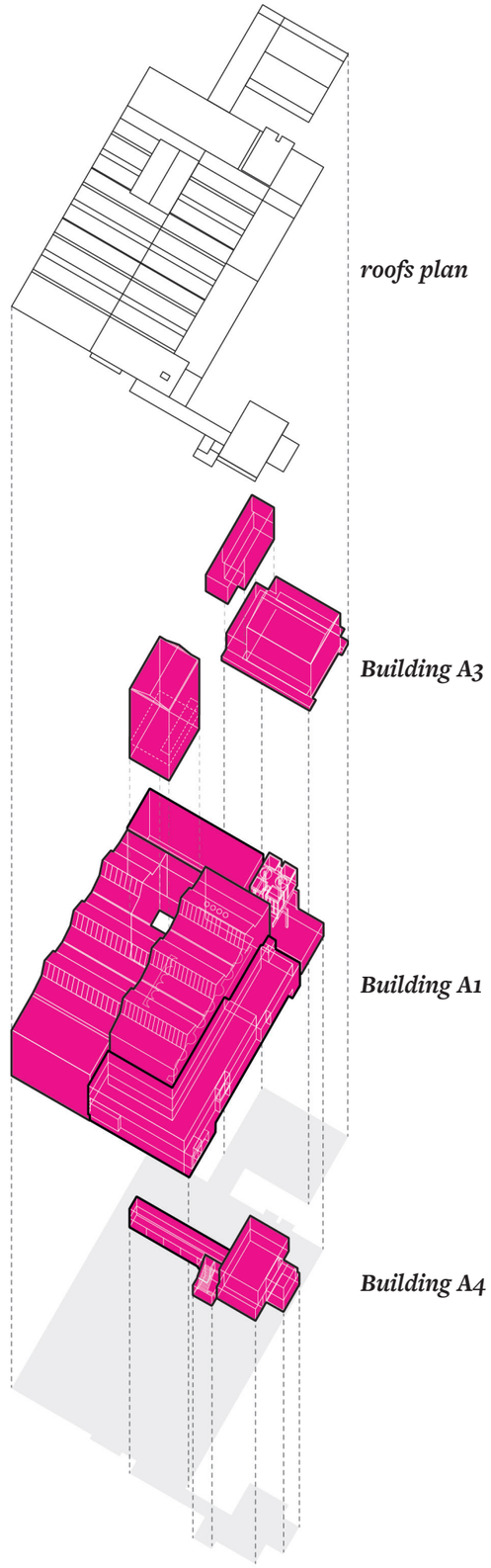
Building A2 (demolished)
Building connected with the central building with which it shares half of the space. The independent structure with no architectural relationship to the central ship is intended for receiving empty containers

Building A3
Building in communication with the central building through a walkway on the second floor, with a completely independent structure and without an architectural relationship with the central building, designated for laboratories and reception of milk.

Building A4
Building intended for complementary uses of the production process such as offices, services and canteen. It is joined to the central building through communication cores in the northern area and has no architectural relationship with it.

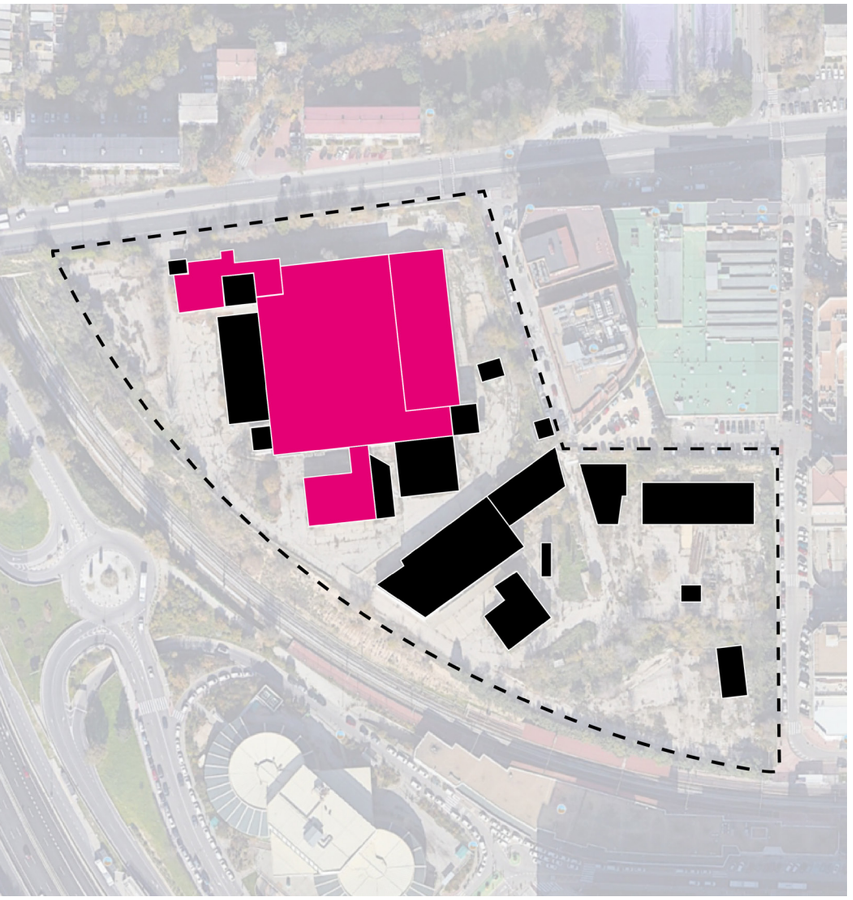
In later stages other buildings were added to the complex, which have neither structural nor architectural relationship with the central core of the complex:

B1 control cabin
B2 office extension
B3 refrigeration docks
B4 processing
B5 receiving raw material
B6.1 case packer building
B6.2 oil and gas
B7.1 palletizing
B7.2 boilers
B8 water tank
B9 shed
B10 cooling tower and absorption machine
B11 cogeneration
B12 purifier
B13 water well
B14 depots
B15 sectioning



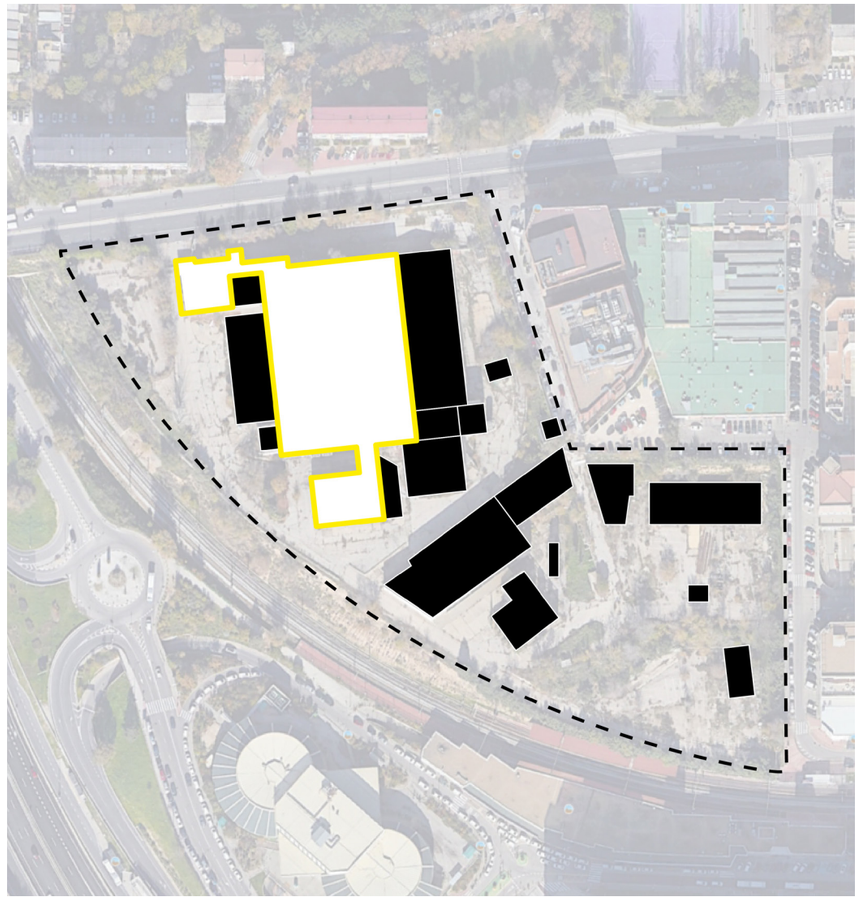
schematic diagram of existing volumes

original project + buildings added later



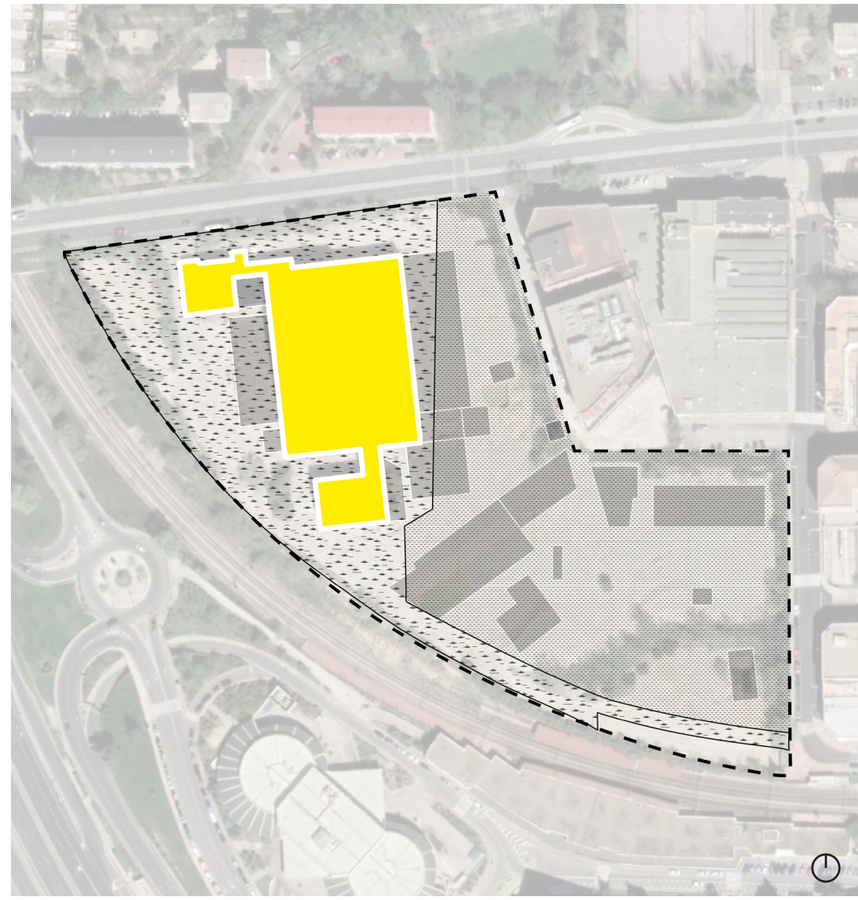
buildings of De la Sota's original project
buildings added later
parcel limit

demolition and preservation



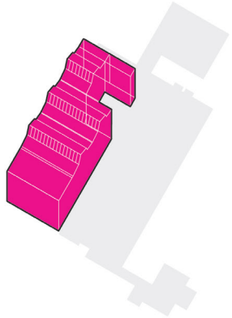
preserved complex
demolished buildings
parcel limit

complex at the present



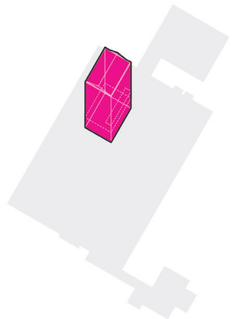
currently preserved complex
demolished buildings
parcel limit
green areas
tertiary sector area

Volumes (still existing)
Building A1



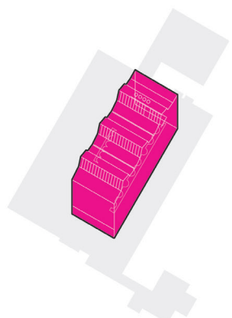
It consists of a block formed by a straight prism with a rectangular base, from which a smaller prism with a rectangular base has been subtracted. The roof is formed by a plane that starts from the north façade and begins to bend in a southerly direction from the first 12 metres, to form a surface that allows light from the north to enter the interior of the building. It contains two overlapping spaces, the first at a semi-basement level with a flat floor and ceiling; above it, at ground floor level, the second space is double height.

1. bottle washing and filling hall



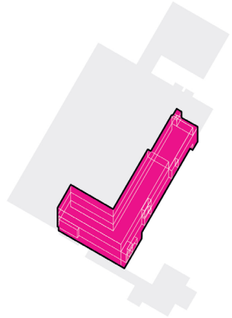
A prismatic volume with a rectangular base and a sloping gabled roof. It consists of four pillars that start from the semi-basement floor and emerge above the roof of volume 1. It is composed of two vertically overlapping spaces. The lower one is integrated in the semi-basement floor. Above it, there is another at ground floor level, characterised by its identity with the adjacent space of volume 1 up to roof level, into which it is integrated, expanding vertically.

2. sterilising tower



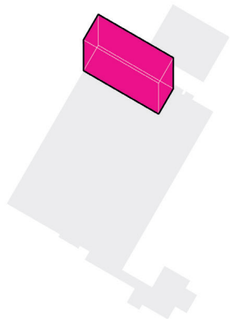
Rectilinear prism with a rectangular base whose upper face is enclosed by a folded surface corresponding to a saw-tooth roof. It houses several differentiated spaces. The semi-basement divided into two independent enclosures of equal size contained the sterilised milk store and the pasteurised milk storage chamber.
Next, the mezzanine contained a single space, ten spans deep. The first floor presents a single space. The platforms supporting the milk tanks have a significant impact on the spatiality of this volume. Volume 4 is inserted in the northern part, invading the internal area of this volume.

3. treatment area



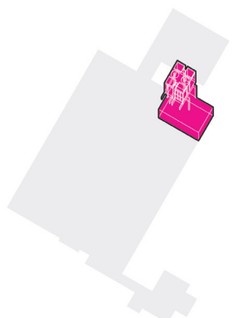
The volume is formed by the coupling of two rectilinear prisms with a rectangular base, orthogonal to each other, which form the north-west corner of the dairy production block.

4. offices



Prismatic volume with a rectangular base and flat roof. Three different spaces overlap vertically. One in the basement, above another space whose floor is raised above the level of the pavement outside.

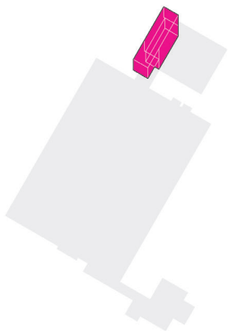
5. stores



A volume composed of a rectilinear prism with a rectangular base and a flat roof with a cooling tower, formed by two equal parallelepipeds with a rectangular base, supported by structural elements. It contains two differentiated and independent spaces, superimposed vertically.

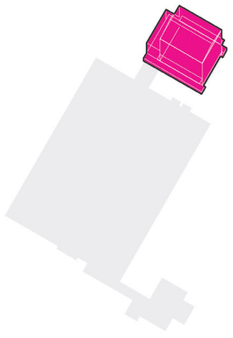
6. cooling water tower

Building A3



A volume composed of two prisms with a rectangular base. The larger one overlaps the smaller prism lengthwise, the side faces coinciding at one end, while the longer upper one protrudes at the other end. The overlapping prism is covered by a flat rectangular roof. There are two floors. The upper floor is a rectilinear prism connecting the production hall with the milk receiving building. This space also served as a walkway for the visitors' route. The ground floor is bordered by walls that extend volume 5.

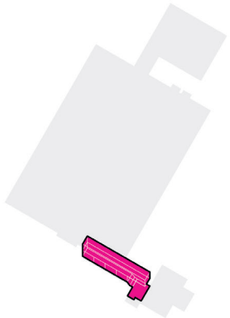
10. labs



Prismatic volume with a rectangular base and sloping gabled roof. A single space with two heights.

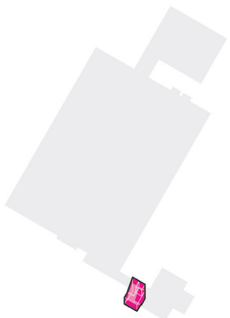
11. milk collection hall

Building A4



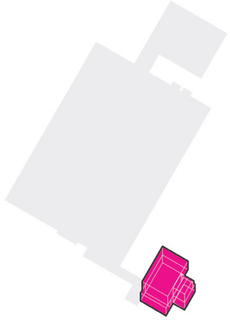
Prismatic volume with a rectangular base and an accessible flat roof. There are 3 differentiated spaces. A portico from which the building is accessed. Then there is a link to the changing rooms building, a unique space that links to the office building. And at last there is a terrace.

7. connection bridge



The volume is made up of a four-piece grid, two contiguous rectangular-based straight prisms, with coplanar roofs and bases at different heights in contact with the ground.

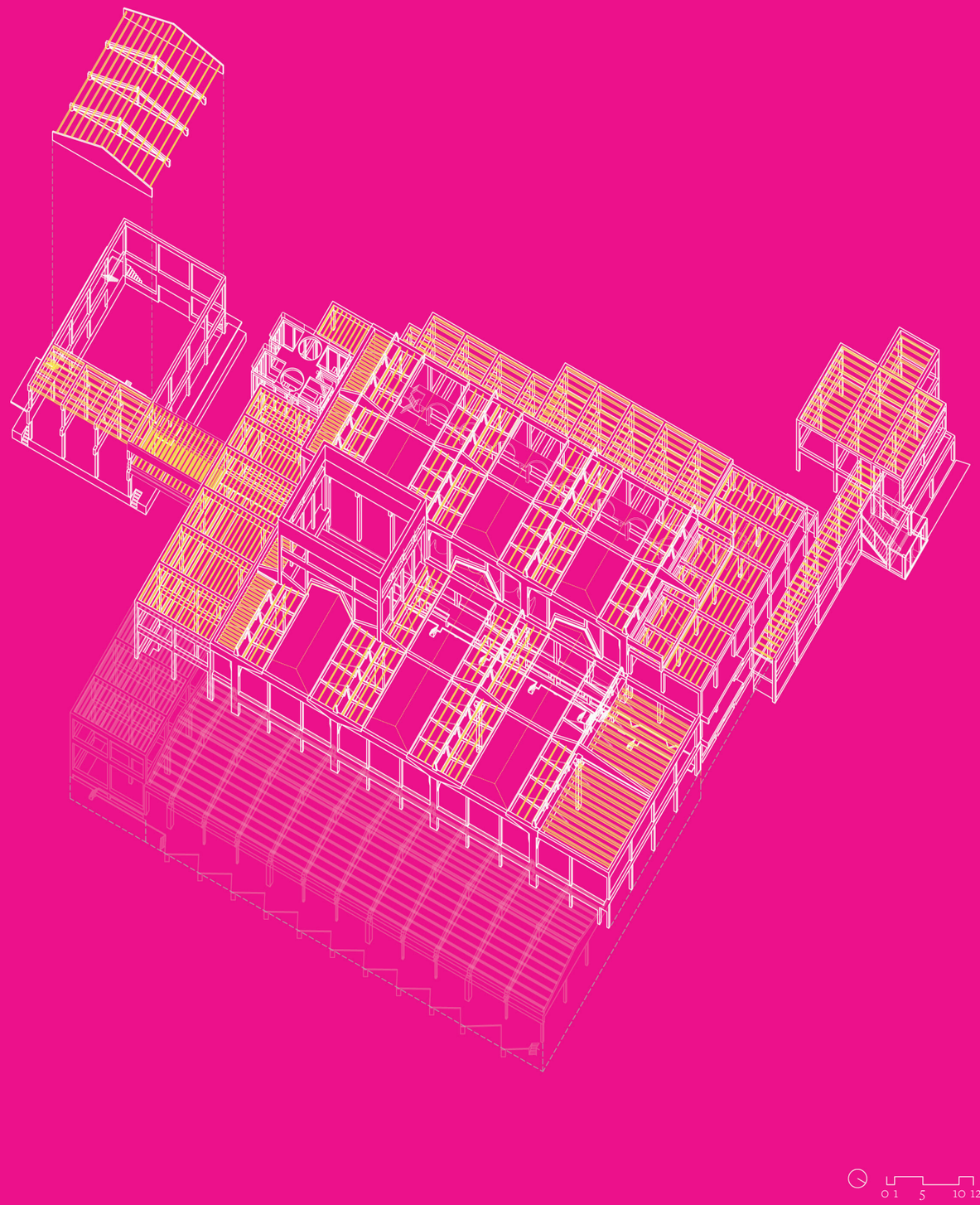
8. employee access



Prismatic volume with a rectangular base and sloping gabled roof. It houses a single space that extends over two heights.

9. canteens and changing rooms

Structural system and materials



Own elaboration starting from the drawing of Ferrando Álvarez-Cortinas, José Ignacio (2015) *Espacios máximos con recursos mínimos: edificio Central Lechera CLESA, Alejandro de la Sota E.T.S. Arquitectura (UPM)*

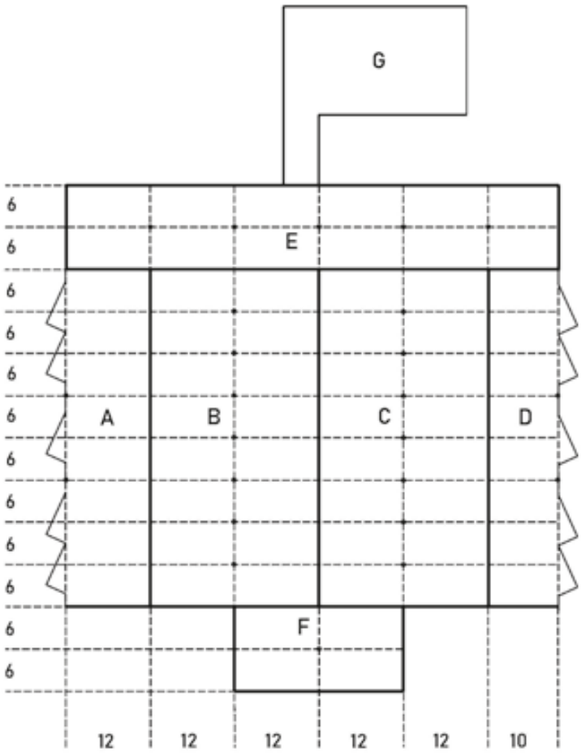
In the CLESA dairy plant, for the first time Sota uses a ***massive construction***, partly built on site as it has always preferred ***elements prefabricated*** in the workshop and assembled on site. The facade is made of concrete blocks and a prefabricated pre-stressed concrete structure, one of the first to be built in Spain, which speeded up construction.
The structure of each part of the complex corresponds to the use for which it is intended, creating ***open spaces*** so that all uses can be carried out without difficulty, allowing for greater ***flexibility*** in the arrangement of the machinery, with its replacement or addition.
This is due to the ***prestressed concrete structures*** that achieve higher structural performance than conventional concrete, thus saving steel. Concrete was used in the project to prevent the possibility of mould growth due to condensation (very frequent in this type of industry).
Structurally, in addition to the fact of wanting to recover as much space as possible, another point to take into consideration is the need to support the enormous weight of both the production machinery and the product warehouses related to the production process. With the ground floor this problem does not arise in contrast to raised floors. This is due to the needs of production, as in the factory, for the production of dairy products, the intervention of gravity is essential in the chain for the filling of the bottles from the storage tanks for treated milk.
The ***idea of regularity*** that already exists in most of De la Sota's works can be seen in the preliminary design. In the course of subsequent stages, this design was modified numerous times to develop each part and adapt it to the conditions of execution. This may seem obvious in any kind of project although for the CLESA factory it was decisive and needed closer attention as, it can be seen from the changes made in the executive design.
The ***modular differences*** in the final design are mainly due to the result of ***assembling different functional parts*** together.
As De la Sota himself stated:

"Every element in Clesa was of extraordinary importance. So each one was studied and put together"

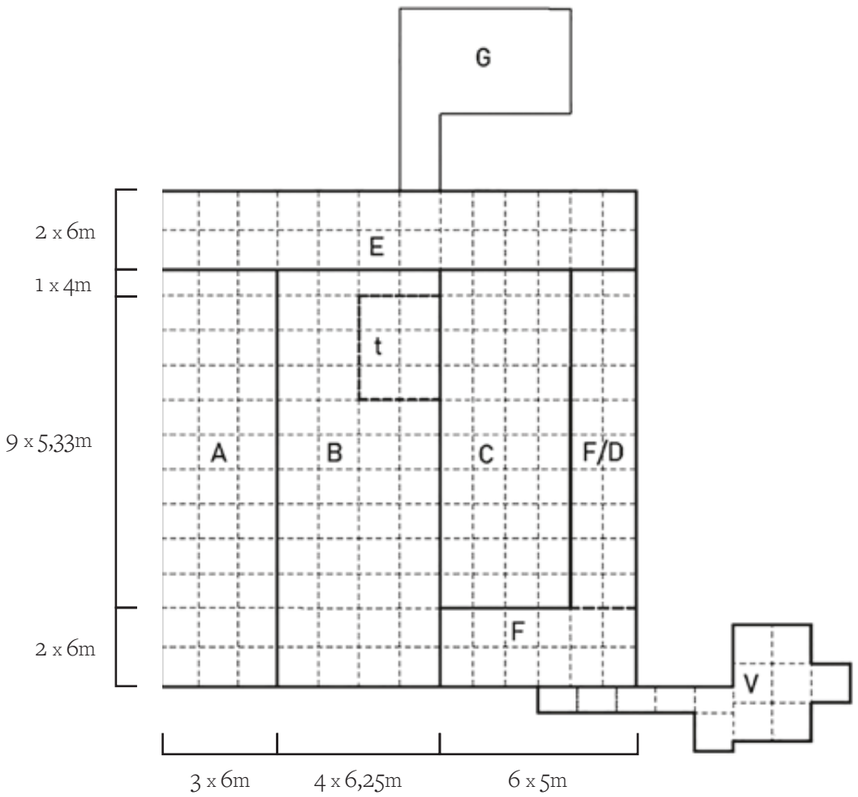
A. de la Sota "Simple justification of his work", conference in A Coruña, 1986

In the executive design the isotropy is not resolved, but there is a ***dialogue*** between the ***regularity*** desired at the beginning and the ***arrangement*** of each part of the complex.

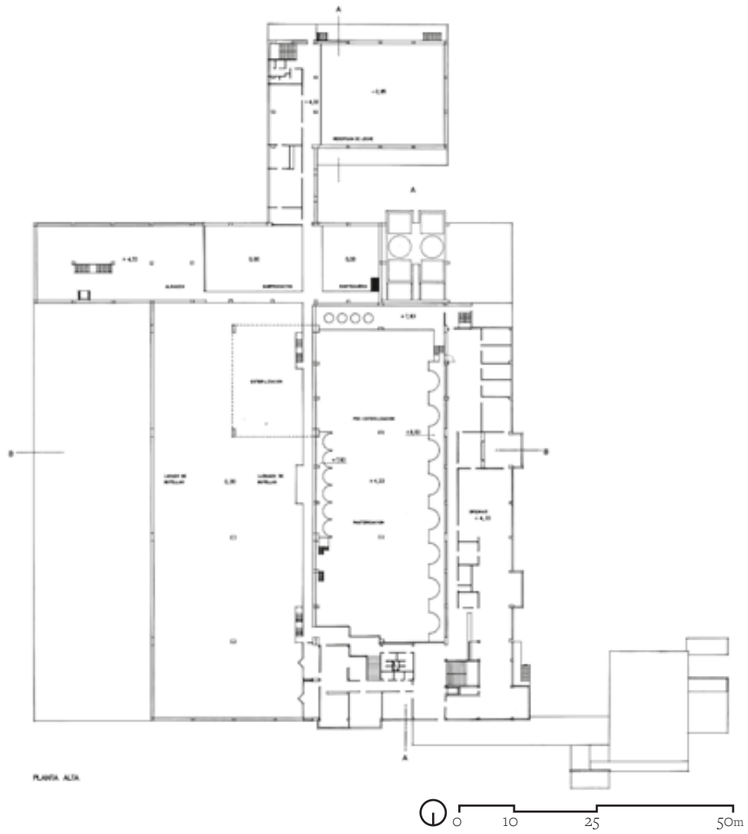
1. preliminary design



2. final design



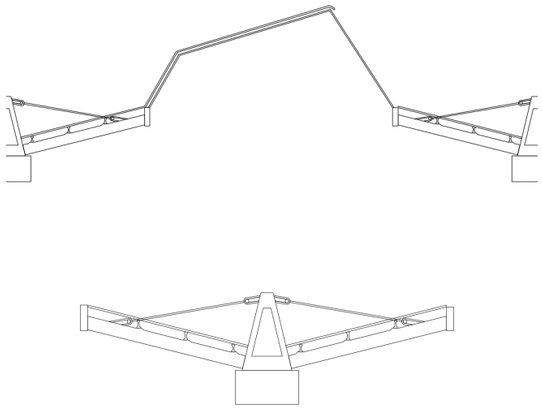
3. executive design



García, Rafael García, Ritmos, métrica y cubierta industrial en la fábrica Clesa de Alejandro de la Sota, 2019

In the preliminary design (1), the regular order is already visible. A simple design, but complete from the point of view of the programme. It is divided into a 12 x 6 m grid (the only exceptions being the 10 x 6 m part D and the smaller than the entire grid part G)
After the preliminary design, the one signed in 1958 (later approved in 1961), corresponds to all intents and purposes to the building that was later constructed, including all the changes made to the previous one. Parts A, B, C, D, E and G retain the same position, while F is moved and incorporated into the main body of the complex (2). Although starting from a precise and modular grid, with the changes made in the executive design, this modularity is transformed, becoming irregular. This characteristic differs from Alejandro de la Sota's other architectures, especially those that are part of the same phase of the factory.
Looking at the grid from north to south, there is an impactful change. The sequence starts with two 6m modules, another nine equal 5.33 m modules, one 4 m module, and finally two more 6 m modules. The uniform 6 m module of the preliminary design is no more and has given way to a tripartite rhythm for the common length of these bays, creating three large north-south sections in each. The three sections are also reflected on the roofs, at the skylights. The total length of the complex has remained unchanged, what has changed is the modulation of the volumes.
As far as the grid running from east to west is concerned, the regularity of the 6 m module of the preliminary design seems to remain on the north façade where it extends along its entire length. In reality, in the actual complex, it has since been modified and in the rectangle of the central body they have a sequence of three 6 m modules, four 6.25 m modules and finally six 5 m modules.
These modules, grouped in sizes of 18 m, 25 m and 10 m, correspond to the widths of the different rooms. The heterogeneity is even stronger here than in the north-south grid.
The main halls in this case have two different width dimensions (25 m and 20 m) than in the preliminary design (both 24 m).
A persistence of the modulation used in the preliminary design is also evident in the foundations. The foundations of the boundary and retaining walls are in solid concrete and the pillars in reinforced concrete.

Roofs

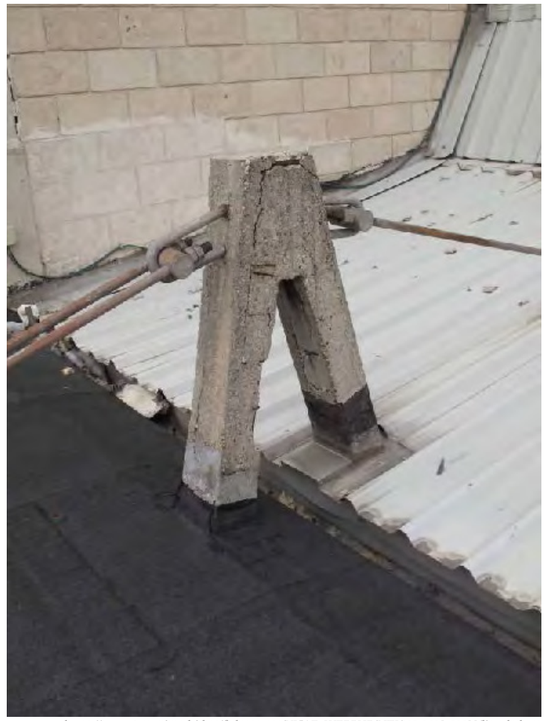


Miguel Churruca Echeverria, *Arquitectura e industria en la obra de Alejandro de la sota. La central lechera CLESA, 2017*

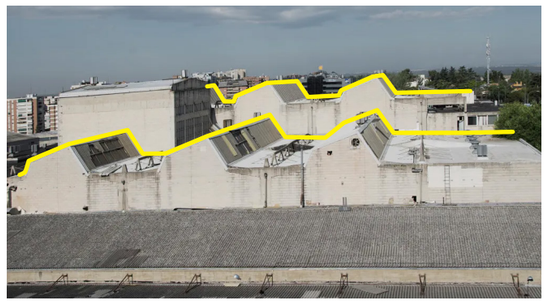
In Spain, the solutions usually adopted to cover and illuminate this type of rectangular volume from above were saw-tooth or shed roofs. This system consists of triangular beams crossing the spans without any intermediate support. But in this case it was not used. Several hypotheses would have led to this result. Firstly, by the architect Alejandro de la Sota himself, as stated in the project report, a saw-tooth metal frame structure would have been inappropriate for reasons of cleanliness and hygiene. Another option would have been cylindrical concrete shed roofs (few examples existed in Spain at that time). In addition, the complex was also designed as a showcase to advertise to visitors and the roofs as a means of making a favourable impression on them.

The main feature of the enclosure are the ***cable-stayed brackets*** resting on it.

The cable-stayed brackets provide support for the characteristic skylights that bring zenithal and natural light into the interiors of the spaces. The cable-stayed brackets are covered by a purlin structure and are clad with fibre cement panels.



1.31 https://www-2.munimadrid.es/fsdescargas/VISAE_WEBPUB/NTI/135-2018-01588/listado.htm



1.32

1.33 https://www.revistaad.es/arquitectura/articulos/una-segunda-vida-para-clesa/17368

Floor and wall coverings

The choice of flooring was different, again based on the distinct functions. ***Rolled asphalt flooring*** (1) was used in the interior and exterior areas with heavy traffic but where there was no contact with milk. This flooring is not too rough, but noiseless, aesthetically consistent and affordable. Whereas there is ***anti-acid tile flooring*** (2) in all the various areas where dairy production takes place. In the other areas, except for the loft, toilets, boiler room and changing rooms, it is used white tile flooring measuring 15 x 30 cm. The offices, canteen and reception area have continuous ***pvc flooring*** (3), while the boardroom and porter's lodge have ***rubber flooring*** (4).

For the horizontal partitions, fibre cement panels were used in the sloping parts.

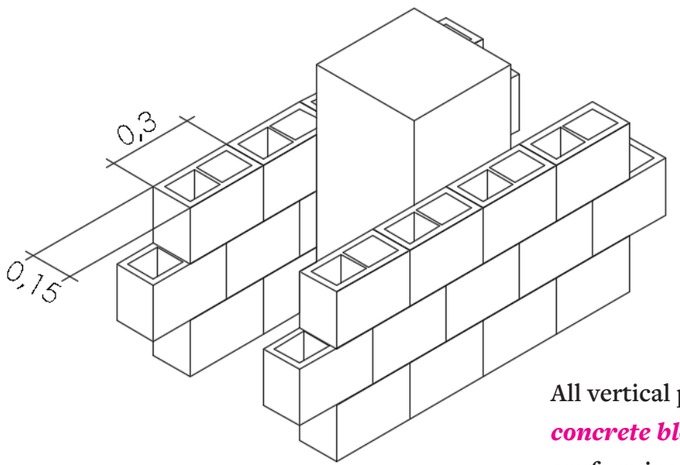
1

2

3

4

Abalos Iñaki, Llinàs Josep, Puente Moisés, *Alejandro de la Sota Barcelona Fundación Caja de Arquitectos*, 2009



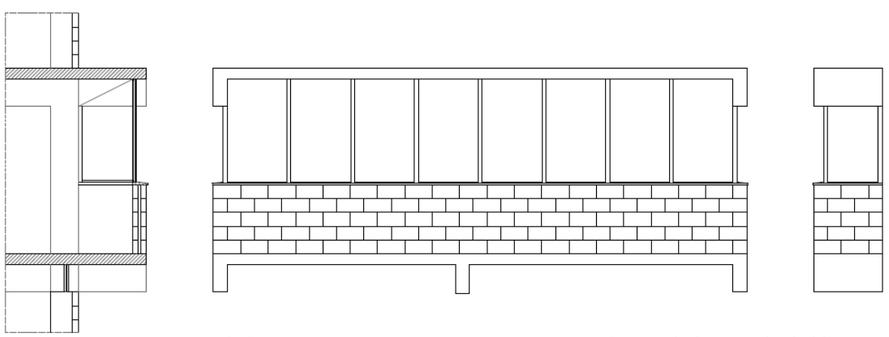
Miguel Churruca Echeverria, *Arquitectura e industria en la obra de Alejandro de la sota. La central lechera CLESA, 2017*

All vertical partitions consist of ***prefabricated concrete blocks*** with dimensions of 30 x 15 cm forming a double wall with cavities. These blocks can be dry-fitted quickly and allow the interior spaces to be filled, in some cases resulting in the creation of load-bearing walls.

Miradores viewpoints

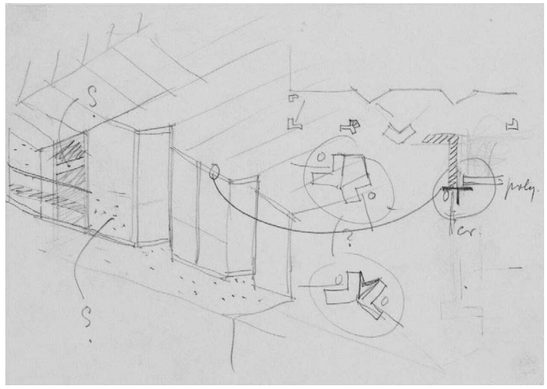
https://www.revistaad.es/arquitectura/articulos/una-segunda-vida-para-clesa/17368

Viewpoints recur as a signature in the designs of architect Alejandro de la Sota. In the CLESA dairy plant there is also a clear reference to the windows, as viewpoints, that were built in the same years in the gymnasium of the Maravillas Institute. These viewpoints are used as a solution to impose an urban scale and give movement to a large façade.
The CLESA factory complex has both interior and exterior viewpoints.
The exterior viewpoints on the western facade have cantilevered edge beams, with a wall that rests and acts as a parapet to which the panoramic windows in their turn rest.
The Mirador closes with fixed windows in the side parts and two openable ones in the central part. This window is shaped like a covered loggia, similar to a gallery. They act as protection for the administrative board and offices of directors and offer a view of the city of Madrid. There are two on the first floor and one on the second also at the height of the offices on this floor plan.The window frames were replaced with white lacquered aluminium ones.



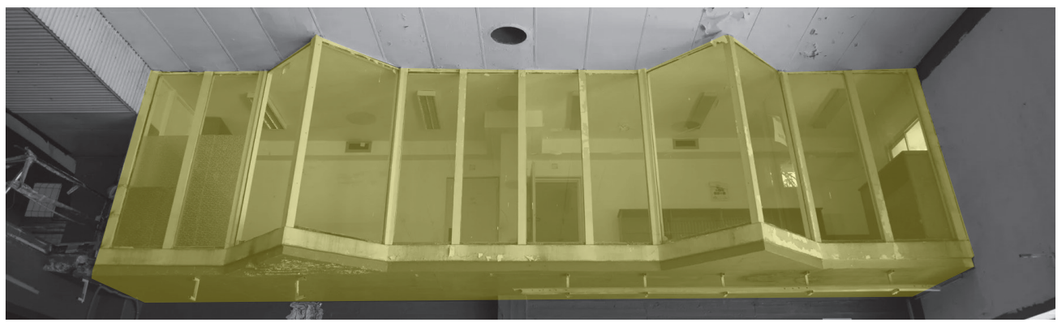
Ferrando Alvarez-Cortinas, José Ignacio, *Espacios Maximos con recursos minimos edificio Central Lechera CLESA Alejandro de la Sota*, 2015

The interior *miradores* consist of transparent galleries jutting out over the production spaces, also present in Sota's other industrial works such as the TABSA and CENIM factories.
The action of aiming and observing must be conceived in this factory as a spatial conception of the complex. Every person who works there, as well as every visitor, finds in the walkways, open spaces and transparent loggias an interesting point of view.



design sketch of the mirador by Alejandro de la Sota

1.34 J. I. Ferrando, 2009



1.35 https://www.revistaad.es/arquitectura/articulos/una-segunda-vida-para-clesa/17368

Analyisis of the state of conservation

https://www-2.munimadrid.es/fsdescargas/VISAE_WEBPUB/NTI/135-2018-01588/listado.htm

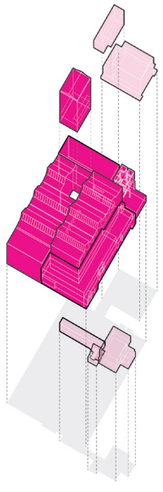
from the left:
detail of the roof cable-stayed brackets
loading bays
roof Building A1
bridge Building A3

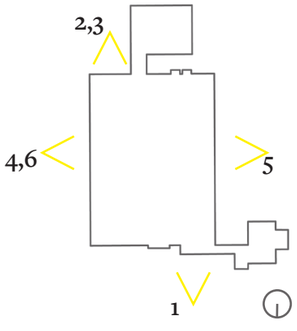
Before presenting the conclusions reached on the state of conservation of each building, it is necessary to carry out an analysis of the general state of conservation of the structures, given the great importance of this element in establishing the real state of conservation of the buildings.
With regard to the ***reinforced concrete structures*** analysed, it is possible to observe numerous elements in which the reinforcement has lost its coating, totally lacking protection and showing that the corrosion process has already begun.
Electrochemical corrosion of the reinforcements is the physical-chemical factor that most affects the durability of reinforced concrete structures. It is the main cause of pathological processes in this type of structure, and may even lead to their ruin due to the total loss of their load-bearing capacity.

The ***corrosion process*** affects reinforced concrete elements in the following way:
- In ***steel bars***, with a loss of section and thus a decrease in strength capacity.
- In ***concrete***, corrosion causes stains, cracks, detachment and delamination due to the increase in volume of the rust produced in the reinforcement.
- In the ***steel/concrete system***, there is a loss of adhesion between the two.
Electrochemical corrosion process, once started, will not stop unless cathodic protection is applied to the structures.
Cathodic protection of reinforcements requires the connection of all reinforcements and their subsequent maintenance.
If the reinforcements have already lost a lot of section, it would be required a traditional reinforcement repair, which would entail the complete removal of the concrete layer, reinforcement or replacement of damaged reinforcements, protection or passivation of the structures and recomposition of the concrete volumes.
It is necessary the presence of oxygen and moisture to get the corrosion started: the ***dairy production environment*** to which the structures have been subjected, the ***current state of neglect*** of the facilities, the ***high exposure to moisture*** to which the analysed structures have been and are exposed is more than evident.
However, these conditioning factors are not sufficient for the initiation of the electrochemical corrosion process of the reinforcement. It is necessary the presence of the triggering factors: ***carbonation of the concrete*** and the ***presence of chlorides***.
Building structures are not subject to a chloride-rich environment. The responsible for the degradation in this particular case are the process of concrete carbonation and its effect on the reinforcement.
The ***armature*** in reinforced concrete structures is ***protected*** by the ***concrete***, which forms an eminently basic environment with pH values close to 12. Under these conditions, the reinforcement is in an ***ideal alkaline environment*** in which the steel is passivated and as long as this situation is maintained, the electrochemical corrosion process will not begin.
However, as time passes, this ***alkalinity decreases***, mainly due to environmental humidity and air pollution, producing the phenomenon of carbonation.
There are also other factors that influence the acceleration of the carbonation process, such as:
- ***Presence of CO2***: the greater the presence, the greater the speed of carbonation.
- ***Water-cement ratio***: the greater the amount of water, the greater the speed of carbonation.
- ***Cement content***: the lower the amount of cement, the greater the speed of carbonation.
- ***Concrete compressive strength***: the lower the strength, the higher the carbonation rate.

Analyisis of the state of conservation

Building A1





1. Broken elements and rusted carpentry appear on the glass facade

2. Holes due to the passage and anchoring of old installations

3. Decay due to anchoring of old installations

4. Damage due to anchorage of auxiliary structures

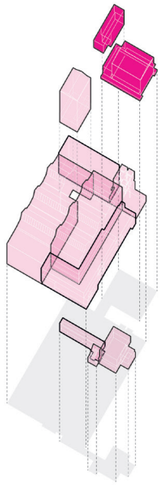
5. Absence of carpentry in doors, openings due to the exit of old installations

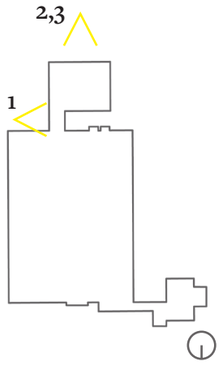
6. Damage due to anchorage of auxiliary structures

https://www-2.munimadrid.es/fsdescargas/VISAE_WEBPUB/NTI/135-2018-01588/listado.htm

Analyisis of the state of conservation

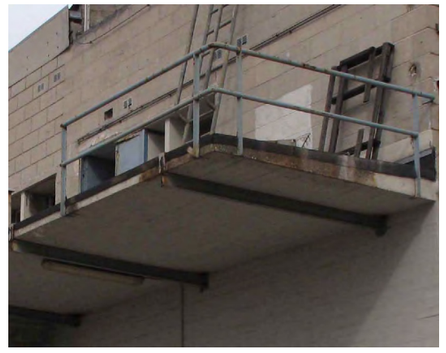
Building A3





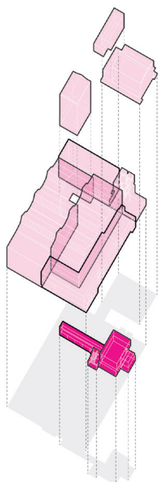
1. The bridge structure is severely damaged along its entire length, without a rusty skin reinforcement cover

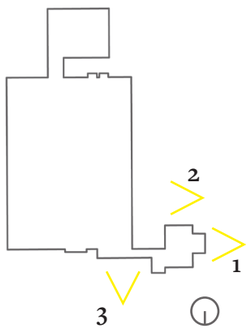
2. Holes due to the passage and anchoring of old installations



3. The metal structure of cantilever roofs shows signs of oxidation

Building A4





1. Very old and oxidised carpentry, which in turn produces stains on facades

2. Serious damage due to anchoring of old structures

3. Absence of glass and broken pieces in the glazed walls

https://www-2.munimadrid.es/fsdescargas/VISAE_WEBPUB/NTI/i35-2018-01588/listado.htm

Analysis of the state of conservation

CATALOGUE

Element

- WL Wall
- W Window
- C Ceiling
- R Railing
- DR Door

Structure

- V Vertical
- O Orizzontal

Material

- C Concrete
- PL Plaster
- M Metal (steel)
- G Glass

Cleaning

- Removal of additional concrete layers
- Removal of detached plaster
- Biocidal application plaster
- Chemical product washing
- Water-based spray at moderate pressure
- Chemical product washing
- Sandpaper
- Nylon brush

Protection

- Paint with undercoat and topcoat
- Re-application painting
- Paint with rust inhibiting primer
- Dehumidification
- Anti-graffiti coating
- Synthetic resin for consolidation of additional elements

Reintegration

- Material recontruction

Filling

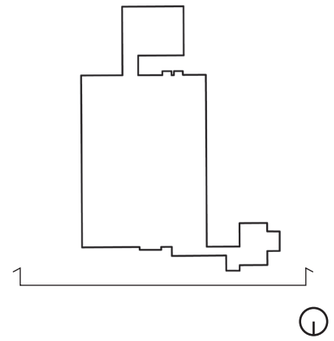
- Filling

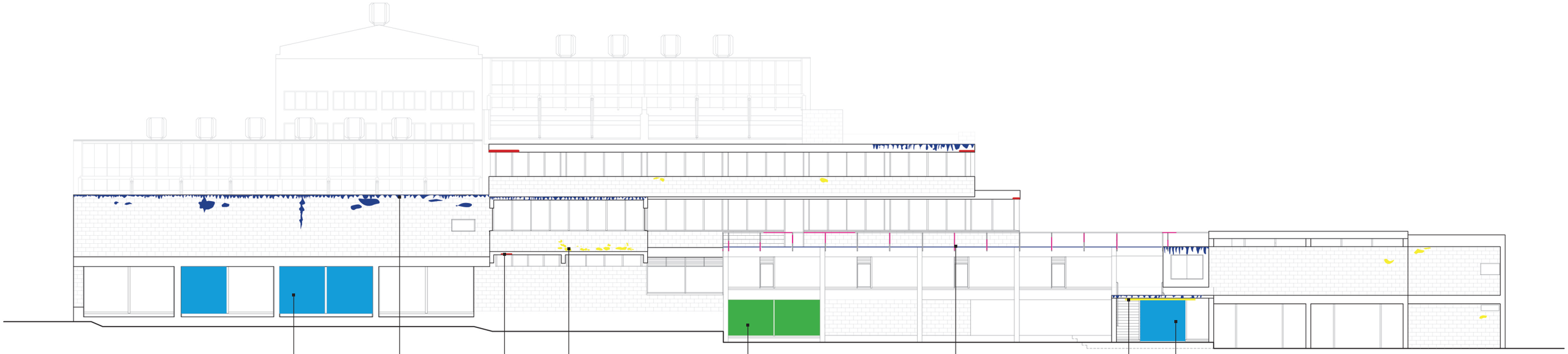
Replacement

- Replacement

Decays

- Corrosion
- Exfoliation
- Broken glass
- Carbonation
- Dripping
- Missing frame





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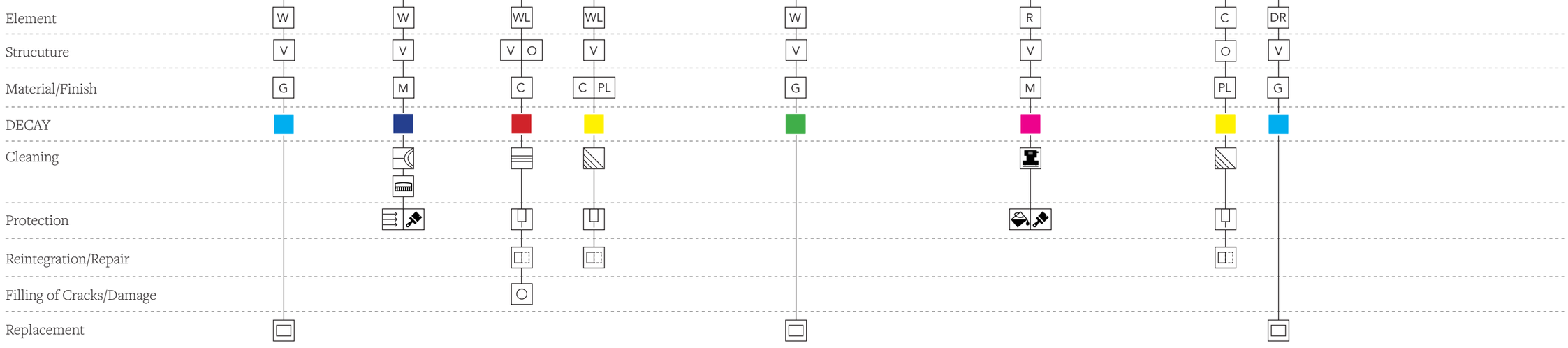
ANALYSIS



CORROSION

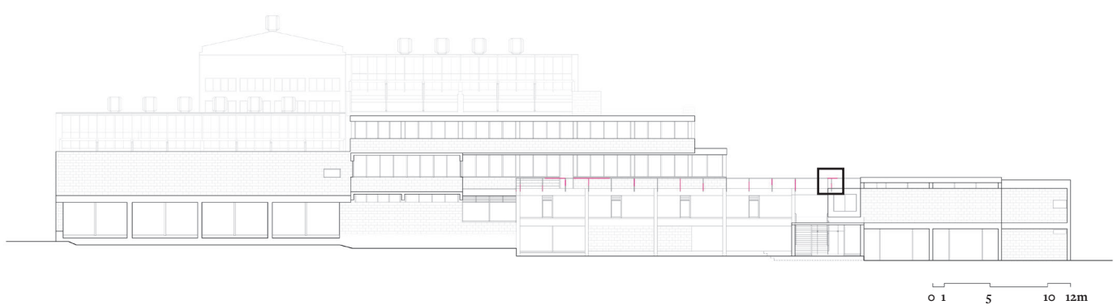
Corrosion of railings
Type of decay: degradation of metal elements due to atmospheric agents. At first it attacks the surface state of the material and then penetrates into the deeper layers of the metallic element

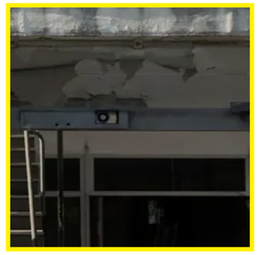
Location: this type of degradation is present on all railings on the walkable roofs on the north facade of the complex

Visible effects: on some elements there is simply a lack of paint on the metal, on others the corrosion is more severe

Possible causes: this type of decay may be mainly due to exposure of the elements to atmospheric agents and lack of maintenance

Suggested intervention: cleaning through the use of sandpaper and then application of paint with rust inhibiting primer and an other paint with undercoat and topcoat





EXFOLIATION

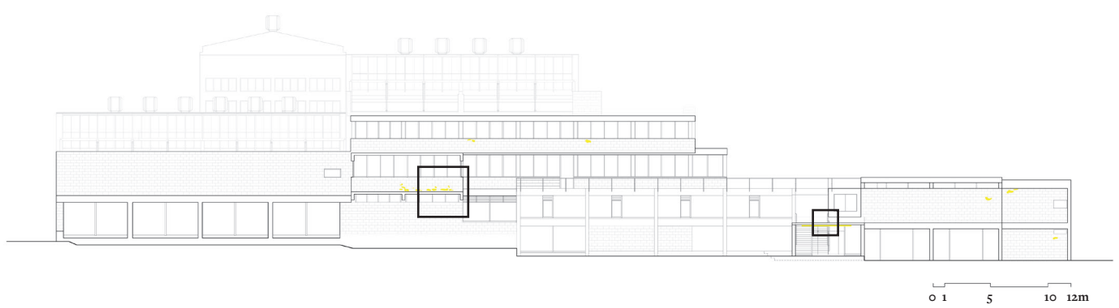
Painting's exfoliation
Type of decay: degradation manifested by the detachment, often followed by dropping, of one or more sub-parallel surface layers (flakes). sub-parallel surface layers

Location: on certain areas of the façade and in particular on the entrance ceiling

Visible effects: the plaster in some parts is partially detached from the rest of the structure or has completely fallen off

Possible causes: this decay may be mostly due to the action of weathering, crystallization and dissolution of salts, or freeze-thaw action cause pieces of the surface to flake off

Suggested intervention: repainting the finish coated



BROKEN GLASS

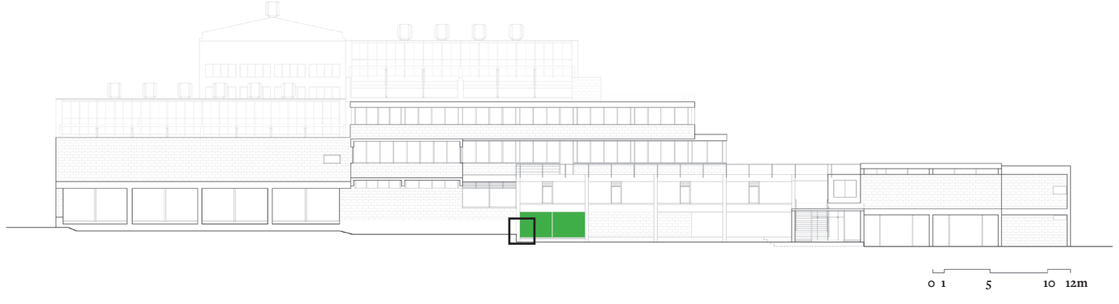
Broken glass
Type of decay: vertical openings with broken glass

Location: North facade windows

Visible effects: vertical openings have severe visible damage with remains of glass shards scattered on the ground. It should also be noted that the glazing is not made of tempered safety glass.

Possible causes: this kind of decay most likely was caused by human intervention

Suggested intervention: replacement of window glass



MISSING FRAME

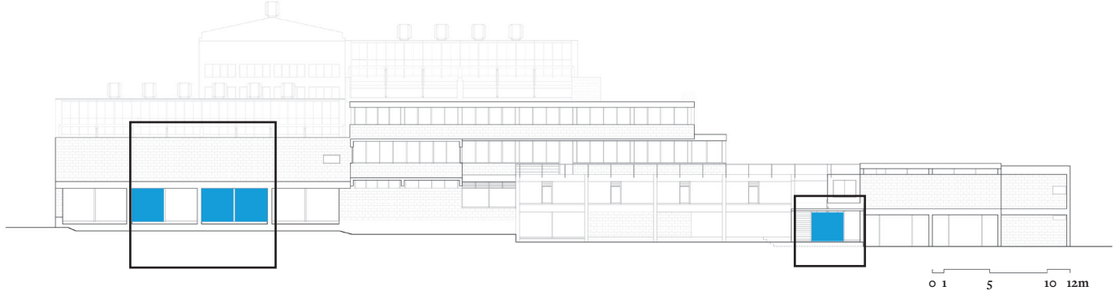
Missing frame
Type of decay: vertical openings without window frames

Location: some windows and even part of the main door on the North facade are missing

Visible effects: the windows are frameless and have been temporarily plugged with metal sheets. The same procedure has been followed with the glass door at the entrance: some temporary fixtures are arranged to block the entrance

Possible causes: this kind of decay most likely was caused by human intervention

Suggested intervention: replacement of window frames



CARBONATION

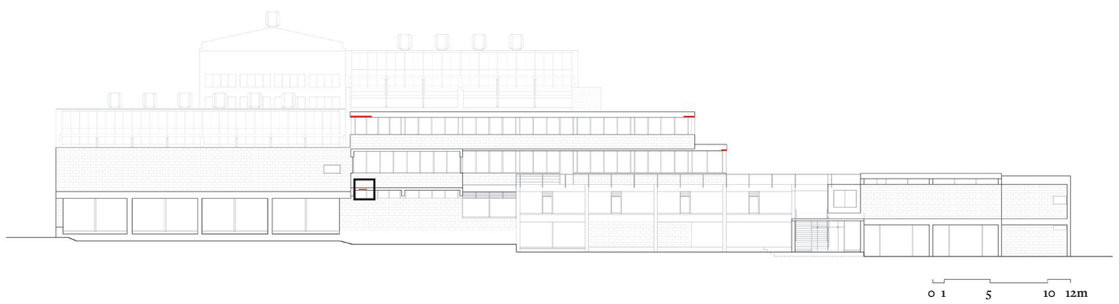
Carbonation
Type of decay: any irregularities or surface cracks on the walls constitute a preferential route for rainwater infiltration, so the degradation moves further into the facade until it reaches the reinforcement bars, causing them to oxidise and expel the protective surface concrete

Location: structural components of the façade

Visible effects: from what can be seen, the iron bars are exposed and the concrete has been ejected, leaving the core of the structure uncovered

Possible causes: one of the most deleterious agents for concrete and this type of decay is carbon dioxide

Suggested intervention: substrate cleaning, passivation of reinforcement bars and geometric recovery with fibre-reinforced thixotropic plaster



DRIPPING

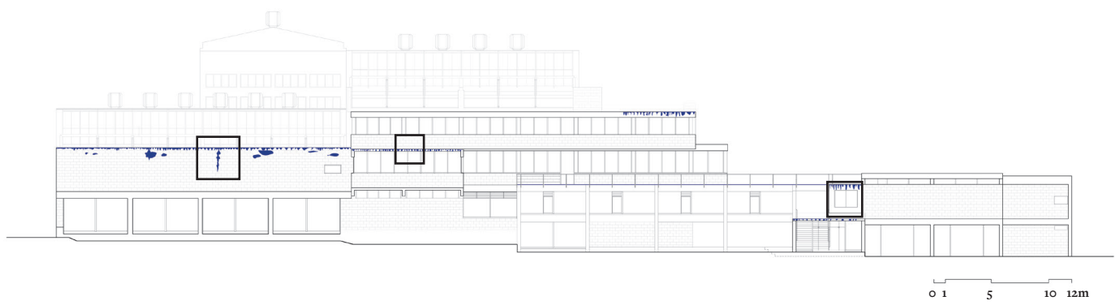
Dripping
Type of decay: parallel fading on some parts of the façade, especially near vertical openings

Location: near vertical openings and on the horizontal overhangs

Visible effects: these damaged parts of the facade show a rather different color from the rest of the envelope with traces running parallel to each other

Possible causes: the vertical traces, which are visible at the horizontal overhangs, are due to rainwater running down the wall

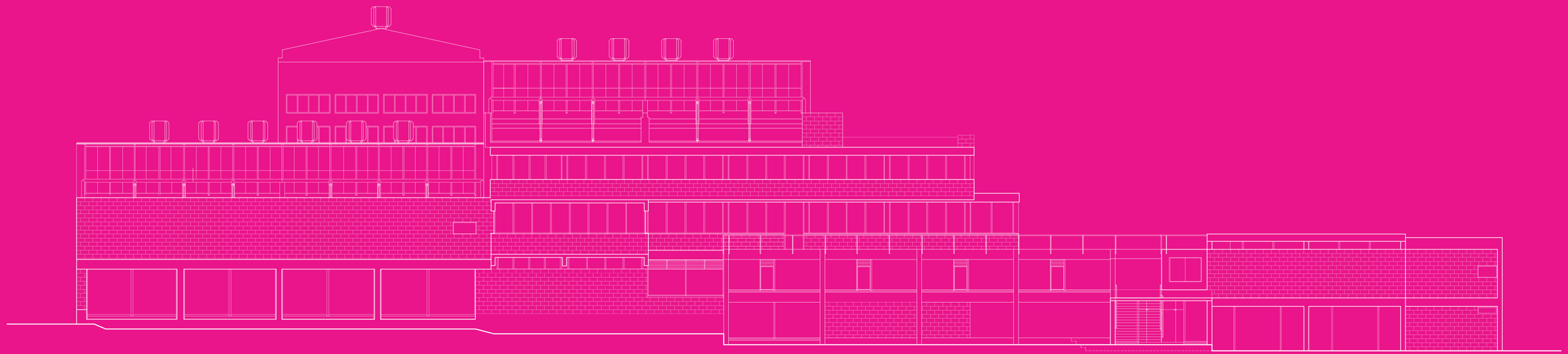
Suggested intervention: cleaning with a sorghum or nylon brush, cleaning with water spray and repainting of the plaster




SALIDA DE
EMERGENCIA

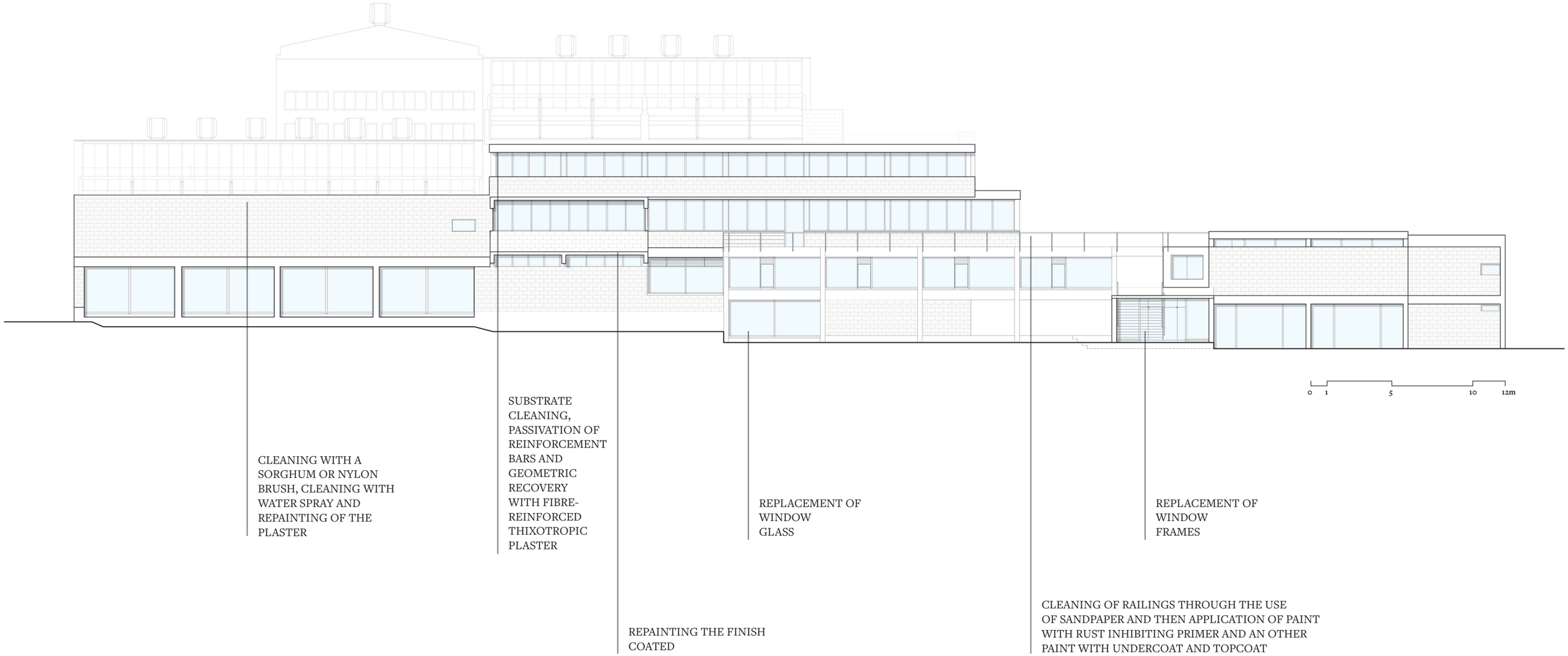
04
The
Proposal

04
The
Proposal



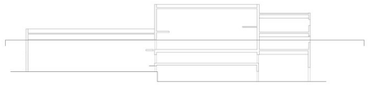
Restoration project

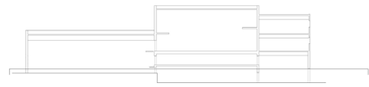
Hypothesis north facade after intervention

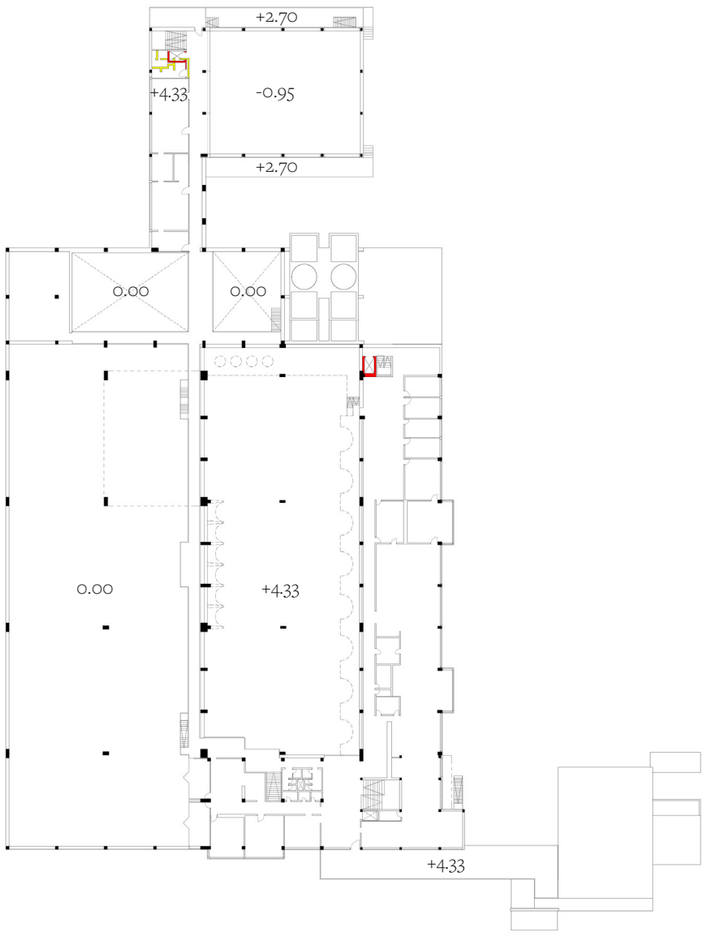


Restoration project - *demolitions/constructions*

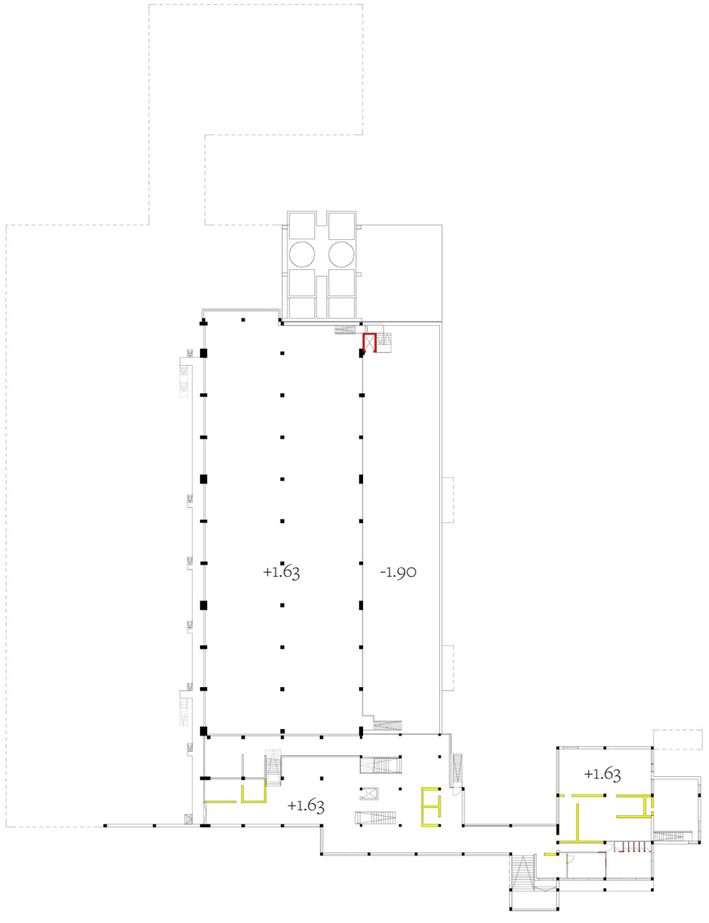
The restoration project of the CLESA milk factory includes some interventions on the external surfaces and frames.
Through the healing of the various degradation currently present in the facade, it will be possible to guarantee the preservation and reuse of the complex.
In addition, some ***demolition*** (yellow) and new ***construction*** (red) interventions are necessary to ***adapt the complex to the new functions*** proposed in the reuse project.
The actions focused on three floors of the complex, namely the ground, mezzanine, and first floor.
These small interventions will serve to integrate those spaces that were originally part of the original functions and are now obsolete. The vertical distribution also required intervention to add two elevators and facilitate access for everyone. One was added at the Experience Labs and another to connect the ground floor from the Social Table room to the top floor where the Incubators are located.
Other interventions were implemented to adapt the restrooms to current regulations, taking into consideration the spaces already used for these functions without carrying out too invasive work.
The spaces thus turn out to maintain their original composition, and adapting to the new functions they are going to host.



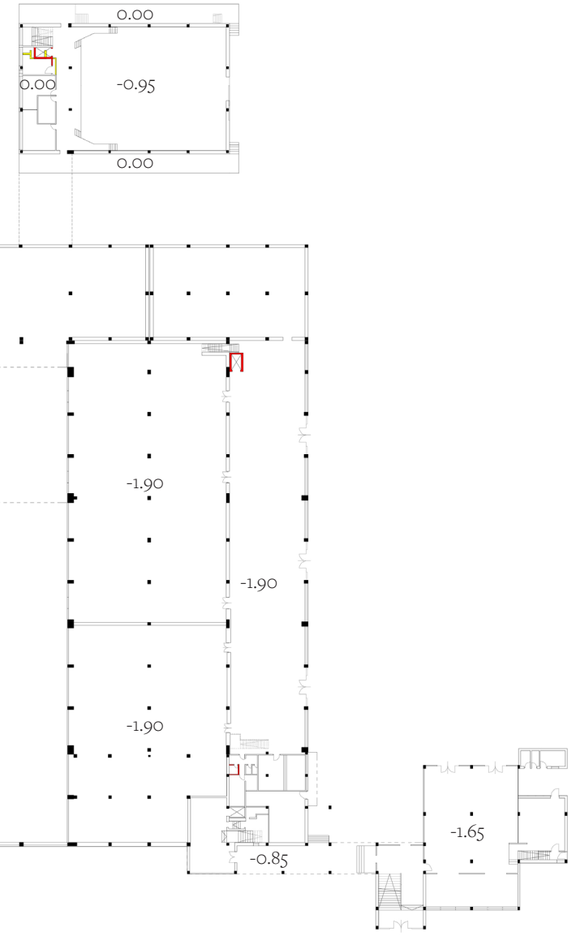




FIRST FLOOR



MEZZANINE FLOOR



GROUND FLOOR

Adaptive reuse proposal

According to the latest update of the Madrid municipality's PGOUM with regard to the factory area, the land where the CLESA plant is located will soon be used for ***tertiary functions*** and no longer residential as had been previously planned, with the construction of four other buildings within the land (also agreed upon according to the Madrid municipality's building design plan) and enclosed by a private open space for public use.

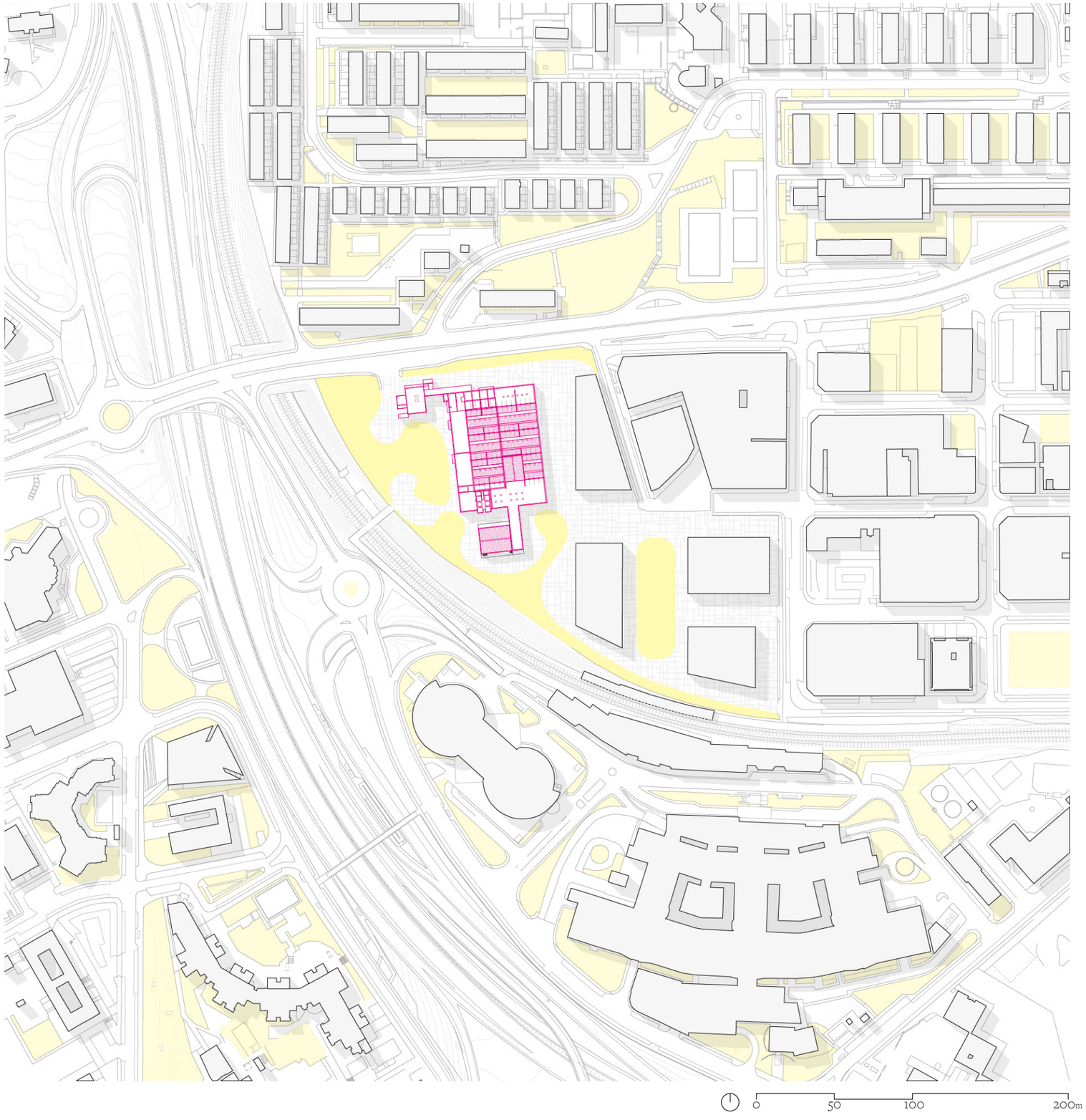
Regarding the concept of the areas surrounding the complex, the plan is to create around to the CLESA an interplay of sinuous lines that go to create green areas alternating with paved ones, embracing the entire complex and making it the protagonist within this new program.

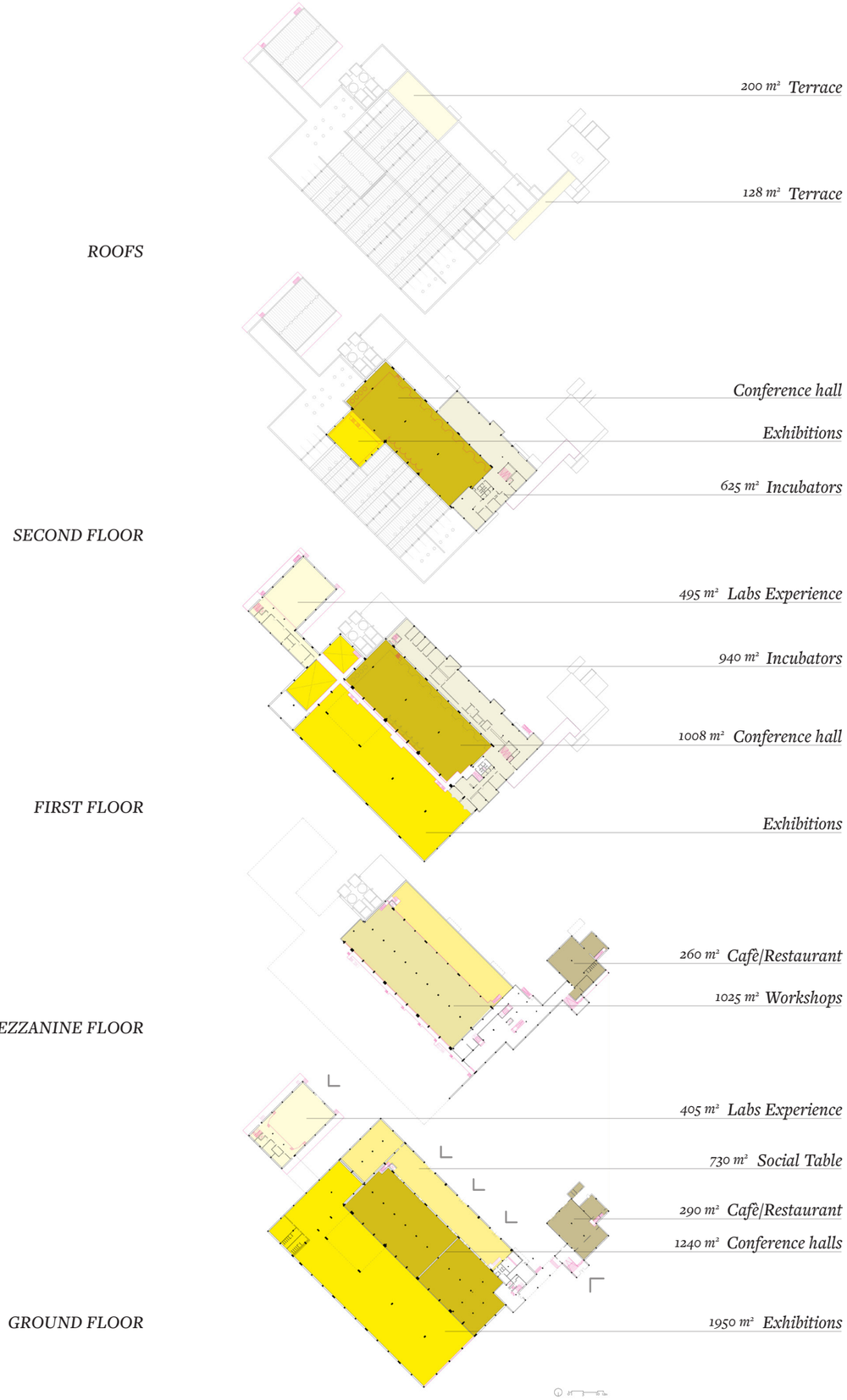
The entire ***park*** will serve to first ***connect*** the complex with the ***main street*** Avenida del Cardenal Herrera Oria.

Despite the increase in visitors due to the presence of the complex's new program, it is estimated that the existing covered public parking spaces combined with those on the block's street edges can go to cover in total the demand for parking spaces.

Then, through the creation of various paths and internal streets, it serves to connect the complex itself and the various buildings together.

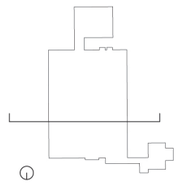
Finally, a link between the parcel itself and the walkway that allows access for visitors arriving both from the ***Ramón y Cajal train station*** and from the various hospital complexes on the other side of the railroad route.

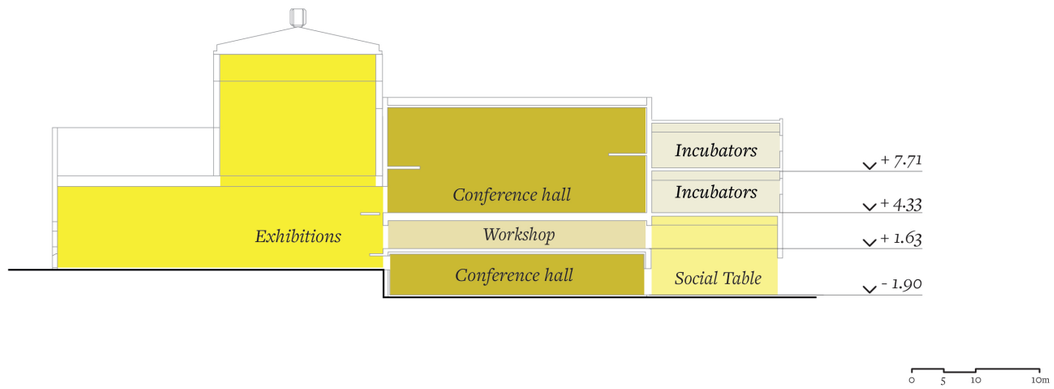


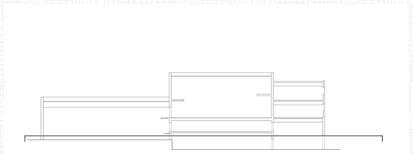


The functional program of the new CLESA stems from the desire requested previously in the competitions that took place in 2015 and later in 2020 to create a ***cultural space*** on par with the one already present in the southern part of the city namely the Matadero in Madrid. This cultural space also responds to the needs of future users of the complex, such as the residents of the Fuencarral and Mirasierra neighborhoods, students, workers and visitors from the surrounding hospitals as well as workers from the industrial polygon.
The cultural purpose is joined by the world of ***science*** and ***biotechnology***, influenced by the close proximity to the various hospital complexes and the medical school.
In addition, the numerous functions recall those that were already inside the building, adapting to what will be the new program.

The main entrance is connected with the Café/ Restaurant, once the canteen factory workers. This is followed by the two main ships, the first, which is spread over three floors, houses the spaces reserved for Conferences with an intermediate floor used for Workshops and connected to the Social Table and Teaching Room. This room is also connected on the top floor with the business and start-up incubators. The other ship, which runs the full height of the complex, is the space reserved for exhibitions. While through the walkway, which connects the central body to the incubators floor, it is possible to access the volume of the Experience Labs, originally also used as laboratories, but in this case with a function purely related to biotechnology.







0.00

0.00

LABS EXPERIENCE

-0.95

0.00

ADMIN

WC

TEACHING ROOM

CONFERENCE HALL 1

-1.90

EXHIBITIONS

0.00

SOCIAL TABLE

-1.90

CONFERENCE HALL 2

-1.90

WC

CAFÈ

-1.65

KITCHEN

-0.85 *HALL*

GROUND FLOOR

0 1 5 10 12m

WORKSHOP

+1.63

SOCIAL TABLE

-1.90

ADMIN

HALL

+1.63

RESTAURANT

+1.63

WC

MEZZANINE FLOOR

0 1 5 10 12m

+2.70

LABS
EXPERIENCE
-0.95

+4.33

+2.70

0.00

0.00

EXHIBITIONS
0.00

CONFERENCE
HALL 3
+4.33

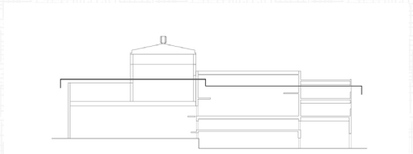
INCUBATORS
+4.33

INCUBATORS

TERRACE
+4.33

FIRST FLOOR

0 1 5 10 12m



+2.70

+2.70

+1.73

+7.83

TERRACE

+7.71

CONFERENCE HALL 3

+4.33

INCUBATORS

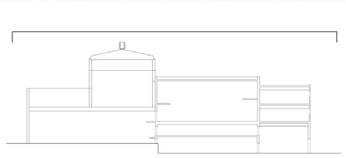
+7.71

+7.71

+4.33

SECOND FLOOR

0 1 5 10 12m

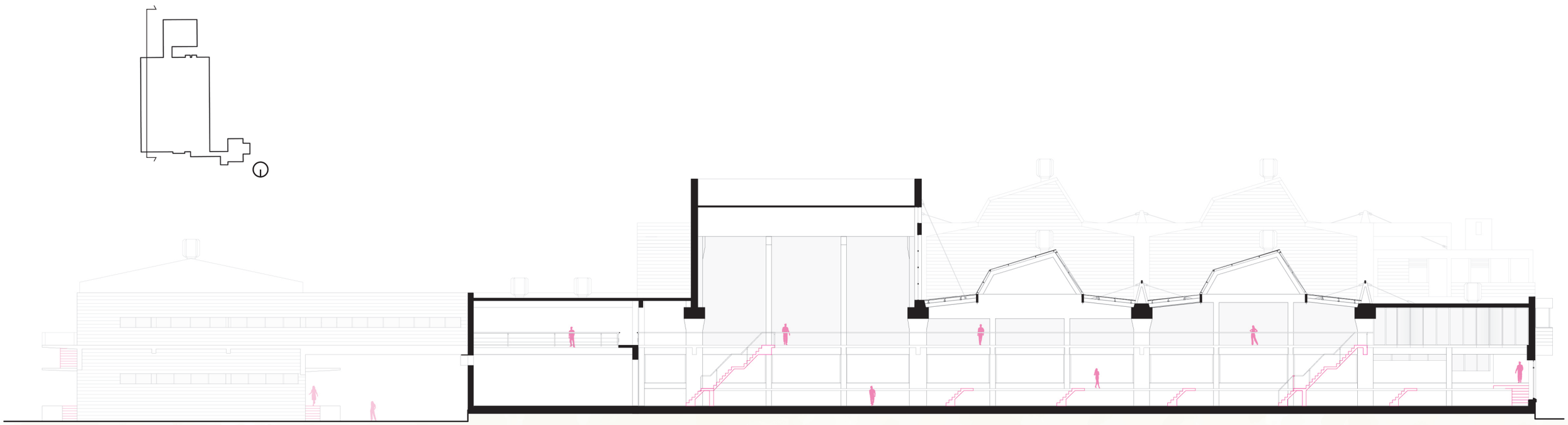


+4.33
+2.70
+7.71
+2.70
+7.71
+1.73
+7.71
+11.32
+7.71
+10.52
+4.33

ROOFS

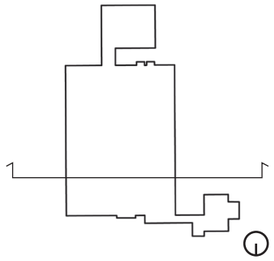
0 1 5 10 12m

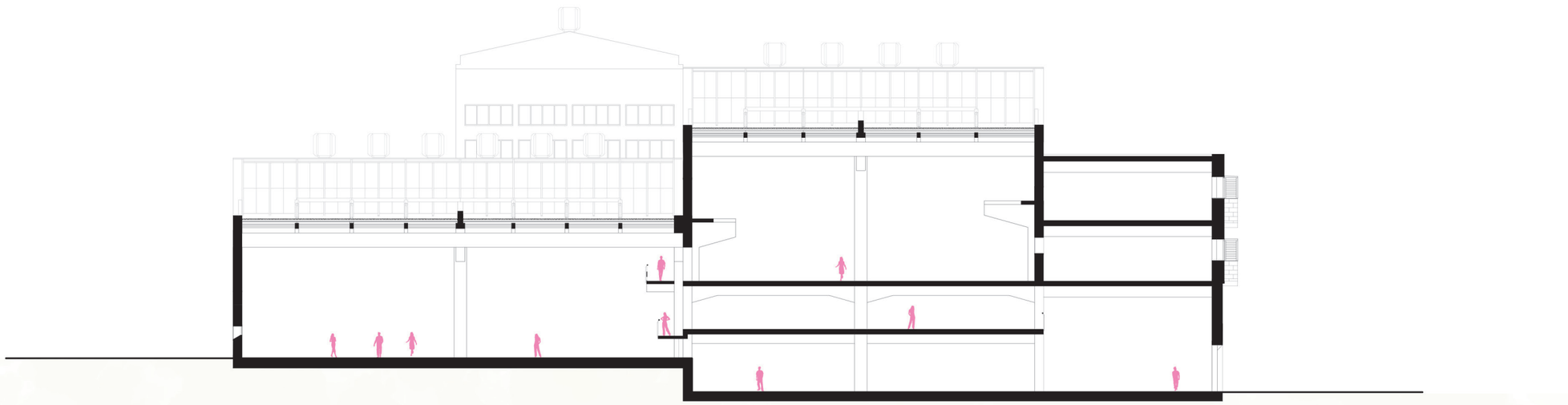
Section A-A'



0 1 5 10 12m

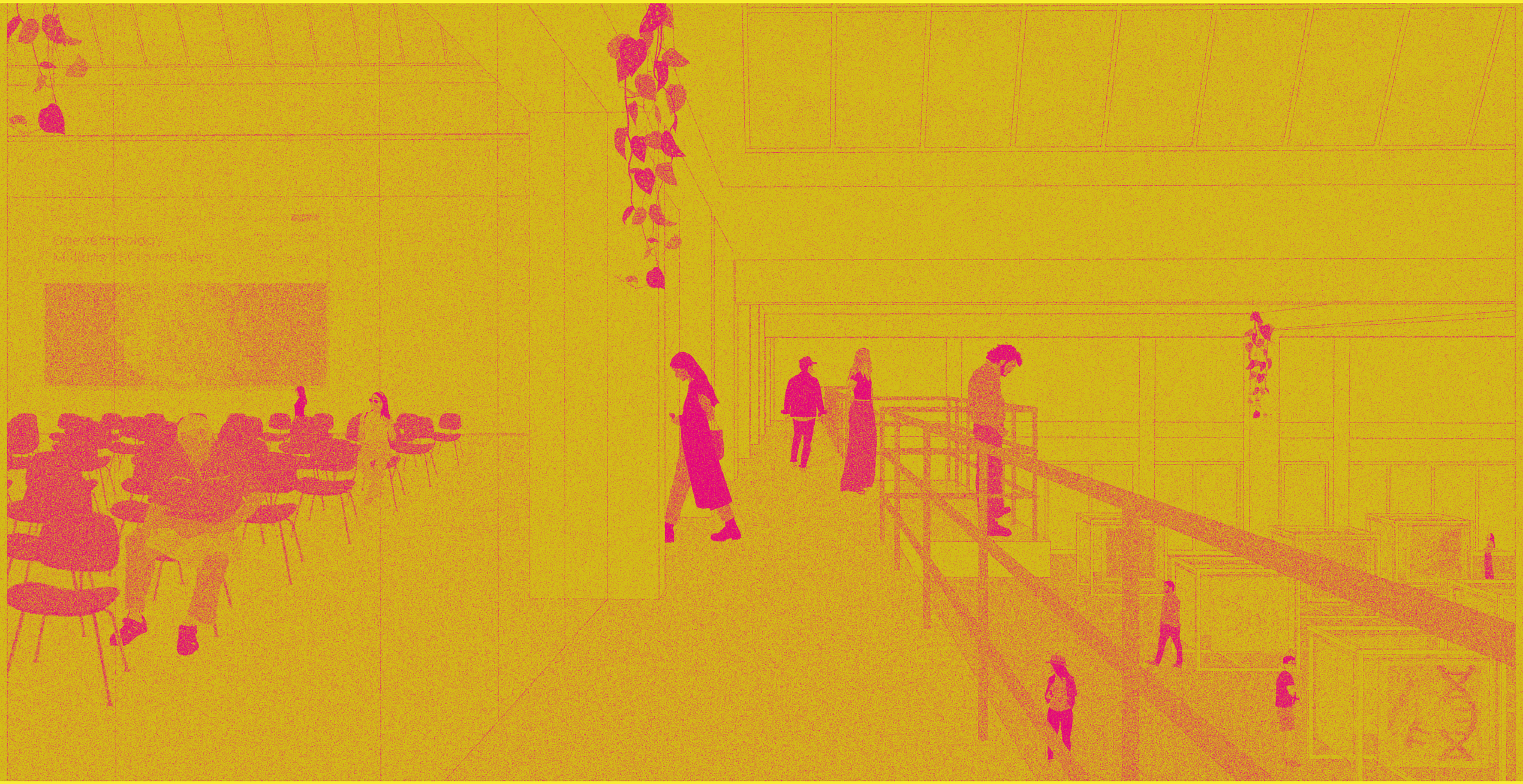
Section B-B'





0 1 5 10 12m


One technology.
Millions improved lives.



CONCLUSIONS

The CLESA factory represents just one of the many examples of industrial buildings in Europe that are currently still not being properly protected and safeguarded and are therefore in danger of being forgotten and permanently demolished.
The project idea for the restoration and reuse of Madrid's CLESA factory in the Fuencarral neighborhood aims first and foremost to protect the complex from future demolition while preserving the factory and in addition to create a new meeting point for the neighborhood, a cultural and biotechnology center. This new area also serves as a conduit with the main functions already present within the neighborhood (the Ramon y Cajal and La Paz hospitals, the University of Medicine, and the industrial polygon), to create a space open to all and containing a multitude of functions to meet the various needs of future users.
In the past, CLESA has hosted functions that served the production of dairy products.
Now the factory remains unchanged but is destined to host new activities, reflecting the surrounding area that has expanded and changed face over the years and embraces the needs of the new society.

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