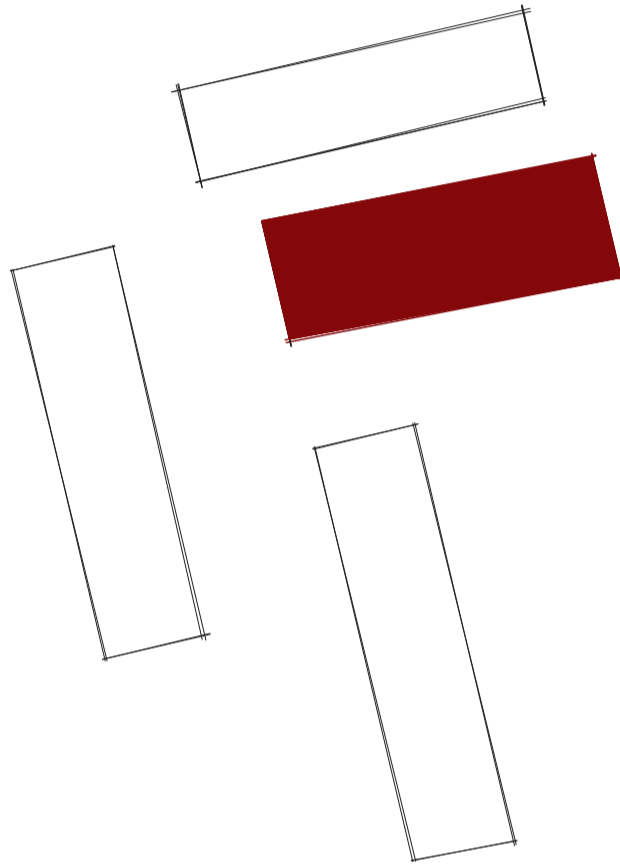


RE-DISCOVERING VERNACULAR LANDSCAPES: MEDITERRANEAN COAST  
**RICE AND BEER LAB**



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UNIVERSITY MASTER'S DEGREE IN ARCHITECTURE  
MASTER'S THESIS

SEPTEMBER 2021

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A mis padres.



## ABSTRACT

The rice has been and is an important part of Pinedo's economy, however, the profits benefits from this sector do not go directly to the farmers who are responsible for cultivating and maintaining the fields throughout the year.

The approach strategy starts from the analysis and focuses on the intervention, rehabilitation and reactivation of one of the blocks of Pinedo. The project is based on the reuse of a pre-existing industrial space that is given a new use by opening up the area and generating new activities that cohabit with society, as well as the addition of new spaces that complement them.

A programme is proposed focusing on the use of rice as the main driving force of the activity, developing its own brand of craft rice beer brewed in the local brewery proposed as part of the project, being the main part of the economic reactivation. It also provides laboratories that allow research for the development of new materials or other products produced with rice.

## KEY WORDS

Rice, Pinedo, rehabilitation, urban block, industry, craft beer, laboratory, economy.

## RESUMEN

El arroz ha sido y es una parte muy importante de la economía de Pinedo, sin embargo, las ganancias procedentes de este sector no repercuten directamente en los agricultores que se encargan de cultivar y mantener los campos a lo largo del año.

La estrategia de aproximación parte del análisis y se centra en la intervención, rehabilitación y reactivación de una de las manzanas de Pinedo. El proyecto se basa en la reutilización de un espacio industrial preexistente al que se dota de un nuevo uso encargándose de abrir el área y generar nuevas actividades que cohabitan con la sociedad, así como la adición de nuevos espacios que las complementen.

Se propone un programa centrado en la utilización del arroz como motor principal de la actividad, desarrollando una marca propia de cerveza de arroz artesanal elaborada en la fábrica local propuesta como parte del proyecto, siendo la parte fundamental de la reactivación económica. También se dota de laboratorios que permitan la investigación para el desarrollo de nuevos materiales u otros productos producidos con arroz.

## PALABRAS CLAVE

Arroz, Pinedo, rehabilitación, manzana urbana, industria, cerveza artesanal, laboratorio, economía.

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THE SITE

## LOCATION

Pinedo is a town located to the south of the city of Valencia in the Poblats del Sud district. It is a locality marked by its location, situated to the south of the mouth of the new Turia riverbed, very close to the port, surrounded by rice fields, orchards, the sea and the Albufera natural park.

The town of Pinedo began to grow at the end of the 18th century and the beginning of the 19th century. In 1840 it began to have 358 inhabitants, a number that increased around 1940, when it raised up to 2,975 inhabitants. The population remained constant until the 1960s, when it began to decrease due to both the rural exodus and the construction of the new riverbed. Currently, Pinedo has a population of approximately 2,500 inhabitants.

The city of Valencia has two different types of population centres: on the one hand, there is the big city, where most of the population is concentrated, and on the other hand, there are the small urban centres located in the suburbs or on the outskirts of the city. These villages, sometimes small towns, try to function independently, in some cases the communications between these areas and the big city are not optimal, making it really difficult to access these towns without the use of a private vehicle. Improved land infrastructure could make living in the peripheral areas a good opportunity for people to enjoy both the scenery and peacefulness of these areas as well as an easy and quick access to the city.

Traditionally, there has been a large rural exodus which has led to a large depopulation of the peripheral localities. The youngest members of families abandoned the countryside and farming and moved to the big cities in search of new opportunities for economic and employment growth. This situation has led to villages being seen as a place where people only go during the summer or on holiday to take a break from the hectic pace of the cities and to visit older relatives who still live there. However, this could change if the job and growth opportunities that people generally seek were available in these locations.

## UBICACIÓN

Pinedo es una localidad que se encuentra al sur de la ciudad de Valencia en el distrito Poblats del Sud. Es una localidad marcada por su ubicación, situada al sur de la desembocadura del nuevo cauce del río Turia, muy cerca del puerto, rodeada de campos de arroz, huertos, el mar y el parque natural de la Albufera.

El núcleo urbano de Pinedo se empieza a originar a finales del siglo XVIII principios del XIX, en 1840 es cuando empieza su crecimiento, cuando empieza a contar con 358 habitantes, número que se dispara alrededor del año 1940, cuando contaba con 2.975 vecinos. La población se mantuvo constante hasta los años 60 cuando empezó a disminuir tanto por el éxodo rural como por la construcción del nuevo cauce del río. Actualmente Pinedo tiene una población de aproximadamente unos 2.500 habitantes.

La ciudad de Valencia tiene dos tipos de núcleos poblacionales bien diferenciados, por una parte, está la gran ciudad que es donde se concentra la mayor parte de población y por otra parte se encuentran los pequeños núcleos urbanos situados en los suburbios o las afueras de la ciudad. Estos pueblos, en ocasiones pequeñas ciudades tratan de funcionar de manera independiente, en algunos casos las comunicaciones entre estas zonas y la gran ciudad no son óptimas, haciendo realmente difícil el acceso hasta estas poblaciones sin el uso del vehículo privado. La mejora de la infraestructura terrestre podría hacer que vivir en las zonas periféricas fuera una buena oportunidad para las personas, ya que así se podría disfrutar tanto de los paisajes y la tranquilidad de estas zonas como de un fácil y rápido acceso a la ciudad.

Tradicionalmente se ha producido un gran éxodo rural que ha provocado una gran despoblación en las localidades de la periferia. Las personas más jóvenes de las familias abandonaban el campo y las tareas de cultivo y se desplazaban a las grandes ciudades en búsqueda de nuevas oportunidades de crecimiento tanto económico como laboral. Esta situación ha generado que los pueblos sean considerados un lugar al que solo se va durante el periodo estival o vacacionar para descansar del ritmo frenético que generan las ciudades y visitar a los familiares mayores que todavía viven allí. Sin embargo, esto podría cambiar si en esas localidades existieran las oportunidades laborales y de crecimiento que por lo general buscan las personas.



## LANDSCAPES

There are four main types of landscape that currently converge in Pinedo, but this has not always been the case, in the past there were five. The analysis of these landscapes helps to understand the place and the characteristics that make it unique.

Firstly, the growth of buildings over the last few decades has meant that some of the most characteristic landscapes of this area have disappeared, as the existence of a road dividing Pinedo and the possible areas of expansion meant that the population decided to extend towards the beach, causing the disappearance of the pine forest which originally existed and which gave the town its name. In some areas further south, near El Saler and La Albufera, this regeneration is already taking place. Something similar is happening with the dunes that used to separate the sea coast from the town. It is necessary both to maintain and regenerate the dunes in order to restore the original character of Pinedo.

Furthermore, the orchards and rice paddies are what currently give the town its greatest character, being one of its main economic motors. Apart from being a picturesque landscape, it has the characteristic that it changes throughout the year, which gives it an added value as it makes it interesting to visit all year round. It is very interesting to see how the landscape changes from the time the rice fields are flooded until the spikes full of rice come out with the grains ready to be harvested. In addition, in Pinedo, many other fruits and vegetables can be grown as the abundance of fields allows the development of other crops.

Another characteristic landscape of the area is the sea and the beach, a place that is not very appreciated by the inhabitants of Valencia, despite the proximity of this beach to the city of Valencia, there are still many people who prefer to move to other areas further south to enjoy the days at the beach. This is because due to its proximity to the port it does not have a particularly good reputation amongst local residents. Regenerating the above-mentioned aspects could make this beach an attractive place for the inhabitants of Pinedo. The beach of Pinedo is the only place where the "corregudes de joies" (horse races) are still organised. These are races in which jockeys and horsewomen compete on horses without saddles. It is a festivity with more than 150 years of tradition, its origin goes back to the farmers of the area who promoted this tradition as part of their festivity, in spite of this, it is a little known festivity in the rest of Valencia.

Finally, the urban landscape of Pinedo, it is in the streets of the town where people live most of the time, both residential and service buildings are what give the place its personality and allow interaction between neighbours. The lack of common spaces that bring people together can create a sense of unease and make it a place where people do not want to move to or simply visit.

## PAISAJES

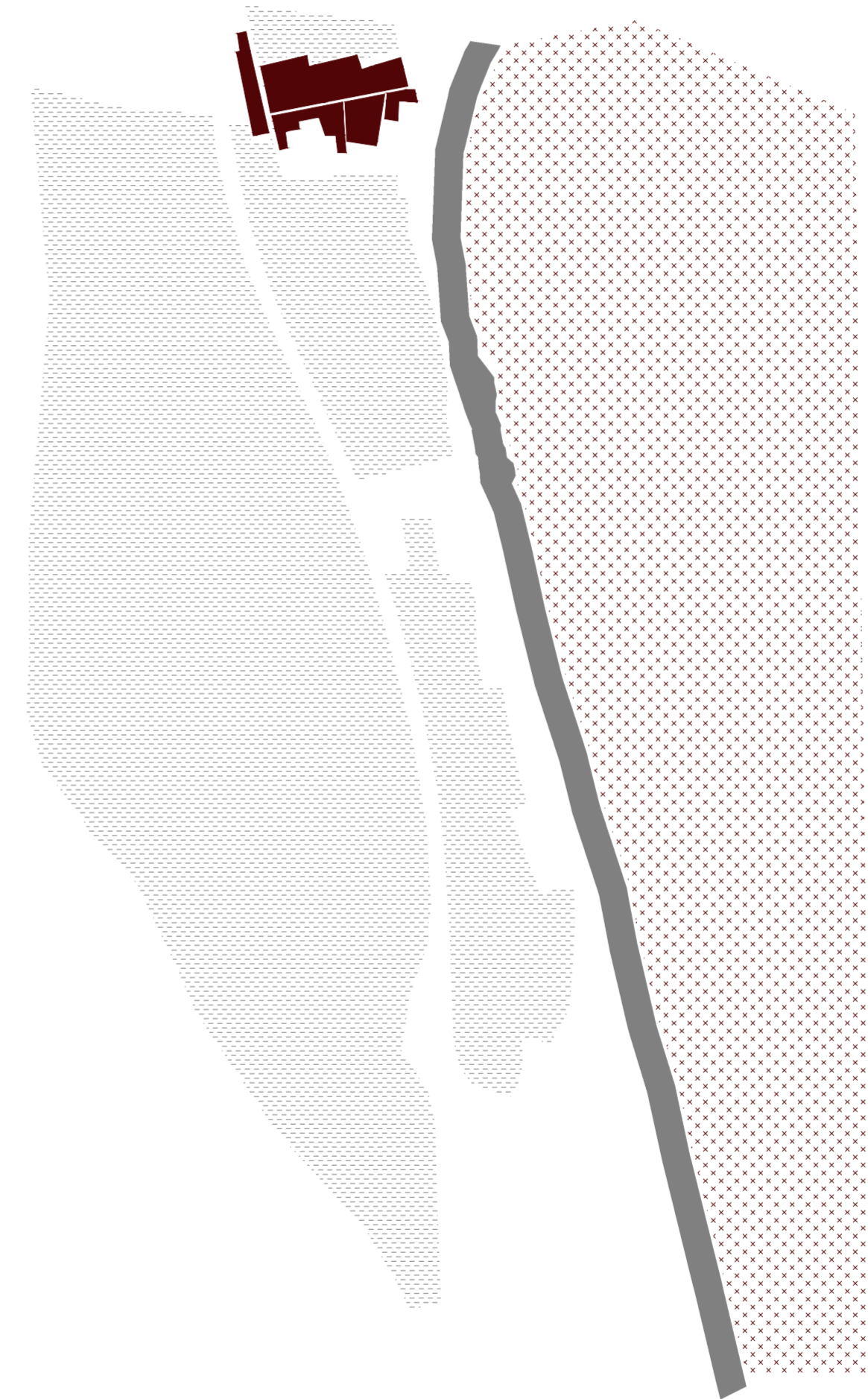
Hay cuatro tipos principales de paisaje que actualmente convergen en Pinedo, pero esto no ha sido siempre así, antiguamente eran cinco. El análisis de estos paisajes ayuda a la comprensión del lugar y las características que lo hacen un lugar singular.

En primer lugar, el crecimiento de las edificaciones durante las últimas décadas ha hecho que unos de los paisajes más característicos de esta zona desapareciesen, ya que al existir una carretera divisoria entre Pinedo y las posibles áreas de expansión, la población decidió extenderse hacia la playa, provocando la desaparición del bosque de pinos que había originalmente y que dio nombre a la localidad. En algunas zonas más al sur, cercanas a el Saler y la Albufera esta regeneración ya está teniendo lugar. Algo similar está pasando con las dunas que separaban el litoral marítimo de la localidad. Es necesario tanto un mantenimiento como una regeneración dunar que devuelva el carácter original a Pinedo.

Por otro lado, los huertos y arrozales son los que dotan de mayor carácter a la localidad actualmente, siendo uno de los principales motores económicos. Aparte de ser un paisaje pintoresco tiene la característica de que es cambiante a lo largo de todas las épocas del año, lo cual le aporta un valor añadido ya que hace que su visita sea interesante a lo largo de todo el año. Es muy curioso ver cómo va cambiando el paisaje desde que están los arrozales inundados hasta que salen las espigas con los granos de arroz listos para ser recolectados. Además, en Pinedo, se pueden cultivar muchas otras frutas y verduras ya que la abundancia de campos permite el desarrollo de otros alimentos.

Otro paisaje característico de la zona es el mar y la playa, lugar que no es demasiado apreciado por los habitantes de Valencia, pese a la proximidad de esta playa a la ciudad de Valencia, todavía son muchas personas las que prefieren desplazarse a otras zonas más al sur para disfrutar de los días de playa. Esto se debe a que debido a su proximidad con el puerto no tiene una especial buena reputación entre los vecinos. Conseguir la regeneración de los aspectos mencionados previamente podría hacer de esta playa un lugar atractivo para los habitantes de Pinedo. Es en la playa de Pinedo, el único lugar en el que todavía se organizan las conocidas como "corregudes de joies" que son unas carreras en las que jinetes y amazonas compiten sobre caballos sin silla de montar. Es una festividad que cuenta con más de 150 años de tradición, su origen se remonta a los agricultores y labradores de la zona que impulsaron esta tradición como parte de su festividad, a pesar de esto es una fiesta poco conocida en el resto de Valencia.

Por último, el paisaje urbano de Pinedo, es en las calles de la localidad donde se vive la mayor parte del tiempo, los edificios tanto residenciales como de servicios son los que dotan al lugar de personalidad y permiten la interacción entre los vecinos. La falta de espacios comunes que reúnan a las personas puede generar un malestar y que no sea un lugar al que las personas se quieran mudar o simplemente visitar.



## POPULATION

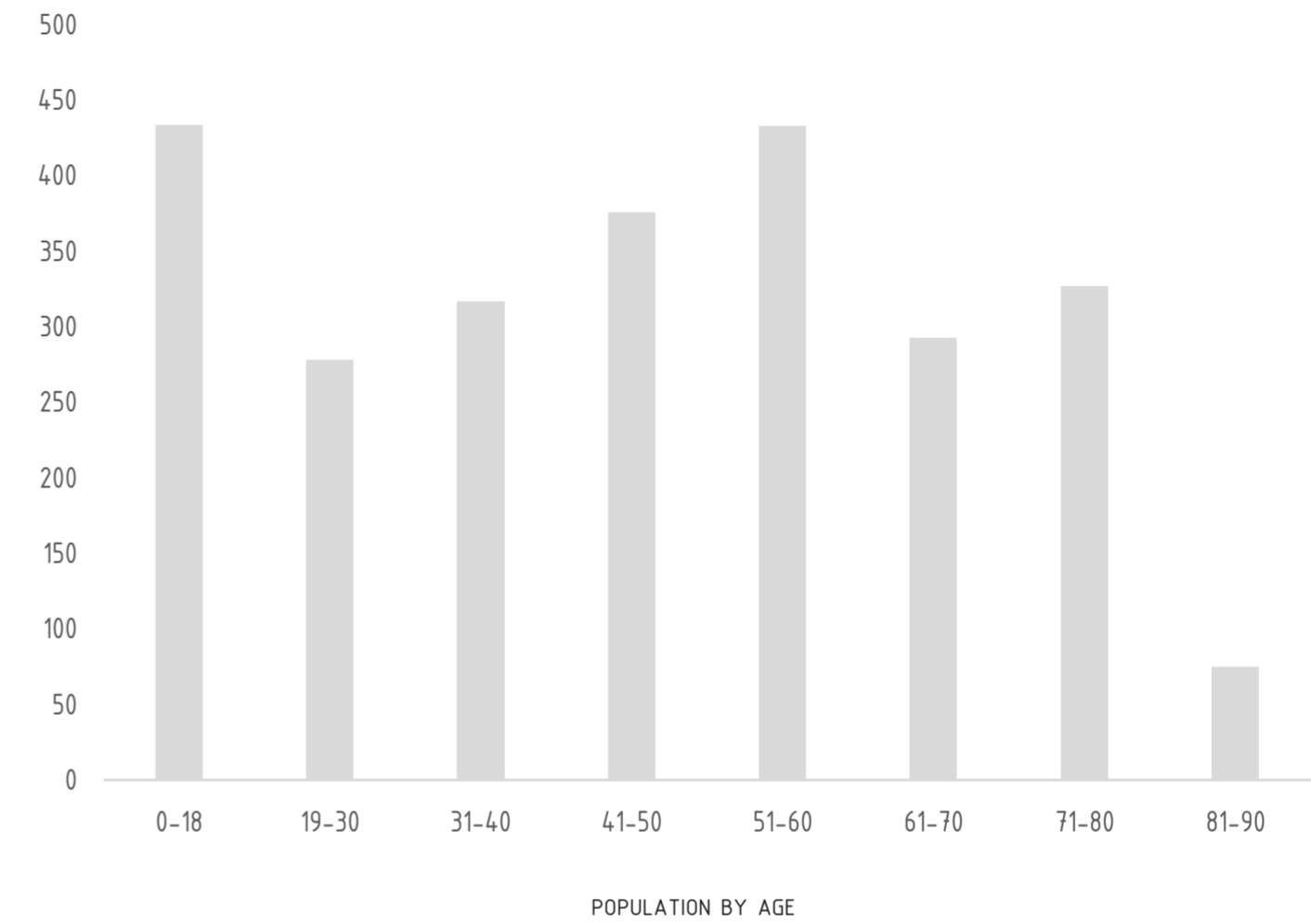
The population of Pinedo has suffered greatly from the consequences of the rural exodus over the years. It is important to put emphasis on finding out what has caused this situation in order to try to reverse it and make this town an attractive place for families.

Despite the fact that Pinedo has both a school and one of the best rated nursery schools in the city of Valencia, it seems that most of its users are people who do not live in Pinedo, as the data on the age of the residents reveals that the population of Pinedo with an ageing index of 160.2 is an ageing population.

The percentage of people under 60 years of age is 72.6% while the percentage of older people is 27.4. For a place to be attractive for its inhabitants, it must offer opportunities and facilities, which in the case of Pinedo are rather scarce.

Unemployment in the town is too high as, of the total active population of 2110 people, 1175 are employed and 935 are unemployed, which equates to a total of 44.3% of people who could currently work, but do not. This means that there is a lack of jobs or opportunities for the inhabitants of Pinedo, at least within the locality, which means that many of these families have to go elsewhere to look for work. One of the objectives of the development of this project is the creation of new jobs in the locality itself to revive the local economy.

On the other hand, both economic and social growth must be done in a conscious and responsible manner in order to avoid gentrification. The consequences of gentrification in many areas of Valencia are, among others, an increase in rent or housing prices, causing residents who already live in these neighbourhoods to move because they cannot afford to pay for their homes or business premises. This must be avoided at all costs in Pinedo.



## POBLACIÓN

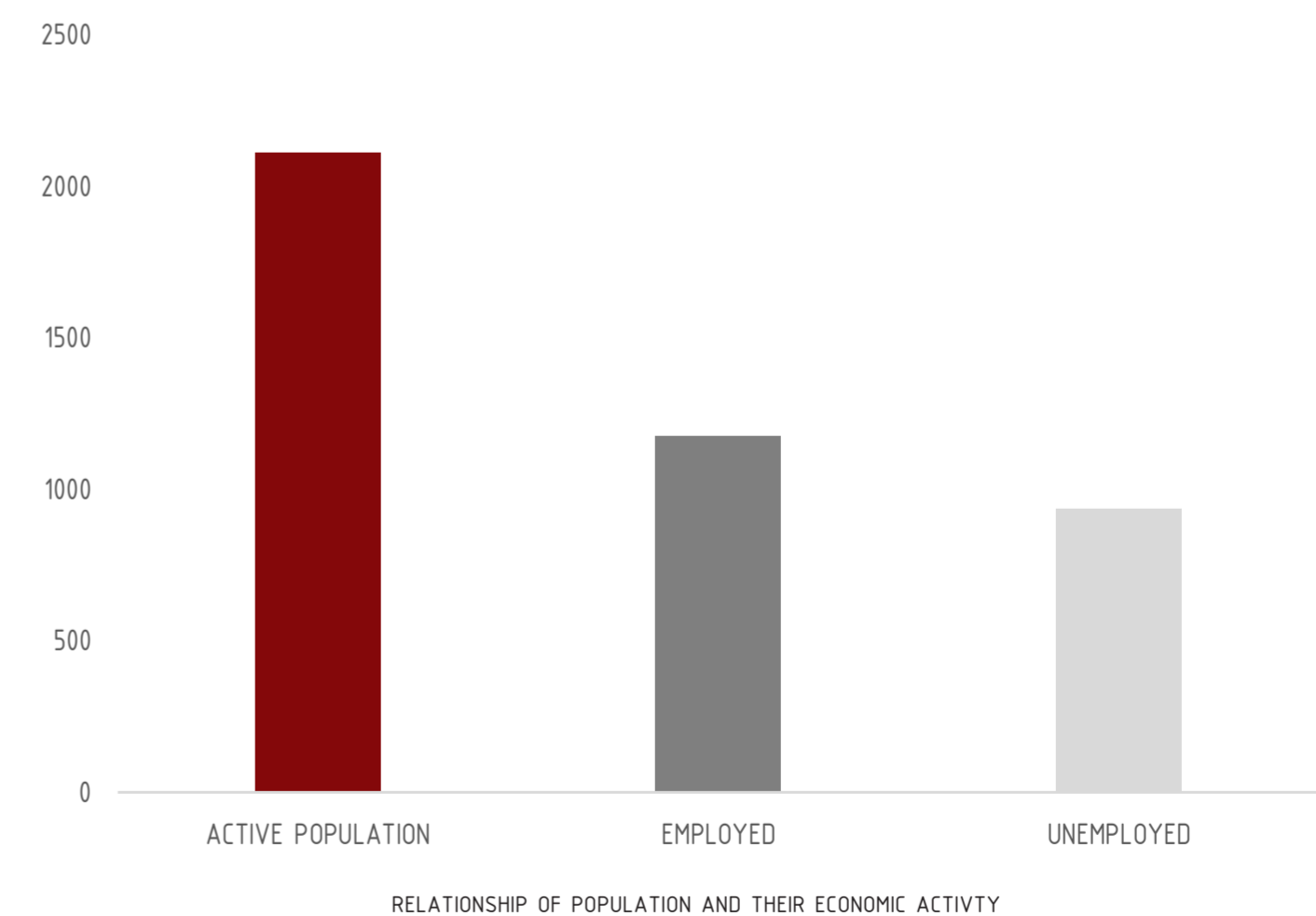
La población de Pinedo ha sufrido bastante las consecuencias del éxodo rural a lo largo de los años. Es importante poner énfasis en averiguar qué es lo que ha causado esta situación para tratar de revertirlo y hacer de esta localidad un lugar atractivo para las familias.

A pesar de que Pinedo cuenta tanto como con un colegio como con una de las escuelas infantiles mejor valoradas de la ciudad de Valencia, parece que la mayor parte de sus usuarios son personas que no residen en Pinedo, ya que los datos sobre la edad de los vecinos revelan que la población de Pinedo con un índice de envejecimiento de 160,2 es una población envejecida.

El porcentaje de personas menores de 60 años es de un 72,6% mientras que el de mayores es un 27,4. Para que un lugar resulte atractivo para los habitantes debe ofrecer unas oportunidades y servicios, bastante escasos en el caso de Pinedo.

El desempleo en la localidad es demasiado elevado ya que, del total de población activa, unas 2110 personas, 1175 están empleadas y 935 se encuentran en una situación de desempleo, lo que equivale a un total de un 44,3% de personas que actualmente podrían trabajar, pero no lo hacen. Esta se traduce en que hay una falta de trabajos u oportunidades para los habitantes de Pinedo, al menos dentro de la localidad, que hace que muchas de esas familias deban irse a otros lugares a buscar trabajo. Uno de los objetivos del desarrollo de este proyecto es la creación de nuevos empleos en la propia localidad que haga que la economía del lugar se reactive.

Por otra parte, tanto el crecimiento económico como el social se deben hacer de una manera consciente y responsable con tal de evitar la gentrificación. Las consecuencias generadas a partir de la gentrificación en muchas zonas de Valencia son, entre otras, un aumento de los precios de los alquileres o de la vivienda, haciendo que los vecinos que ya viven en esos barrios deban trasladarse por no poder pagar sus residencias o locales comerciales. Algo que se debe evitar a toda costa en Pinedo.



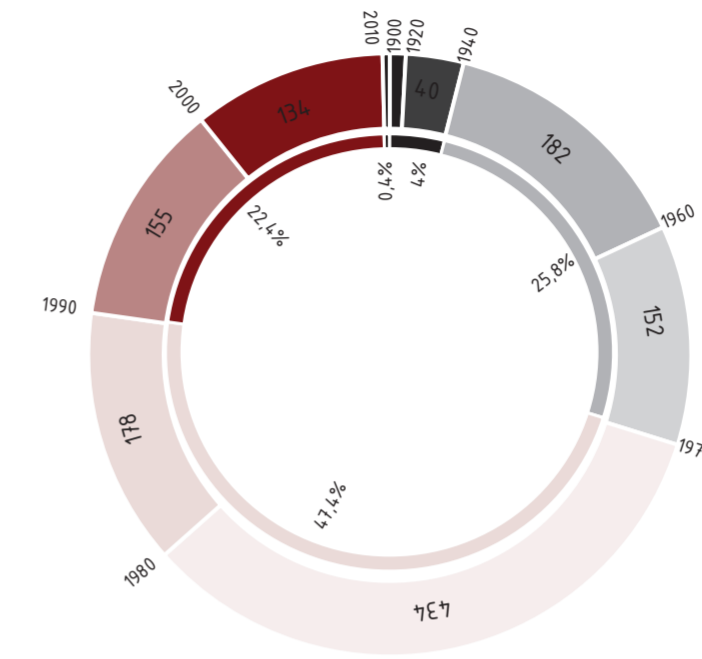
## HOUSING STOCK

The population of Pinedo is not the only thing that is ageing. The local housing stock is also ageing. Approximately 63.6% of the buildings were built before 1980, while only 36.4% are built after that date. Of the 1297 dwellings built in Pinedo, only 140 are built after the year 2000. This means that most of these residential dwellings are probably in need of renovation to ensure the quality and standards of habitability in force today.

The graphs explain the growth of construction over the years in Pinedo. Between 1900 and 1940, 40 buildings were constructed, some of which are still standing today, providing the population with a heritage. Between 1940 and 1970 there was an exponential growth of buildings, with 25.8% of the total being built, but it was between 1970 and 1990 when the bubble really burst and this huge, sometimes uncontrolled growth took place, with 47.4% of the buildings in Pinedo being constructed. From the nineties onwards, this growth gradually slowed down again, however, it is from the real estate crisis between 2008-2014 when the construction of new homes collapsed, representing during this period of years that the constructions are equivalent to 0.4% of the total.

All this is summarised in the fact that 4% of the buildings are more than 100 years old, 26% are between 50 and 80 years old, 47% are between 30 and 50 years old and finally only 23% are less than 30 years old, which is still quite a high age.

One of the ideas behind the project is precisely the reuse of existing spaces and buildings, instead of demolishing to build a new, to take advantage of and improve existing buildings. This means both an economic saving and a benefit for the environment, since, among other things, there is less consumption of raw materials, less waste generation and therefore a more sustainable construction.



PROPERTIES IN PINEDO OVERTIME

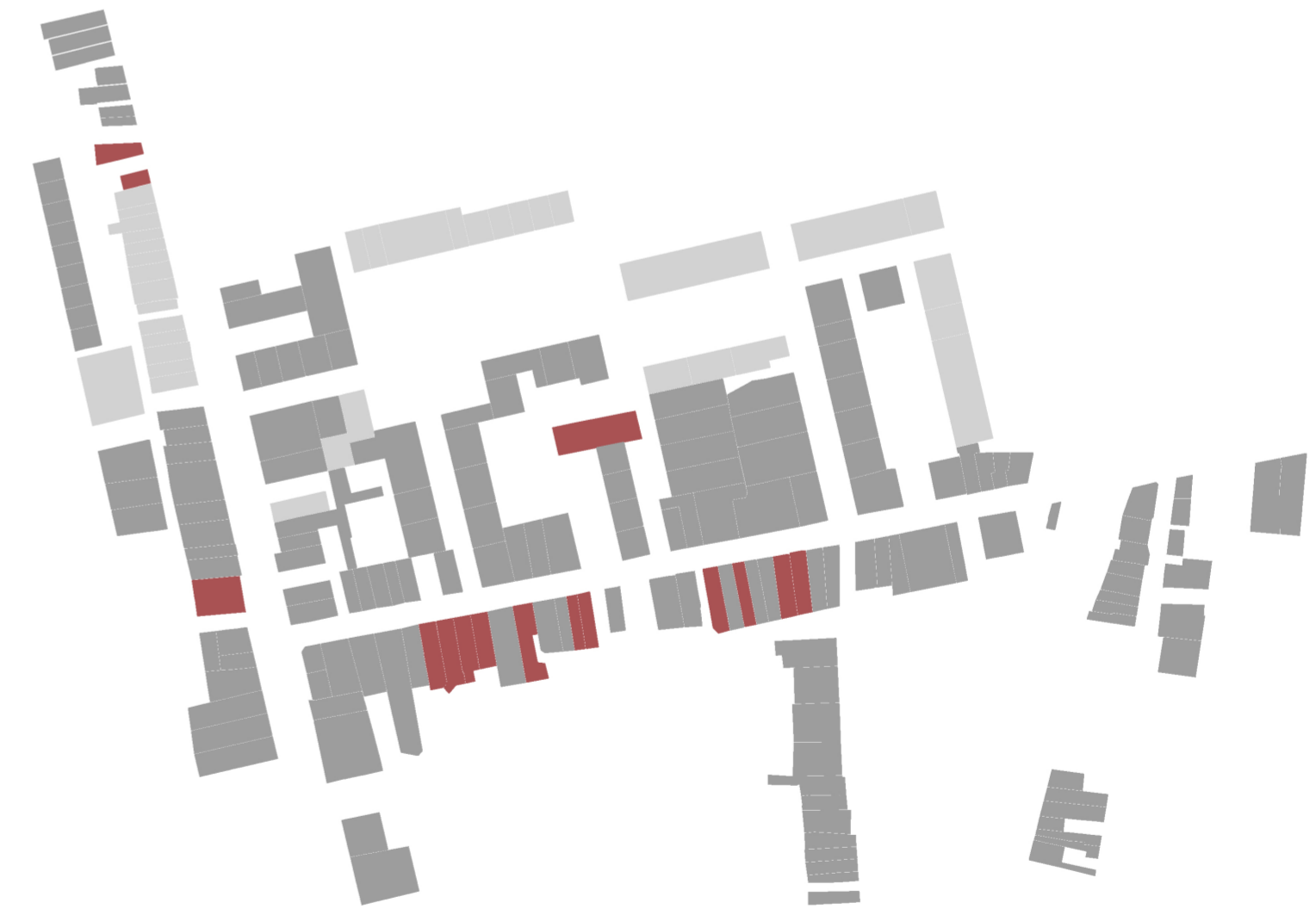
## PARQUE INMOBILIARIO

La población de Pinedo no es lo único envejecido. El parque de viviendas de la localidad también lo está. Aproximadamente un 63,6% de los edificios fueron construidos antes de 1980, mientras que solo el 36,4% son posteriores. De las 1297 viviendas construidas en Pinedo solamente 140 son posteriores al año 2000. Todo esto se traduce en que posiblemente la mayor parte de esas viviendas residenciales necesitarían una reforma que asegure la calidad y los estándares de habitabilidad vigentes hoy en día.

Los gráficos explican cómo ha sido el crecimiento de la construcción a lo largo de los años en Pinedo. Entre el 1900 y el 1940 se construyeron 40 edificios, algunos de los cuales todavía siguen en pie aportando a la población un patrimonio. Entre 1940 y 1970 hay un crecimiento exponencial de las edificaciones, construyéndose un 25,8% del total, pero, es entre 1970 y 1990 cuando la burbuja realmente explota y se produce ese gran crecimiento, a veces descontrolado en el que se construyen el 47,4% de los edificios de Pinedo. A partir de los noventa este crecimiento se vuelve a ralentizar de forma gradual, sin embargo, es a partir de la crisis inmobiliaria entre los años 2008-2014 cuando la construcción de nuevas viviendas se desmorona, representando durante este periodo de años que las construcciones equivalen a un 0,4% del total.

Todo esto se resume en que el 4% de los edificios tienen más de 100 años, el 26% tiene entre 50 y 80, el 47% entre 30 y 50 y por último únicamente el 23% menos de 30, que sigue siendo una edad bastante elevada.

Una de las ideas de las que surge el proyecto es precisamente la reutilización de los espacios y edificios ya existentes, en vez de demoler para construir de nuevo, aprovechar y mejorar las obras ya existentes. Esto supone tanto un ahorro económico como un beneficio para el medio ambiente, ya que, entre otras cosas, se produce un menor consumo de materias primas, una menor generación de desechos y por lo tanto una construcción más sostenible.



AGE OF PINEDO'S REAL ESTATE MARKET

- Buildings > 80 years
- Buildings > 50 years
- Buildings > 20 years



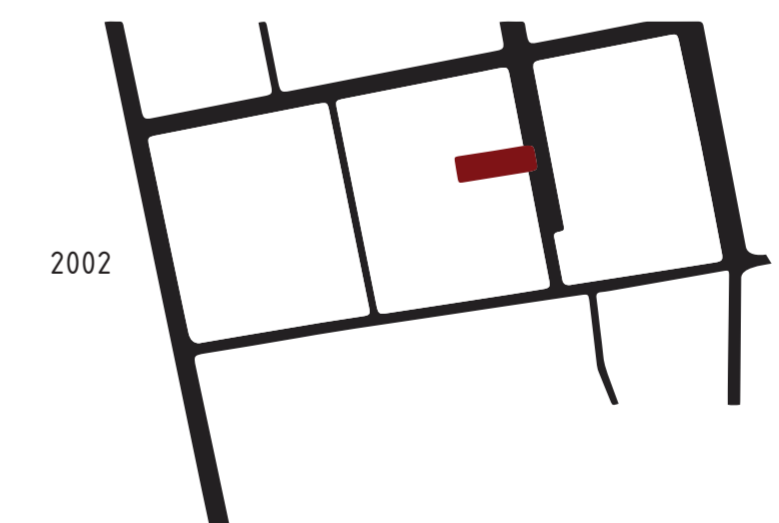
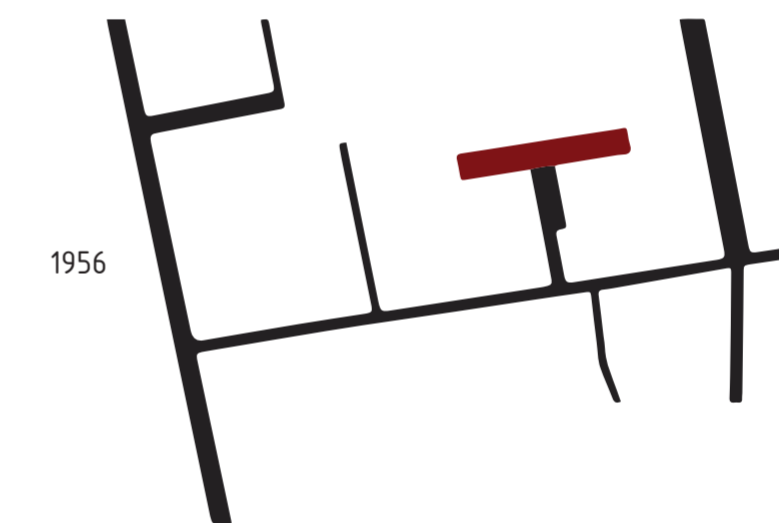
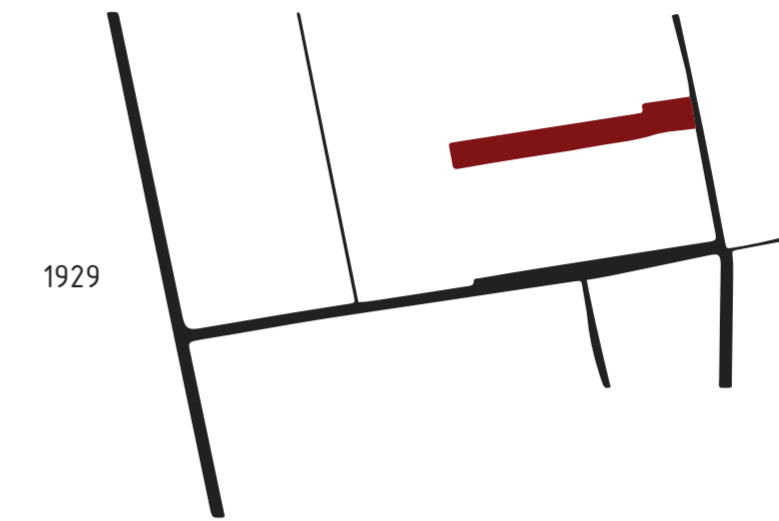
## EVOLUTION

The growth of the town and the construction of new houses over the years has meant that the streets that make up Pinedo have evolved and adapted to the new needs of society. As can be seen in the diagrams, in the plans analysed in 1929 Pinedo was made up of two main streets that formed an axis, one was the main road that communicated with Valencia and the other was the Camino al Mar. It was around these two streets that the first dwellings were built, generally one or two-storey detached houses inhabited by people who worked in the fields and in activities such as agriculture. The appearance of a warehouse stands out, which will be analysed later because of its relevance to the project. The surrounding area consisted of fields and irrigation ditches.

The greatest change took place from 1956 onwards, when a locality quite similar to what is known today can already be seen. In this case, during these years the single-family houses gave way to residential buildings of up to six floors. This is when more streets appeared and the central blocks of Pinedo began to be delimited. As for the emblematic building, it can be seen that it no longer maintains all its original size, but it is still practically intact.

It is from the year 2002 when Pinedo definitively takes on the shape it has today, the three blocks in the centre are closed off and are formed by the tallest residential buildings, surrounded in the adjoining streets by the first constructions which were the single-family houses. Unfortunately, half of the landmark building has disappeared. Currently, this building is out of planning, although when analysing the evolution of the streets, it is shown that it is these same streets which have invaded the building.

Therefore, Pinedo is ordered from the two original streets that have been maintained over the years, creating an axis in what would be the equivalent of the centre, it can be determined that you can walk everywhere, as it is a town that can be crossed from end to end in less than ten minutes. The more distant areas, which would be the fields, are also very close, as the same journey on foot would take no more than 15 minutes.



## EVOLUCIÓN

El crecimiento de la localidad y la construcción de nuevas viviendas a lo largo de los años ha hecho que las calles que componen Pinedo evolucionen y se vayan adaptando a las nuevas necesidades de la sociedad. Como se puede apreciar en los diagramas, en los planos analizados del año 1929 Pinedo estaba formado por dos calles principales que formaban un eje, uno era la carretera principal que comunicaba con Valencia y la otra era el Camino al Mar. Era alrededor de estas dos calles donde surgían las primeras viviendas, generalmente viviendas unifamiliares de una o dos plantas habitadas por las personas que se dedicaban al campo y a actividades como la agricultura. Destaca la aparición de una nave que será objeto de análisis posteriormente por su relevancia para el proyecto. Los alrededores estaban formados por campos y acequias.

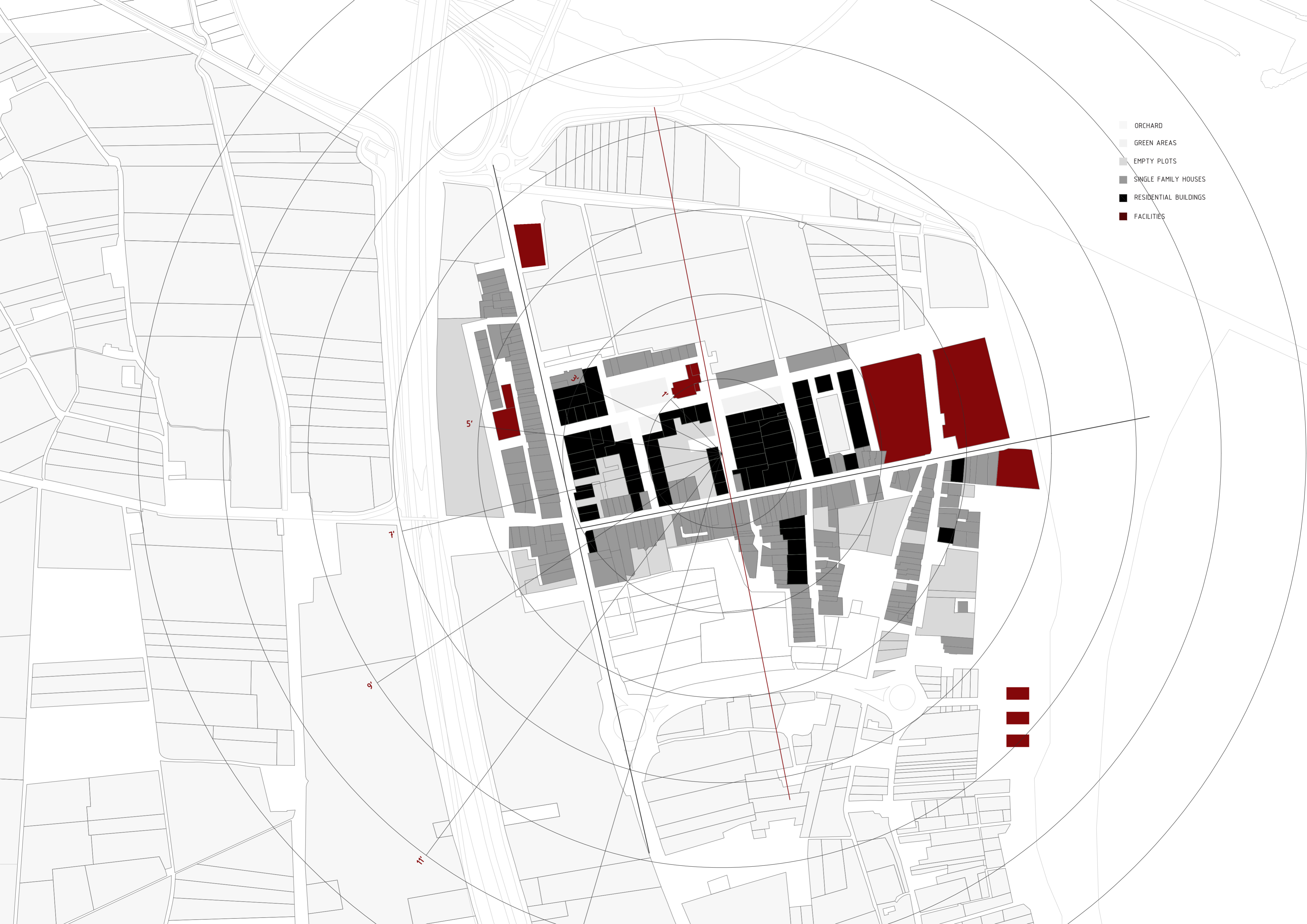
El mayor cambio se produce a partir del año 1956, cuando ya se puede ver una localidad bastante parecida a lo que conocemos hoy en día. En este caso, durante estos años las viviendas unifamiliares dan paso a edificios residenciales de hasta seis plantas. Es cuando surgen más calles y se empiezan a delimitar las manzanas centrales de Pinedo. En cuanto al edificio emblemático se puede observar que ya no mantiene todo su tamaño original, pero todavía se conserva de manera prácticamente íntegra.

Es a partir del año 2002 cuando Pinedo cobra definitivamente la forma que tiene en la actualidad, se cierran las tres manzanas que se encuentran en el centro y que están formadas por los edificios residenciales con mayor altura, rodeados en las calles colindantes por las primeras construcciones que eran las viviendas unifamiliares. Por otra parte, desafortunadamente, la mitad del edificio emblemático desaparece. Actualmente, este edificio se encuentra fuera de ordenación, aunque realmente al analizar la evolución de las calles se demuestra que han sido esas mismas calles las que han invadido el edificio.

Por lo tanto, Pinedo queda ordenada a partir de las dos calles originales que se mantienen a lo largo de los años, creando un eje en lo que sería el equivalente al centro, se puede determinar que se puede ir andando a todos los sitios, ya que es una localidad que se puede cruzar de punta a punta en menos de diez minutos. Las zonas más alejadas que serían la huerta también tienen una gran proximidad ya que el mismo recorrido andando no llevaría más de 15 minutos.



- ORCHARD
- GREEN AREAS
- EMPTY PLOTS
- SINGLE FAMILY HOUSES
- RESIDENTIAL BUILDINGS
- FACILITIES



## SWOT

The lack of quality public transport to bring the area closer to the city of Valencia highlights one of the main weaknesses of the area, as access by private vehicle is practically necessary. The territorial division generated by the road has a negative impact. Another threat to the territory is the threat to the ecosystem, if the landscape and the orchards which generate the life of the autochthonous flora and fauna are not cared for, they will disappear.

However, Pinedo is a town with great potential, there are a large number of empty plots of land where spaces can be created to enhance the area and make it more attractive. The connection generated through the cycle lane is very interesting, despite this, it is a lane with shortcomings and with an unfinished itinerary. The main attractions at present are the promenade and the gastronomy, being a place of reference when people want to enjoy traditional dishes such as paella.

The creation of new products based on locally grown rice, offers one of the greatest opportunities for socio-economic growth in the area. Turning Pinedo into a place of reference known at least on a national level would be a great boost for the economic reactivation that would lead to an improvement of the local infrastructures.

The rice culture in Pinedo is nothing new, however, at present the profits from rice cultivation are not benefiting the villagers, as the rice is generally sold to a few companies who process and distribute it, with the intermediaries making the most profit.

Rice cultivation is a long process that has a series of phases throughout the year, from the preparation of the soil in the first months of the year to harvesting, drying and packaging in the last quarter of the year. It is a process that has been carried out since ancient times and little has changed in all this time.

## DAFO

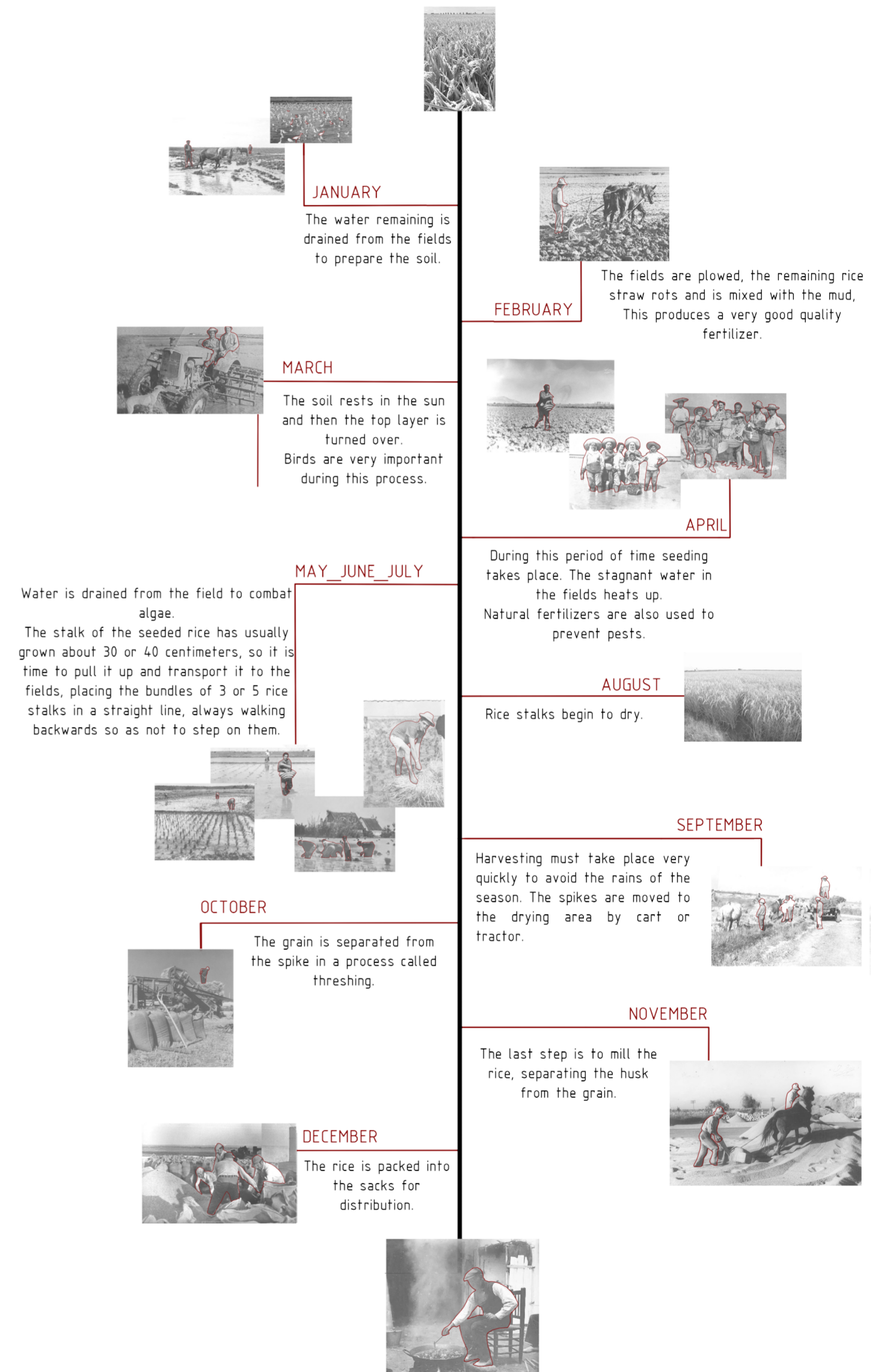
La falta de un transporte público de calidad que acerque la zona a la ciudad de Valencia pone de manifiesto una de las principales carencias de la zona, ya que es prácticamente necesario el acceso en vehículo privado. La división territorial que genera la carretera produce un impacto negativo. Otra amenaza del territorio es la que sufre el ecosistema, si no se cuida el paisaje y la huerta que generan la vida de la flora y la fauna autóctonas estas desaparecerán.

Sin embargo, Pinedo es una localidad con un gran potencial, hay una gran cantidad de solares vacíos en los que se pueden generar espacios que potencien la zona y la conviertan en más atractiva. La conexión que se genera a través del carril bici es muy interesante, a pesar de esto es un carril con carencias y con un itinerario inacabado. Los principales atractivos actualmente son el paseo marítimo y la gastronomía, siendo un lugar de referencia al que se acude cuando se quiere disfrutar de platos tradicionales como la paella.

La creación de nuevos productos cuya base sea el arroz cultivado de forma local, brinda una de las mayores oportunidades que pueden generar un crecimiento socioeconómico en la zona. Convertir Pinedo en un lugar de referencia conocido al menos a nivel nacional supondría un gran impulso para la reactivación económica que llevaría a una mejora de las infraestructuras locales.

La cultura que gira en torno al arroz en Pinedo no es una novedad, sin embargo, actualmente las ganancias obtenidas de su cultivo no están beneficiando a los habitantes del pueblo, ya que por regla general el arroz se vende a algunas empresas que son las que lo procesan y distribuyen siendo de esta manera los intermediarios los que obtienen un mayor beneficio.

El cultivo del arroz es un proceso largo que tiene una serie de fases a lo largo de todo el año, desde la preparación del suelo en los primeros meses del año hasta su recolección, secado y empaquetado en el último trimestre. Un proceso que se realiza desde antaño y que poco ha cambiado en todo este tiempo.



2.

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THE PLOT



## STRATEGY

The intervention is carried out inside the block, in addition to filling in the existing gaps in the façades of the surrounding streets, creating a new space that can be enjoyed by both neighbours and visitors.

Making changes in the city makes the inhabitants adapt to these new circumstances, for example, what happened in Colombia with the implementation of the telecable, a kind of underground, but instead of circulating underground, it circulates in the form of a cable car through the air. Both neighbours and visitors began to perceive a new vision of the reality in which they lived. When they began to see their houses from an aerial perspective, they began to act and change the roofs, which until now had been relegated to being only an element of protection.

A new vision of the locality entails a new care of the spaces, it is a question of activating the space to activate the programme and to start the improvements. Through the activation of the programme, circulation is activated, which means that circulation changes the perspective from which we perceive things and it is this perception that makes us take care of the environment around us in a more conscious way.

The methodology used to carry out the project begins with the investigation of the history behind the building that inspired the development of this project. Through the research carried out to find out the context of this building. Seeking the connection of the building's past with the present reality of both those who lived through the evolution that Pinedo has undergone, as well as those new inhabitants, so that it is the building that tells them part of the history that has taken place.

The new buildings are responsible for activating the back of the block, making at least the buildings facing the interior of the block an active and attractive space.

The idea is to reactivate a territory through the recovery of its heritage, extending the vision to the surroundings, not only to the building that is being renovated, but also to how it will affect the landscape and the existing buildings.

It is essential to maintain the piece of history that still remains in the locality, as it is the only construction of this style that is still standing, which is why one of the main strategies is the rehabilitation of this space, giving it a new use that reactivates its activity and makes its care and maintenance interesting.

## ESTRATEGIA

La intervención se realiza en el interior de la manzana, además se completan los vacíos existentes en las fachadas de las calles que la rodean, creando un nuevo espacio del que pueden disfrutar tanto los vecinos como los visitantes.

Hacer cambios en la ciudad hace que los habitantes se adapten a estas nuevas circunstancias, es el caso por ejemplo de lo que sucedió en Colombia con la implementación del telecable, tanto los vecinos como los visitantes empezaron a percibir una nueva visión de la realidad en la que vivían. Al empezar a ver sus casas con una perspectiva aérea empezaron a actuar y cambiar las cubiertas, que hasta el momento habían quedado relegadas únicamente a ser un elemento de protección.

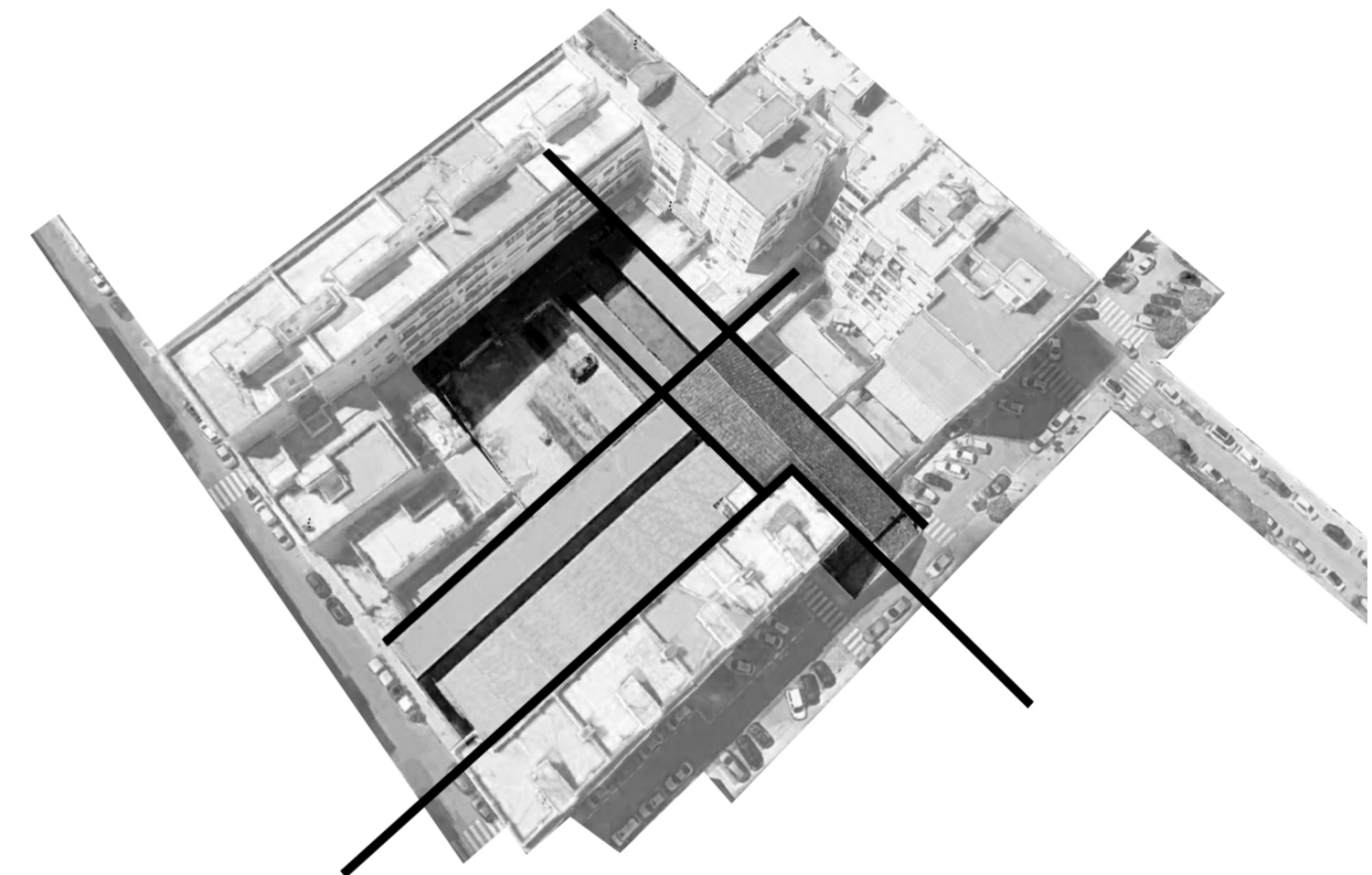
Una nueva visión de la localidad conlleva un nuevo cuidado de los espacios, se trata de activar el espacio para activar el programa y que empiecen las mejoras. A través de la activación del programa se activa la circulación, lo que conlleva a que la circulación cambie la perspectiva desde la que percibimos las cosas y es a la vez esta percepción la que hace que cuidemos de una manera más consciente del entorno que nos rodea.

La metodología empleada para la realización del proyecto comienza con la investigación de la historia que hay detrás del edificio que inspiró el desarrollo de este proyecto a través de la investigación realizada para conocer el contexto de este edificio. Buscar la conexión del pasado del edificio con la realidad del presente tanto de los que vivieron la evolución que ha sufrido Pinedo, así como aquellos nuevos habitantes, que sea el edificio el que les cuente parte de la historia que ha sucedido.

Los nuevos edificios se encargan de activar el fondo de manzana, haciendo que, al menos, los edificios que dan al interior de la manzana se conviertan en un espacio activo y atractivo.

La idea es reactivar un territorio desde la recuperación de su patrimonio, ampliando la visión al entorno, no únicamente al edificio que se renueva, sino también a cómo va a afectar al paisaje y a los edificios existentes.

Es fundamental mantener el pedazo de historia que todavía permanece en la localidad, ya que es la única construcción de este estilo que todavía sigue en pie, es por eso que una de las estrategias principales es la rehabilitación de este espacio, darle un nuevo uso que reactive su actividad y haga interesante su cuidado y mantenimiento.





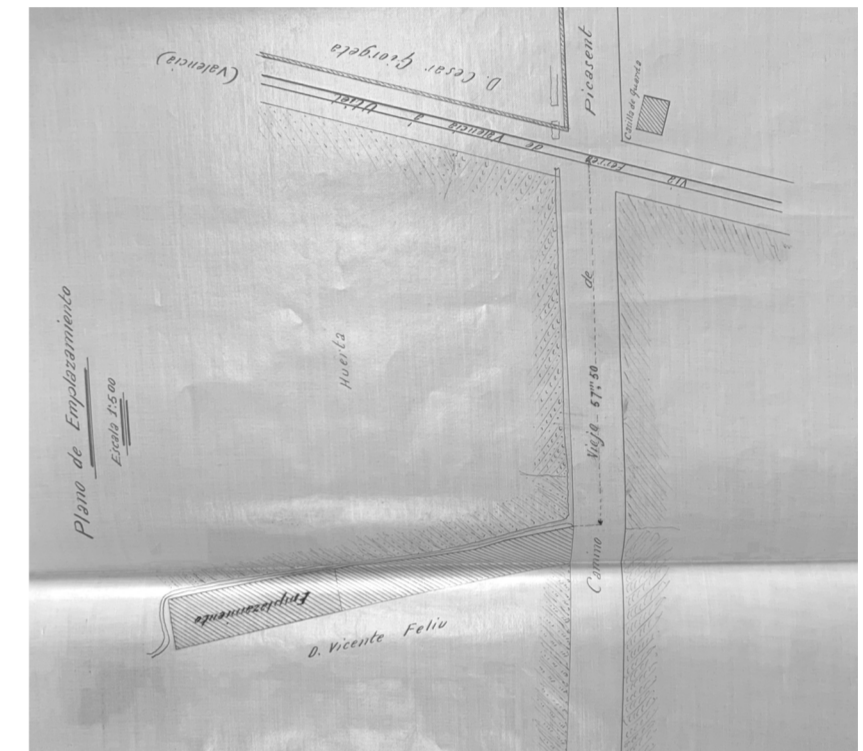
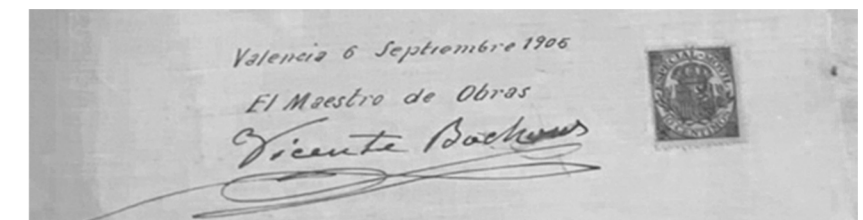
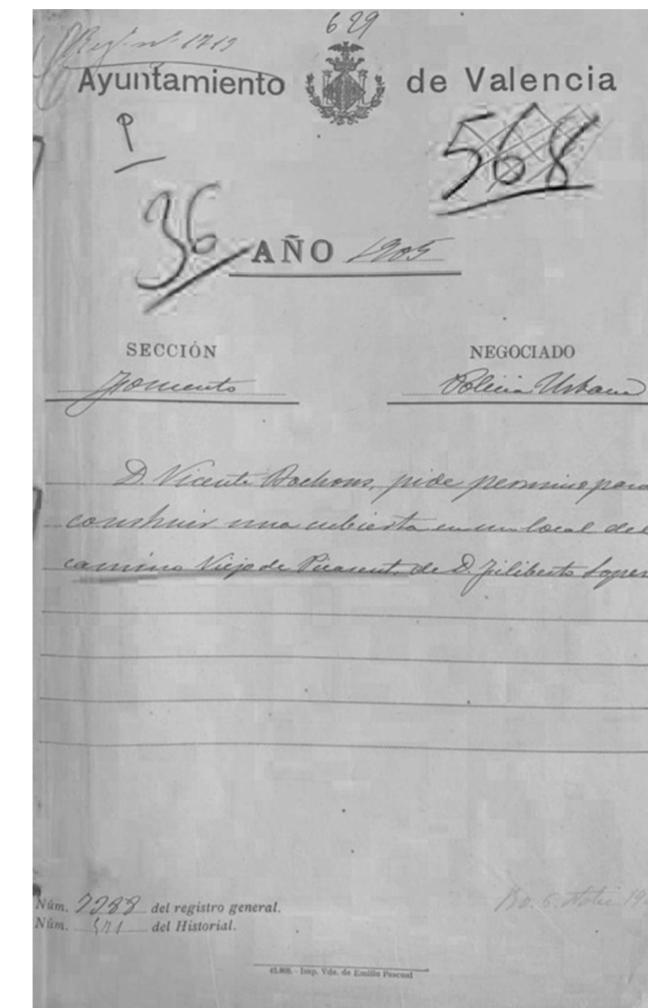
## STRATEGY

The research was carried out in two ways, the first was by word of mouth, as carrying out a documentary search without knowing anything more than the address was very complicated. Asking passers-by, both older and younger people, if they know what the function of the building was, if they know who the owner is or what its current use is, were the first strategies carried out. The data obtained from these street surveys revealed that the building was formerly a rice warehouse, the place where the rice grains were dried and where the sacks were then stacked for later distribution. This confirms once again the importance of rice for the people of Pinedo.

Later, the historical plans of the locality were analysed to see how the territory had evolved, when it had been built and what was in its immediate surroundings. This analysis revealed that it is a pre-1929 construction, so it is approximately 100 years old. Originally there were two adjoining buildings that have been destroyed and have given way to new constructions.

The next step was a visit to the town hall of Pinedo, where the original plans were requested in order to be able to carry out the project. The town council of Pinedo did not have such information and sent the request to the town council of Castellar, where I was finally informed that if I wanted further documentation, it would be necessary to consult the Municipal Historical Archive of the city of Valencia.

The search in the Archive was not easy; they sent me a list of documents available for consultation between 1900 and 1940 for the specified area. As I did not know the name of the original road, the search was complicated, but it was fruitful and I managed to find a building from 1905 which, although it may not be exactly the same, is very similar both in size and shape, confirming that the old warehouse is more than 115 years old. This helped me and allowed me to make a more accurate approximation of both the interior condition and the materials used in the construction of the warehouse.



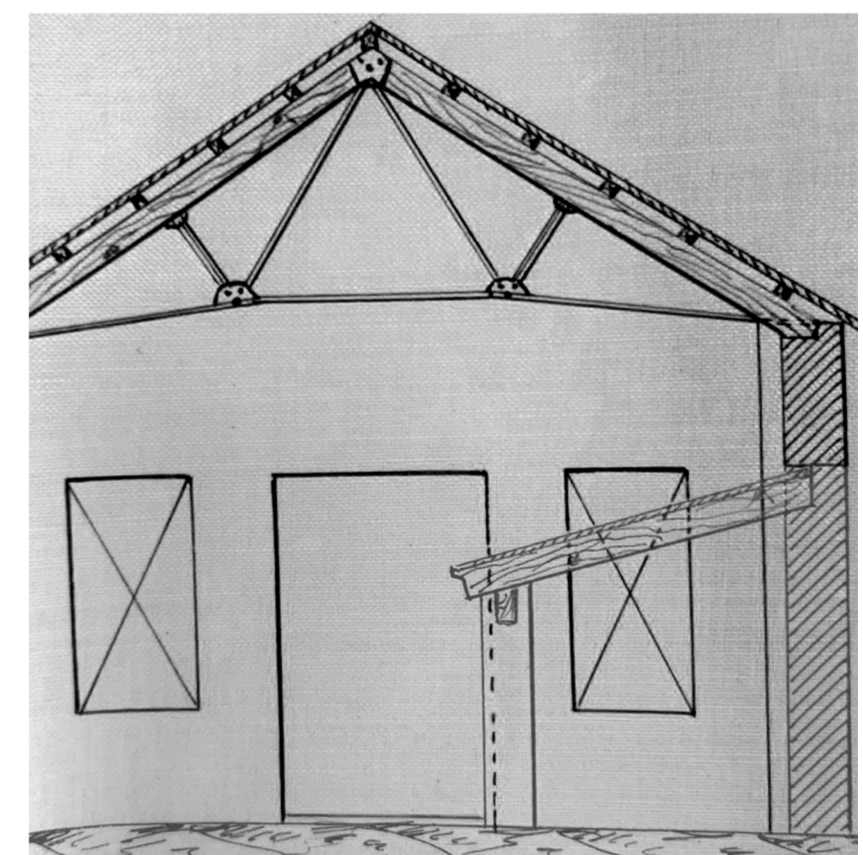
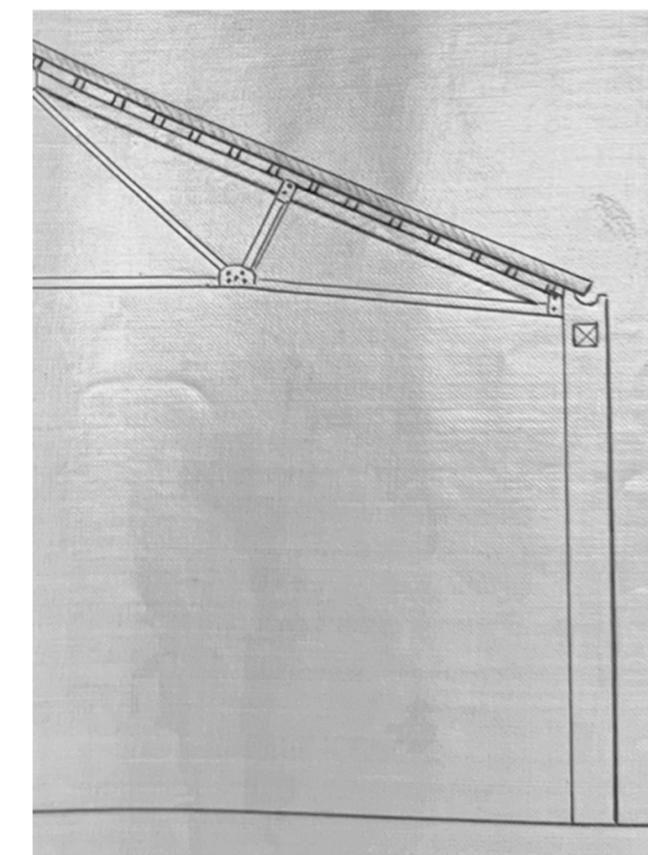
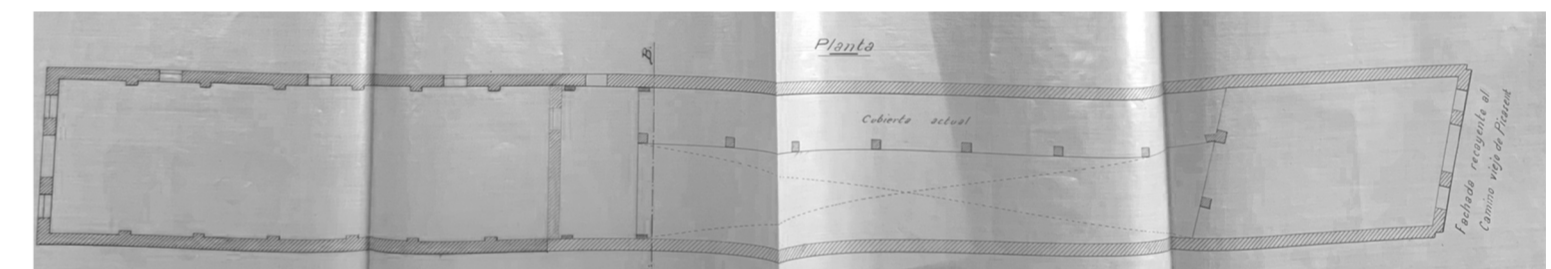
## ESTRATEGIA

La investigación se realiza de dos maneras, la primera es el boca a boca, ya que realizar una búsqueda documental sin conocer nada más que la dirección era algo muy complicado. Preguntando a los viandantes, tanto a los mayores como a los más jóvenes si conocen cual era la función del edificio, si saben quién es el propietario o cuál es su uso actual, fueron las primeras estrategias realizadas. Los datos obtenidos de estas encuestas callejeras revelaron que el edificio antiguamente era un almacén de arroz, el lugar donde se secaban los granos de arroz y donde posteriormente se apilaban los sacos para su posterior distribución. Esto confirma una vez más la relevancia del arroz para el pueblo de Pinedo.

Más tarde se analizaron los planos históricos de la localidad para ver cómo había evolucionado el territorio, cuando había sido construido y qué había en su entorno más próximo. Este análisis reveló que es una construcción previa al año 1929 por lo que ronda aproximadamente los 100 años. Originalmente eran dos naves anexas que se han ido destruyendo y cediendo territorio a nuevas construcciones.

El siguiente paso, fue la visita al ayuntamiento de Pinedo, lugar en el que se procedió a pedir los planos originales para poder realizar el proyecto. El ayuntamiento de Pinedo no disponía de tal información y remitió la instancia al ayuntamiento de Castellar, donde finalmente se me informó de que si quería una mayor documentación sería necesario consultar el Archivo Histórico municipal de la ciudad de Valencia.

La búsqueda en el Archivo no fue fácil, me enviaron un listado con los documentos disponibles para consulta entre los años 1900 y 1940 del área especificada. Al no conocer el nombre de la vía original, la búsqueda era complicada, pero fue fructuosa y logré encontrar una construcción del año 1905 que, si bien puede que no fuera exactamente la misma, es muy parecida tanto en dimensión como en forma, confirmando que el antiguo almacén tiene más de 115 años de antigüedad. Esto me ayudó y me permitió realizar una aproximación más certera acerca tanto del estado interior como de los materiales empleados en la construcción de la nave.



PLANS OBTAINED FROM THE MUNICIPAL HISTORICAL ARCHIVE OF VALENCIA



## CURRENT SITUATION

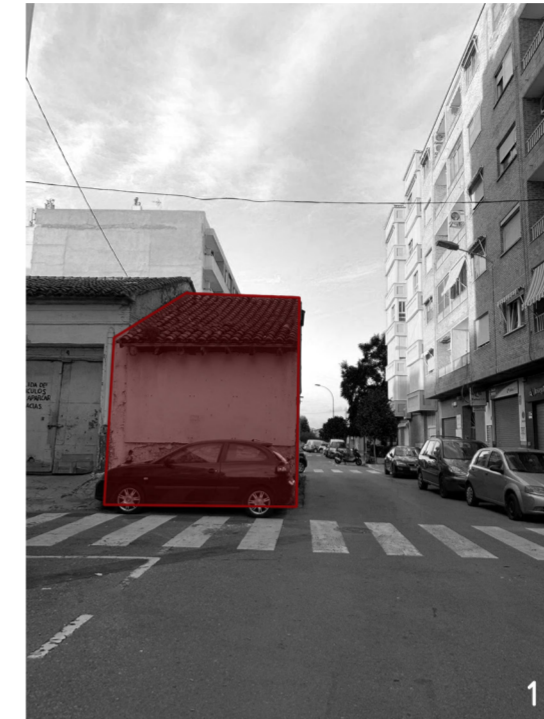
The current situation of the plot of land on which the work is to be carried out will be assessed in several ways.

First of all, the old rice warehouse is in a very poor state, it has two distinct and separate parts, one part that is going to be eliminated, which are the remains of the demolished part, and the main building, which is the one of heritage interest.

This decision not to recover the annex to the main warehouse is taken after contacting several neighbours, whose opinions are unanimous and are in favour of the removal of this part, in addition to the fact that this part of the building is out of order also represents a challenge for the council, so the partial removal of this element may represent a middle ground of understanding between the neighbours and the council, as each has its own interests. While the municipality would like to completely remove the space occupied by the street, the neighbours want to keep it at all costs.

A few years ago, the interior space was a rather neglected green area that generated insect infestations with the autumn rains, so the neighbours opted to transform it into a parking area. The entire interior of the block was asphalted and pergolas and fences were installed to protect cars from the weather. Parking for the residents of Pinedo should not be a problem as it is possible to park in practically all the adjoining streets and as it is such a small town it is possible to park in designated areas on the outskirts and then access the houses on foot, as is already done in other European cities.

Finally, the accesses to the interior of the block. One of them, which is adjacent to the old rice warehouse, is walled up. The one that leads from Travesía de Pinedo to the sea is closed and only opens to give access to cars parked inside. Finally, in Carrer Mossèn Cuenca there is also an access, a kind of interior corridor that crosses the buildings, this passageway gives access to neighbours who have storage rooms in these areas.



## SITUACIÓN ACTUAL

La situación en la que se encuentra hoy en día la parcela sobre la que se va a actuar se va a evaluar por partes.

En primer lugar, el antiguo almacén de arroz se encuentra en un estado muy mejorable, cuenta con dos partes diferenciadas y separadas, una parte que va a ser eliminada que son los restos de la zona ya desaparecida y la nave principal que es la que tiene el interés patrimonial.

Esta decisión de no recuperar el anexo a la nave principal se toma después de establecer contacto con varios vecinos, cuyas opiniones son unánimes y están a favor de la eliminación de esta parte, además el hecho de que este trozo de edificio esté fuera de ordenación también supone un desafío para el ayuntamiento, por lo que la retirada parcial de este elemento puede suponer un punto intermedio de entendimiento entre los vecinos y el ayuntamiento, ya que cada uno tiene sus propios intereses. Mientras que el ayuntamiento querría eliminar por completo el espacio que ocupa la calle, los vecinos quieren mantenerlo a toda costa.

El espacio interior hace unos años era una zona verde bastante descuidada que generaba plagas de insectos con las lluvias del otoño, por lo que los vecinos optaron por transformarlo en una zona de parking. Se asfaltó todo el interior de manzana y se instalaron pérgolas y vallas que protegen a los coches de las inclemencias meteorológicas. El aparcamiento para los vecinos de Pinedo no debería suponer un problema ya que se puede aparcar prácticamente en todas las calles colindantes y como es una localidad tan pequeña se puede implementar la modalidad de aparcar en zonas habilitadas a las afueras para después acceder a las viviendas a pie, esto ya se hace en otras ciudades europeas.

Por último, los accesos al interior de la manzana. Uno de ellos, que es el que colinda con el antiguo almacén de arroz está tapiado. El que da a la Travesía de Pinedo al mar está cerrado y solo se abre para dar acceso a los coches que estacionan en el interior. Por último, en la calle Mossèn Cuenca también hay un acceso, una especie de corredor interior que atraviesa los edificios, este pasadizo da acceso a los vecinos que tienen trasteros en esas zonas.





## FAÇADES STUDY

The study of the pre-existing façades is one of the first actions to be taken into account for the development of the project, as it is very important to understand what is happening inside the block before starting to carry out any action.

After analysing the façades of the adjoining buildings, these are classified into 4 types.

Firstly, most of the facades are the rear facades of the buildings, this type of facades is characterised by having windows that belong to two types of rooms, bedrooms or living rooms, depending on the block of flats we are talking about. In the case of the block located to the east, the rooms that overlook the interior of the block are the living rooms, while the windows of the façades of the blocks of flats located to the west and north belong to rooms. In this way, the heights of the new blocks can be different, always respecting the distance between buildings.

On the other hand, there are the dividing facades, one of them is located next to the original building, so it cannot be used to build in height, however, it can be used to bring an artistic touch to the area, encouraging local artists in annual competitions serving as a canvas to design different murals.

Thirdly, the facades of the pre-existing building occupy a good place to take into account. In this case, as there are two very different types of facades, it was decided to separate them into two groups, those in need of restoration and those in need of replacement. The façades to be restored are those that still maintain the character of the building today, with the original materials. On these façades, what needs to be done is to replace the carpentry with new ones, in better condition and which ensure the habitability of the warehouse, as well as maintenance work in the most deteriorated areas.

In the other two façades, the intervention to be carried out is to replace the existing façades, one of them because it is of no interest, it will be explained later how and why it will be replaced, while the other façade will be partially replaced by a large window that generates a connection between the interior of the block and the interior of the warehouse.

## ESTUDIO DE FACHADAS

El estudio de las fachadas preexistentes es una de las primeras acciones a tener en cuenta para el desarrollo del proyecto, ya que es muy importante comprender qué sucede en el interior de la manzana antes de empezar a realizar cualquier actuación.

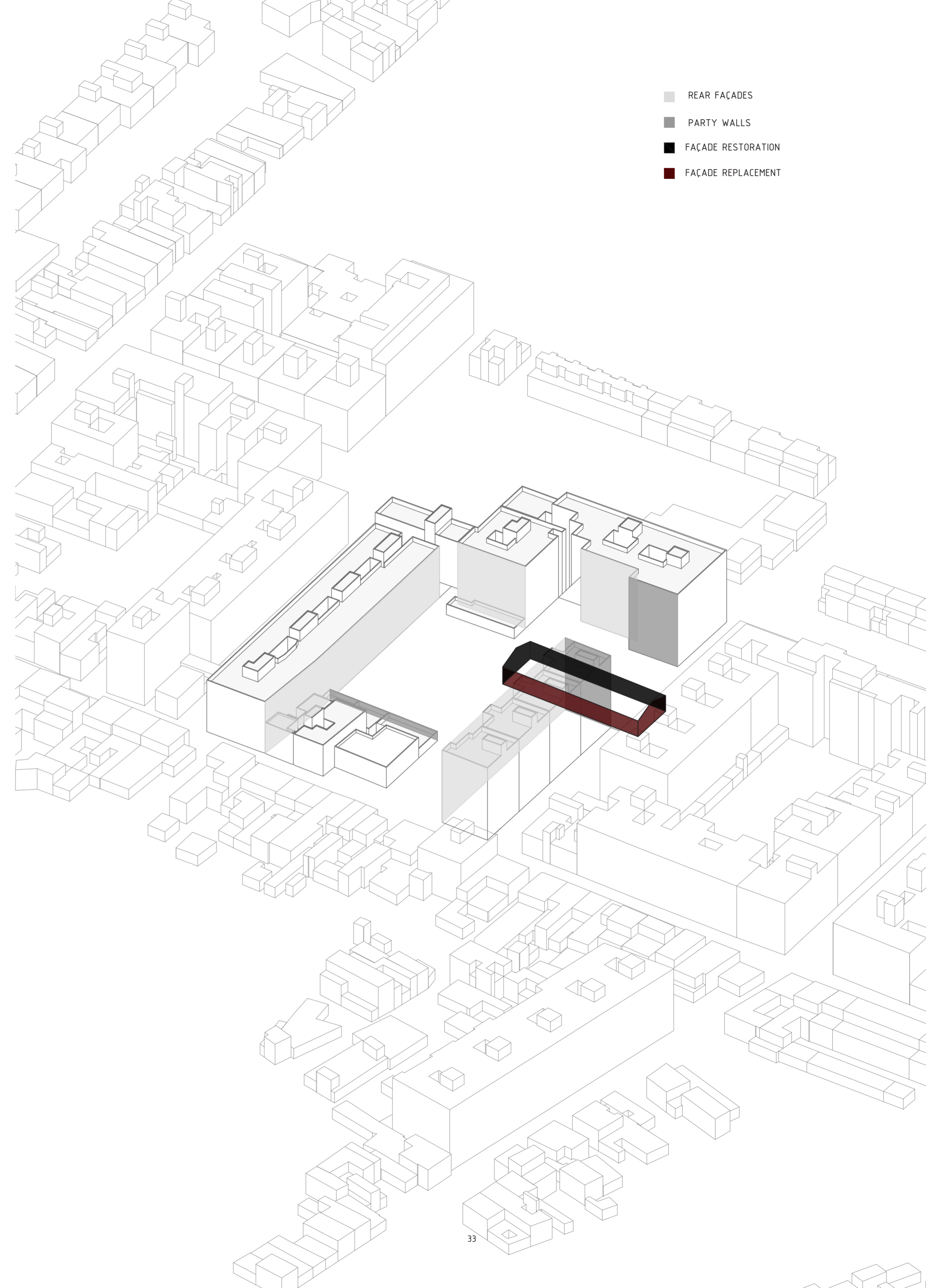
Tras realizar el análisis de las fachadas de los edificios colindantes, éstas se clasifican en 4 tipos.

En primer lugar, la mayor parte de fachadas son las fachadas traseras de los edificios, este tipo de fachadas se caracterizan por tener ventanas que pertenecen a dos tipos de estancias, habitaciones o salones, dependiendo del bloque de viviendas del que se hable. En el caso del bloque situado al este, las estancias que tienen vistas al interior de la manzana son los salones, mientras que las ventanas de las fachadas de los bloques de viviendas ubicados en el oeste y el norte pertenecen a habitaciones. De esta manera, las alturas de los nuevos bloques pueden ser diferentes, siempre respetando la distancia que se establece entre edificios.

Por otra parte, se encuentran las fachadas medianeras, una de ellas está ubicada junto a la nave original, por lo que no se puede aprovechar para construir en altura, sin embargo, si que puede ser empleada para aportar un toque artístico a la zona, impulsando a los artistas locales en concursos anuales sirviendo como lienzo donde diseñar distintos murales.

En tercer lugar, las fachadas de la nave preexistente ocupan un buen lugar a tener en cuenta, en este caso al tratarse de dos tipos de fachadas muy diferenciados se opta por separarlas en dos grupos, las que necesitan una restauración y las que necesitan una sustitución. Las fachadas a rehabilitar son las que hoy en día todavía mantienen el carácter del edificio, con los materiales originales. En estas fachadas lo que se debe hacer es sustituir las carpinterías por unas nuevas, en mejor estado y que aseguren la habitabilidad del almacén, así como tareas de mantenimiento en aquellas zonas más deterioradas.

En las otras dos fachadas la intervención que se va a realizar es la de sustituir las fachadas existentes, una de ellas porque no tiene interés, se explicará más adelante cómo y por qué va a ser reemplazada, mientras que la otra fachada será sustituida parcialmente por una gran ventana que genere una conexión entre el interior de la manzana y el interior del almacén.





## FAÇADES STUDY

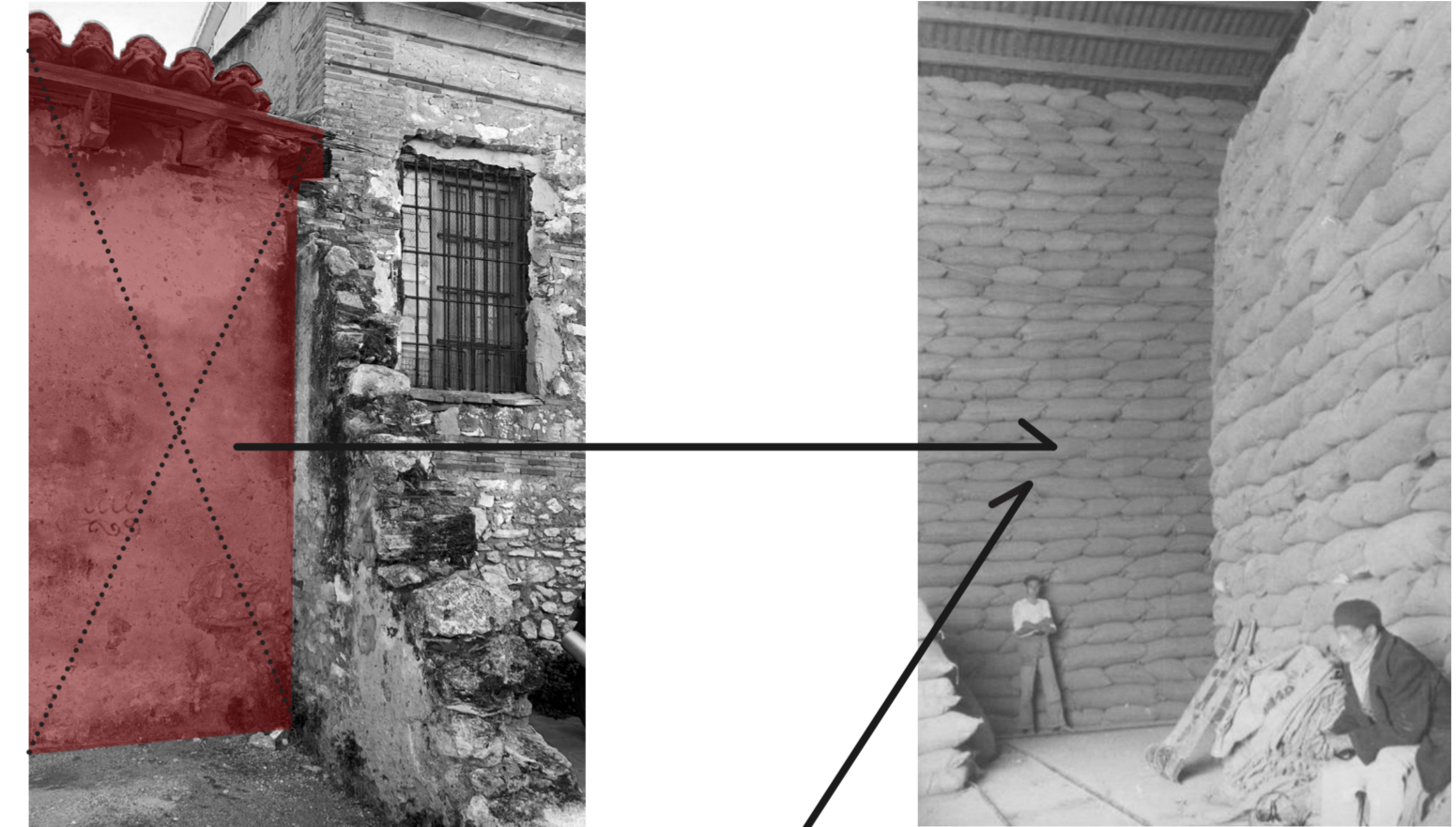
Giving a second chance to one of Pinedo's most emblematic buildings is one of the most important tasks in the development of this project. One of the strategies followed for the recovery of this space is the replacement of the façade facing Marino Villamil street, the easternmost of the plot.

By eliminating the building attached to the main building, the wall that currently separates them is not sufficiently attractive to give it the importance of the main façade. Taking as inspiration the old image of the sacks of rice piled up in warehouses, the construction of a singular façade made of concrete was taken. Using as a reference the use of concrete in the way it was used by Miguel Fisac, it is proposed to build a unique formwork that evokes and imitates those organic shapes produced by the sacks stored on the walls.

In recent decades, research has been carried out on the addition of natural plant fibres to concrete to improve its properties. It has been demonstrated that the improvement in properties provided by the addition of this type of fibre is equal to or even superior to the use of other fibres traditionally used, such as steel, glass or plastic fibres.

In this case, the use of ground rice husks is chosen to produce a lightened mortar, an advanced material that is more sustainable than common concrete, which also provides an improvement in mechanical resistance to both bending and compression and has great properties in terms of thermal and acoustic insulation. This type of mortar is not recommended for use as load-bearing elements, but this is not a disadvantage as the load transmission of the building is taken care of by the load-bearing elements already built.

By adding ground rice husks to the cement, apart from the aforementioned improvement of properties, it is also possible to use an abundant and local resource that would normally be a waste product.



## ESTUDIO DE FACHADAS

Darle una segunda oportunidad a uno de los edificios más emblemáticos de Pinedo es una de las tareas más importantes del desarrollo de este proyecto. Una de las estrategias seguidas para la recuperación de este espacio es la sustitución de la fachada que da a la calle Marino Villamil, la más al este de la parcela.

Al eliminar la nave anexa a la nave principal, la pared que hay actualmente separándolas no es suficientemente atractiva como para darle la importancia de fachada principal. Tomando como inspiración la antigua imagen de los sacos de arroz apilados en los almacenes como este, se opta por la construcción de una fachada singular realizada con hormigón. Empleando como referencia el empleo del hormigón de la manera en la que lo utilizaba Miguel Fisac se propone la construcción de un encofrado único que evoque e imite esas formas orgánicas que producían los sacos almacenados en las paredes.

En las últimas décadas se ha estado investigando acerca de la adición de fibras naturales vegetales a los hormigones para mejorar sus propiedades. Está demostrado que la mejora de las propiedades que proporciona la adición de este tipo de fibras es igual o incluso superior que el empleo de otras fibras utilizadas tradicionalmente como son las fibras de acero, vidrio o plástico.

En este caso se opta por el empleo de cascarilla de arroz molida para dar lugar a un mortero aligerado, un material avanzado que es más sostenible que el hormigón común, que además proporciona una mejora de las resistencias mecánicas tanto a flexión como a compresión y que presenta grandes propiedades en cuanto al aislamiento térmico y acústico. Este tipo de morteros no están recomendados para ser empleados como elementos portantes, pero esto no es un inconveniente ya que de la transmisión de cargas de la nave se encargan los elementos portantes ya construidos.

Añadiendo la cáscara de arroz molida al cemento, aparte de la mejora de propiedades ya mencionadas, también se consigue emplear un recurso abundante y propio de la zona que de normal sería un desecho.





3.

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THE PROGRAM

## FORM

The group of buildings is developed within the block, so that the existing buildings are of great importance when it comes to generating the new ones. The boundaries of the plot are defined by the blocks of flats that form it.

Regarding the exterior defining lines, in order to adapt the buildings to the existing openings in the plot, two lines are taken as the main directions of the project, which become the axes. These directions are obtained from the alignment of the façade of the old warehouse inside the plot, the west, and the perpendicular to it, as it also coincides with other limits of the plot. These guides are adjusted to the rest of the limits of the existing buildings, parallel and perpendicular.

Another direction that is respected is the one of the historical façade. This guide is maintained as a singular element, as it was decided to maintain this façade due to its architectural interest. It is the only one that does not follow the alignment of the others, thus giving a special character to the most emblematic façade of the project and respecting its original form.

In addition, this turn of direction with respect to the main axes is interesting for the creation of the routes generated in the space, as it makes a kind of funnel that opens outwards, becoming smaller as you go along, to finally open up again in the large central square of the project, thus achieving a different sensation for pedestrians along the path they take.

The interior modulation is governed by the assumption made according to the plans of the Municipal Historical Archive of the city of Valencia. It is determined that the axes of the trusses that make up the historic building are five metres apart, which is why the same modulation is followed inside the other three buildings, serving as the axis of the pillars and trusses.

The width of the buildings is determined both by the previously explained axes and by the dividing module itself. In this case, as five metres would be too little to define the building, a distance of ten metres is chosen.

## FORMA

El conjunto de edificios se desarrolla dentro de la manzana por lo que los edificios existentes tienen una gran importancia a la hora de generar los nuevos. Los límites de la parcela están definidos por los bloques de viviendas que la definen.

En cuanto a las líneas definitorias exteriores, con el fin de conseguir adaptar los edificios a los huecos existentes de la parcela, se toman dos líneas que se marcan como las principales direcciones del proyecto que se convierten en los ejes. Estas direcciones se obtienen de la alineación de la fachada del antiguo almacén que se encuentra en el interior de la parcela, la oeste, y la perpendicular a ésta, ya que además coincide con otros de los límites de la parcela. Estas guías se ajustan al resto de límites de los edificios existentes, paralela y perpendicularmente.

Otra dirección que se respeta es la de la fachada histórica, se mantiene esta guía como elemento singular ya que se decide mantener esa fachada por el interés arquitectónico que presenta. Es la única que no responde a la alineación de las demás, dotando así de un carácter especial a la fachada más emblemática del proyecto y respetando su forma original.

Además, este giro de dirección respecto a los ejes principales es interesante para la creación de los recorridos que se generan en el espacio ya que hace una especie de embudo que se abre en el exterior, se va haciendo más pequeño según avanza, para finalmente abrirse otra vez en la gran plaza central del proyecto, consiguiendo así que la sensación de los viandantes sea diferente a lo largo del camino que realizan.

La modulación interior se ve regida por la suposición realizada según los planos del Archivo Histórico Municipal de la Comunidad Valenciana. Se determina que los ejes de las cerchas que componen el edificio histórico se encuentran separadas cinco metros entre ellas, por eso se sigue esa misma modulación en el interior de los otros tres edificios, sirviendo como eje de pilares y cerchas.

El ancho de los edificios viene determinado tanto por los ejes explicados previamente como por el mismo módulo divisor, en este caso como cinco metros sería demasiado poco para definir el edificio, se opta por una distancia de diez metros.



## FORM

Societies evolve, times change and, in the end, everything flows and nothing remains, this also happens with architecture, that is why one of the main ideas is the generation of buildings that act as containers that can host different uses according to the needs of society. Just as the old rice warehouse will have a more profitable use today, it is very interesting to generate volumes that can adapt to the passing of time, because in this way they will not fall into abandonment when the use to which they are currently destined changes. For this reason, each of the buildings has a communication core that contains some of the basic services that all the buildings need, being a box within a box.

As for the heights defining the buildings, after having carried out the study of the façades, it is determined that two of the new volumes will have a total height of fourteen metres above ground level, one of them will also have a basement at a height of minus three metres and the only building with a different height will be five metres.

These heights correspond to a floor spacing of four and a half metres. The height chosen for the floors is based on several reasons.

Firstly, the clear height of the ground floors of the surrounding buildings is between four and five metres, so maintaining a similar height achieves the same language in terms of the ground floors. Another reason is the structure used.

In order to achieve a relationship between the building to be refurbished and the new ones, it was decided to use the same structural system, in this case the truss. As the length of the trusses is considerable, the height of the trusses will also be significant, so it was decided to give the floors of the public buildings sufficient height. Finally, in order to maintain the desired industrial appearance, with high ceilings and exposed structures.

The aim is for the volumes to be perceived as light steel and glass elements on the ground floor, so that everything functions as a unit open to the public, while the upper floors are given a more closed and protected appearance, using a skin that gives the buildings their character by showing or hiding the different activities that take place inside through full and empty spaces. The building tells the story of its activity through the materials.

## FORMA

Las sociedades evolucionan, los tiempos cambian y al final, todo fluye y nada permanece, esto también pasa con la arquitectura, por eso una de las ideas principales es la generación de edificios que actúen como contenedores que puedan albergar distintos usos según las necesidades de la sociedad. Igual que el antiguo almacén de arroz va a tener un uso más provechoso en la actualidad, es muy interesante la generación de unos volúmenes que puedan adaptarse al paso del tiempo, porque de esta manera no caerán en el abandono cuando el uso al que se destinan actualmente cambie. Por este motivo, cada uno de los edificios tiene un núcleo de comunicación que alberga algunos de los servicios básicos que todos los edificios necesitan, siendo una caja dentro de otra caja.

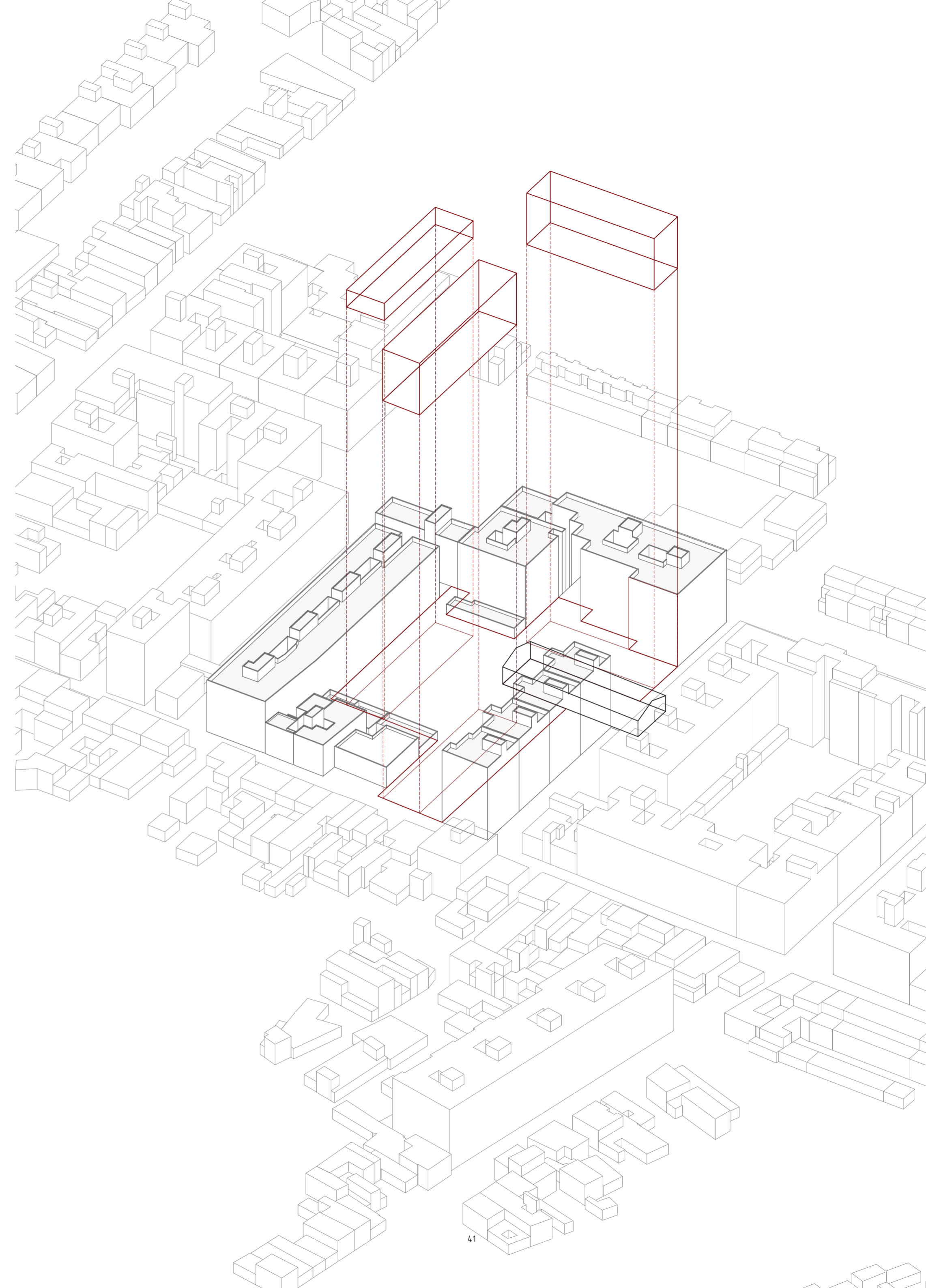
En cuanto a las alturas que definen los edificios, después de haber realizado el estudio de fachadas se determina que dos de los nuevos volúmenes tendrán un total de catorce metros de altura sobre cota cero, uno de ellos también tendrá un sótano a cota menos tres metros y el único edificio con una altura distinta será de cinco metros.

Estas alturas corresponden a un espacio entre plantas de cuatro metros y medio, la altura elegida para las plantas está tomada en base a varios motivos.

En primer lugar, la altura libre de las plantas bajas de los edificios de alrededor es de entre cuatro y cinco metros, por lo que manteniendo una altura similar se logra un mismo lenguaje en cuanto a las plantas bajas. Otra de las razones es la estructura empleada.

Para lograr una relación entre el edificio a rehabilitar y los nuevos se opta por emplear el mismo sistema estructural, en este caso la cercha, al tratarse de unas cerchas con una longitud importante, el canto de estas también lo será, por lo que se decide dar a las plantas de los edificios públicos suficiente altura. Por último, para conseguir mantener el aspecto industrial deseado, con techos altos y estructuras vistas.

La finalidad es que se perciban los volúmenes como elementos ligeros de acero y vidrio en planta baja, que todo funcione como una unidad abierta al público, mientras que en las plantas superiores se otorga un aspecto más cerrado y protegido, mediante el empleo de una piel que aporta el carácter a los edificios mostrando u ocultando las distintas actividades que tienen lugar en el interior a través de llenos y vacíos. El edificio cuenta su actividad a través de los materiales.



## USE

The use of this site offers a wealth of opportunities. Reusing the interstitial space, opening up the complex and giving it to the population is one of the main motivations behind the realisation of this project. The objectives outlined above are achieved through the architecture presented and the reclamation of the space.

Firstly, one of the strategies followed to open up the interior of the block is to allow access to it through three of the four streets that make it up. These accesses currently exist, but instead of being open and inviting people to enter, they are architectural barriers, fences or walls.

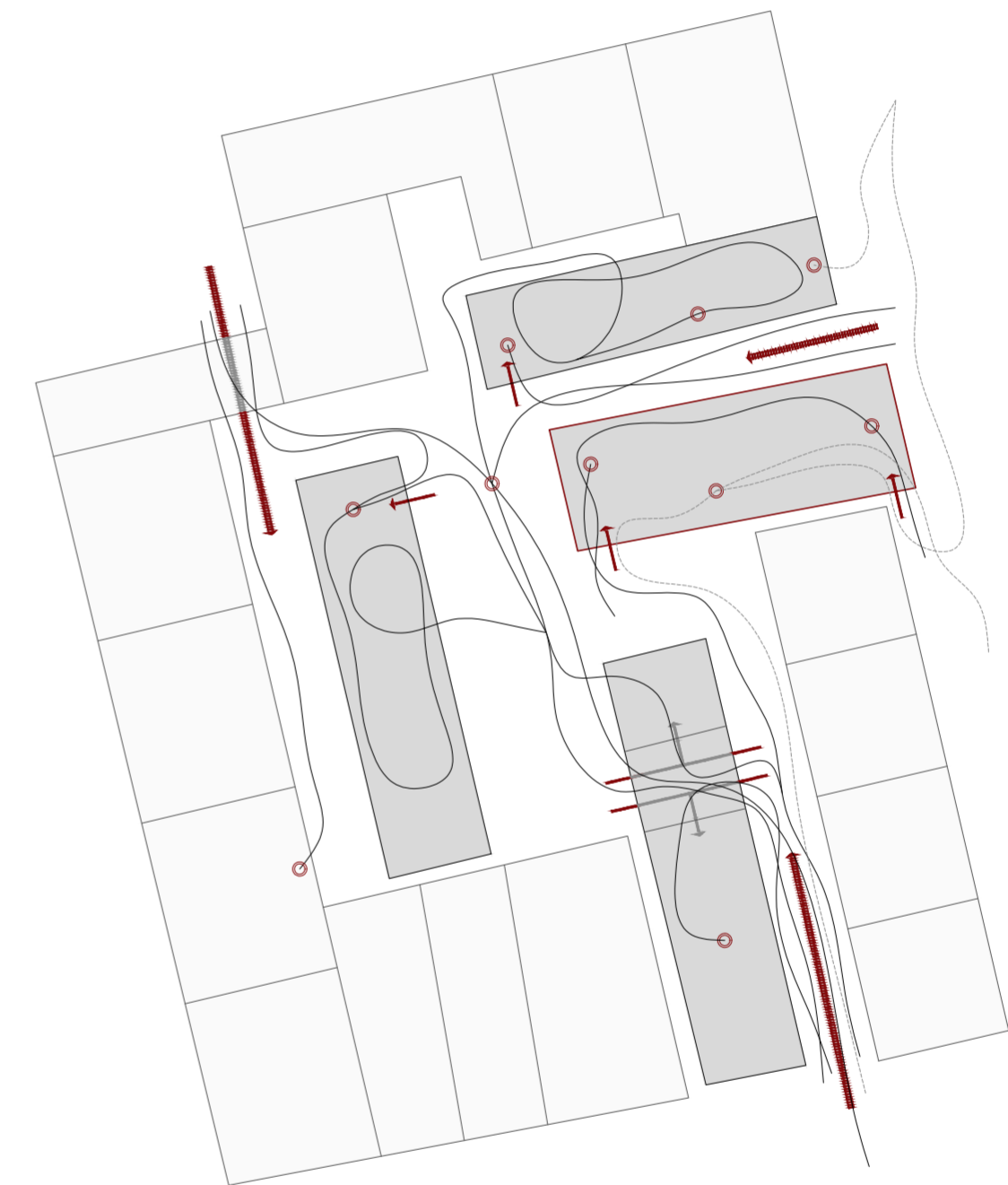
Each access has a main purpose, although all of them can be used by different people. Firstly, the access located on the northernmost street would be a kind of secondary access, its function is more relegated to the use of neighbours wishing to access their ground floors.

Secondly, there is the main access, which is located in the easternmost part of the plot. This access is designed to be used more frequently by both visitors and residents. This is due to the fact that it is the access that shares the route with the old rice warehouse, being one of the most charming accesses.

Finally, the third access is designed to be used mainly by the employees of the complex, although, like all of them, it can be used by any passer-by. This is because it mainly serves one of the buildings with a more private programme.

As for the interior accesses to the buildings, most of them are from the interior of the block's square. There is also an access to the old building from the outside to attract people passing by on the street, as well as for unloading goods.

With regard to the routes, it is an area with a lot of movement, the four main groups of movements would be those carried out by: neighbours, workers, visitors and students. Occasionally, goods are also unloaded, and this route has also been taken into account in the design. On most occasions, each group of people has a different timetable, as the activities carried out within the complex are designed to keep the action going at different times of the day and practically every day of the week.



## USOS

El uso de este solar brinda una gran cantidad de oportunidades. Reaprovechar el espacio intersticial, abrir el complejo y cederlo a la población es una de las principales motivaciones de la realización de este proyecto. Los objetivos expuestos previamente se consiguen a través de la arquitectura presentada y la recuperación del espacio.

En primer lugar, una de las estrategias seguidas para abrir el interior de manzana es permitir el acceso a ella a través de tres de las cuatro calles que la conforman. Estos accesos, actualmente existen, pero en vez de estar abierto e invitar a la gente a que entres son barreras arquitectónicas, vallas o muros.

Cada acceso tiene una finalidad principal, aunque todos pueden ser empleados por las distintas personas. En primer lugar, el acceso situado en la calle más al norte sería una especie de acceso secundario, su función queda más relegada al uso de los vecinos que deseen acceder a sus plantas bajas.

En segundo lugar, está el acceso principal, que es el situado en la zona más este de la parcela. Este acceso se proyecta con la finalidad tanto de que los visitantes como los vecinos lo utilicen con mayor frecuencia. Esto se debe a que es el acceso que comparte recorrido con el antiguo almacén de arroz, siendo uno de los accesos con mayor encanto.

Por último, el tercer acceso está más pensado para ser empleado principalmente por los empleados del complejo, aunque como todos, puede ser utilizado por cualquier viandante. Esto se debe a que principalmente da servicio a uno de los edificios con un programa más privado.

En cuanto a los accesos interiores a los edificios, la mayoría se producen desde el interior de la plaza de la manzana. Quedando también un acceso al edificio antiguo desde el exterior para atraer a las personas que pasan por la calle, así como para realizar la descarga de mercancía.

Por lo que respecta a los recorridos, es una zona con mucho movimiento, los cuatro grupos de movimientos principales serían los realizados por: vecinos, trabajadores, visitantes y alumnos. En ocasiones puntuales también se realiza la descarga de mercancía, cuyo recorrido también se ha tenido en cuenta para el diseño. En la mayoría de ocasiones cada grupo de gente tiene un horario diferenciado, ya que las actividades desarrolladas dentro del complejo están pensadas para mantener la acción en diversas horas del día y prácticamente todos los días de la semana.



## SOLAR STUDY

The solar study is carried out in order to check which areas are going to have a higher solar incidence and which are going to have a lower solar incidence, it also shows the shadows that are going to be produced on the plot.

This study makes it possible to establish which façades will need extra protection from the sun, as it shows which areas will be exposed to the sun for most of the day or which areas will be protected by neighbouring buildings.

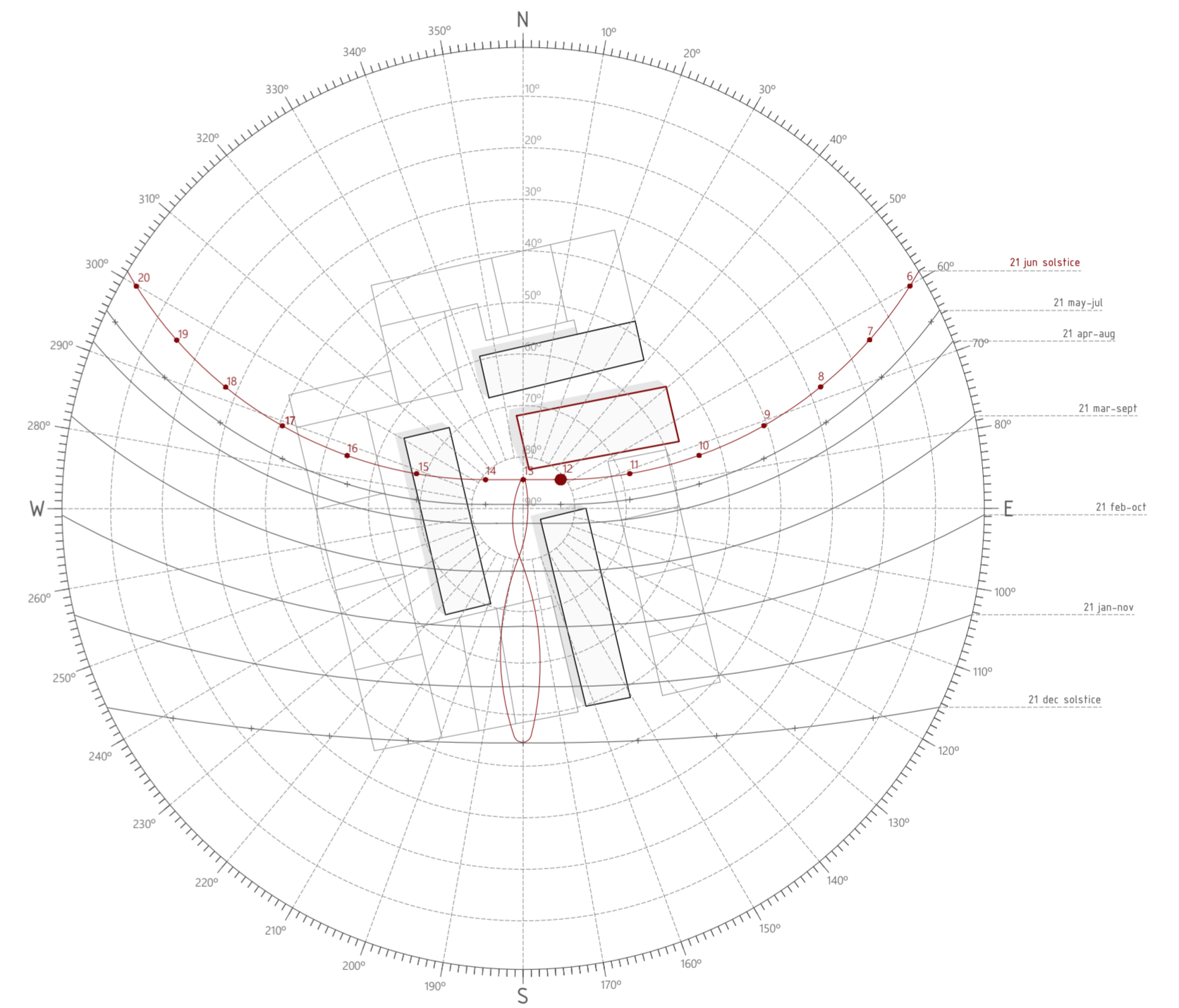
This analysis determines that it is feasible to install photovoltaic modules on the roofs of the buildings to supply energy to the whole complex.

## ESTUDIO SOLAR

El estudio solar se realiza con el fin de comprobar qué zonas van a tener una mayor incidencia solar y cuáles una menor, también se encarga de mostrar las sombras que se van a producir en la parcela.

Este estudio permite establecer cuáles van a ser las fachadas que necesiten una protección extra frente al sol, ya que muestra en qué zonas va a estar incidiendo el sol durante la mayor parte del día o qué zonas quedan protegidas por los edificios colindantes.

La realización de este análisis determina que es viable la instalación de módulos fotovoltaicos en las cubiertas de los edificios para que abastezcan de energía al conjunto.





## PROGRAM

The third building, located to the south of the plot, has research and education as its main driving force. The ground floor is separated in order to generate a passage space and differentiate the uses it generates. In the isolated block, it is proposed to create a space annexed to the exhibition building, which could be an area for audio-visual exhibitions, as it can be closed off and remain in darkness. This area also opens its doors to the interior of the block. On the other side of the ground floor is a rest area or canteen for the workers and students of the building.

The first floor is dedicated to education, a teaching space focused on brewing, brand design and crop knowledge, all tasks related to the economic activity generated through the programme. This floor also has a coworking area. The top floor is where the research activity is located, as it hosts the laboratories where both new beer formulas and other ways of using rice in construction materials are researched. On the same floor there is also an office to manage the laboratory tasks.

Finally, the former rice warehouse is converted into a cosy bar where you can taste both the rice beer brewed on the block and the other craft beers also created on the factory. The bar is divided into three parts, the bar area itself, where people can have a drink on the ground floor. This area contains a wet core, where all the service areas are host, such as toilets, changing rooms, kitchen, fridges, storeroom and the bar. All of these spaces are gathered in a lozenge whose upper part is used as another area of the bar, being a quieter area where you can dine or have a drink. Finally, there is also a terrace in the outdoor area where you can enjoy the square and the surroundings.

Therefore, it can be considered that each building has its own character: the first is commercial and productive, the second is for exhibitions, the third is for educational purpose and, finally, the fourth is for leisure. The common point is the square, which is the area where they all converge and interact, converting this individuality into a whole that is better understood and complemented by functioning as a grouping.

In short, the programme reactivates the economy, creates jobs and encourages the use of local products.

## PROGRAMA

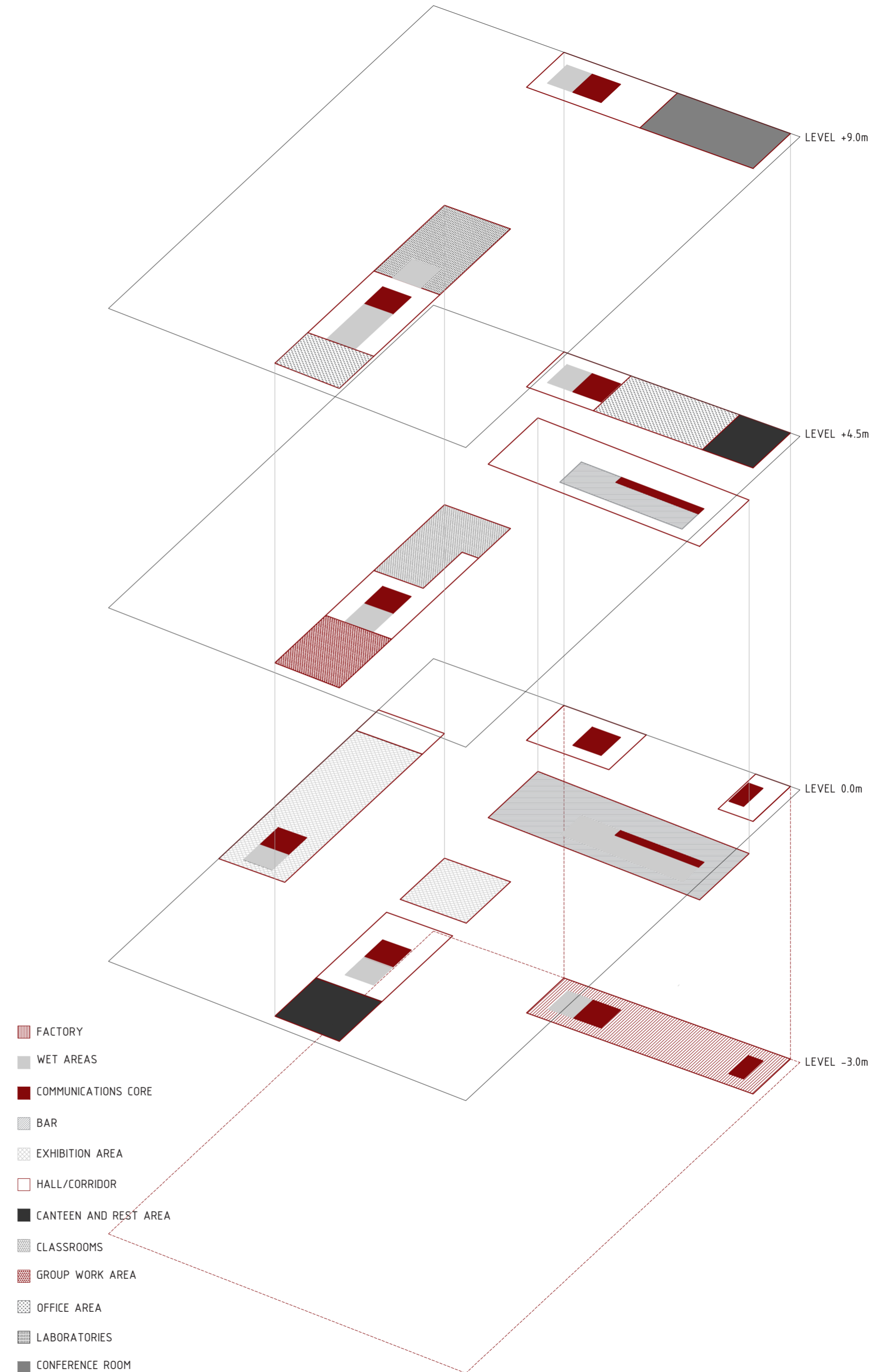
El tercer edificio, situado al sur de la parcela tiene como principal motor la investigación y la formación. La planta baja se encuentra separada para generar un espacio de paso y diferenciar los usos que genera. En la pastilla que queda aislada se propone la creación de un espacio anexo al edificio de exposiciones, pudiendo ser una zona en la que se realicen exhibiciones audiovisuales ya que se puede cerrar y quedar en oscuridad. Esta zona también abre sus puertas al interior de la manzana. En la otra parte de la planta baja se encuentra una zona de descanso o cantina para los trabajadores y estudiantes del edificio.

La primera planta es la que está dedicada a la formación, una formación enfocada a la elaboración de la cerveza, el diseño de una marca y el conocimiento de los cultivos, todas tareas relacionadas con la actividad económica generada a través del programa. Esta planta también cuenta con una zona de trabajo en equipo. En la última planta es donde se ubica la actividad investigadora, ya que se instalan los laboratorios en los que se investiga tanto nuevas fórmulas de cerveza, como otras maneras de utilizar el arroz en los materiales de construcción. En la misma planta también hay una oficina para gestionar las tareas del laboratorio.

Por último, el antiguo almacén de arroz se convierte en un acogedor bar en el que se pueden degustar tanto la cerveza de arroz fabricada en la manzana, como el resto de cervezas artesanales también creadas en el recinto. El bar se divide en tres partes, la zona de bar propiamente dicha, donde la gente puede tomar algo en la planta baja. Esta zona contiene un núcleo húmedo, donde se albergan todas las zonas de servicio, como baños, vestuarios, cocina, neveras, almacén y la barra. Todos estos espacios quedan recogidos en una pastilla cuya parte superior es empleada como otra de las zonas del bar, siendo una zona más tranquila en la que se puede cenar o tomar algo. Por último, también se habilita una terraza en la zona exterior en la que disfrutar de la plaza y el entorno generado.

Por lo tanto, se puede considerar que cada edificio tiene un carácter propio, el primero el comercial y productivo, el segundo es el expositivo, el tercero es el formativo y, por último, el cuarto es el lúdico. Teniendo como punto común la plaza, que es la zona en la que todos convergen e interactúan, convirtiendo esa individualidad en un conjunto que se comprende mejor y se complementa funcionando como una agrupación.

En definitiva, el programa reactiva la economía, crea puestos trabajo y fomenta el empleo del producto local.





## THE BREWERY

Both the brewery and the craft rice beer brewery are presented as one of the main engines that will reactivate the urban block and Pinedo.

Beer is one of the first fermented beverages consumed by people and there is a great variety of beers depending on the cereal used to make it, as well as the temperature and amount of fermentation used. The main characteristic of the beer brewed in Pinedo is that the grain used is rice. This type of beer is already a reality and exists today, being a good alternative for people with celiac intolerance, which can also be enjoyed by people without digestive diseases.

The process that must be followed for the elaboration of beer is a meticulous work that consists of a series of steps, starting with the design of the recipes, a task that is carried out by the master brewers, the laboratories allow the realization of tests where new recipes are developed.

The next step is milling and mashing, when the grain is milled and mixed with water, later the maltose, the part of the starch that has been converted into fermentable sugar, can be extracted. The wort, which is the liquid part, is then filtered out of the malt, which is the solid part. Then the wort is boiled, a process in which the wort is sterilised by boiling. Once boiled, it is centrifuged, a process in which a cleaner wort is obtained, as a sediment is generated with the unwanted particles.

This process is carried out in two different ways depending on whether you want to obtain a lager or ale beer, but it generally takes place in horizontal tanks in which the beer is subjected to low temperatures. Finally, the beer is bottled, stored and distributed.

The facilities are designed to produce not just one type of beer, but up to six, and the brew masters are responsible for the design and testing in the laboratories for the creation of new beverages.

The images were taken at the Cruzcampo brewery in the Soho district of Malaga, a clear example of how this type of facility in a mainly residential area is viable. The tanks designed have a capacity of 500 litres per type of beer, with these capacities a self-supply for approximately fifteen days is achieved.

## LA CERVECERÍA

Tanto la cervecería como la fábrica de cerveza de arroz artesana se presentan como uno de los principales motores que van a reactivar la manzana y Pinedo.

La cerveza es una de las primeras bebidas fermentadas consumida por las personas y hay una gran variedad de cervezas dependiendo del cereal que se utilice para su elaboración, así como la temperatura y cantidad de fermentación que emplee. La característica principal de la cerveza fabricada en Pinedo es que el grano que utiliza es el de arroz, esta modalidad de cerveza ya es una realidad y existe hoy en día, siendo una buena alternativa para personas celíacas, que además también pueden disfrutar las personas sin enfermedades digestivas.

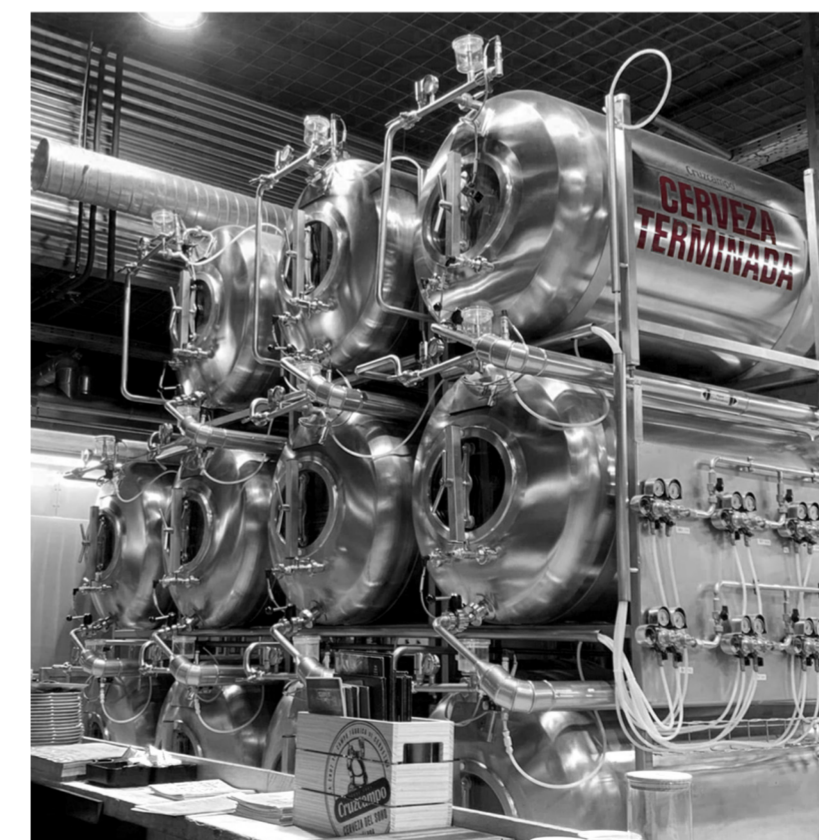
El proceso que se debe seguir para la elaboración de la cerveza es un trabajo meticuloso que consta de una serie de pasos, empezando por el diseño de las recetas, tarea de la que se encargan los maestros cerveceros, los laboratorios permiten la realización de pruebas donde desarrollar nuevas recetas.

El siguiente paso es la molienda y maceración, cuando se muele el grano y se mezcla con agua, más tarde se puede extraer la maltosa, la parte del almidón que se ha convertido en azúcar fermentable. A continuación, se filtra el mosto que es la parte líquida de la malta que es la parte sólida. Después se realiza la cocción, proceso en el que se esteriliza el mosto mediante la ebullición, una vez hervido se centrifuga, proceso en el que se consigue un mosto más limpio ya que se genera un poso con las partículas no deseadas.

Más tarde se produce la fermentación de la cerveza, este proceso se realiza de dos formas distintas dependiendo de si se quiere obtener una cerveza lager o ale, pero generalmente se produce en tanques horizontales en los que se somete a la cerveza a bajas temperaturas. Por último, se procede al embotellado, almacenaje y distribución.

Las instalaciones diseñadas permiten no solo la realización de un tipo de cerveza, sino hasta seis, siendo los maestros cerveceros los encargados del diseño y la realización de las pruebas en los laboratorios para la creación de nuevas bebidas.

Las fotografías han sido tomadas en la fábrica de cerveza Cruzcampo situada en el barrio del Soho de Málaga, esta fábrica es un claro ejemplo de que la convivencia de este tipo de instalaciones en una zona principalmente residencial es viable. Los tanques diseñados tienen una capacidad de 500 litros por tipo de cerveza, con estas capacidades se consigue un autoabastecimiento para aproximadamente quince días.



OWN PHOTOGRAPHS TAKEN AT THE CRUZCAMPO BREWERY IN MALAGA

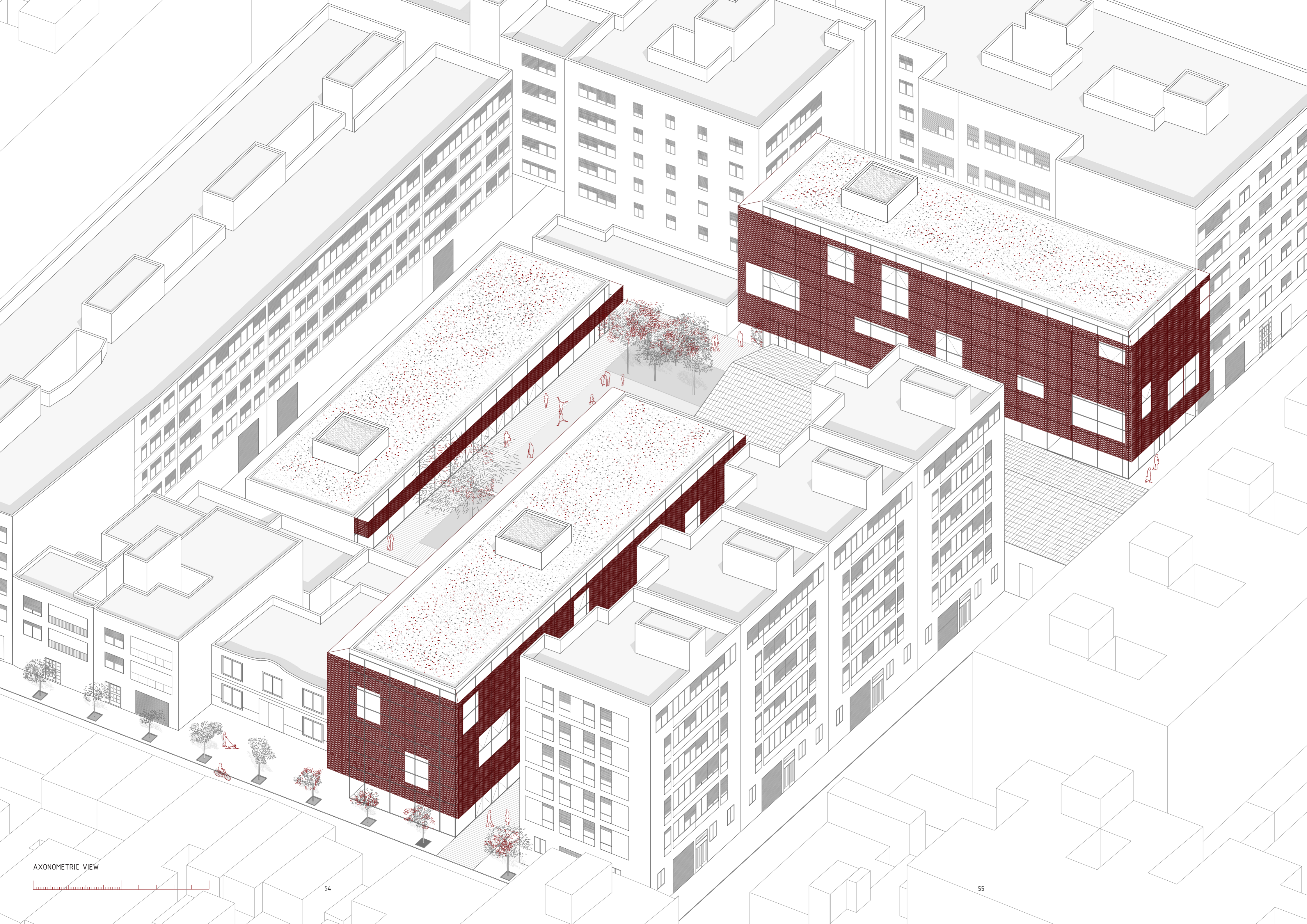


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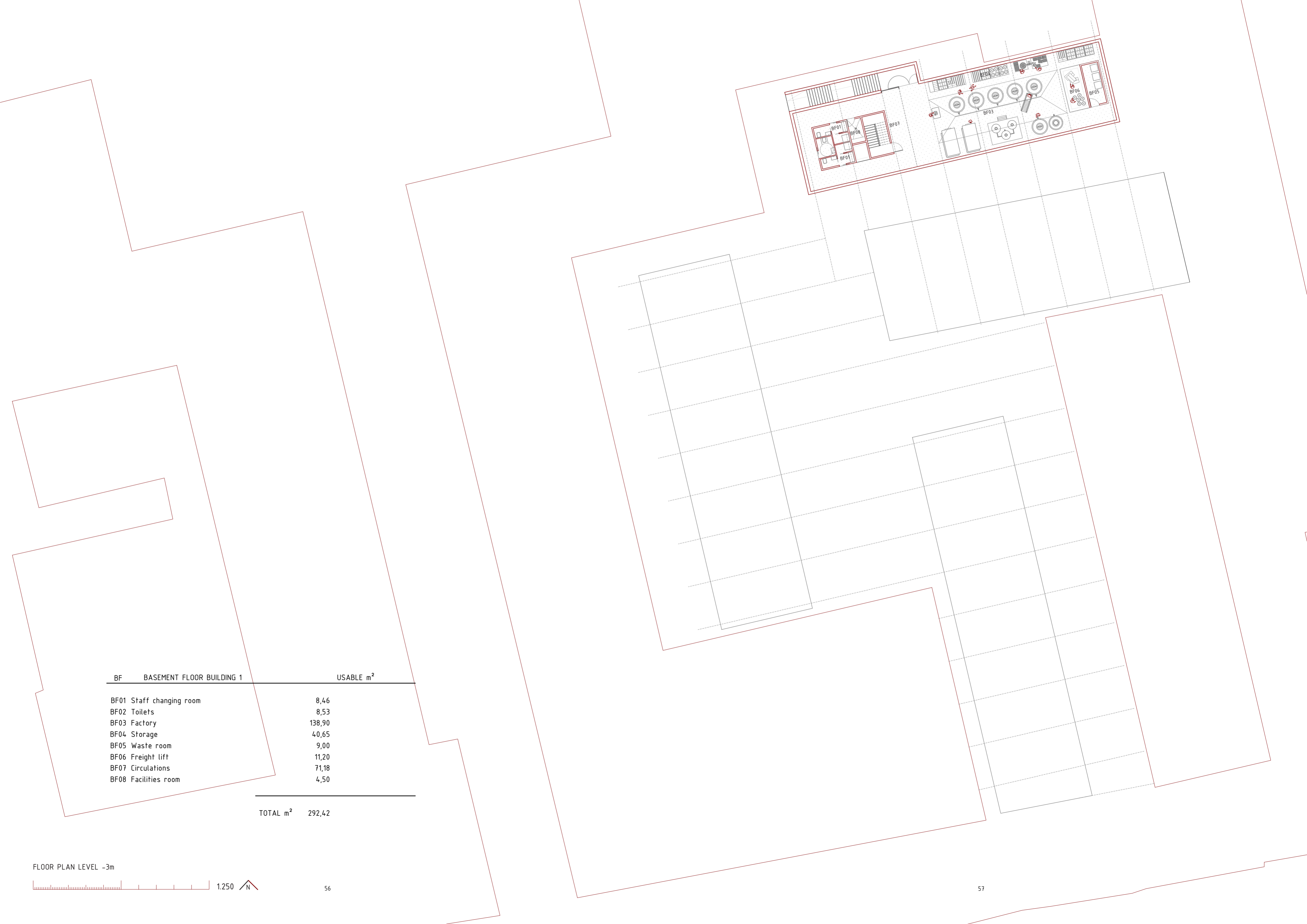
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THE ARCHITECTURE









BF	BASEMENT FLOOR BUILDING 1	USABLE m <sup>2</sup>
BF01	Staff changing room	8,46
BF02	Toilets	8,53
BF03	Factory	138,90
BF04	Storage	40,65
BF05	Waste room	9,00
BF06	Freight lift	11,20
BF07	Circulations	71,18
BF08	Facilities room	4,50

TOTAL m<sup>2</sup> 292,42

FLOOR PLAN LEVEL -3m





1GF	GROUND FLOOR BUILDING 1	USABLE m <sup>2</sup>
1GF01	Hall	56,00
1GF02	Circulations	49,40
1GF03	Facilities room	4,50
1GF04	Unloading area	14,80
1GF05	Storage	28,60
1GF06	Freight lift	11,20
<b>TOTAL m<sup>2</sup></b>		<b>164,50</b>

2GF	GROUND FLOOR BUILDING 2	USABLE m <sup>2</sup>
2GF01	Hall	56,00
2GF02	Exhibition area	308,00
2GF03	Storage	10,37
2GF04	Facilities room	7,00
2GF05	Toilets	16,00
<b>TOTAL m<sup>2</sup></b>		<b>397,37</b>

3GF	GROUND FLOOR BUILDING 3	USABLE m <sup>2</sup>
3GF01	Hall	56,00
3GF02	Circulations	82,86
3GF03	Facilities room	4,50
3GF04	Audiovisual room	112,50
3GF05	Toilets	18,90
3GF06	Staff rest room	107,50
<b>TOTAL m<sup>2</sup></b>		<b>382,26</b>

4GF	GROUND FLOOR BUILDING 4	USABLE m <sup>2</sup>
4GF01	Service area	185,45
4GF02	Bar counter	128,90
4GF03	Hall	27,30
4GF04	Toilets	22,58
4GF05	Staff toilets	8,80
4GF06	Staff changing room	8,60
4GF07	Storage	4,60
4GF08	Kitchen	32,00
4GF09	Terrace	116,00
<b>TOTAL m<sup>2</sup></b>		<b>534,23</b>

FLOOR PLAN LEVEL 0m





1FF	FIRST FLOOR BUILDING 1	USABLE m <sup>2</sup>
1FF01	Toilets	19,70
1FF02	Circulations	78,80
1FF03	Facilities room	4,50
1FF04	Office area	138,45
1FF05	Private office	23,10
1FF06	Staff rest room	81,19

TOTAL m<sup>2</sup> 345,74

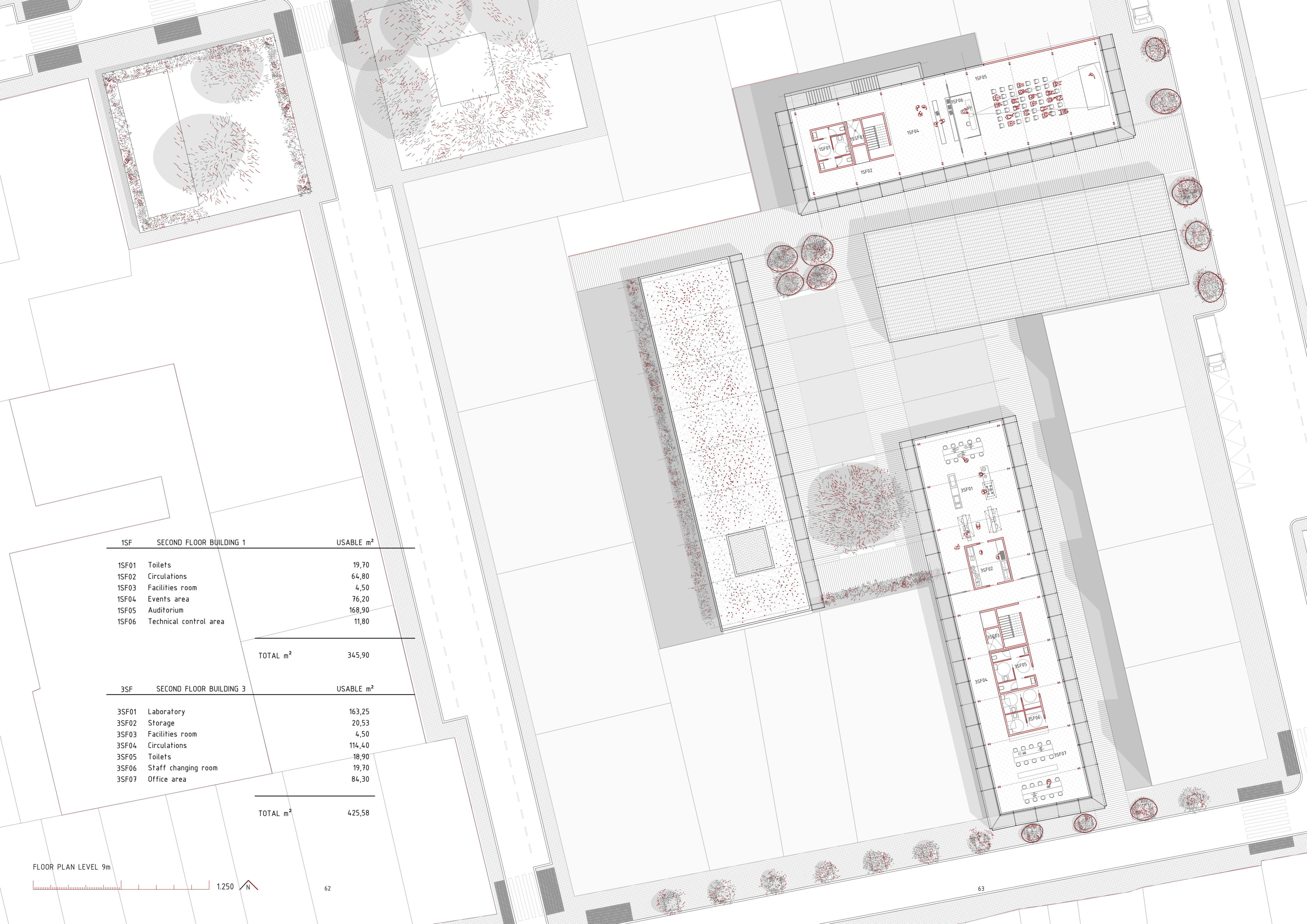
3FF	FIRST FLOOR BUILDING 3	USABLE m <sup>2</sup>
3FF01	Classroom 1	81,30
3FF02	Classroom 2	76,03
3FF03	Facilities room	4,50
3FF04	Group study area	137,19
3FF05	Toilets	18,90
3FF06	Circulations	109,30

TOTAL m<sup>2</sup> 427,22

4FF	FIRST FLOOR BUILDING 4	USABLE m <sup>2</sup>
4FF01	Play area	32,89
4FF02	Auxiliary bar counter	8,00
4FF03	Service area	38,91

TOTAL m<sup>2</sup> 79,80

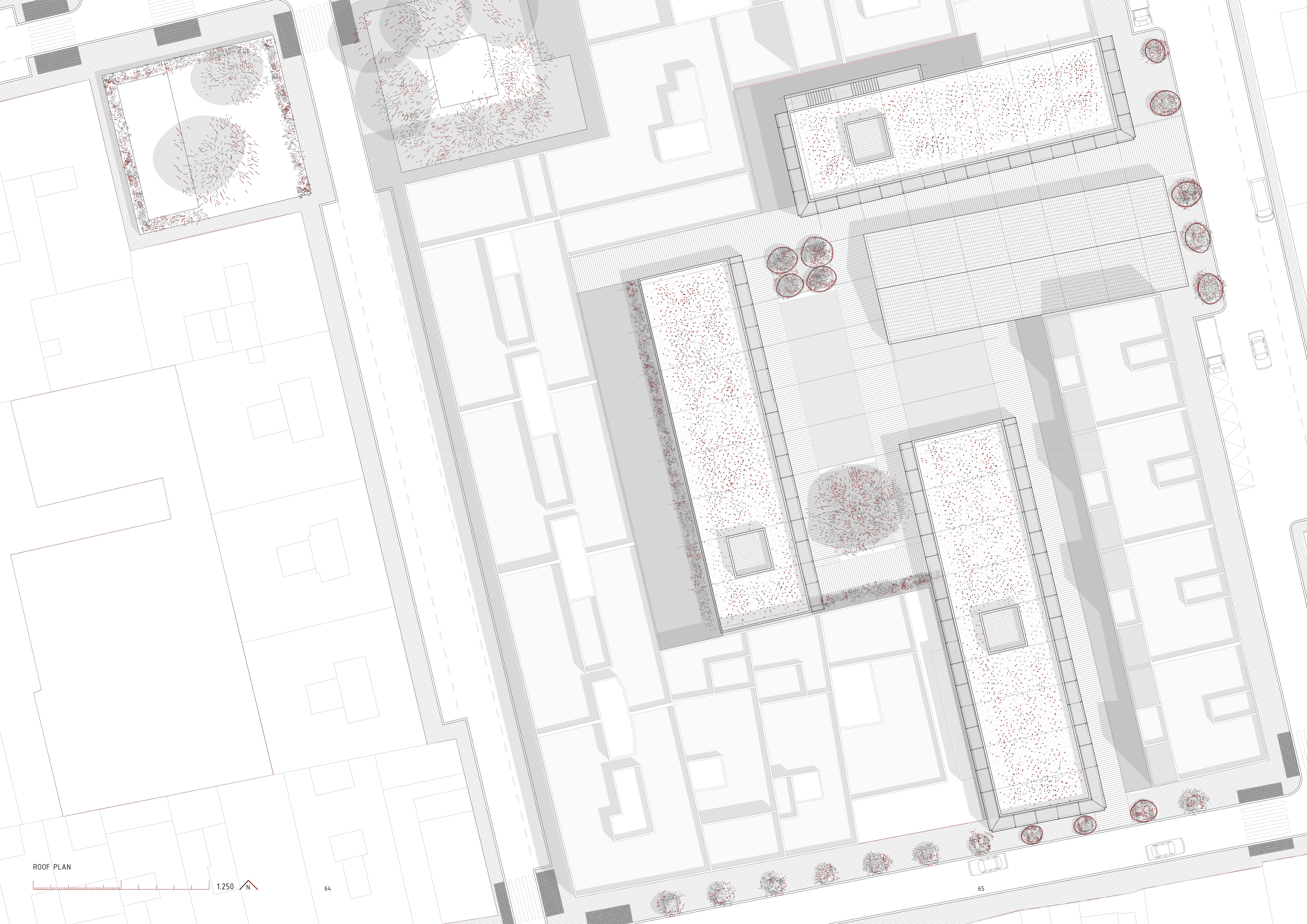




1SF	SECOND FLOOR BUILDING 1	USABLE m <sup>2</sup>
1SF01	Toilets	19,70
1SF02	Circulations	64,80
1SF03	Facilities room	4,50
1SF04	Events area	76,20
1SF05	Auditorium	168,90
1SF06	Technical control area	11,80
<b>TOTAL m<sup>2</sup></b>		<b>345,90</b>

3SF	SECOND FLOOR BUILDING 3	USABLE m <sup>2</sup>
3SF01	Laboratory	163,25
3SF02	Storage	20,53
3SF03	Facilities room	4,50
3SF04	Circulations	114,40
3SF05	Toilets	18,90
3SF06	Staff changing room	19,70
3SF07	Office area	84,30
<b>TOTAL m<sup>2</sup></b>		<b>425,58</b>

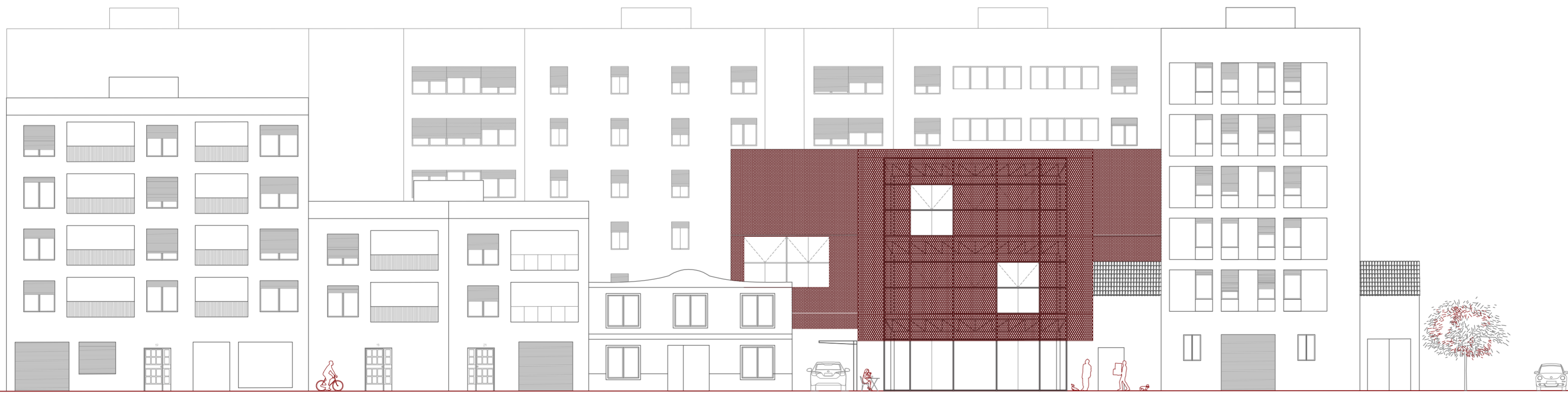
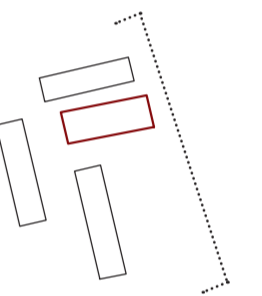




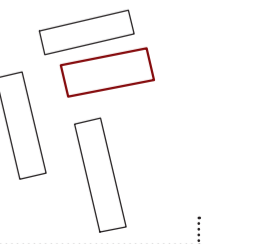




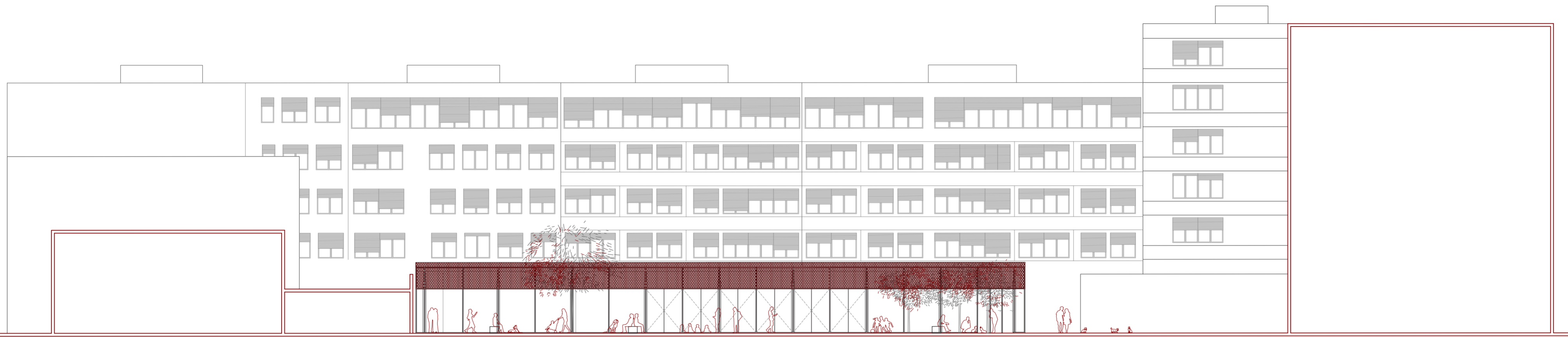
ELEVATION 1-1'



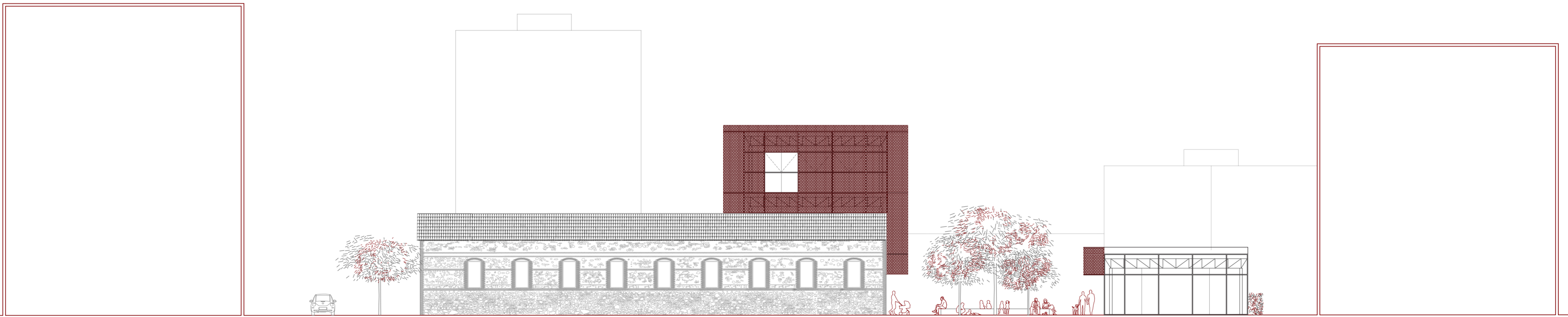
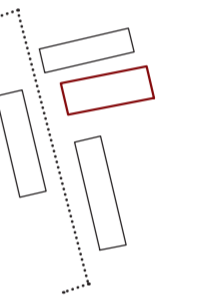
ELEVATION 2-2'



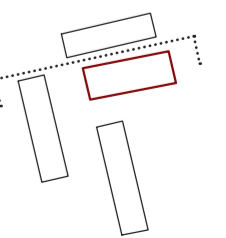




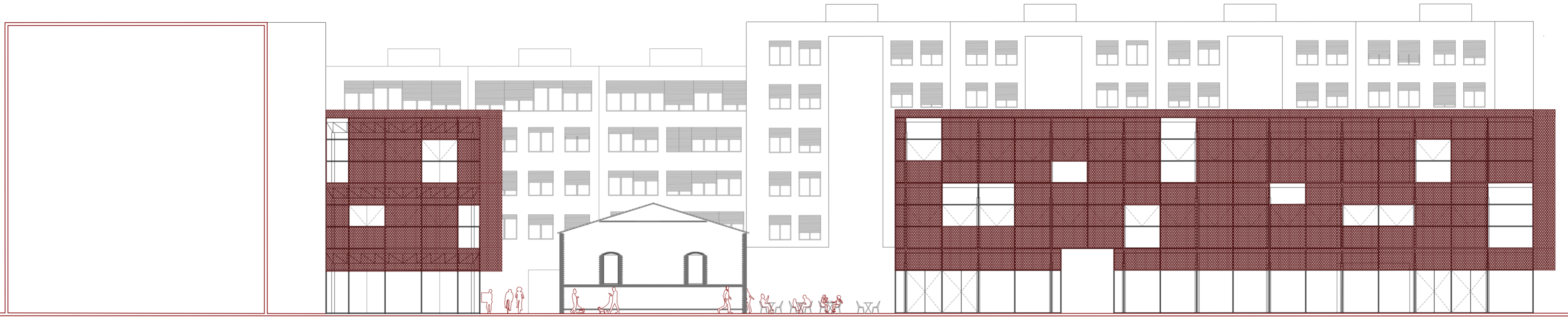
ELEVATION 3-3'



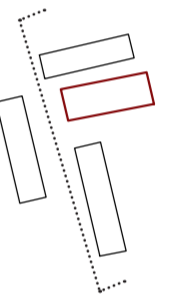
ELEVATION 4-4'



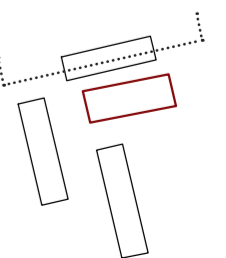


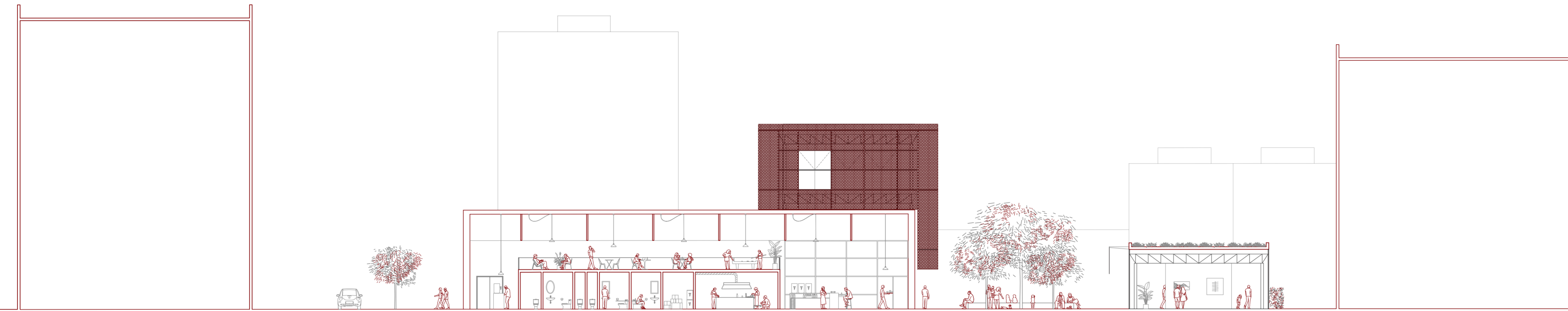


ELEVATION 5-5'

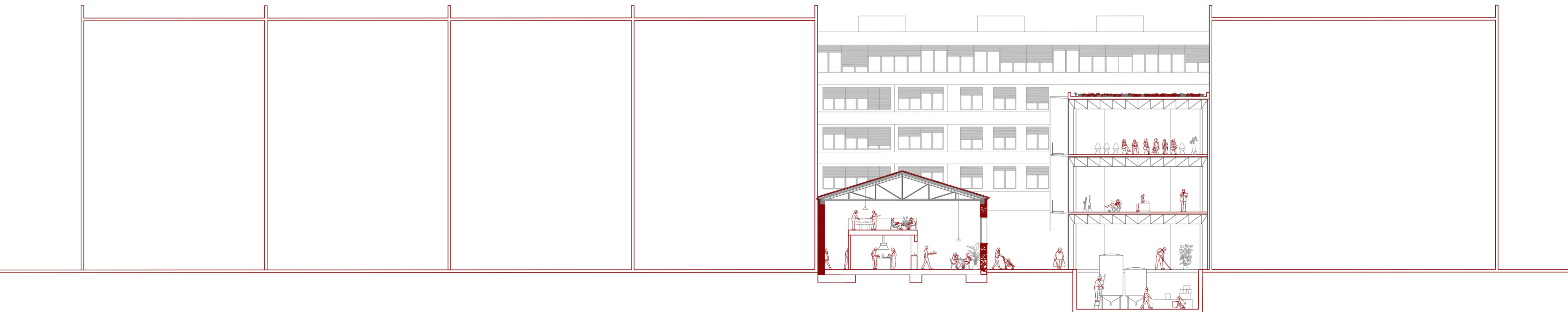
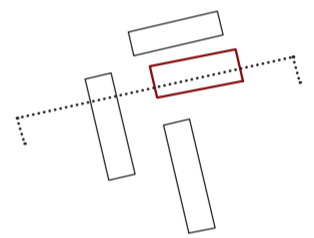


SECTION A-A'

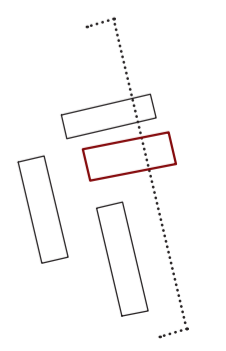




SECTION B-B'



SECTION C-C'









5.

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THE STRUCTURE



## STRUCTURAL ANALYSIS

### SOIL TYPE DESCRIPTION

The project is located in the town of Pinedo, a coastal area south of the city of Valencia. It is located in the urban area of the town, within a block where there are already other buildings with a height of up to six storeys. The project consists of three buildings with various public uses, these buildings have between one and three floors, but a built area of more than 300 m<sup>2</sup> so that according to the CTE DB SE-C (table 3.1) it is a type C-1 building.

In order to analyse the type of soil in the area, the GEOWEB platform of the Instituto Valenciano de la Edificación has been used. The soil of the area is determined as loose or very loose sands, belonging according to the CTE DB SE-C (table 3.2) to soil type T3.

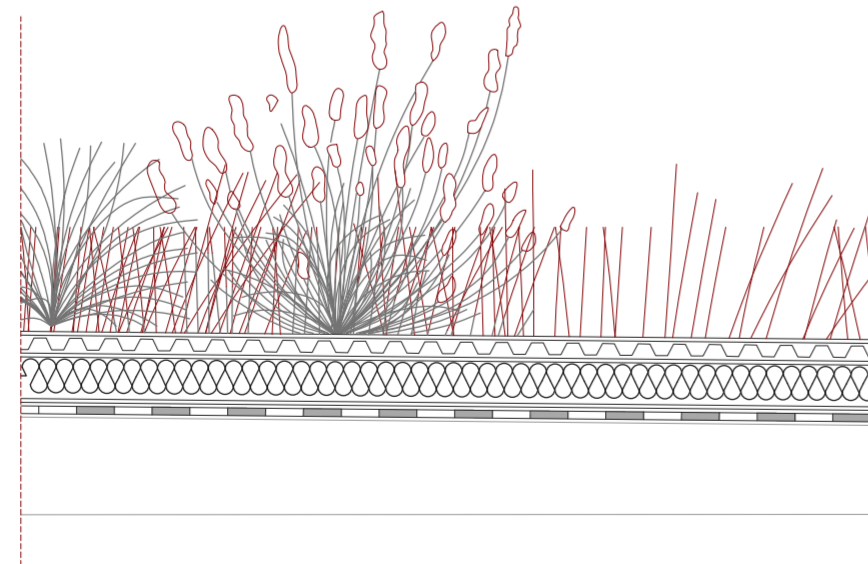
The characteristic stress of the soil according to the IVE is 100 kN/m<sup>2</sup>.



### PERMANENT LOADS

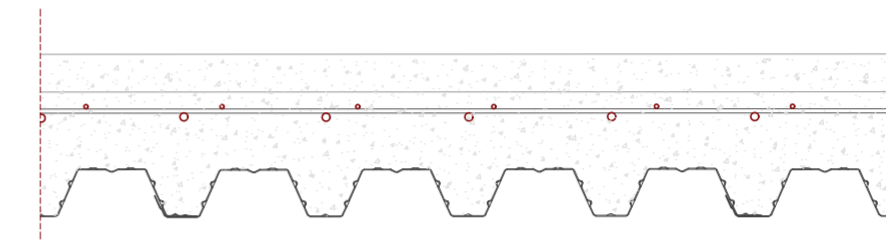
#### ROOF

The type of roof selected for the project is an extensive green roof for all the buildings. The layers that make up this roof are a vapour barrier sheet, lightweight concrete for slope formation, a waterproof sheet, a geotextile separating layer, thermal insulation, another roof protection membrane, a drainage layer, a filtering sheet, the substrate and finally the vegetation. With this system, a total weight of 1.2 kN/m<sup>2</sup> is estimated.



### SLAB

The floor slab is a composite slab made of a composite steel sheet and concrete. According to the company, the total weight according to the estimated concrete depth is 1.7 kN/m<sup>2</sup>. To this weight is added that of the floor finish, in this case microcement is used to achieve a continuous finish on all floors and maintain the industrial style. The regular weight for that kind of finishing is 0.1 kN/m<sup>2</sup> which means a total weight of 1,8 kN/m<sup>2</sup> per slab.



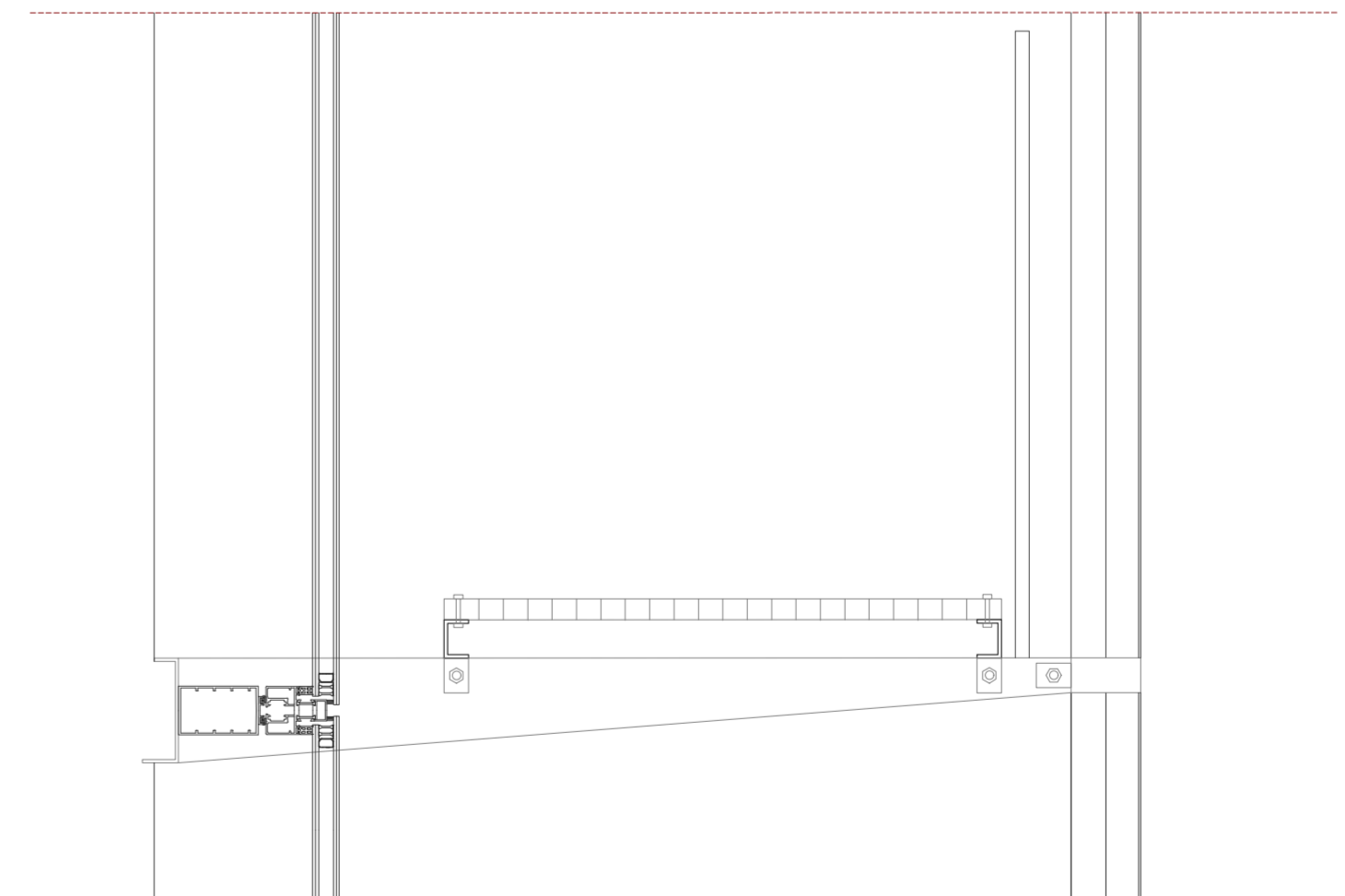
### INNER PARTITIONS

There are three types of interior partitions, those forming the core of the staircase, which are made of reinforced cellular concrete blocks with a weight of 1 kN/m<sup>2</sup>.

The rest of the interior partitions are partition walls made with plasterboard systems, for which a weight of 0.5 kN/m<sup>2</sup> is determined.

### ENCLOSURE

The external enclosures are made with the 0.5 kN/m<sup>2</sup> curtain wall construction system, in order to achieve lightweight enclosures that at the same time bring a large amount of light into the space. As external cladding and solar protection system, it is proposed to install 0.2 kN/m<sup>2</sup> service walkways on the outside of the curtain wall, which are cantilevered and contain a substructure of mullions and transoms to which a skin is anchored, which is a 0.2 kN/m<sup>2</sup> PVC textile mesh. In total the dead weight of these elements is 0.9 kN/m<sup>2</sup>.



**SOIL ACTIONS**

One of the buildings has a one-storey basement, reaching down to -3m, the calculation of ground pressure is carried out using spreadsheets.

**EMPUJE GENERADO POR EL PESO DE LAS TIERRAS**

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$P_i = \gamma \cdot z_i \cdot K$

coeficiente empuje activo  $K_a = \tan^2\left(45 - \frac{\varphi}{2}\right)$   
 coeficiente empuje en reposo  $K_o = 1 - \sin(\varphi)$   
 coeficiente empuje pasivo  $K_p = \tan^2\left(45 + \frac{\varphi}{2}\right)$

Clase de suelo	Ángulo de rozamiento interno $\varphi$	Tipo de empuje		
		Activo $K_a$	Reposo $K_o$	Pasivo $K_p$
Grava suelta angulosa	40,0 °	0,217	0,357	4,599
Grava sin arena	37,5 °	0,243	0,391	4,112
Arena semidensa angulosa	35,0 °	0,271	0,426	3,690
Arena semidensa redondeada	32,5 °	0,301	0,463	3,322
Arena suelta angulosa	32,5 °	0,301	0,463	3,322
Arena suelta redondeada	30,0 °	0,333	0,500	3,000
Margas	30,0 °	0,333	0,500	3,000
Arcilla arenolimososa media	27,5 °	0,368	0,538	2,716
Arcilla arenolimososa blanda	27,5 °	0,368	0,538	2,716
Limo	27,5 °	0,368	0,538	2,716
Arcillas dura	25,0 °	0,406	0,577	2,464
Arcillas medias	20,0 °	0,490	0,658	2,040
Arcillas blandas	17,5 °	0,538	0,699	1,860
Sedimento arcilloso muy orgánico blando	14,0 °	0,610	0,758	1,638

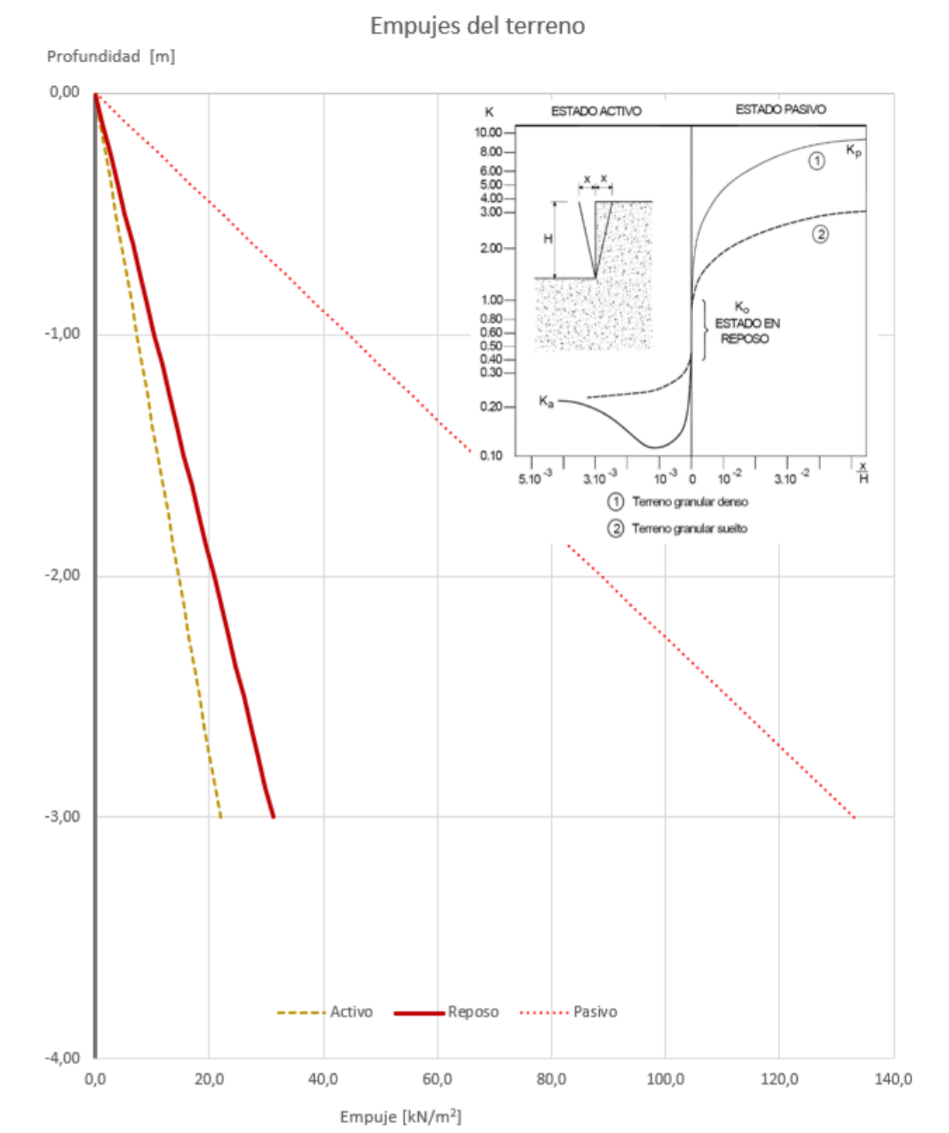
Tabla D.27. Propiedades básicas de los suelos

Clase de suelo		Peso específico aparente (kN/m <sup>3</sup> )	Ángulo de rozamiento interno
Terreno natural	Grava	19 – 22	34° - 45°
	Arena	17 – 20	30° - 36°
	Limo	17 – 20	25 – 32°
	Arcilla	15 – 22	16° – 28°
Rellenos	Tierra vegetal	17	25°
	Terraplén	17	30°
	Pedraplén	18	40°

**CALCULO DEL EMPUJE TOTAL SOBRE EL MURO**

Ángulo de rozamiento interno	$\varphi$	25,0 °
Peso específico suelo [kN/m <sup>3</sup> ]	$\gamma$	18,0
Profundidad máxima [m]	$z_{max}$	3,00
Profundidad nivel freático [m]	$h$	4,00
Sobrecarga superficial [kN/m <sup>2</sup> ]	$s$	0,00

Tipo de empuje	Activo	Reposo	Pasivo
	$K_a$	$K_o$	$K_p$
	0,406	0,577	2,464
Profundidad $z_i$ [m]	Empuje total [kN/m <sup>2</sup> ]		
0,00	0,0	0,0	0,0
-0,13	0,9	1,3	5,5
-0,25	1,8	2,6	11,1
-0,38	2,7	3,9	16,6
-0,50	3,7	5,2	22,2
-0,63	4,6	6,5	27,7
-0,75	5,5	7,8	33,3
-0,88	6,4	9,1	38,8
-1,00	7,3	10,4	44,4
-1,13	8,2	11,7	49,9
-1,25	9,1	13,0	55,4
-1,38	10,0	14,3	61,0
-1,50	11,0	15,6	66,5
-1,63	11,9	16,9	72,1
-1,75	12,8	18,2	77,6
-1,88	13,7	19,5	83,2
-2,00	14,6	20,8	88,7
-2,13	15,5	22,1	94,2
-2,25	16,4	23,4	99,8
-2,38	17,4	24,7	105,3
-2,50	18,3	26,0	110,9
-2,63	19,2	27,3	116,4
-2,75	20,1	28,6	122,0
-2,88	21,0	29,9	127,5
-3,00	21,9	31,2	133,1





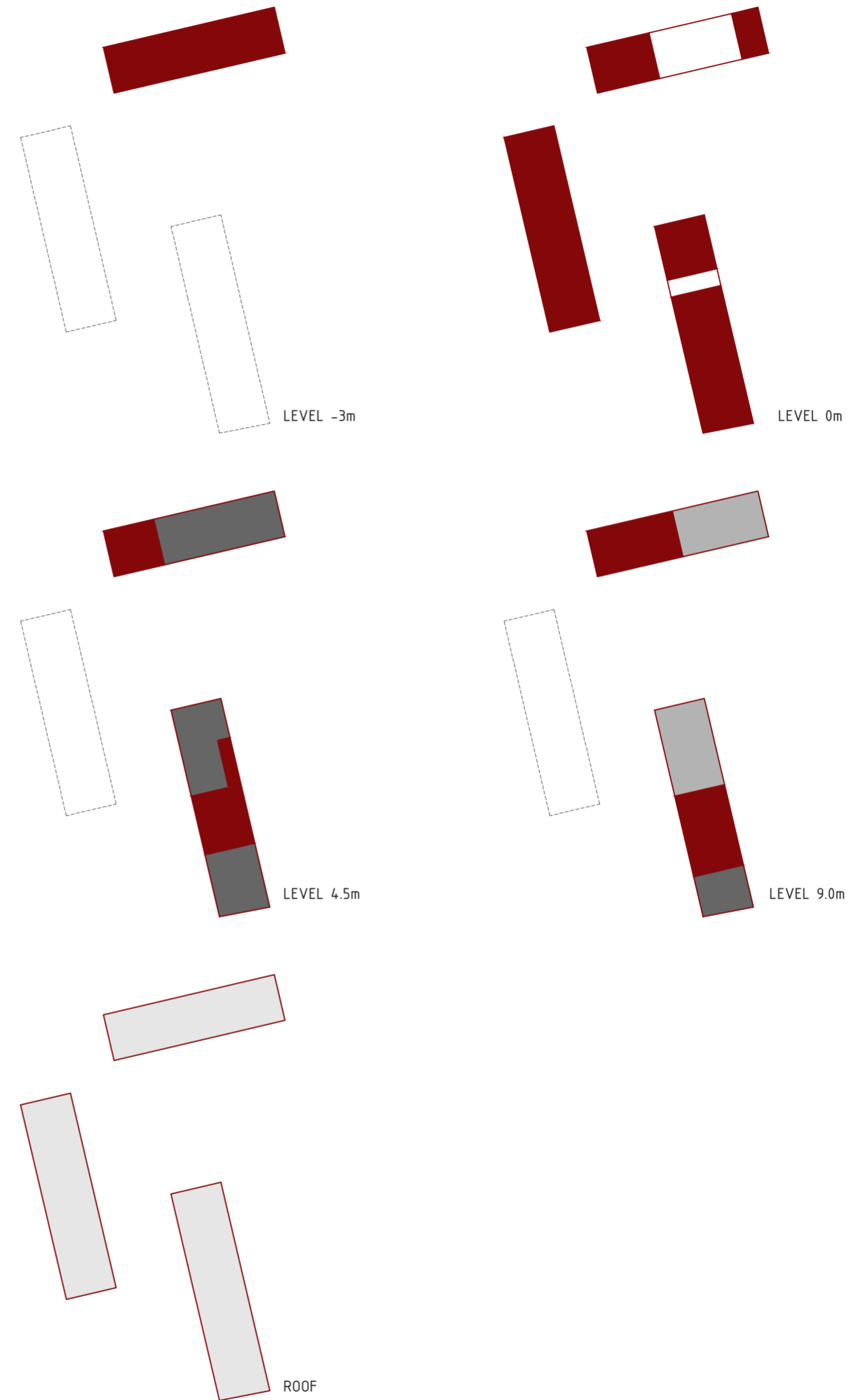
VARIABLE ACTIONS

USE OVERLOAD

The buildings in the complex are of a public nature but each has different uses, so overloads of use may vary. According to the CTE DB SE-AE, the serviceability overload is the weight of everything that can gravitate on the building by reason of its use. The effects of the overload can be simulated by the application of a uniformly distributed load. According to the fundamental use in each zone of the building, the values in Table 3.1 are adopted as characteristic values.

Tabla 3.1. Valores característicos de las sobrecargas de uso

Categoría de uso		Subcategorías de uso		Carga uniforme [kN/m <sup>2</sup> ]	Carga concentrada [kN]
A	Zonas residenciales	A1	Viviendas y zonas de habitaciones en, hospitales y hoteles	2	2
		A2	Trasteros	3	2
B	Zonas administrativas			2	2
C	Zonas de acceso al público (con la excepción de las superficies pertenecientes a las categorías A, B, y D)	C1	Zonas con mesas y sillas	3	4
		C2	Zonas con asientos fijos	4	4
		C3	Zonas sin obstáculos que impidan el libre movimiento de las personas como vestíbulos de edificios públicos, administrativos, hoteles; salas de exposición en museos; etc.	5	4
		C4	Zonas destinadas a gimnasio u actividades físicas	5	7
		C5	Zonas de aglomeración (salas de conciertos, estadios, etc)	5	4
D	Zonas comerciales	D1	Locales comerciales	5	4
		D2	Supermercados, hipermercados o grandes superficies	5	7
E	Zonas de tráfico y de aparcamiento para vehículos ligeros (peso total < 30 kN)			2	20 <sup>(1)</sup>
F	Cubiertas transitables accesibles sólo privadamente <sup>(2)</sup>			1	2
G	Cubiertas accesibles únicamente para conservación <sup>(3)</sup>	G1 <sup>(7)</sup>	Cubiertas con inclinación inferior a 20°	1 <sup>(4)(6)</sup>	2
			Cubiertas ligeras sobre correas (sin forjado) <sup>(5)</sup>	0,4 <sup>(4)</sup>	1
		G2	Cubiertas con inclinación superior a 40°	0	2





**WIND OVERLOAD**

The three buildings have similar characteristics in terms of the relationship between the longitudinal and transverse ratios, and two of them have the same height. For the development of the work the structural calculations that have been carried out are those that belong to the building that has the basement and the one with only one floor, with the obtaining of these data an approximation of the results that the third building would also provide.

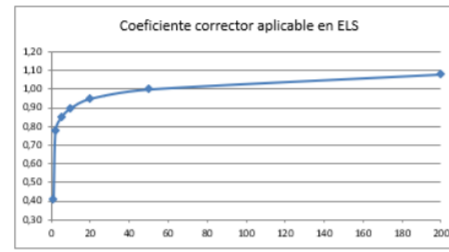
**ACCIONES GENERADAS POR EL VIENTO**

Densidad del aire	$\delta$	1,25	kg/m <sup>3</sup>
Velocidad del viento	$v_b$	27,0	m/s
Velocidad del viento en ELS	$v_{b,ELS}$	27,0	m/s
Presión dinámica del viento	$q_b = 0,5 \cdot \delta \cdot v_b^2$	0,456	kN/m <sup>2</sup>
Presión dinámica del viento en ELS	$q_{b,ELS}$	0,456	kN/m <sup>2</sup>
Duración del periodo de servicio		50	años
Coefficiente corrector aplicable en ELS		1,00	

Presión estática del viento [kN/m <sup>2</sup> ]	$q_e = q_b \cdot C_{pe} \cdot C_{pe}$	Presión a barlovento
	$q_e = q_b \cdot C_{pe} \cdot C_{pe}$	Succión a sotavento

Coeficiente de Exposición		$C_{pe} = F \cdot (F + 7 \cdot k)$
Grado de aspereza del entorno	II	Según tabla D.2
k	0,170	$F = k \cdot \ln(\max(z, Z) / L)$
L	0,010	
Z	1,000	

Años	Corrección
1	0,41
2	0,78
5	0,85
10	0,90
20	0,95
50	1,00
200	1,08



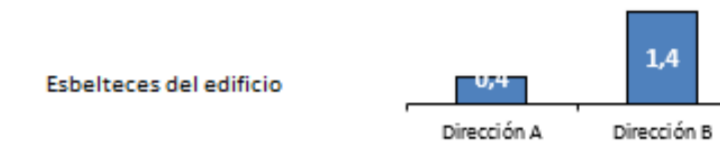
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Geometría del edificio	Profundidad	35 m	10 m
	Esbeltez	0,4	1,4
	Altura del edificio	14 m	
		Dirección A	Dirección B



**Tabla D.2 Coeficientes para tipo de entorno**

Grado de aspereza del entorno	Parámetro		
	k	L (m)	Z (m)
I Borde del mar o de un lago, con una superficie de agua en la dirección del viento de al menos 5 km de longitud	0,156	0,003	1,0
II Terreno rural llano sin obstáculos ni arbolado de importancia	0,17	0,01	1,0
III Zona rural accidentada o llana con algunos obstáculos aislados, como árboles o construcciones pequeñas	0,19	0,05	2,0
IV Zona urbana en general, industrial o forestal	0,22	0,3	5,0
V Centro de negocios de grandes ciudades, con profusión de edificios en altura	0,24	1,0	10,0

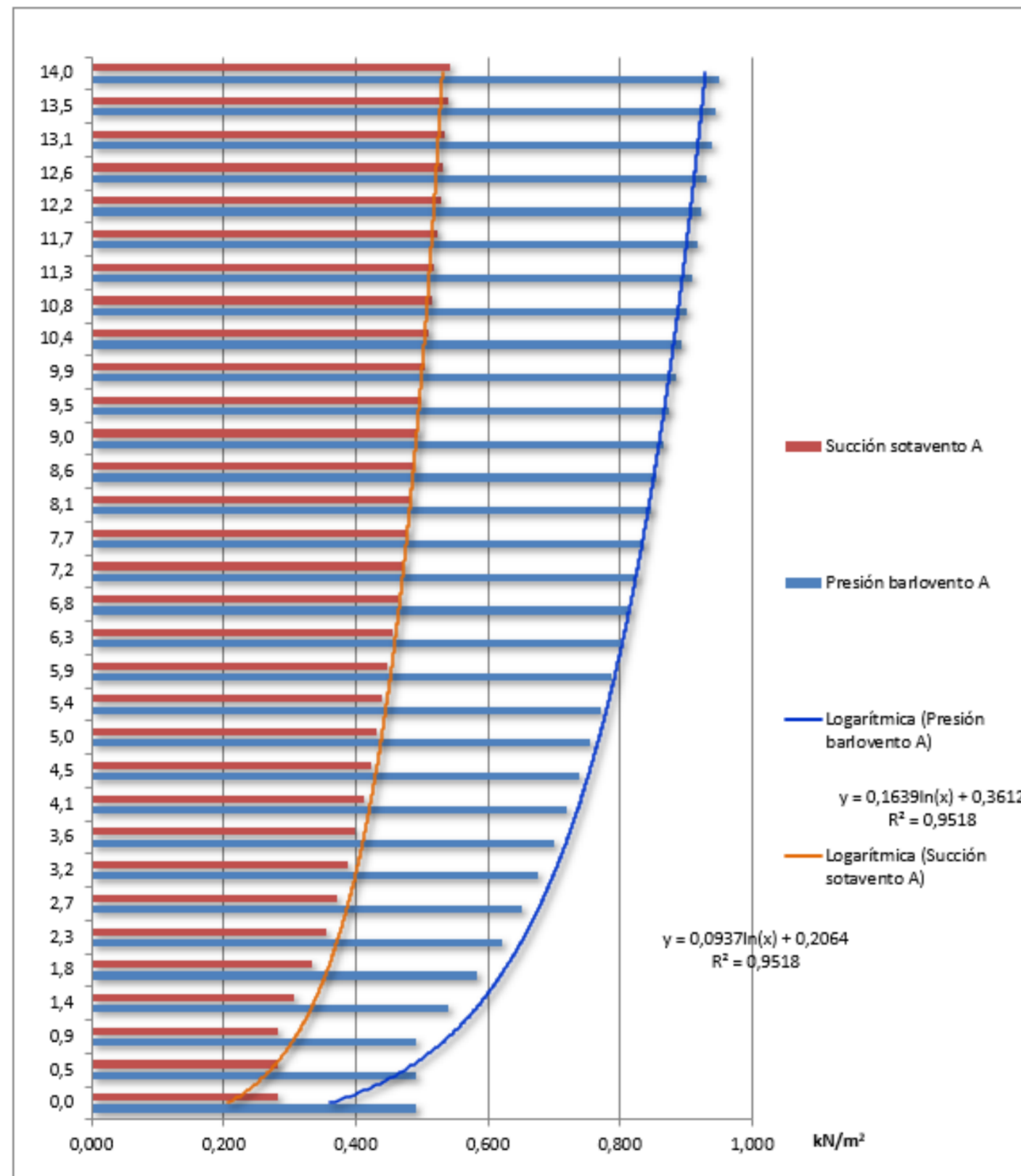


Coeficientes de presión y succión	Presión $c_p$	0,70	0,80
	Succión $c_s$	0,40	0,60

Altura del punto	Presión estática del viento [kN/m <sup>2</sup> ]					
	F	$C_{pe}$	Presión barlovento A	Succión sotavento A	Presión barlovento B	Succión sotavento B
0,0	0,7829	1,5445	0,493	0,281	0,563	0,425

0,0	0,7829	1,5445	0,493	0,281	0,563	0,425
0,5	0,7829	1,5445	0,493	0,281	0,563	0,425
0,9	0,7829	1,5445	0,493	0,281	0,563	0,425
1,4	0,8345	1,6895	0,539	0,308	0,616	0,465
1,8	0,8834	1,8317	0,584	0,334	0,668	0,504
2,3	0,9213	1,9453	0,620	0,355	0,709	0,535
2,7	0,9523	2,0402	0,651	0,372	0,744	0,561
3,2	0,9785	2,1220	0,677	0,387	0,773	0,584
3,6	1,0012	2,1940	0,700	0,400	0,800	0,604
4,1	1,0213	2,2583	0,720	0,412	0,823	0,621
4,5	1,0392	2,3165	0,739	0,422	0,844	0,638
5,0	1,0554	2,3697	0,756	0,432	0,864	0,652
5,4	1,0702	2,4188	0,771	0,441	0,882	0,666
5,9	1,0838	2,4643	0,786	0,449	0,898	0,678
6,3	1,0964	2,5067	0,799	0,457	0,914	0,690
6,8	1,1081	2,5466	0,812	0,464	0,928	0,701
7,2	1,1191	2,5840	0,824	0,471	0,942	0,711
7,7	1,1294	2,6195	0,835	0,477	0,955	0,721
8,1	1,1391	2,6531	0,846	0,484	0,967	0,730
8,6	1,1483	2,6851	0,856	0,489	0,979	0,739
9,0	1,1570	2,7155	0,866	0,495	0,990	0,747
9,5	1,1653	2,7447	0,875	0,500	1,000	0,755
9,9	1,1732	2,7726	0,884	0,505	1,011	0,763
10,4	1,1808	2,7994	0,893	0,510	1,020	0,770
10,8	1,1880	2,8251	0,901	0,515	1,030	0,777
11,3	1,1949	2,8499	0,909	0,519	1,039	0,784
11,7	1,2016	2,8738	0,917	0,524	1,048	0,791
12,2	1,2080	2,8969	0,924	0,528	1,056	0,797
12,6	1,2142	2,9192	0,931	0,532	1,064	0,803
13,1	1,2202	2,9409	0,938	0,536	1,072	0,809
13,5	1,2259	2,9618	0,945	0,540	1,080	0,815
14,0	1,2315	2,9821	0,951	0,543	1,087	0,821

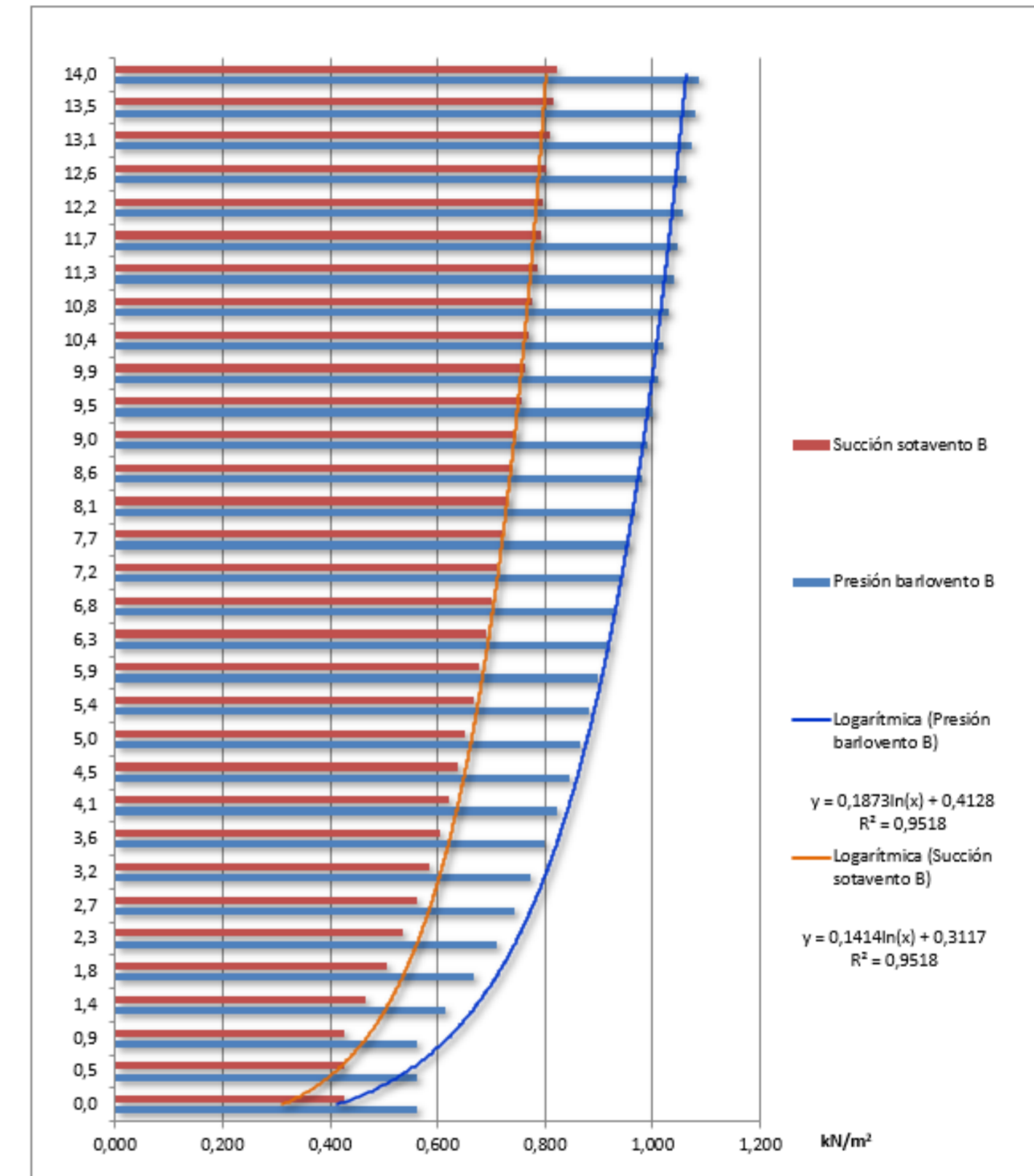
Presiones y succiones en las fachadas **perpendiculares a la dirección A**



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Presiones y succiones en las fachadas **perpendiculares a la dirección B**



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## SNOW OVERLOADS

The distribution and intensity of the snow load on a building, or in particular on a roof, depends on the climate of the location, the type of precipitation, the relief of the environment, the shape of the building or roof, the effects of wind, and the thermal exchanges on the exterior walls. The value of the snow load per unit of surface in horizontal projection,  $q_n$  can be taken:

$$q_n = u \times S_k$$

$u$ : Shape coefficient of the roof, as the roof is horizontal  $u = 1$

$S_k$ : The characteristic value of the snow load on a horizontal terrain according to table 3.8 of the DB SE-AE its value for Valencia for its altitude is  $0.2 \text{ kN/m}^2$

**Tabla 3.8 Sobrecarga de nieve en capitales de provincia y ciudades autónomas**

Capital	Altitud m	$S_k$ kN/m <sup>2</sup>	Capital	Altitud m	$S_k$ kN/m <sup>2</sup>	Capital	Altitud m	$S_k$ kN/m <sup>2</sup>
Albacete	690	0,6	Guadalajara	680	0,6	Pontevedra	0	0,3
Alicante / Alacant	0	0,2	Huelva	0	0,2	Salamanca	780	0,5
Almería	0	0,2	Huesca	470	0,7	SanSebas- tián/Donostia	0	0,3
Ávila	1.130	1,0	Jaén	820	0,4	Santander	1.000	0,3
Badajoz	180	0,2	León	570	1,2	Segovia	10	0,7
Barcelona	0	0,4	Lérida / Lleida	150	0,5	Sevilla	1.090	0,2
Bilbao / Bilbo	0	0,4	Logroño	380	0,6	Soria	0	0,9
Burgos	860	0,3	Lugo	470	0,6	Tarragona	0	0,4
Cáceres	440	0,6	Madrid	660	0,7	Tenerife	950	0,2
Cádiz	0	0,4	Málaga	0	0,6	Teruel	550	0,9
Castellón	0	0,2	Murcia	40	0,2	Toledo	0	0,5
Ciudad Real	640	0,6	Orense / Ourense	130	0,2	Valencia/València	690	0,2
Córdoba	100	0,6	Oviedo	230	0,4	Valladolid	520	0,4
Coruña / A Coruña	0	0,2	Palencia	740	0,5	Vitoria / Gasteiz	650	0,7
Cuenca	1.010	0,3	Palma de Mallorca	0	0,4	Zamora	210	0,4
Gerona / Girona	70	1,0	Palmas, Las	0	0,2	Zaragoza	0	0,5
Granada	690	0,4	Pamplona/Iruña	450	0,7	Ceuta y Melilla	0	0,2
		0,5						

## THERMAL ACTIONS

According to the CTE the provision of expansion joints can help to reduce the effects of temperature variations. In typical buildings with concrete or steel structural elements, thermal actions may not be considered under some conditions. As these are insulated buildings, it is not necessary to provide expansion joints as the maximum length is less than the required length for the provision of joints.

## ACCIDENTAL ACTIONS

### EARTHQUAKE

According to article 1.2.2 of the current NCSR-02, the building is classified in the category of 'normal importance'.

The application of this standard is mandatory for the constructions listed in Article 1.2.1, except for: in normally significant constructions with frames well braced to each other in all directions where the seismic acceleration is less than  $0,08g$ .

In accordance with the seismic-resistant construction standard NCSE-02, due to the use and situation of the building, in the municipality of Valencia, seismic actions are NOT considered since the building is well braced and the seismic acceleration of Valencia is  $0.06g$ .

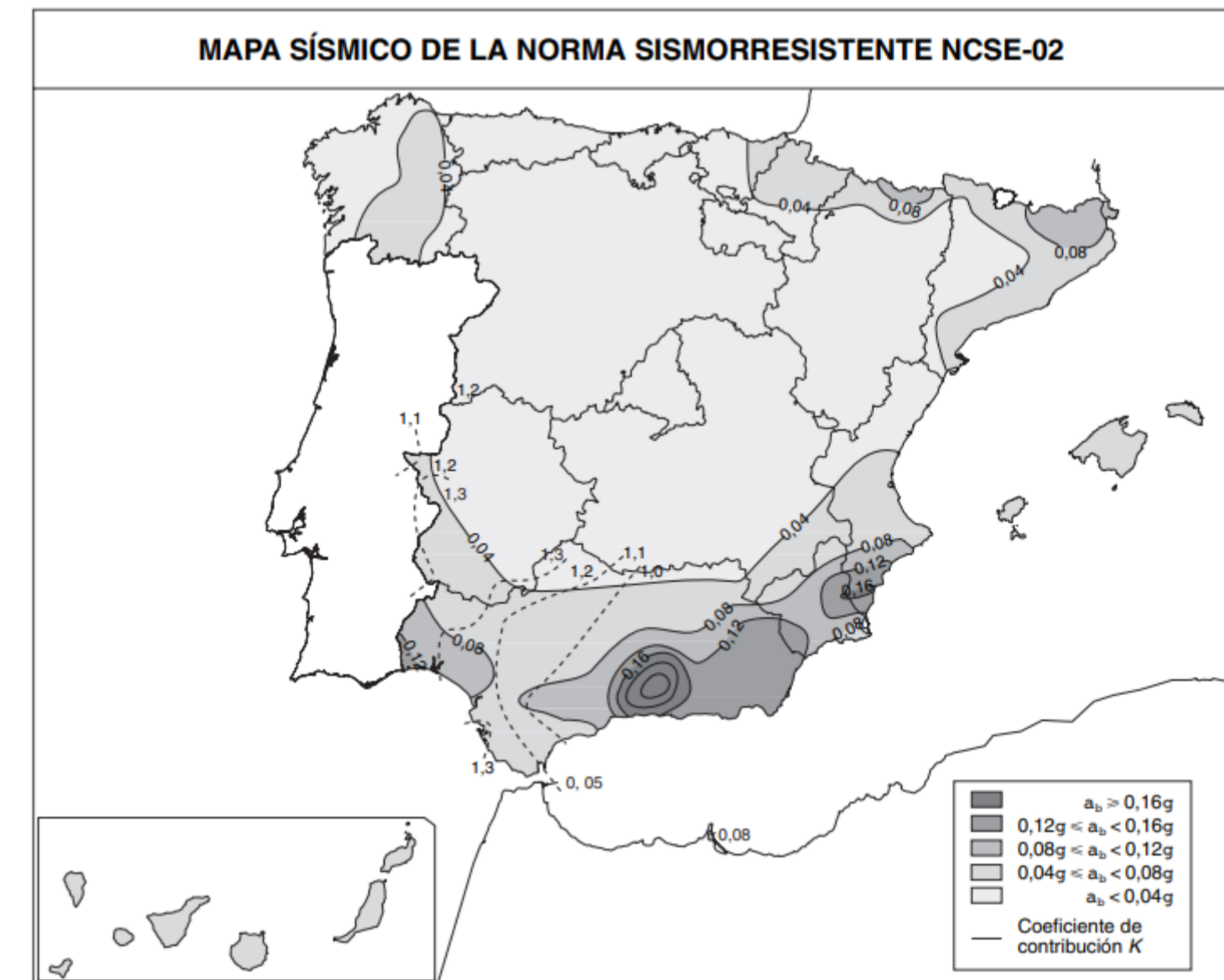


Figura 2.1 Mapa de Peligrosidad Sísmica



LOAD AND COMBINATIONS ACCORDING TO THE CTE

The combination of loads can be done straight from the Architrave program, once the values of each load have been defined on their right hypothesis, using automatically the expression of the equation:

$$\sum_{j \geq 1} \gamma_{G,j} G_{k,j} + \sum_{m \geq 1} \gamma_{G,m} G_{k,m} + \gamma_{Q,1} Q_{k,1} + \sum_{i > 1} \gamma_{Q,i} \psi_{0,i} Q_{k,i}$$

Where:

- Gk: The characteristic value of permanent loads.
- Qk: The characteristic value of variable loads (overloads)
- $\gamma_G$  and  $\gamma_Q$ : The simultaneity coefficients of overloads.
- $\psi_0$  and  $\psi_{0k}$ : The combination value on an overload.

The previous expression gives rise to as many combinations as variable actions are, considering for each of the combinations that the fundamental variable action is one of the overloads acting on the structure, and adding the rest of the overloads with their combination value.

LOADCASE

- HIP1: permanent
- HIP2: use
- HIP3: snow
- HIP4: Wind direction A
- HIP5: Wind direction B

ELU COMBINATIONS

- Combination 1 = 1,35 x HIP1 x 1,5 HIP2 + 0,5 x 1,5 x HIP3 x 0,6 x 1,5 x HIP4
- Combination 2 = 1,35 x HIP1 x 1,5 HIP2 + 0,5 x 1,5 x HIP3 x 0,6 x 1,5 x HIP5
- Combination 3 = 1,35 x HIP1 x 1,5 HIP3 + 0,6 x 1,5 x HIP4
- Combination 4 = 1,35 x HIP1 x 1,5 HIP3 + 0,6 x 1,5 x HIP5
- Combination 5 = 1,35 x HIP1 x 1,5 HIP4 + 0,5 x 1,5 x HIP3
- Combination 6 = 1,35 x HIP1 x 1,5 HIP5 + 0,5 x 1,5 x HIP3

ELS CHARACTERISTIC COMBINATIONS

- Combination 1 = HIP1 + HIP2 + 0,5 x HIP3 + 0,6 x HIP4
- Combination 2 = HIP1 + HIP2 + 0,5 x HIP3 + 0,6 x HIP5
- Combination 3 = HIP1 + HIP3 + 0,7 x HIP2 + 0,6 x HIP4
- Combination 4 = HIP1 + HIP3 + 0,7 x HIP2 + 0,6 x HIP5
- Combination 5 = HIP1 + HIP4 + 0,7 x HIP2 + 0,5 x HIP3
- Combination 6 = HIP1 + HIP5 + 0,7 x HIP2 + 0,5 x HIP3

ELS FREQUENT COMBINATIONS

- Combination 1 = HIP1 + 0,5 x HIP2 + 0 x HIP3 + 0 x HIP4
- Combination 2 = HIP1 + 0,5 x HIP2 + 0 x HIP3 + 0 x HIP5
- Combination 3 = HIP1 + 0,5 x HIP3 + 0,3 x HIP2 + 0 x HIP4
- Combination 4 = HIP1 + 0,5 x HIP3 + 0,3 x HIP2 + 0,5 x HIP5
- Combination 5 = HIP1 + 0,5 x HIP4 + 0,3 x HIP2 + 0 x HIP3
- Combination 6 = HIP1 + 0,5 x HIP5 + 0,3 x HIP2 + 0 x HIP3

ELS QUASI-PERMANENT COMBINATIONS

- Combination 1 = HIP1 + 0,3 x HIP2 + 0 x HIP3 + 0 x HIP4
- Combination 2 = HIP1 + 0,3 x HIP2 + 0 x HIP3 + 0 x HIP5

DESCRIPTION OF THE SOLUTION

FOUNDATION

As the complex consists of a total of three buildings, the strategy followed for each building has been determined depending on the boundary conditions of each building. The materials used in all cases are concrete HA30 and for the reinforcement steel B500.

BUILDING 1

For the foundation solution of the building with basement wall, a spread footing was chosen along the entire perimeter of the building. Two of these strip footings are party walls, as they adjoin an existing building and the street boundary. To compensate for the eccentricity produced by these footings, centring beams are used to tie them to the footings under the wall, also improving stability and behaviour in the event of earthquakes. In the area of the communications core, a small foundation slab has been designed to take the loads from the staircase and the lift.

BUILDING 2

This is the building with only one floor. As it is a structure of metal pillars, the solution for this building is the foundation with isolated footings. These footings are tied by means of foundation beams to ensure stability in both directions.

BUILDING 3

The solution chosen for this building is the same as for building 1. After carrying out several tests, the most efficient option is to place a continuous footing from which all the columns start, as the option of combined footings was inefficient and irregular. A reinforced concrete slab was also chosen for the core construction.

STRUCTURE

The designed base structure is the same in all 3 buildings, each one adapting the size of its elements to the corresponding loads in each case.

The materials used are hot-rolled steel columns, cellular concrete blocks, HA30 concrete and B500 rebar.

In order to achieve an industrial appearance reminiscent of the refurbished warehouse, an exposed structure was chosen. The supports are steel HEB columns. The beams are replaced by a Pratt flat truss, which is similar to the original one in the warehouse. The truss is made of PHR type rectangular cross-section profiles. Other HEB profiles are used as auxiliary elements to the truss. The choice of a truss as the construction system is due to the fact that the spans to be spanned by the beams are very large. Structural elements are arranged every five metres.

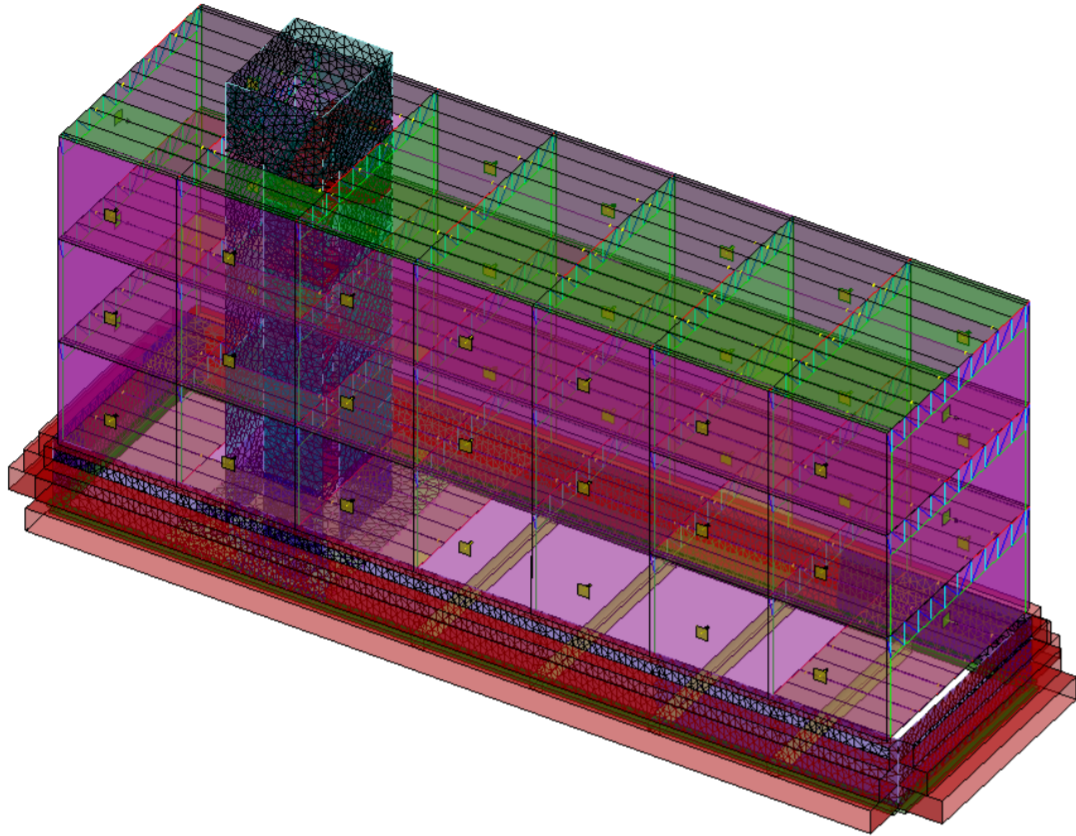
In the factory area there is a double height, but there are two areas where there is a floor slab. As the free height in this area is not sufficient for the installation of a truss, beams are used, which are also made of steel sections.

The staircases are made of in-situ reinforced concrete and the communication cores common to all floors are made of cellular concrete blocks.

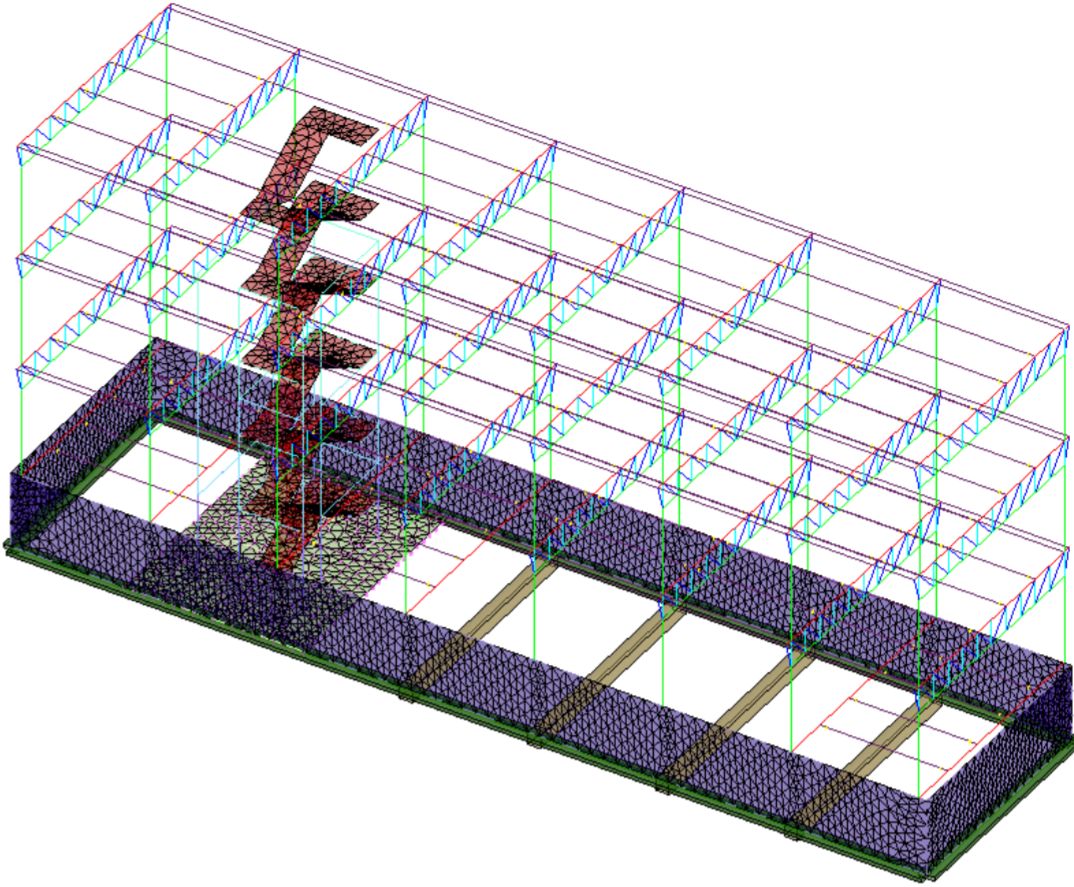
With regard to the floor slabs, a mixed slab made of steel sheeting and concrete has been chosen, in order to make it as light as possible, saving the large spans without adding extra weight to the structure.

The metal service walkways are joined to the floor slabs by a series of metal profiles that distribute the loads generated by the cantilever.

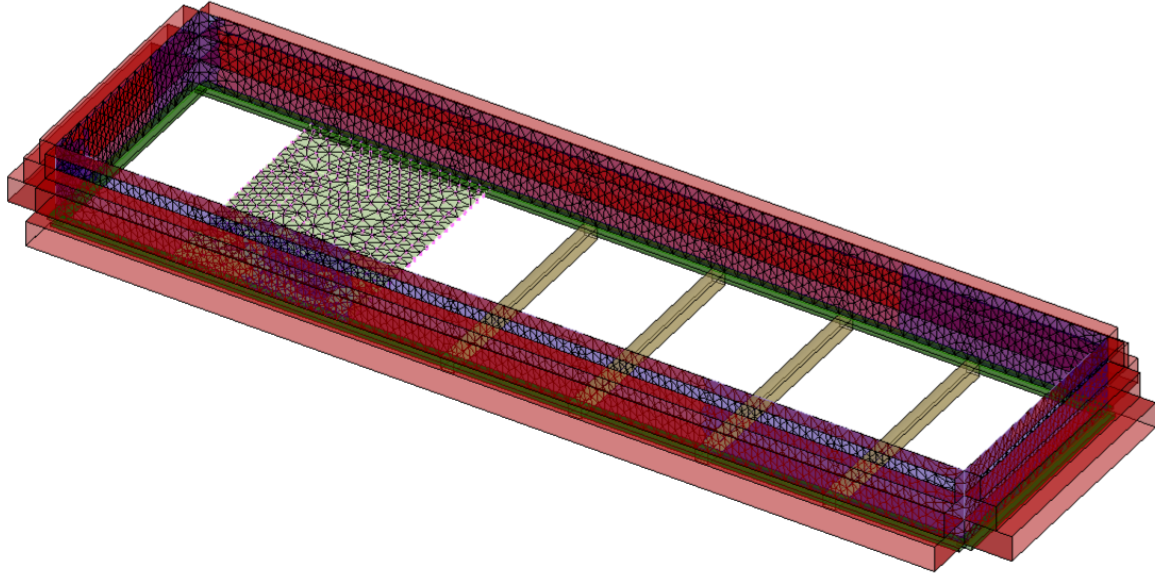
STRUCTURAL ANALYSIS - ARCHITRAVE



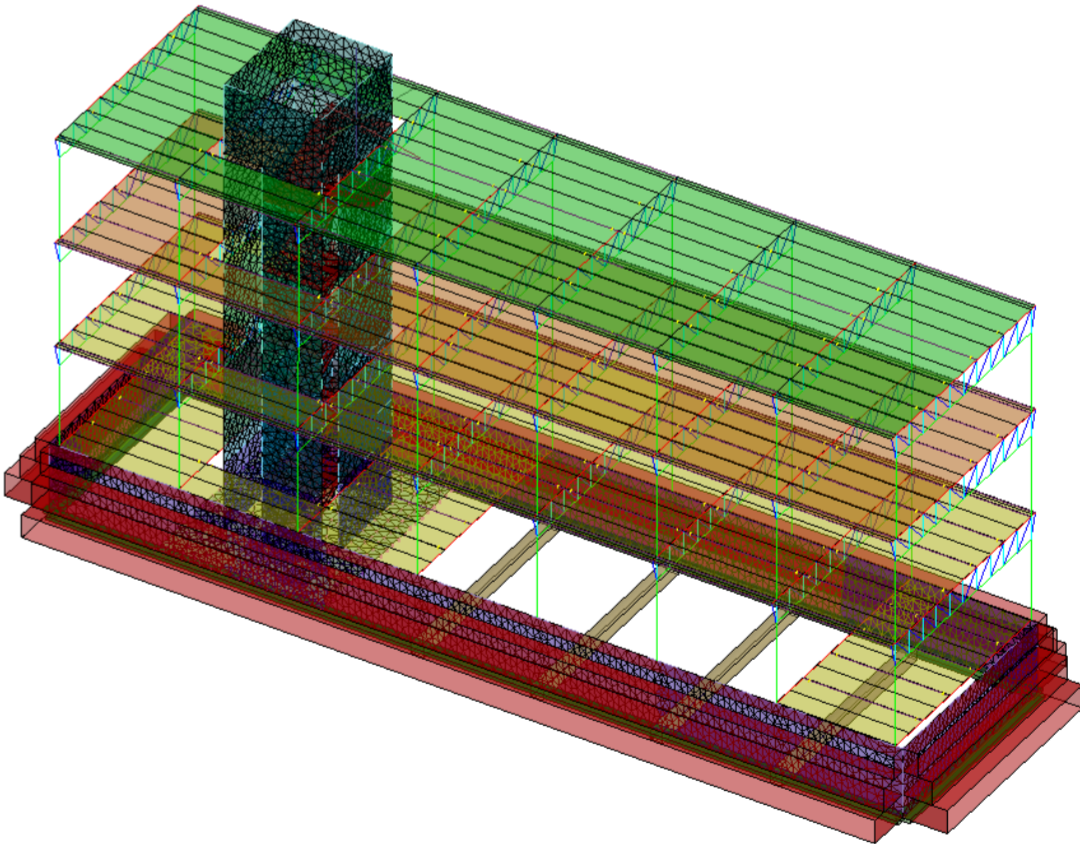
FULL STRUCTURAL MODEL



STRUCTURAL ELEMENTS



FOUNDATION AND BASEMENT LOADS



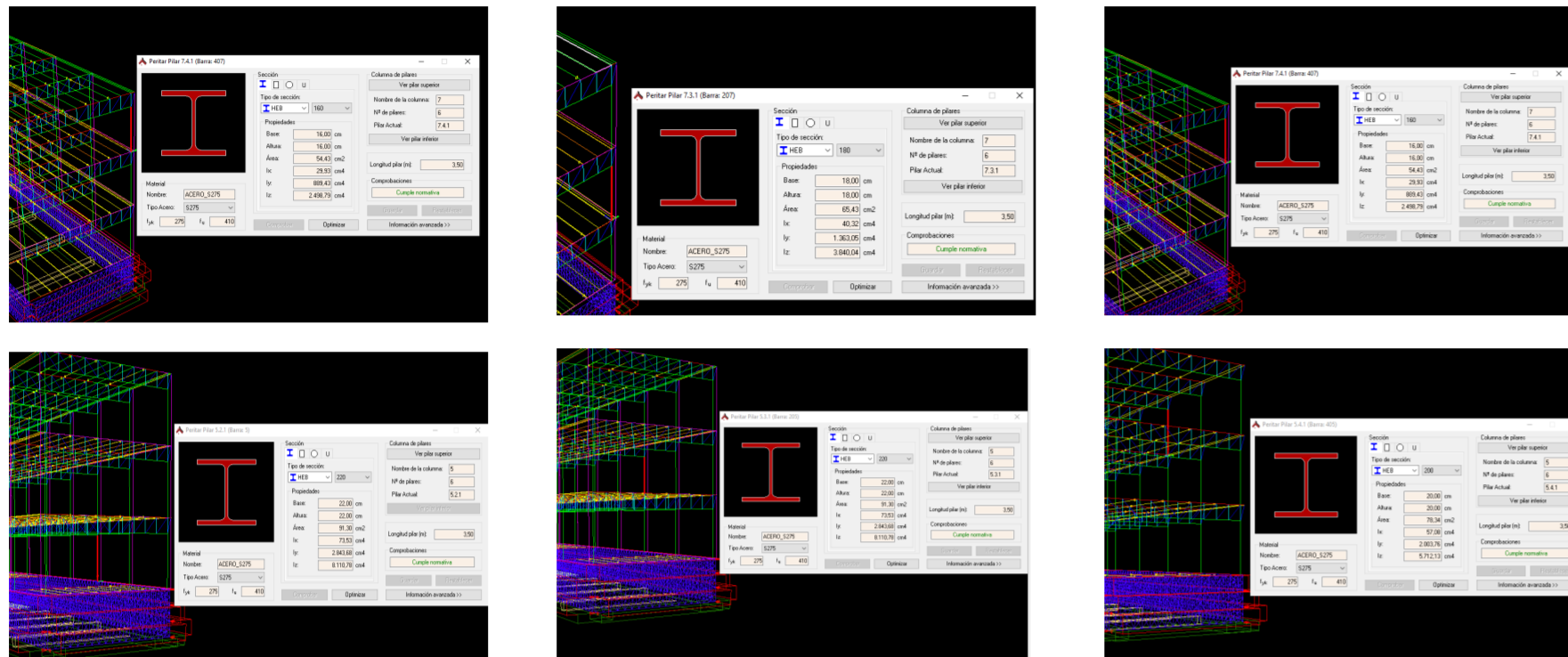
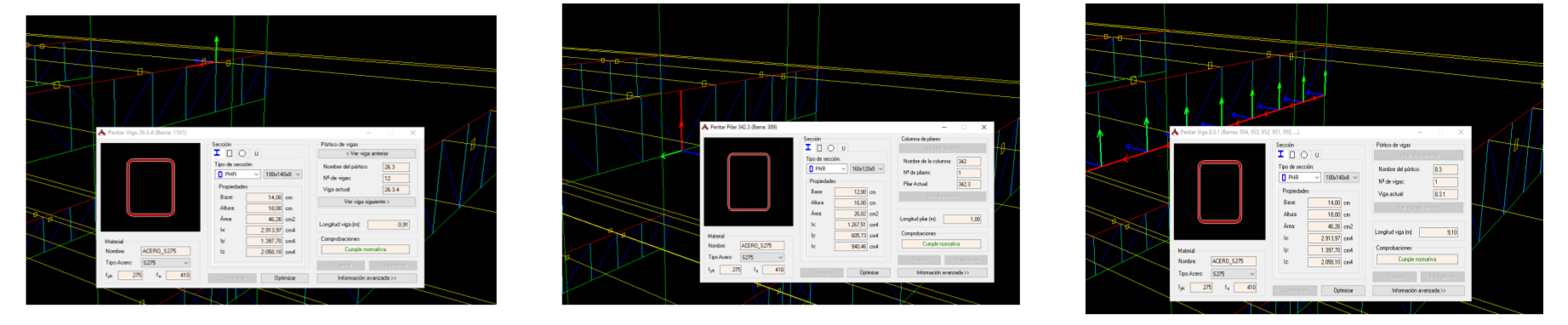
LOADS OVER STRUCTURAL ELEMENTS



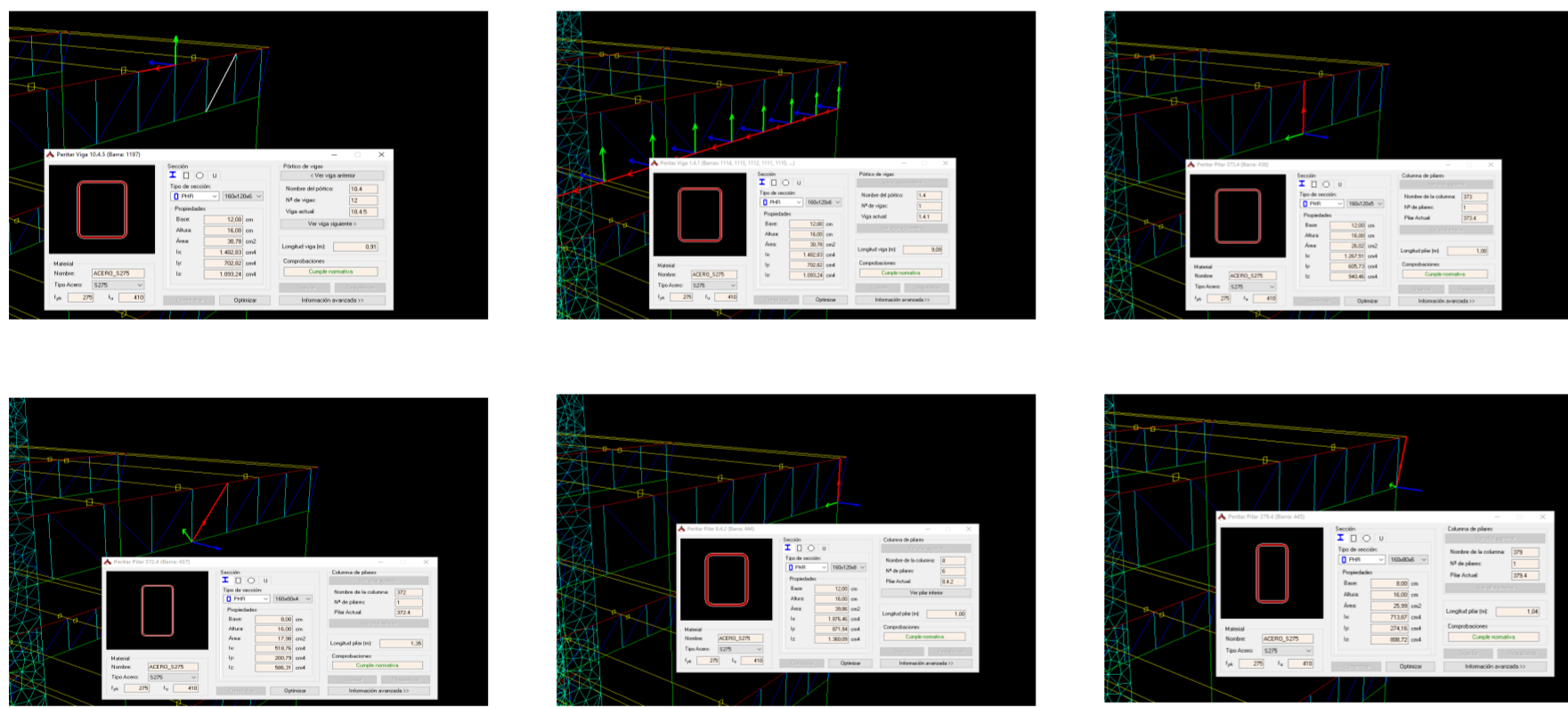
# VERIFICATION OF THE DIMENSIONING OF THE STRUCTURAL ELEMENTS - ARCHITRAVE

The structure was dimensioned and calculated using the programme Architrave.

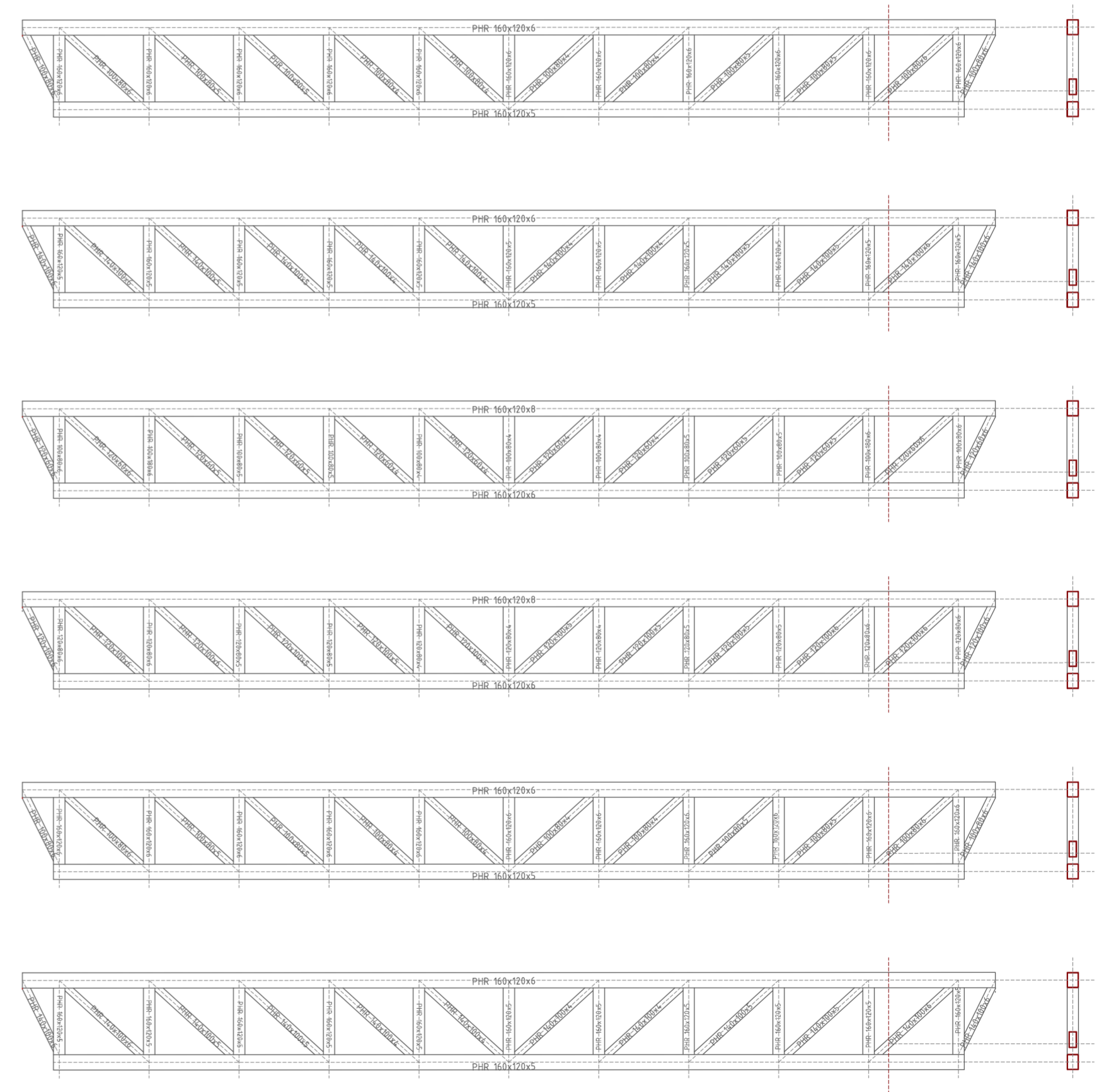
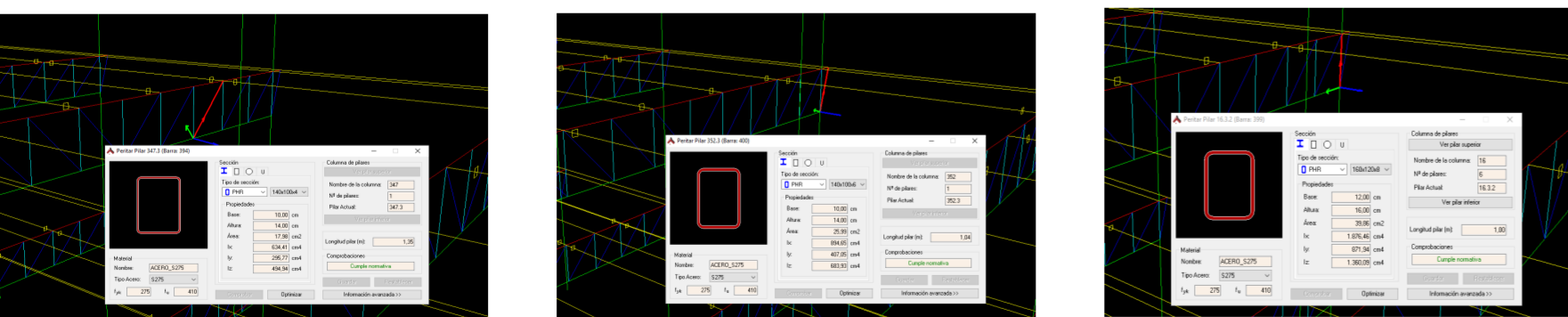
## EXTERNAL SUPPORT ELEMENTS



## EXTERNAL TRUSSES



## INNER TRUSSES



TRUSSES FORMING SCHEME  
GRAPHIC SCALE 1:50

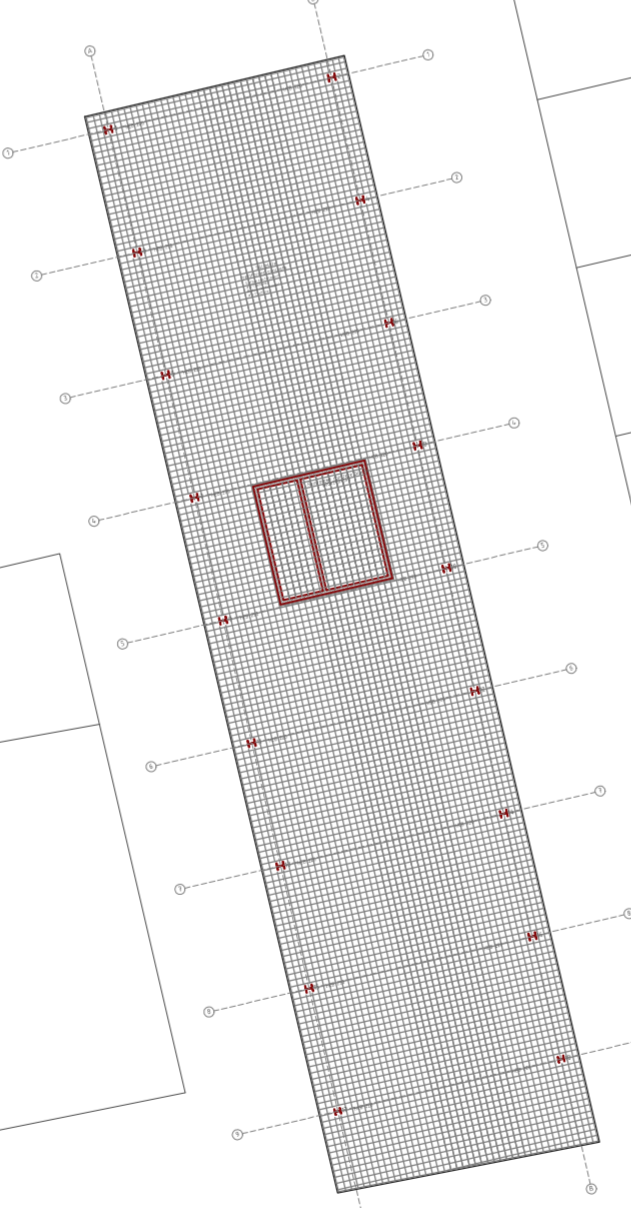
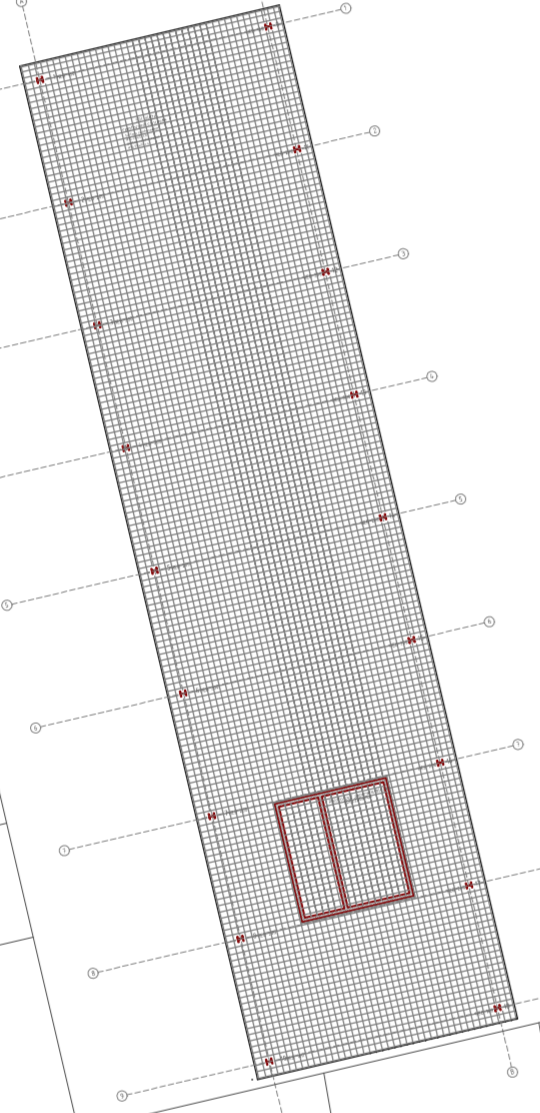
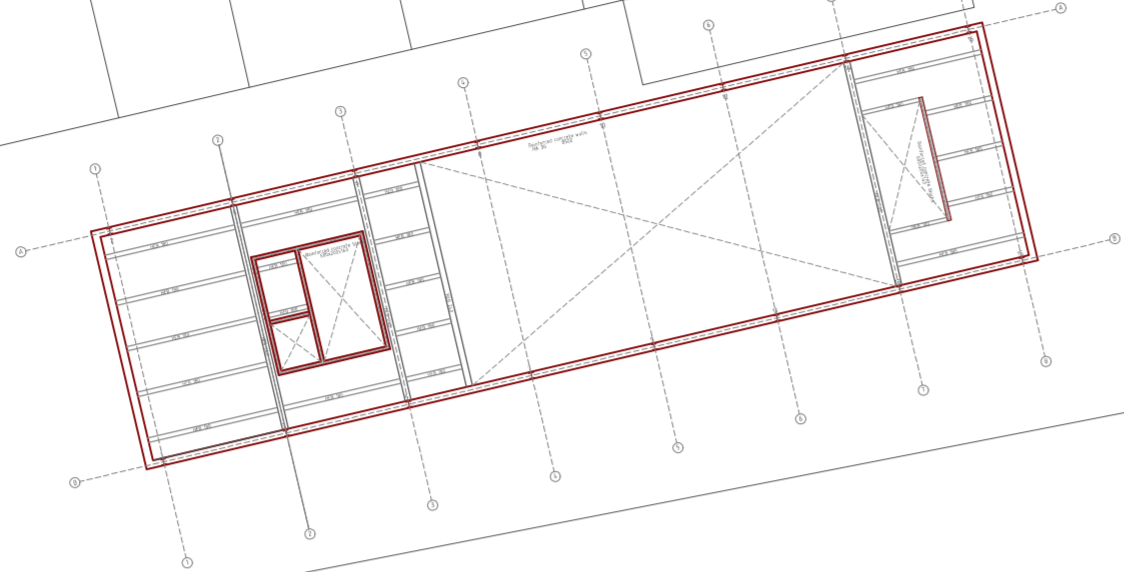






REINFORCED CONCRETE						
Type	$f_{ck}$ (N/mm <sup>2</sup> )	$\alpha$ long term	$\gamma_c$	Steel pilars	Steel beams	$\gamma_s$
HA30	30,00	1,00	1,50	B500	B500	1,15

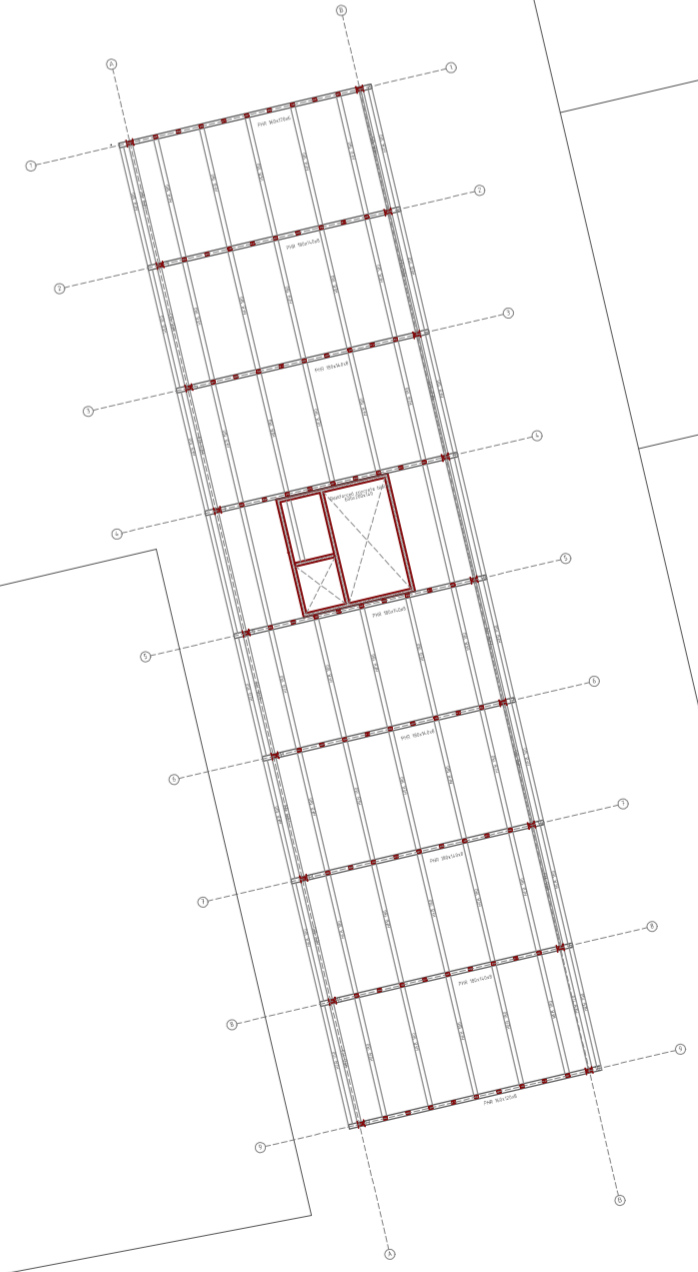
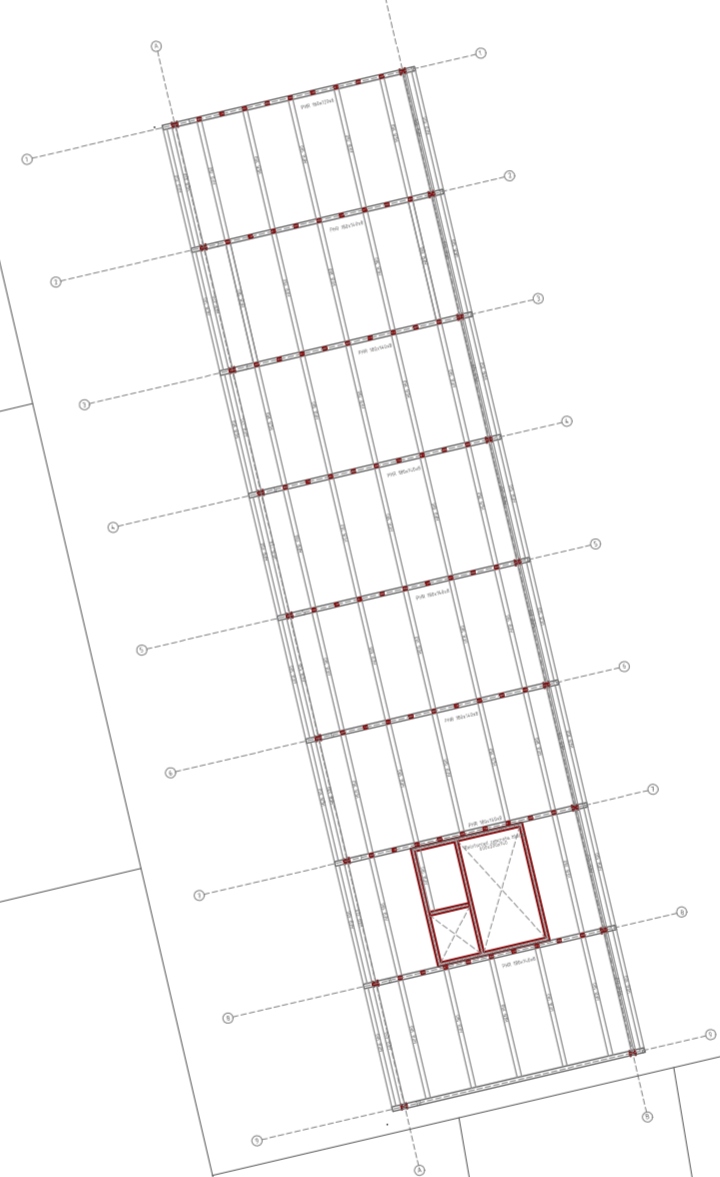
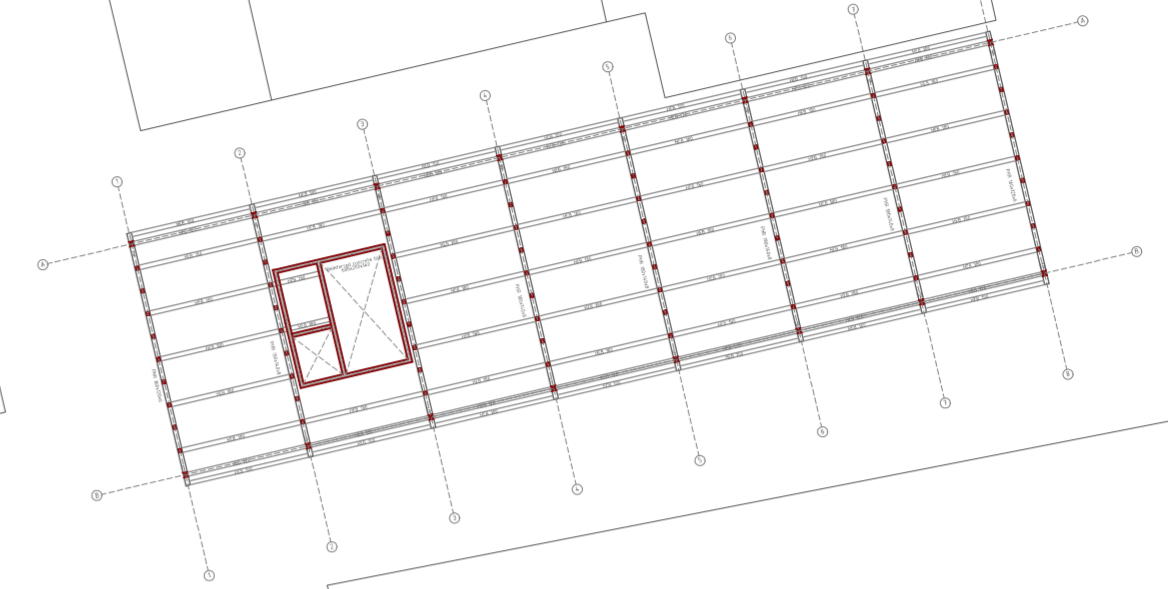
STEEL					
Type	$f_y$ (N/mm <sup>2</sup> )	$f_u$ (N/mm <sup>2</sup> )	$\gamma_{M0}$	$\gamma_{M1}$	$\gamma_{M2}$
S275	275,00	410,00	1,05	1,05	1,25



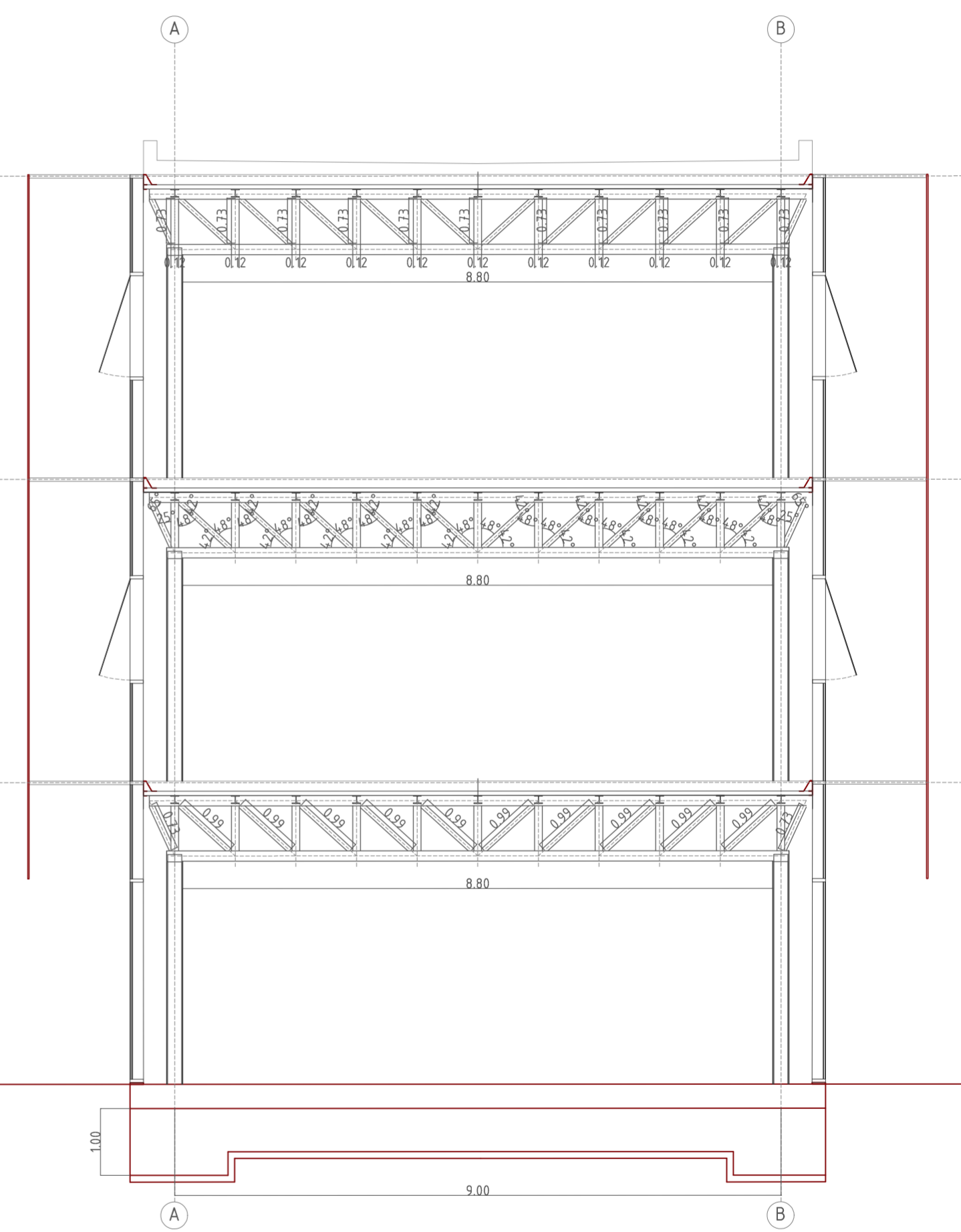
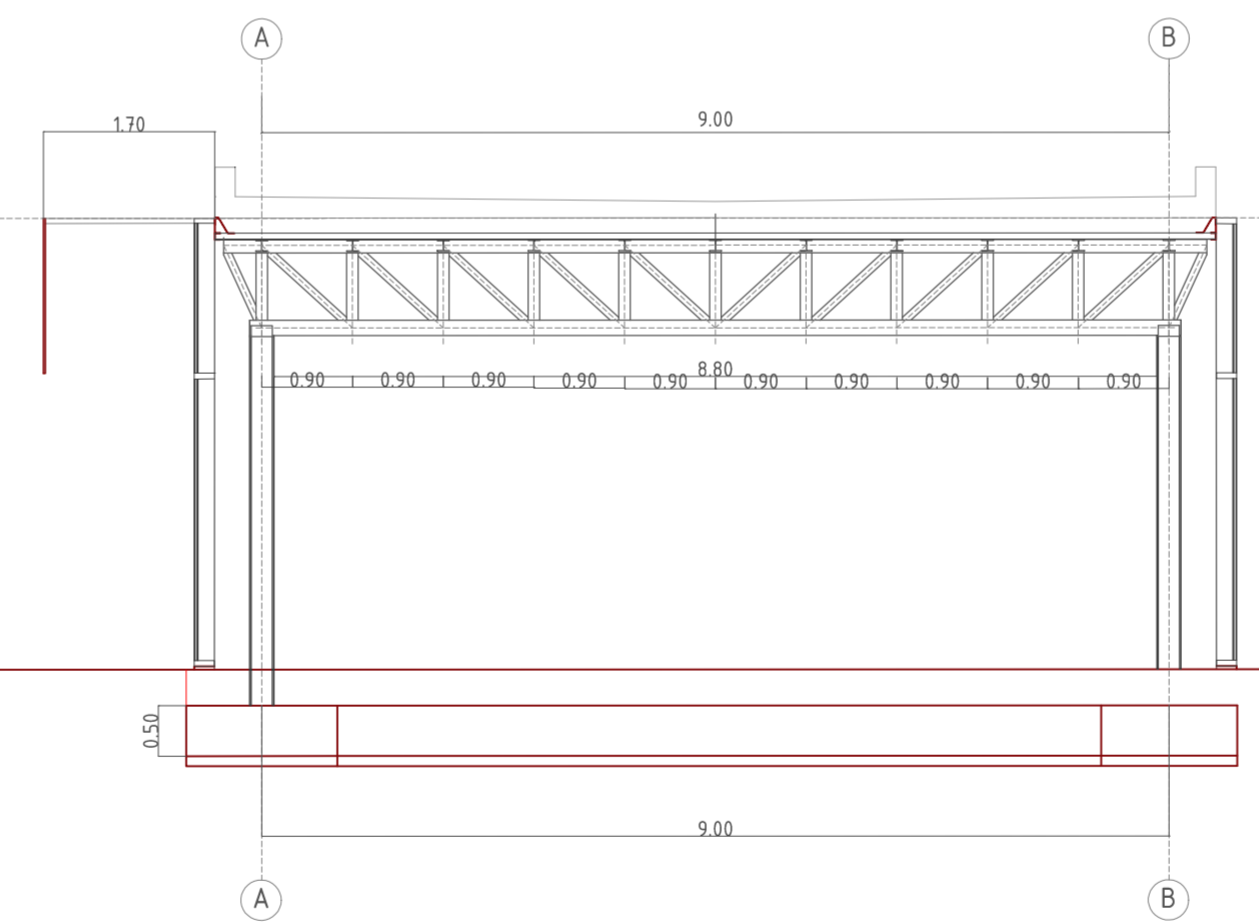
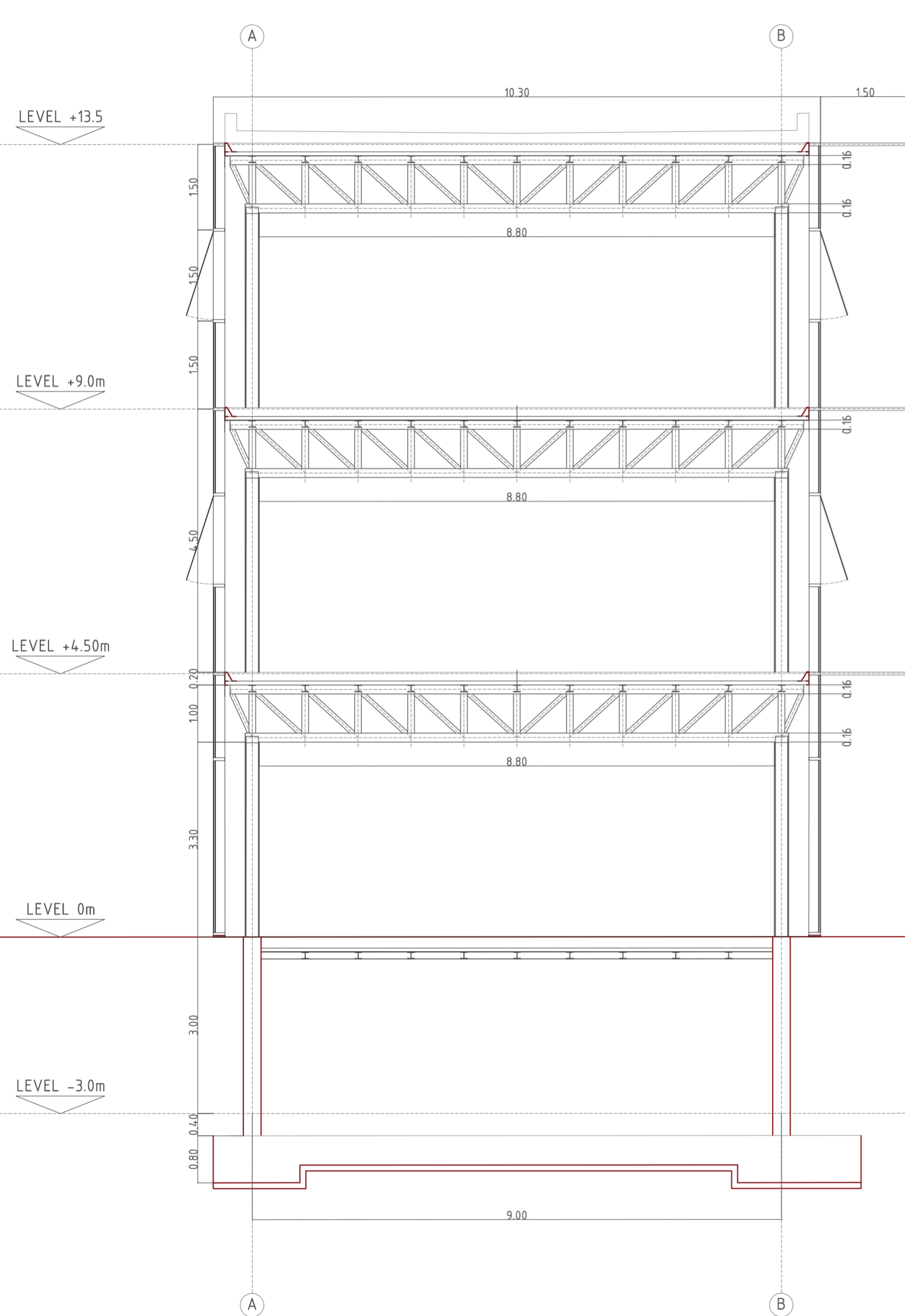
STRUCTURE PLAN LEVEL 0m  
GRAPHIC SCALE 1:300

REINFORCED CONCRETE						
Type	$f_{ck}$ (N/mm <sup>2</sup> )	$\alpha$ long term	$\gamma_c$	Steel pilars	Steel beams	$\gamma_s$
HA30	30,00	1,00	1,50	B500	B500	1,15

STEEL					
Type	$f_y$ (N/mm <sup>2</sup> )	$f_u$ (N/mm <sup>2</sup> )	$\gamma_{M0}$	$\gamma_{M1}$	$\gamma_{M2}$
S275	275,00	410,00	1,05	1,05	1,25



STRUCTURE PLAN LEVEL 4.5m  
GRAPHIC SCALE 1:300



PILLARS BUILDING 1			
	Storey 1	Storey 2	Storey 3
End pillars	HEB 200	HEB 180	HEB 160
Central pillars	HEB 220	HEB 220	HEB 200

PILLARS BUILDING 2	
	Storey 1
End pillars	HEB 200
Central pillars	HEB 220

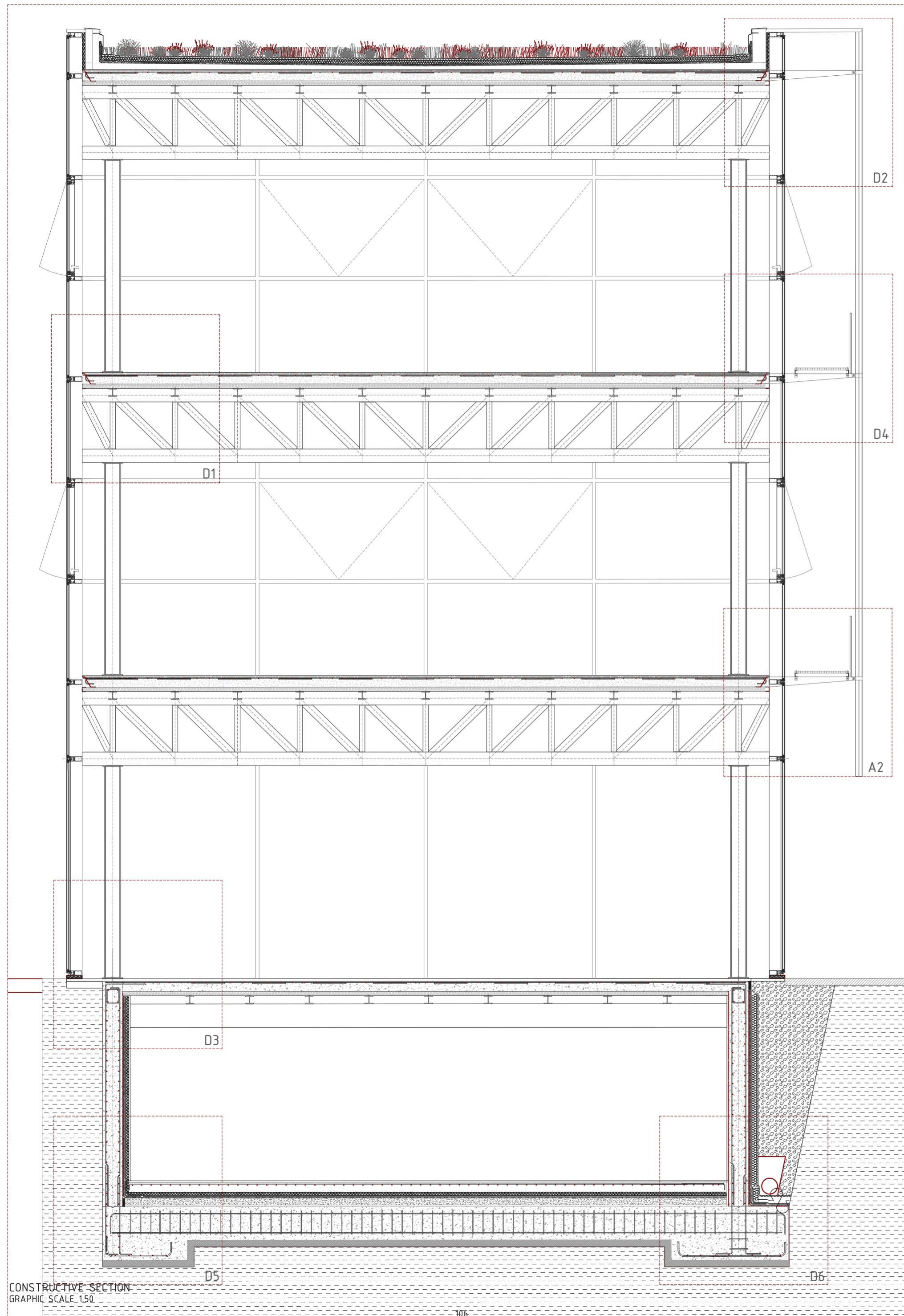
PILLARS BUILDING 3			
	Storey 1	Storey 2	Storey 3
End pillars	HEB 200	HEB 180	HEB 160
Central pillars	HEB 220	HEB 220	HEB 200



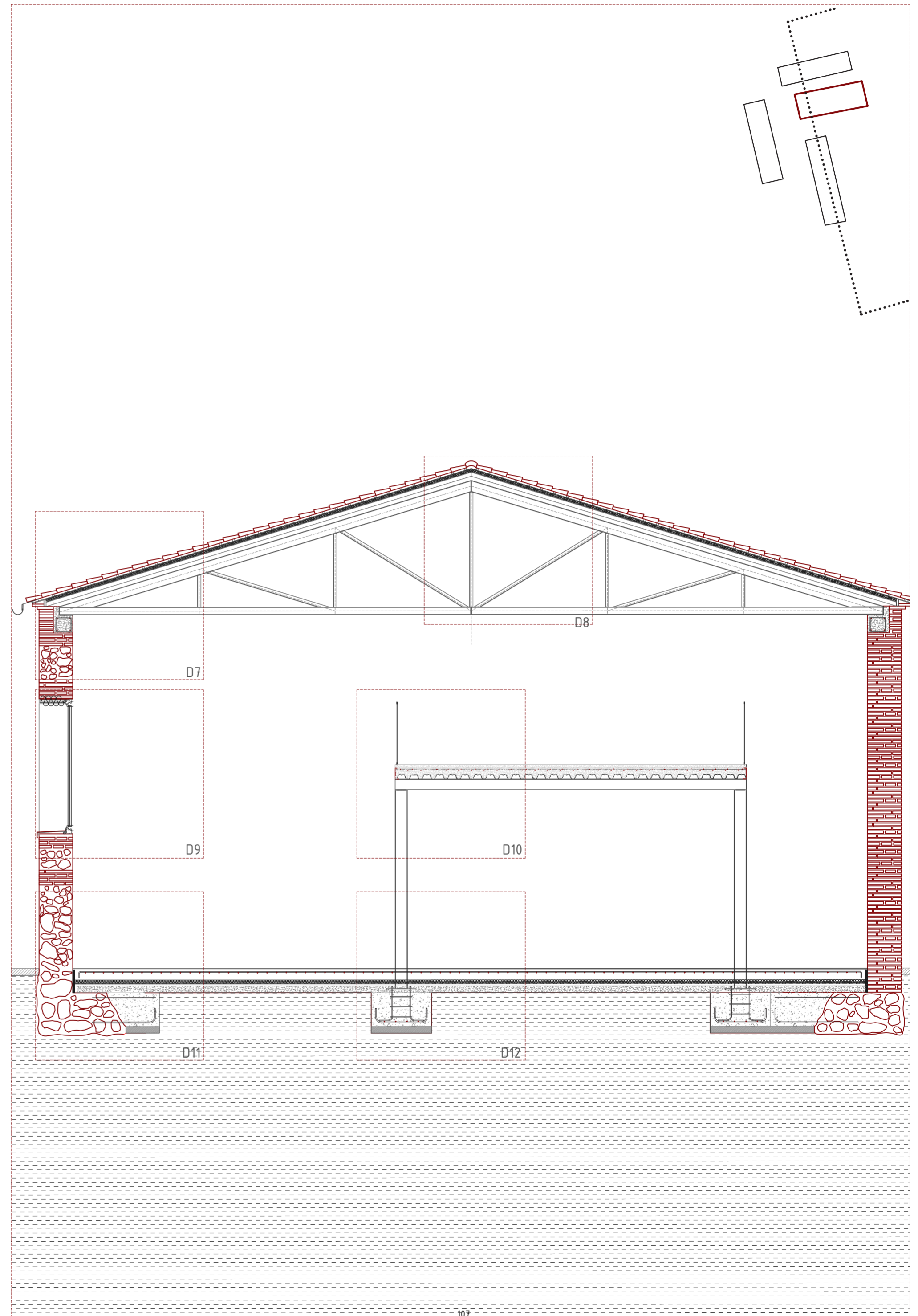
6.

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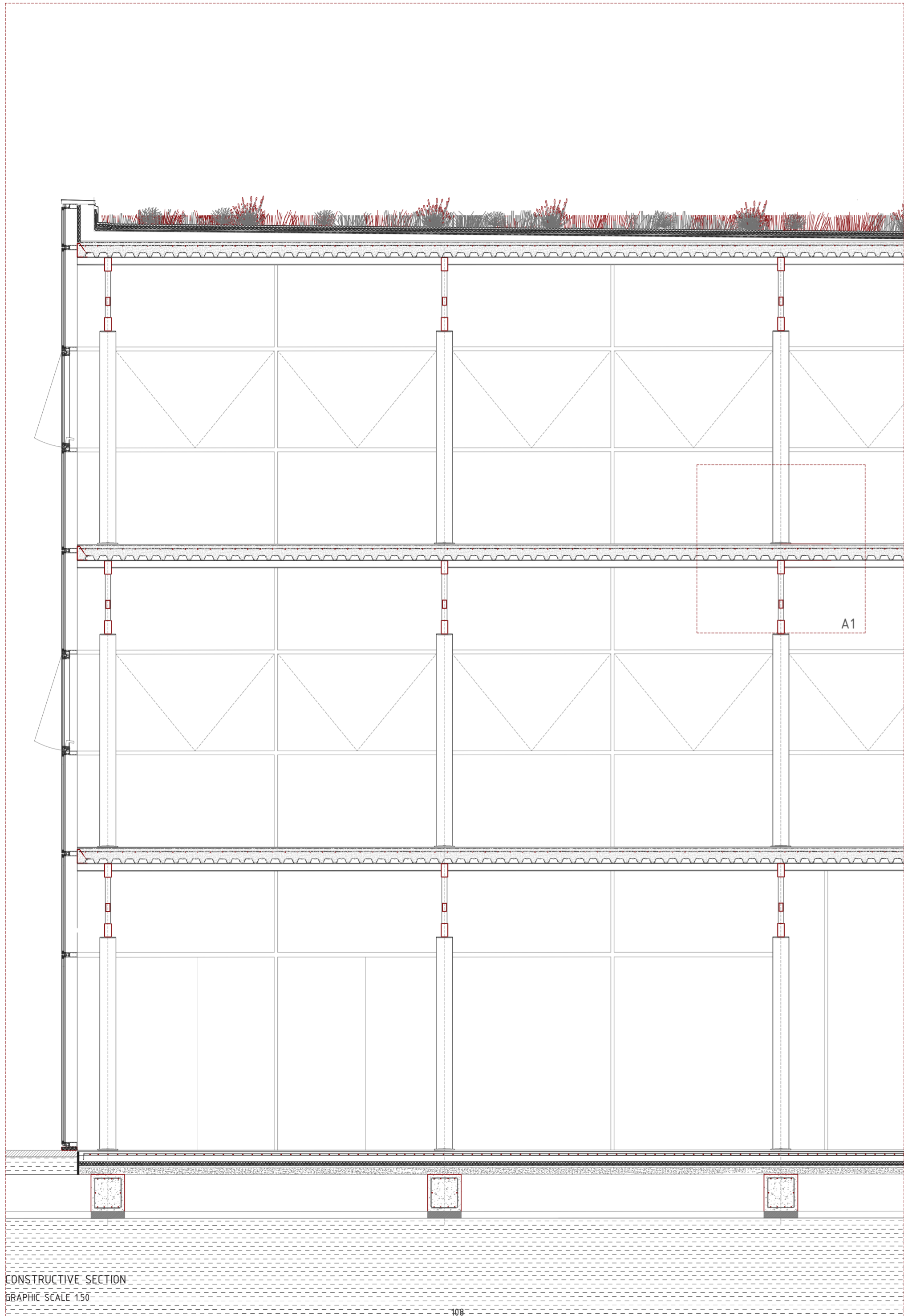
THE CONSTRUCTION



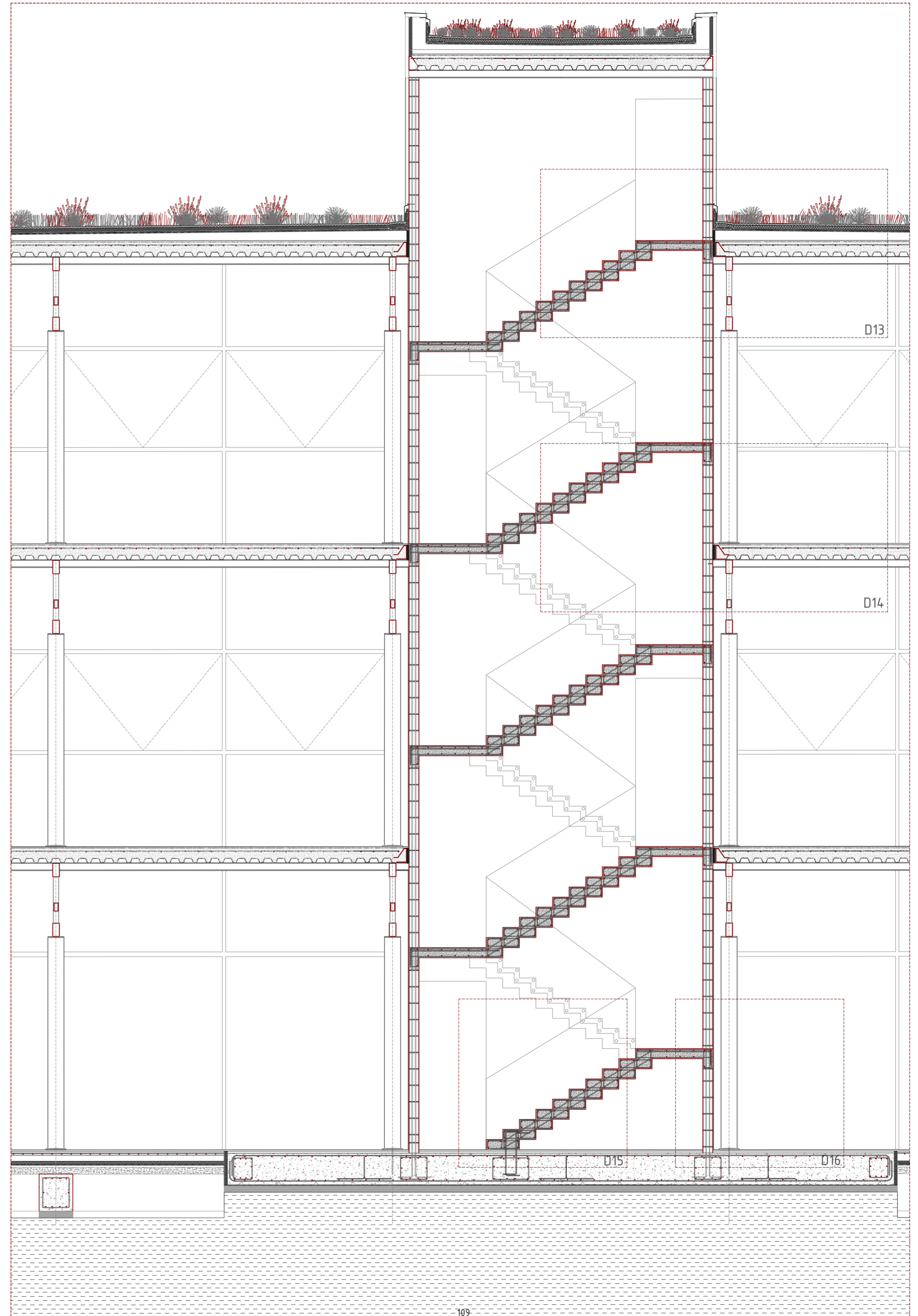
CONSTRUCTIVE SECTION  
GRAPHIC SCALE 1:50



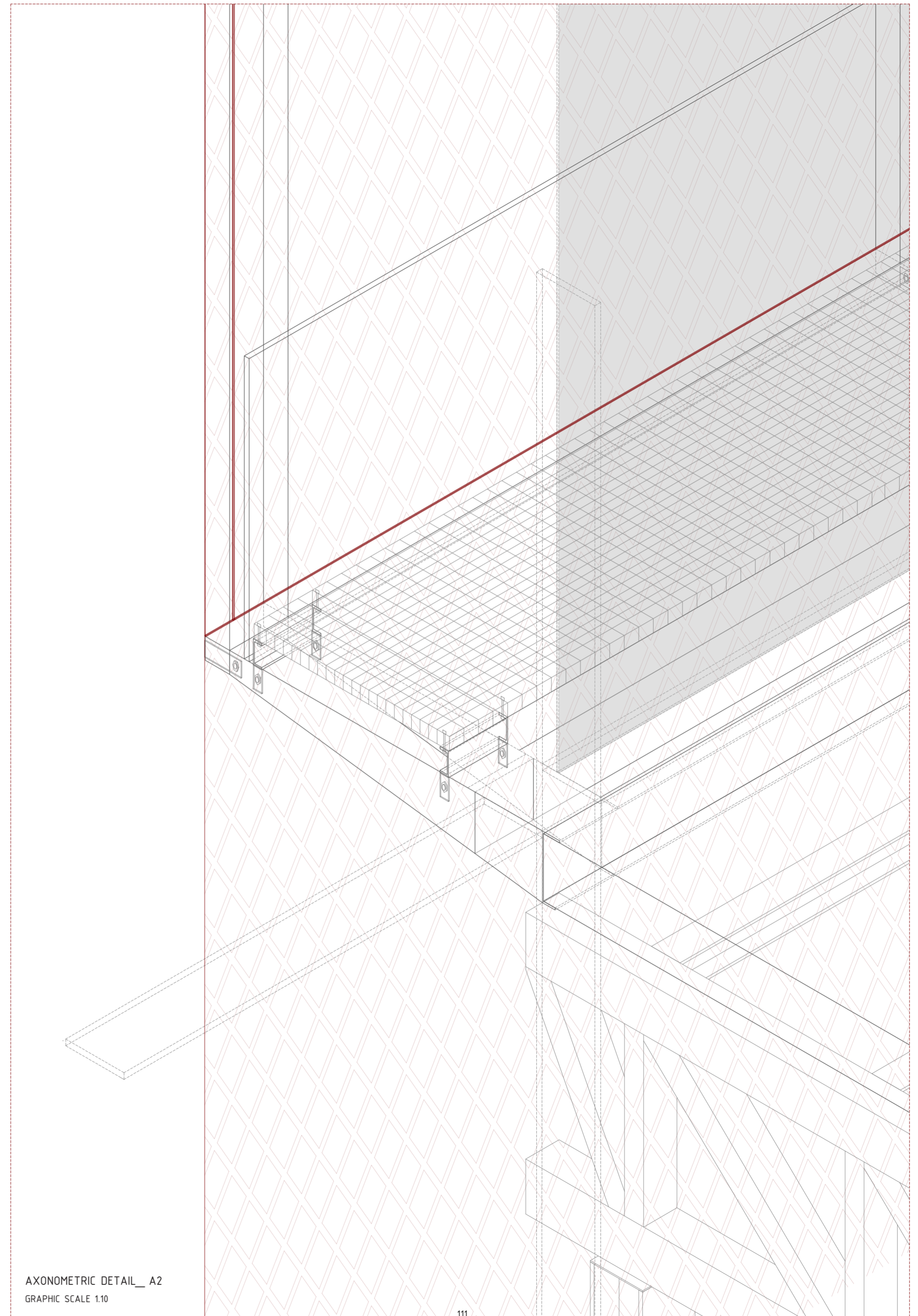
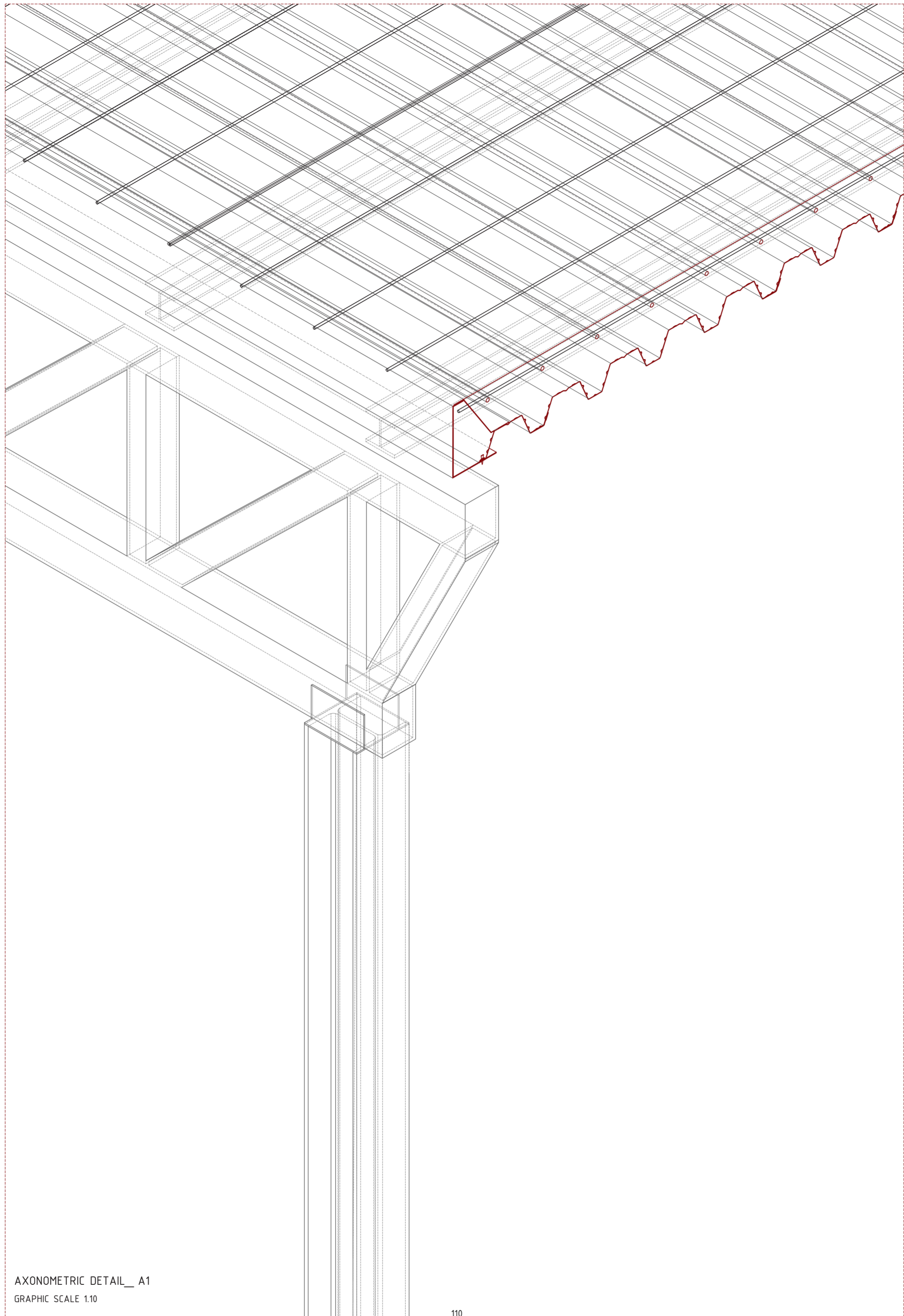




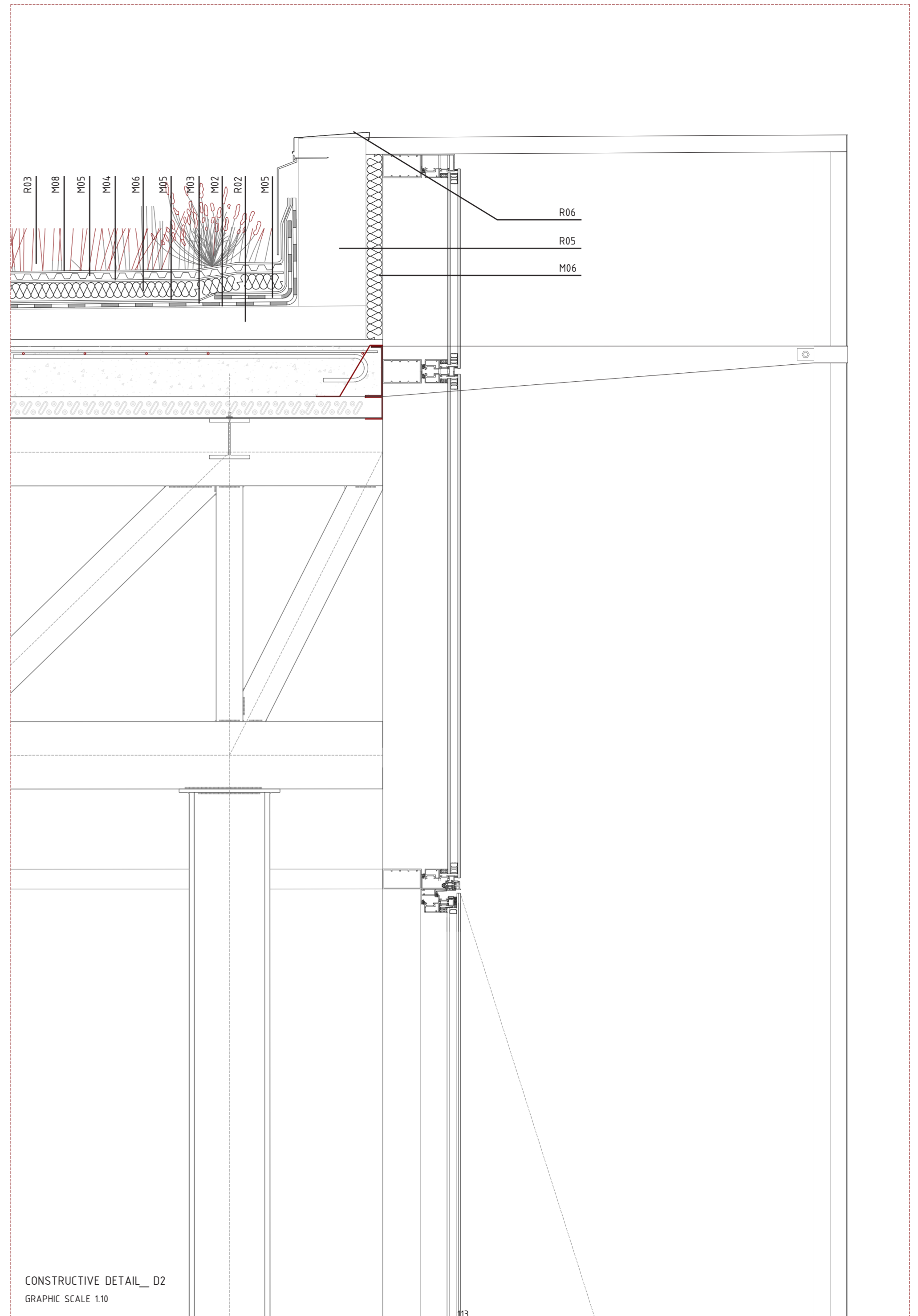
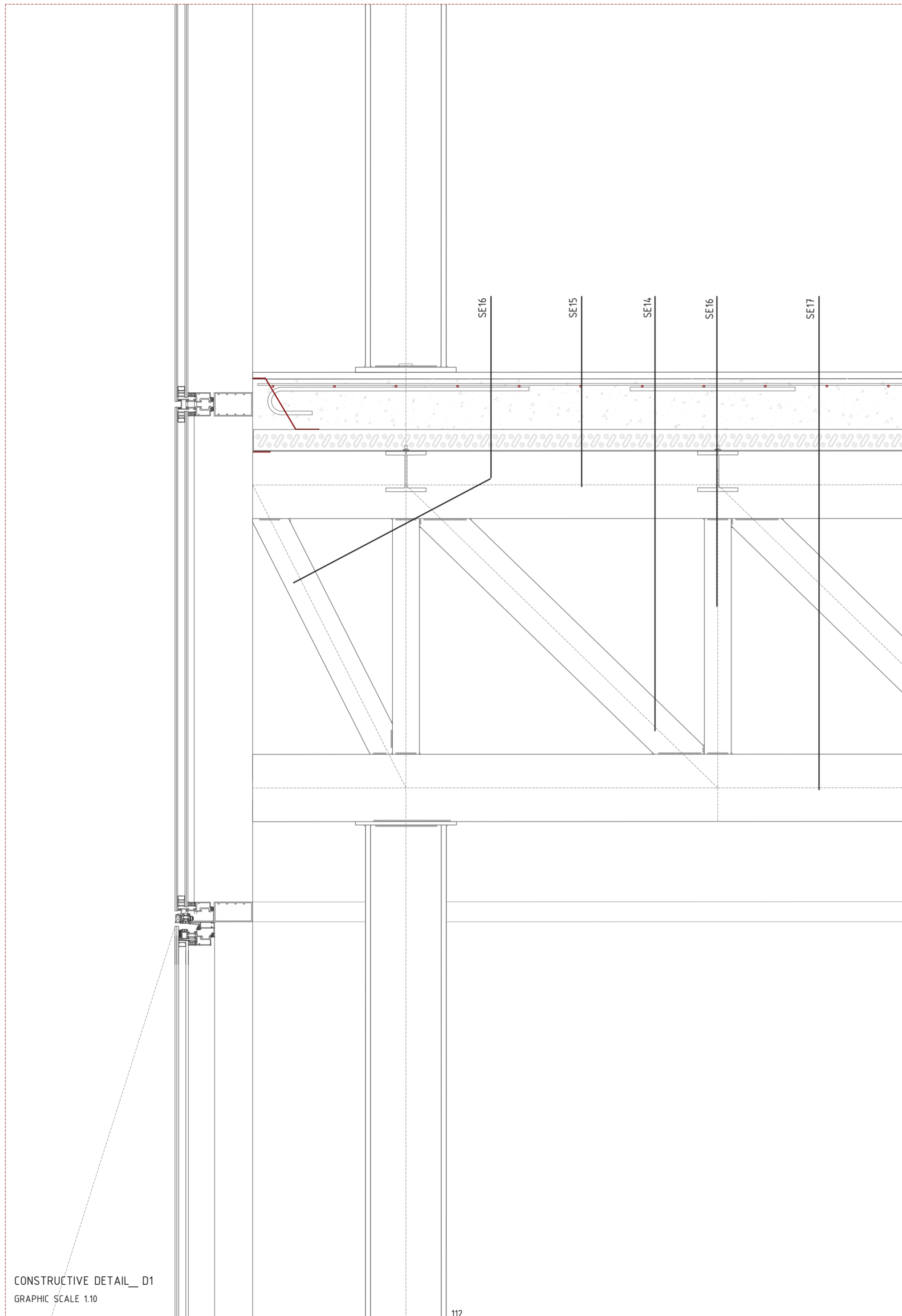
CONSTRUCTIVE SECTION  
GRAPHIC SCALE 1:50



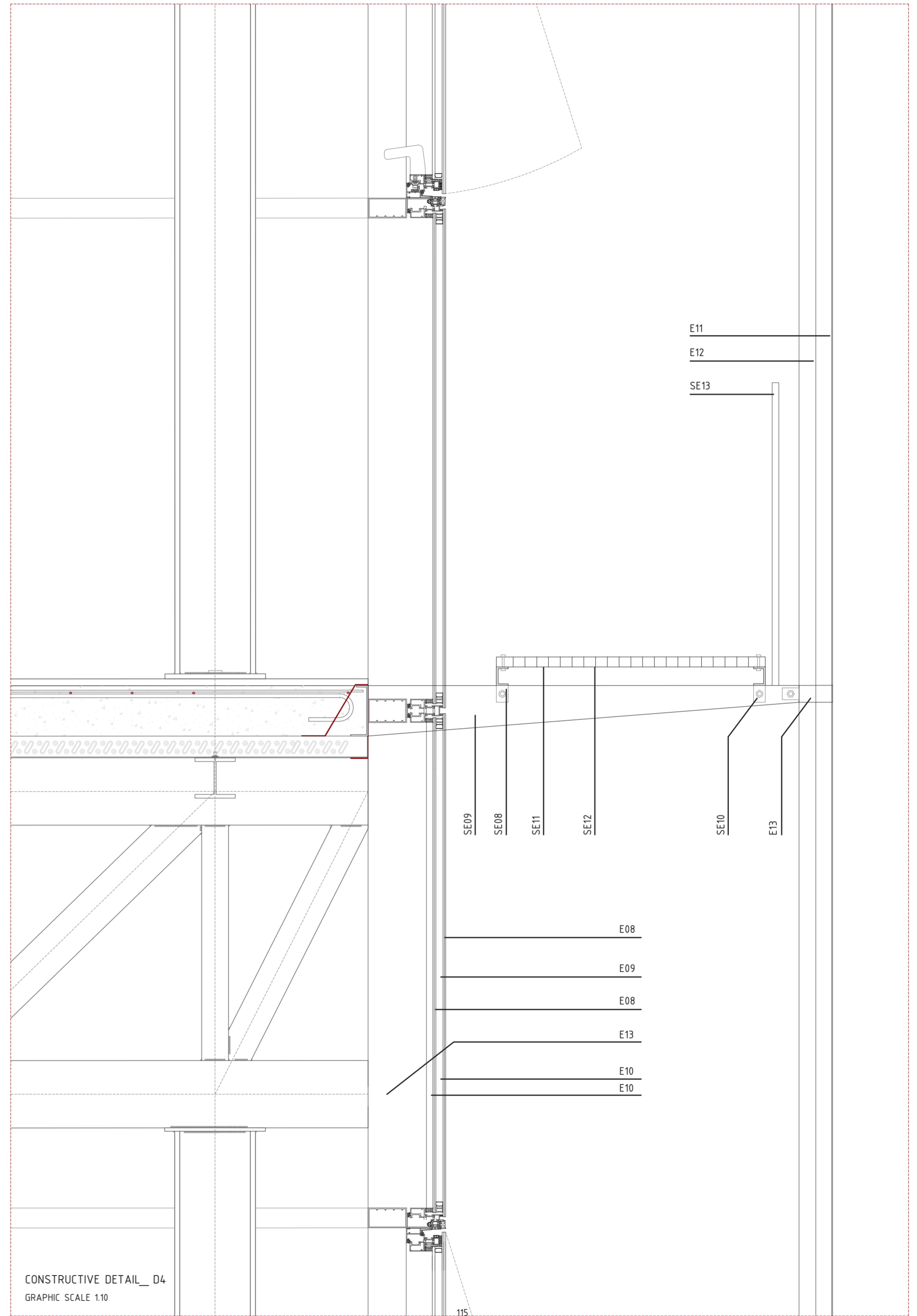
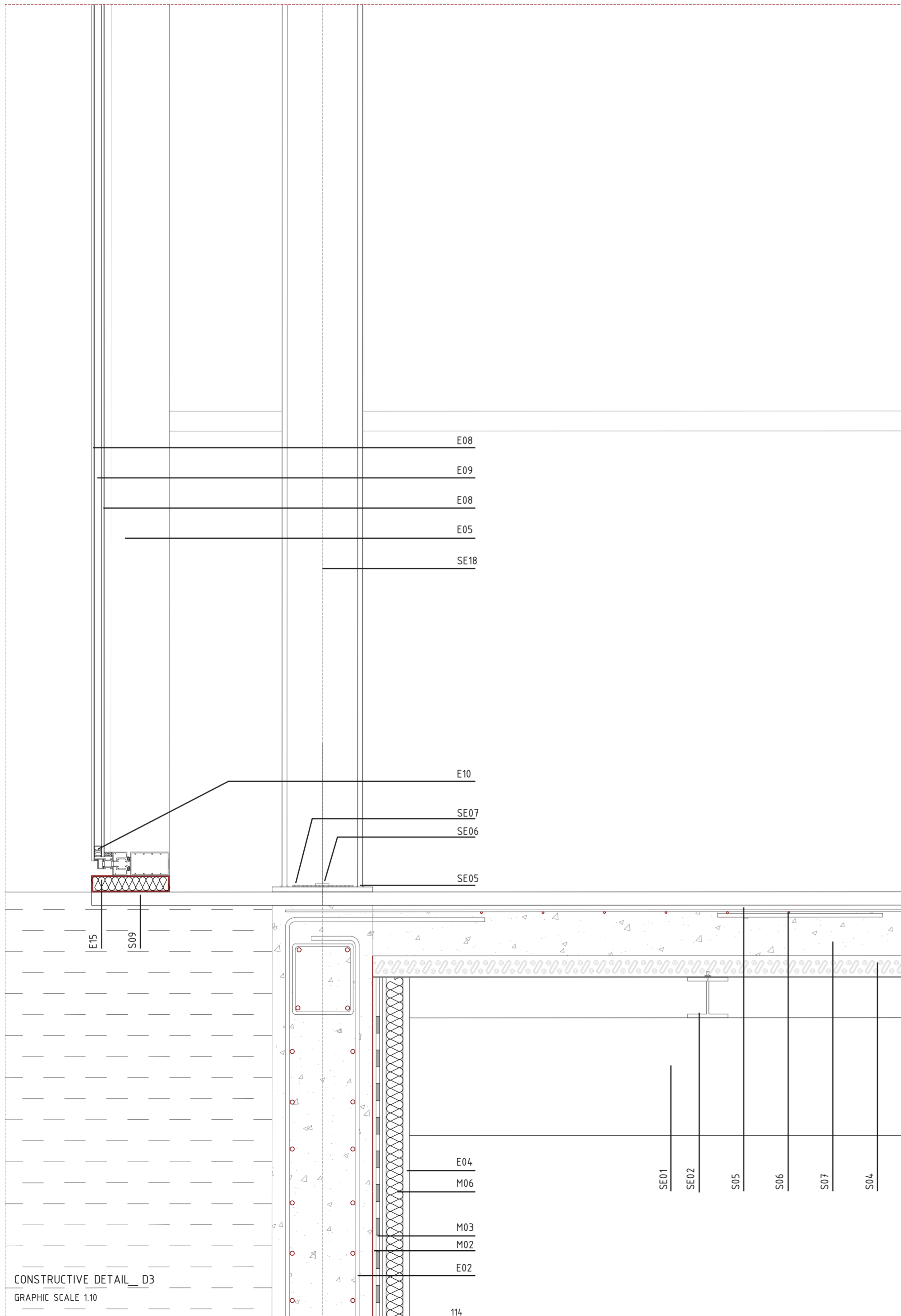


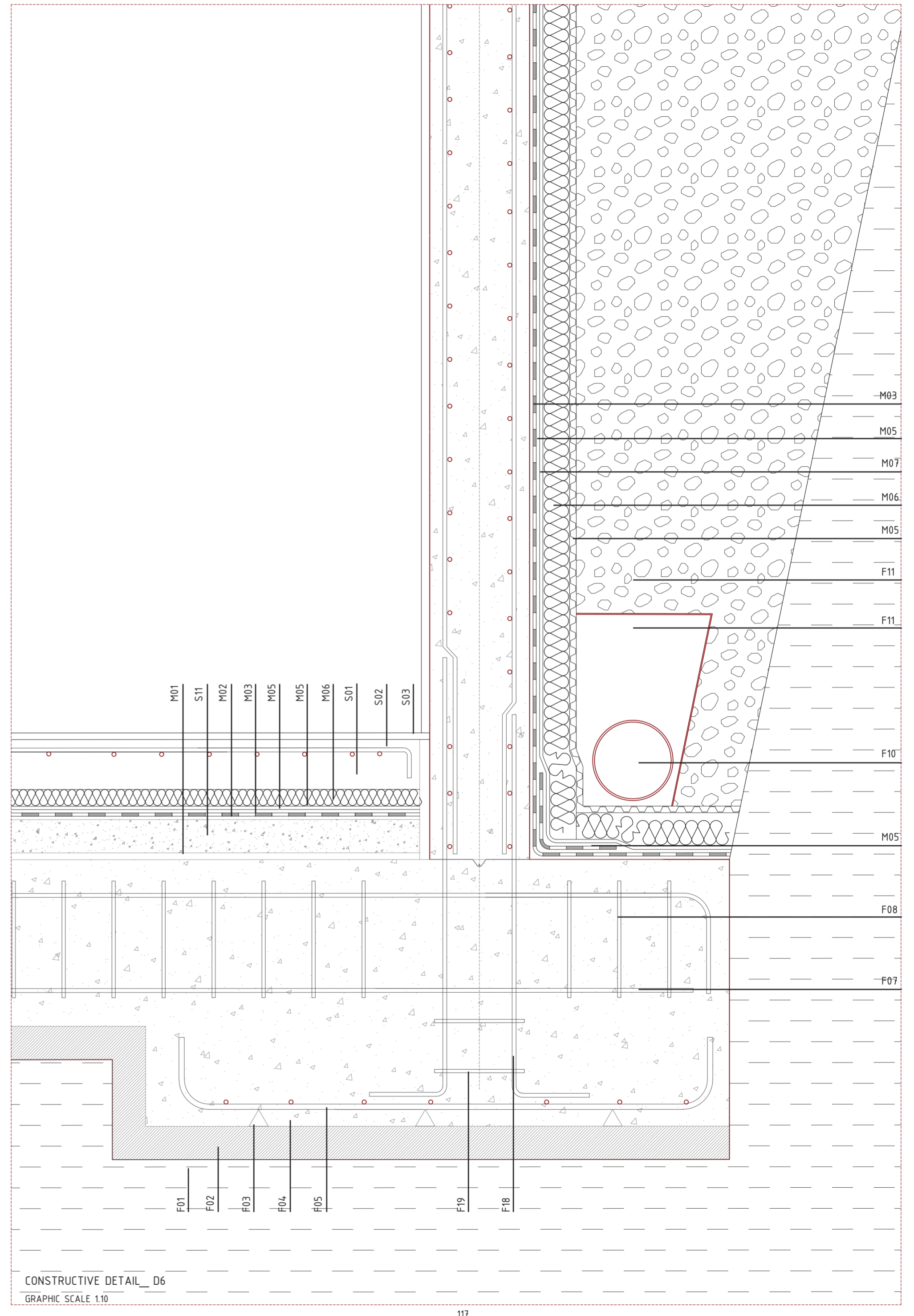
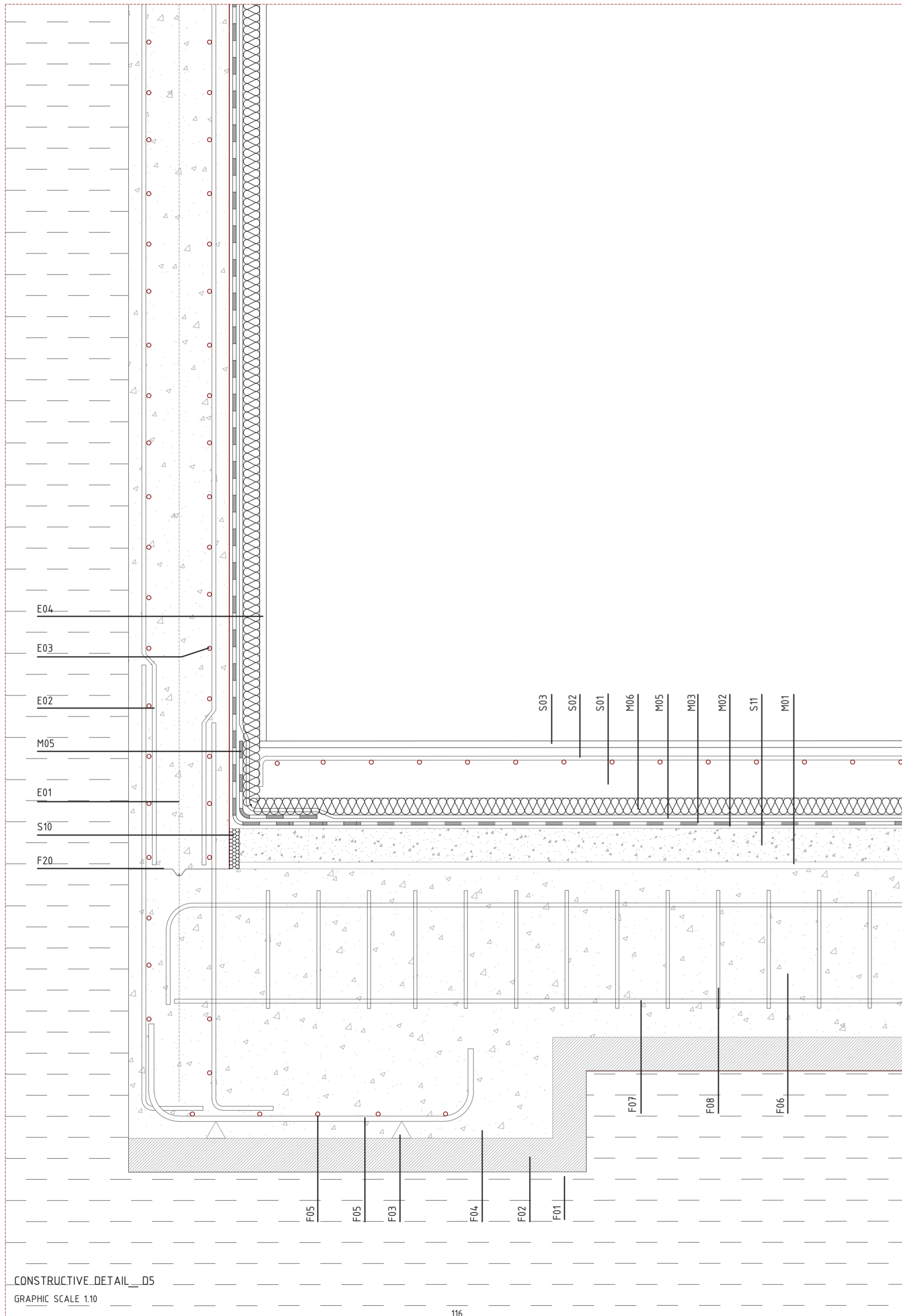




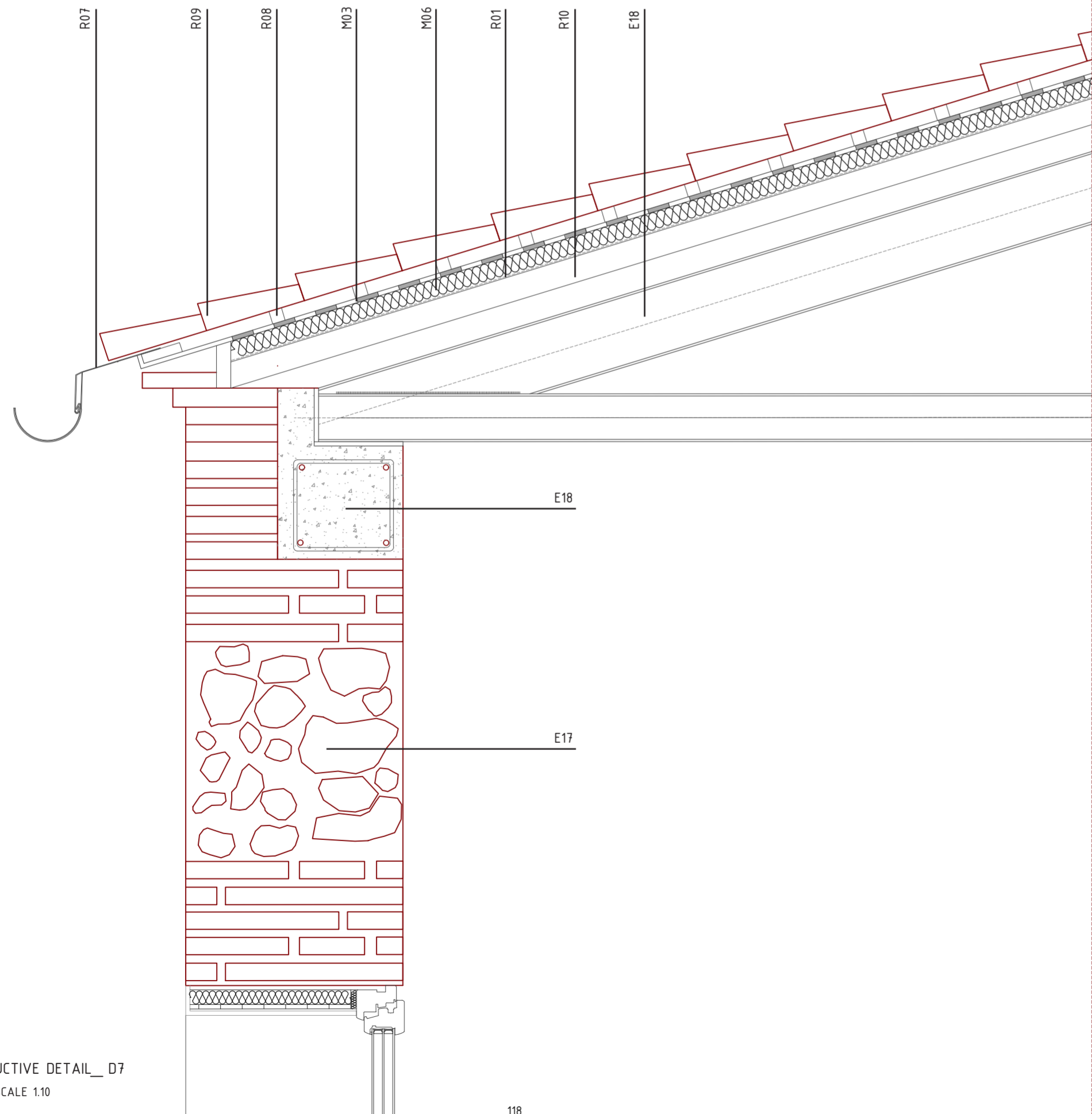




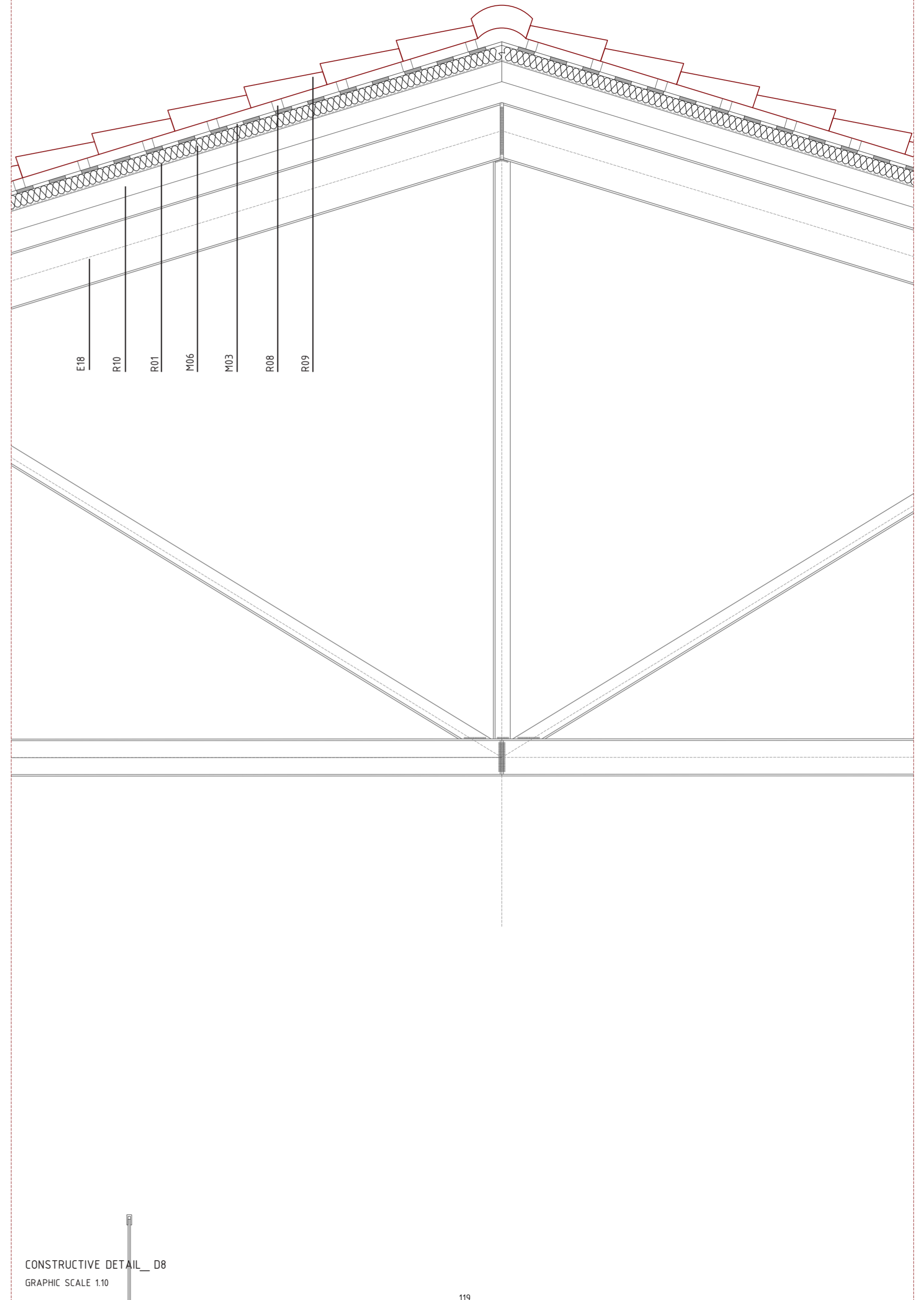




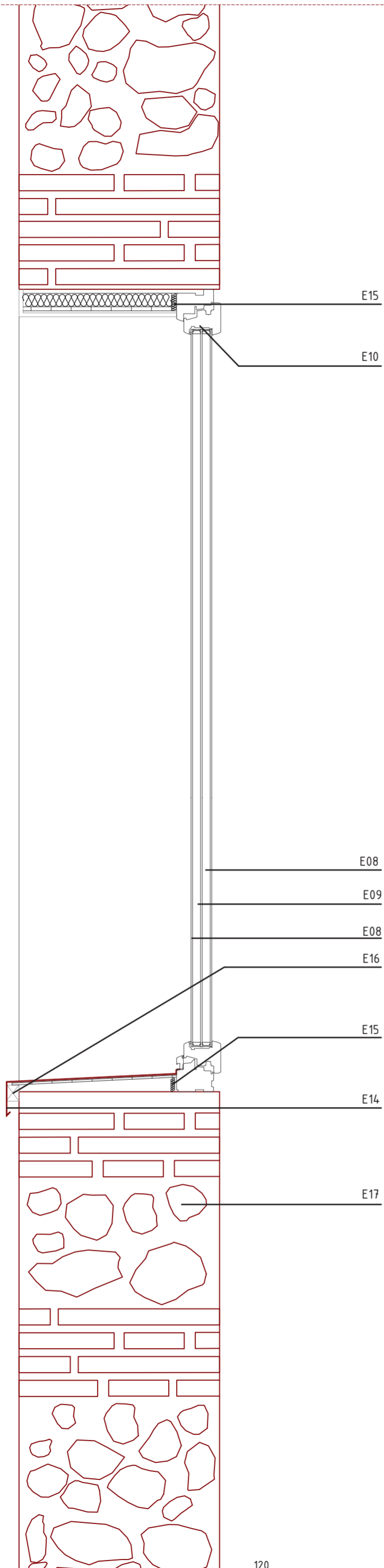




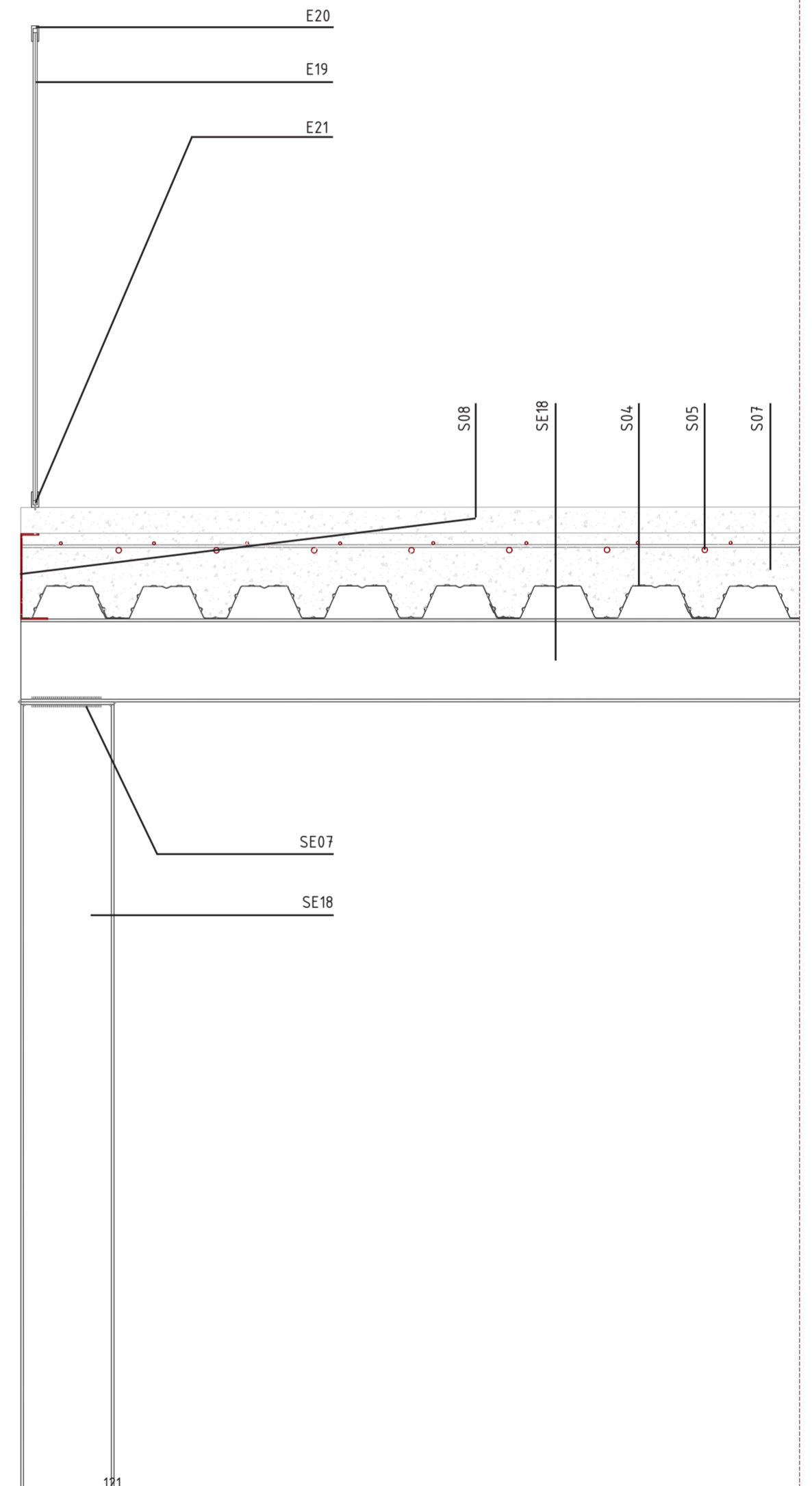
CONSTRUCTIVE DETAIL\_D7  
GRAPHIC SCALE 1:10



CONSTRUCTIVE DETAIL\_D8  
GRAPHIC SCALE 1:10

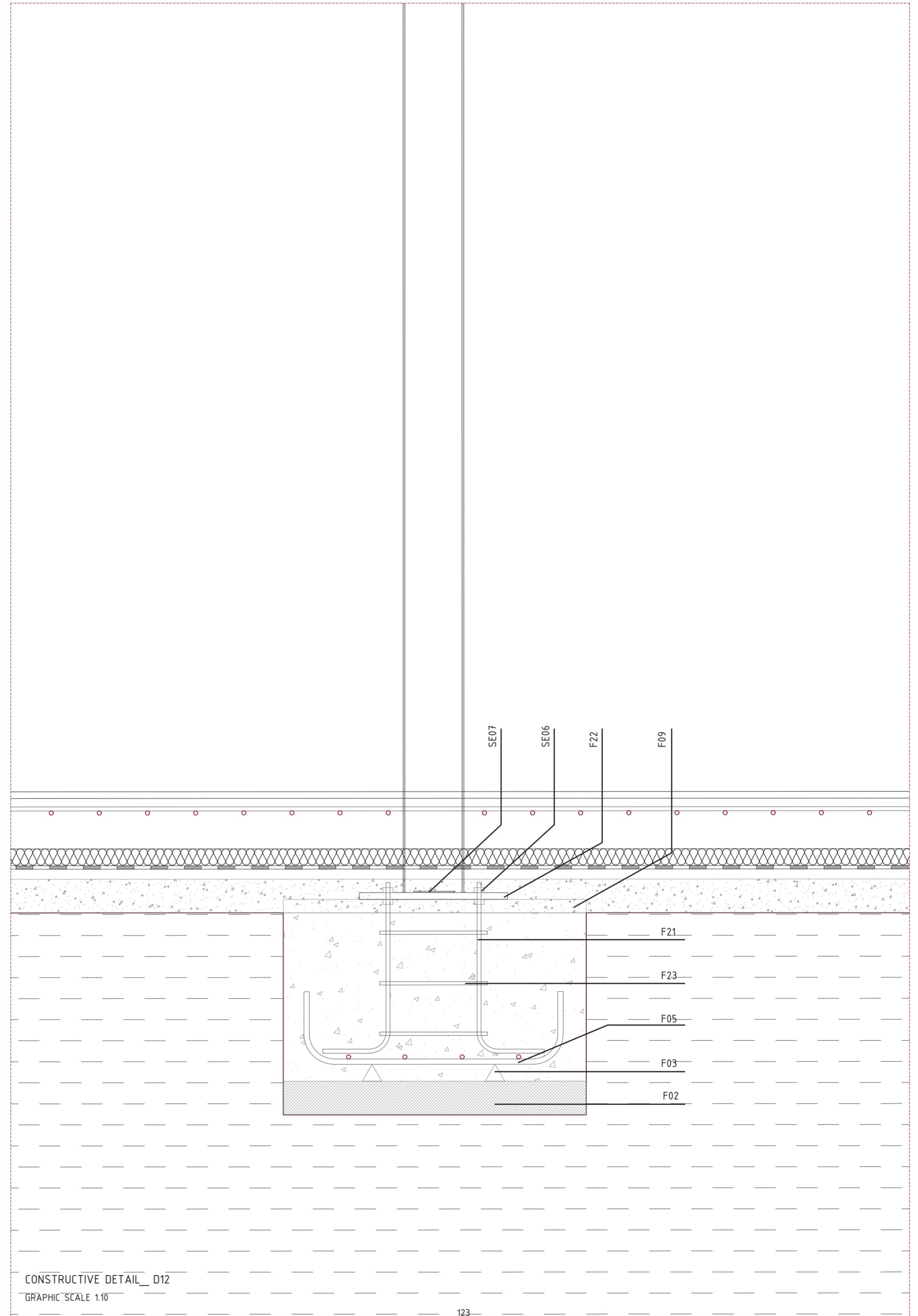
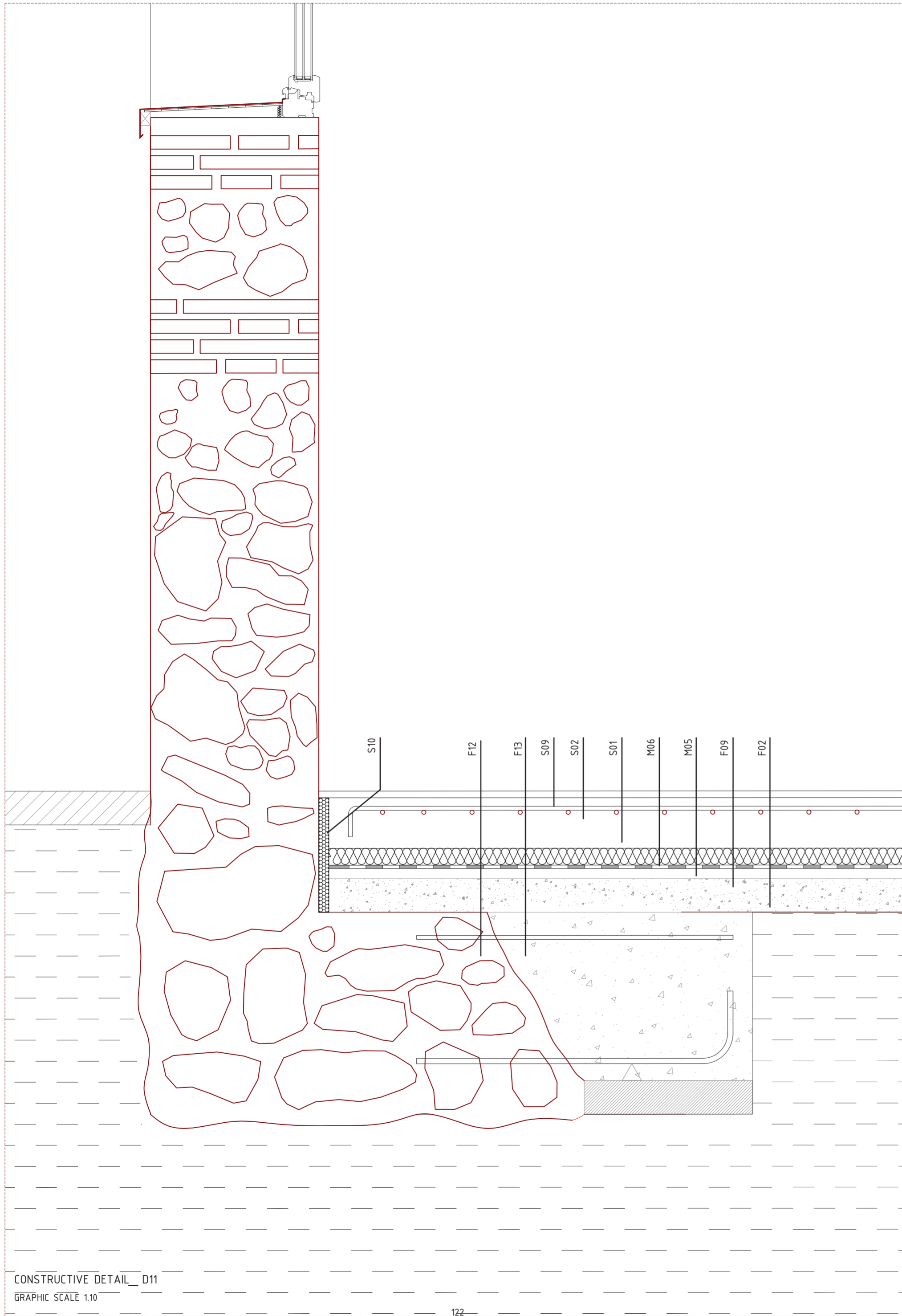


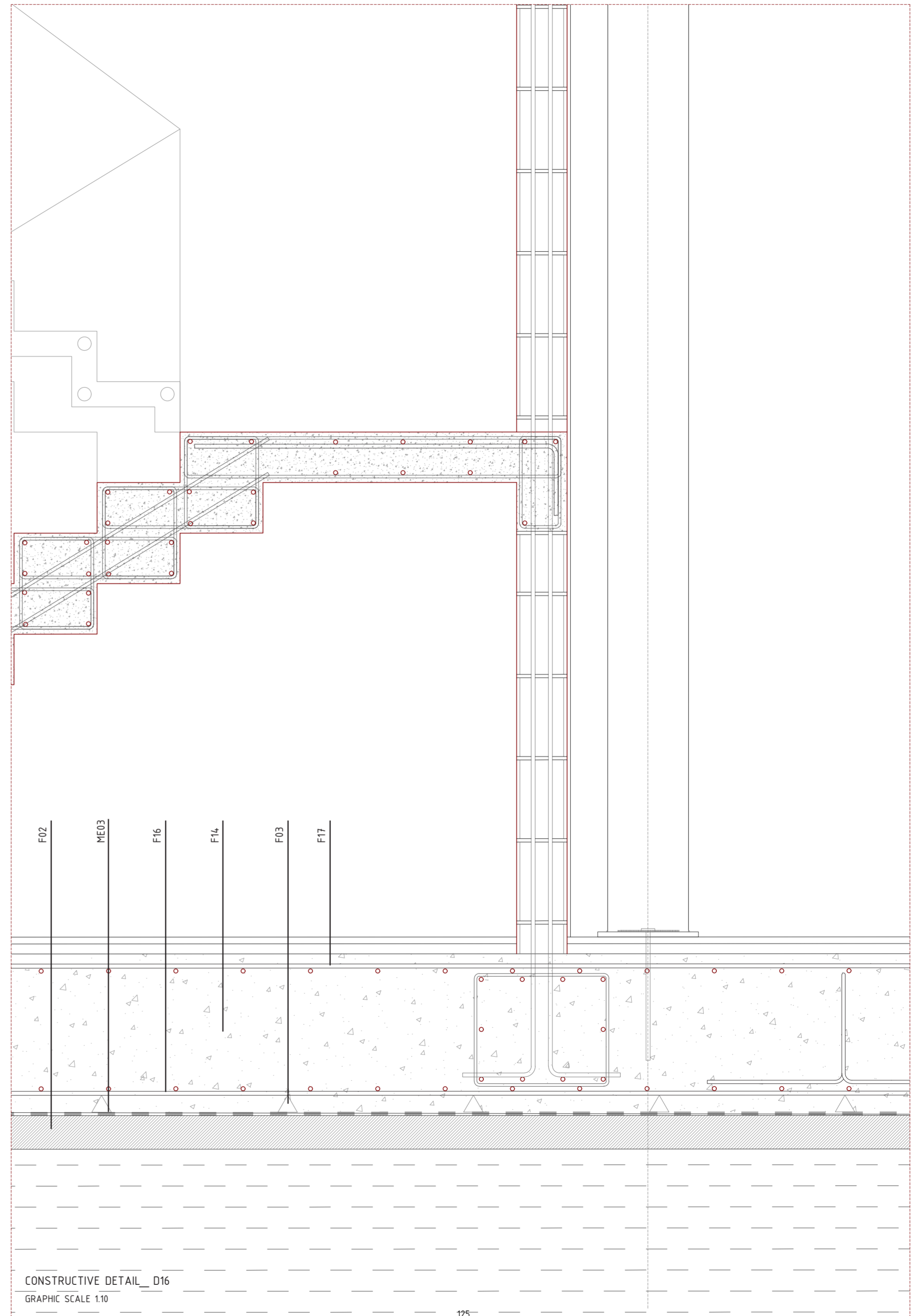
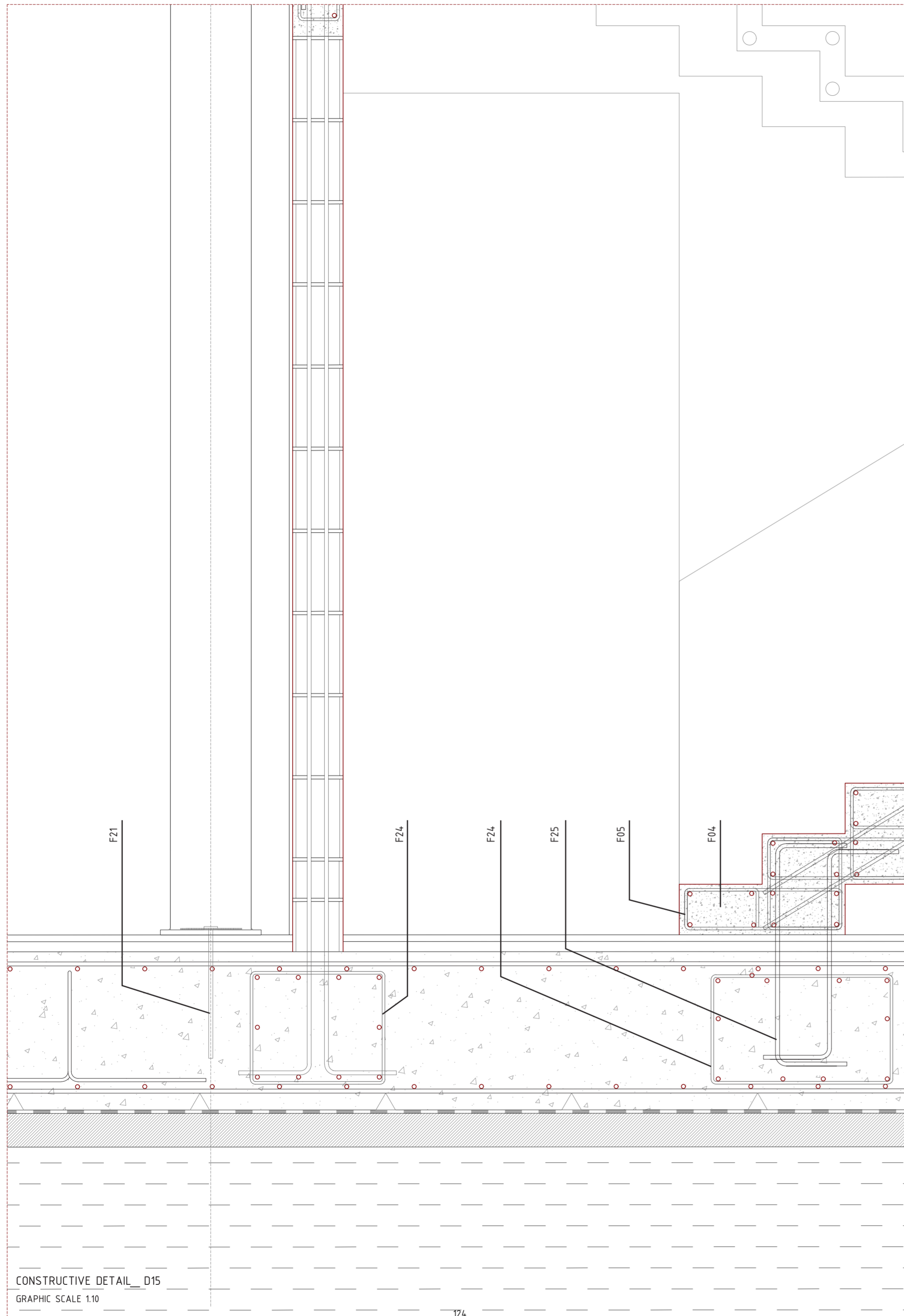
CONSTRUCTIVE DETAIL\_D9  
GRAPHIC SCALE 1:10



CONSTRUCTIVE DETAIL\_D10  
GRAPHIC SCALE 1:10









**FOUNDATION (F)**

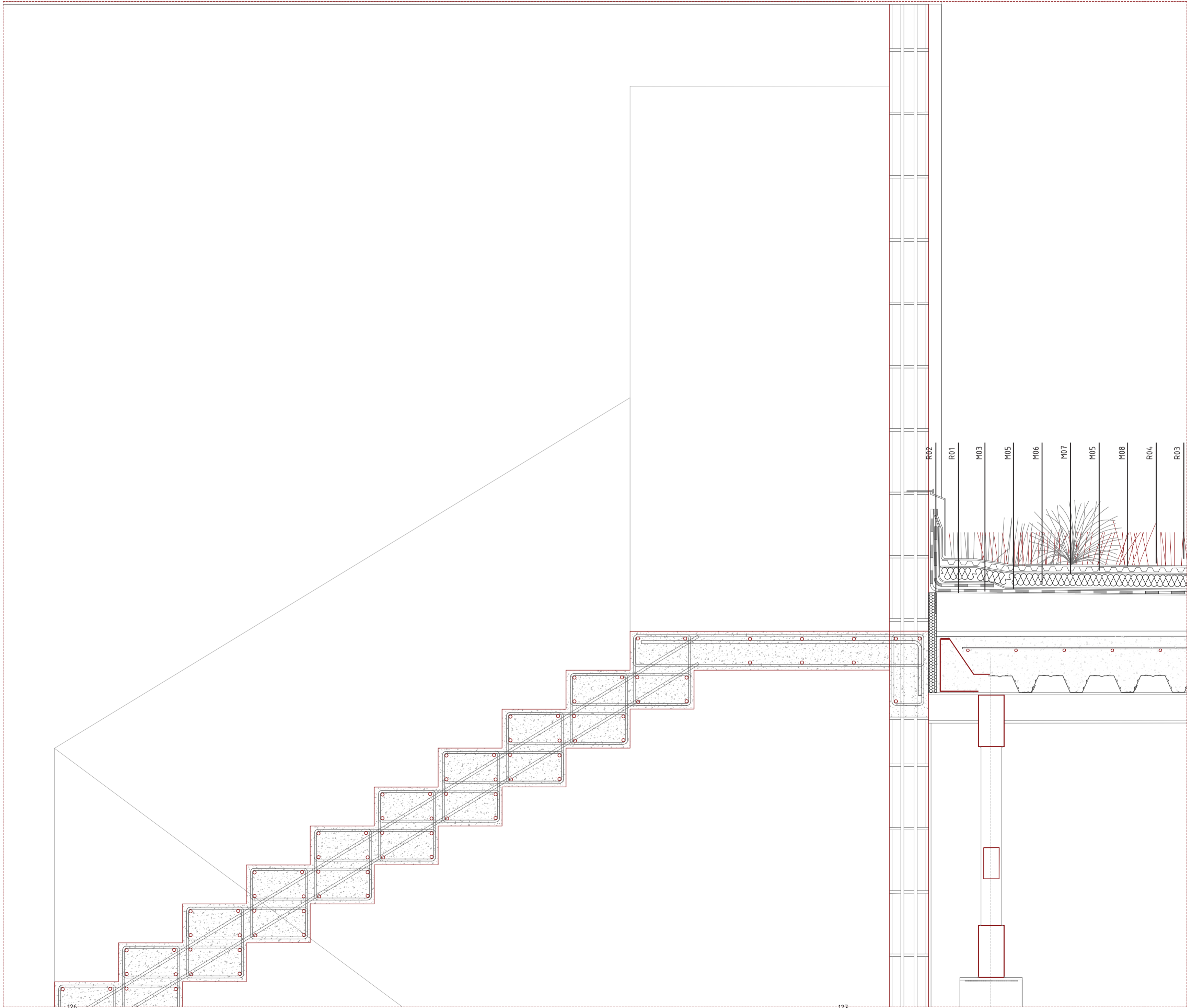
- F01\_Compacted base
- F02\_Mud slab
- F03\_Mesh spacers
- F04\_HA30 concrete
- F05\_Bottom footing reinforcement  $\varnothing 16$
- F06\_Strap beam
- F07\_Strap beam reinforcement  $\varnothing 12$
- F08\_Strap beam links  $\varnothing 8$
- F09\_Regulating mortar layer
- F10\_Perforated drainpipe
- F11\_Drainage gravel
- F12\_Original masonry footing
- F13\_Reinforcement footing
- F14\_Foundation slab
- F15\_Top mesh support chairs
- F16\_Bottom slab reinforcement  $\varnothing 16$
- F17\_Top slab reinforcement  $\varnothing 16$
- F18\_Wall reinforcement  $\varnothing 12$
- F19\_Wall links  $\varnothing 10$
- F20\_Shear keys
- F21\_Bolt  $\varnothing 16$
- F22\_Anchorage plate
- F23\_Links  $\varnothing 12$
- F24\_Foundation beam
- F25\_Tie bars
- F26\_Stairs reinforcement

**SLABS (S)**

- S01\_Sill plate
- S02\_Reinforcement sill plate mesh  $\varnothing 16$
- S03\_Coloured polished concrete
- S04\_Corrugated sheet steel profile
- S05\_Anti-fracture mesh
- S06\_Negative framework
- S07\_HA 30 concrete
- S08\_Perimeter section
- S09\_Continuous microcement cladding
- S10\_Expansion joint
- S11\_Mud slab

**ENCLOSURES (E)**

- E01\_HA30 concrete wall
- E02\_Wall reinforcement  $\varnothing 12$
- E03\_Wall links  $\varnothing 8$
- E04\_Continuous microcement cladding
- E05\_Curtain wall uprights
- E06\_Curtain wall transoms
- E07\_Curtain wall
- E08\_Double glass 4+4
- E09\_Air chamber
- E10\_Carpentry with thermal bridge breakage
- E11\_PVC textile netting
- E12\_Skin uprights
- E13\_Skin transoms
- E14\_Sill
- E15\_Polyurethane foam
- E16\_Silicone sealant
- E17\_Original masonry wall
- E18\_Support beam
- E19\_Safety glass
- E20\_Handrails
- E21\_Anchoring
- E22\_Safety glass handrail
- E23\_Rail fasteners



**MEMBRANES (M)**

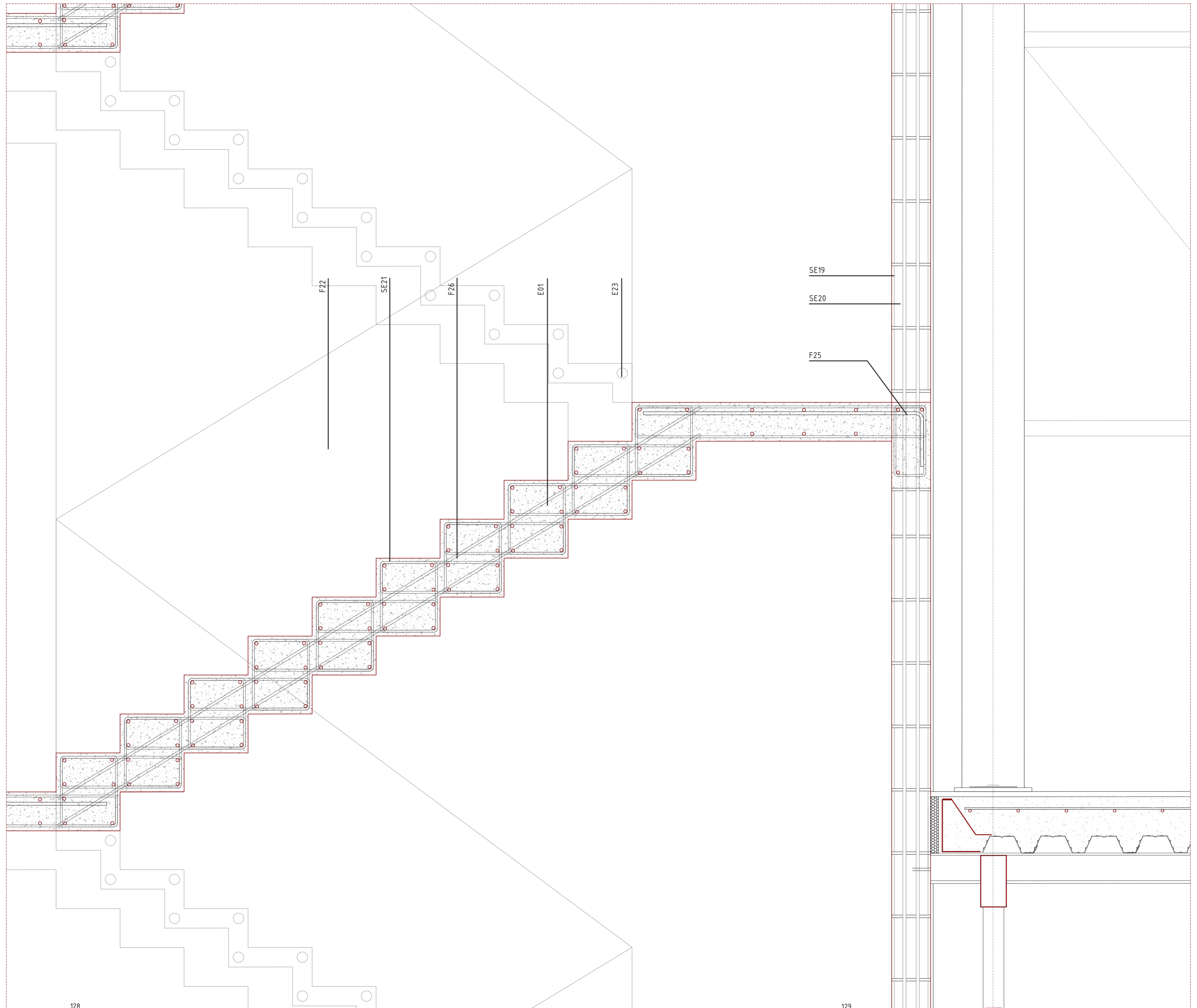
- M01\_Anti-capillary layer
- M02\_Aphaltic primer
- M03\_Waterproofing sheet
- M05\_Reinforcing waterproofing sheet
- M05\_Geotextile separating layer
- M06\_Thermal insulation
- M07\_Anti-punching geotextile layer
- M08\_Rooting membrane

**STRUCTURAL ELEMENTS (SE)**

- SE01\_HEB 240
- SE02\_HEB 180
- SE03\_Perimeter banding
- SE04\_HEB 200
- SE05\_Anchor plate
- SE06\_Screws
- SE07\_Welding
- SE08\_CPS canal section
- SE09\_UPN Cantilever
- SE10\_Catwalk anchor
- SE11\_Catwalk for maintenance
- SE12\_Aluminium grate
- SE13\_Steel railing
- SE14\_Truss
- SE15\_PHR 160x120x6
- SE16\_PHR 100x80x6
- SE17\_PHR 160x120x5
- SE18\_HEB 220
- SE19\_Reinforced concrete blocks 600x200x140
- SE20\_Concrete blocks reinforcement
- SE21\_In situ concrete stairs
- SE22\_Handrail fixing

**ROOF (R)**

- R01\_Vapour barrier
- R02\_Slope concrete
- R03\_Vegetation
- R04\_Topsoil layer
- R05\_Concrete parapete
- R06\_Crowning plate
- R07\_Gutter
- R08\_Wooden bards
- R09\_Roof tiles
- R10\_Roof support

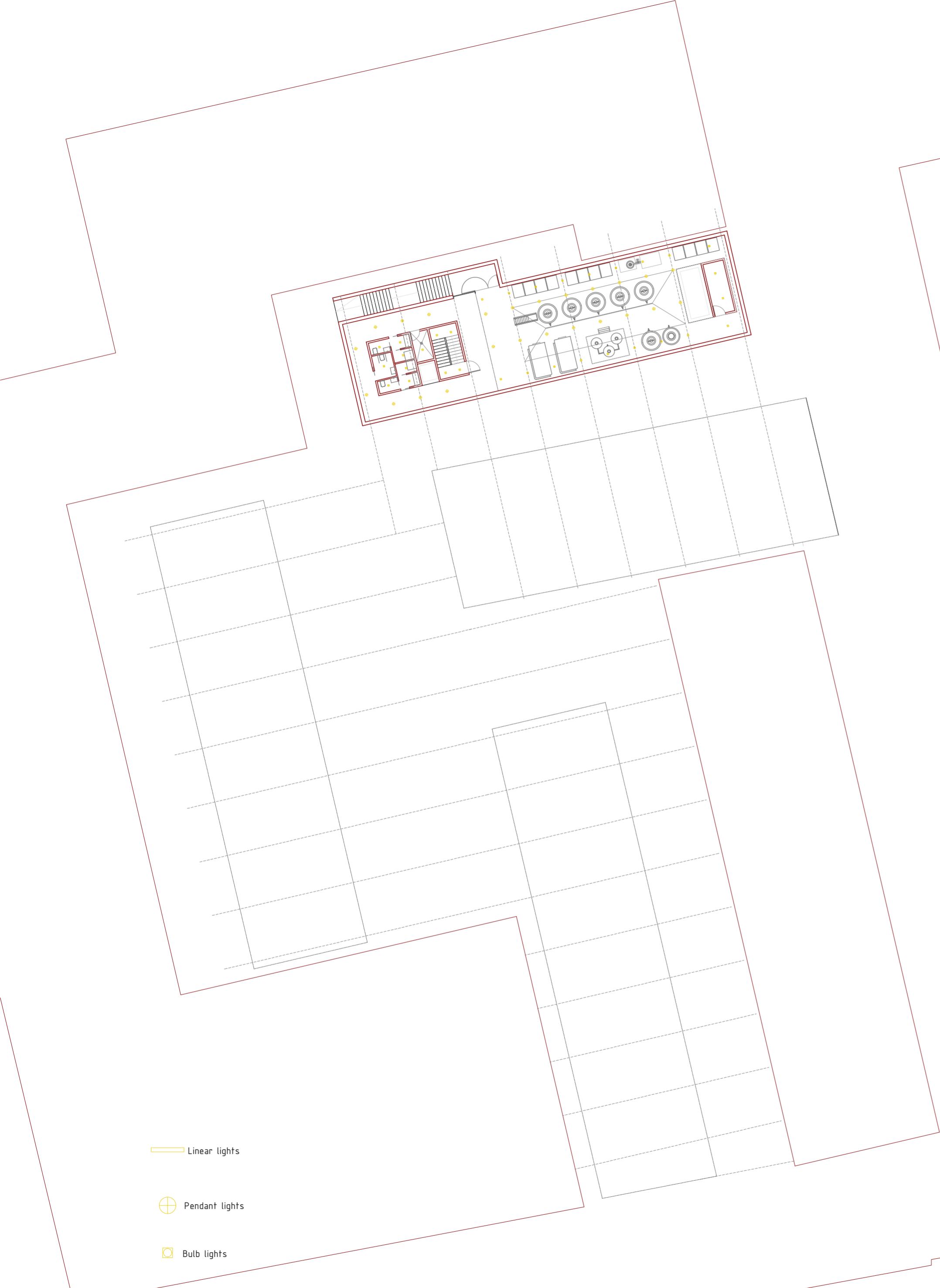




7.

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FACILITIES AND CTE






LIGHTING-SYSTEM\_LEVEL -3.00 m  
GRAPHIC SCALE 1:300



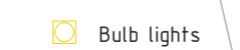


LIGHTING-SYSTEM\_LEVEL 0.00 m  
GRAPHIC SCALE 1:300



-  Linear lights
-  Pendant lights
-  Bulb lights

LIGHTING\_SYSTEM\_LEVEL 4.50 m  
GRAPHIC SCALE 1:300

-  Linear lights
-  Pendant lights
-  Bulb lights

LIGHTING\_SYSTEM\_LEVEL 9.00 m  
GRAPHIC SCALE 1:300








VENTILATION SYSTEM\_LEVEL 0.00.m  
GRAPHIC SCALE 1:300



VENTILATION SYSTEM\_LEVEL 9.00.m  
GRAPHIC SCALE 1:300











-  Public collection Pipe
-  PVC collection-box
-  Collection PVC pipe

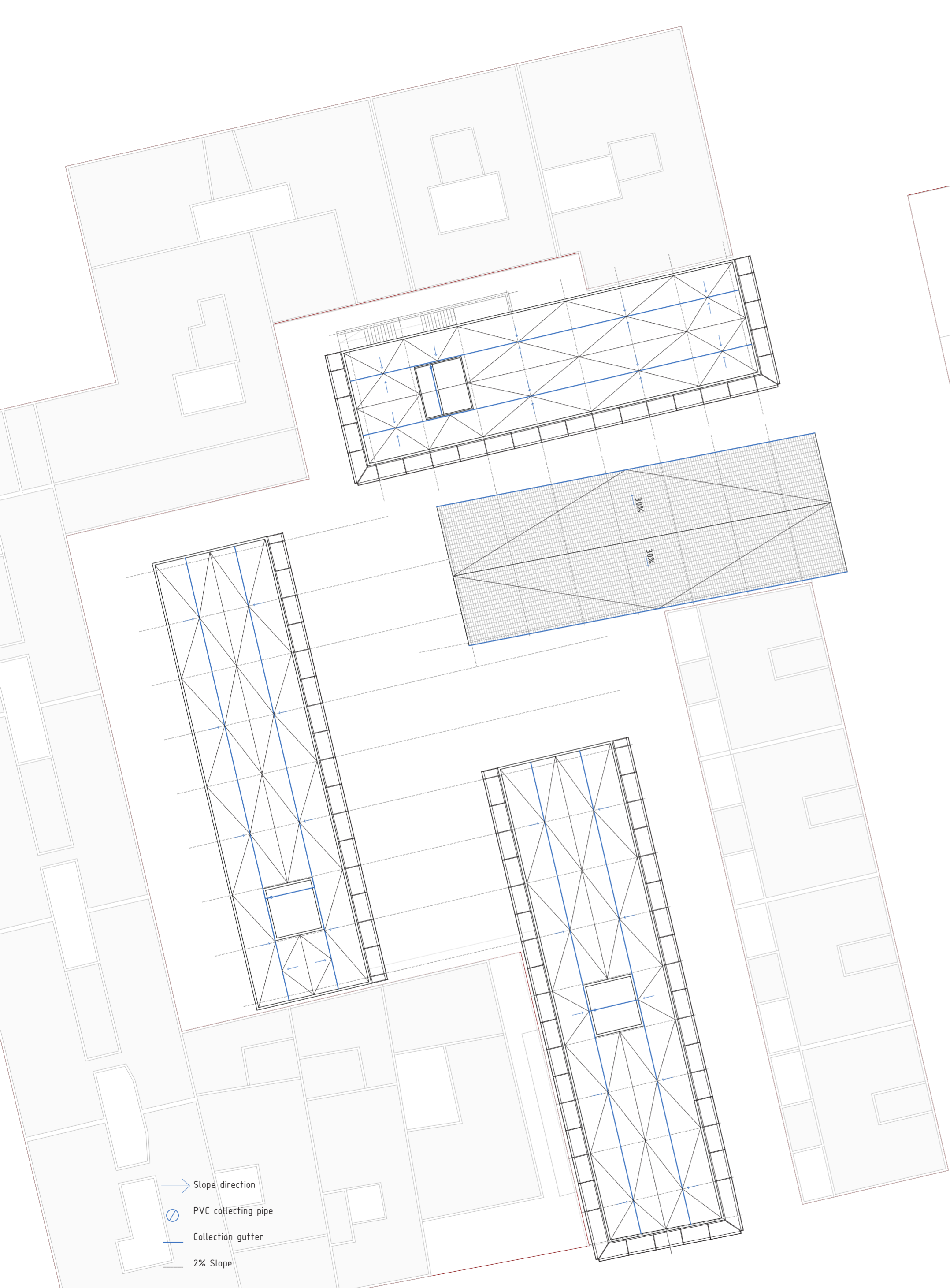
COLLECTING WATER SYSTEM LEVEL 0.00 m  
GRAPHIC SCALE 1:300



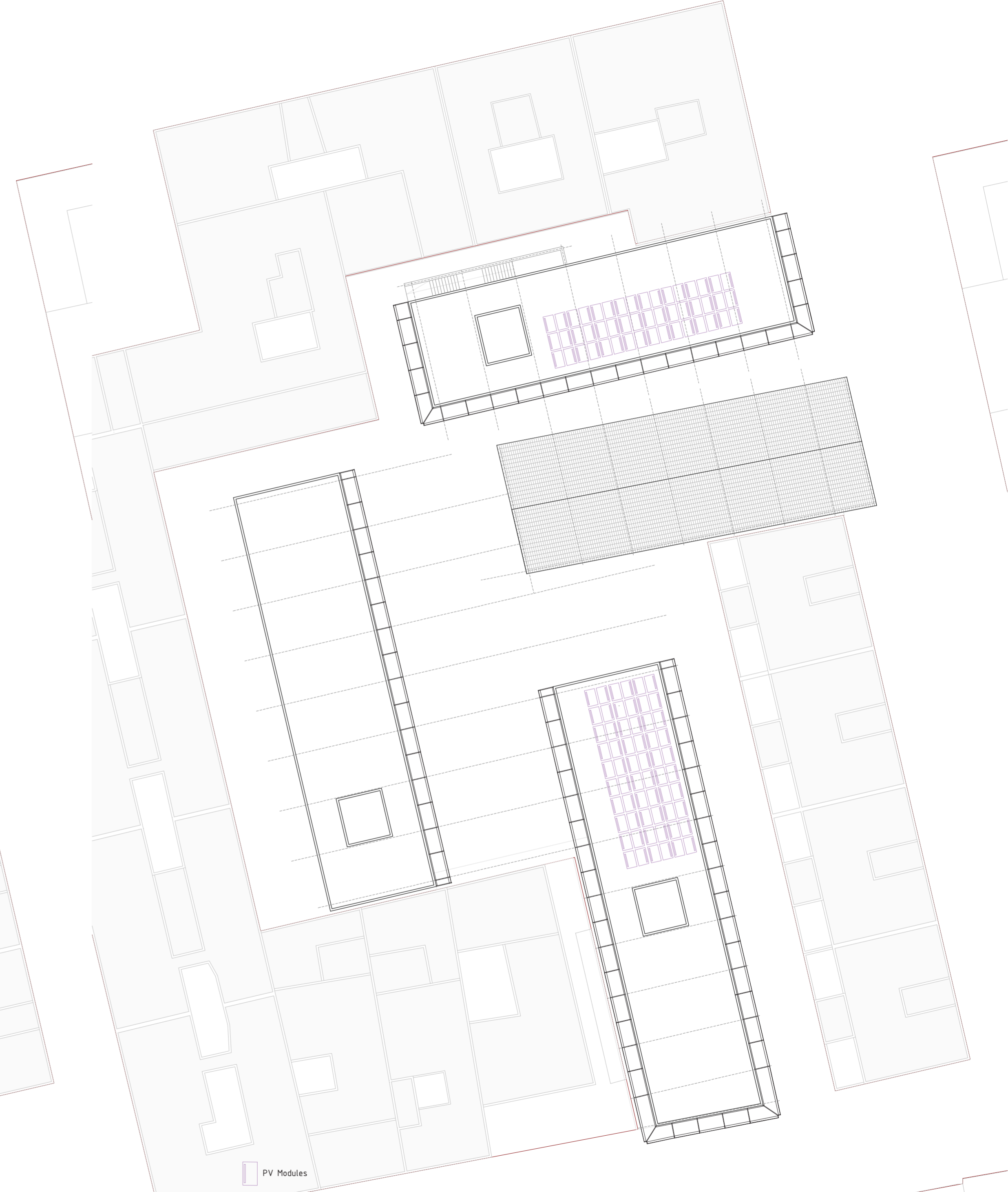
-  Building's water collection
-  Pumping system and heater
-  Cold water cut off valve
-  Hot water cut off valve
-  Cold water pipe
-  Hot water pipe

HOT AND COLD WATER FACILITIES LEVEL 0.00 m  
GRAPHIC SCALE 1:300





RAIN WATER COLLECTING AND DRAWING SYSTEM  
GRAPHIC SCALE 1:300



PHOTOVOLTAIC MODULES DISTRIBUTION  
GRAPHIC SCALE 1:300



## JUSTIFICATION FOR COMPLIANCE WITH CTE DB-SI

### INTERNAL SPREAD

#### 1. Compartmentation in fire sectors

The compartmentalisation in fire sectors is carried out according to the criteria of maximum admissible surfaces specified in the CTE DB-SI table 1.1. All the buildings have an automatic extinguishing system, so the maximum surfaces can be double those specified in the standard.

The main criteria for determining the fire sectors is based on the use of the different areas of the complex, it is divided into:

Sector 01 - The factory 361.2 m<sup>2</sup>, both the stairs and the lift communicating with the rest of the building are compartmentalised and separated satisfying the conditions set out in table 1.2. Likewise, the surface area is less than 2,500 m<sup>2</sup>. This sector belongs to the below-ground sector group, as the upward discharge height is higher than 1.5 m.

Sector 02 - Indoor unloading area 58.4 m<sup>2</sup>, this area is used for both unloading and storage, it has safety doors that comply with the CTE and direct access to the outside of the building.

Sector 03 - Building A 635.6 m<sup>2</sup>, this sector comprises the part of the building that does not belong to the previously mentioned sectors.

Sector 04 - Exhibition building 415 m<sup>2</sup>, this is an open-plan building without a residence on the upper floors, as it is a single-storey building with a surface area of less than 500 m<sup>2</sup>.

Sector 05 - The former rice warehouse, now converted into a bar 532 m<sup>2</sup>, is a public building not exceeding 2,500 m<sup>2</sup>, and communicates directly with the outside through two exits.

Sector 06 - Audiovisual room 130 m<sup>2</sup>, this room operates independently, as it is an open-plan space its surface area must be less than 500 m<sup>2</sup>, it is located on the ground floor and has direct access to a secure area.

Sector 07 - Building C 976.6 m<sup>2</sup>, this sector is made up of all the areas that make up the building with the exception of the laboratories.

Sector 08 - Laboratories 136 m<sup>2</sup>, as this is an area with a special use, its separation into a different fire sector is determined in order to be on the safety side.

#### 2. Premises and special risk areas

The special risk premises and areas of the project as a whole are the kitchens, staff changing rooms, machinery rooms and lifts, being classified according to the low risk level, in accordance with table 2.1 of the CTE DB-SI.

The laboratory area, in the absence of a clear classification of the type of function carried out, is interpreted as a clinical laboratory, according to the CTE, and would therefore be included in the medium risk group.

The conditions of the special risk areas integrated in the building are in accordance with the criteria set out in table 2.2 of the CTE DB-SI.

### CONCEALED SPACES, PASSAGE OF INSTALLATIONS THROUGH FIRE COMPARTMENTATION ELEMENTS.

Fire compartmentation of occupiable spaces is continuous in concealed spaces. It is maintained at the points where the elements are crossed by the installations, except for those whose cross-section is less than 50 cm<sup>2</sup>.

### REACTION TO FIRE OF CONSTRUCTIVE, DECORATIVE AND FURNITURE ELEMENTS.

The construction elements comply with the reaction to fire conditions established in table 4.1 of the CTE DB-SI.

The reaction to fire conditions of the components of electrical installations are regulated in accordance with the criteria of their specific regulations.

The outer skin, which is made up of a textile element, is level T2 in accordance with the UNE-EN 15619:2014 standard.

As for the decorative elements, as these are public establishments, the conditions are met:

The seats and fixed seating in the assembly hall are tested in accordance with the standards:

- UNE-EN 1021-1:2015 "Assessment of the flammability of upholstered furniture - Part 1: ignition source: burning cigarette".
- UNE-EN 1021-2:2006 "Assessment of the flammability of upholstered furniture - Part 2: ignition source: flame equivalent to a match".

Textile elements installed to generate darkness or give privacy to certain spaces shall be Class 1 in accordance with UNE-EN 13773:2003 "Textiles and textile products. Behaviour to fire. Curtains and draperies. Classification scheme".

### EXTERNAL PROPAGATION

#### 1. Party walls and façades.

The vertical separating elements of the adjoining buildings shall be EI 120, this type of separation is only carried out in two of the buildings, in the areas where party walls are shared.

The risk of limiting the horizontal external spread of fire through the façade between two fire compartments is ensured. Buildings with different fire sectors comply with the minimum distance set out in this section of the CTE.

The risk of vertical fire propagation through the façade between two fire sectors or towards the protected stairways shall be at least EI60, in addition the protruding elements that form the walkways and crossbeams also prevent the passage of flames.

The reaction to fire class of the selected building system, occupying more than 10% of the surface area, will be C-s3, d0 as the façades of the tallest buildings are 14 m high.

#### 2. Roofs

The roofs have a fire resistance of REI 60 in order to limit the risk of external spread of fire through the roof, both to neighbouring buildings and to the building itself.

### OCCUPANT EVACUATION

#### 1. Compatibility of the elements of evacuation.

Not applicable as the total floor area of each building separately is less than 1,500 m<sup>2</sup>.

#### 2. Calculation of occupancy.

To calculate the occupancy of buildings, table 2.1 is used as a reference, taking into account the usable area of each zone. For enclosures not included in the table, the most approximate occupancy value is taken into account.

BUILDING A	AREA [m <sup>2</sup> ]	DENSITY [m <sup>2</sup> /person]	OCCUPATION [people]
Factory	257,00	10	25,70
Storage	62,00	4,0	1,55
Hall	60,00	2	30,00
Offices	335,00	10	33,50
Conference room	48,00	1	48,00
Toilets	61,20	3	20,40
<b>TOTAL</b>			<b>160,00</b>

BUILDING B	AREA [m <sup>2</sup> ]	DENSITY [m <sup>2</sup> /person]	OCCUPATION [people]
Exhibition area	257,00	2	128,50
Storage	12,00	4,0	0,30
Hall	57,00	2	28,50
Toilets	20,00	2	10,00
<b>TOTAL</b>			<b>168,00</b>

BUILDING C	AREA [m <sup>2</sup> ]	DENSITY [m <sup>2</sup> /person]	OCCUPATION [people]
Laboratory	160,00	5	32,00
Storage	23,00	4,0	0,58
Hall	55,00	2	27,50
Offices	141,00	10	14,10
Classrooms	180,00	1,5	120,00
Exhibition area	114,00	2	57,00
Toilets	70,00	2	35,00
<b>TOTAL</b>			<b>230,00</b>

OLD RICE WAREHOUSE	AREA [m <sup>2</sup> ]	DENSITY [m <sup>2</sup> /person]	OCCUPATION [people]
Hall	27,00	2	13,50
Zonas de servicio	250,00	10	25,00
Toilets	40,00	2	20,00
Storage	10,00	4,0	0,25
Kitchen	32,00	10	3,20
Standing areas	100,00	2	50,00
<b>TOTAL</b>			<b>112,00</b>

### 3. Number of exits and length of escape routes.

Both the exits and the evacuation routes are shown in the attached plans, in accordance with compliance with this section of the CTE.

### 4. Sizing of means of escape

The dimensioning of the escape elements is carried out in accordance with table 4.1.

The doors of the project comply with the requirements of the table in terms of the minimum width necessary for evacuation. There are three types of evacuation doors, those of the main entrances, which are automatic sliding doors. The door separating the stairwell from the factory is 1.20 m wide. The access that connects the factory with the outside also has a door with a higher step than that required by the CTE.

The dimensioning of the staircase also complies with the requirements for unprotected stairs in the area where it is protected and the requirements for protected stairs where it is protected.

### 5. Protection of stairways.

The staircase protection complies with the provisions of the CTE. For the height of 3.00 m to be saved in the direction of ascending evacuation, with an occupancy of the area of less than 100 people, it would be acceptable for it not to be protected, however, the placement of a protected staircase is established for greater safety.

### 6. Doors located on escape routes.

As there are automatic doors at building exits intended for the evacuation of more than 50 persons, the conditions set out in this section do not apply.

In the event of an emergency, all building access doors can be locked and kept open.

### 7. Signposting of means of evacuation.

Evacuation signs defined in the UNE 23034:1988 standard are used according to the following criteria:

Exits from the enclosure, floor or building have a sign with the sign "EXIT", placed in a visible manner from all points of the enclosure.

In the case of emergency exits, an "EMERGENCY EXIT" sign shall be displayed.

There shall be signs indicating the direction of travel, visible from the evacuation origins.

The signs shall be visible even if the normal lighting supply fails. They shall be photoluminescent and shall comply with UNE 23035-1:2003, UNE 23035-2:2003 and UNE 23035-4:2003.

The maintenance of these signs shall be carried out in accordance with the standard UNE 23035-3:2003.

### 8. Fire smoke control

This section is not applicable as the requirements specified in the standard are not met.

## INSTALLATION OF FIRE PROTECTION SYSTEMS

### 1. Provision of fire protection facilities

According to table 1.1 Provisions of fire protection installations, it is determined that it is necessary to install:  
In general:

- Portable fire extinguishers of efficiency 21A at a maximum distance of 15 m on each floor from the source of evacuation, as well as in areas of special risk.

Public areas:

- Fire hydrants equipped as the floor area exceeds 500 m<sup>2</sup>.
- Alarm system for a total occupancy of more than 500 people.

### 2. Marking of manual fire protection systems

The signage of manual fire protection installations must comply with the provisions of the current Regulation on fire protection installations, approved by Royal Decree 513/2017 of 22 May.

## INTERVENTION BY THE FIRE BRIGADE

### 1. Approach conditions and environment

Approach to buildings

The approach roads for fire brigade vehicles comply with the minimum clear width, height and load-bearing capacity of the road.

Building surroundings

Not applicable as the maximum downward evacuation height is 9m.

### 2. Accessibility by façade

Not applicable as the maximum downward evacuation height is 9m.

## FIRE RESISTANCE OF THE STRUCTURE

### 1. Fire resistance of the structure

An element is considered to have sufficient fire resistance if, for the duration of the fire, the design value of the effect of the actions, at all times  $t$ , does not exceed the value of the resistance of that element.

### 2. Main structural elements

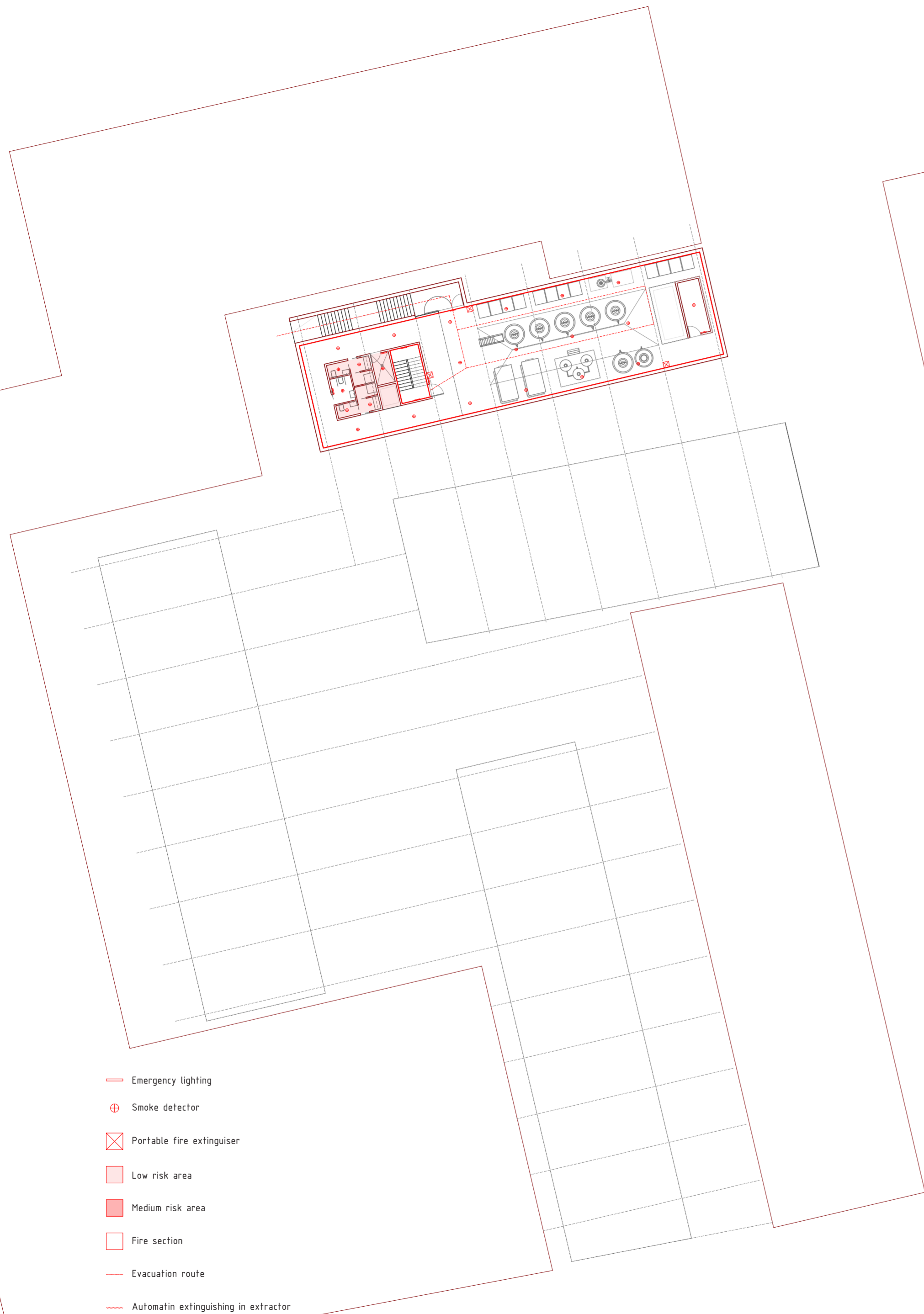
The fire resistance of the main structural elements is considered to be sufficient as they reach the classes indicated in tables 3.1 and 3.2 and withstand fire for the equivalent fire exposure time indicated in annex B.

### 3. Secondary structural elements.

Structural elements whose collapse under the direct action of fire cannot cause damage to the occupants, nor compromise the overall stability of the structure, evacuation or compartmentalisation in fire sectors of the building, such as small mezzanines or floors or stairs of lightweight construction, etc., need not meet any fire resistance requirements.

The supporting structures of enclosures formed by textile elements, such as marquees, shall be R 30, except when it is accredited that the textile element, in addition to being level T2 in accordance with standard UNE-EN 15619:2014 or C-s2,d0, in accordance with UNE-EN 13501-1:2007, as established in Chapter 4 of Section 1 of this DB, presents, in all its covering layers, a surface perforation equal to or greater than 20 cm<sup>2</sup> after the test defined in standard UNE-EN 14115:2002.













- Emergency lighting
- ⊕ Smoke detector
- ⊗ Portable fire extinguisher
- Low risk area
- Medium risk area
- Fire section
- Evacuation route
- Automatin extinguishing in extractor

COMPLIANCE WITH CTE DB-SI\_LEVEL -3.00 m  
 GRAPHIC SCALE 1:300







- Emergency lighting
- ⊕ Smoke detector
- ⊗ Portable fire extinguisher
- Low risk area
- Medium risk area
- Fire section
- Evacuation route
- Automatin extinguishing in extractor

COMPLIANCE WITH CTE DB-SI\_LEVEL 0.00 m  
 GRAPHIC SCALE 1:300

-  Emergency lighting
-  Smoke detector
-  Portable fire extinguisher
-  Low risk area
-  Medium risk area
-  Fire section
-  Evacuation route
-  Automatic extinguishing in extractor

COMPLIANCE WITH CTE DB-SI\_LEVEL 4.50 m  
GRAPHIC SCALE 1.300

-  Emergency lighting
-  Smoke detector
-  Portable fire extinguisher
-  Low risk area
-  Medium risk area
-  Fire section
-  Evacuation route
-  Automatic extinguishing in extractor

COMPLIANCE WITH CTE DB-SI\_LEVEL 9.00 m  
GRAPHIC SCALE 1.300



## JUSTIFICATION FOR COMPLIANCE WITH CTE DB-SUA

### SAFETY AGAINST THE RISK OF FALLS

#### 1. Slipperiness of floors

The flooring used in all the buildings and areas of the complex is microcement, with the exception of the factory, which has a coloured polished concrete floor. According to the tests carried out on these materials, it can be determined that depending on the surface sealing applied, they can be class 1,2,3, therefore in wet areas that require a higher class, more layers of sealing will be applied in order to guarantee safety in the event of slipping.

#### 2. Discontinuities in the flooring

In order to comply with this section of the CTE DB-SUA, it is established that there shall be no joints with an overhang of more than 4mm. Other elements protruding from the level of the flooring shall not protrude from the flooring by more than 12mm. Drainage openings in areas such as the factory will be covered with gratings through which a sphere with a diameter of no more than 1.5 cm will fit.

#### 3. Level changes

In order to protect slopes and thus limit the risk of falling, protective barriers are placed at slopes, gaps and openings where there is a difference in level of more than 55 cm. The perception of differences in level of less than 55 cm shall also be facilitated by visual and tactile differentiation, starting at least 25 cm earlier.

Protective barriers are designed with a height of 0.90m as the protected heights do not exceed 6m.

As this is an area for public use, the design of the crash barriers takes into account that there are no points of support in the height between 30cm and 50cm above ground level. They shall have no openings that can be penetrated by a sphere of 15 cm in diameter. All these conditions are ensured as the protection elements are continuously installed safety glass.

#### 4. Stairs and ramps

The stairs in all areas of the complex have a tread of between 28 and 30 cm and a riser of 15 cm. In this way, they comply with all the measures established in this section of the CTE.

The sections are straight and have a minimum of three steps. The maximum height of each flight of stairs is 1.5 m. All the steps of the same staircase have the same riser and tread.

The useful width of the flights is 1.2 m, complying with the minimum required for staircases for general use in public buildings. In all cases, the stair treads are at least as wide as the flights of stairs. There will also be a strip of visual and tactile paving at the start of the flights.

The stairs will be fitted with handrails 90 cm above the ground.

#### 5. Cleaning of external glazing

This section is not applicable as the use of the buildings is not Residential Housing, however, service walkways have been provided to allow access to the outside of the building for both cleaning and maintenance.

### SAFETY FROM THE RISK OF IMPACT OR ENTRAPMENT

#### 1. Impact with fixed elements

The clear height of the project is at least 2.5 m, but generally higher than 3.5 m, as the ceilings are arranged in this way to accommodate the trusses and the various uses. Doors also have a minimum clear height of 2 m.

The fixed elements that protrude from the façade, i.e. the service walkway and the skin in circulation areas, start at 3 m, thus complying with the 2.20 m minimum required by the CTE.

There are no circulation areas invaded by doors or swing doors. The swing doors located in the kitchen of the bar will have transparent parts. All industrial doors, as well as automatic doors, comply with the safety conditions of use established in their specific regulations and will be CE marked in accordance with the corresponding European Regulations and Directives.

Existing glazing in areas at risk of impact will have a performance classification according to UNE-EN 12600:2003 as all glazing exceeds 30cm.

All large glazed surfaces that can be mistaken for doors or openings are provided with visually contrasted signage along their entire length at a lower height of between 0.85 and 1.10m.

#### 2. Entrapment

The automatic opening and closing elements are fitted with protective devices appropriate to the type of drive and comply with their own technical specifications.

### SECURITY AGAINST THE RISK OF ENTRAPMENT IN ENCLOSURES

#### 1. Entrapment

Doors that have devices for locking from the inside have a system for unlocking the doors from the outside of the enclosure. Accessible toilets and changing room cabins have an easily accessible device on the inside, by means of which a perceptible call for assistance is transmitted from a control point or area of frequent passage of people. The opening force of the exit doors is 65 N as they are located on accessible routes with fire resistance.

### SAFETY FROM THE RISK CAUSED BY INADEQUATE ILLUMINATION

#### 1. Normal lighting in traffic areas

In each zone there shall be a lighting installation capable of providing a minimum illuminance of 20 lux in outdoor areas and 100 lux in indoor areas. The average uniformity factor shall be at least 40%.

#### 2. Emergency lighting

The buildings are equipped with emergency lighting, which provides the necessary illumination to facilitate the visibility of users so that they can leave the building, indicating the exits and the existing equipment and means of protection. Emergency lighting is provided in all buildings, as total occupancy is expected to exceed 100 people. General toilets, plant rooms and accessible routes.

These luminaires are located at least 2 m above ground level, all exit doors have one, as well as staircases in each of their sections and changes of direction in corridors.

### SAFETY AGAINST RISKS CAUSED BY HIGH OCCUPATION SITUATIONS

This section does not apply because the buildings are not intended for more than 3000 standing spectators.

### SAFETY FROM THE RISK OF DROWNING

This section does not apply.

### SAFETY FROM RISKS CAUSED BY MOVING VEHICLES

This section does not apply.

### SAFETY FROM THE RISKS CAUSED BY LIGHTNING STRIKES

#### 1. Verification procedure

In order to determine whether the installation of a lightning protection system is necessary, calculations are made to check the estimated frequency of lightning strikes.

$$N_e = N_g A_e C_1 10^{-6} \text{ [nº impactos/año]}$$

Being:

$N_g$ : impact density on the ground, obtained according to figure 1.1.

$N_g = 2$

$A_e$ : Equivalent capture area of the isolated building in  $m^2$ , which is the area enclosed by a line drawn at a distance  $3H$  from each of the points on the perimeter of the building, where  $H$  is the height of the building at the point on the perimeter in question.

$A_e = 12,118 m^2$

C1: coefficient related to the environment, according to table 1.1

C1 = 0,5

Ne = 0.012118

The tolerable risk, Na, is determined by the formula:

$$N_a = \frac{5,5}{C_2 C_3 C_4 C_5} 10^{-3}$$

Being:

C2: coefficient depending on the type of construction, in accordance with the table 1.2

C2 = 0,5

C3: coefficient depending on the contents of the building, in accordance with the table 1.3

C3 = 1

C4: coefficient depending on the use of the building according to the table 1.4

C4 = 3

C5: coefficient depending on the need for continuity in the activities carried out in the building, in accordance with the table 1.5

C5 = 1

Na = 0.00366

Ne > Na 0.012118 > 0.00366 therefore a lightning protection system is necessary.

## 2. Type of installation required

The required efficiency E for a lightning protection installation is determined by the following formula:

$$E = 1 - \frac{N_a}{N_e}$$

E = 0.6979

For the required efficiency of 0.6979 the necessary protection level described in Annex SUA B is 4 and therefore the installation of lightning protection is not mandatory.

## ACCESSIBILITY

### 1. Accessibility conditions

The buildings comply with accessibility conditions to facilitate non-discriminatory, independent and safe access and use of the buildings for people with disabilities.

The following requirements are met:

The plot has at least one accessible route connecting to the main entrances to the buildings.

All buildings have accessible lifts connecting all floors. In the same way, the accessible routes connect each floor, the accessible access to it, with the public use areas, with any evacuation origin and with the accessible elements such as accessible parking spaces, accessible toilets and reserved spaces.

The assembly hall has one reserved space for wheelchair users for every 100 seats or fraction thereof.

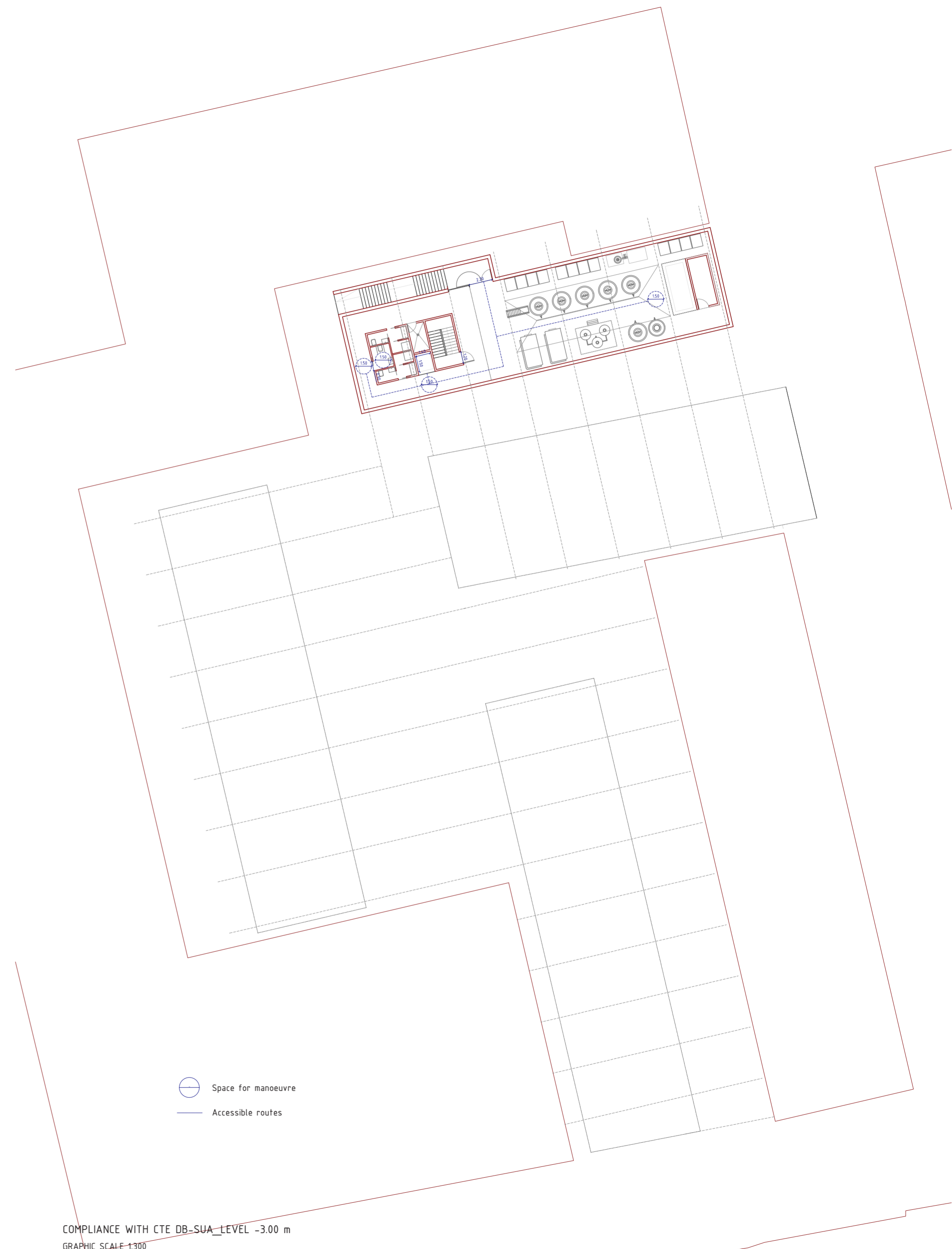
The accessible toilets comply with the regulations, as there is at least one accessible toilet for every 10 units, as well as changing rooms with accessible changing cabins and showers.

Switches, intercom devices and alarm buttons are accessible mechanisms.

### 2. Conditions and characteristics of information and signage for accessibility.



The following elements shall be marked as accessible elements:

Accessible building entrances, accessible routes, accessible lifts, accessible toilets and general use toilets.








 Space for manoeuvre  
 Accessible routes

COMPLIANCE WITH CTE DB-SUA\_LEVEL 0.00 m  
GRAPHIC SCALE 1:300



 Space for manoeuvre  
 Accessible routes

COMPLIANCE WITH CTE DB-SUA\_LEVEL 4.50 m  
GRAPHIC SCALE 1:300



COMPLIANCE WITH CTE DB-SUA\_LEVEL 9.00 m  
 GRAPHIC SCALE 1:300



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