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DAC REHABILITATION

GRAPHICAL SURVEY, DIAGNOSIS AND PROPOSALS FOR INTERVENTION OF “GUARDIA Y CUSTODIA” OF “EL POLVORÍN”

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Course: Q1 2018- 2019

SUMMARY

This project, carried out for the subject of the DAC of Rehabilitation, is based on one of the two military buildings that are in the foothills of Montjuic, in the district of "El Polvorín", now, part of the "Marina del Port".

In this building resided the guard that guarded the warehouse where the gunpowder was stored to supply the arms of the Castle of Montjuic. Through it a tour of history, environment and the whole is made to understand the meaning and importance of the building.

In this study a description is made as detailed as possible to understand how it was built and its deterioration over the years. And it is helped by means of photographs, graphs and drawings to be able to visualize it.

The process carried out for the graphic survey is detailed, explaining which information sources have been consulted, which tools have been used for the measurement and finally the plans derived from all this work have been included.

The project will consist of different sections. In them we will describe the building in its current state, locating all those injuries as well as detecting all those points for which the current legal regulations are not being met.

In the second section, the necessary proposals will be made to solve the localized injuries as well as for the building to comply with the stipulations of the Technical Building Code. Likewise, the realization of some functional and / or aesthetic improvements will be studied to make the building more useful.

With the improvements in communication, and the inauguration this September, of two new subway stations in this neighborhood, access to the building, almost unknown in Barcelona, has been facilitated in this way the search for information and data collection It has been easier.

This project has been carried out between the months of September 2018 and December 2019.

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1. INTRODUCTION

The study building is one of the two that make up "El Polvorín" complex, strategically located to the west and at the foot of the Montjuïc mountain, a point sufficiently far from the possible consequences of the war, the Castle and its fortification.

The assembly of Polvorín has a military interest for its uniqueness and is also protected as a cultural asset of local interest.

The final purpose of this project is to give a neighbor utility to the building called "Guard Corps", formerly housing the troops and current Social Center, understanding that it has an undoubted architectural and historical value, as it is intimately related to the structure and defensive organization from the city of Barcelona.

With rectangular shape of 19.24 × 8.5 meters and a single floor, it consists; of a room for collective use, kitchen, general toilets and different warehouses for deposit of effects and materials. Sentry boxes are next to the fence, outside the fence but high enough to facilitate surveillance.



Image 1: Building "Cuerpo de Guardia of E Polvorín"

This building was the dwelling of the troops that guarded the main building for being an isolated warehouse and quite a distance from others. Built in 1733, "El Polvorín" is part of the buildings that Felipe V ordered to be built after the War of Succession to repress the city.

It was an arsenal of stone, which housed explosives, ammunition, artifices and a huge amount of gunpowder, approximately 4,000 quintals, and its main purpose was to supply the two guns that were in the tower at the mouth of the Llobregat River.



Image 2: Powder store of "El Polvorín".

2. GENERALITIES

2.1. Location and environment

2.1.1. Location

Location

Address: Segura, 34 / Polvorín 16
 District: Sants-Montjuïc
 Neighborhood: La Marina de Port
 Postal code: 08038
 Population: Barcelona

Construction time

Century XVIII and later reforms

Original use

Military

Urban qualification

Urban planning key: 7a (p),

Existing protection

Special plan for the protection of architectural heritage B (Bienes Culturales de Interés Local (BCIL)).

Cadastral reference

8495408DF2789E0001KK

Planning

Planning scope B1328, was approved on 26/06/2014.



Imagen 3: Site of complex "el polvorín" (1)

PARCELA CATASTRAL 8495408DF2789E

Croquis



Fotografía fachada



Parcela construida sin división horizontal
 CL SEGURA 34
 BARCELONA (BARCELONA)
 12.377 m²

INFORMACIÓN DE LOS INMUEBLES Excel

8495408DF2789E0001KK CL SEGURA 34
 Espectáculos | 160 m² | 100,00% | 1900

Imagen 4: Datas "Cuerpo de Guardia" (2.)

1. Plan Geoportal Barcelona.
2. Catastral file of Sede Electronic of cadastral.

2.1.2. Current environment of the complex "El Polvorín"

The building of our project called "Cuerpo de Guardia" or "Guardia y Custodia" of "El Polvorin" is located to the south and in the foothills of Montjuïc Mountain, located in the powder keg neighborhood, now integrated into neighborhood "La Marina del Port", surrounded by the beauty of the mountain.

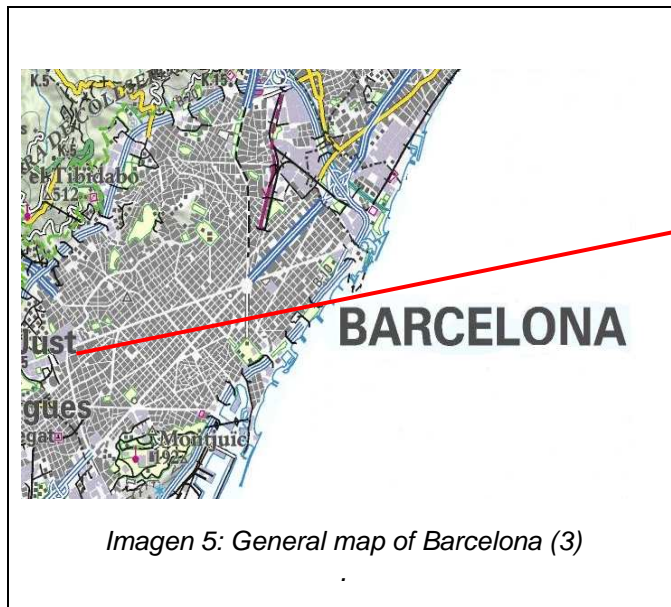


Imagen 5: General map of Barcelona (3)

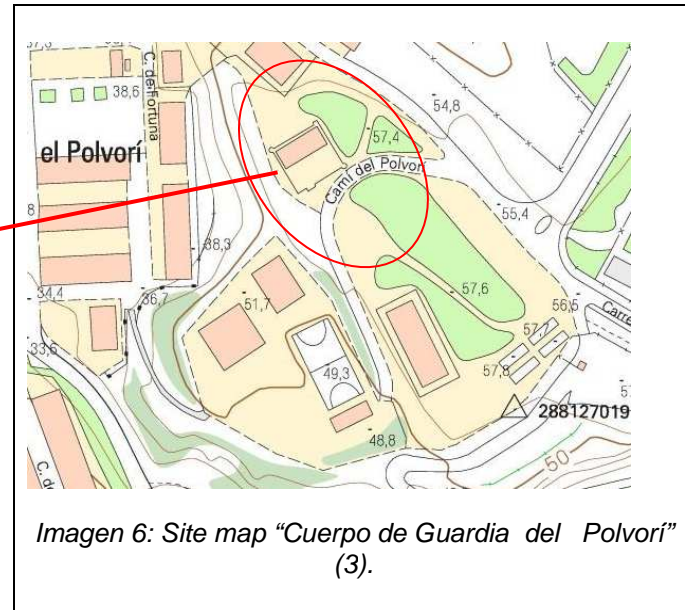


Imagen 6: Site map "Cuerpo de Guardia del Polvorin" (3).

Strategically, we must highlight the proximity to the castle, which helps us to understand the choice of the location of the complex "El Polvorin".

Montjuïc is a large green lung where we find numerous gardens in which to walk and enjoy nature. In them we will see collections of Mediterranean plants, cactus and all kinds of flowers in a land marked by strong slopes that becomes a great viewpoint.

Full of cultural and sports facilities, such as the Miró Foundation, the Bernat Picornell Swimming Pools or the Lluís Companys Olympic Stadium, Montjuïc offers culture, nature and history, all in one.



Imagen 7: aerial photograph of Castle of Motnjuic

The fortification and the Castle were used since antiquity as a military surveillance post, it is one of the two most important elevations in Barcelona.

On the seafront, the mountain of Montjuïc, is a small hill attached to the coast that emerges from the plain of "El Delta del Llobregat". Its profile is steep on the east slope and smooth on the west slope, it has a maximum altitude of 191.7 m (Castillo) and a minimum of 7.8 m and an approximate area of 360 ha. In the geological field the area is classified as sand, conglomerates and clays.

The stone of Montjuïc, served for the construction of the city of Barcelona throughout history, is sandstone, a compact and resistant stone of white, vinous or violaceous colorations.

From the waste material of the quarries, unique to the city of Barcelona, a non-compacted mixture of rocky fragments with a sandy and silty matrix was poured into other pits, such as the one that corresponds to "El Polvorin" neighborhood, and which has forced special foundation of the new housing blocks.

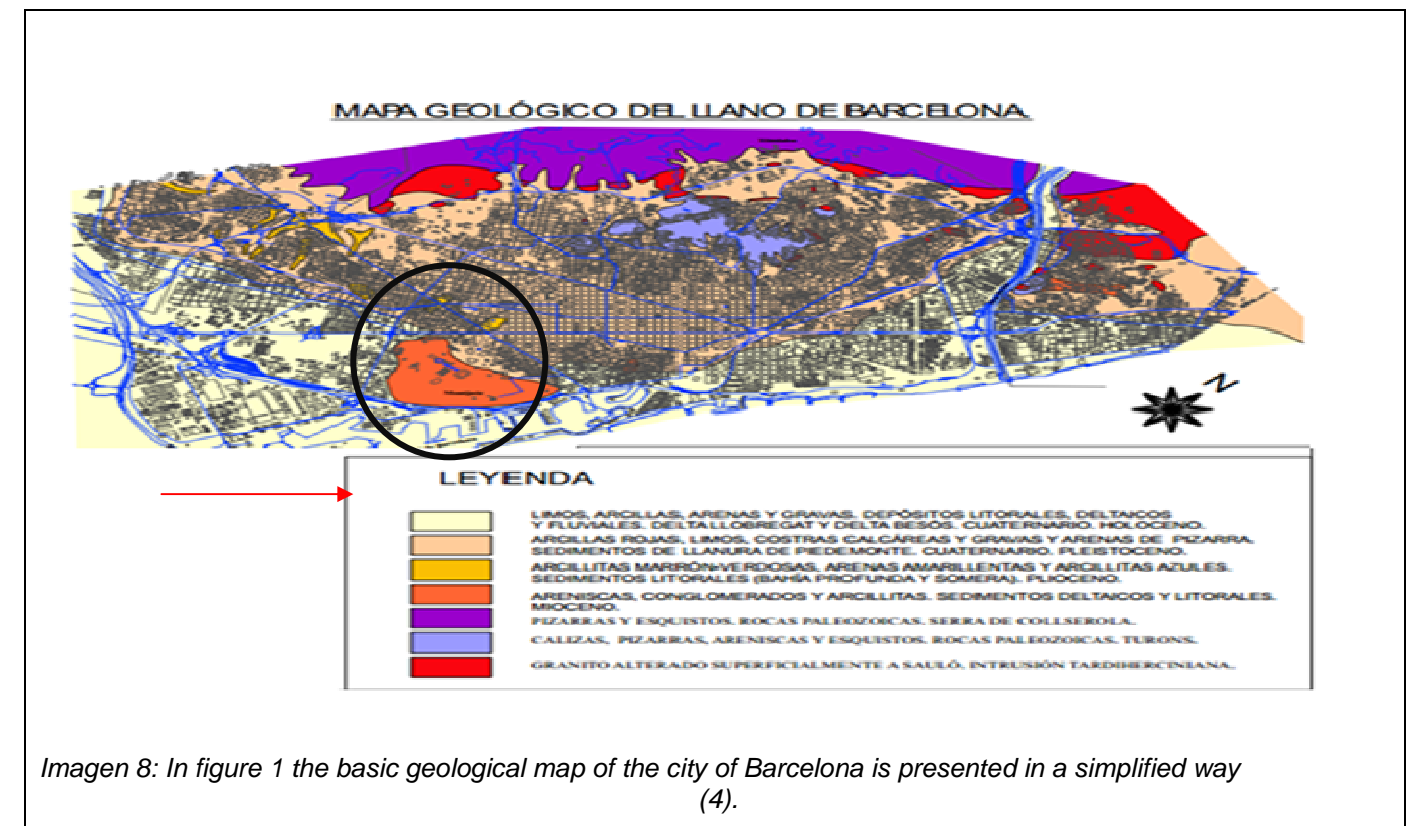


Imagen 8: In figure 1 the basic geological map of the city of Barcelona is presented in a simplified way (4).

3. District map of Catalunya 1:50. El Institut Cartogràfic i Geològic de Catalunya.

4. Geological map of Barcelona of the company Geoservicios Bac and Ventanyol.

"La Marina del Port" is made up of a series of historic neighborhoods, of which "El Polvorín" neighborhood is part where the building of our project is located. It belongs to the district of Sants-Montjuïc, located east of Barcelona, and part of the Marina de Sants. It is located between the neighborhoods of La Bordeta, La Marina del Prat Vermell, Montjuïc and borders on Hospitalet de Llobregat.

The neighborhood has been organized around the current Paseo de la Zona Franca, next to the port of Barcelona, geographically limited to Hospitalet and Fira.2, which in recent years has brought new impetus to the neighborhoods of "La Marina", and the long-awaited inauguration of line 10 of the metro that, as we have said, was possible with the opening of the new stations.

The Marina del Port is now one of those neighborhoods composed of a large proportion of the popular population, with a history of neighborhood and working struggle, collective construction of structures and mutual support that, in many cases, was a reference for other places.

Its asymmetric development over time has generated significant socioeconomic inequalities. In recent years, despite the recovery indicated by many indicators, territorial differences have increased.

The consequences of this situation are particularly serious, in aspects such as the increase in situations of risk of poverty and social exclusion, the lack of employment and the impact of long-term unemployment in homes, the progressive worsening of working conditions and the lack of means for preventive policies.

Given this situation, a Neighborhood Plan was born as a municipal initiative for improvement in areas such as housing, public space, education, health and the creation of conditions in economic activity.

Its main objective is to reduce social inequalities and boost access to services, urban quality and well-being for the entire neighborhood

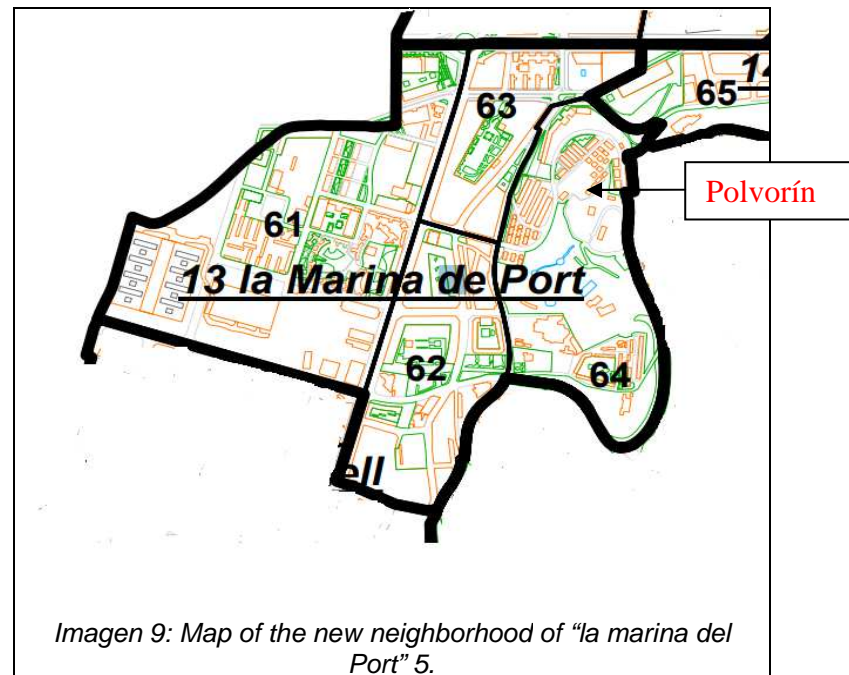


Imagen 9: Map of the new neighborhood of "la marina del Port" 5.

"La Marina del Port" groups more than 30,397 inhabitants, with a population that highlights the presence of young people compared to other neighborhoods in the city, with a foreign population proportion that is much lower than the average, modest study levels and a majority of working classes.

The underground economy has a strong presence, as a remedy to the lack of job opportunities.

The political framework led the neighborhood to be condemned for decades to a situation of political oblivion to which the city of Barcelona turned its back without wanting to see its reality.

One of the problems of the neighborhood is its infrastructure, its abrupt orographic disposition, it degrades the presence of some spaces, it deteriorates the coexistence and it makes travel difficult, both in the neighborhood itself, and in relation to the rest of the city.



Imagen 10: aerial photograph of neighborhood of "la Marina del Port".

To remedy this, some mechanical stairs have been installed that connect "El Polvorín" with the rest of the neighborhood, improving the neighborhood space.

2.1.3. Accessibility

Line 10 of the Metro, has opened the Fonería and Foc stations, separated just over 500 meters from one of the main arteries of the city of Barcelona, such as the Zona Franca.

We can say that the neighborhood of the Marina del Port that once traveled from subsistence economy to the industrial era has everything to try to leave behind the difficulties of the post-industry and join prosperity.

A good part of its space is occupied by La Fira de Barcelona, the corporate offices and the corresponding service offer.

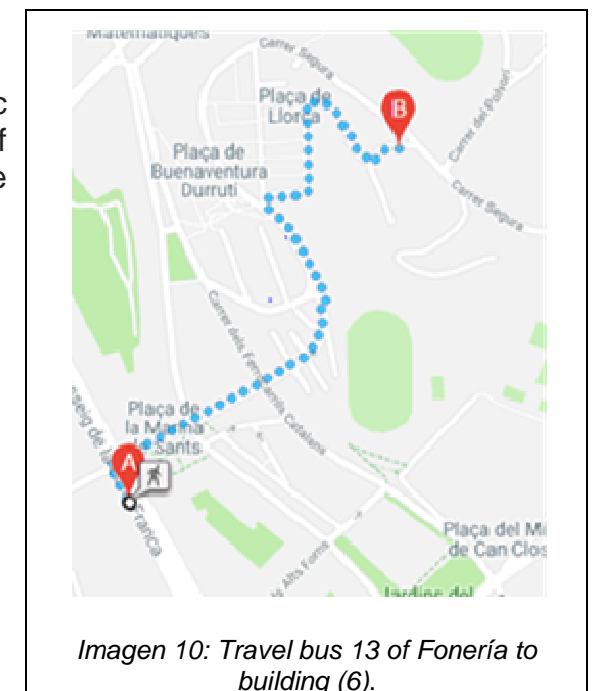


Imagen 10: Travel bus 13 of Fonería to building (6).

With the arrival of the metro, its location near the airport, the Zona Franca and the Fira, one of the most important trade show institutions in Europe, there is an increase in its attractiveness.

The transformation that is currently underway is even deeper, because the remains of the factories are replaced by office buildings and commercial areas that grow thanks to the Fira.

But there are also drawbacks, since part of the neighborhood is well urbanized, the eastern part of the Zona Franca promenade, on the other side there are housing towers without commercial premises in the lowlands, devoid of transportation and without services, a conflict zone.

The implementation of two new elevators have begun this September, both will complement the escalators that currently join these slopes and will give better access to "El Polvorín".

Taking advantage of the works in the environment, new trees will be planted, urban furniture will be placed and a part of the lighting will be renewed.

In the neighborhood there are several important roads; direct access to Ronda Litoral, arrives in a few minutes to the airport, to the other business centers of the city and to the entire metropolitan area, being connected to the main network of roads and highways.

"El Polvorín" building has a large free parking area for light vehicles.

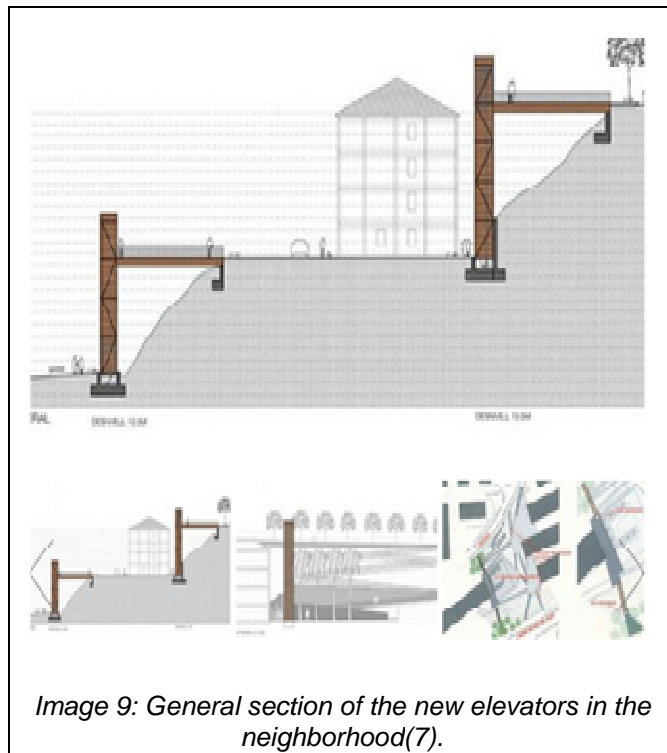


Image 9: General section of the new elevators in the neighborhood(7).

7. Town Hall of Barcelona, news of 09/10/2018, "The works of the elevators begin to go up and down the Polvorín".

2.1.4. Services and equipment.

Supplies and evacuation

According to the following enlarged topographic map view, we can know where there are different urban elements nearby (trees, street furniture, lampposts, pylons, pedestrian crossings, sewerage, etc.), as well as the location of supply points of the water network, electricity and evacuation.

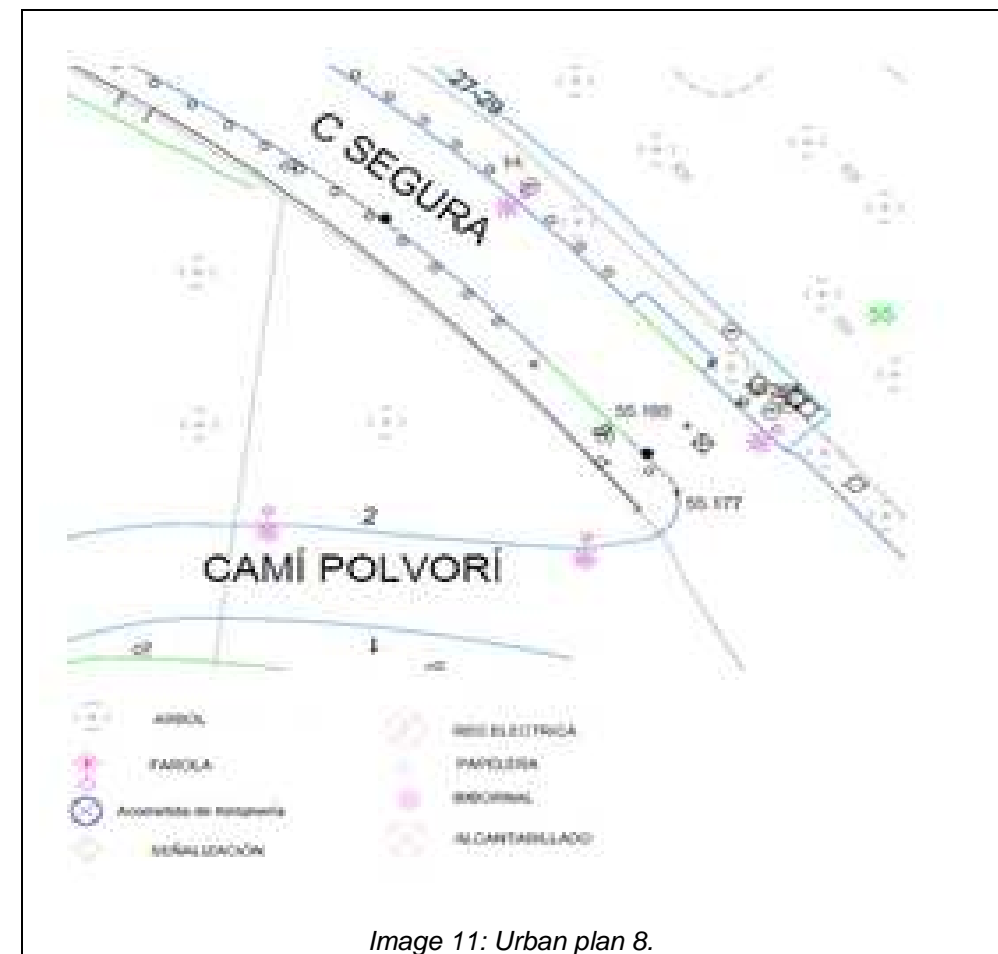


Image 11: Urban plan 8.

8. Point of Cartographic Information of Barcelona.

Equipment

It is necessary to take into account the different equipment available in the building environment, as well as the services available to neighbors to develop a study of the needs and, subsequently, the potential and usefulness of the proposal we make for the building of "Cuerpo de Guardia".

3. HISTORICAL ASSESSMENT OF THE BUILDING AND ITS ENVIRONMENT

We will review the history of the environment of the "**Cuerpo de Guardia**" and of the building itself, since the events that take place in each period condition the modifications, alterations and events that have occurred in the building of this study.

Strategically located at the top of the mountain of Montjuïc, the castle named after the same name, is an imposing defensive construction that responds to the type of fortifications in the shape of a star.

The origins of the castle go back to 1640, in the middle of "Guerra dels Segadors", when a small fort was built around an old watchtower. It was the beginning of the militarization of the mountain.

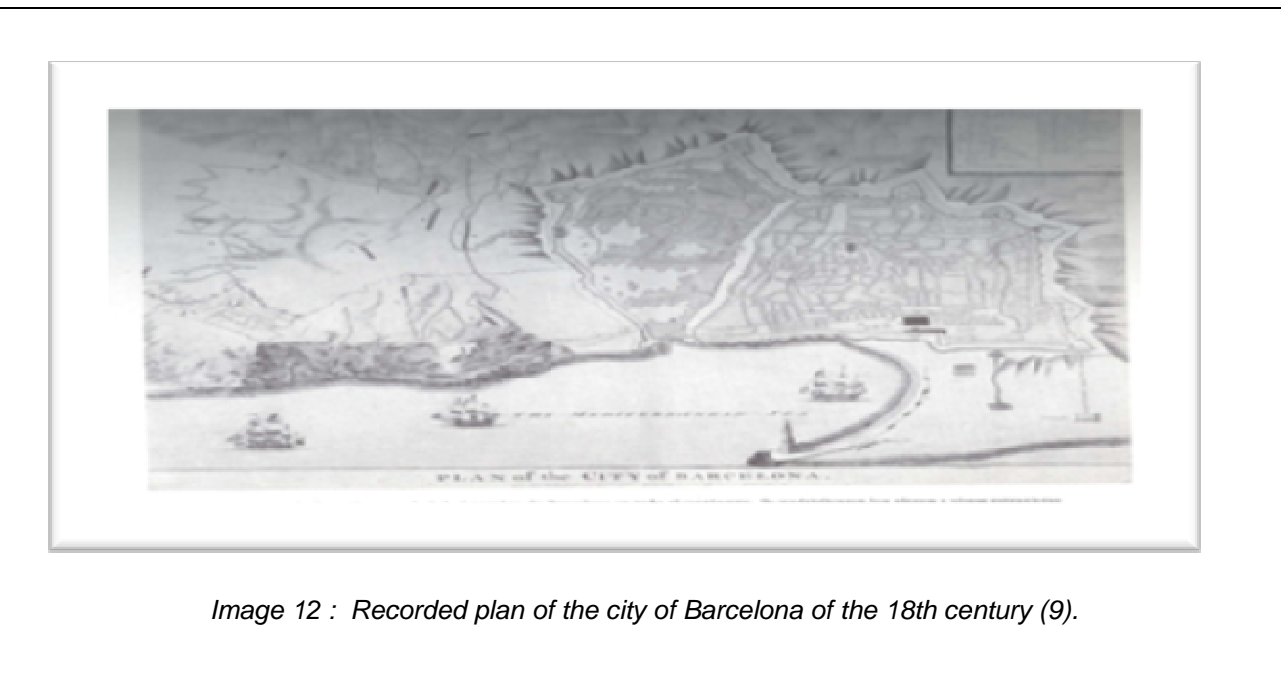


Image 12 : Recorded plan of the city of Barcelona of the 18th century (9).

9. Map kept in the Municipal Institute of History of Barcelona.

This small initial fortification was reformed and modernized, finished the "War of Succession" (1701-1714).

The castle passed to monarchical ownership and a permanent garrison was established. Together with the Ciutadella, Montjuïc became the guardian of the city of Barcelona.

The entrance of the Bourbon troops to the Castle of Montjuïc decided to take out "El Polvorín" inside the fortress and build a powder keg outside. In 1731 it was still in the phase of designating experts to assess the lands of the Montjuïc skirt that would occupy the warehouses¹.

To understand the meaning of the complex Polvorín, related to the structure and defensive organization of the Fortress, we have to understand its strategic position, its link with the Castle, it was intended to move it away from the theater of war and to put it to the point, reinforcing any device of defense, for that reason the "Cuerpo de Guardia" was the one that assumed the function of vigilance of the powder magazine for being an isolated warehouse.

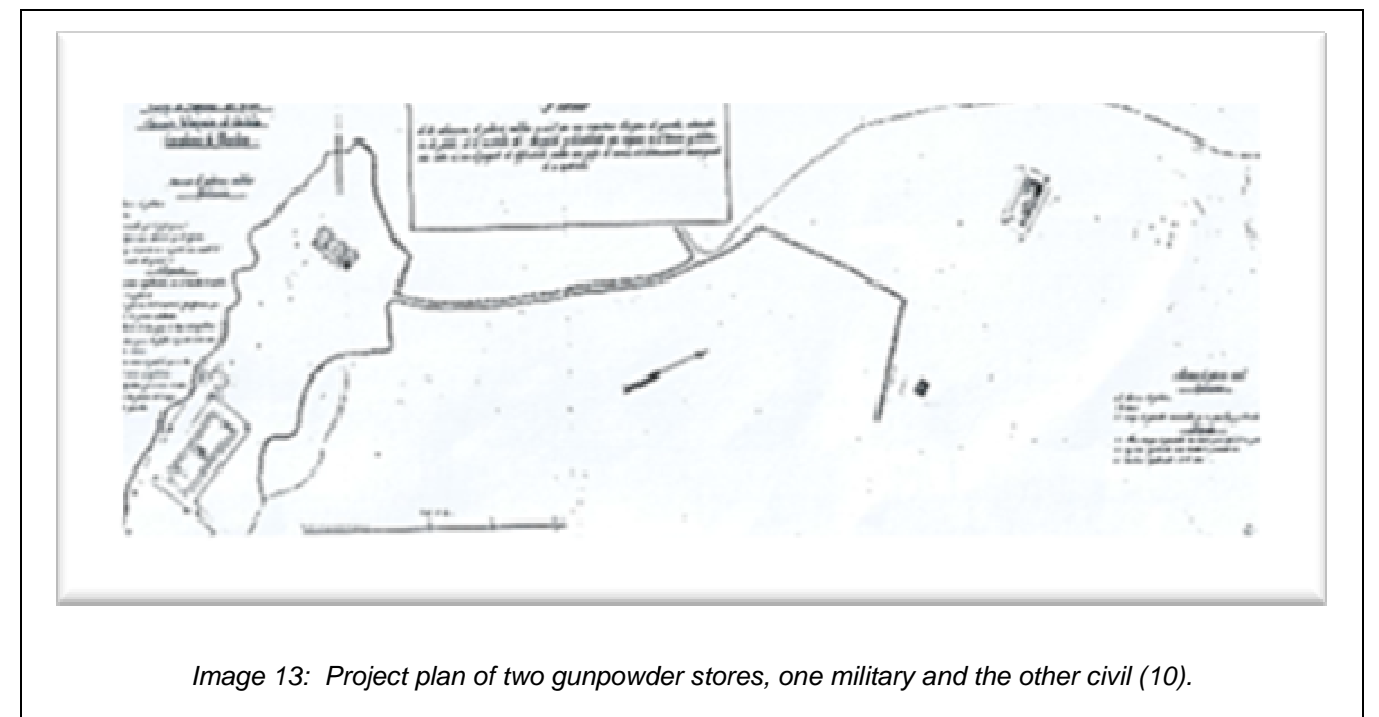


Image 13: Project plan of two gunpowder stores, one military and the other civil (10).

"**Cuerpo de Guardia**" is one of simple construction made in 1732, it had autonomous spaces distributed from an open space. Of a plant, it was composed in origin of troop dormitory, kitchen and latrine.

10. Archive of the crown of Aragón Patrimonio, BGRP, Volumes, 121.

Years before the first modification of the complex of Polvorín it would be impossible for us to imagine that among dusty roads, wheat fields, vineyards, carob trees, isolated farmhouses and shepherds that pastured with their flocks, a bucolic stamp of Montjuïc.

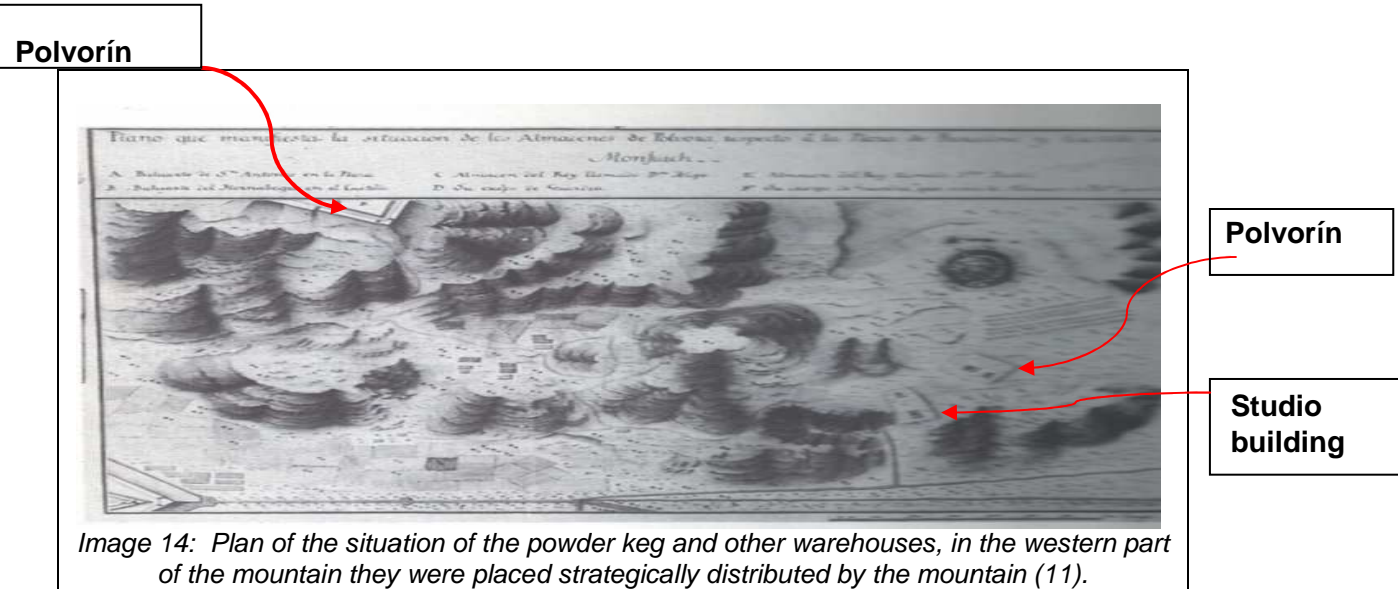


Image 14: Plan of the situation of the powder keg and other warehouses, in the western part of the mountain they were placed strategically distributed by the mountain (11).

All this coexisted with the bombers that went from the castle to the city, as on December 3, 1842, to end an insurrection that had begun in Barcelona for dissatisfaction with the policy of the regent Baldomero Espartero, the next day they surrendered. The castle was used to imprison unionists anarchists and revolutionaries.

We assume that all these events led to reinforce the path of the mountain and the first modification of the "Cuarpo de Guardia" occurred in the 1849 project was the appearance of a longitudinal wall along the path between the "Cuerpo de Guardia" and "El Polvorín".

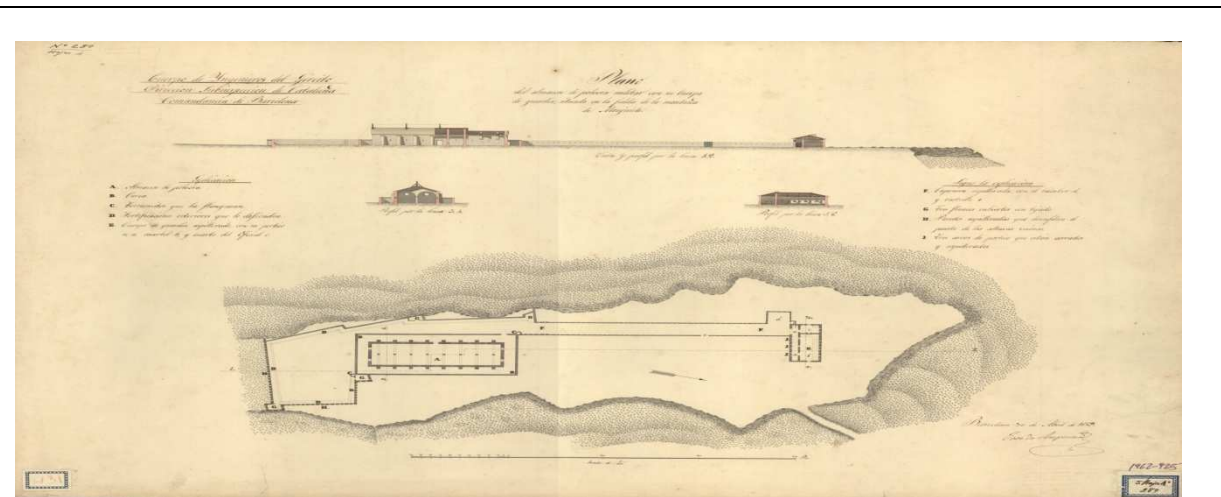


Image 15: Plane of the gunpowder store, according to project of 1849 (12).

In 1854 the increase of the population and the consequent risk for healthiness made advisable the demolition of the medieval walls.

From that fact Barcelona was growing as a dynamic and restless city, which grew with an expansive, disorganized urbanism and notable social contradictions. They were a few years of great development for the city both demographically and economically and urbanly.

The Pla del Ensanche and the annexation of several neighboring municipalities meant a great extension of the urban perimeter and especially the Universal Exhibition of 1888, the great urban impulse that the city of Condal experienced at this time. Infrastructure was improved and Barcelona made an important leap towards modernization.

In the First World War caused a boom in the Catalan industry and therefore its economy because of the neutrality of Spain. Also increased trade, and more specifically the number of tonnage that moved daily in the port of Barcelona.

During the Spanish Civil War, between 1936 and 1939, the city experienced more than 200 bombings that caused 2,500 deaths and tens of thousands of wounded.

"Cuerpo de guardia" in these years we do not know that there were changes in the building and as seen in the aerial plan of the bombing of 1938 continues with the same morphology.



Image 16: Graphic of bombing number 18 dated January 11, 1938(13)

11. Map Identified in a Volume of establishment of the General Basilica of the Royal Heritage of Catalonia.
 12. Book "Montjuïc, la muntanya de la ciutat" author Estanislau Roca i Blanch Map of the General Military Archive of Madrid

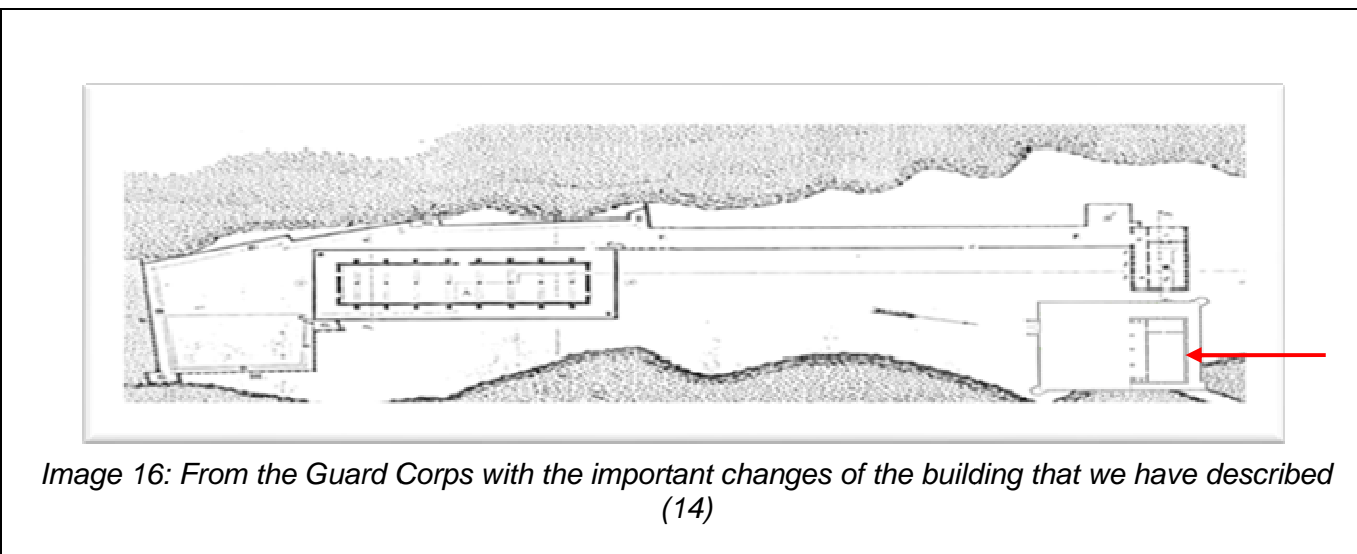
13. Archive –Ufficio Storico-Aeronautica Militare, Fondo O, M, S. in Rome.

On January 26, 1939 the Francoists entered Barcelona, beginning a postwar period that brought; shortage of food, hardship, misery and repression, which appropriate the city.

After the war the City took advantage of the damage that there was to improve the most deteriorated urban areas and project new avenues

New waves of emigrants came to Barcelona and many went to live in the mountains in barracks because it was impossible to find housing.

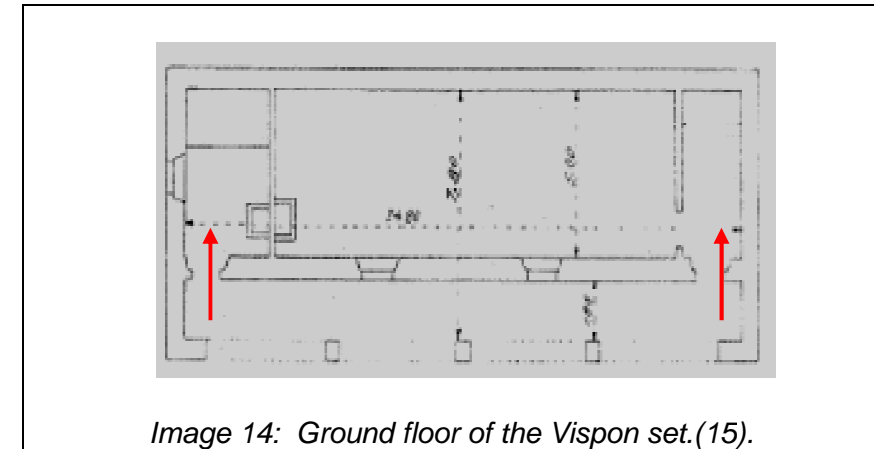
The second modification in the important "Guard Corps" we believe was in the mid-40s, due to the type of constructions that we found similar from that time.



The most important changes observed are:

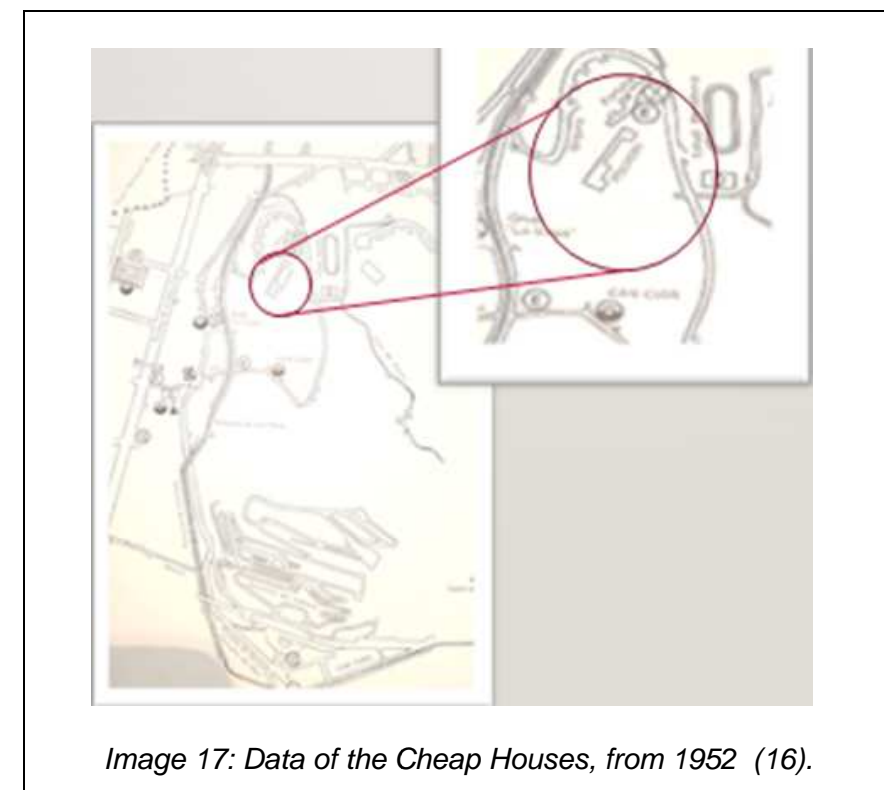
- The vertical partition that separates the porch from the interior area of the building becomes the exterior wall.
- Two accesses to the interior of the building, protected by arcades resolved by means of arches.
- The small windows until that moment are changed by larger ones that help to get more light into the building.
- Courtyard with arved ashlar parapet and a brick wall with burlap.
- Garitas in diagonal in two of the four ends of the wall, stone and brick masonry.

14. Map showing the difference of the plant with modification 1849.



At the beginning of the 50s in the area take place a set of actions that clearly anticipate the use that you want to give the territory; the orchards, the fields, the farmhouses were giving way to the industry and the various urban centers.

This industrial growth occurred in parallel to an urban development that led to the birth of the new Polvorín neighborhood. As of that year, great public initiative actions were carried out, first with the construction of the neighborhood to temporarily lodge the people who lived in the barracks.



14. Graphic survey of the Commander Engineer Francisco Dopido 1940.
15. Barcelona remembers the barracks where the city changed its name news diario.es.

"El Polvorín" neighborhood, built on the quarry, on a rocky slope, was full of private vineyards, which is why numerous expropriations not exempt from certain conflicts had to be carried out.

It owes its name to the complex of El Polvorín and it was built in half slope of Montjuïc and, like the rest of the new neighborhoods, its main characteristic was the isolation. The construction was sponsored by the National Housing Institute to house slum dwellers and police families.

It was built in a record time in three months was carried out in four phases between 1953 and 1964 in an area of 3.6 ha of extension. It consisted of some 400 homes and 48 were rented. In the first phase, 44 blocks were built, of which 35 would be occupied by canyons and nine by police.



Image 18: Montjuïc hillside huts.

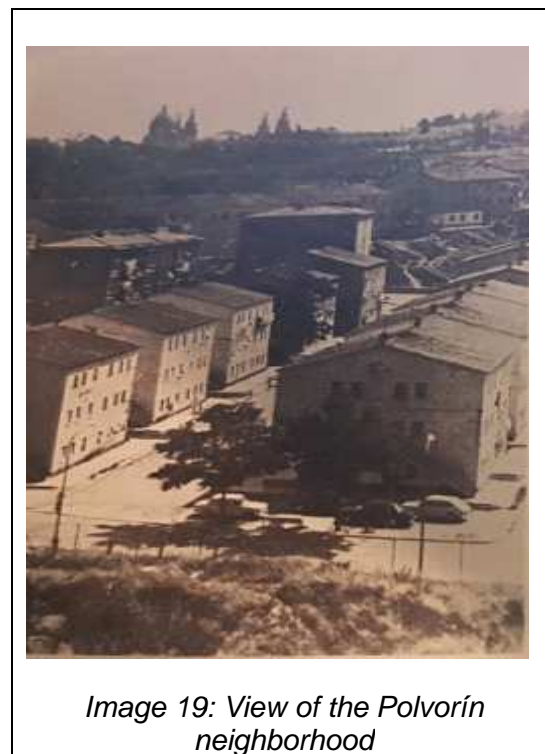


Image 19: View of the Polvorín neighborhood



Image 20: Initial arrangement of "El Polvorín" neighborhood

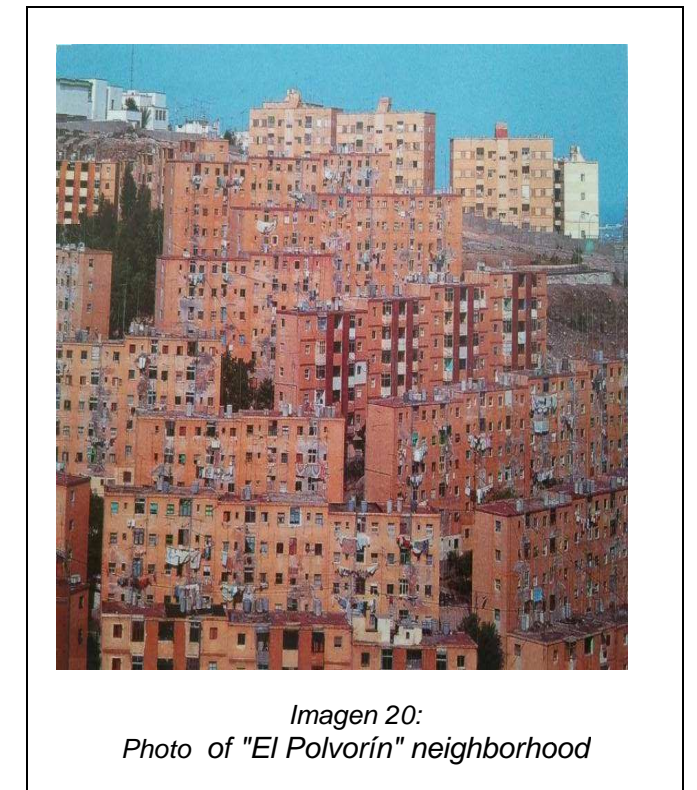


Imagen 20:
Photo of "El Polvorín" neighborhood

We assume that, for these reasons in 1960, the military corps march from the "Guard Corps" by decree and the Castle theoretically becomes the city of Barcelona and a military museum is created under the supervision of the army.

Abandoned building by administrations is occupied by homeless people, in these years changes are appreciated due to lack of maintenance:

- Disappearance of the longitudinal wall of the road.
- Part of the wall that surrounds the building disappears and covers one of the sentry boxes.
- The chimney that appears in the original plans disappears.

The biggest inconvenience that the neighborhood had, was a landfill about 100 meters from the neighborhood, all the garbage in the city. The spill that began in 1959 (17), were launched to throw 900 tons of garbage daily.

The spill brought an incredible degradation of the environment, bad smells, rats, putrefaction, mosquitoes and the constant danger of infections and accidents, especially for children.

14. The spill ended in 1971 as a result of a flood that evidenced the seriousness of the problem, "Zona Franca book from 1900 to 1986.

15. Plan of the Composition of the blocks, book Zona Franca from 1900 to 1986.

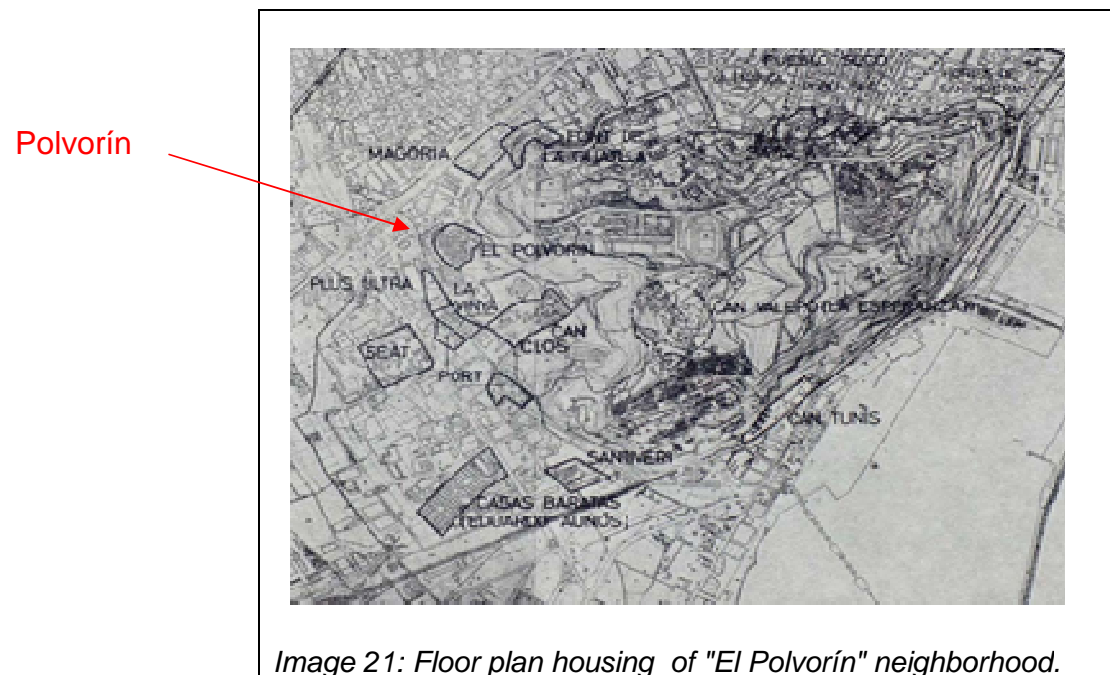
The neighborhood had shortcomings that could be summarized as: late installation of running water (1976 before used deposits), lack of asphalt, difficult access, lack of means of transport,

education, lack of means of communication in general (mailboxes, telephone booths,...) nonexistent ambulatory and a long etc.

Soon the blocks presented different pathological processes with different types of injuries, due to the poor quality of the materials used for the construction of the neighborhood, they did not resist the passage of time and quickly began to degrade, which soon began to present structural problems .

This effect had its maximum exponent in the detection of aluminosis in homes, so An interior reform plan was approved that has created a new neighborhood.

At the end of the seventies the remodeling of the neighborhood began with the construction of new blocks and the demolition of the old ones.



Since the 70s, the neighborhood struggle has become evident, where greater participation in municipal bodies is demanded, habitat improvements, transportation, services, equipment and, above all, access to healthcare.

In 1971 the Neighborhood Association was created, we do not know in what year the neighbors of the building take charge, a space for different activities organized by the entities of the neighborhood, such as the neighborhood association.

Although it is from the 80s when most of the neighborhood claims are put into practice, the most important achievement is the ambulatory that was built in 1986.

Two years later 1988, in the "Cuerpo de Guardia" it housed for eight years (from 1988 to 1996) the only radio station that was in the neighborhood "Radio Zona Franca ", currently Alternativa

Barcelona and the headquarters of the publication La Marina. A small loft was made to house the radio chain. An antenna was placed.

In 1990 several reforms were carried out to rent the building for various activities for the residents of the neighborhood and it became the current social center.

- Interior remodeling with the incorporation of the kitchen and bathrooms and the disappearance of latrines.
- A false ceiling and pavement is installed.
- Entrance door to the enclosure and a metal fence.

At that same moment in the neighborhood a project of integral rehabilitation for the buildings affected by aluminosis is realized, that began in 1995, finished with the progressive demolition of 500 affected floors and the construction in the same lots of other so many houses in which the inhabitants of the neighborhood have been relocated.

Finally, in this year 2018, the Association of neighbors is interested in the proposal of rehabilitation of the building that we do in this work.

Chronology

1714 - finished the "War of Succession" (1701-1714).

1731 - It is still in the phase of designating experts to assess the lands of the Montjuïc skirt that would occupy the powder stores.

1732 - "El Polvorín", and the "**Cuerpo de Guardia**" are constructed.

1842 - On December 3 General Espartero ordered the bombing of Barcelona, revolted against the Government, from Montjuïc.

1849 - Project to build a longitudinal wall along the road between the Guard Corps and the Polvorín.

1854 - Increase of the population and the consequent risk for healthiness made the demolition of the medieval walls advisable.

1859 - Creation of l'Eixample de Barcelona.

1936 - Spanish Civil War 1936-1939.

1939 - The Francoists enter Barcelona.

1945 - Second modification in the "**Cuerpo de Guardia**", disappearing the arpilleras of the facade and appearing the arcs of half point.

1953 -. The first houses of a new neighborhood built on top of the mountain, "El Polvorín", are built. The name has its origin in the old military building that is conserved there. The Polvorín district is born

1959 - - Garbage begins to be dumped in the old abandoned quarries, 100 meters from the "**Cuerpo de Guardia**". The mountain will also serve as a landfill until December 1971.

1960 - Of the "**Cuerpo de Guardia**" the military march and is left by the administrations until the association of neighbors takes charge of the building.

1968 - The exodus of the inhabitants of the barracks begins towards polygons of houses built on the outskirts

1971 - The Neighborhood Association is created in "El Polvorín" neighborhood.

1977 - Four blocks of self-construction are created, the Administration provides the material and the neighbors themselves are the labor force.

1988 - The "**Cuerpo de Guardia**" housed for eight years (from 1988 to 1996) the only radio station that was in the neighborhood "Radio Zona".

1990 - Several reforms are carried out to rent the building.

1997- The building is used to offer activities to the neighbors.

2007 - Finally, the castle became a municipal property, finally closing the doors of the museum and recovering space for the city.

2018 - Proposal for the rehabilitation of the building.

4. CHARACTERISTICS OF THE BUILDING AND ITS CURRENT STATE

Given its military constructive singularity and the few buildings that exist with similar typologies, as well as for the good state of conservation of the characteristics, original appearance and its classification as an Asset of Cultural Interest, it is necessary to guarantee the conservation of those heritage values in the interventions planned in the building, thus preventing possible transformations that distort them and making them compatible with the intended use of the intervention proposal that we will propose.

We must explain that a few years before the construction of the study building, French military engineers arrived, and these played an important role in the study, research, application and evolution of the typologies related to the military collective occupation and its defense, being pioneers in the application of numerous systems (construction, ventilation, heating, sanitation, etc.), this knowledge was taken to the civilian field for its effective result.

An important characteristic of the "**Cuerpo de Guardia**", with respect to "El Polvorín" was its location, separated approximately 80 m, it was to leeward to avoid that one or spark could arrive with the wind to the warehouse.

Isolated building formed by a single volume and consists of a single plant with a structural type of load walls.

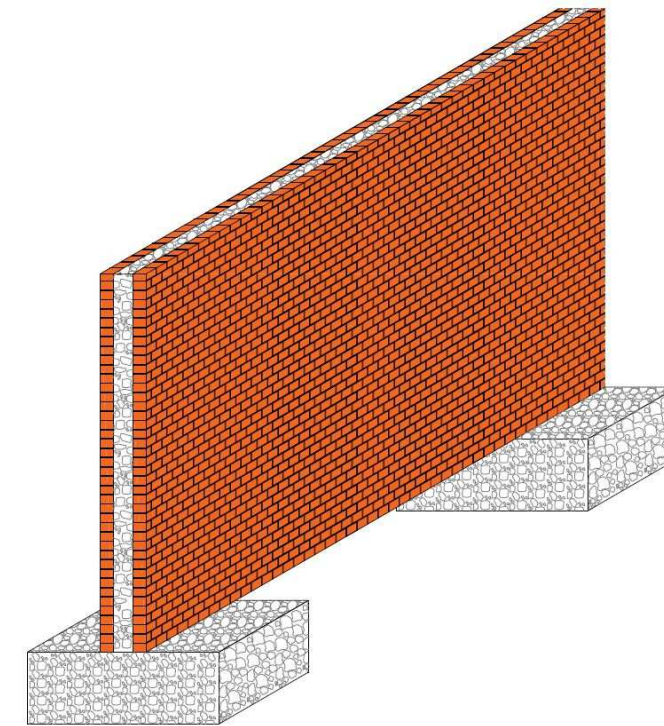
4.1. Constructive features

FOUNDATION

The existing foundation system is unknown, as we have not been able to do any action aimed at finding out, and for the type of construction of a single floor, having masonry load walls of irregular stone joined by mortar type mortar were built 286 years ago. years. The hypothesis of a superficial foundation with ditches / shales executed through the perimeter of the wall has been established.

In addition, we decided that the thickness of the foundation had a small increase with respect to the loading walls, that the ditches were filled by masonry normally from the area.

The foundation was supported on the ground, we believe that part of the site was filled with waste material from the Montjuïc quarries, as it was one of the waste from the stone quarry. On the ground there is a concrete slab on the entire surface that serves as a desolate plant.



VERTICAL STRUCTURE

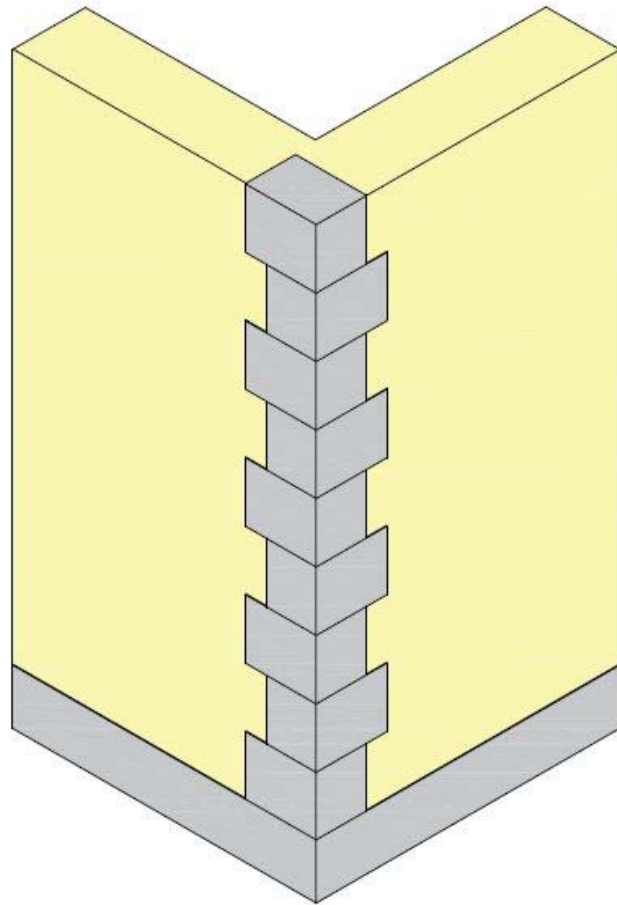
STONE WALLS

The walls that make up the building are formed mostly by stone masonry and lime mortar. They work by gravity in what stands out its high resistance and durability.

Due to the construction of wide walls, a considerable thermal inertia is acquired which provides the maintenance and comfort of the interior temperature.

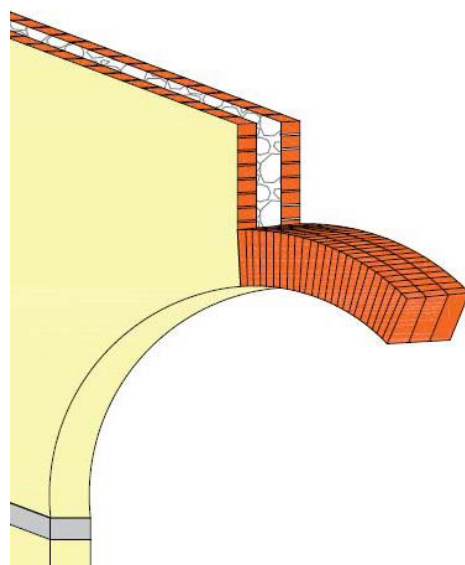
Two courses of masonry are arranged on the outer faces of the wall and the central part of the wall is usually formed by filling with smaller stones.

Although the stones do not have a regular geometry and were placed randomly, in the corners, carved chairs were used in order to form a link between them.



ROUND ARCHE

These arches on the porch, not only provide aesthetics, but also distribute the upper load forces, moving them on the sides, leaving the gap.



HORIZONTAL STRUCTURE

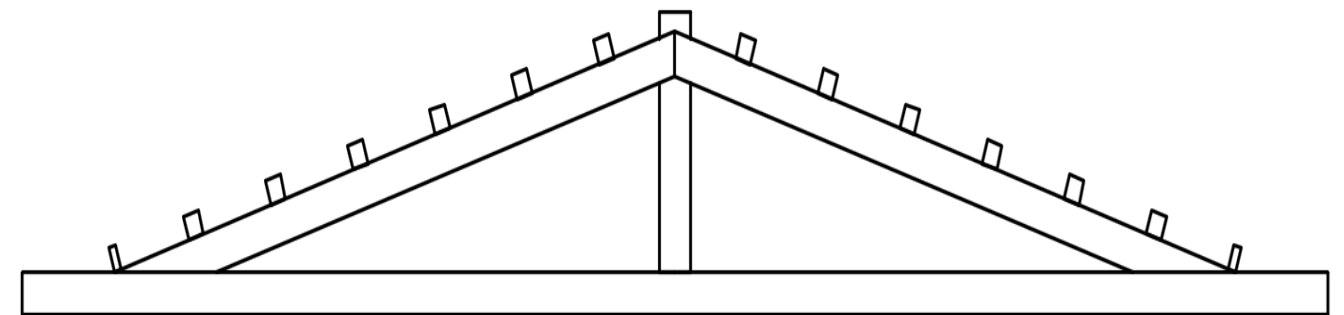
COVERS

The cover has good conditions to prevent the entry of water from the rain. It has a minimum inclination of 30° for the slopes of the roof, the latter constituting flat roof tiles. Your link is as fair as possible, but without materials, such as nails or screws for fastening, and thus the appearance of leaks has been avoided.

The entire building is made up of 4 waters: formed by Arabic tile to the facade plane, ceramic brick board of 30x15cm, 5x2cm wooden cans. and beams of solid wood of edge, of dimensions that vary between 15 and 20 cm diameter.

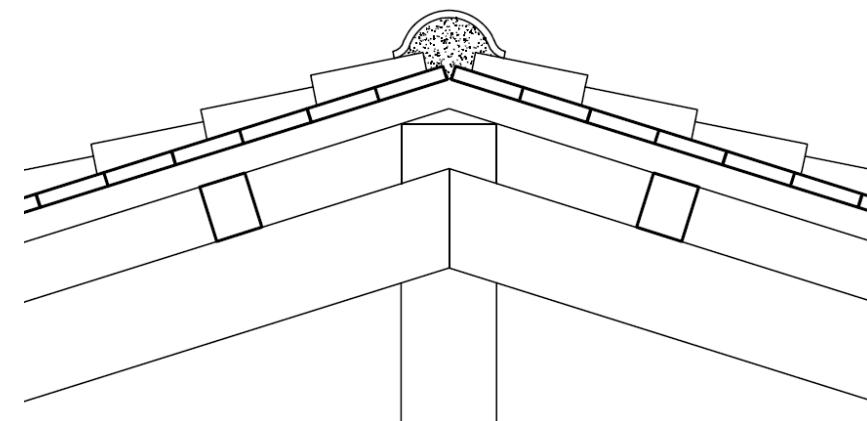
WOODEN CHAIRS

The building has its roof with three wooden trusses, where part of its section can be seen in the arcade, since in the interior part of the building we have a false ceiling, embedded in the enclosures, placed perpendicular to the main façade following the roof slopes. . This type is called torque knife and pendolón.



RIDGEPOLE

The ridges are made with the same roof tiles, gripped with mortar and arranged parallel to the main façade.



SLOPES

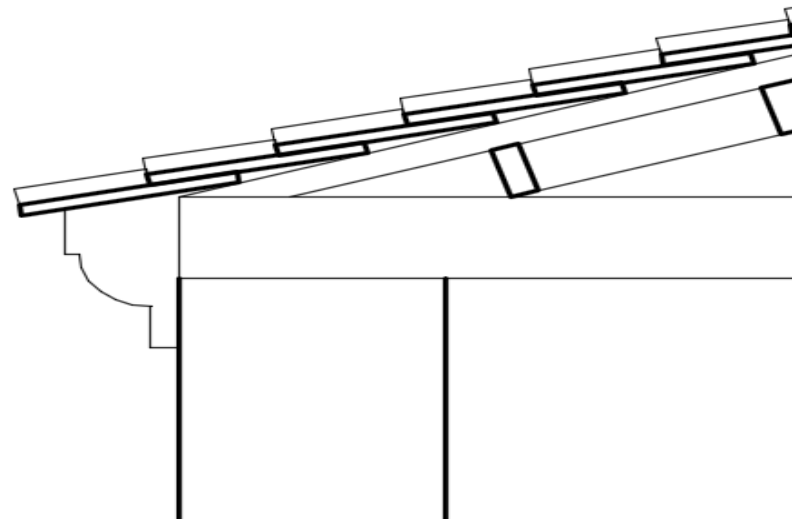
The maximum slope that is located on the roof is 31%.

ALEROS AND CORNISA

The eaves has the function of protecting the outer walls from moisture and at the same time has its aesthetic part, of building decoration.

Formed by Arab tiles placed perpendicular to the roof. Fly between 12 and 32cm is more or less impossible to access them and take the measure.

The cornice has a modulated finish.



NON-STRUCTURAL ELEMENTS

INTERIOR DIVIDERS

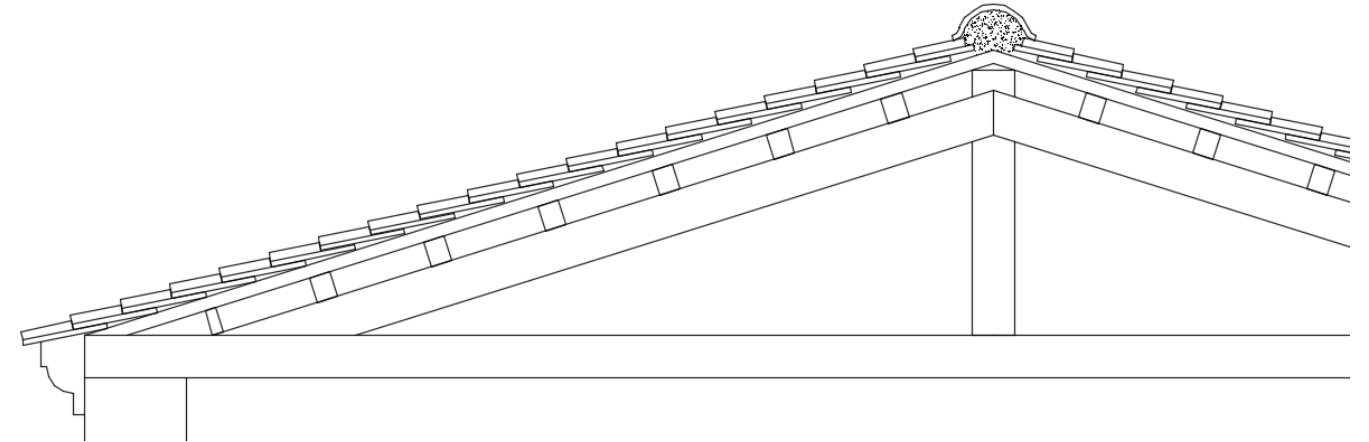
The dividing walls separate the bathrooms, kitchen and the open room.

PAVEMENTS

The ceramic gridded pavement of 30x30 cm.

ARAB TILES

The roof is protected by Arab tile against climatic phenomena: wind, rain, snow, cold and heat.



INTERIOR COATINGS

Vertical walls finished with lime mortar.

In toilets and kitchen, finished parts are appreciated by simple enameled ceramic tile.

The ground floor kitchen has a white 20x20cm tiling arranged in the entire front part of the countertop.

In the toilets, the tiling has a format of 20x20 white tiling part of the walls.

EXTERIOR COATINGS

On the outside of the building, the facades had been plastered with lime mortar.

CARPENTRY

INTERIOR DOORS

All the interior woodwork of the building is made of wood.

WINDOWS

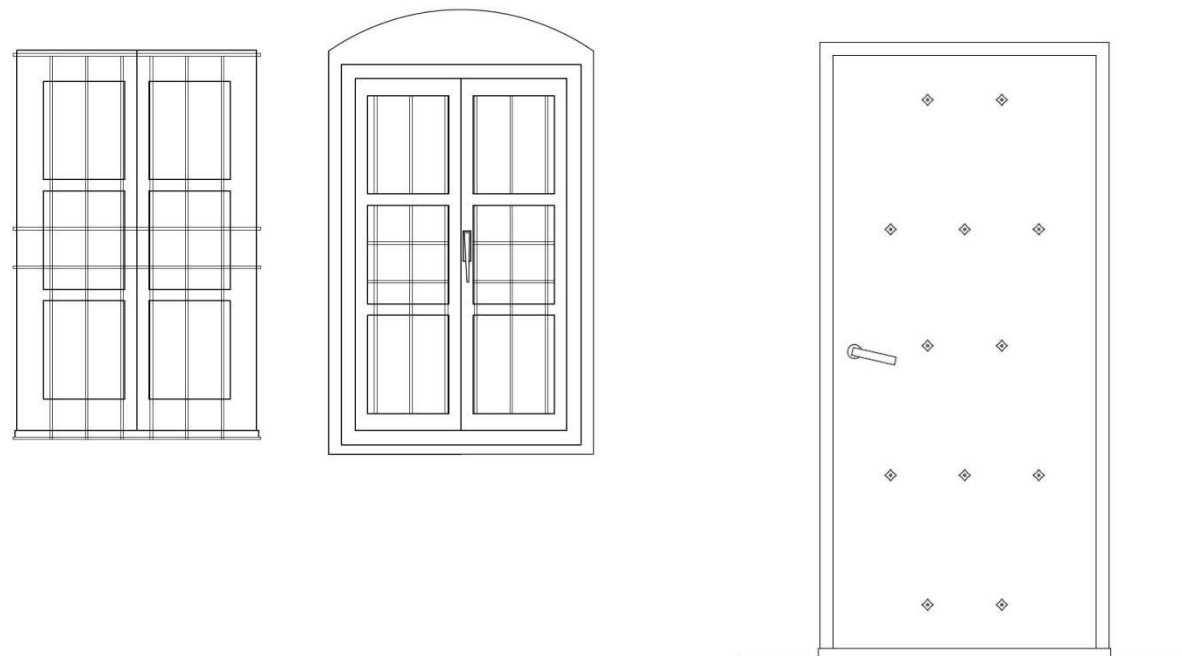
There is a variety in window carpentry, with two glass doors glazed with translucent glass and shutters.

ACCESS DOORS

The accesses to the building are iron finished with rivets are of similar dimensions and two are distributed on each side of the main facade.

LOCKSMITHS

The locksmith elements in the "Guard Corps" are basically window bars. These grilles appear in the windows and are made with solid rounds of between 1.5 cm. of diameter embedded directly to the vertical walls, placed in some of the openings horizontally, vertically or arranged their bars in both directions forming a grid of 10 x 12 cm. approximately.



FACILITIES

PLUMBING

The building is connected to the urban supply network that provides drinking water.

ELECTRICITY

The electricity supply is by air connection, where the wiring reaches the facade fastened by staples and all the outside, until you reach the electrical panel located on the porch in one of the two warehouses distributed on the sides.

Most rooms have a point of light that does not all work properly.

GAS

The building does not have natural gas installation since it is a very old construction and never reformed in this aspect.

4.2. Historical assessment that justifies the original / authentic parts of the building

The military architecture of this era reigns in sober, polished style, without noble materials and devoid of adornments. This new typology has the following constructive **systems**:

- Use of the semicircular arch.



- Molded finish of the cornice only in the corners resolved with ashlar masonry the rest made with mortar.



- Stone and mortar masonry walls were plastered with paste or mortar, with irregular shape.
- Paving of masonry around the building and the pavement of the porch solved with joints run and breaks joints.
- We suppose that the exterior walls were revoked, in order to protect them and endow them with an aesthetic finish.

- Windows and doors with reduced arch.



- Wooden trusses, slats, scrapers and roof tiles.



- Load-bearing walls, with latticework of wooden beams.



In the 18th century, different materials from the area were used, such as the stone from the quarries of Montjuïc that is used in the most significant elements of the building:

- Encounters in the corners of the building and the baseboards, elements compromised, solved with chairs, carved in their faces.

4.3. Current Status of the "Cuerpo de Guardia" of "El Polvorín"

The building, part of the complex of "El Polvorín" of 1732-, it is of simple construction, it has autonomous spaces distributed from an open courtyard with two entrances. Of a single plant, it is composed of a diaphanous space, kitchen, washbasins and warehouses.

- Two accesses to the interior of the building, are sheltered from the weather by means of arcades solved by arches.



Image: Two accesses to the interior of the building.

- Wall of brick placed to blight, offering the observer the smaller face of the piece making the wall reach a thickness of 1 foot, surrounding the "Guard Corps" and with loopholes on all sides.



- Outside, there are two whorled and covered booths (only that of the main façade) at the ends of one of the diagonals, located in the limits of the shelter area and in one of the other two diagonals, another square-shaped sentry box.



- Around the building of the body of guard is a sidewalk of ashlar masonry to avoid that the waters of rain, when falling on the land they formed furrows or potholes that could cause the stagnation of the waters and peel the foundations.



Image: sidewalk stone.

- The cover has good conditions to prevent the entry of water from the rain. Ceramic products, in addition to being natural, are characterized by their durability and long service life, like this cover.



Image: Cover to 4 waters

- The alpeices of the window openings are of stonework, but of little thickness, and it has a simple cornice.



- The exterior cladding of the building, the walls were revoked, in order to protect them and give them an aesthetic finish.



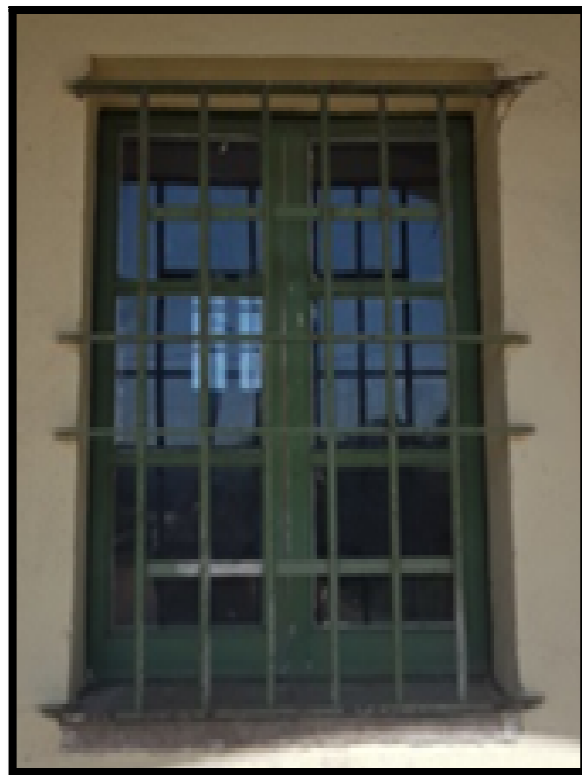
- Porch with four semicircular arches.



- Reinforcement in the wooden trusses.



- Rolled steel gratings (its production is not until 1950).



Main and later façade



Side Facades



Inside

- The kitchen is tiled $\frac{3}{4}$ parts of the height, the wall of the sink, with a ceramic tile of 20x20 cm white background. The rest of the wall is plastered and painted with a white paint with a matte finish.



- All the rooms with a false ceiling, with an aesthetic function and seen hiding the upper framework that is formed by the wooden trusses.



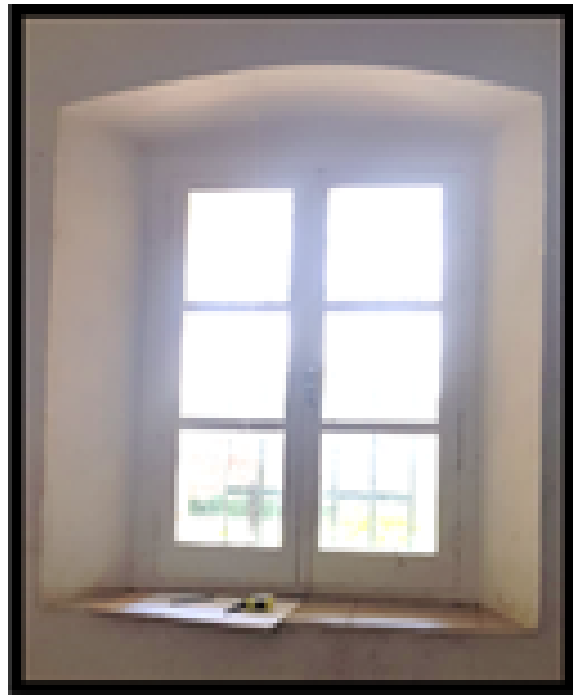
- Ceramic tile floor of 30x 30 cm.



- Warehouse storage of all kinds of documentation.



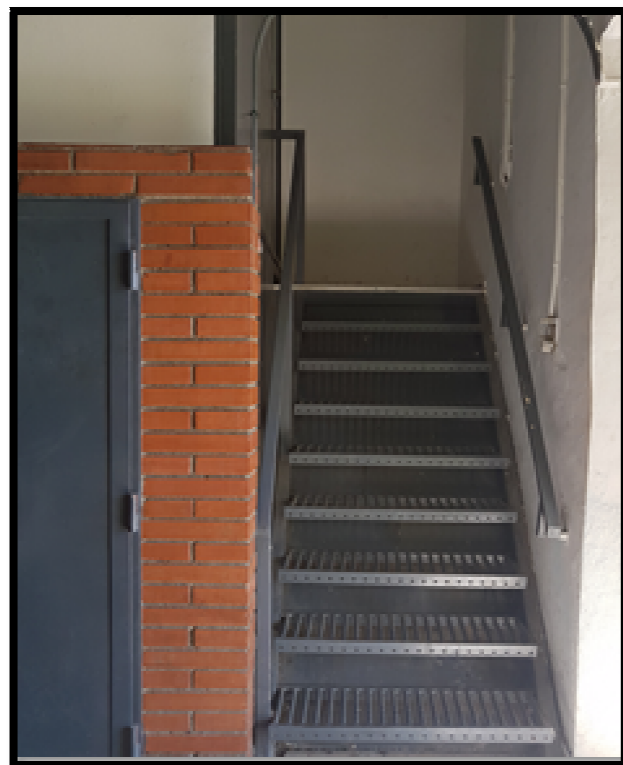
- All window finishes are made of solid lacquered wood with interior matt white paint and green exterior. With a varnish finish to protect the wood.



- The bathroom has a tiled ceramic tile of 20 x 20cm, placed in Valencian color white.



- Metallic staircase to access the loft.



5. GRAPHIC SURVEY

5.1. Previous jobs

The lifting of the building can be done by traditional techniques and tools, that is, from the preparation of sketches, sketches or drawings that, with the help of metric tapes, plumb lines, clinometers, etc. (allow to establish the necessary metric data to define and know the object.

We have taken direct measurements using the classic measuring instruments: decameter, alignment pull, plumb bob, compass, laser...

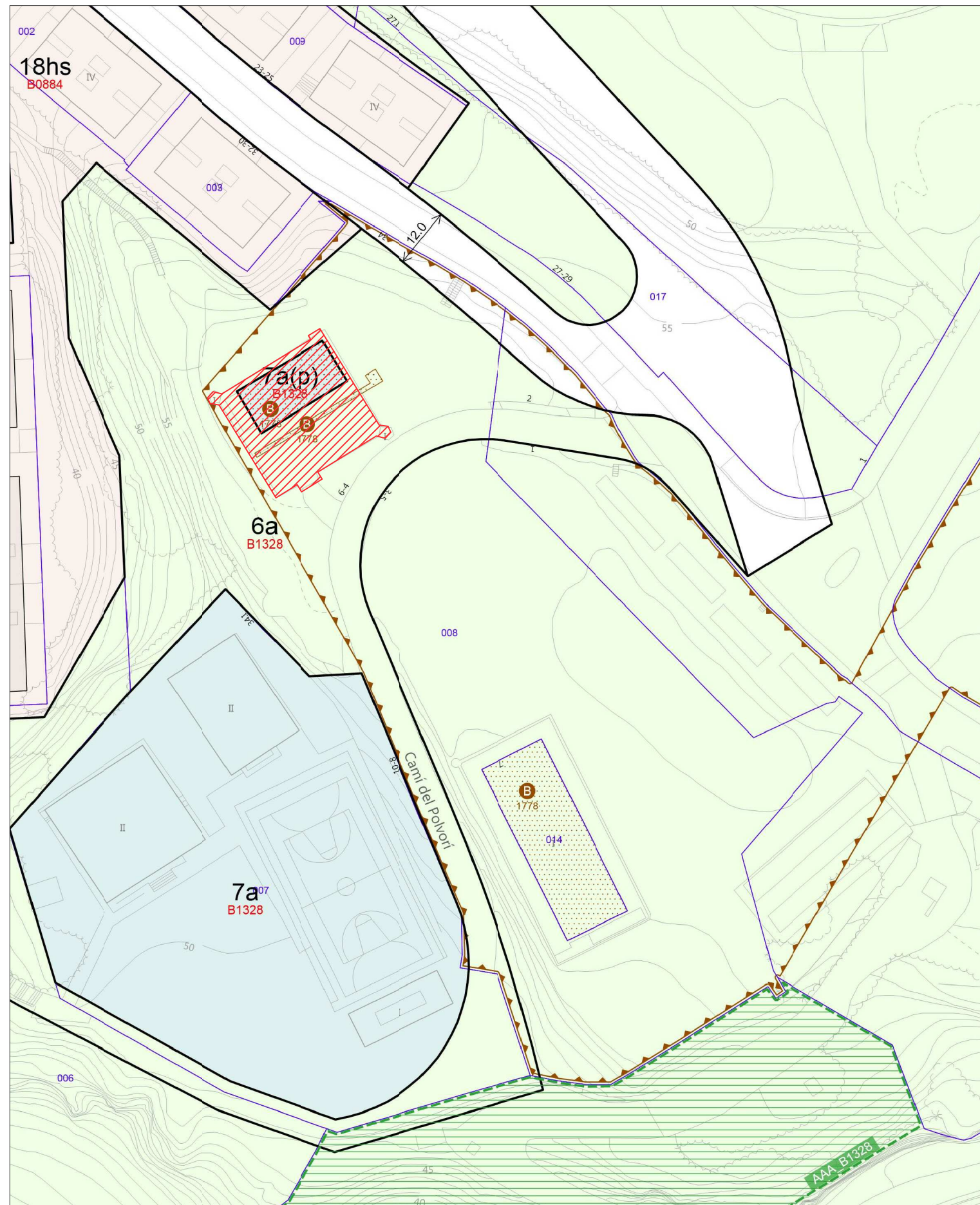
Sketches have been made, as well as graphic documentation through a camera. The sketches made in the data collection during our visits to the building are attached.

5.2. Building survey

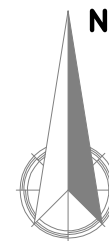
To analyze and understand the building and its built architecture, especially in this building of a military nature, of which we do not have plans or plans, it is necessary to make the data as accurate as possible to make the sketches and the respective survey.

The survey is carried out in order to establish the metric and formal knowledge of the Guard building and custody of the powder keg.

5.2. Building survey



SITE (E:1/1000)



Coordenades U.T.M.
 X= 428.295,44
 Y= 4.579.567,62

Project	
EL POLVORIN	
Subject	
DAC REHABILITATION	
Teacher	
David Hernandez Falgan	
Students	
FERNÁNDEZ FERNÁNDEZ, MONTSERRAT JIMENEZ DELGADO, LUNA GORT GARCIA, BELÉN	
Group	
II	
Plane	
SITE	
Date	Number
16.01.19	1
Escale	
1/1000	



SITE (CONVENCIONAL SCALE)

Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

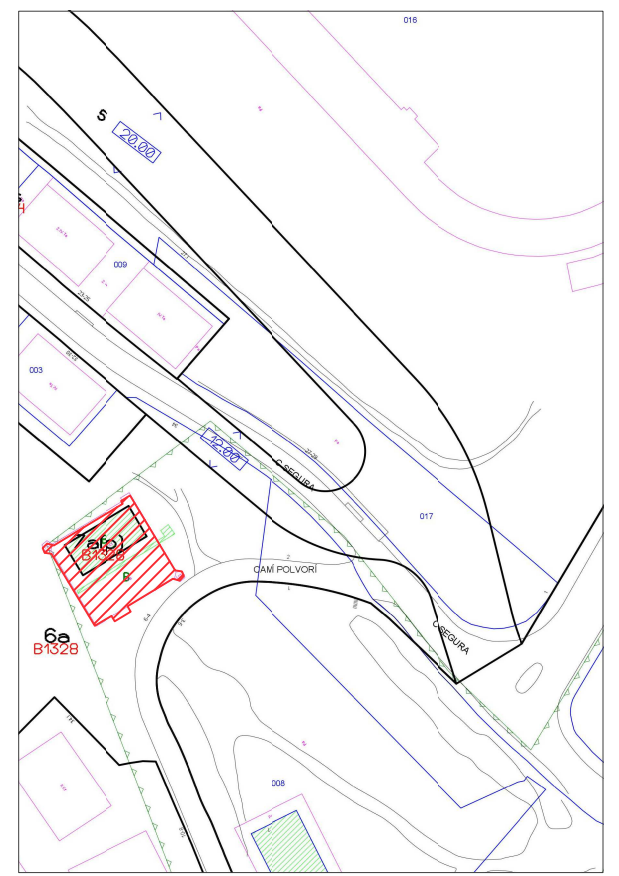
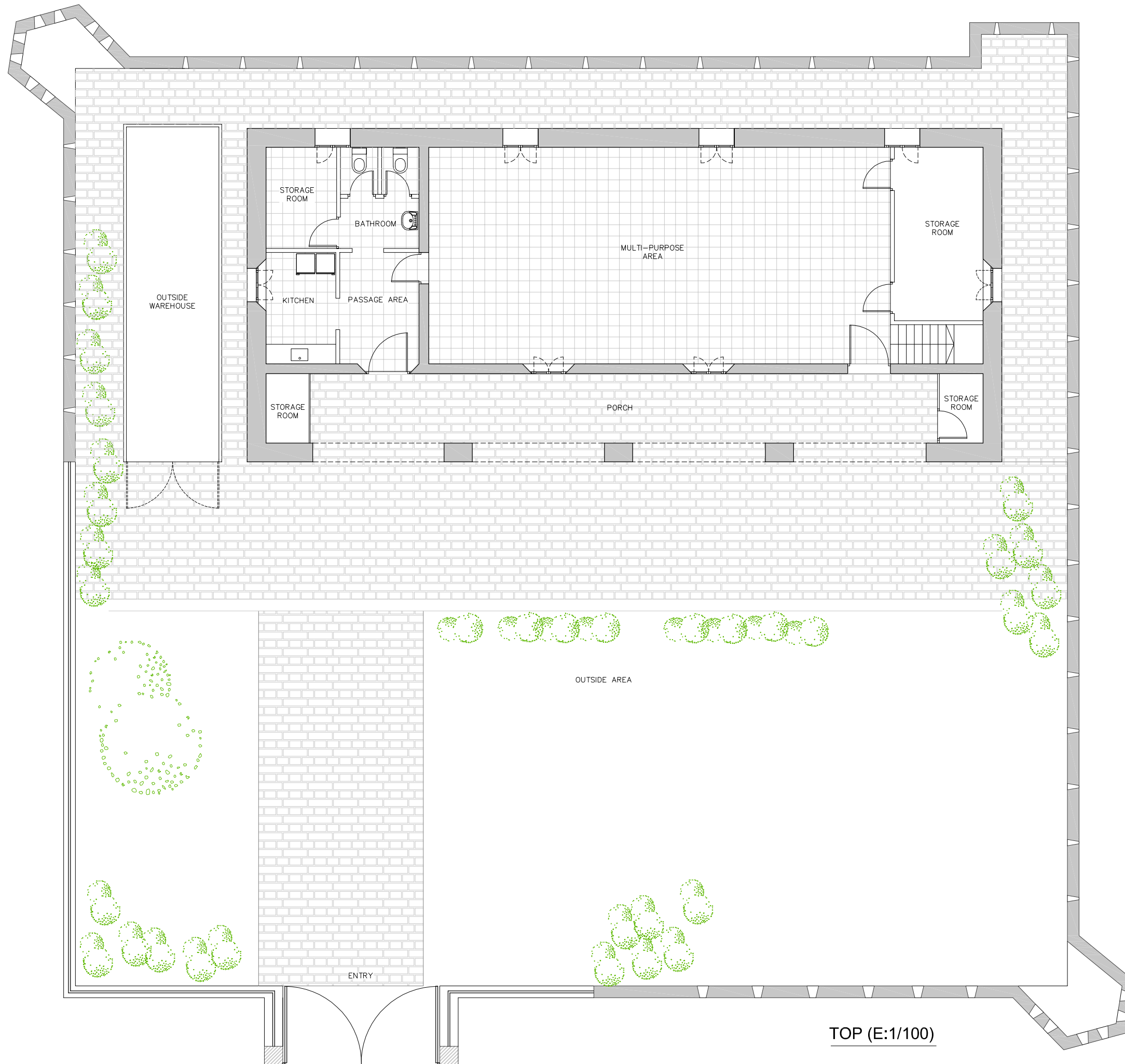
Plane
**SITE
CURRENT STATUS**

Date
16.01.19

Escale
1/100

Number

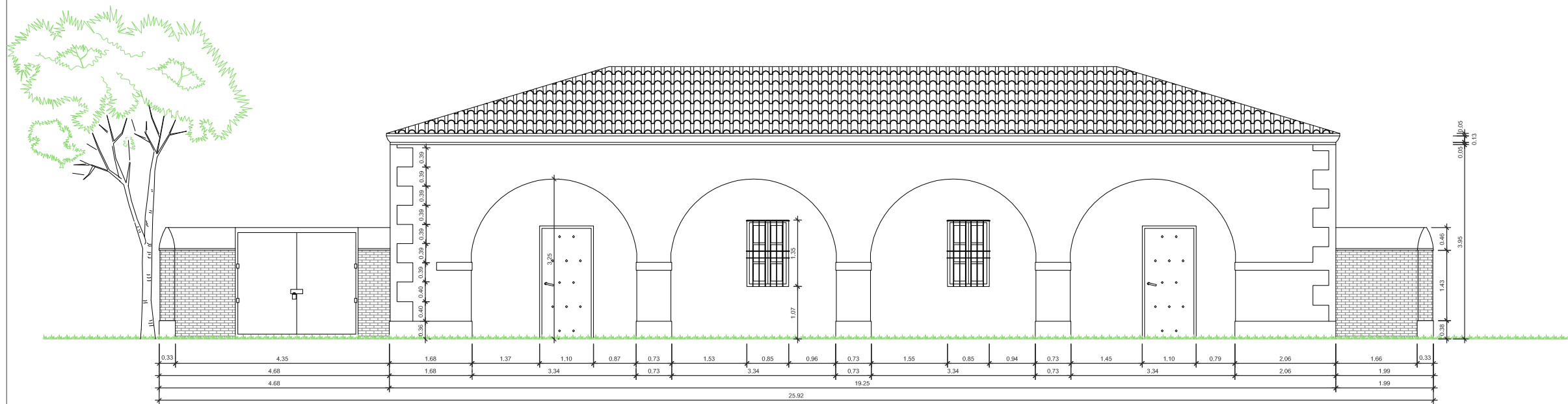
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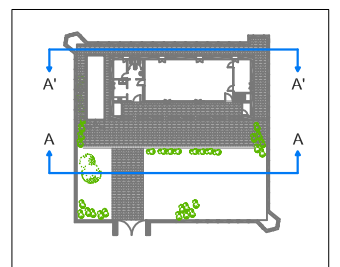
SITE (CONVENCIONAL SCALE)

Project		EL POLVORIN
Subject		DAC REHABILITATION
Teacher		David Hernandez Falgan
Students		FERNÁNDEZ FERNÁNDEZ, MONTSERRAT JIMENEZ DELGADO, LUNA GORT GARCIA, BELÉN
Group		II
Plane		TOP CURRENT STATUS
Date	Number	3
16.01.19		
Escale	1/100	

TOP (E:1/100)



FRONT A-A (E:1/100)



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
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GORT GARCIA, BELÉN**

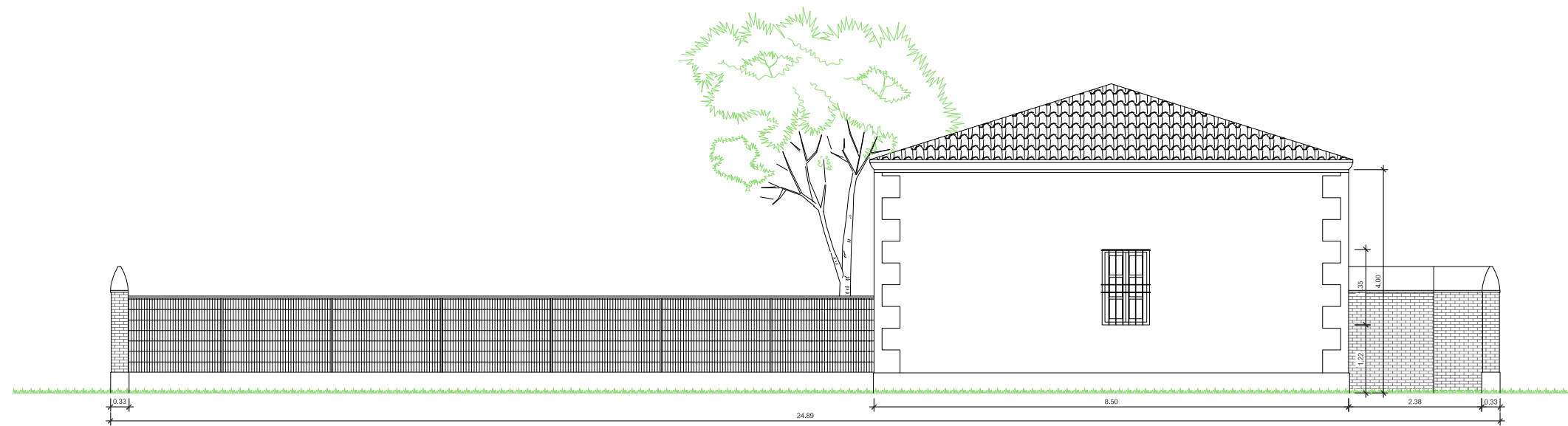
Group
II

Plane
**MAIN - BACK
FRONT**

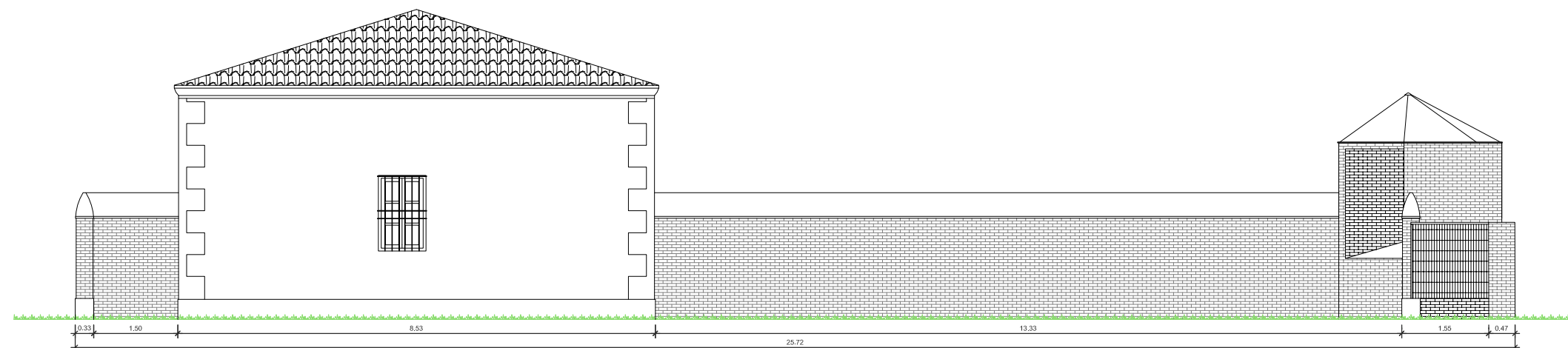
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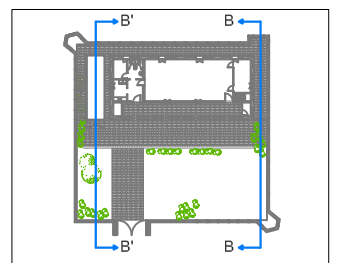
FRONT A'-A' (E:1/100)



SIDE B-B (E:1/100)



SIDE B'-B' (E:1/100)



Project
EL POLVORIN

Subject
DAC REHABILITATION

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David Hernandez Falgan

Students
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JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

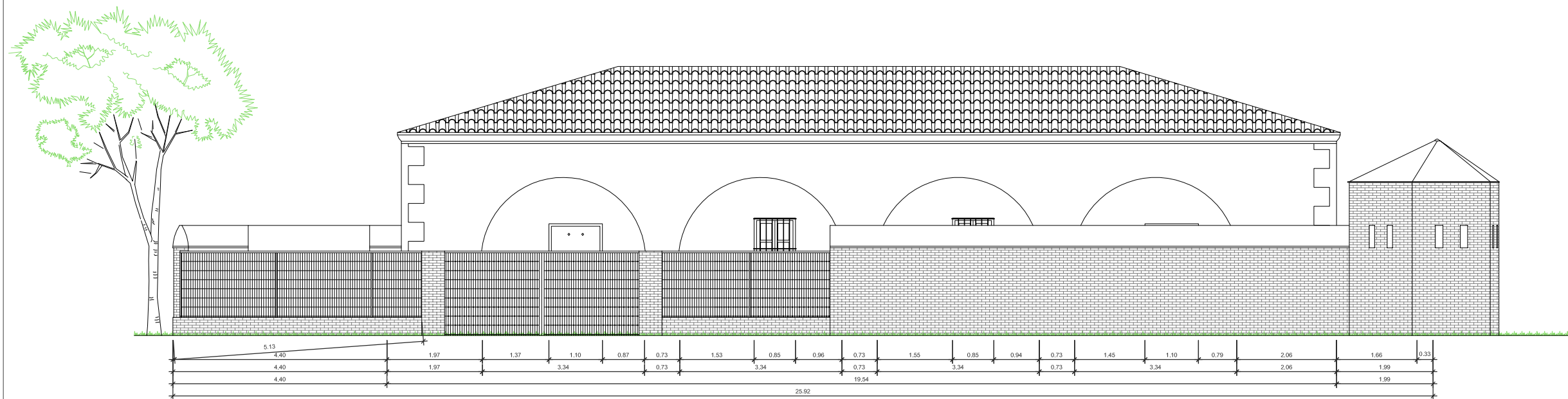
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Date
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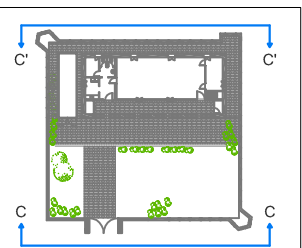
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5



FRONT C-C (E:1/100)



Project
EL POLVORIN

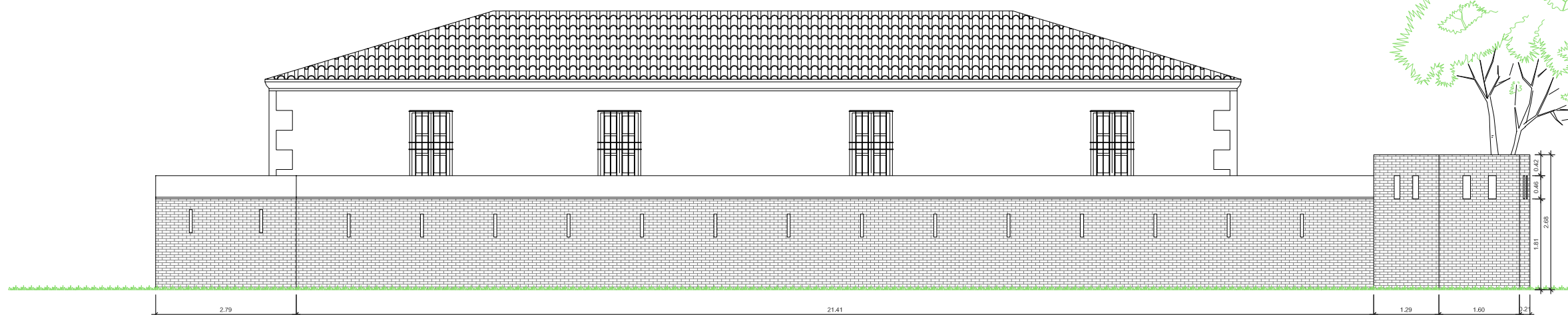
Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

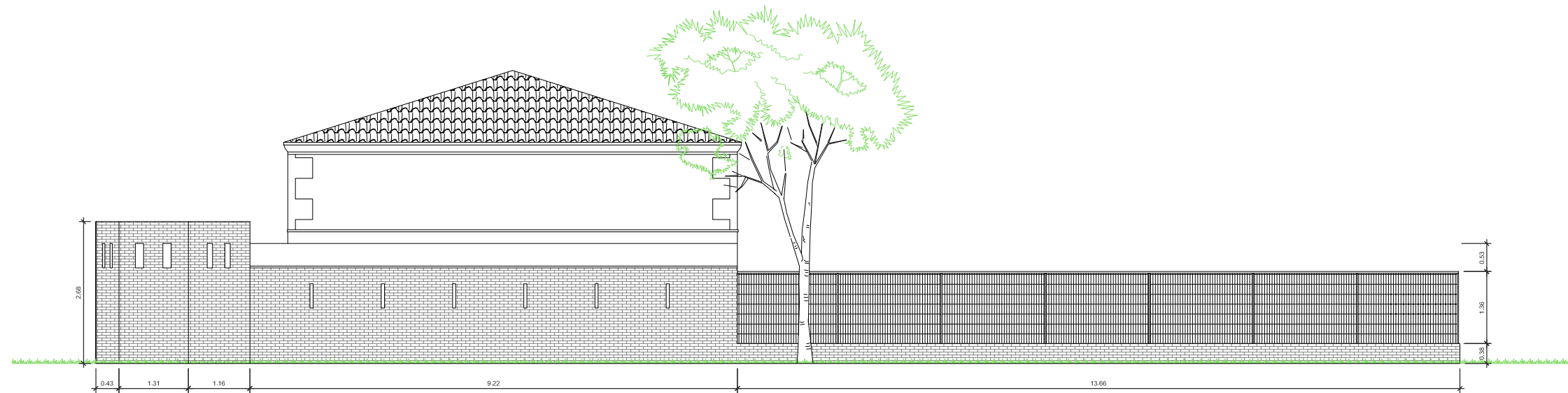
Group
II

Plane
**MAIN - BACK
FRONT**

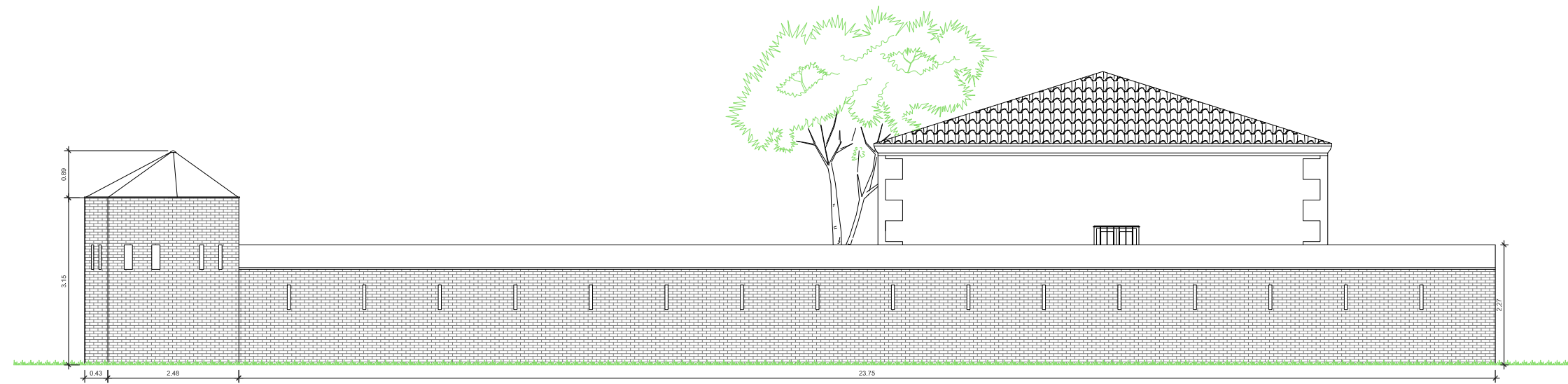


FRONT C'-C' (E:1/100)

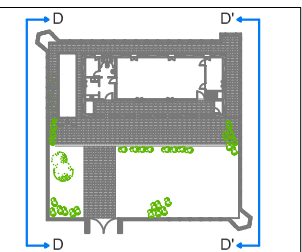
Date	Number
16.01.19	6
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SIDE D-D (E:1/100)



SIDE D'-D' (E:1/100)



Project
EL POLVORIN

Subject
DAC REHABILITATION

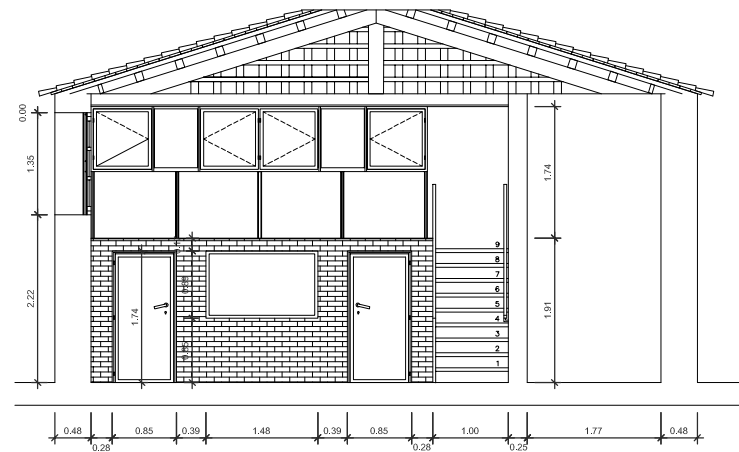
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

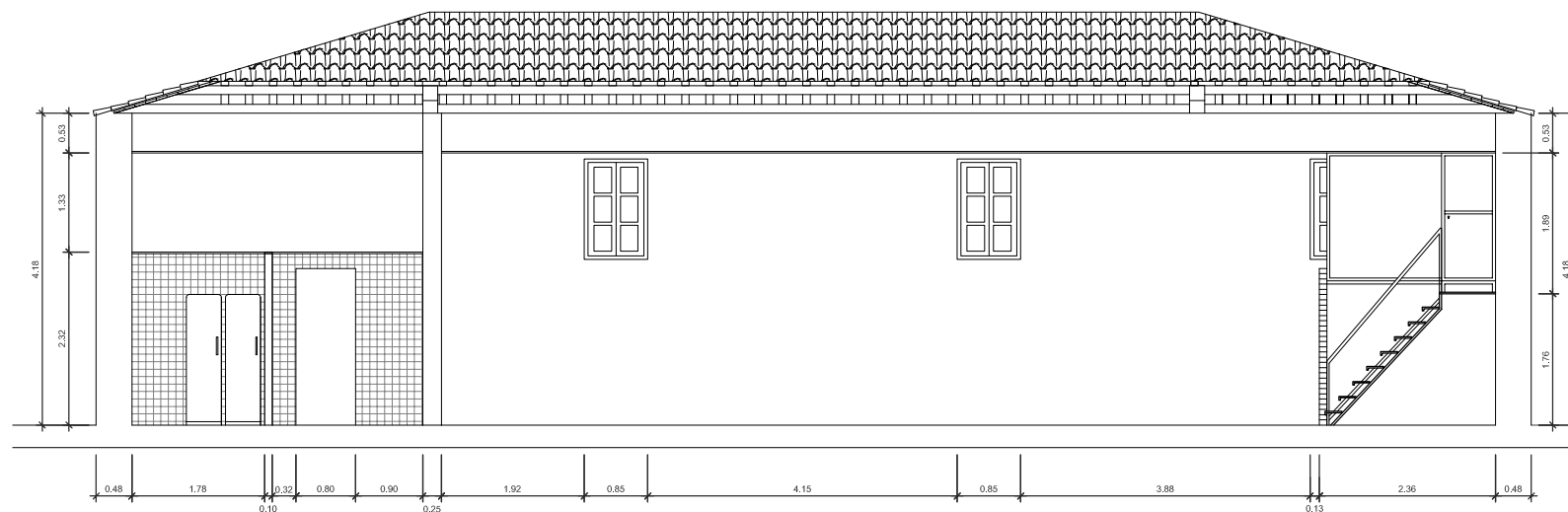
Group
II

Plane
SIDES

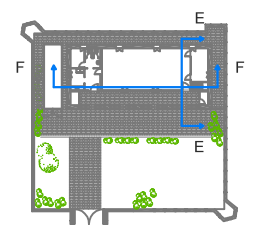
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SECTION E-E (E:1/100)



SECTION F-F (E:1/100)



Project
EL POLVORIN

Subject
DAC REHABILITATION

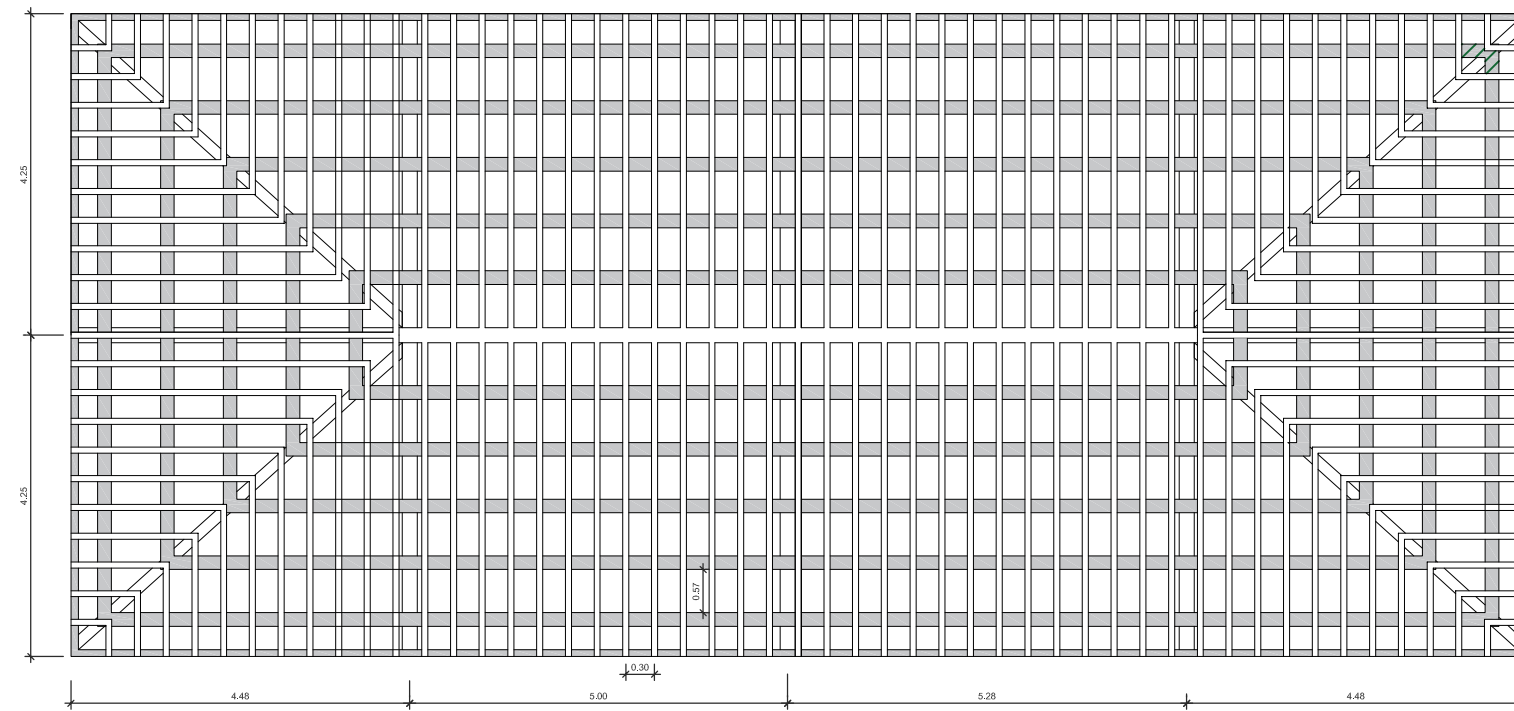
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

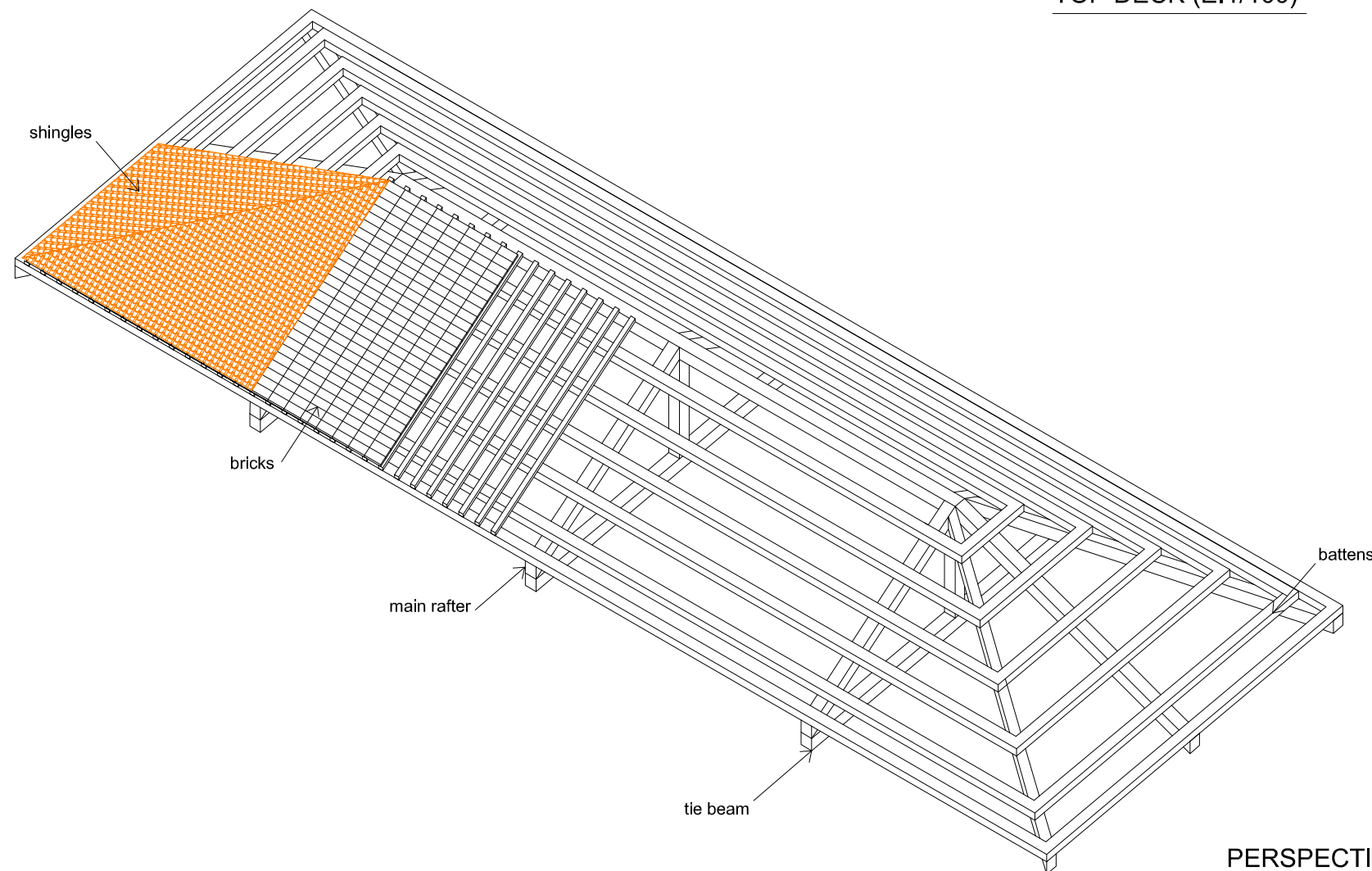
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Plane
SECTION

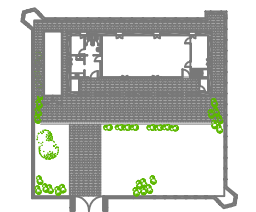
Date 16.01.19	Number 8
Escale 1/100	



TOP DECK (E:1/100)



PERSPECTIVE DECK



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
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JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

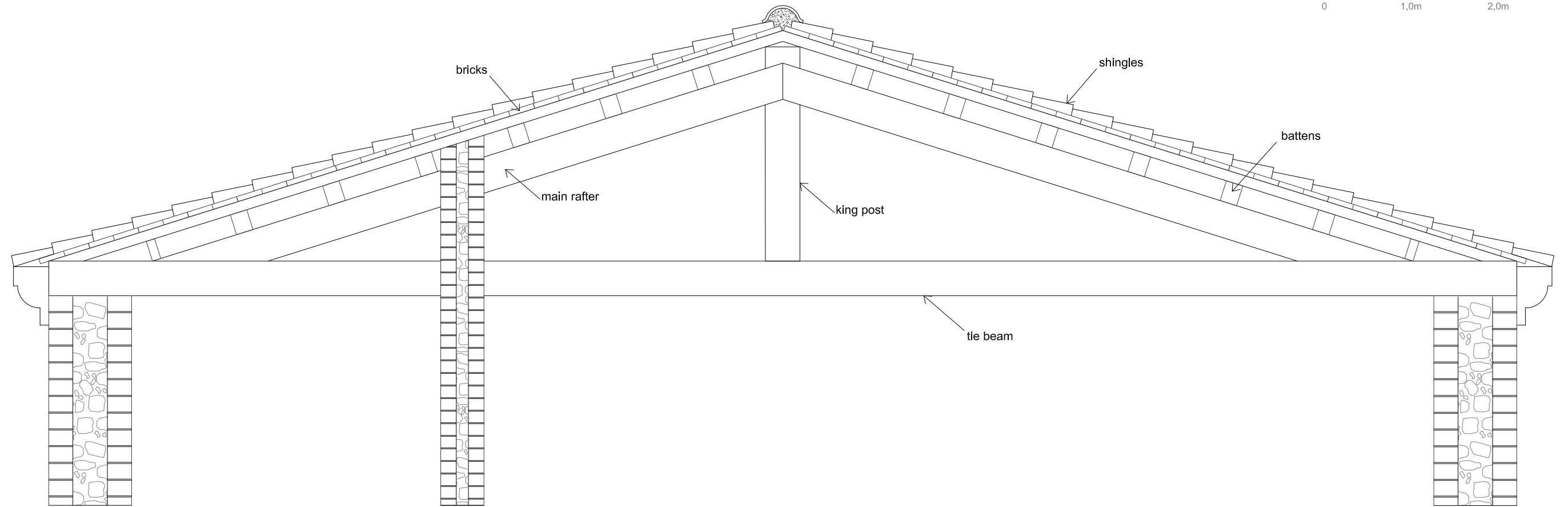
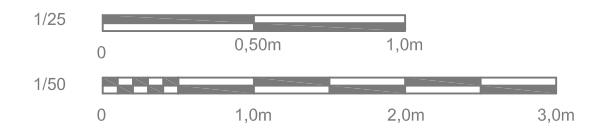
Group
II

Plane
**TOP AND
PERSPECTIVE
DECK**

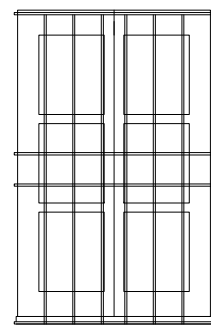
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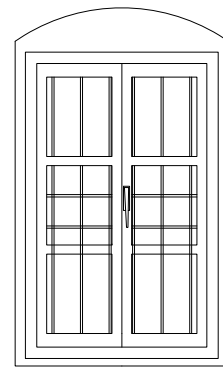
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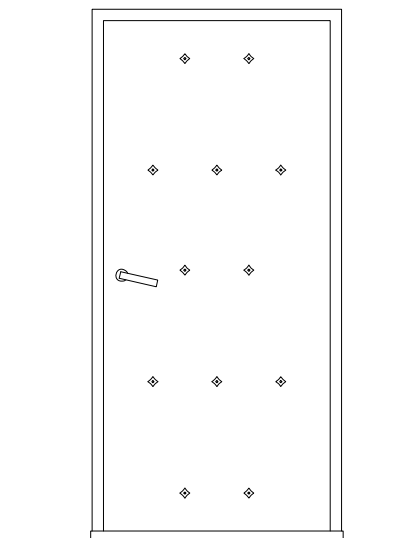
DECK
e.1/25



Wooden window
(outside)



Wooden window
(inside)



Iron door

Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
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JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN

Group
II

Plane
DETAILS

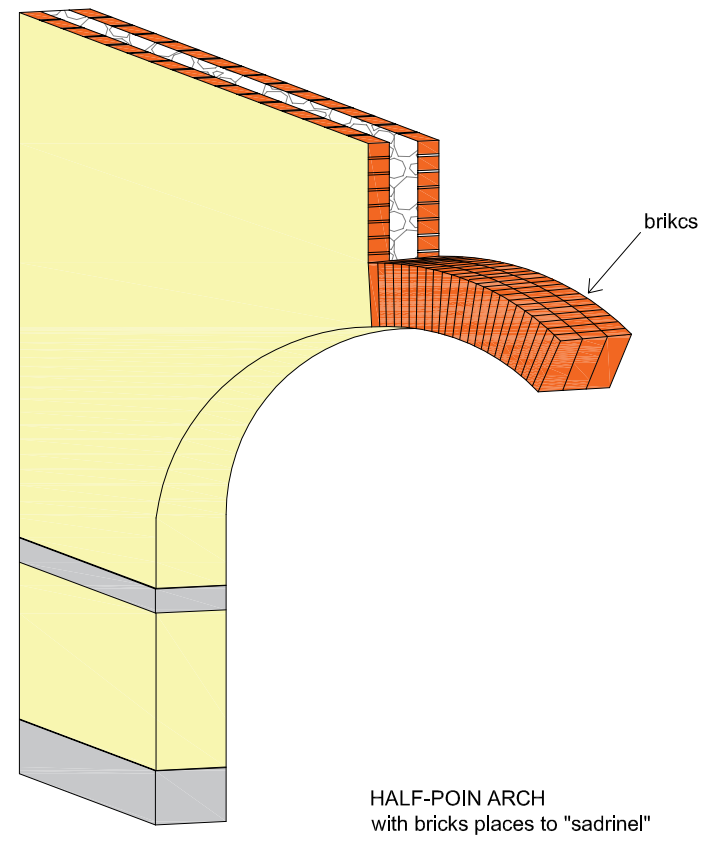
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16.01.19

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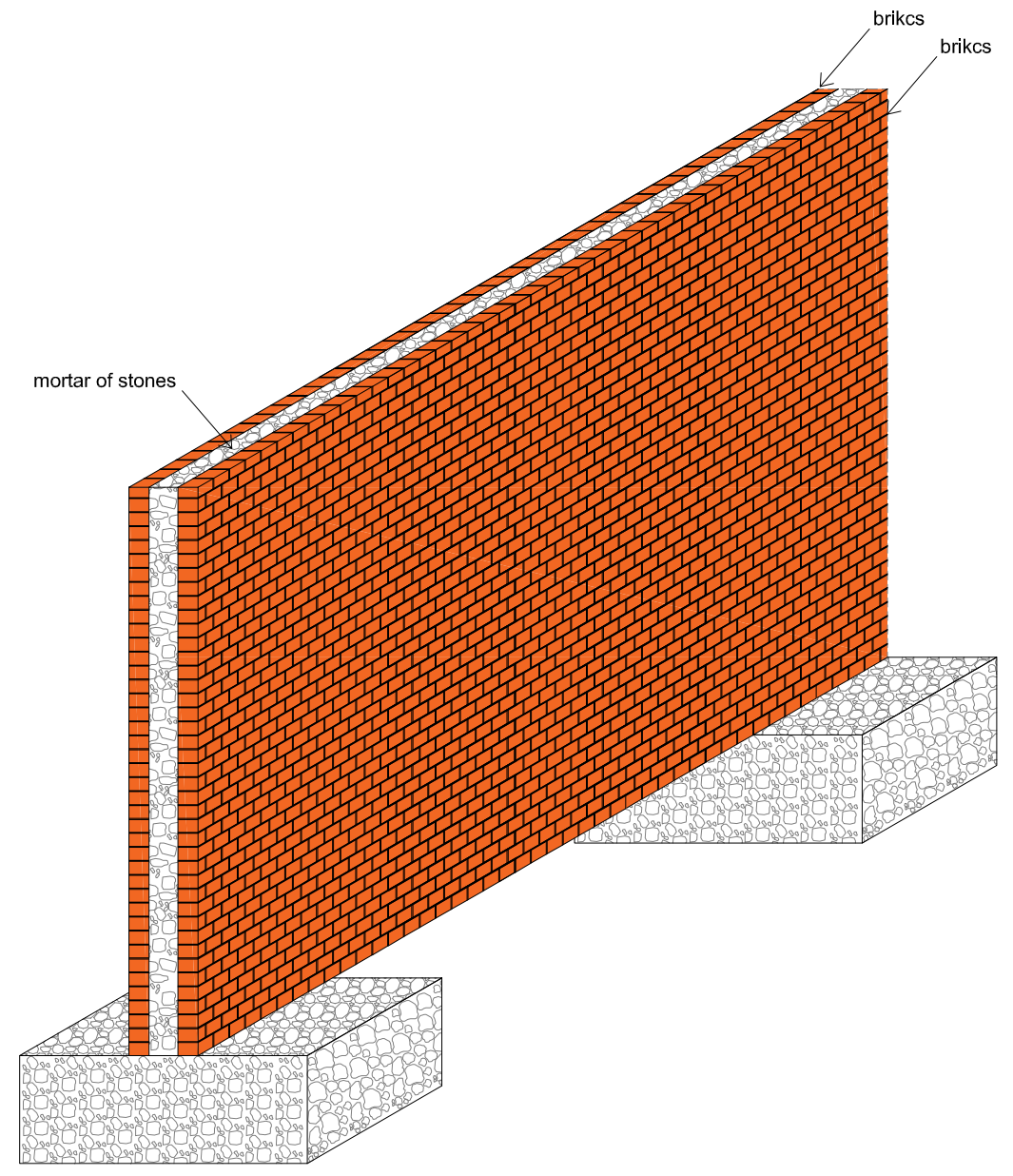
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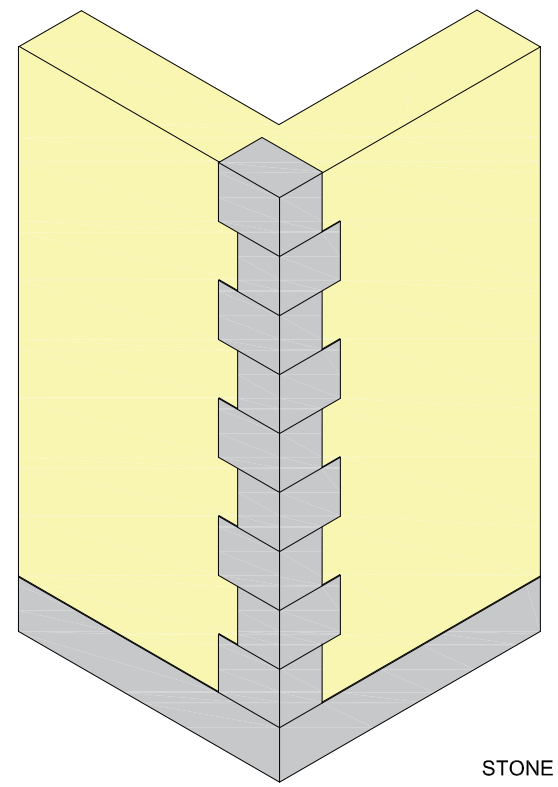
CARPENTERY



HALF-POINT ARCH
with bricks places to "sadrinel"



THREE-LEAF WALL:
brick - mortar of stones - brick
FOUNDATION OF DITCH



STONE CORNER

Project EL POLVORIN	
Subject DAC REHABILITATION	
Teacher David Hernandez Falgan	
Students FERNÁNDEZ FERNÁNDEZ, MONTSERRAT JIMENEZ DELGADO, LUNA GORT GARCIA, BELÉN	
Group II	
Plane DETAILS	
Date 16.01.19	Number 11
Escale 1/50	

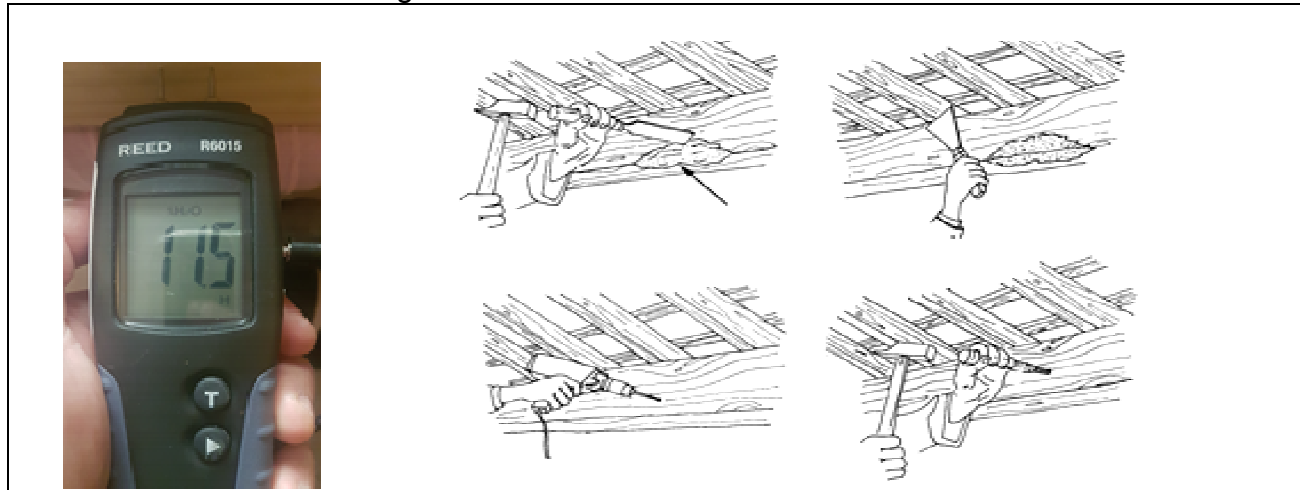
6. DIAGNOSIS

The object of this study is to locate the existing injuries in the building of the “**Cuerpo de Guardia**” for once located, proceed to its analysis in order to know the causes that may have caused them, thus facilitating the obtaining of a series of processes of intervention, if these are finally considered necessary.

6.1. Work methodology

We have moved to the “**Cuerpo de Guardia**” from September to November 2018 to proceed with the definition of the current state of the building and locate the different injuries observed. The documents and devices from which the data collection was carried out and the subsequent analysis of the current status and the existing injuries are the following:

- Approximate plans in floors and elevation of the building of the graphic survey and also consulted documents of the historical archive, neighborhood library and Atenea.
- Humidity hygrometers in materials and non-destructive tests. We have checked the humidity of the woods of the study building and we know the amount of humidity that there is and the state of the wood according to the tests "in situ".



- Thermo-hygrometer measures the temperature and humidity of the environment.



6.2. Criteria for ordering injuries

It is done in each building, visually inspecting the most representative building elements. These parts are:

6.2.1. Exterior construction elements:

Perimeter wall, facades, roof, etc.

6.2.2. Interior construction elements:

Walls, pavement, windows, wood framework, etc.

6.2.3. Facilities:

Water supply, water evacuation, etc.

In this section the description of all the injuries that have been detected in the home will be made. To make this section have made different visits to the house to get information by helping us lifting graphs, sketches and photographs of injuries.

Afterwards, an analysis and diagnosis is carried out, in which are attached some technical files that summarize these three points: technical recognition, analysis and diagnosis.

In addition, each lesion will be classified according to its origin and type of risk.

Classification of injuries according to their origin:

- Physical injuries: are caused by moisture, dirt or erosion.
- Mechanical injuries: caused by a mechanical factor, such as cracks, fissures, detachments or deformations.
- Chemical injuries: are caused by a chemical process such as oxidation, corrosion, living organisms, etc.

Classification of injuries according to the risk they can cause:

- Mild risk injury: The one that normally affects the aesthetics of the building without affecting their physical integrity.
- Serious risk injury: That which affects beyond the aesthetics of the building, but does not damage the functioning of the structure.
- Very serious risk injury: The one that affects the structure directly, creating a great danger for the stability of the building and greatly affecting the safety of people.

Next, we make a summary of the localized injuries of our inspection:

6.2.1. Exterior construction elements

Exterior of the building.

- Sagged masonry parapet, only in the zone of lateral west passage, of perimeter sidewalk that surrounds the building. (File nº1).



Sf01-Photo num.44

- Loophole narrow openings located throughout the section of the wall, have losses and erosion of the bricks that make them up. (File nº2).



Dw50-Photo num.48

- Wall in the southern part, has collapsed has lost its verticality. (File nº3)



Chw 48- Photo num. 36 bis

- The main sentry box on its outside and inside dirt on its walls and in the rear sentry box the cover has disappeared and there are debris inside (File nº4, nº5, nº6.).



Cvw44- Photo num. 49

dw03 - Photo num.50

C01- Photo num.45

- Various painted blue and white, on the intrados of the back wall (File nº7).



dw 02 - Photo num.45 bis

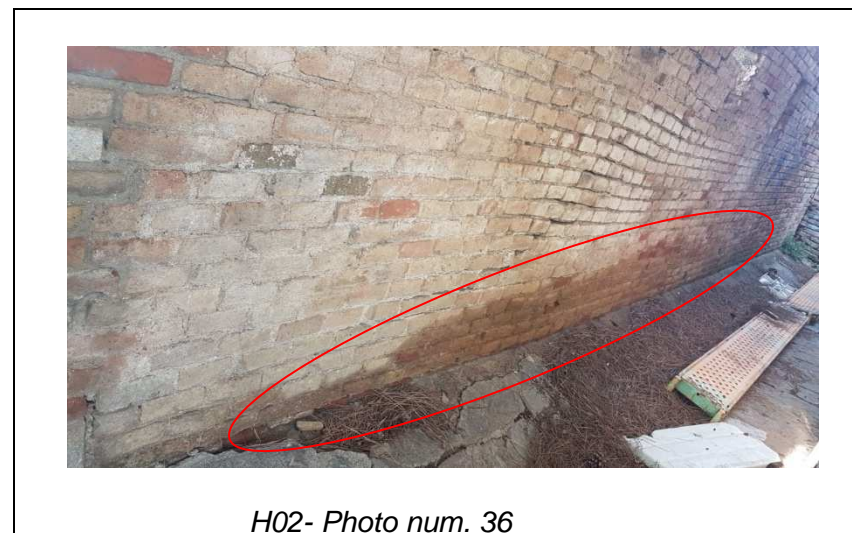
- Pillars of the entrance to the enclosure with various vertical cracks. (File nº8).



- Lost left outer wall of section in the lower part. (File nº9).

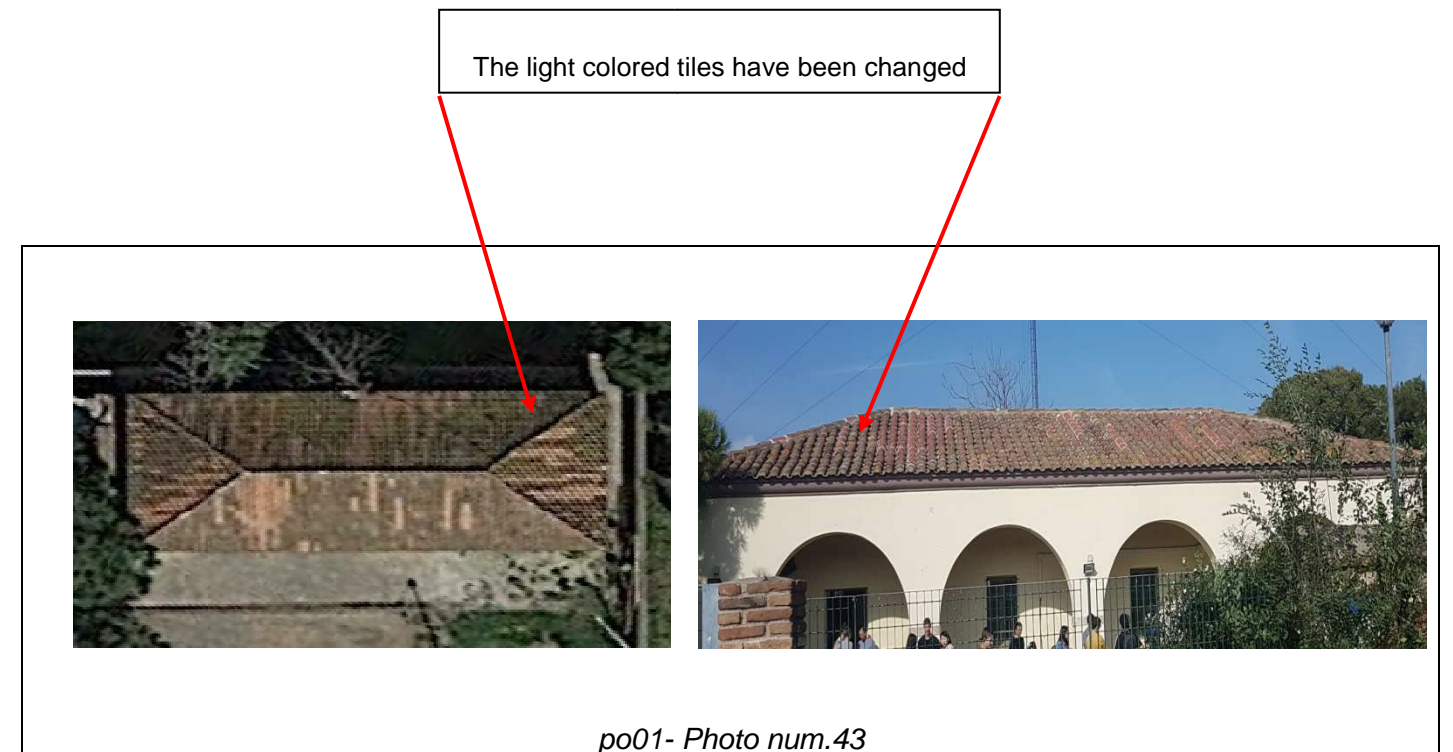


- Humidity in the perimeter wall that surrounds the building on the south side in the intrados. (File nº10).

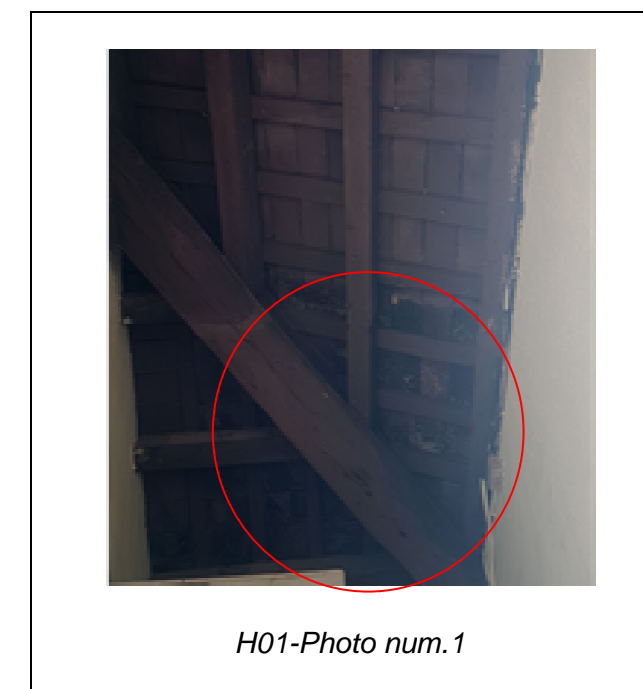


Deck

- Spots and plant organisms (mosses) located in the darkest / greenish areas throughout the cover. (File nº11).



- Humidity by filtration in the wooden structure of the porch (File nº12).



- The majority of the trusses present cracks in the longitudinal direction, of variable dimensions according to the truss, of different length and thickness in each and different situation in the section. (File nº13).

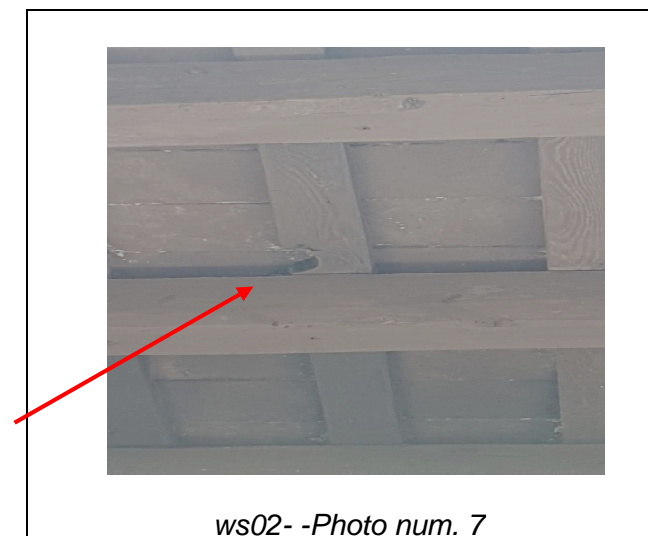


- Longitudinal crack, which opens in the direction of the fiber, the strut of the truss already has a reinforcement along its entire length. (File nº15).



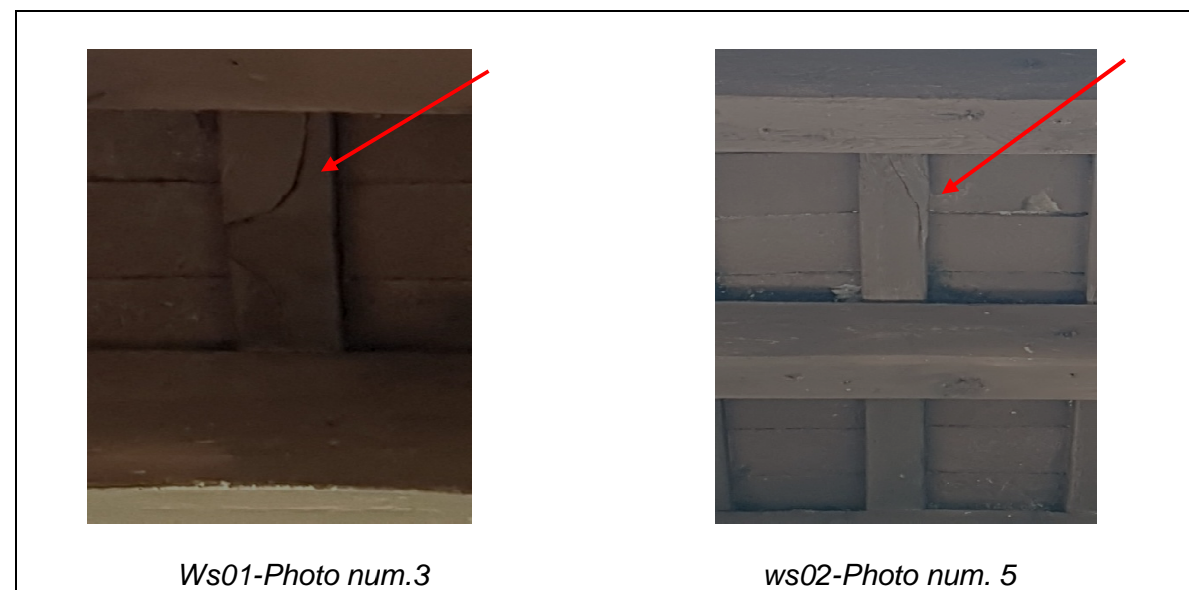
Chb 06-Photo num.6

- Jump a knot in one of the battens of the roof truss. (File nº16).



ws02- -Photo num. 7

- Cracks in curvilinear form between the concentric layers of the growth rings that occur in the wood slats of the framework. (File nº14).



- Dirt in wooden battens and slats (File nº17).

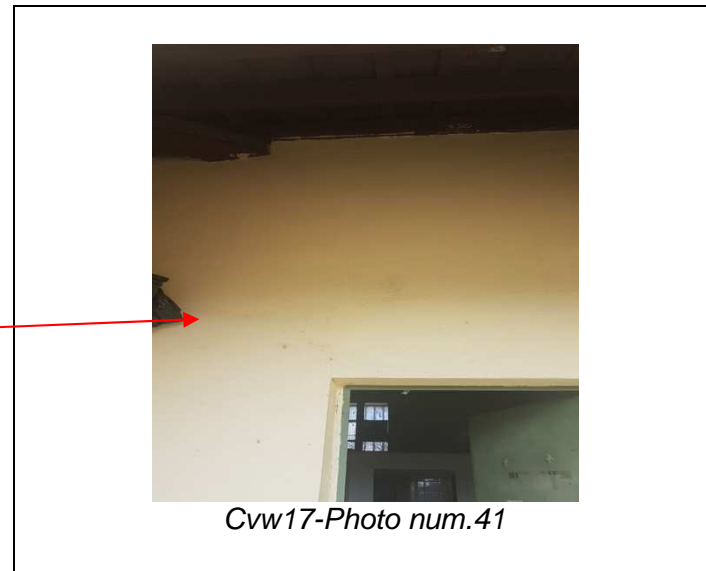


Dpl 01-Photo num.12

Facades

Main facade

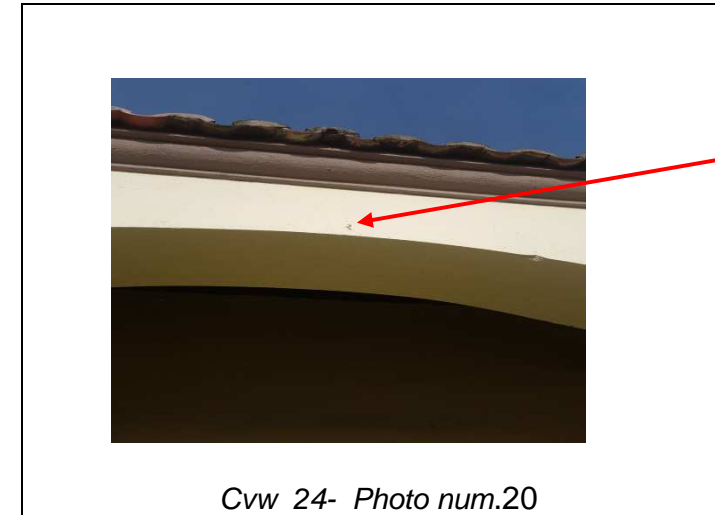
- Vertical fissure in the upper part of the door (File nº18).



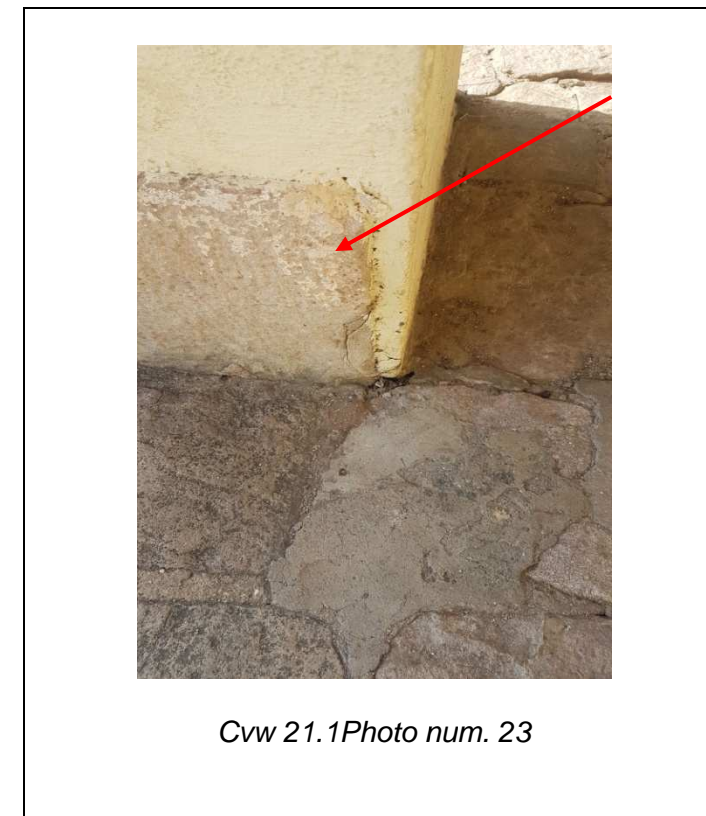
- Crack in the sill open in the middle formed by block of stone (File nº19).



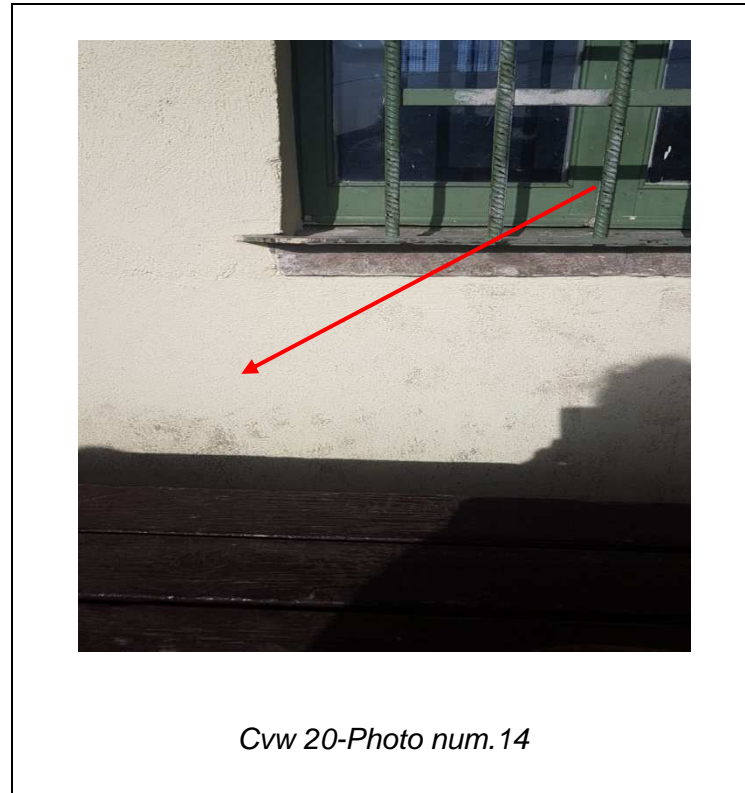
- Fissure in the center or key of the semicircular arch in the photos 19, 20 y 21 (File nº20).



- Various vertical cracks in the pillar, in the lower part the base formed by a block of masonry carved by three of its faces, photos 23, 13 and 42 (File nº21).



- Fissures in singular points in the windows (File nº22).



- Crack that comes out at the weakest point of discharge that is the bottom window (File nº 24).



- The covering has fallen and the support material is seen in this case the masonry wall taken with mortar. (File nº 23).

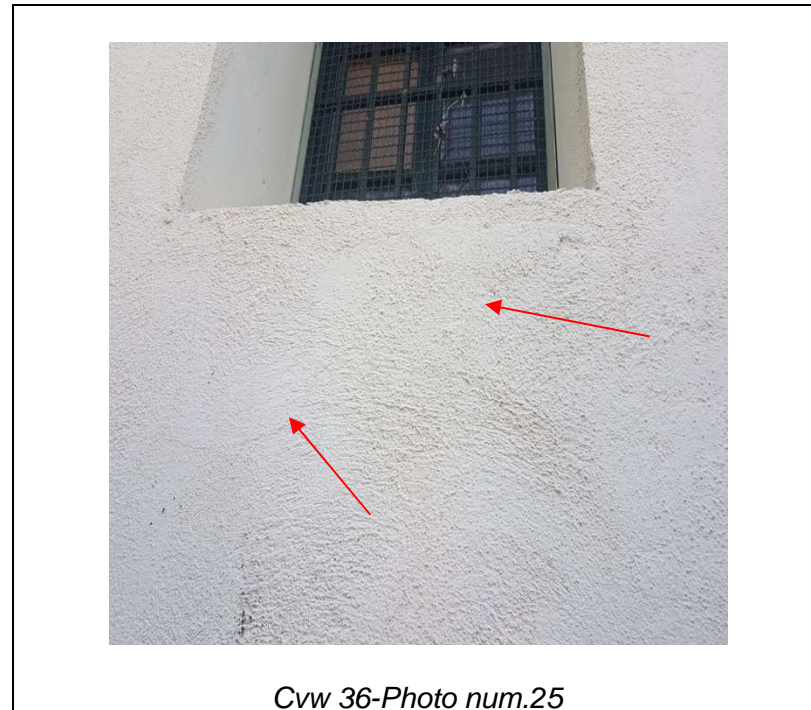


- Fissures and cracks leave the union of the truss with the tie and the pair with the masonry wall in photos 25 and 23 (File nº25).

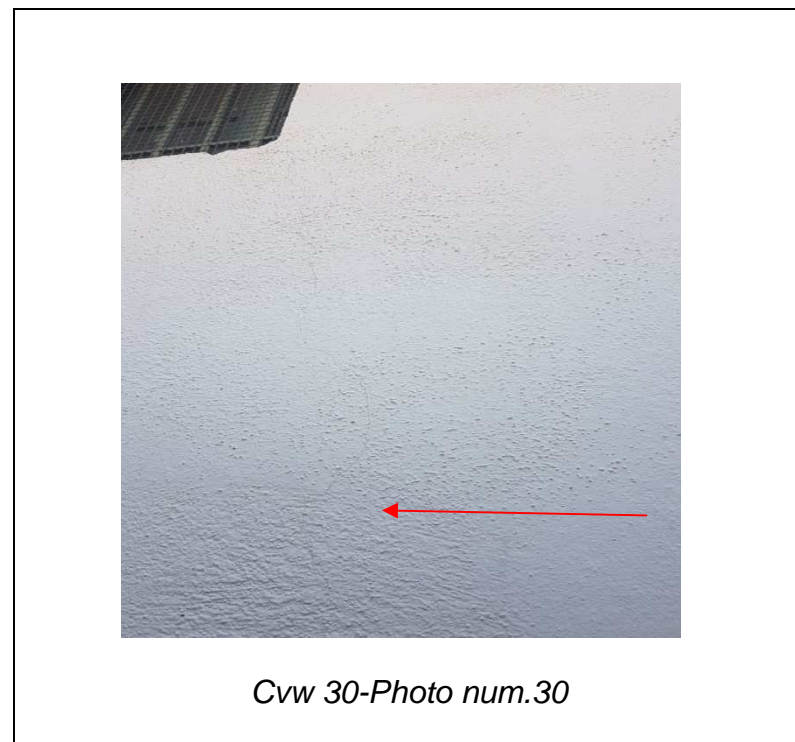


Posterior Facade

- Various descending cracks in the rear facade under the windows. (File nº26).



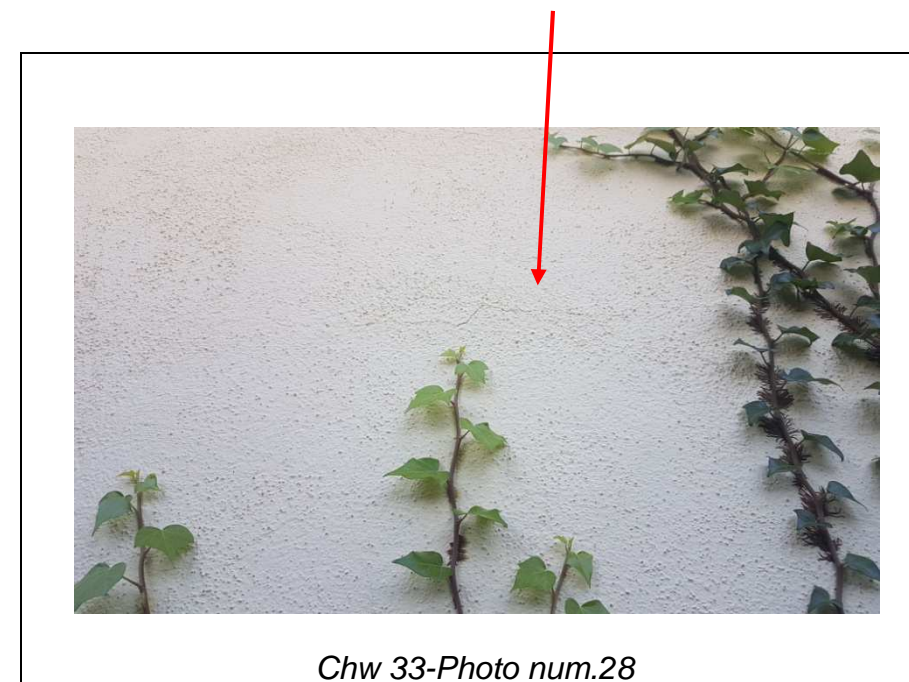
- Multiple vertical fissures on the inside of the entire facade in the photos 24, 25, 26, 27, 28, 29,30, 31, 32,33 y34 (File nº27).



- Painting on the back facade in the corner in the stone (File nº28).

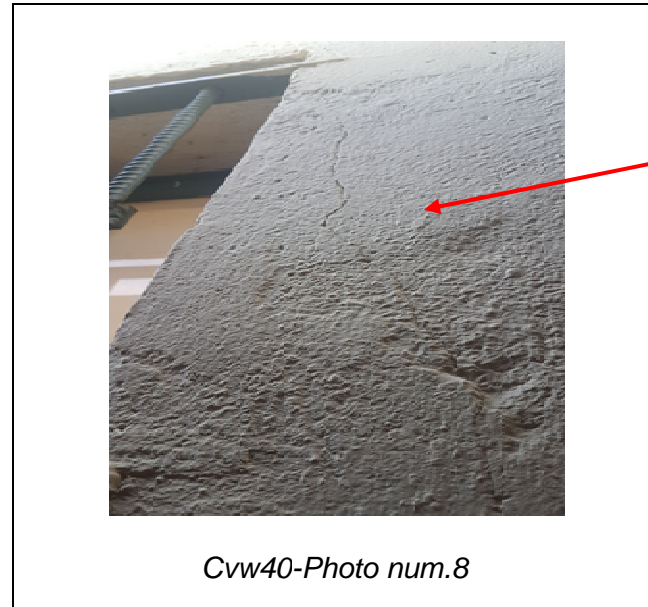


- Longitudinal fissure in the facade (File nº29).

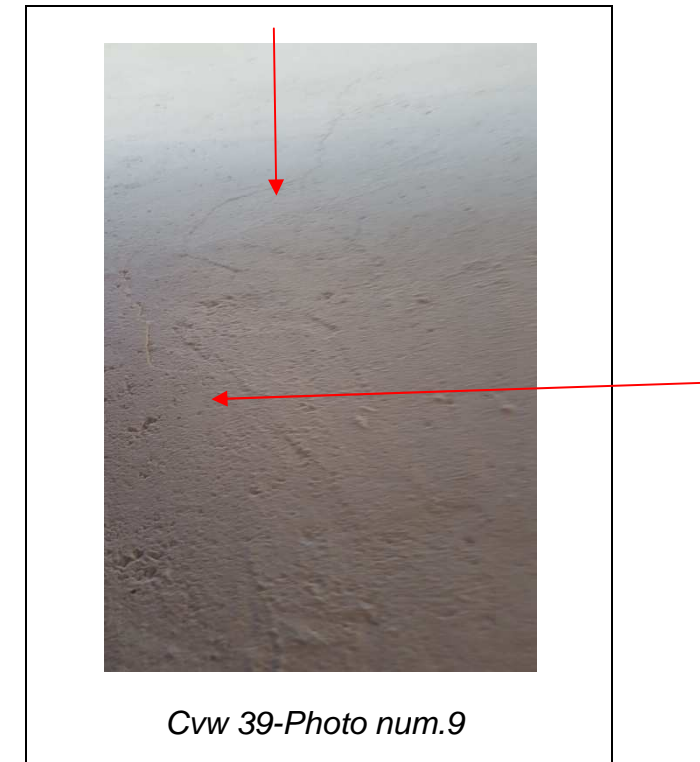


Side facade

- Diagonal fissure in the wall at the top of the window in descending order, in photos 8 and 34 (File nº30)



- Various horizontal and vertical fissures in the lateral walls walls in photos 9 and 10 (File nº31).



6.2.2. Inside construction elements

Inside.

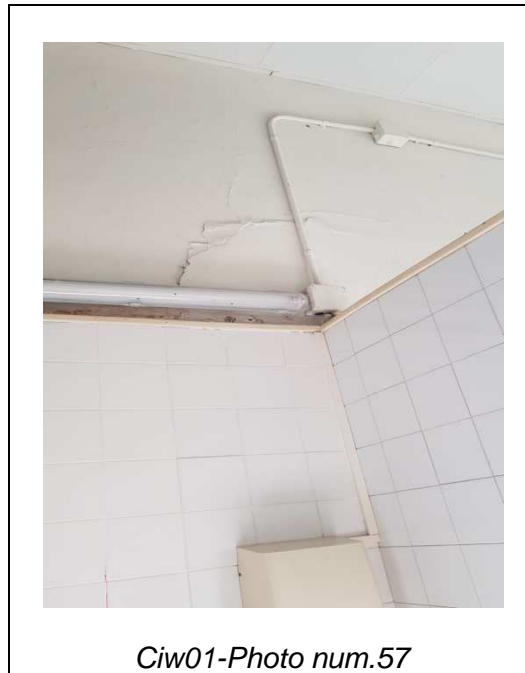
- Multiple fissures in the upper part of the vertical wall, it is seen that a moisture treatment has been carried out by capillarity, projecting cement mortar into the wall in order to waterproof one meter from the floor. (File nº32).



- Accidental humidity in linear and horizontal form in the vertical wall, of the structural wall in washbasins (File nº33).



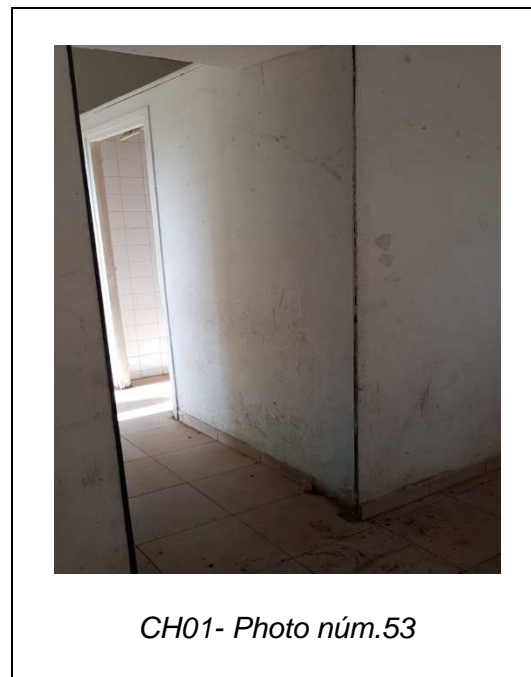
- Upward crack in vertical masonry facing that is divided into two parts. (File nº 34).



- Crack in the corner of the union of two different materials, the masonry wall and the brick dividing wall. (File nº36).



- Zone step from the open space to the services is seen as the siding has fallen leaving the wall of masonry taken with mortar. (File nº35).



- On the inside face of the facing the covering has fallen leaving the masonry wall in sight. (File nº 37).



- On the inside face of the wall there are several cracks in the lower part of the window in the masonry wall. (File nº38).

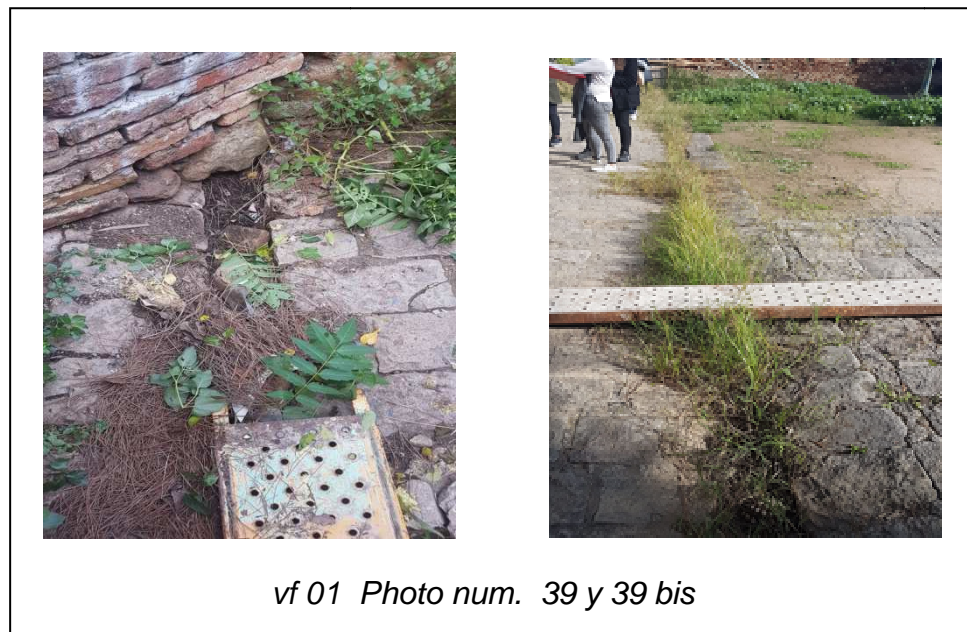


- On the inside face of the facing the covering has fallen leaving the masonry wall with mortar. (File nº.39).



6.2.3. Facilities

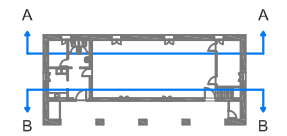
- External canalization obstructed by plants and soil, not drained. (File nº40).



- Outer chest exterior side side broken. (File nº41).

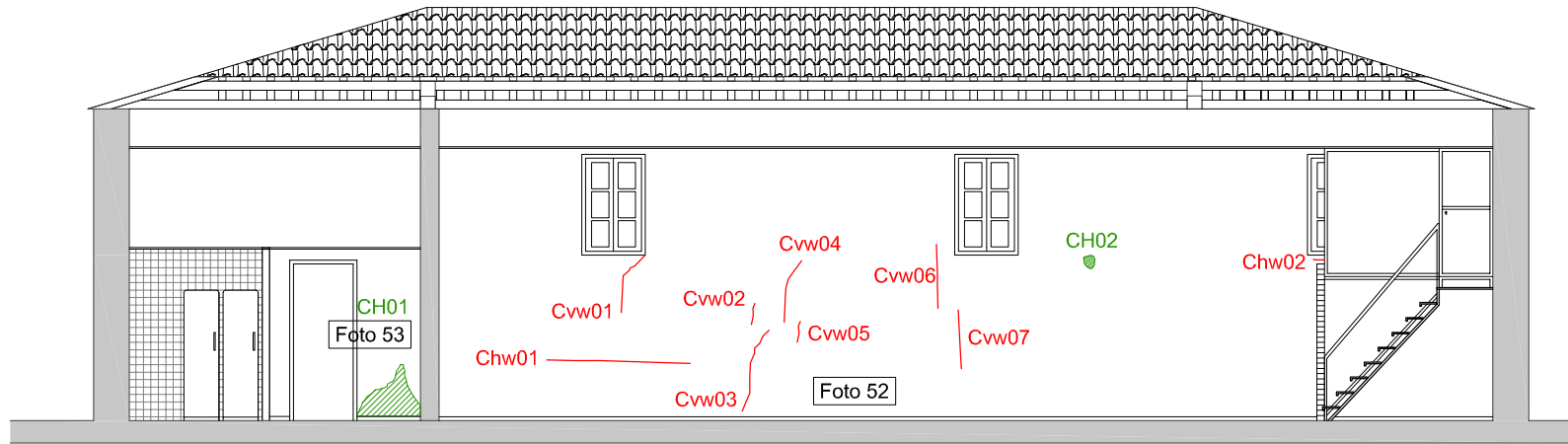


6.3 Graphic survey of injuries

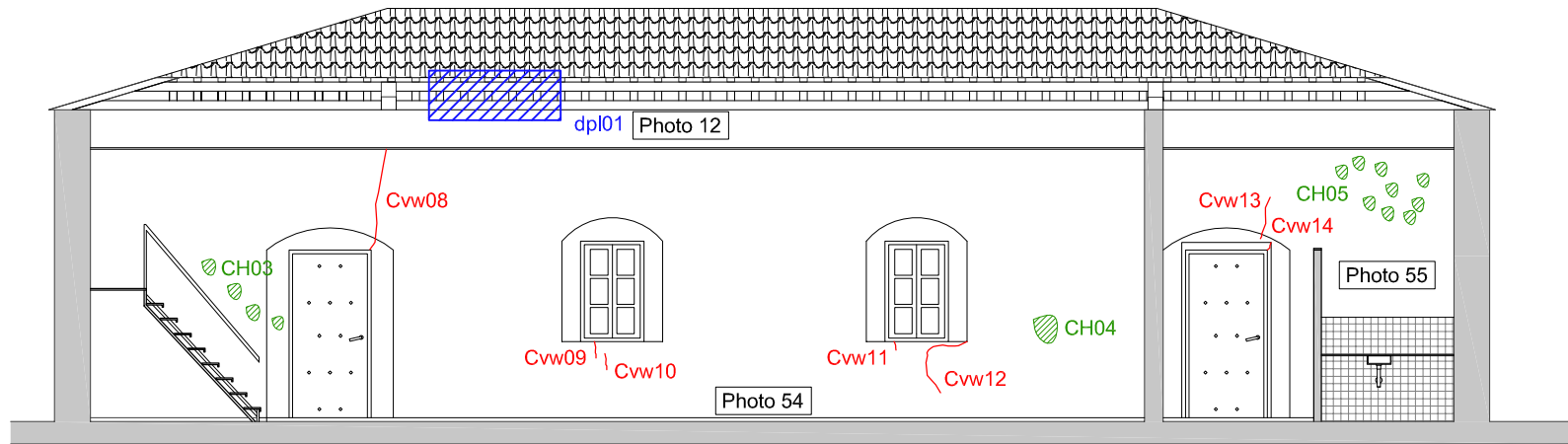


SYMBOLGY

- C = Crack
- F = Fissure
- H = Humidity
- CH= Chipped
- d = Dirt
- S = Subsidence
- v = Vegetation
- po= plants organisms
- b = broken
- C = collapse
- v = Vertical
- h = Horizontal
- i = Inclined
- w = Wall
- g = Ground
- f = Floor
- r = Repaired
- s = Stepped
- l = Lintel
- b = Beam
- ws = wod Slat
- pl = planked



SECTION A-A (E:1/100)



SECTION B-B (E:1/100)



Foto 53



Photo 54



Photo 54



Foto 52

Project
EL POLVORIN

Subject
DAC REHABILITATION

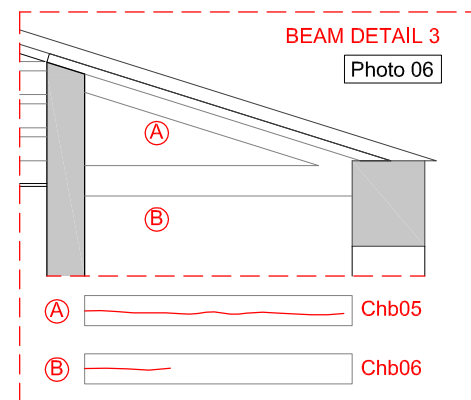
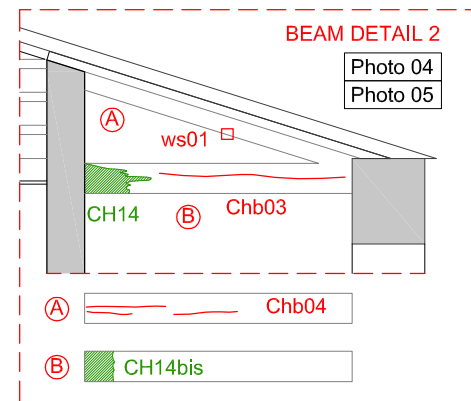
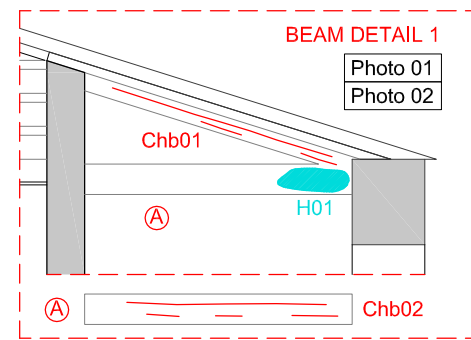
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

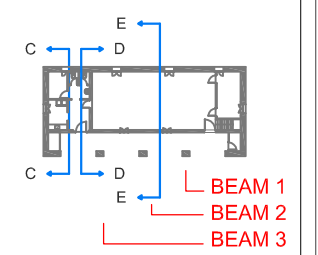
Group
II

Plane
PATHOLOGIES

Date	Number
16.01.19	12
Escale	
1/100 1/50	



SECTIONS AND TOP (E:1/50)



SYMBOLOLOGY

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Project
EL POLVORIN

Subject
DAC REHABILITATION

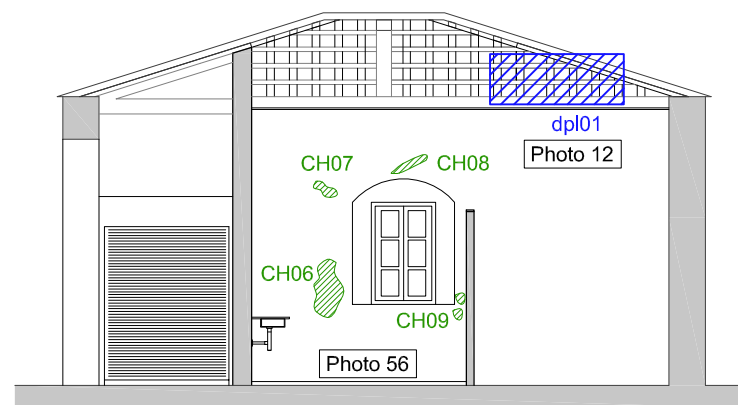
Teacher
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Students
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JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

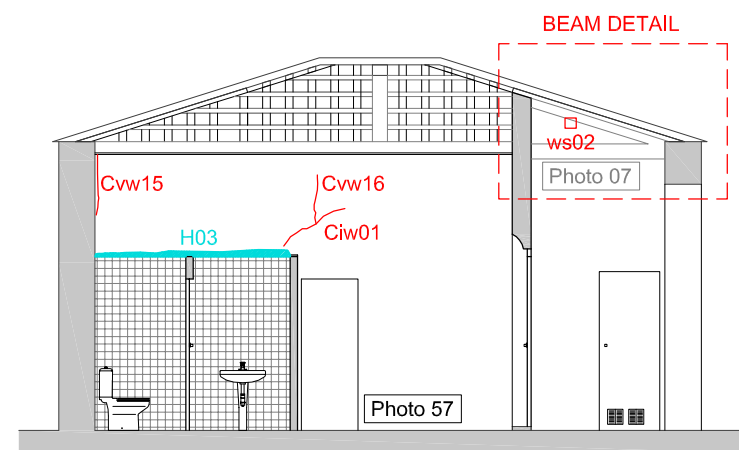
Group
II

Plane
PATHOLOGIES

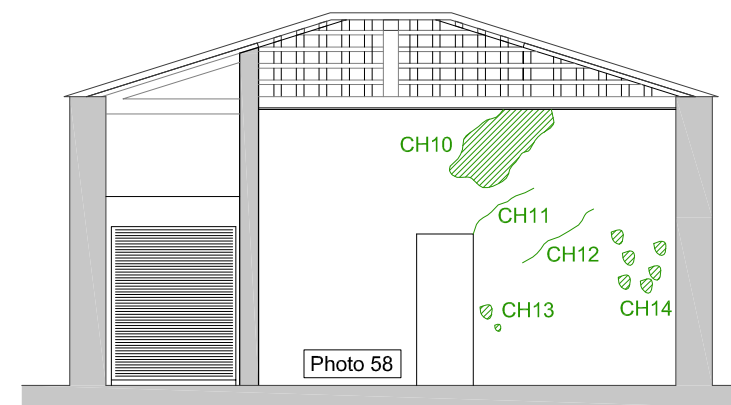
Date	Number
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Escale	
1/100 1/50	



SECTION C-C (E:1/100)



SECTION D-D (E:1/100)



SECTION E-E (E:1/100)



Photo 42



Photo 13



Photo 20

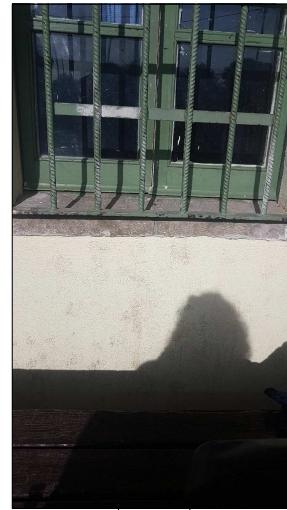


Photo 16

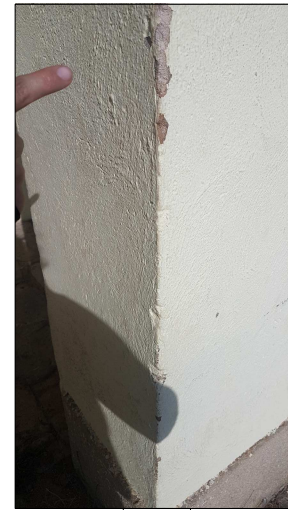
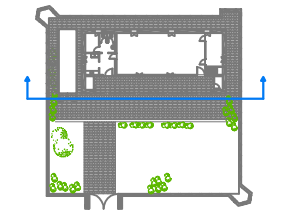


Photo 22



SYMBOLOLOGY

- C = Crack
- F = Fissure
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- g = Ground
- f = Floor
- r = Repaired
- s = Stepped
- l = Lintel
- b = Beam
- ws = wood Slat
- pl = planked

Project
EL POLVORIN

Subject
DAC REHABILITATION

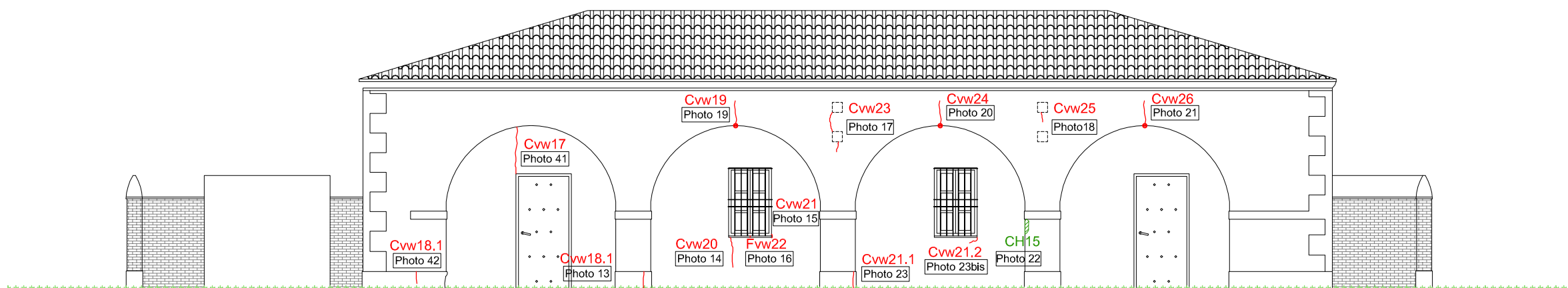
Teacher
David Hernandez Falgan

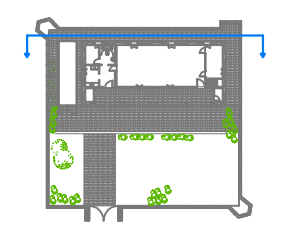
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
PATHOLOGIES

Date	Number
16.01.19	14
Escale	
1/100	





SYMBOLY

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We believe that the appearance of cracks and fissures, both vertical and horizontal in the posterior facade, is caused by some old windows that in one of the modifications that were made to the building, were surely filled with other material and that provokes the Appearance of fissures and cracks due to discontinuity in the support without sufficient lock

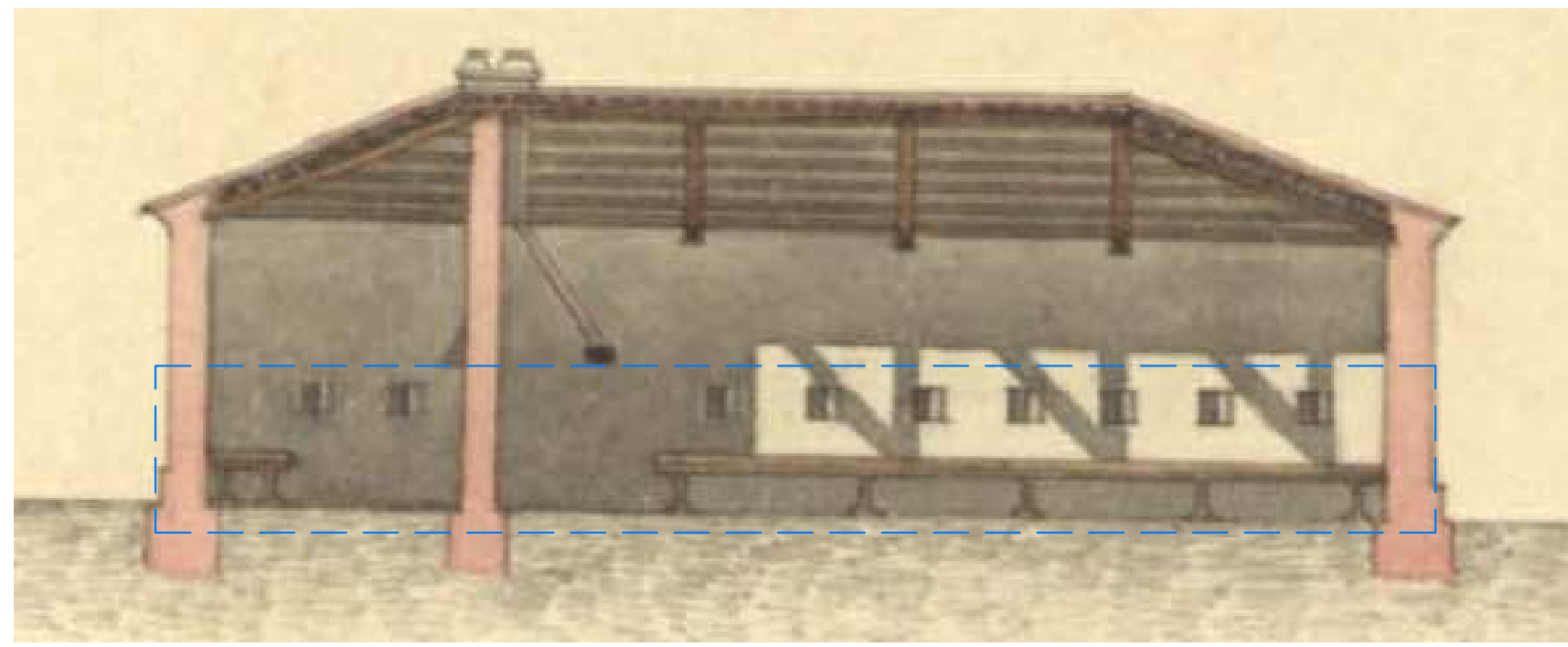


Photo 31

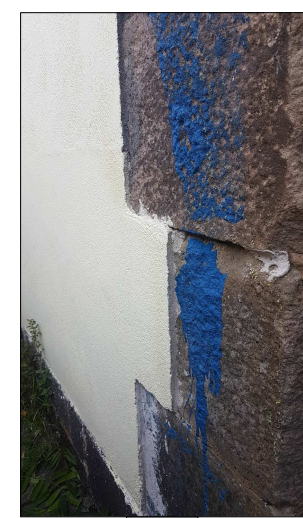
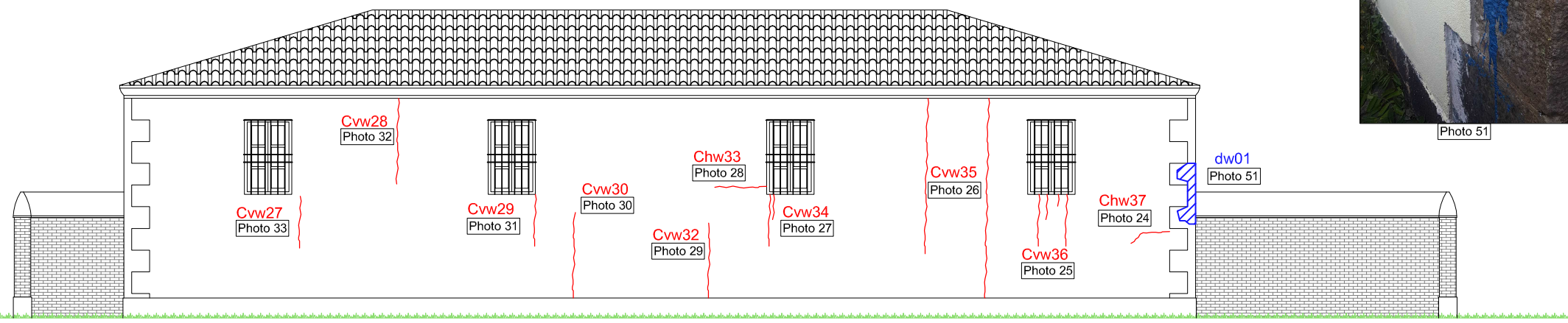


Photo 51



Project
EL POLVORIN

Subject
DAC REHABILITATION

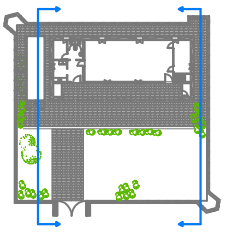
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA,BELÉN**

Group
II

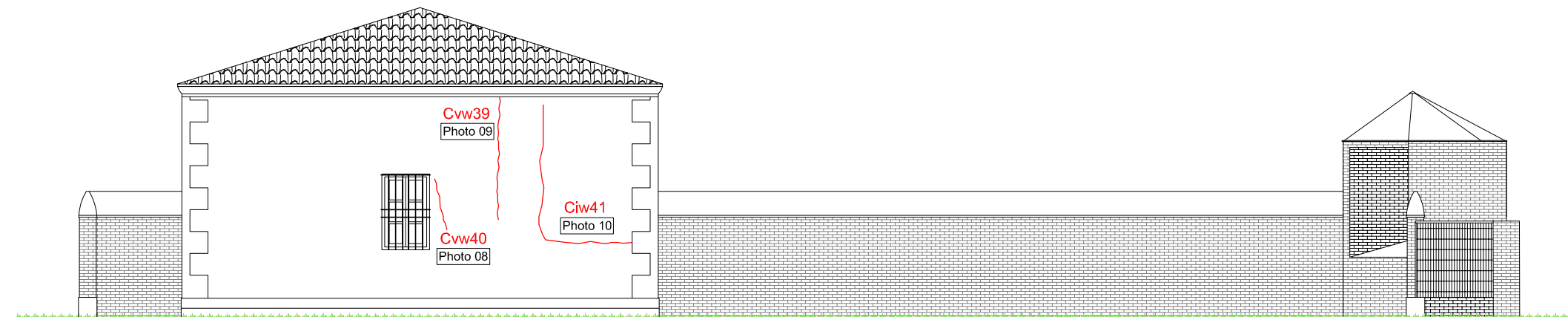
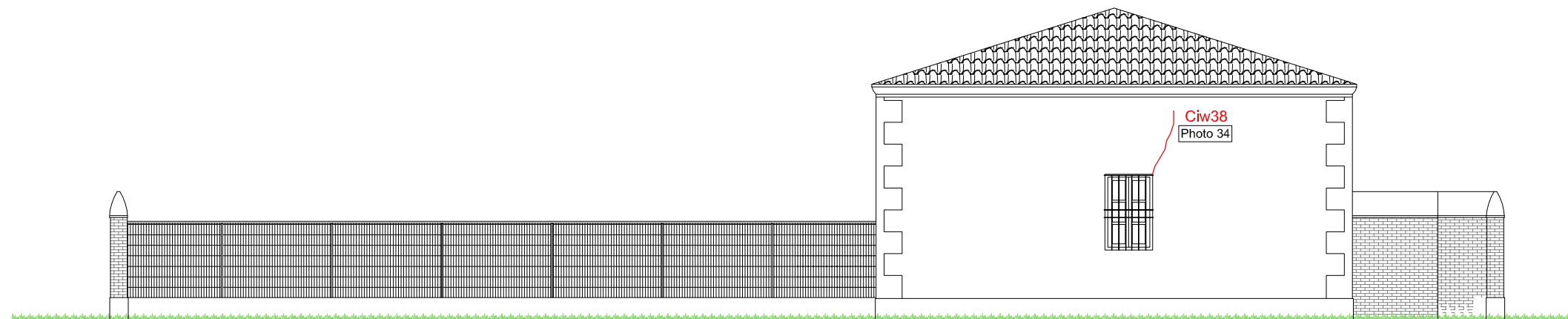
Plane
PATHOLOGIES

Date	Number
16.01.19	15
Escale	
1/100	



SYMBOLGY

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Project
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DAC REHABILITATION

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GORT GARCIA,BELÉN**

Group
II

Plane
PATHOLOGIES

Date	Number
16.01.19	16
Escale	
1/100	



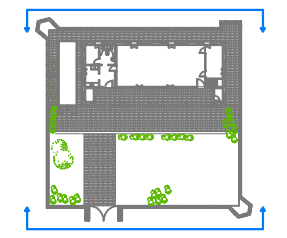
Photo 37bis



Photo 49bis

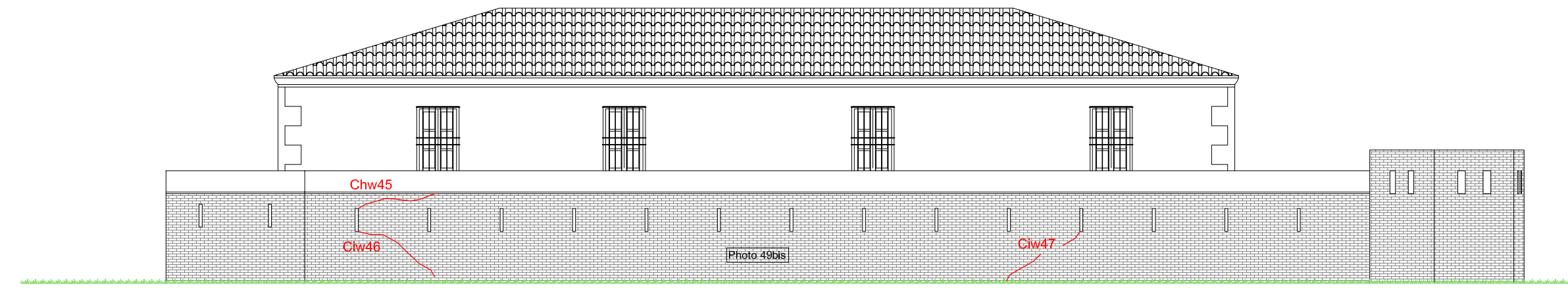
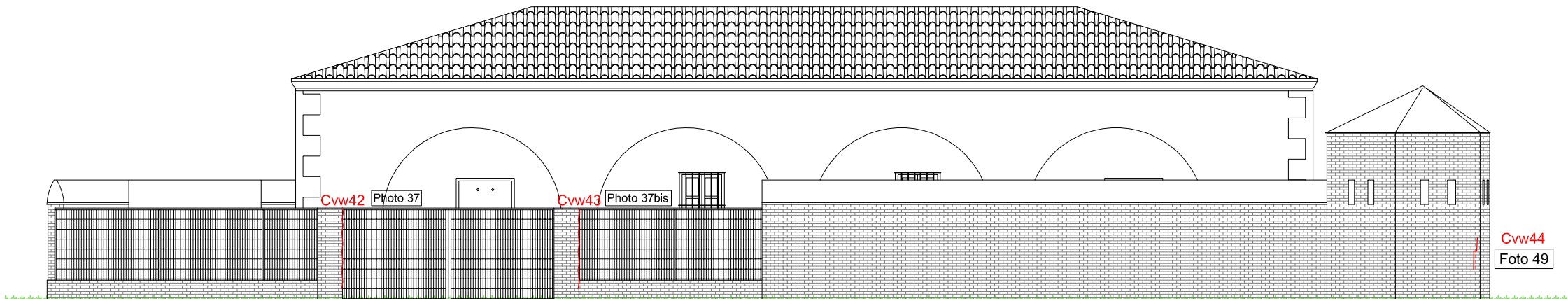


Foto 49



SYMBOLY

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Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
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Students
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GORT GARCIA, BELÉN

Group
II

Plane
PATHOLOGIES

Date	Number
16.01.19	17
Escale	
1/100	



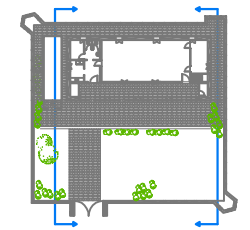
Photo 36bis



Photo 35



Foto 48

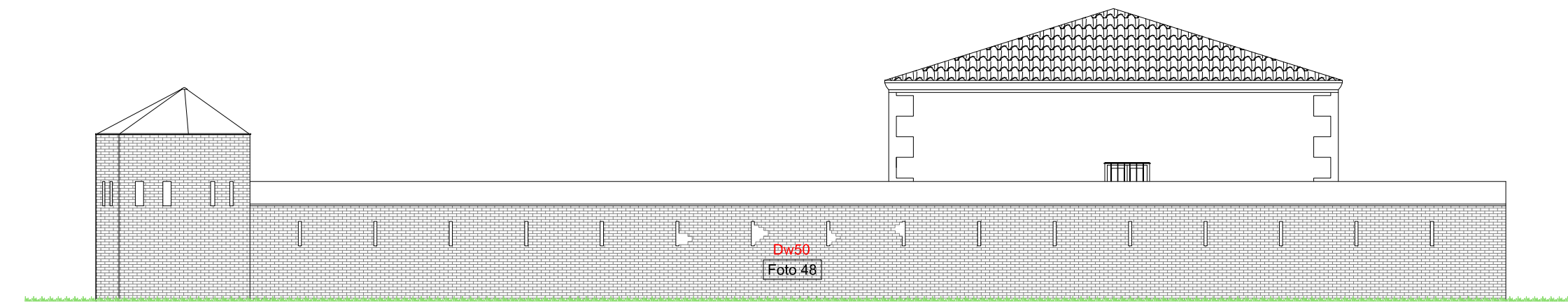
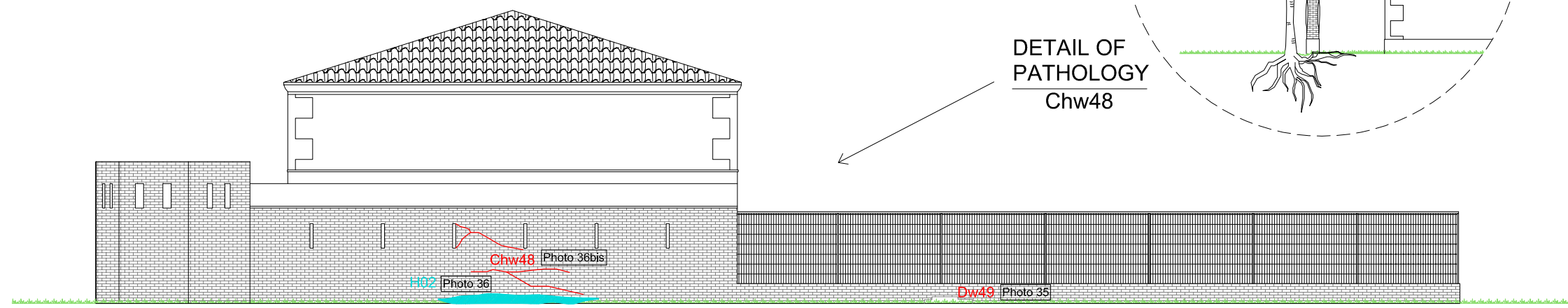


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DETAIL OF PATHOLOGY
Chw48



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
PATHOLOGIES

Date	Number
16.01.19	18
Escale	
1/100	

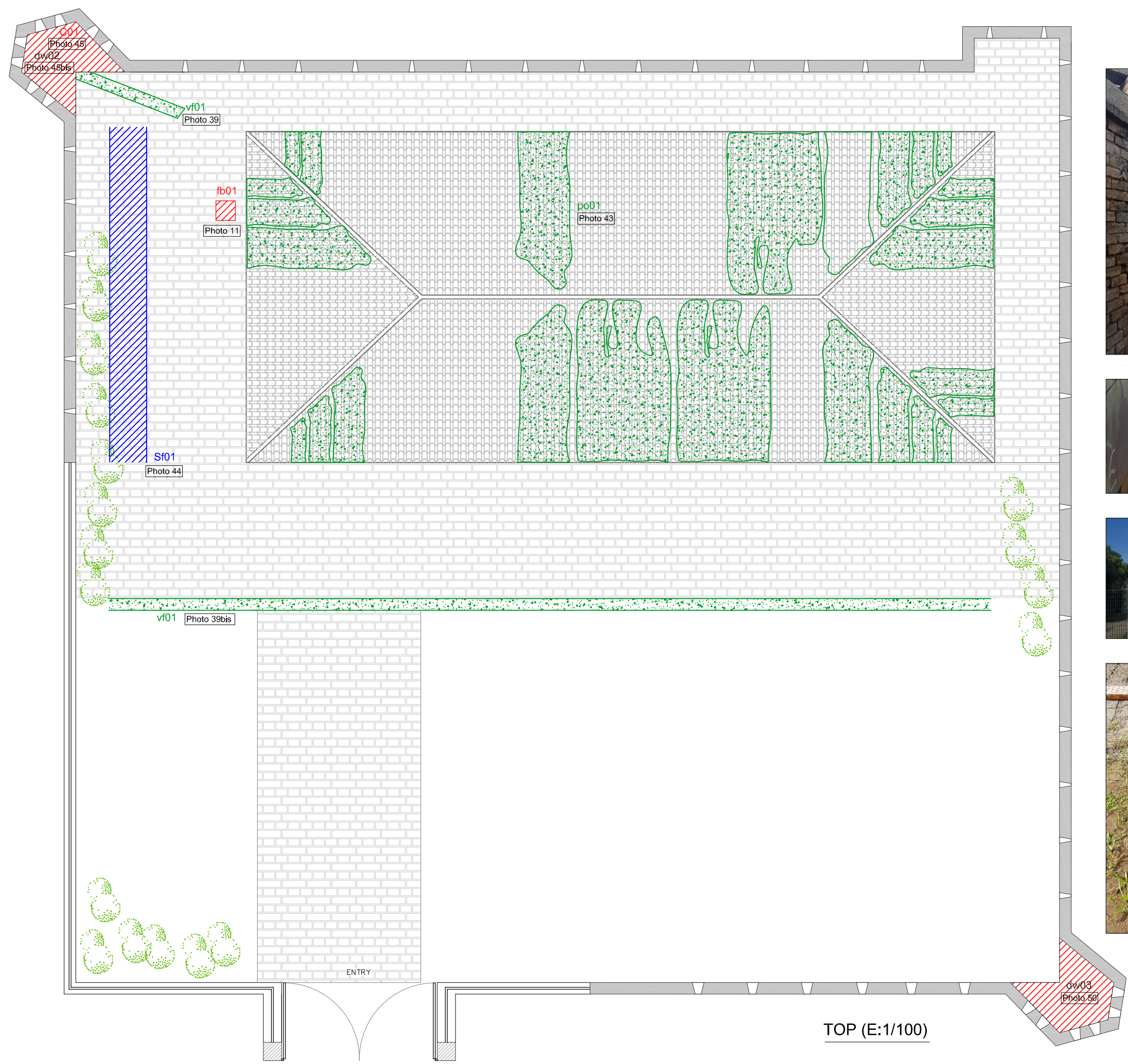


Photo 45



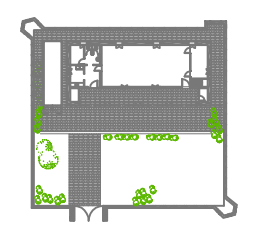
Photo 44



Photo 43



Photo 39bis



SYMBOLY

- C = Crack
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- b = Beam
- ws = wod Slat
- pl = planked

Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

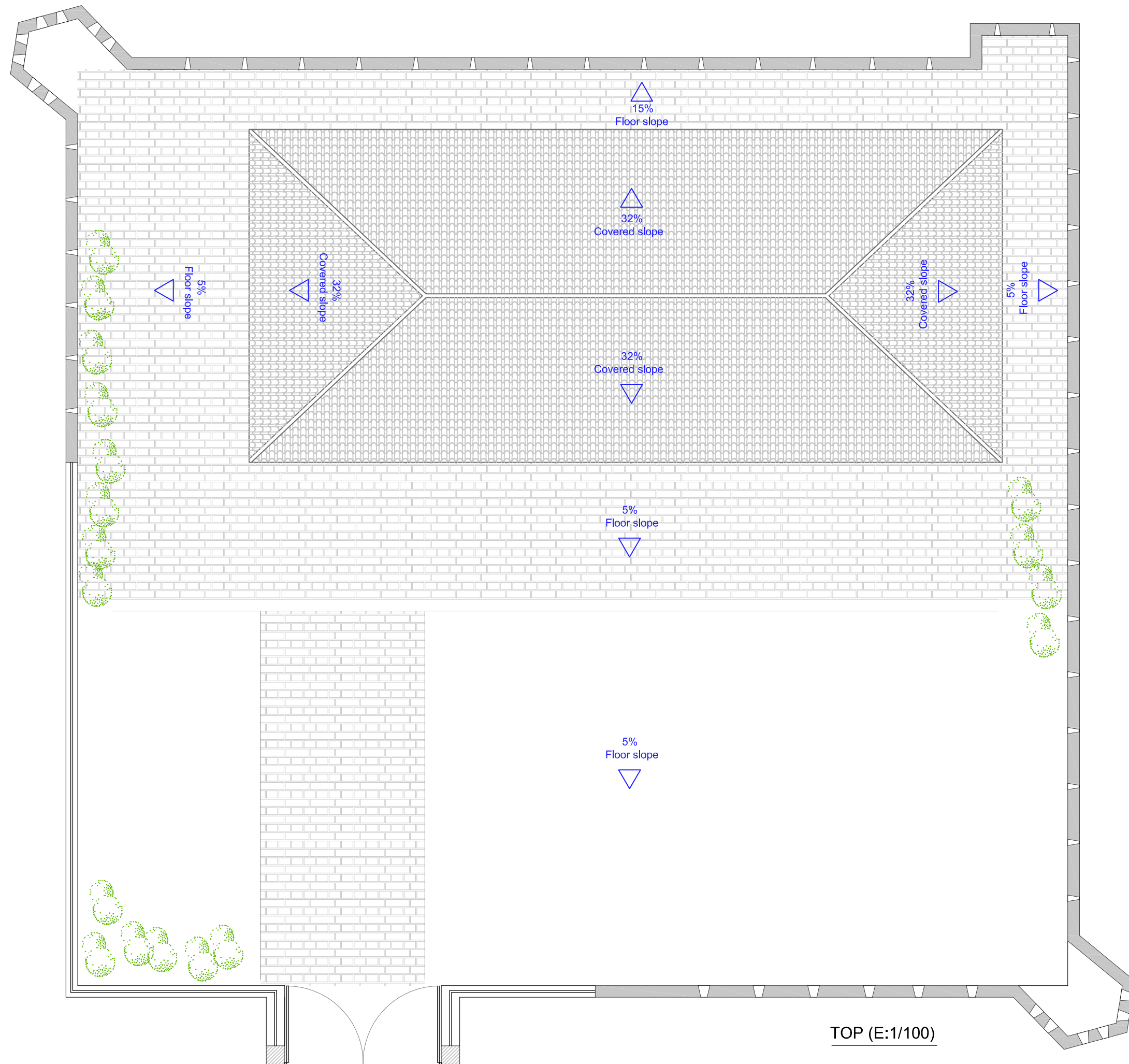
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
PATHOLOGIES

Date
16.01.19
Escale
1/100

Number
19



SYMBOLGY	
C	= Crack
F	= Fissure
H	= Humidity
CH	= Chipped
d	= Dirt
S	= Subsidence
v	= Vegetation
po	= plants organisms
b	= broken
C	= collapse
v	= Vertical
h	= Horizontal
i	= Inclined
w	= Wall
g	= Ground
f	= Floor
r	= Repaired
s	= Stepped
l	= Lintel
b	= Beam
ws	= wod Slat
pl	= planked

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Group
II

Plane
**FLOOR SLOPE AND
 COVERED SLOPE**

Date	Number
16.01.19	20
Escale	
1/100	

TOP (E:1/100)

6.4. Analysis of injuries.

In this section the analysis and diagnosis will be made, in which the possible causes by which these pathological processes have occurred will be explained, it will be complemented with some files that are found in the Annex: Pathological Processes Technical Files, in which we will find the analysis of each lesion and as well as the proposed intervention proposed to solve these pathological processes.

6.4.1. Physical, chemical and mechanical injuries

Physical injuries

Humidity by capillarity

This humidity present in the ground ascends by capillarity causes the rise of water through the pores of the brick due to the surface tension of water molecules, the causes that cause this moisture are due to the presence of water for lack of drainage. It manifests with greater intensity in the winter periods and moderates during the rest of the year. The appreciable humidity stain manifests secondary injuries such as partial detachments along the affected area of the wall, while patinas appear due to humidity of different shades. It is considered a mild injury, since the decomposition of the affected material is not very advanced. It does not reach much height, that depends on the porosity of the brick, evaporation and the humidity itself.

Annex - File nº10.

Accidental humidity

The main cause of this type of humidity is the loss of water through pores in the pressure pipe and also affects the volume changes of the wall causing local failures, and the loss of the load capacity of the mortar.

These humidities show a malfunctioning water evacuation facilities, and may affect by extension other structural and structural elements.

Annex - File nº33.

Dirt

By surface deposit, when the particles stay on the surface of the roofing materials. It can be clearly seen that the use of a chimney, non-existent now, has been the cause of the generation of soot stains, due to the accumulation and deposit of particles that contained the atmosphere and that little by little they were adhering by gravity. The superficial deposit of particles generally causes patinas for more or less permanent dirt. This injury is considered mild, mainly affects the aesthetics of the building so it does not affect their safety.

Annex - File nº17.

Humidity by filtration

The main cause of this type of humidity, is the filtration of water by means of injuries in the materials that make up the cover and by penetration the water passes through holes, perforations, fissures or cracks caused by deterioration of the wood combined with the help of the wind, by lack of waterproofing, by excessive porosity, by differential movements of the different elements, by lack of maintenance and cleanliness.

These humidities not only affect the conditions of healthiness and comfort of the buildings, but can also affect the service conditions.

They can also affect the durability of the materials and, by extension, the structures and construction elements of the roof (rot).

Annex - File nº12.

Cracks and fissures

By thermal origin by hygrothermal shrinkage of the finish, that is to say, to the variations thereof by changes in temperature and humidity, may appear in the form of vertical series.

Annex - File nº30.

Landslides

They can affect the finishes and the cause may be the breakage of the adhesion of continuous finishes, produced by grazing efforts. These efforts may be due to the expansion-contraction of the structural element that is the masonry wall or expansion-contraction of the finish.

Annex - File nº23.

Mechanical injuries

Cracks and fissures

- Cracks: Uncontrolled openings that affect the entire thickness of a constructive element.
- Fissures: uncontrolled openings that only affect the surface of the building element (they are thinner than cracks).

Crack sentry

The possible causes are due to poor initial compaction of the soil where the sentry box was built, the use of a filling material in the ground that was not adequate and that would correspond to failure of the mortar to compression and change in the conditions of its use of its inside, as a barbecue.

Annex - File nº4

Vertical fissure façade

The cracks and fissures of the vertical elements caused by mechanical actions. The cause comes from the poor response of the same to a specific load, in front of the demands of resistance and elasticity to which it is subjected, tensions appear that imply an effort causing injuries by cracking, in our building, both in the structural elements, as in the finishing materials.

Annex - File nº31.

Vertical fissures semicircular arches

The cracks can be due to a punctual load, the cracking is generated when the construction element, in this case the masonry wall, receives a direct load that causes a mechanical stress too intense, the deformation will result in the appearance of cracks and fissures. We can observe several vertical cracks that start right in the center of several semicircular arches and in the baseboards.

Annex - File nº19.

Fissures union truss with wall

The possible cause is produced when the wooden beam is supported by a masonry load wall. We are matching two structural materials of very different characteristics. Thus, wood is much more resistant than masonry. Then, the load of the beam is transmitted over a very small area. The wall is almost always wider than the wing of the beam. Due to the above, it is easy for the wall not to resist the tension that will produce the beam, appearing cracks and / or cracks.

Annex - File nº25.

Vertical fissure façade

The possible cause is the deformability that presents the mortar in the wall in front of the pieces of masonry, it produces an elongation of the same in the direction perpendicular to that of the application of the load. Under excessive vertical loads, the mortar is crushed, subjected to local tractions to the pieces in horizontal direction, and produce their vertical cracking.

Annex - File nº27.

Fissures horizontal façade

Cracking process caused by an accidental humidity of the water pipe that is in the facing of the inside face, as the material softens cracks on the exterior side of the facing, following the extension of moisture, in this case horizontally .

Annex - File nº42.

Cracks pillars exterior wall

The transmission of vibrations when striking periodically the metallic door, of entrance to the enclosure, in a constant point of the pillar causing the appearance of a crack in all its length.

Annex - File nº8.

Deformations or breaks in the wood

The fendas, knots and changes of direction of the fibers, are the points where the defects and singularities of the wood are accentuated.

The fendas can be measured through its length, being the distance between two lines perpendicular to the longitudinal axis of the piece passing through the ends of the fence. Those whose width does not exceed 1 mm will be disregarded.

Annex - Card nº8

Cracks in windows on the inside

Some fissures are caused by the appearance of tensions due to changes in the material, also by the jambs when there is some movement in the structure and tends to lower causing a fissure in the lower part of the window.

Annex - File nº38.

Chemical injuries**Decementation of the outer wall**

The loss of mass in the areas where the wall starts and, above all, the presence of water. This process is due to the leaching of some of the components of the brick and that come from industrial pollution, generally attacking the sand with a component of silica or cementing bacteria, with the corresponding loss of material.

Annex - File nº9.

Disintegration of the outer wall

It is an alteration that involves a loss of cohesion due to a loss of union, it is located in humid areas. It could also be possible due to the segregation of brick components by thermohydric variations, frosts, etc.

The pulverization in factory structures such as the outer wall of the building is produced by the loss of the material in the form of small particles of smaller size than the grains of sand.

Annex - File nº9.

Organizations on deck

This lesion consists of the presence of dark spots and plant organisms, on the roof of our building we have moss, it is located in different areas of shadows where the humidity is maintained for a longer time and it is an ideal situation for the appearance of moss. These organisms can exert a destructive effect on the tile roof of the study building, reaching a depth of 1 cm.

Annex - File nº11.

Cracks interior walls

Some fissures are caused by deformability of the mortar against the pieces of masonry, it produces an elongation in the direction perpendicular to the application of the load. Under

excessive vertical loads, the mortar is crushed, subjected to local tractions to the pieces in horizontal direction, and produce their vertical cracking.

Annex - File nº32.

Work injury

Defective execution

By the resolution of the wrong way of certain constructive unions of constructive elements with divergent loads (the trusses are not supported in the center, which is not suitable for the discharge arc).

Annex - File nº20.

6.4.2. Elements with preventive actions.

Deck

We observe how the woodworm has attacked, to the wooden framework of the roof, they receive the larvae of coleopterans that perforate wood (beams, ribbons, etc.), in which they build galleries and to which they damage, producing a characteristic dust or sawdust also called I wanted They attack the sapwood of the conifer and need moisture, in the attack of these insects, and since it is a ground floor it is in contact with the ground which favors the attack.

The damage caused is usually not very serious for the structure, because they are small insects and when feeding on the sapwood, they are usually an attack in the perimeter zone. It is appreciated as the holes that consist of circular exit holes, 1.5 to 2mm. diameter. It has eradicated the woodworm with the treatment of type of injections to pressure through valves that have a double action insecticide and fungicide.

In addition, we believe that we must apply liquid protective products as a preventive measure, the active principles remain fixed in the wood once the solvent has evaporated.

6.5 Structural analysis.

Objectives of the calculations

The purpose of the following section is to define the state of conservation of the building structure of the "**Cuerpo de guardia del polvorín**" by analyzing the results obtained in the calculations.

When making the calculations, it was necessary to know the characteristics of the materials that make up the building. A constructive and structural analysis has been carried out to identify the loads that affect the structure.

At first, the existing structural safety was verified with a decrease in loads, in the most unfavorable loading wall . In the case that they are positive we will keep the cover; and in case it is not, we will replace it.

Analysis of masonry walls

To determine the stability of the walls, it has been used a regulations to ensure that the structure meets these requirements.

The procedure used is based on the content of the Technical Building Code, respecting in particular the prescriptions, models and parameters established in the following **Basic Documents**. We have also taken into account the Basic Building Standard, and the regulatory standard of building on actions in the structural rehabilitation works, the roofs of residential buildings.

- DB SE "Structural safety"
- DB SE-AE "Structural safety: Actions in Construction"
- DB SE-F "Structural safety: Factory "
- CTE-SE-M; Structural safety of wood

Rest of loads

Then we calculate one of the wooden beams:

Data	
Dimension of the beam	11 cm x17 cm
Dimension of strip	5 cm x 8 cm
Inter-axis	0,60 m
Light	5,00 m
Wood type	C-18

Permanent actions

These actions are those produced by the weight of the constructive elements, and variables that can act such as use and snow.

Own weight

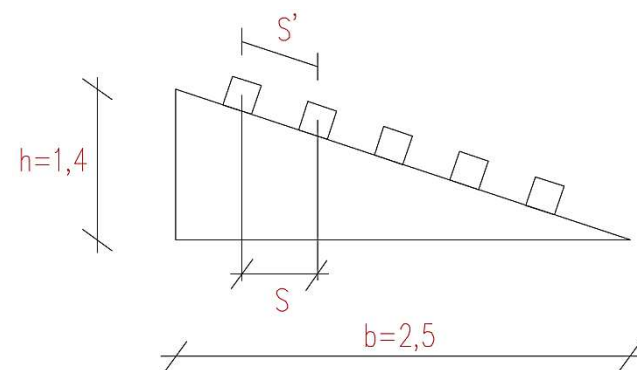
It is the load owing weight of the structural elements, the enclosures, the separating elements and fixed equipment.

To determine the own weights and the permanent loads of the materials and construction systems used, have been taken as reference AEOR-93 and DBSE-AE, the files from which the data have been extracted are in ANNEX IV, section of own weights.

The loads are as follows:

Permanent		Total Kg/m ²
Own weight of the beam	1m x(0,11 m x 0,17m x 700Kg/m ³) = 13Kg/m ²	13
Own weight of the strip	0,7x(3,3 ud x 0,05 m x 0,08 cm x 1m)=9,24 Kg/ m ²	9,24
Arabic tile	50 Kg/m ²	50
Brick	40 Kg/m ²	40
Mortar	10 Kg/m ²	10
Own weight of the cover	13Kg/m ² + 9,24 Kg/ m ² + 50 Kg/m ² + 40 Kg/m ² + 10 Kg/m ²	122,24

- Belts perpendicular to the slope
- Parameters



$$\cos \alpha = \frac{S}{S'} = \arctg \frac{h}{b} = 29,24^{\circ}$$

$$S = 0,6mS' = \frac{S}{\cos \alpha} = \frac{0,6}{\cos 29,24} = 0,6876$$

Variable actions

Overload of use: they are actions derived from the use, which act superficially on the resistant elements.

Table 3.1 of the CTE SE-AE regulation.

A uniformly distributed load value of 3 kN / m² is adopted for use as dwellings.

Wind: are those produced by the wind on the elements exposed to it. For this determination it is considered that it acts horizontally on the elements and with a direction that forms an angle of approximately 10° with respect to the horizontal.

Thermal actions: are produced by the dilatations of materials due to temperature variations. The thermal action can be calculated through table 3.6 of the CTE regulation.

Snow: it is the load that the structure must support in case of snowfall; the snow load will depend on the altitude where the building is located.

To do this, in table 3.7 (Overload of snow) the building is in Barcelona, its altitude is 0 meters. In the annex E of the DB-SE-AE the climatic zone is indicated, in this case the snow overload is 0.4 kN / m².

The loads are as follows :

Variables	
Overload of use	0,4 KN
Snow	0,40 KN
Pressure wind	0,8 KN
Suction wind	1,2 KN

Causing maximum effort and testing

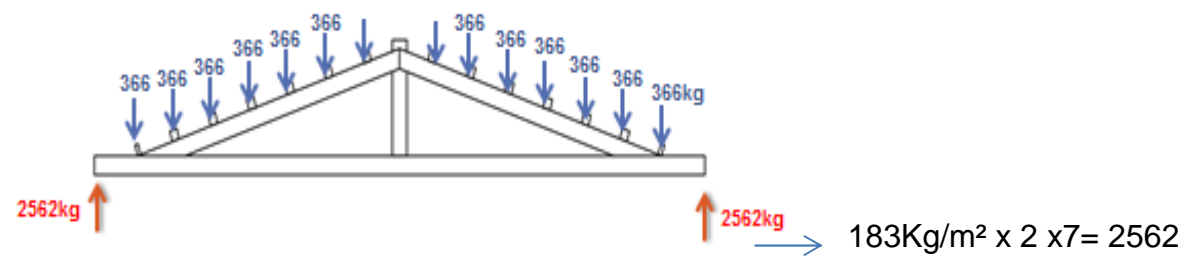
The coefficients used in the combinations are based on the origin and the favorable or unfavorable effects of the actions.

Combinaciones		P. propio	Uso	Nieve	Viento	Total
Uso principal	qz	4,11	0,24 x 1	0	0	4,35KN/m
	qy	2	0,24 x 1	0	0	2,24KN/m
Nieve principal	qz	4,11	0	0,24 x 1	0,55 x 0,6	4,68KN/m
	qy	2	0	0,12 x 1	0	2,12KN/m
Viento p. principal	qz	4,11	0	0,24 x 0,5	0,55 x 1	4,78KN/m
	qy	2	0	0,12 x 0,5	0	2,06KN/m
Viento a. succión	qz	4,11	0	0	-0,83	3,28KN/m
	qy	2	0	0	0	2KN/m

Qz máx → **4,78KN/m**
 Qy máx → **2,24KN/m**

Calculate the truss

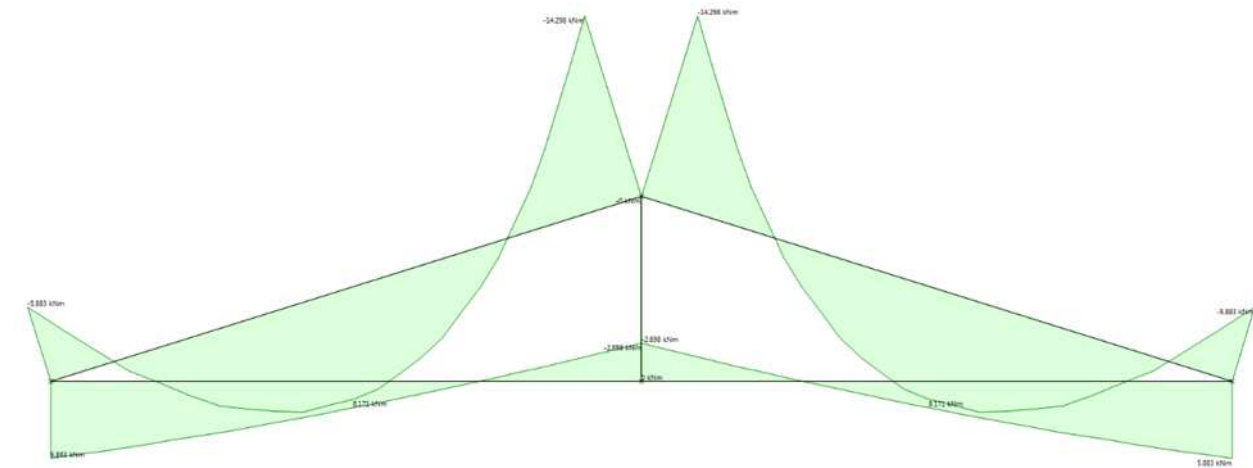
$$RA = VA = \frac{5}{2} \times \left(0,6 \times 122,24 \frac{\text{Kg}}{\text{m}^2} \right) = 183 \text{Kg/m}^2$$



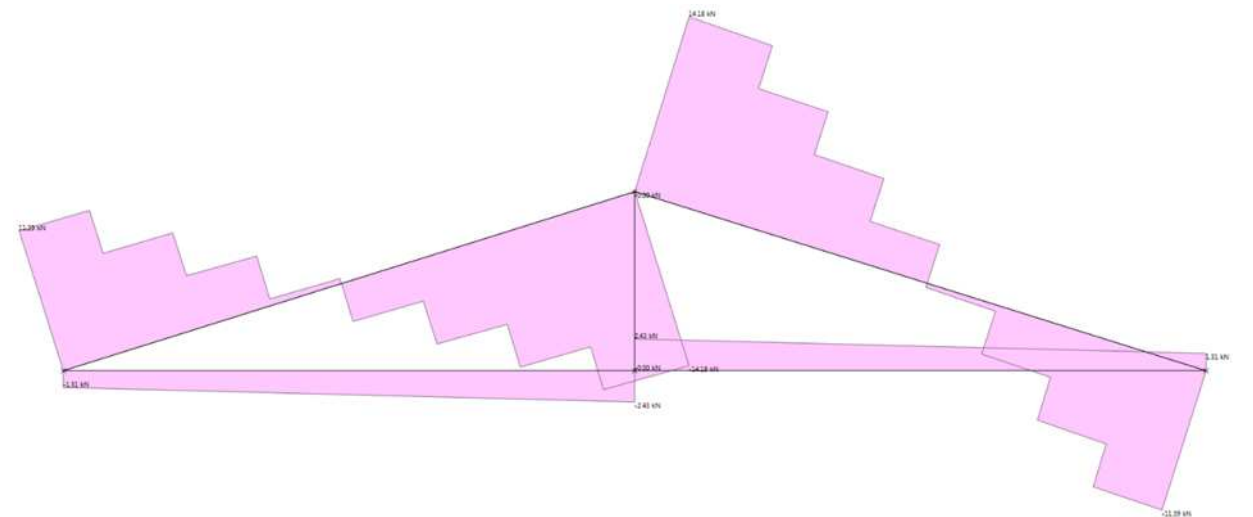
With the program "Wineva" we can define our own combinations to particularize them according to our hypothesis on the cover.

Diagrams

Moments



Shear



Checking the deflection

Data	
Light	5000 mm
E	900000 N/cm ²
I	3255 m ⁴
Qv	15 N/cm ²
Qp	6,6 N/cm ²
Kdef.p	0,8
Kdef.v	0,5

$$F_{zm\acute{a}x} = \frac{5}{384} \times \frac{q_{zm\acute{a}x} \times L^4}{E \times I_y} = \frac{5}{384} \times \frac{4,78 \times L^4}{(9 \times 10^5) \times (3255 \times 10^4)}$$

$$L \leq \sqrt[3]{\frac{384 \times (9 \cdot 10^5) \times (3255 \cdot 10^4)}{300 \times 4,78 \times 5}} = 7153 \text{ mm}$$

$$F_{ym\acute{a}x} = \frac{5}{384} \times \frac{q_{ym\acute{a}x} \cdot L^4}{E \times I_y} = \frac{5}{384} \times \frac{2,24 \times L^4}{(9 \times 10^5) \times (3255 \times 10^4)}$$

$$L \leq \sqrt[3]{\frac{384 \times (9 \cdot 10^5) \times (3255 \cdot 10^4)}{300 \times 2,24 \times 5}} = 9209 \text{ mm}$$

$$7153 \text{ mm} \leq 5000 \text{ mm} \Rightarrow \text{ACCEPTABLE}$$

$$9209 \text{ mm} \leq 5000 \text{ mm} \Rightarrow \text{ACCEPTABLE}$$

Wall calculation process

The procedure consists, essentially, in comparing the resistant capacity of the most significant sections of the wall, with the state of stresses before the indicated load combination.

The verification condition of the carrying capacity of a load wall is:

$$N_{Sd} \leq N_{Rd}$$

N_{Sd} : is the calculation value of the solicitation.

N_{Rd} : is the calculation value of the resistant capacity deduced from the properties of the material.

Therefore, in order to carry out the checks, it has been assumed that all the joists are in a good state of conservation, counting on the totality of their inertia according to the corresponding sections.

Wall data	
Height	4,40 m
Thickness	0,50 m
Permanent loads	2,00 KN/m ²
Wood	C-18

Calculation	
Wall weight	4,40 m x 3,70 m x 0,50 x 2 = 16, 28 T.

It has been verified that the structure supports its own weight and is able to withstand the overloads of use, according to regulations.

The bearing capacity of the loading wall has been checked.

$$N_{Sd} < N_{Rd} \Rightarrow \text{ACCEPTABLE}$$

Loads according to previous specifications:

The cover receives the overloads of use and snow, receive the safety Coefficients.

- The safety coefficient that applies to permanent actions : 1,35
- The safety coefficient that applies to variable actions : 1,50

Therefore, to carry out the checks, it has been assumed that everything is in a good state of conservation, counting on all of its inertia in accordance with the corresponding sections.

Resistant class

The wood that makes up the structural beams of the "Cuerpo de guardia" building is made of pine wood (coniferous) since this type of wood is the most commonly used and common in the area with straight wooden trunks of considerable length.

For calculation purposes, has been considered a class C18 resistant wood.

Calculation of the Service Limit State

"SLS" is a type of limit state, refer to solvable situations, repairable or that admit palliative measures. In the verification calculations of the "SLS" the actions are not increased (coefficient 1) and it is checked that the deformation does not cause damage to the constructive elements.

SLS			
Q SLS Cover	122 Kg/m ²	1,50	183 Kg/m ²
Q SLS Wall	6,12 Kg /m ²	1,50	9.18 Kg/m ²
Q SLS TOTAL =	122 Kg/m ² +9,18 kg/m ² = 131,18 Kg/m ²		

Calculation of the Ultimate Limit State

"ULS" is a limit state, the safety coefficients used in the calculations related to an "ULS" are substantially increased, by gravity since it can cause damage or collapse of the structure.

Q ULS	
Q ULS Cover =	18,3 KN/m
Q ULS Walls =	4,40 m x1m x 1x1800Kg/m ³ = 7272,00 Kg = 72,72KN/m
Q ULS total =	18,3 KNx72,72 KN/m= 91,02KN/m

6.6. Various analyzes

6.6.1 Hygrothermia

Solve this case with materials:

- The climatic zone is Barcelona and that is C2. Take the most unfavorable conditions of Barcelona, in this case it will be calculated by a temperature in winter of 4°C and in summer of 28°C, with a humidity of 73% and 69% (looking at the DB-HE 2009 on pages 59- 60).

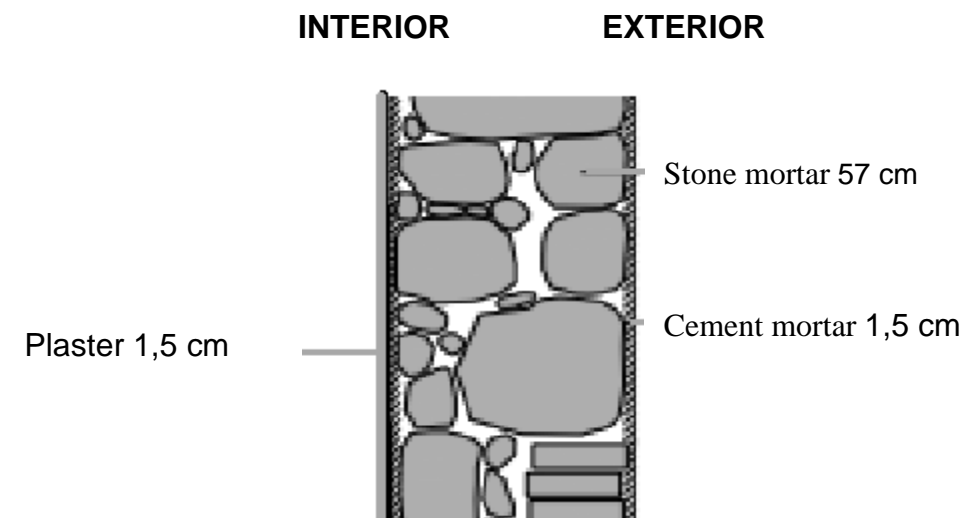
U limit:	0.95 W/m ² ·K (ZONA C2)
Surface thermal resistance:	Rse = 0.04 m ² ·K/W
	Rsi = 0.13 m ² ·K/W

DATA	
Cement mortar	λ = 0.93 W/m·K
Stoneware Quartz	λ = 2.6 W/m·K
Plaster	λ = 0.17 W/m·K

UNITS

Thicknesses	Meters
Coefficient of thermal conductivity	W / m·K

- Calculate the thermal resistance (RT) and thermal transmittance (U)



$$RT = Rsi + Rt + Rse$$

$$Rsi = 0,13 \text{ m}^2 \text{ K} / \text{W} \text{ (DB-HE1, table E.1)}$$

$$Rse = 0,04 \text{ m}^2 \text{ K} / \text{W} \text{ (DB-HE1, table E.1)}$$

$$Rt = \frac{me}{\lambda m} + \frac{ep}{\lambda p} + \frac{ee}{\lambda e}$$

$$Rt = \frac{0,015}{0,17} + \frac{0,015}{0,93} + \frac{0,57}{2,6} = 0,32 \text{ m}^2 \cdot \text{K/W}$$

$$RT = 0,13 + 0,32 + 0,04 = 0,49 \text{ m}^2 \cdot \text{K/W}$$

$$U = \frac{1}{RT}$$

$$U = \frac{1}{0,49} = 2,04 \text{ m}^2 \cdot \text{K} / \text{W}$$

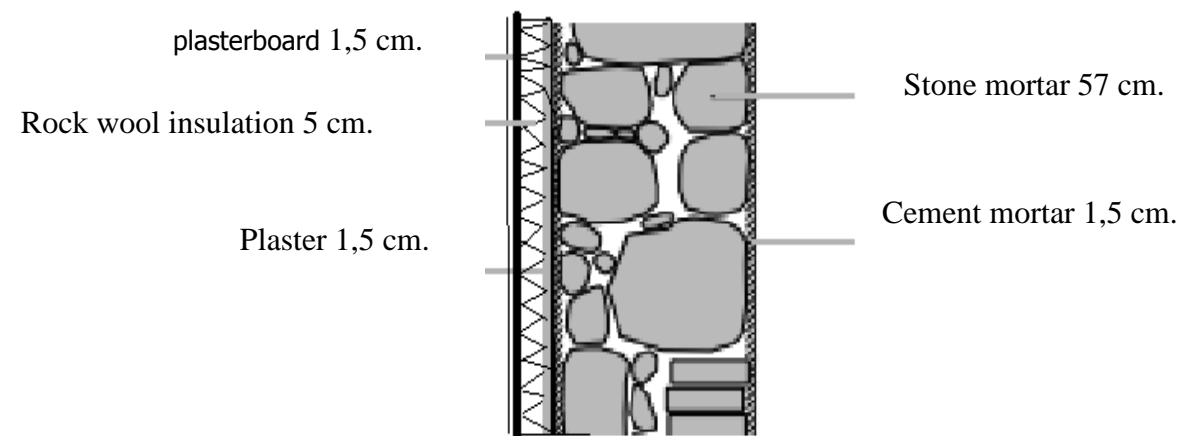
Let's look at the DB-HE 2009 in the section on "transmittance limit of façade walls and enclosures in contact with the ground" (Appendix D (D.2) D.B. HE) and gives us:

$$2,04 \text{ m}^2 \cdot \text{K/W} < 0,95 \text{ m}^2 \cdot \text{K/W} \Rightarrow \text{NOT ACCEPTABLE}$$

Solve this case with materials:

- Check adding to the wall, rock wool insulation and plasterboard.

DATA	
Cement mortar	$\lambda = 0,93 \text{ W/m}\cdot\text{K}$
Stoneware Quartz	$\lambda = 2,6 \text{ W/m}\cdot\text{K}$
Plaster	$\lambda = 0,17 \text{ W/m}\cdot\text{K}$
Rock wool	$\lambda = 0,037 \text{ W/m}\cdot\text{K}$
Plasterboard	$\lambda = 0,3 \text{ W/m}\cdot\text{K}$



$$RT = R_{si} + R_t + R_{se}$$

$$R_{si} = 0,13 \text{ m}^2 \text{ K} / \text{W} \text{ (DB-HE1, table E.1)}$$

$$R_{se} = 0,04 \text{ m}^2 \text{ K} / \text{W} \text{ (DB-HE1, table E.1)}$$

$$R_t = \frac{0,015}{0,17} + \frac{0,015}{0,93} + \frac{0,57}{2,6} + \frac{0,05}{0,037} + \frac{0,015}{0,3} = 0,89 \text{ m}^2 \cdot \text{K} / \text{W}$$

$$R_t = 0,088 + 0,016 + 0,219 + 1,35 + 0,05 = 1,723$$

$$RT = 0,13 + 1,723 + 0,04 = 1,89 \text{ m}^2 \cdot \text{K} / \text{W}$$

$$U = \frac{1}{RT}$$

$$U = \frac{1}{1,89} = 0,52 \text{ m}^2 \cdot \text{K} / \text{W}$$

Look at the DB-HE 2009 in the section on "transmittance limit of façade walls and enclosures in contact with the ground" (Appendix D (D.2) D.B. HE) and gives us:

$$1,25 \text{ m}^2 \cdot \text{K} / \text{W} < 0,95 \text{ m}^2 \cdot \text{K} / \text{W} \Rightarrow \text{ACCEPTABLE}$$

As we have seen traditional constructions such as the masonry wall of the building, the "Cuerpo de guardia", the need for thermal insulation is fundamental.

A common problem is the accumulation of moisture on the inner side of the wall, it is caused by poor insulation, the inner face of the wall is cold and the water vapor condenses inside.

To solve the damage, the thermal insulation of the wall must be reinforced and the calculations tell us that the proposal we have made is acceptable: placing an insulator of glass wool and then a plasterboard (knauf or Durlock type).

6.6.2 Facilities

The application of the facilities in the military architecture of the eighteenth century was of little complexity, which could consist of a drain to evacuate water from a sink or sink or the evacuation of smoke by means of chimneys.

In these buildings, like the object of study, they ended up incorporating the facilities in some way, being very strange today to find a building that does not have the basic facilities, regardless of their age.

They have not been valued because they are insufficient to carry out our intervention proposal because they have to be changed.

6.6.3. Accessibility

We begin with a diagnosis of the environment where we will evaluate the initial situation in which our building is located.

With the collected data we will draft an accessibility plan where the deficiencies detected and the improvement actions that are going to be implemented will be written.

The two main entrances of the building have a gap that prevents a person with reduced mobility can access, the toilets would not be adapted and the pavement would not be suitable. So for everything analyzed we believe that our spaces have to be accessible, without neglecting aesthetics and functionality, where we will adapt the main entrances so that they do not have any kind of impediment between the exterior and the interior through a totally continuous pavement.

The interior pavement will be made using a non-slip parquet floor ideal for kitchens and areas of food handling where there are dangers of falls due to landslides.

So in our project we will make a bathroom adapted for people with reduced mobility where you will have a side area for a possible companion or to perform a rotation maneuver with the wheelchair, the pike will be at a lower height, the sink faucet will be lever and reclining mirror.

The entire ground floor will be adapted except the upper floor, which will be accessed by a staircase, and all the doors of the building will have a minimum width of 80 centimeters.

The outside area of the dining room will be paved with wooden planks for greater accessibility in space.

The only thing that we wanted to generate would be common spaces united by an accessible itinerary where all the slopes and ridges will be eliminated to have a much more diaphanous area not only visually but also functionally.

7. DIAGNOSTIC

After performing the in-depth analysis of the building of the "Cuerpo de guardia", of its systems, elements and materials we observe different pathological processes with different injuries, and we determine the possible causes that can reach the following conclusions:

The initial state of the building is acceptable, taking into account its age (1732), the changes and reforms it has suffered over the years. Because it is a military building and it has been given that function until 1960, it has had to be kept in suitable conditions for its use.

The main drawback is precisely its cataloging as an element of historical-cultural interest. This means that can not make more optimal performances, as most of its components can not be replaced by others with better features and greater benefits.

Outside area

The outdoor area is generally in a good state of preservation, like the stone surrounding the building, although one of its sides has undergone an intervention due to subsidence, the other areas are in good condition. More significantly, different injuries were located such as disintegration, collapse, cracks, dirt, etc. of several areas of the outer wall and sentry boxes, by mechanical and physical factors.

But the main intervention in this area is the installation of water collection, since the entire canalization is obstructed by plants and soil.

Cover

On the cover the intervention will eliminate the activity of organisms and vegetation. The structure was in good condition, beams with little deformation, except for different points where the joints show section losses, with wood very damaged by cracks and longitudinal cracks, but all these injuries have been reinforced with metallic reinforcement. Longitudinal fissures are also seen in the central area of the truss, slats, etc. where they present more tensions that can be due to overload or fatigue, but that do not affect the carrying capacity.

Facade

This vertical structure is formed by walls of load, masonry and mortar, presents cracks and fissures in different areas, these cracks may be caused by different causes, but the fissures caused by point loads that could not be absorbed correctly by the walls, predominate. in spite of them they do not present any risk for the stability of the whole.

Inside walls

By deformability that presents the mortar against the masonry pieces. Under excessive vertical loads, the mortar is crushed, subjecting to local tractions the pieces in horizontal direction, and produce their vertical cracking.

And also for a bad hygrothermal behavior of the building will be intervened by placing insulation of the walls on its inside face.

Arches

Due to a direct load of the beams that causes a mechanical stress that is too intense, the fissures appear, although due to changes in temperature when being in an external zone, these fissures may also appear.

Carpentry

The wooden windows are not in good condition, have simple glass and do not comply with the regulations of thermal and acoustic insulation, the windows will be replaced by new aluminum.

With our proposal we recommend a series of actions that we believe would substantially improve the quality of the building and give it a better service.

8. PROPOSAL FOR INTERVENTION

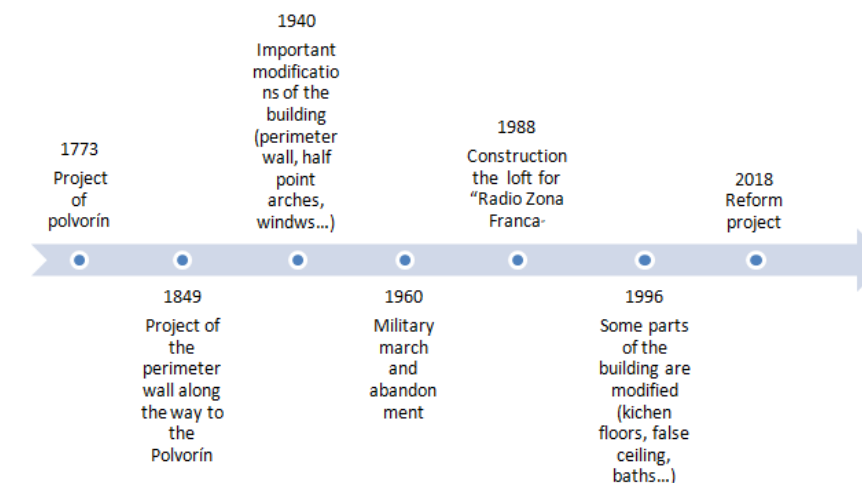
During these months we have been studying the building of guard and custody of the whole of the magazine and when we have raised the intervention in the building we have taken into account the following values:

The significant values: respect for the historical stages of the building (because it is an 18th century building, a military building related to the structure and defensive organization of the Castle of Montjuic that assumed the function of surveillance of the Building of the magazine)-limits the intervention. On the other hand it is a diaphanous space that allows us a wide development in our project.

The Instrumental values: The building is in good condition, although different specific actions were performed to solve the injuries identified, such as the collapse of the perimeter wall and the drainage of the outer area we'll explain later.

The documentary values: We have made a timeline, in which we go through all the years of the building, we analyze with it characteristics of the building that allow us to see similarities with the way of building of the time, for example, the use of the Stone Masonry, the arch of Half point, the windows with arch and the use of the stone in the most compromised elements of the building.

Here we wanted to represent a line of time where to locate the different moments of the building and try to relate them to the three values explained above:



With this data we have developed a table in which we consider whether the element of each lesion is original or not. The elements are divided in good condition, normal state, bad conditions and non existent and we make a new division between elements with value, without value and the non existent ones:

	ORIGINAL ELEMENTS	NO ORIGINAL ELEMENTS	
		VALUE	WORTHLESS
GOOD CONDITION	Meeting facade with stone floor	Window grilles for being first productions of rolled steel	Attic radio zona franca
	Corrugated comice covered	Reinforcements of iron so that the trusses of the interior structure, has its own value for being part of the structure	Entrance door to the enclosure and perimeter metal fence
NORMAL STATE	Stone sockets on the facade	Iron doors for their crafts	False ceiling installation
	Windows and doors with reduced arches		Interior pavement
	Round arches		Wooden windows
	Wooden trusses, slats and slats		Antenna
	Construction typology masonry walls and mortar		Streetlight
POOR CONDITION	Exterior stone playground	Wall and sentry boxes for the type of placement. The loopholes of the perimeter wall	x
	Arab roof tiles		
DOES NOT EXIST	Boarded arpilleras on the northern interior wall	Fireplace of S.XVII	
		Wall of communication between the polvorin and the guard corps	x

Thanks to the Insitu visits to the building we have been able to classify by means of a table the systems or elements of greater importance for the building taking into account the gravity and the risk of its injuries:

	Injury	mechanical	physical	chemical	injurya	Gravity (10 points)	Risk (10 points)	Total (20 points)	heritage value	Use
Enclosures	Subsidence ground outside					9	9	18/20	9	8
	Lost brick					6	8	14/20	9	5
	Collapsed wall					7	10	17/20	9	5
	Wall paintings					2	1	3/20	9	5
	Cracks sentry									
	Cracks pillars (entrance farm)					6	4	10/20	1	6
	Lost material (perimeter wall)					4	8	12/20	9	5
Cover	Humidity (interior wall)					9	9	18/20	9	5
	Humidity by wood filtration					9	7	16/20	7	8
	Crack in fissures of trusses					7	5	12/20	7	8
	Holes in slats					1	1	2/20	7	8
	Texas plant organisms					9	7	16/20	1	8
Facade	Dirt in slats by the effect of an old fireplace					8	1	9/20	1	8
	Vertical and horizontal fissures					7	3	10/20	8	8
	Fissure in wall arch					8	5	13/20	6	6
Inside	Exterior wall painting					2	1	3/20	8	8
	Humidity in vertical wall in bathroom					8	2	10/20	1	1
	Fissures in windows					4	2	6/20	5	6
	Fissures in horizontal walls					6	2	8/20	5	6

Injury	
chemical	
physical	
mechanical	

8.1 Proposed objectives

The purpose of the intervention to be carried out in the powder keg assembly is to transform the area into a future center for cooking workshops. The Polvorin is located in the neighborhood of Marina del Port and access can be made through the streets of Polvorin road, Segura street or Turia street or with public transport.

In order to carry out the distribution of the spaces in a coherent manner and to define the proportions of all the uses, it is necessary to define the number of people that the center will host, as well as to analyze the state in which the set is located.



The social cooking workshops are considered cooking workshops for social purposes to teach healthy eating habits to members of collectives physically, intellectually and socially vulnerable. Social cooking workshops apart from encouraging coexistence among students, also encourages the student's professional development.

The cooking workshop that will be carried out will have a large diaphanous cooking room where the practical training courses will be given, and an area with a large table with chairs to be able to teach the theoretical classes. On the ground floor, a food storage and refrigeration area will be located in order to have the raw material to teach the classes. The toilets will be renovated with three toilet areas, where one of them will be adapted for people with special needs. Through a side staircase, we will climb a small walkway that will take us to the administration area; a necessary zone to be able to process the necessary administrative subjects to be able to manage the courses.

The plot is located in an area of difficult access where only a bus passes or the nearest metro is about 20 minutes walk, for this we will enable parking areas for greater accessibility to the neighborhood.

In our project we want the exterior to be linked with our exterior patio and the interior of the building. In the outdoor patio we will set a stage for local artists and tables to come so that the students of the courses can do real practices. Within this space, different events of the neighborhood can be held both in summer and winter, as tents will be enabled so that the exterior can be used throughout the year. Outside the outer part of the wall, four distinct areas will be enabled: a picnic area with tables, a barbecue area, a playground and a parking area.

The location of this building allows it to be an ideal location, located outside the hustle and bustle of the neighborhood and would be in a quieter part surrounded by nature. One of the factors that have been taken into account when choosing the use has been to maintain the current aesthetics of the whole, an aesthetic that is governed by a special plan to protect the architectural heritage of cultural assets of local interest but that It has not prevented us from carrying out our activity. And although it has a military aesthetic, we wanted to maintain that sobriety to be able to emphasize the different qualities that surround the building.

8.2 Intervention proposal

According to the functional proposal that has been defined, the social cooking workshop is intended to serve 14 to 18 students in each of the different shifts of the courses. This number of people would be the largest number of students who could monopolize the school to take the courses, without counting the two monitors that teach the classes and an administrative person. The restaurant service where students practice in the outdoor area will have a capacity to accommodate up to 54 people. At the functional level, the intervention did not want to fragment the space and wanted to try to maintain a connected space.

In the field of diagnosis, the building will have an average intervention to be able to obtain the benefits that the future Barcelona social kitchen workshop needs, such as structural safety, good insulation and minimum conditions of habitability and functionality.

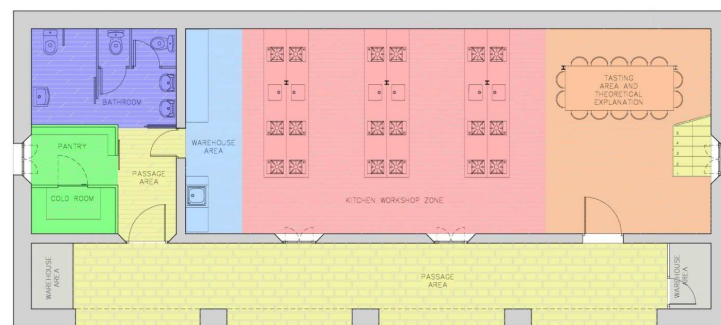
In the different areas of the building and the perimeter has a common denominator that would be the humidity and various fissures and cracks.

The intervention wanted to maintain the original aesthetics giving continuity to the heritage value that the area has.

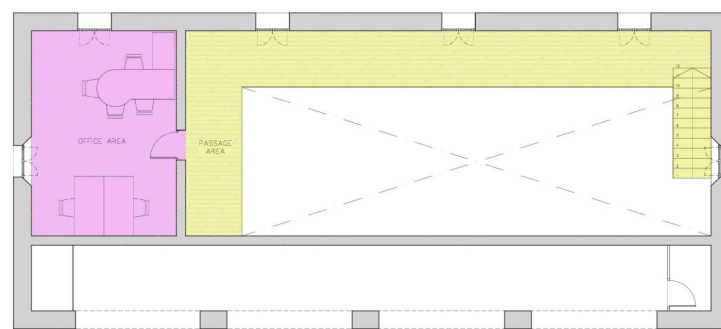
Therefore, the morphology of the facades will be conserved since only small rehabilitation works will be carried out in order to return them to their initial state. No type of change of overtures is made and it will be left of origin.

The study of these pathologies will help us to identify the causes that generate the injuries and how to manage their repair.

To explain the uses and to be able to locate them we will carry out the following zoning:



LOW LEVEL (E:1/100)



TOP FLOOR (E:1/100)

8.3 Intervention criteria

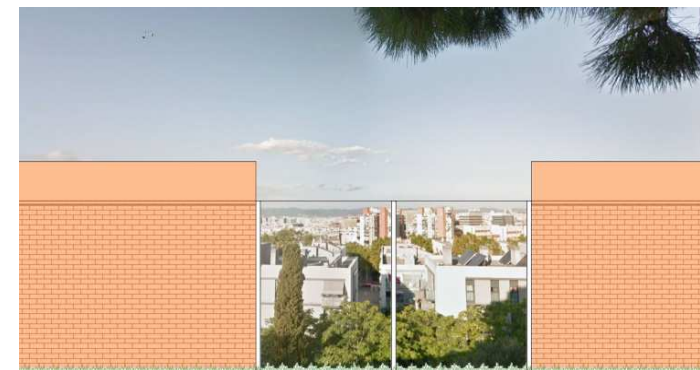
Once the construction systems of the building have been analyzed and the study of the diagnosis has been carried out, we can define which are the parts on which we have to work and which ones will be left without intervention.

The elements that we will delete in the new project will be the attic of the free zone radio since it is a disused space that we will not use in our work and you need this space to be able to put the staircase that goes up to the top. We will also remove the false ceiling to have a greater amplitude on the ground floor and to be able to see the wooden structure of the roof.

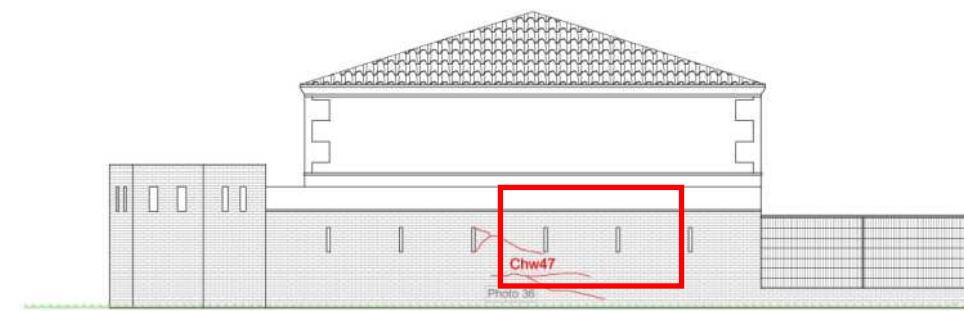
Externally we will remove the stoneware pavement that is located on the right side of the porch just in front of the warehouse. Here we carry out a stoneware paving removal work that was added later and the original pavement pavement was sought. The lamp that is in the middle of the patio will move it outside our perimeter and we will place it outside our perimeter. The antenna and the wood house that is located posteriorly and laterally respectively, will be eliminated from our project due to lack of use since, for example, since there is no radio, the satellite dish is no longer necessary.

On the other hand, the elements that we would reinforce, replace or repair would be, for example, the wooden deck of the roof that currently rests on a third of the semicircular arch and would have to rest on the middle point of the discharge arch. For this we will change the location of the trusses so that these unbalanced discharges do not generate more fissures in their arches. On the other hand, the tiles of the roof to eliminate the appearance of plant organisms in Arab tiles caused by moisture, water accumulation and leaks will be cleaned with

chemicals to be able to reuse the original tiles and not replace them with new roof tiles.



The roof will also need a new gutter in its entire perimeter to prevent humidity since there is currently no water collection element. Externally, we will reform the perimeter wall in the North-West area due to a loss of verticality caused by the roots of a nearby tree that may cause its collapse.



Our way of intervening will be to request permission to the City to move the tree, because it is the main cause of the injury, once solved, we will intervene in the wall replacing the existing damaged material by a vertical closing of laminar

glass anchored on the sides wall with a profile since it is not an original element of the building and we believe it is right that we delimit the space but at the same time we want to create a connection with the neighborhood and through this glass we can enjoy the views.

Within the outer petrile pavement, the North-West zone would be one of the most damaged areas due to the stagnation of water due to the lack of drainage. The intervention to be carried out will be the execution of a new drainage system that will consist in the recovery of rainwater, accumulating them in a deposit to reuse it as an irrigation and sanitation system and the land will be restored with well compacted gravel. In the area of the outdoor tables we will place a wooden floor to access the area without much difficulty and to be a more consistent space in which to place the outdoor tents.

As regards the façade finishes, all the carpentry are in poor condition due to humidity and lack of maintenance, so new insulating double glazed joinery will be installed to avoid humidity and leaks.



The interior stoneware floor of the building is replaced by a wooden technical floor where all the installations can pass through its interior.

In our case, the intervention is related to the building's energy efficiency.

Therefore, we propose energy efficiency measures such as:

One of the measures to be carried out will be to raise the tiles to place a thermal insulation and a waterproofing sheet that will solve the water leaks and in this way protect the wood from the trusses.

We will take advantage of the tiles that are in good condition and the rest will be replaced by new ones, the roof should be maintained at least once a year to clean the surface.

Another proposal is to raise the pavement as it is in direct contact with the land and we will place a thermal insulation in order to produce comfort for users.

As a heating system we use pellet stoves, since the surface to be heated is ideal for this type of installation.

One of the most critical points of energy efficiency are the holes in the façade and that we are going to solve by changing the carpentry and its glazing.

An element that we have to add is the isolation of the area of exterior enclosures of the building, since once the calculation of hygrotherm does not comply with the normative. This insulation will be placed on the bottom and we will put an upper layer of plasterboard.

As for the facilities, we will have to provide gas points in the area of the kitchen workshops, light points throughout the building and water points in the toilets and in the workshop area. You will have to check if the pissed and supply pipes are in good condition and if they comply with current regulations.

The elements that we put in value and we want to **preserve** for being original of the time are: the encounters of the corners of the façade with the ashlar masonry, the façade stone sockets, the exterior petrile patio, wooden trusses, slats and scrapers, the Arab tiles and semicircular arches. And there are other elements that although they are not original we believe that it has an added value to the whole and that they would be the grilles of the windows pr be the first laminated steel productions; the walls, loopholes and booths for the type of placement to blight;

iron gates for their craftsmanship or the iron reinforcements of the trusses for having the courage to be part of the structure.

8.4 Description and order of intervention

The main objective of the building to intervene is to leave the building in optimal conditions to be used as a restoration space and office area.

With all these interventions what we want to realize is a more rigid structure and redistribute the building although it retains its exterior morphology and it's a esthetics.

The general actions that are to be carried out are the replacement of the roof, stiffening of the building, repair of cracks and the new location of the facilities through a technical floor.

But the first thing that will have to be done is the previous work, dismantling and demolition, the stabilization of the building by covering and ridgizing the arches to then start all the repairs punctual.

The first thing we will do is remove the tiles and the roof from the roof in order to dismantle the existing roof. Once the arch is repaired, the wooden beams will be replaced to replace the new ones.

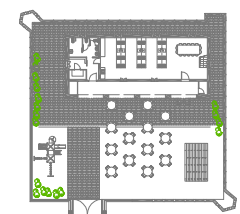
Once the structural elements are recovered, we will continue with the renovation of all the wastewater and rainwater, light and gas installations...to condition the different spaces.

Once finished this stage we will begin with the repair of the different cracks and humidity. Finally it will be carried out in exchange for exterior and interior carpentry, all the interior renovation such as washbasins, refrigerated chamber, interior coating of exposed work, cooking lines, painting...

8.5 PROPOSED INTERVENTION PLANS



SITE (CONVENCIONAL SCALE)



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**


Group
II

Plane
**SITE
REFORM STATUS**

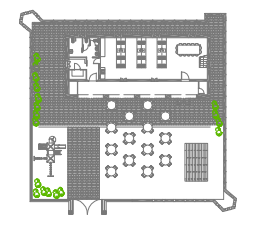
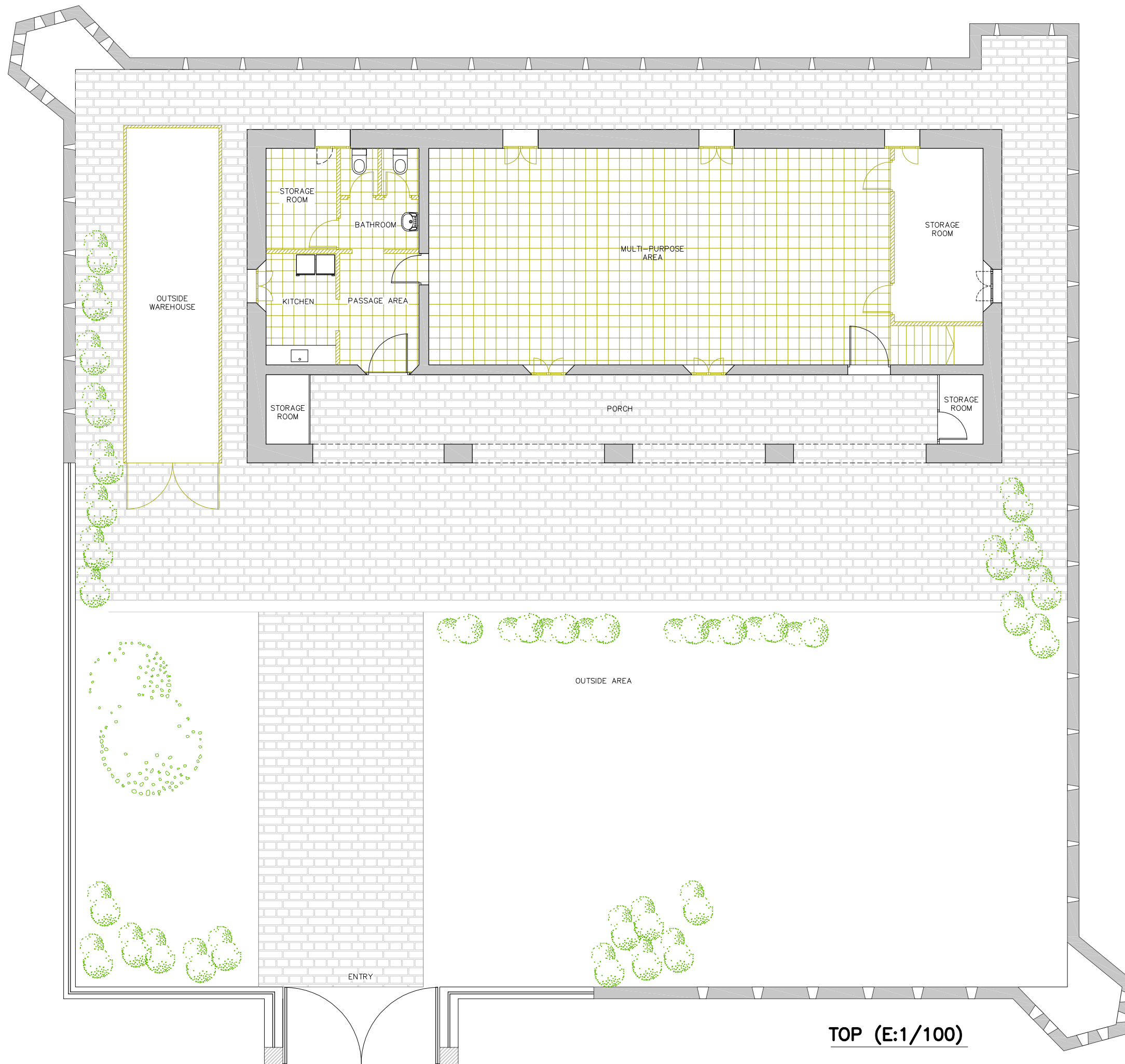
Date	Number
16.01.19	21
Escale	
1/100	

1/100 0 0,5m 2,0m 3,0m 4,0m 5,0m 6,0m

Symbology

 Dismantling zone (Partitions, carpentry, floors and wood area)

 New Construction Zone



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

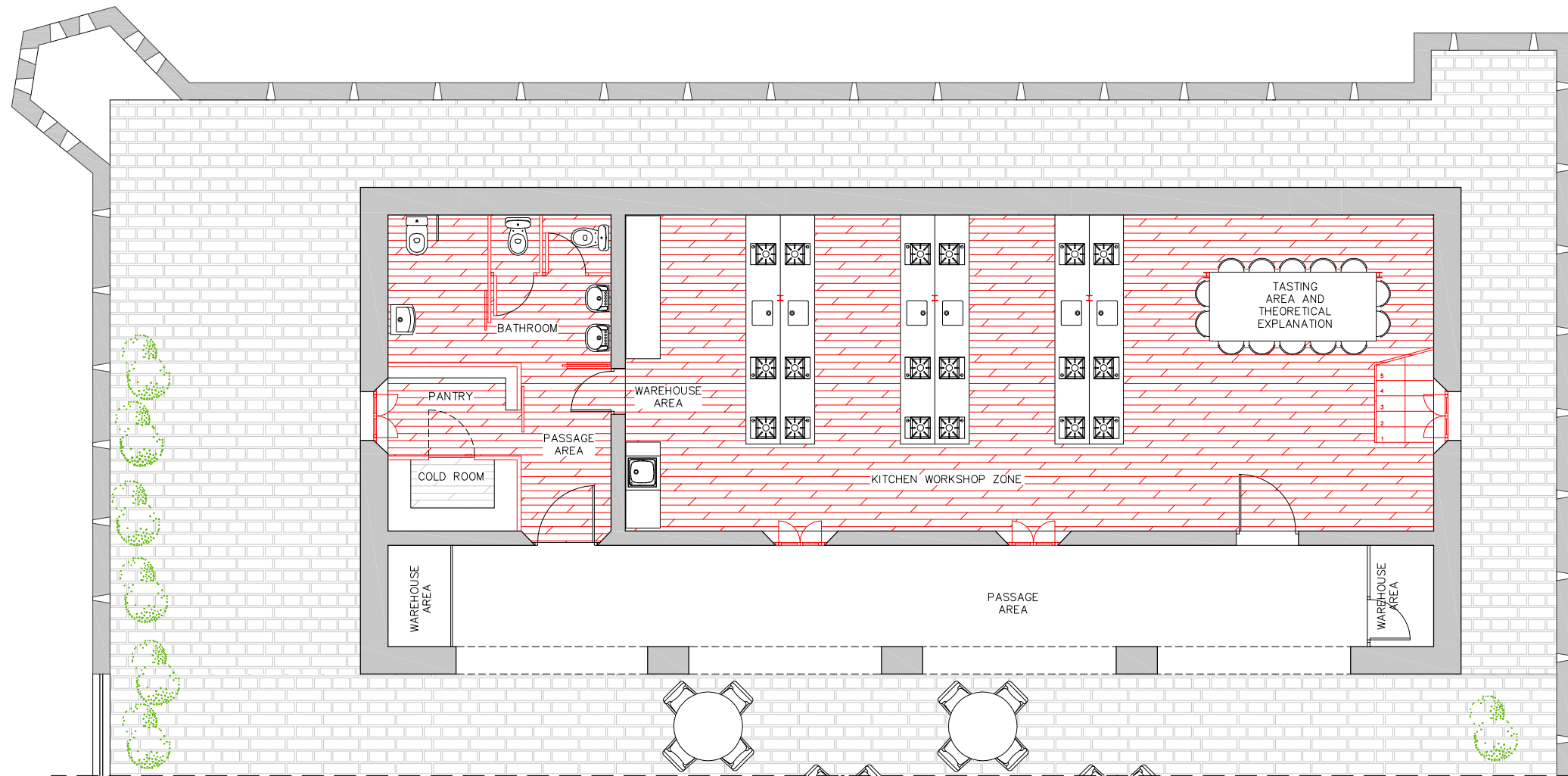
Group
II

Plane
**TOP
REFORM STATUS**

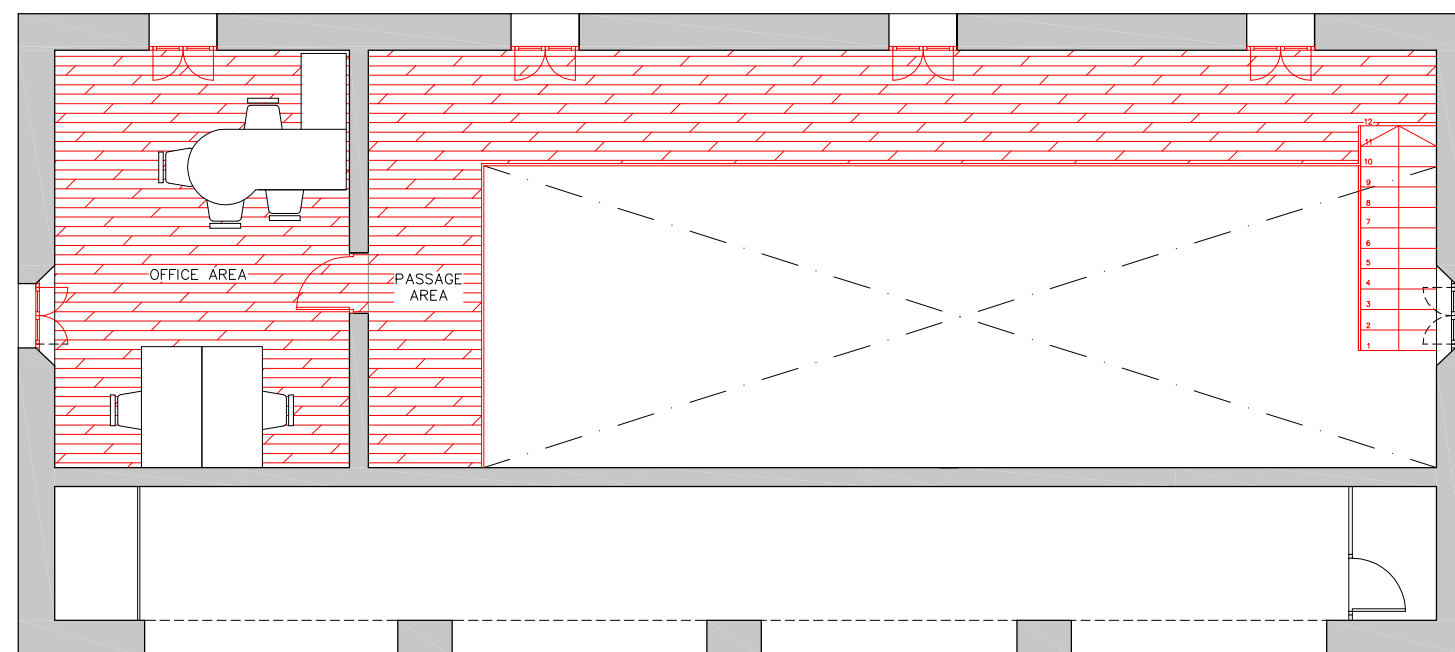
Date
16.01.19
Escale
1/100

Number
22

TOP (E:1/100)



LOW LEVEL (E:1/100)

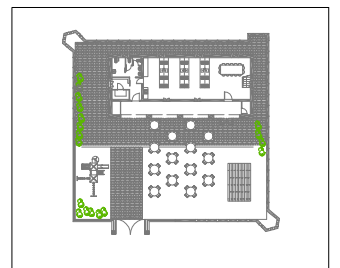


TOP FLOOR (E:1/100)



Symbology

- Dismantling zone
- New Construction Zone (Partitions, carpentry and floors)



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

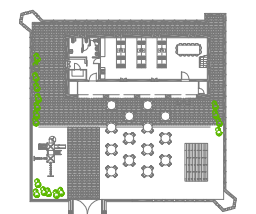
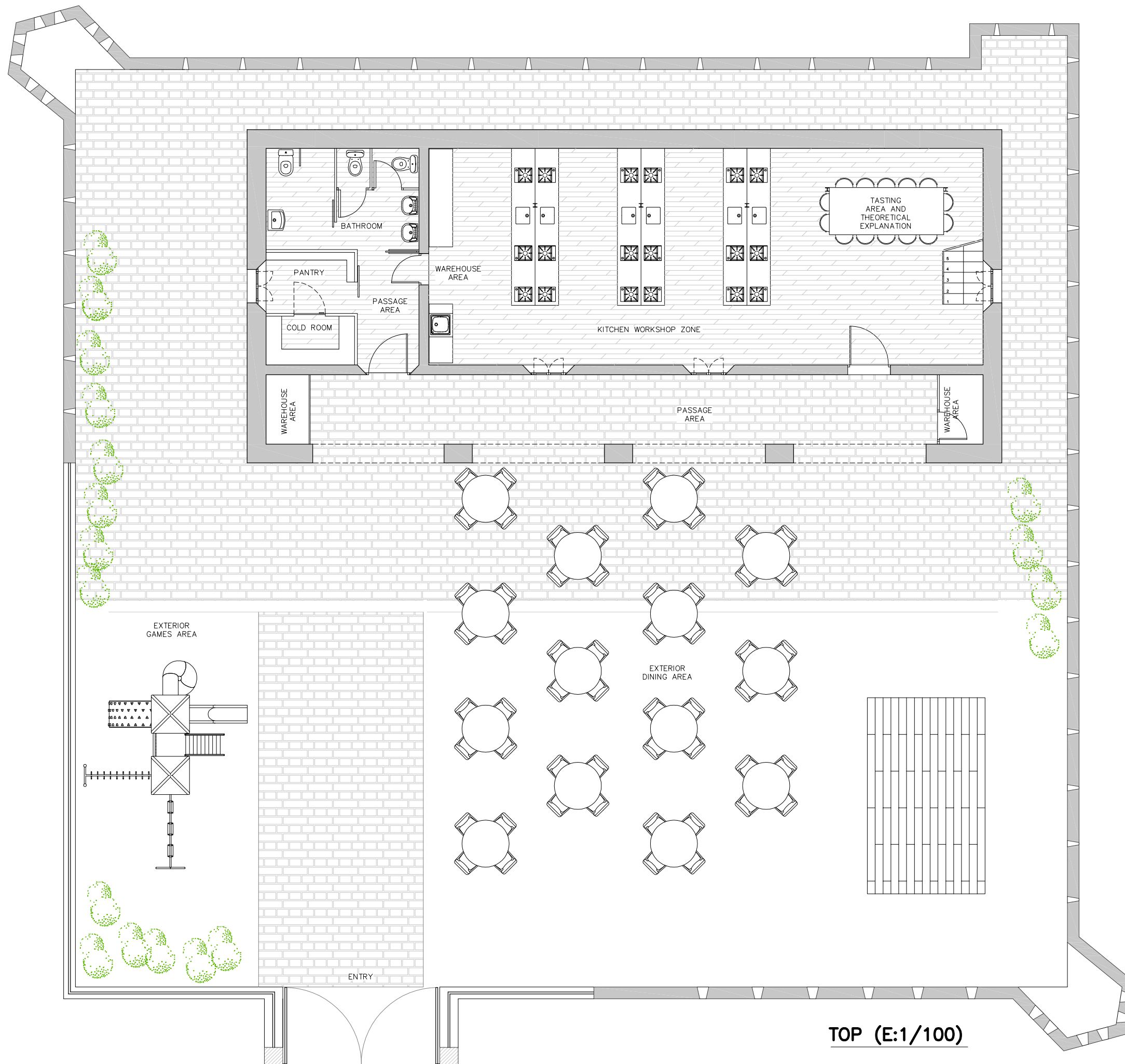
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**LOW LEVEL AND
TOP FLOOR
REFORM STATUS**

Date	Number
16.01.19	23
Escale	
1/100	

1/100 0 0,5m 2,0m 3,0m 4,0m 5,0m 6,0m



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**TOP NO TENT
REFORM STATUS**

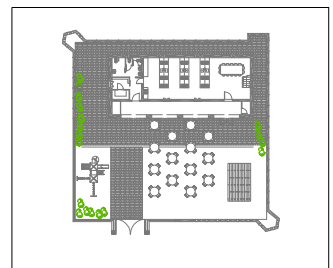
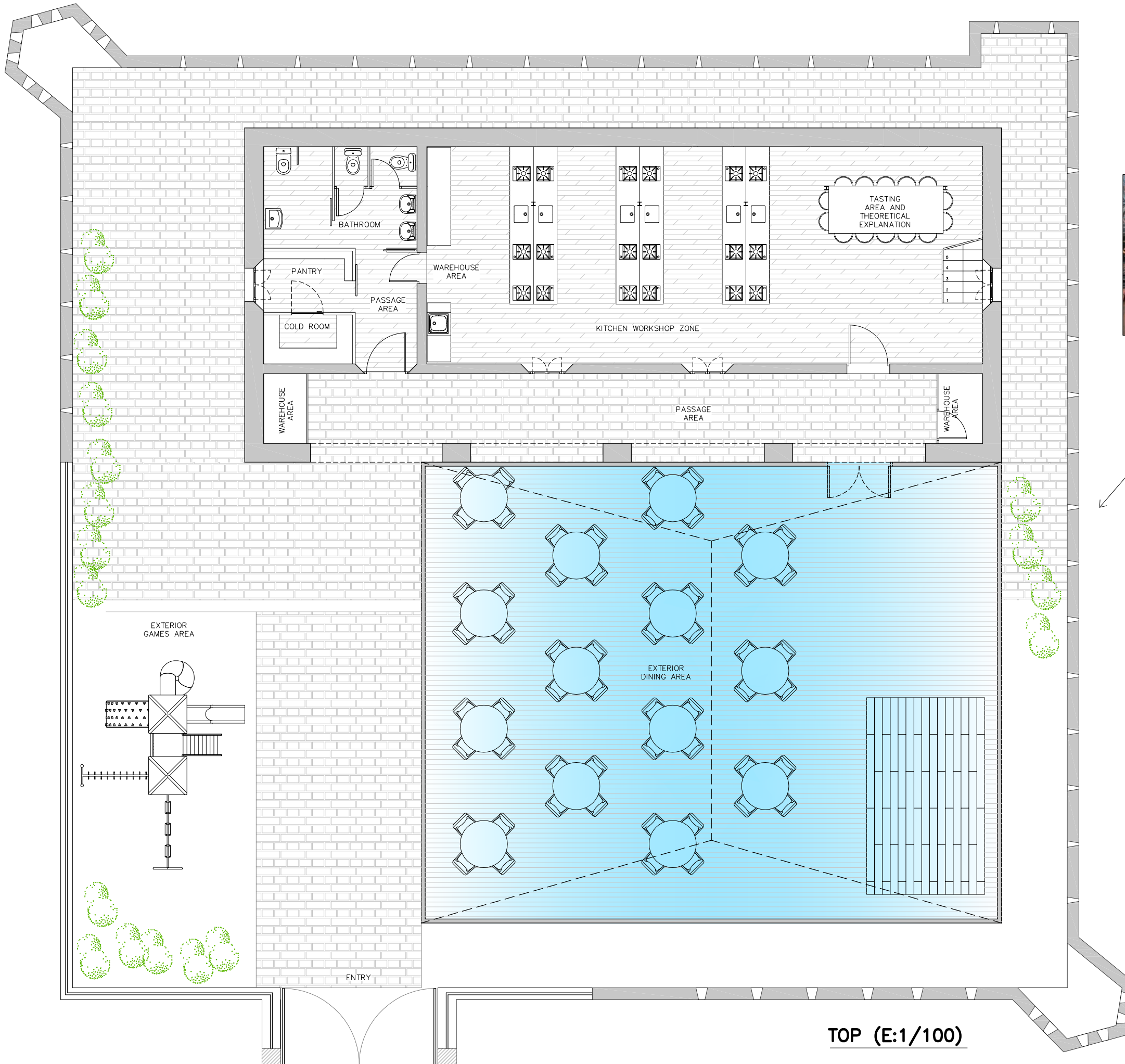
Date
16.01.19
Escale
1/100

Number

24

TOP (E:1/100)

1/100 0 0,5m 2,0m 3,0m 4,0m 5,0m 6,0m



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**TOP WITH TENT
REFORM STATUS**

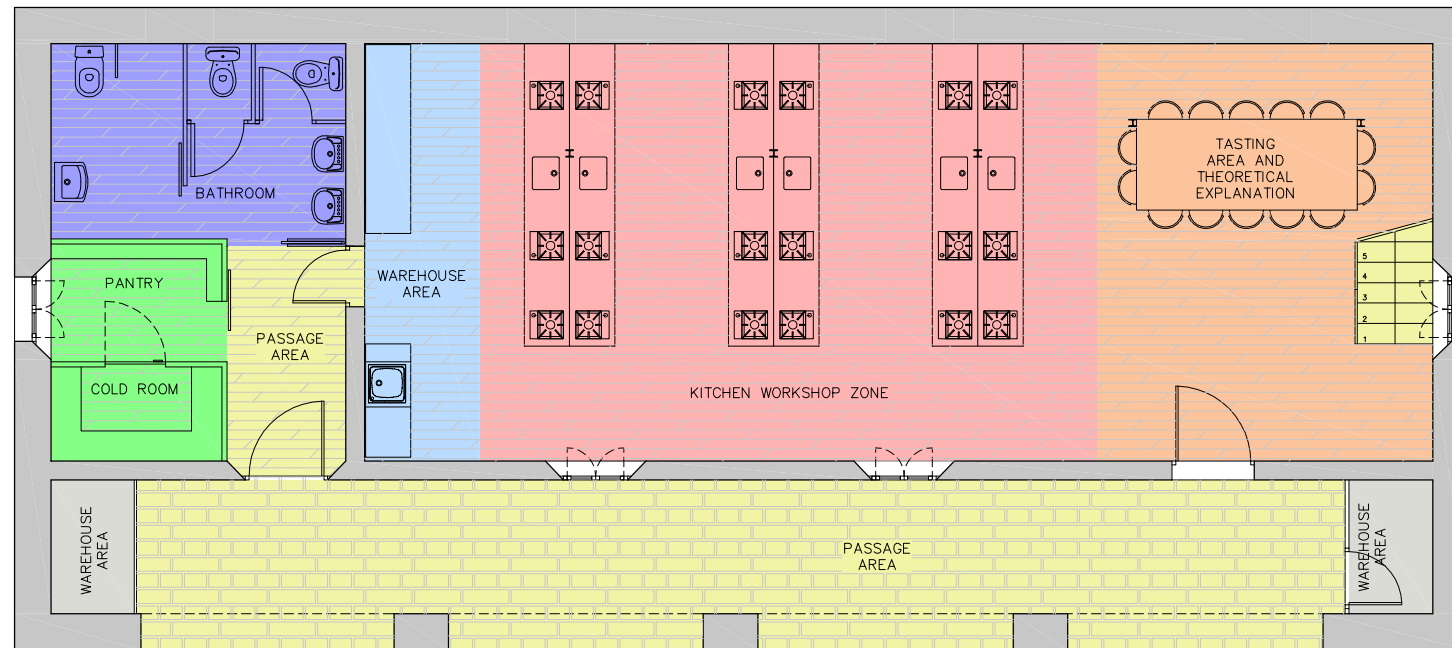
Date
16.01.19

Escale
1/100

Number

25

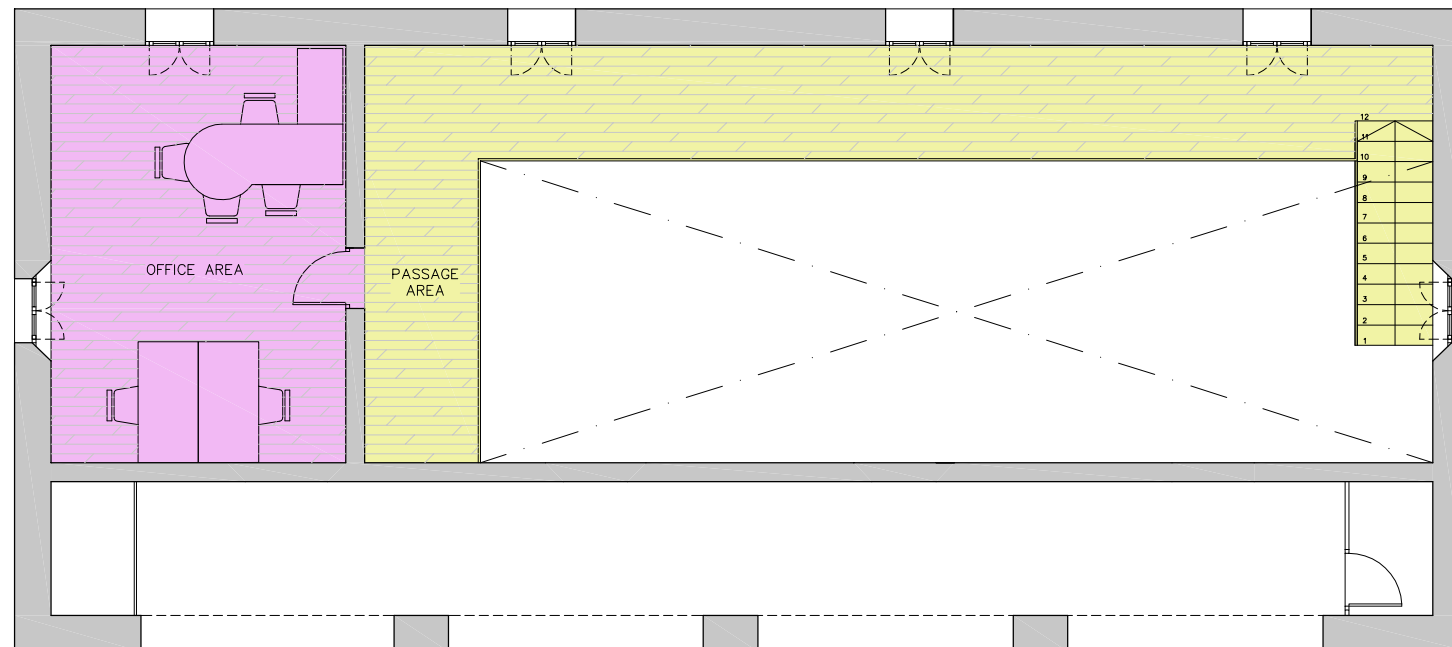
TOP (E:1/100)



LOW LEVEL (E:1/100)

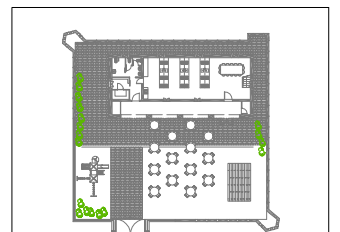
Symbology

- Tasting area and theretical explanation
- Kitchen workshop zone
- Warehouse area
- Bathroom
- Pantry and cold room
- Passage area
- Warehouse area
- Office area



TOP FLOOR (E:1/100)

SURFACES	
Tasting area and theretical explanation	23,00 m2
Kitchen workshop zone	45,00 m2
Warehouse area	8,40 m2
Bathroom	10,20 m2
Pantry and cold room	6,80 m2
Passage area	71,50 m2
Warehouse area	4,00 m2
Office area	21,70 m2
Total surfaces	190,60 m2



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

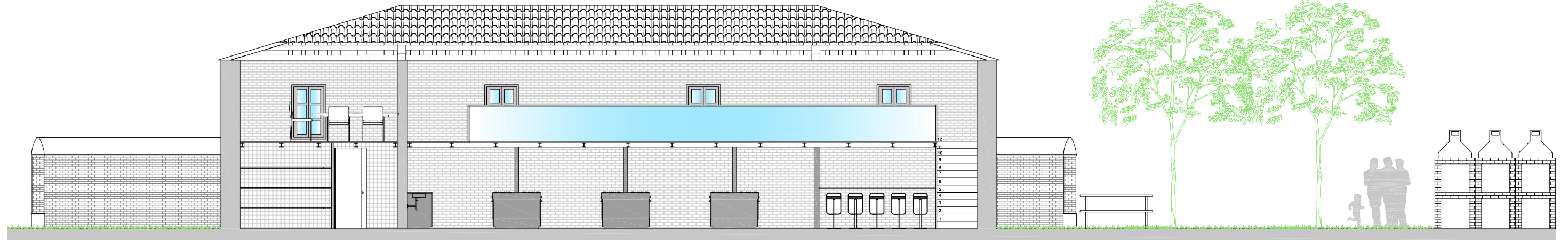
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**ZONING
REFORM STATUS**

Date	Number
16.01.19	26
Escale	
1/100	

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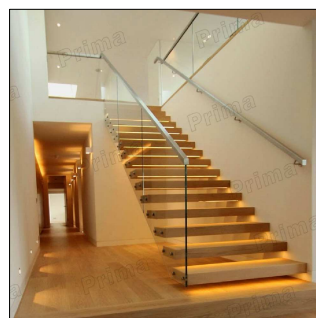
SECTION G-G (E:1/100)



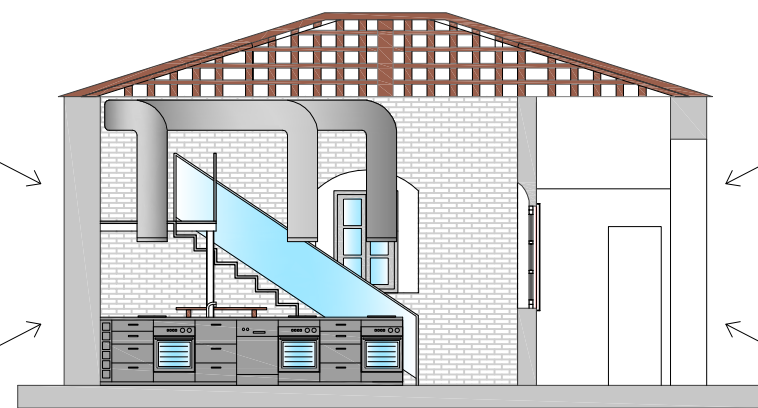
decorative hood for installation on island model CC480 inox Teka



wooden table of industrial style to realize the theoretical classes and to test the made dishes



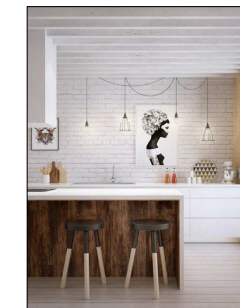
stainless steel handrail with transparent glass



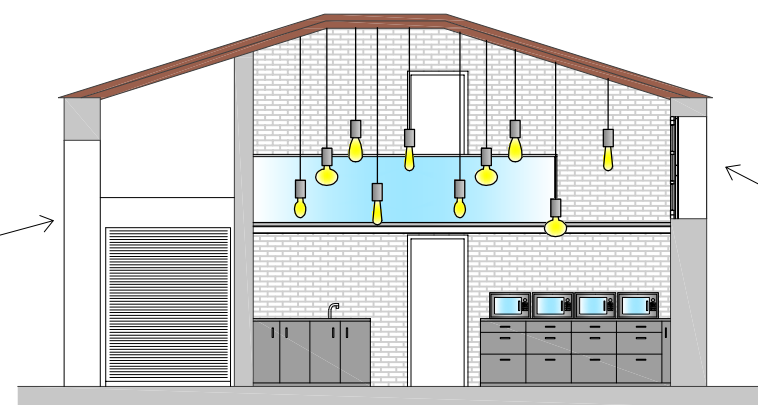
SECTION H-H (E:1/100)



continuous furniture to carry out the cooking workshops Made with oak wood for durability and resistance



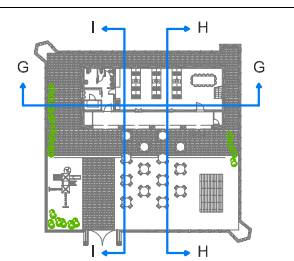
brick wall cladding seen white



SECTION I-I (E:1/100)



copper-colored ceiling lamps with the only coating that the bulb itself



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

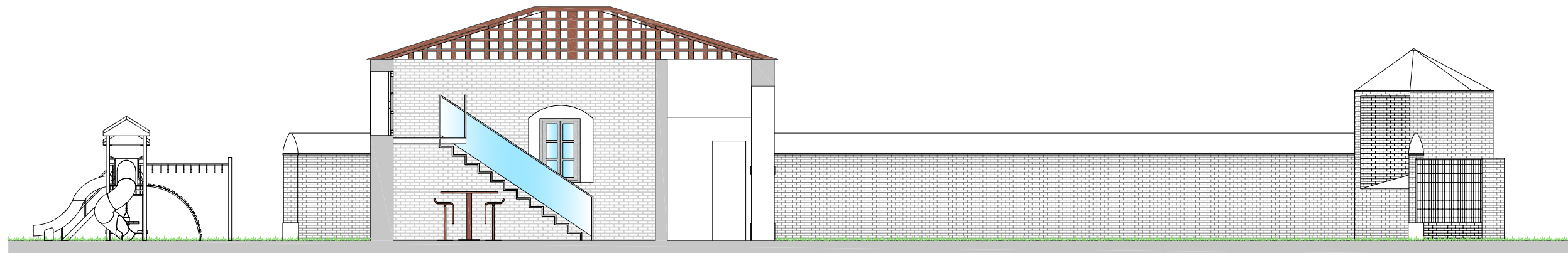
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

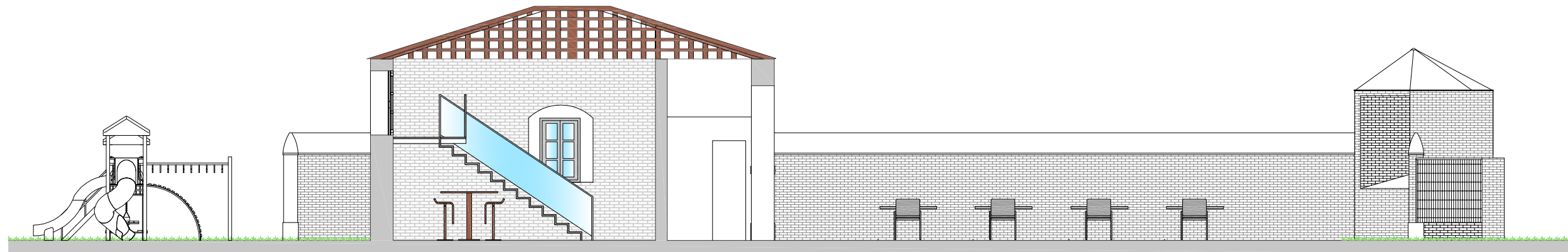
Plane
**SECTION G-G, H-H
AND SECTION I-I
REFORM STATUS**

Date	Number
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Escale	
1/100	

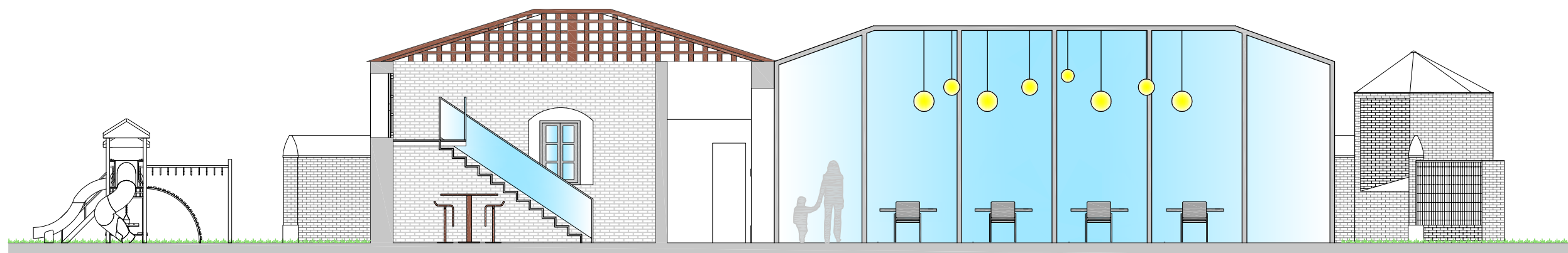
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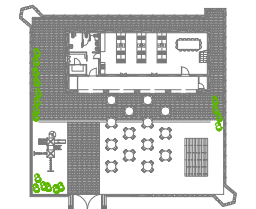
SECTION H-H (E:1/100)
WITHOUT EXTERIOR FURNITURE



SECTION H-H (E:1/100)
WITH EXTERIOR FURNITURE



SECTION H-H (E:1/100)
WITH EXTERIOR FURNITURE
AND PLASTIC TENT



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMÉNEZ DELGADO, LUNA
GORT GARCÍA, BELÉN**

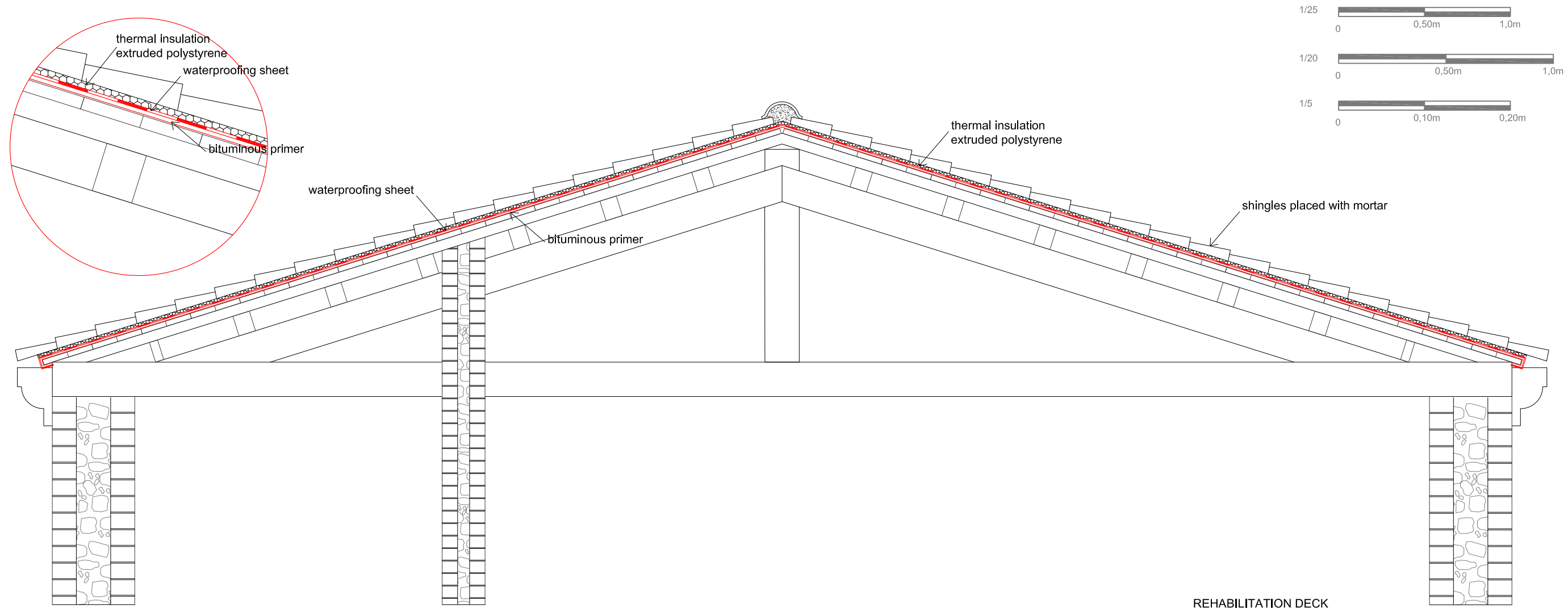
Group
II

Plane
**SECTIONS H-H
REFORM STATUS**

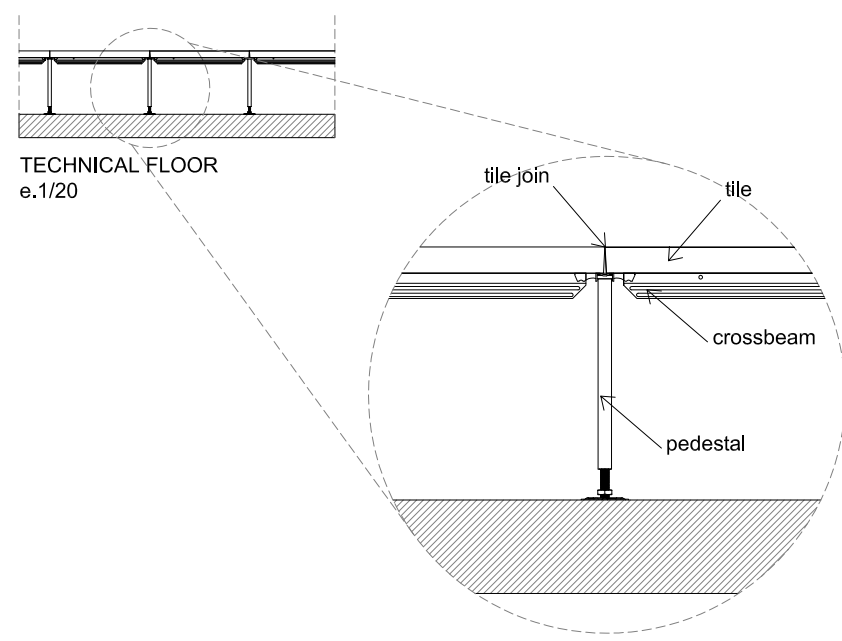
Date Number

Escale
1/100

28

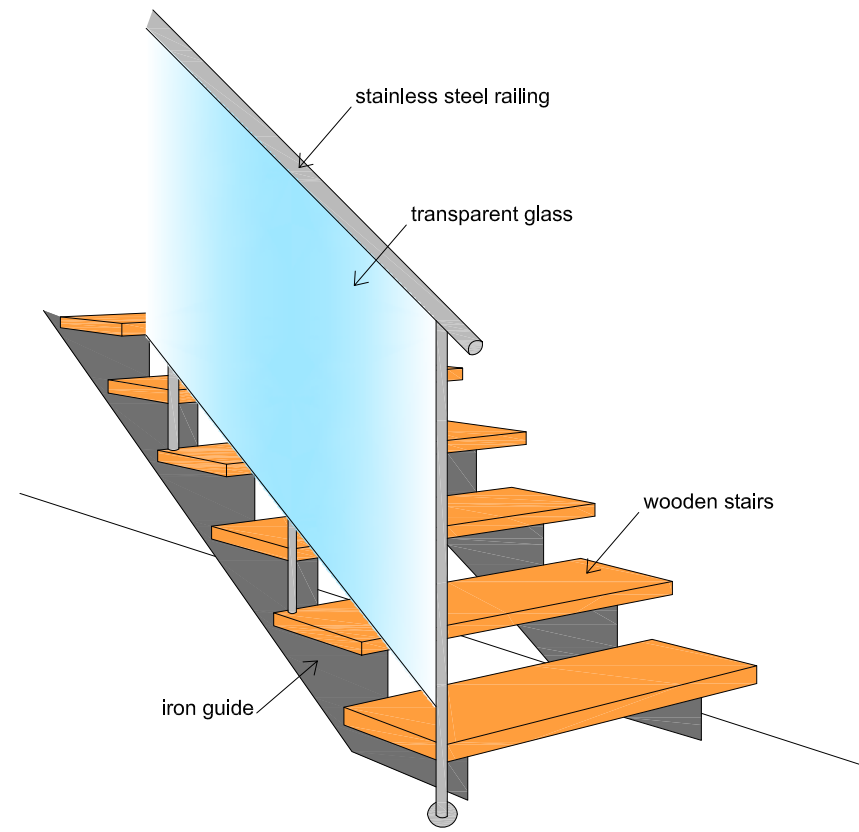


REHABILITATION DECK
e.1/25



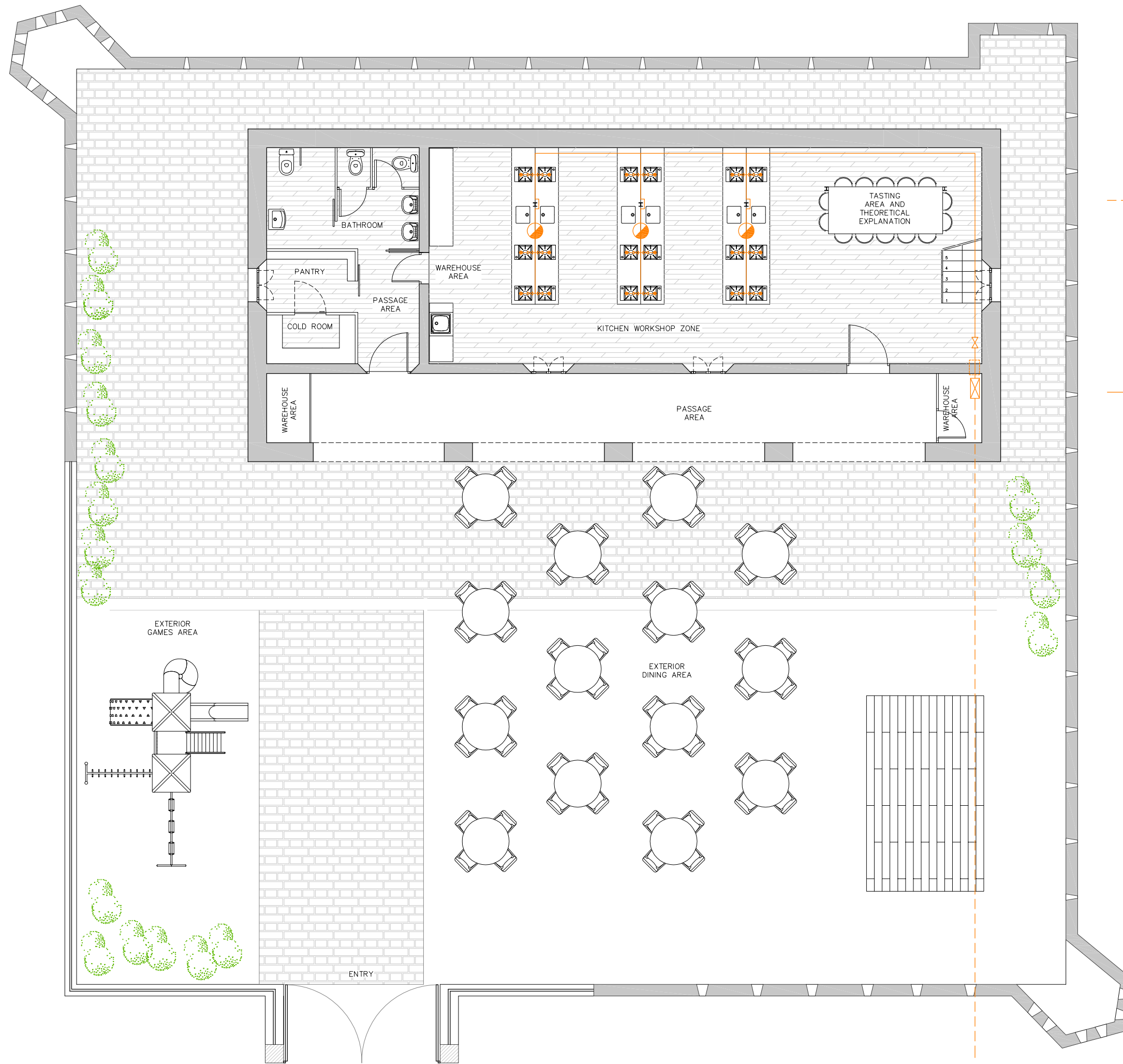
TECHNICAL FLOOR
e.1/20

DETAIL
e.1/5











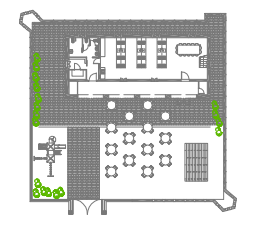
STAIR PERSPECTIVE

Project EL POLVORIN	
Subject DAC REHABILITATION	
Teacher David Hernandez Falgan	
Students FERNÁNDEZ FERNÁNDEZ, MONTSERRAT JIMENEZ DELGADO, LUNA GORT GARCIA, BELÉN	
Group II	
Plane REHABILITATION DETAILS REFORM STATUS	
Date 16.01.19	Number 29
Escale 1/25 1/20 1/5	

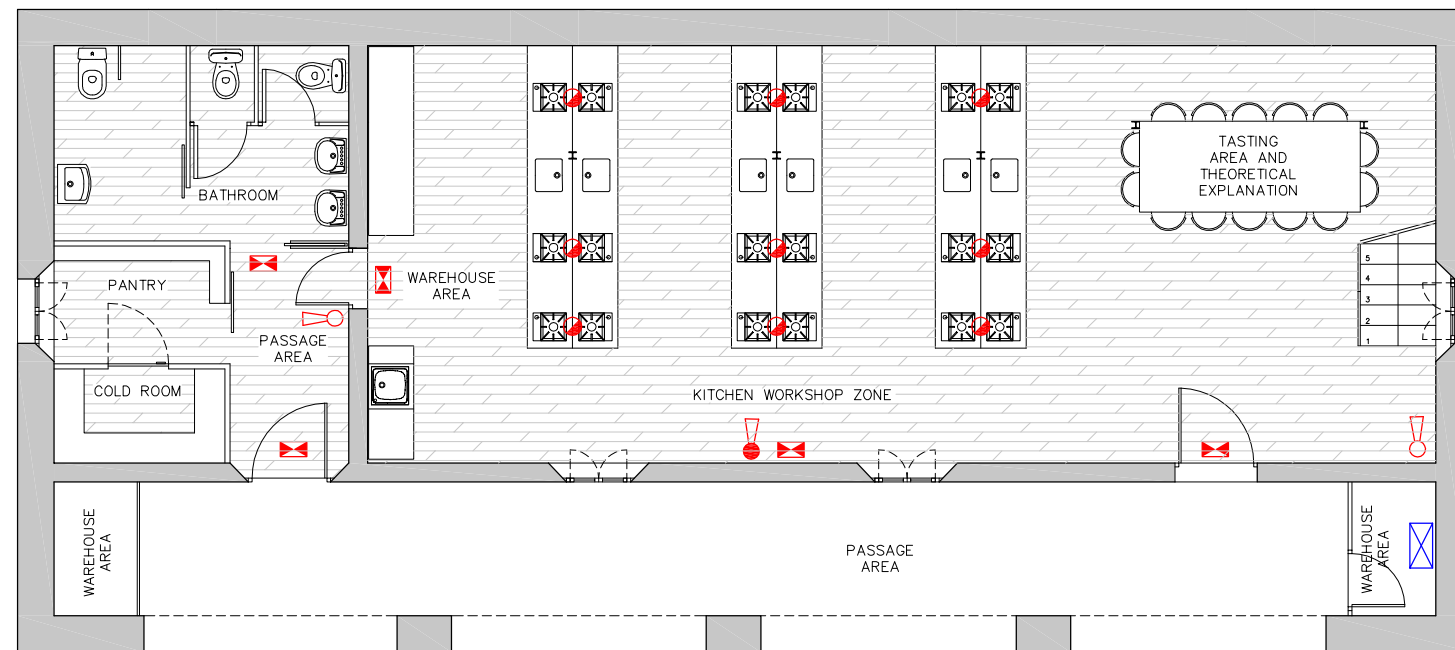


Symbology

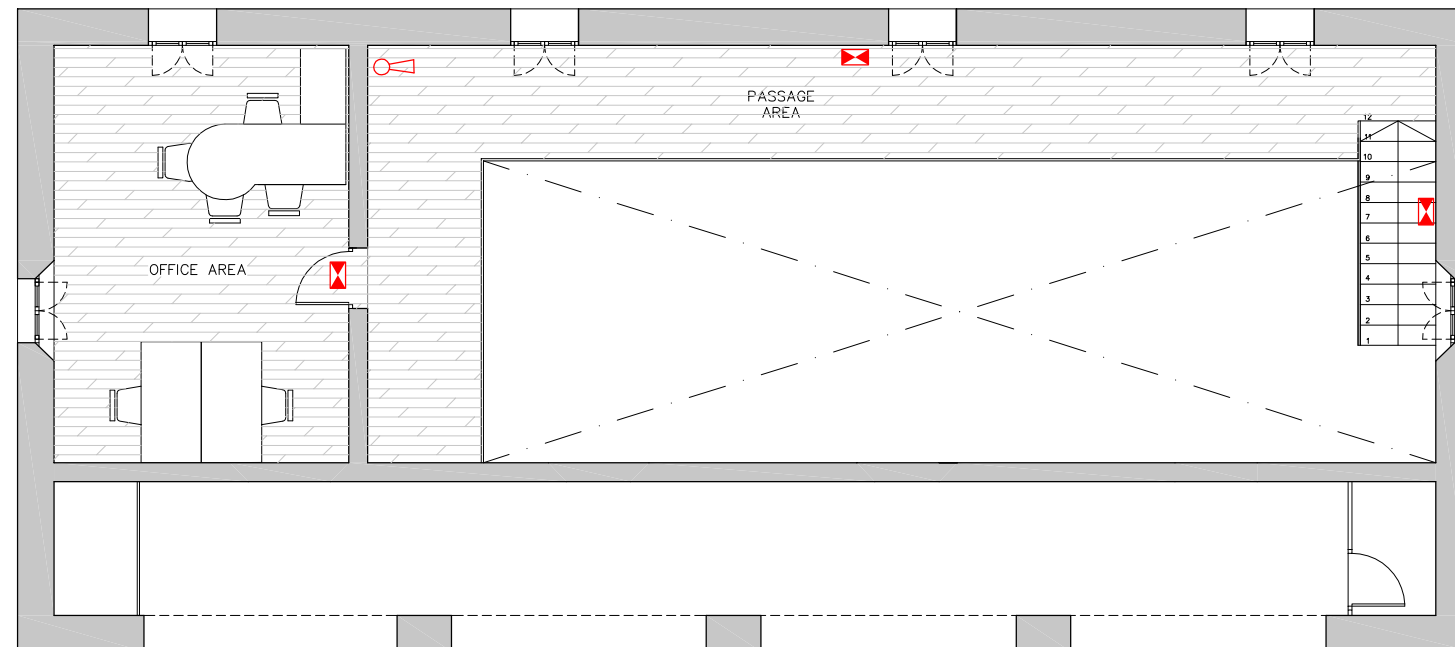
-  Connection casket and key in charge with the supply company
-  Connection stem with the medium pressure B supply company
-  Ventilated cabinet and gas counter G-25 on the front
-  Passengers
-  General key
-  Cu 60x64 duct in installation buried by technical earth
-  Connection point
-  Smoke evacuation duct with exit to the deck at > 10.00 m from any other outlet and air intake to the bell



Project		EL POLVORIN	
Subject		DAC REHABILITATION	
Teacher		David Hernandez Falgan	
Students		FERNÁNDEZ FERNÁNDEZ, MONTSERRAT JIMENEZ DELGADO, LUNA GORT GARCIA, BELÉN	
Group		II	
Plane		INSTALLATION OF GAS REFORM STATUS	
Date	Number	30	
16.01.19			
Escale	1/100		








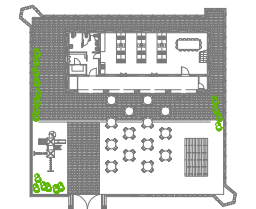
LOW LEVEL (E:1/100)



TOP FLOOR (E:1/100)

Symbology

-  Switchboard
-  Autonomous device with Cd-Ni battery for emergency lighting and signaling
-  Extinguisher 6kg polyvalent powder
-  Extinguisher 5kg CO2 powder
-  Automatic extinguishing of the kitchen bell



Project
EL POLVORIN

Subject
DAC REHABILITATION

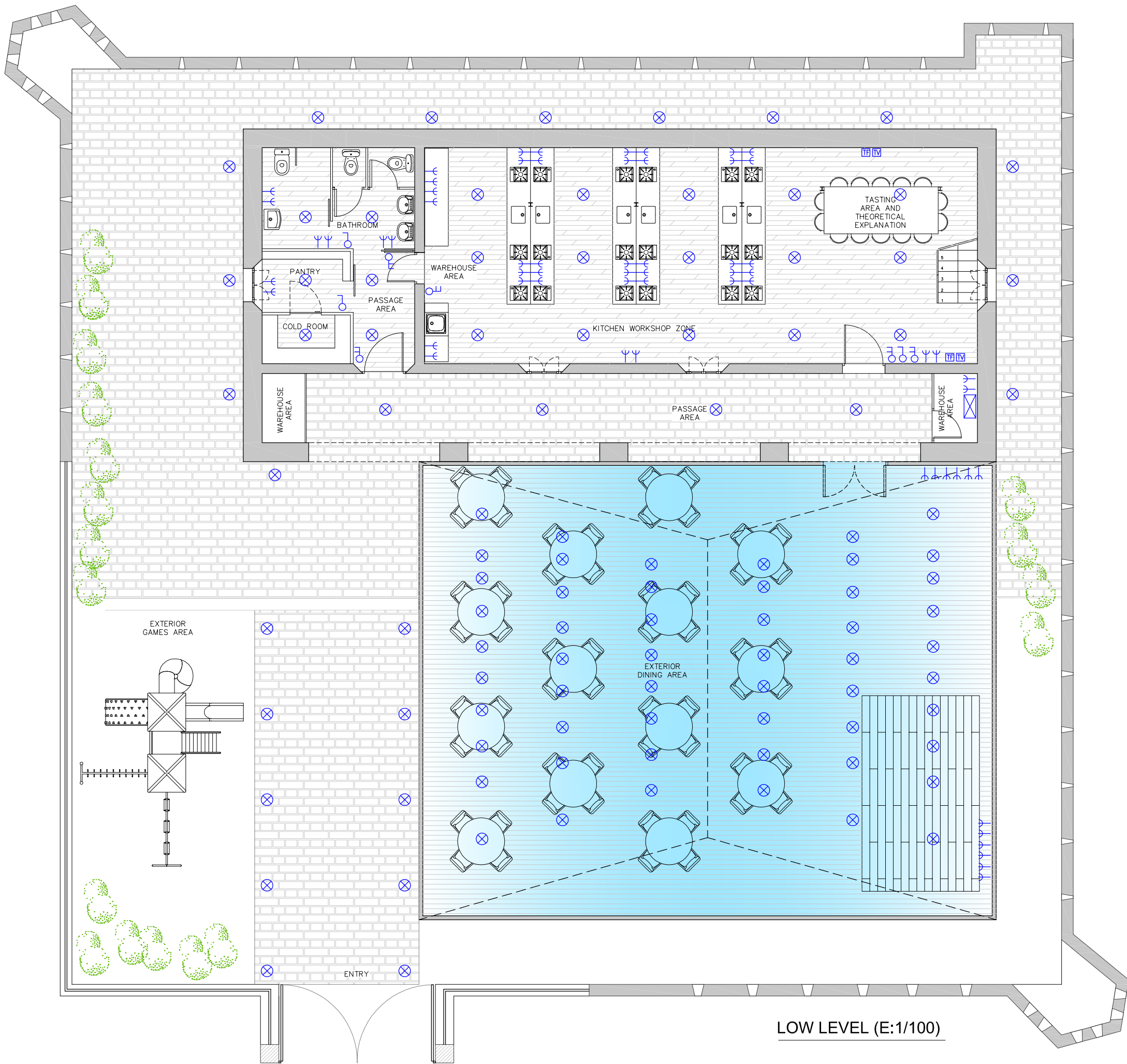
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

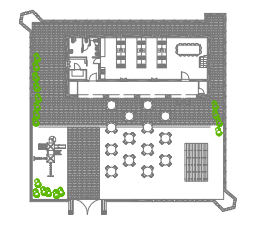
Plane
**INSTALLATION OF
SECURITY
REFORM STATUS**

Date	Number
16.01.19	31
Escale	
1/100	



Symbology

- Distribution panel
- Lightpoint
- Plug
- switch
- Switched switch
- TV plug
- Telephone Plug



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

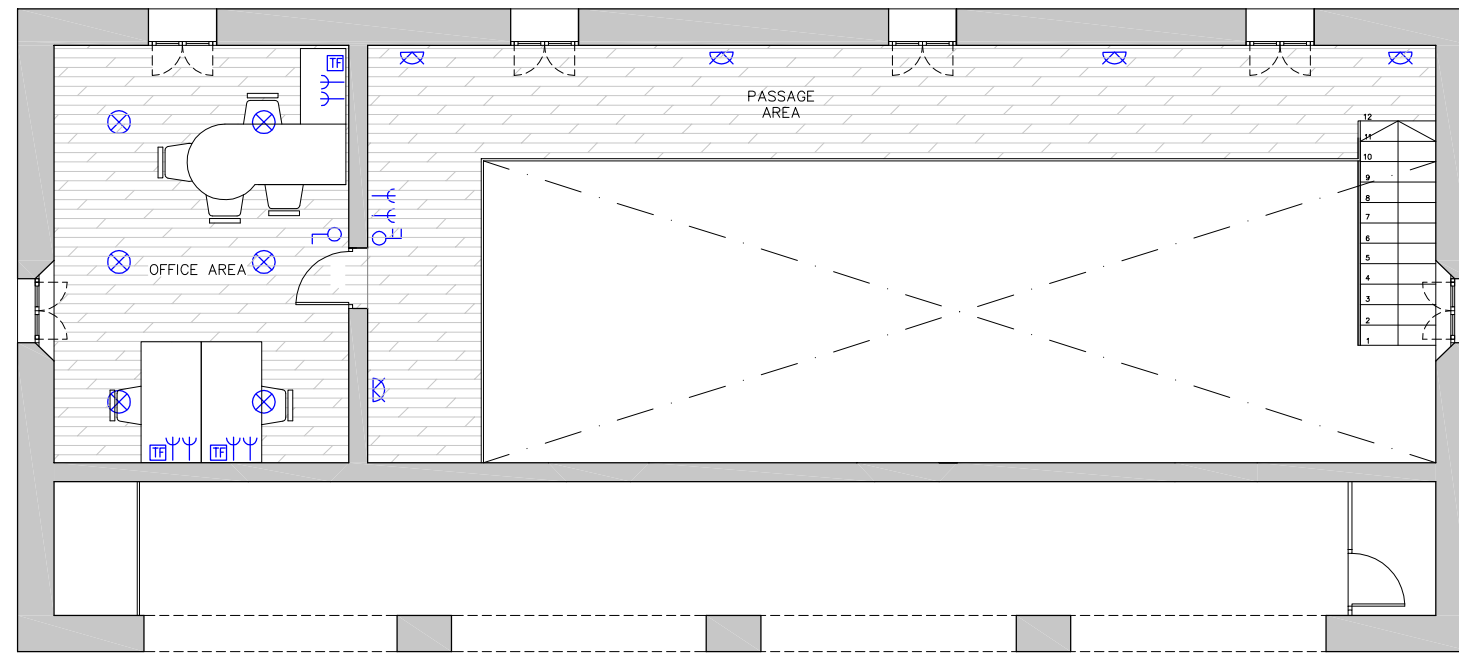
Plane
**LIGHT
INSTALLATION
REFORM STATUS**

Date
16.01.19
Escale
1/100

Number








32

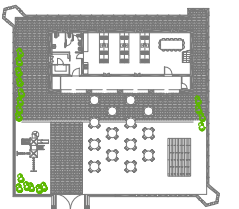
LOW LEVEL (E:1/100)



TOP FLOOR (E:1/100)

Symbology

-  Distribution panel
-  Lightpoint
-  Plug
-  switch
-  Switched switch
-  TV plug
-  Telephone Plug



Project
EL POLVORIN

Subject
DAC REHABILITATION

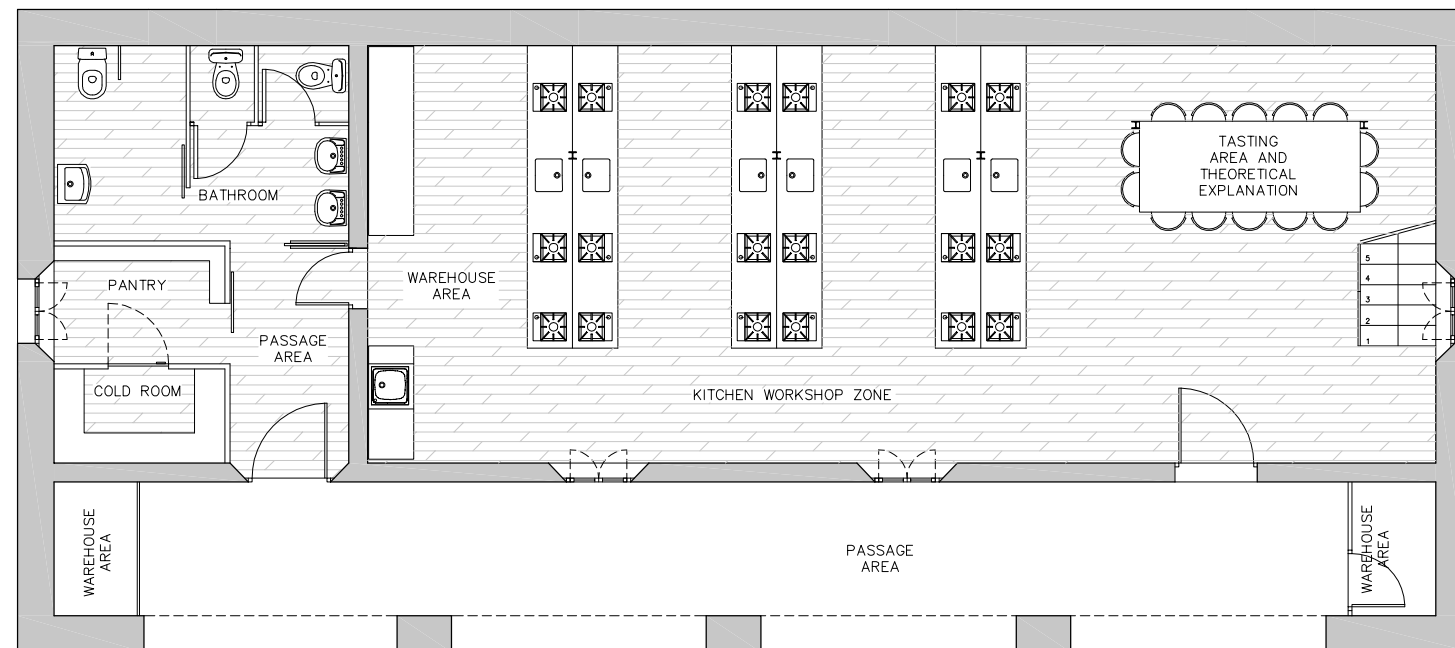
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

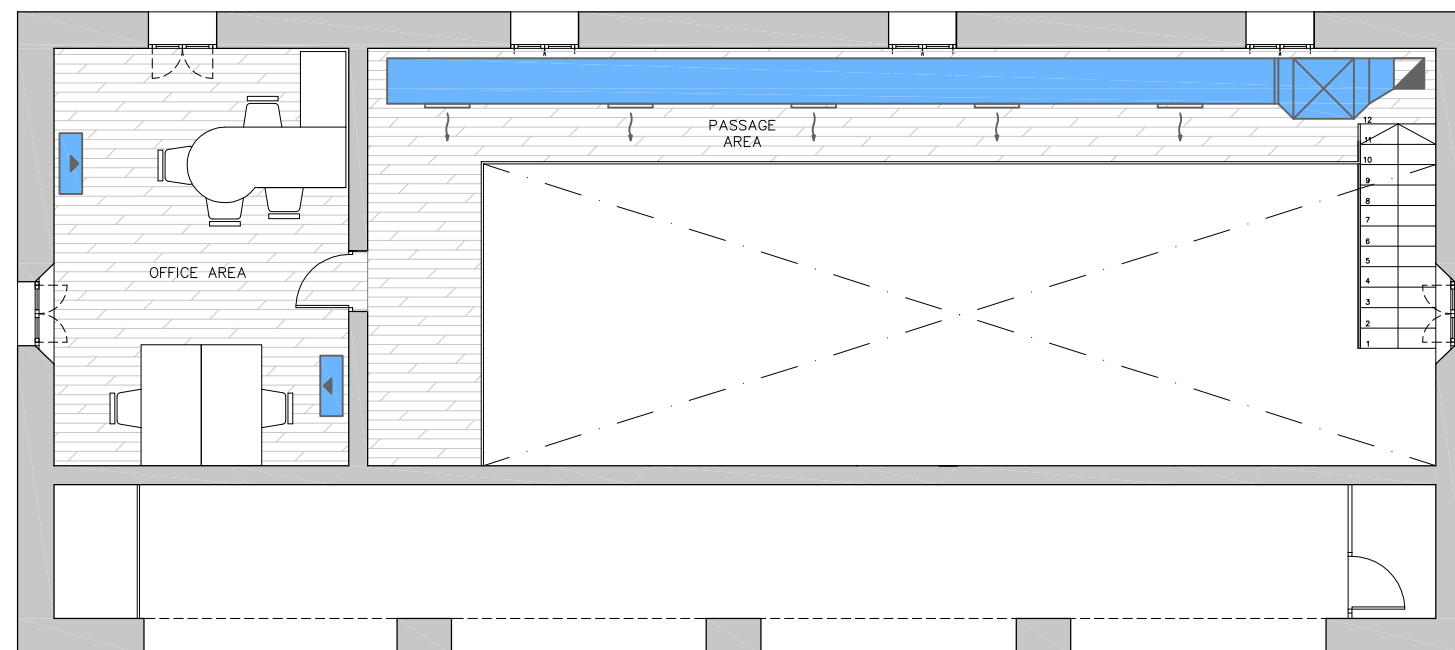
Group
II

Plane
**LIGHT
INSTALLATION
REFORM STATUS**

Date	Number
16.01.19	33
Escale	
1/100	



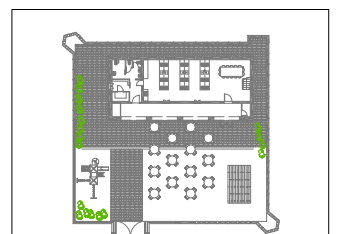
LOW LEVEL (E:1/100)



TOP FLOOR (E:1/100)

Symbology

- Conduct to the outside
- Extraction motor
- Exit air extraction
- AA Split



Project
EL POLVORIN

Subject
DAC REHABILITATION

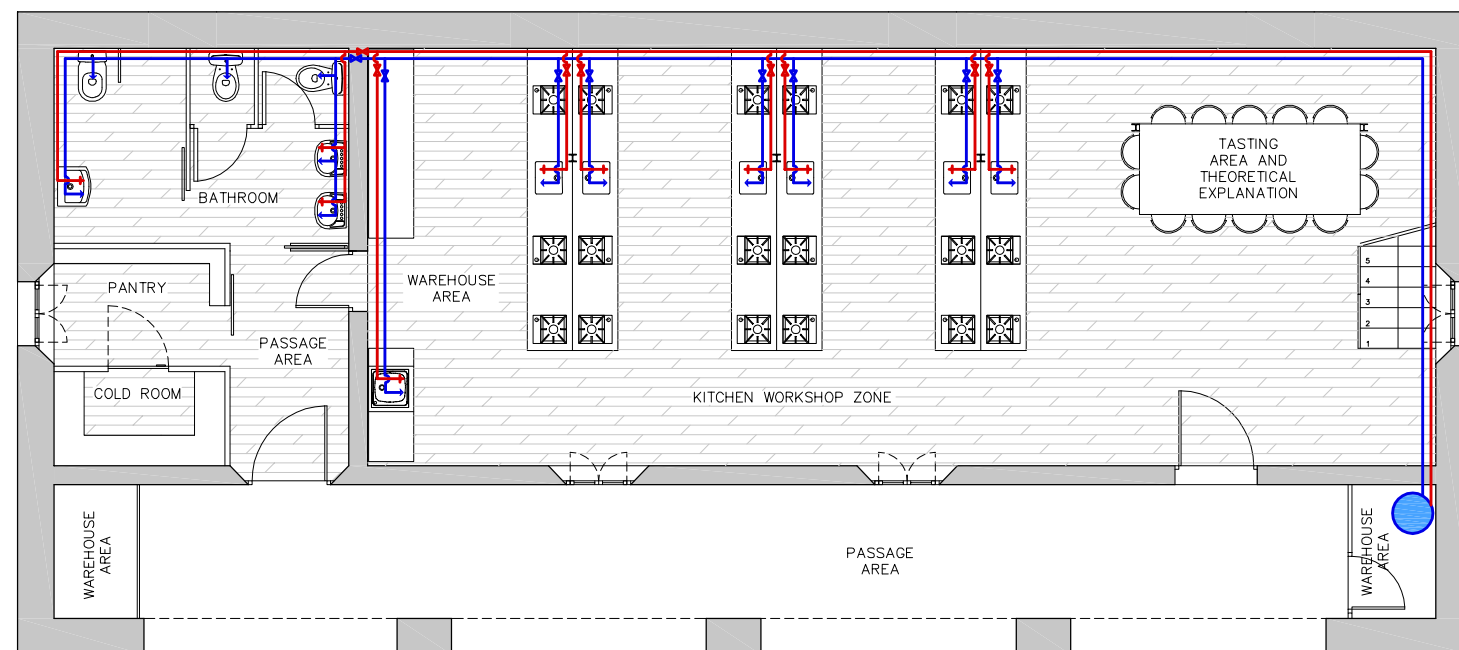
Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II







Plane
**VENTILATION
INSTALLATION
REFORM STATUS**

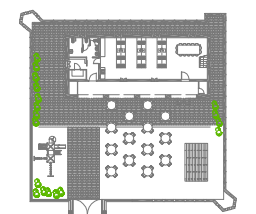
Date	Number
16.01.19	34
Escale	
1/100	



LOW LEVEL (E:1/100)

Symbology

-  Boiler
-  Hot water
-  Cold water
-  Cold water stopcock
-  Hot water stopcock
-  Connection points



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

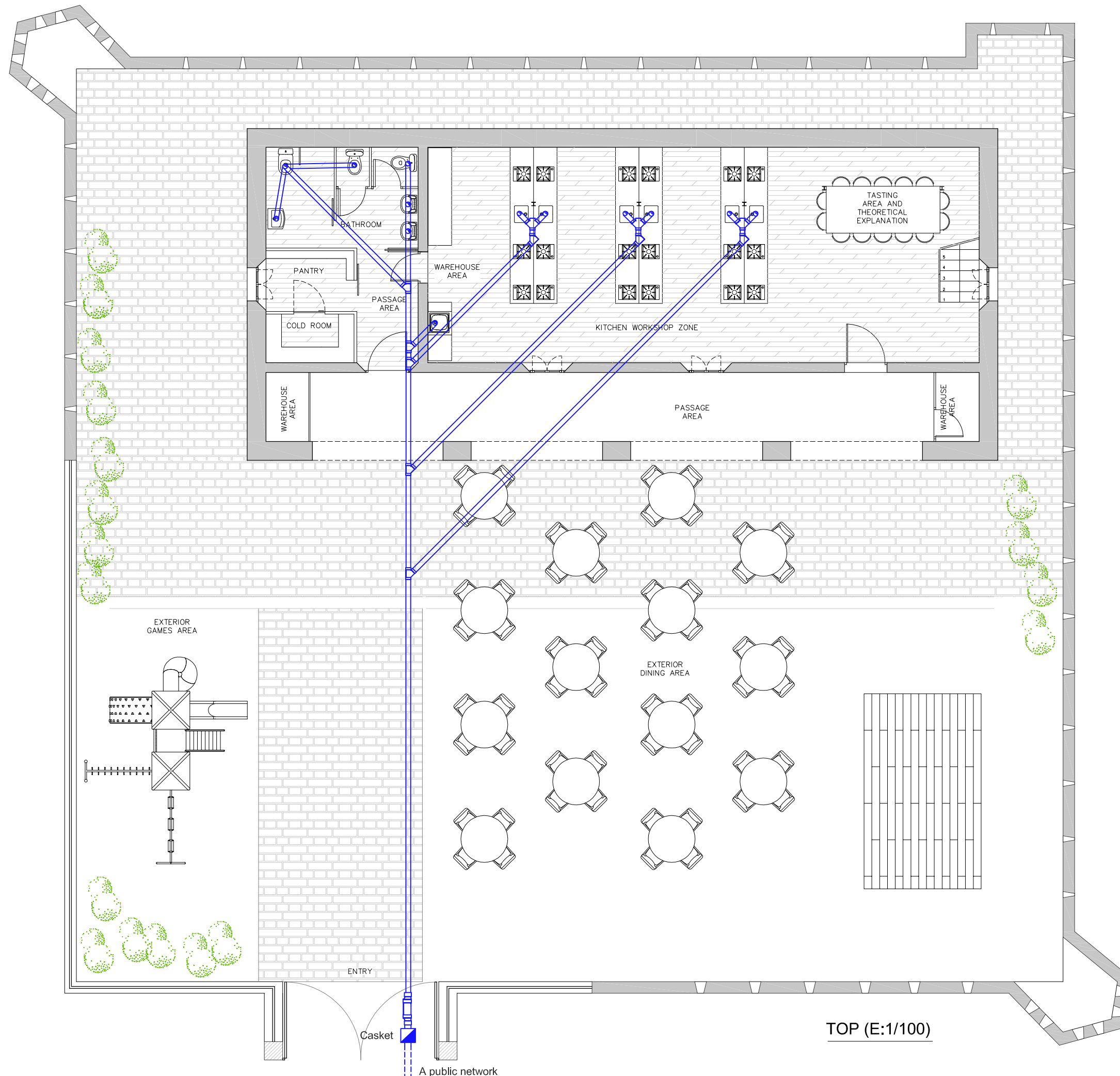
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

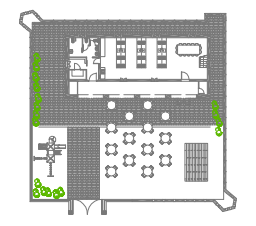
Plane
**WATER
INSTALLATION
REFORM STATUS**

Date	Number
16.01.19	35
Escale	
1/100	

1/100 0 0,5m 2,0m 3,0m 4,0m 5,0m 6,0m



TOP (E:1/100)



Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

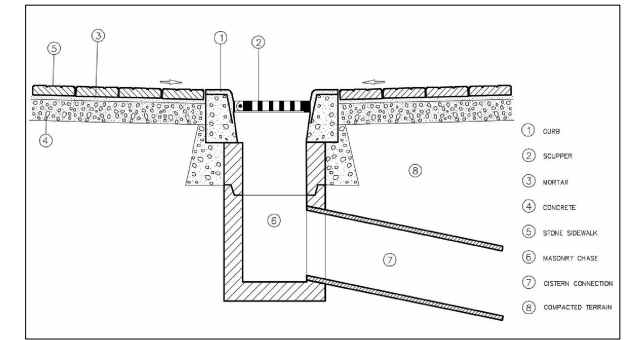
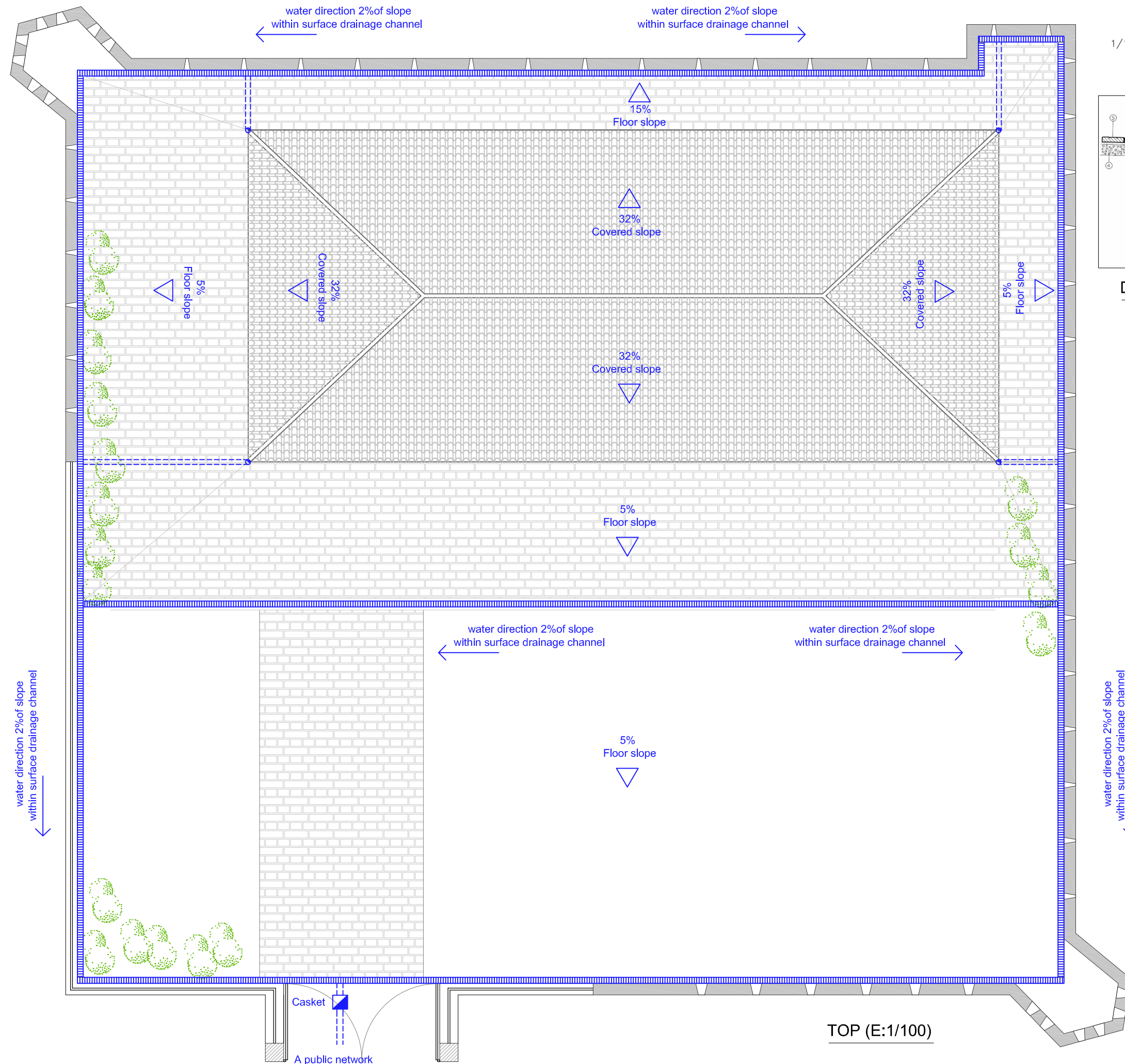
Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**WASTEWATER
INSTALLATION
REFORM STATUS**




Date
16.01.19
Escale
1/100

Number
36



DETAIL SURFACE DRAINAGE CHANNEL (E:1/100)

Symbology

-  Surface drainage channel
-  Buried drainage channel
-  Downspouts

Project
EL POLVORIN

Subject
DAC REHABILITATION

Teacher
David Hernandez Falgan

Students
**FERNÁNDEZ FERNÁNDEZ, MONTSERRAT
JIMENEZ DELGADO, LUNA
GORT GARCIA, BELÉN**

Group
II

Plane
**RAINWATER
INSTALLATION
REFORM STATUS**

Date
16.01.19

Escale
1/100

Number

37

9. CONCLUSION

The preparation of the project has not been easy, since we began the historical inquiries, going through the architectural survey, as well as the complete diagnosis of the whole and the elaboration of the intervention recommendations.

During this time we have been able to put into practice the knowledge acquired during these years and we have been able to expand knowledge such as the diagnosis of building pathologies.

The magnitude of the project has required an unexpected increase in the time of the work to be carried out, but a good coordination of the designers along with the visits with the property, have provided a correct survey, the main source to start the project.

The search for historical information and its preparation was combined with the realization of the different plans and constructive details. Once these points are made, we write the diagnosis and its pathologies and recommendations for its intervention.

On the other hand, this study has helped us to really assess the effort required by a rehabilitation project. This study has allowed us to develop different types of work within the same project. All this has given us the means to realize that learning does not end when the race ends, but that throughout our working life the acquisition of new knowledge allows us to evolve as technicians.

We have learned to make decisions, take responsibility, properly organize time and work, assess the work done by the people who make up the group, know our own mistakes to know how to solve them and know how to distinguish the priorities at all.

Personally we have liked to make this work in paper format, but we would have enjoyed it much more if it had been done in reality, it is always more didactic to execute it in the work since that is where the real problems that arise are faced.

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- https://www.google.es/search?safe=active&ei=nXC_W5ixJLGalwTCkbagDg&q=barcelon
- https://elpais.com/diario/2007/10/12/catalunya/1192151258_850215.html
- <https://a.cat+fomento+de+ciudad+barrio+de+la+marina+del+pot&oq=barcelona.cat>
- https://www.barcelona.cat/mobilitat/es/actualidad-y-recursos/noticias/empiezan-las-obras-de-los-ascensores-por-subir-y-bajar-del-polvorin_717457
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- <http://w133.bcn.cat/geoportalbcn/GeoPortal.aspx?lang=ca>
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- <http://www.bcn.cat/estadistica/castella/terri/mdte03/aeb/dte3aeb.pdf>
- <https://upcommons.upc.edu/bitstream/handle/2117/79882/memoria.pdf?sequence=1&isAllowed=y>
- http://oa.upm.es/38443/1/TFG_IRENE%20JIMENO%20GUADALIX.pdf
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- Estanislau roca i Blanch.Montjuïc, la muntanya de la ciutat.
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- Cuadernos de lesiones en elementos constructivos, Institut Valencià de L'edificació.ISBN: 978-84-96602-98-4.
- Apuntes higrotermia, Construcción IV. Atenea. EPSEB
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- Método RehabiMed Arquitectura Tradicional Mediterránea I. Rehabilitación Ciudad y Territorio. ISBN : 84-87104-77-0

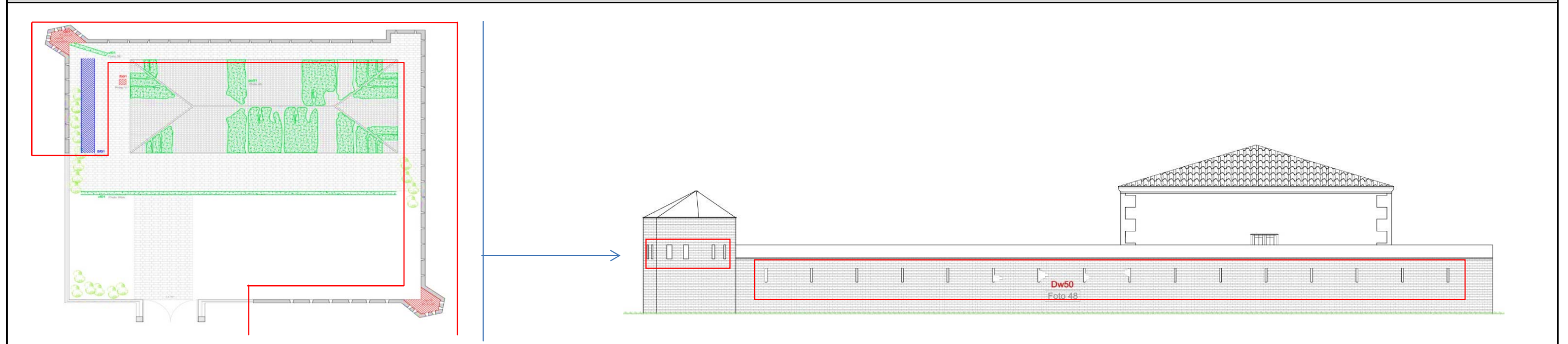
11. ANNEXES


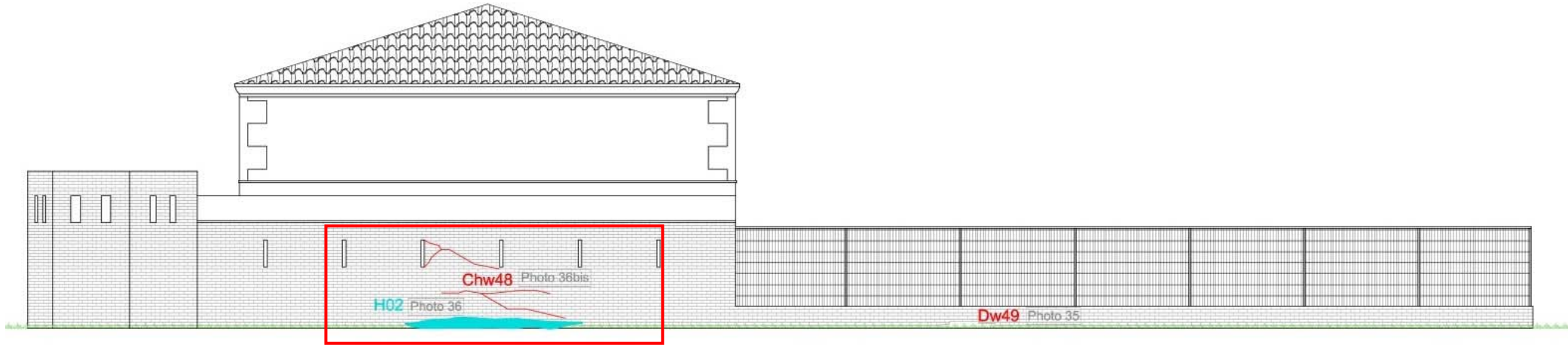
11.1 Pathological Processes Technical Files


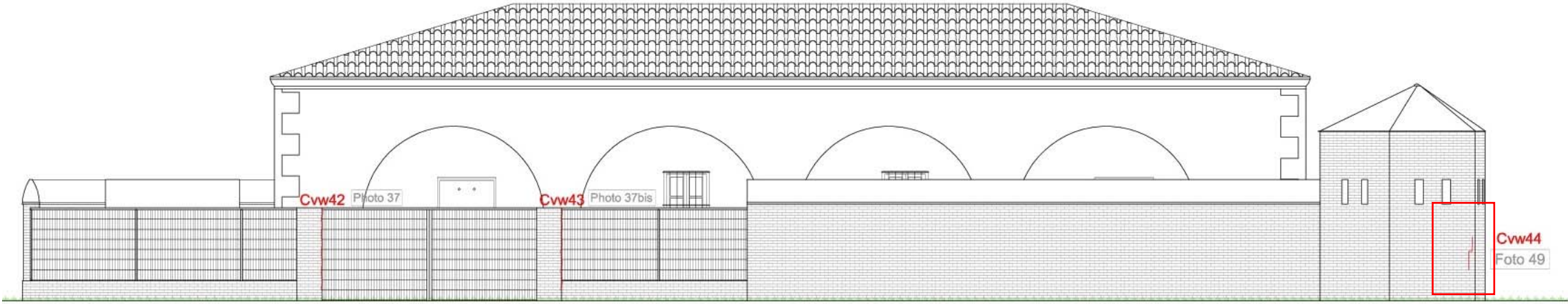
File	1	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Horizontal wall outdoor passage area		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 19		Pavement	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
44		Sf01	LOW	MID	HIGH
Photographs			Description injury		
			It is appreciated that the petril of sunken masonry, only in the zone of lateral step west, of perimeter sidewalk that surrounds the building.		
			Analysis and possible causes		
			The possible cause is that it has yielded the land that sustains them due to lack of drainage and vegetation.		
			Possible interventions and actions		
			The previous works will consist of cleaning, de-rubbing and the elimination of the vegetation avoiding at all times its starting to not damage the support. For the total elimination of the roots, the application of herbicides will proceed. It will also be filled with gravel (compaction behavior is excellent) and concrete (the concrete will be reinforced with a 6 cm partition mesh), leveling and placing the damaged stone.		
Location of the lesion					
					


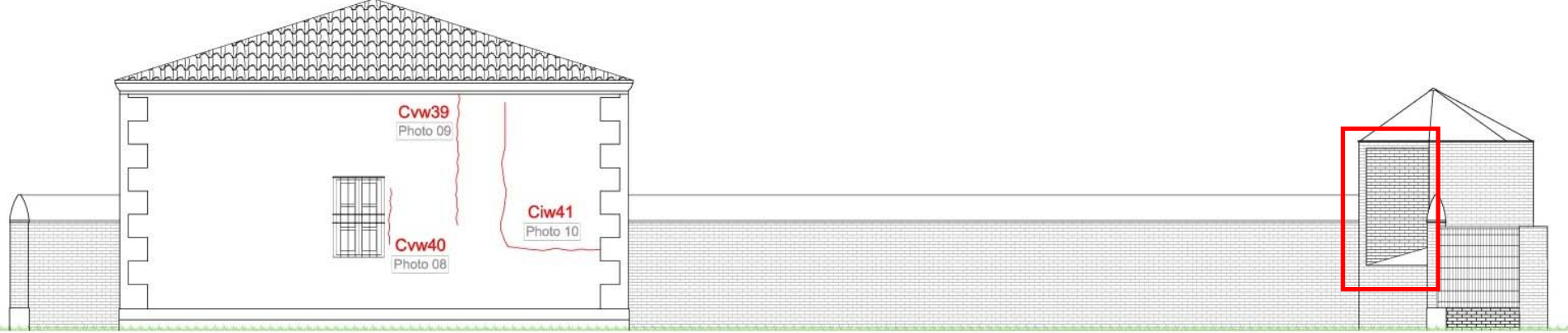
File	2	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Non-structural wall of the exterior		Around the perimeter	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 19		Perimeter exterior wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
48		Dw50	LOW	MID	HIGH
Photographs			Description injury		
			It is appreciated that the narrow openings holes located in the entire section of the wall, have losses of section and erosion of the bricks that make them up.		
			Analysis and possible causes		
			The possible cause is by physical erosion and it could also be chemical as the lack of cohesion between the materials, called decementation (brick with components of cementing bacteria) which is the loss of mass in the areas of the wall and especially by the presence of water. It could also be by segregation of the components as the type of pulverization in factory structures that is produced by the loss of the material.		
			Possible interventions and actions		
			The loopholes will be reconstructed with the missing bricks, differentiating the zone that is reconstructed with a brick of a different tonality and in the areas that the brick is damaged by loss of part of its section, a physical substitution of the damaged area in the which consists of the subtraction of the material of the element replacing it with the new bricks		


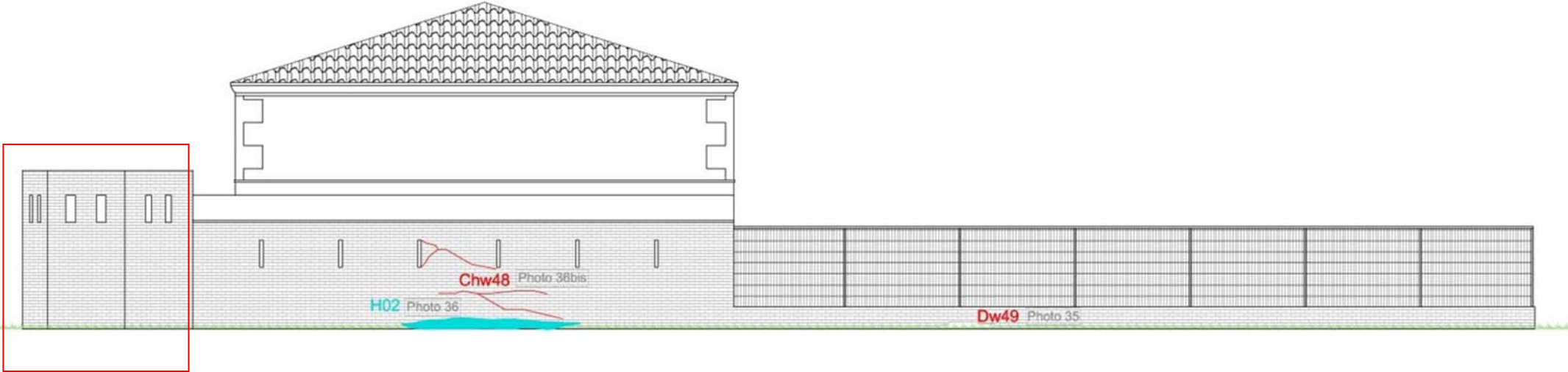
Location of the lesion


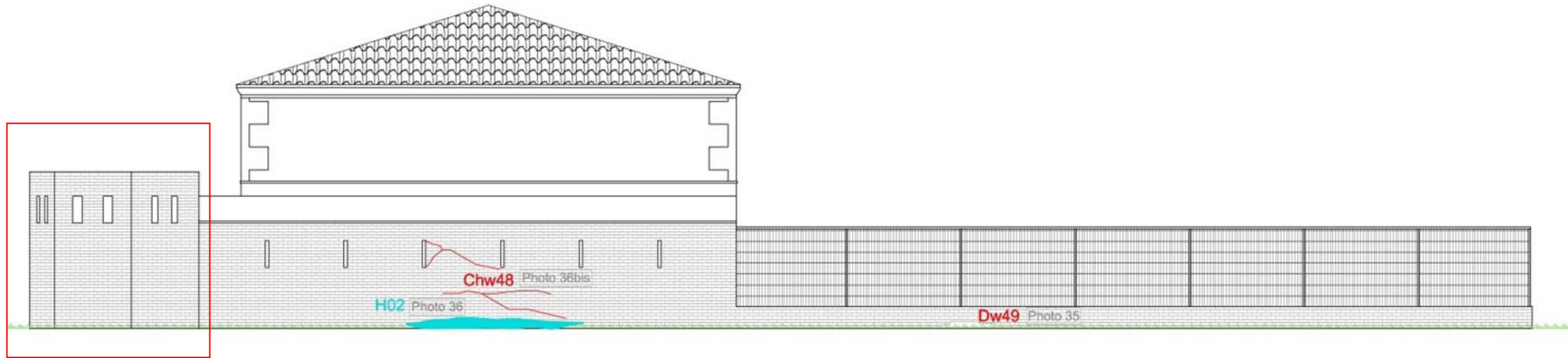



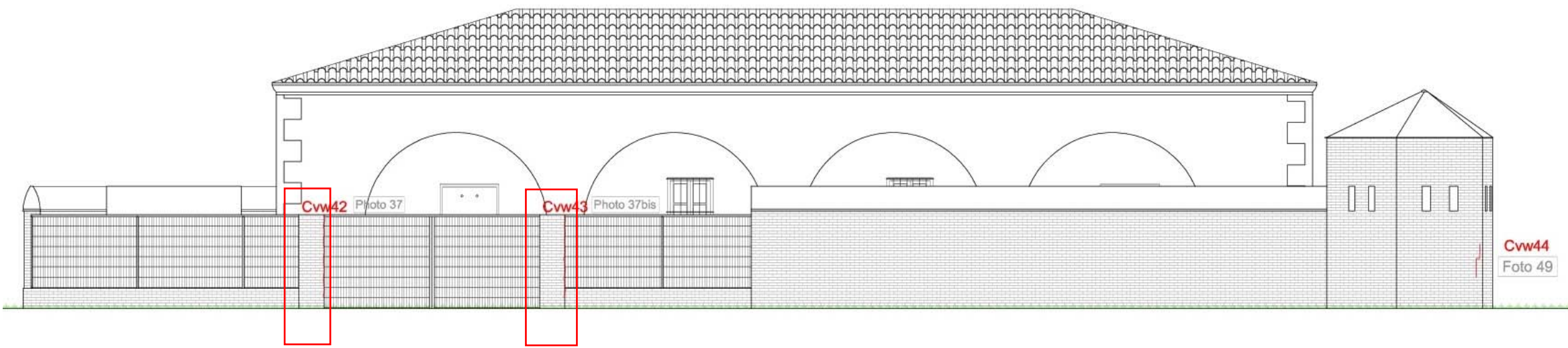
File	3	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Non-structural wall of the exterior		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 18		Outside wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
36 Bis		Chw 48	LOW	MID	HIGH
Photographs		Description injury			
		It is observed that in the outer perimeter wall in the southern part, it has collapsed and has lost its verticality.			
		Analysis and possible causes			
		The possible cause is for affections of the roots of a pine in the proximity of the wall, this type of tree develops a root system from a root where it expands very close to the surface.			
		Possible interventions and actions			
		Elimination of the problem by changing the location of the tree and in the injured area will replace the enclosure of the wall with a laminar safety glass.			
Location of the lesion					
					


File	4	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Booth of the non-structural wall of the outside	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 17	Perimeter booth		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
49	Cvw44		LOW	MID	HIGH
Photographs			Description injury		
			<p>It is observed that in the garita (filthy and covered) of the main entrance to the enclosure, crack in the exterior part in the brick and continues towards the lower part of the masonry of the stone of the quarry of Montjuïc, united with lime mortar.</p>		
			<p>Analysis and possible causes</p> <p>The possible causes are due to a bad initial compaction of the soil where the garita was built, the use of a filling material in the ground that was not adequate, due to the failure of the mortar to compression and / or change in the conditions of its use of its interior, as a barbecue.</p>		
			<p>Possible interventions and actions</p> <p>With the verification of a testimony of plaster we verify that the crack does not enlarge and we will proceed to repair the crack with a Sewn of cracks consists of interposing between the lips of the crack of the wall elements of greater resistance and rigidity as sutures, such like metal bars, pieces of brick factory, etc. Its objective is to return the lost continuity to the affected wall.</p>		
Location of the lesion					
					

File	5	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Booth of the non-structural wall of the outside	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 16	Pavement		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
50	dw03		LOW	MID	HIGH
Photographs			Description injury		
			It can be seen that the bricks of the interior walls show dirt and soot in the main entrance.		
			Analysis and possible causes		
			The possible cause of soot dirt is the misuse of the sentry box since it has been used in its interior as a barbecue, which has produced thermal movements to which the materials are subjected, taking into account that these are not refractory with what movements of dilation and contraction are much greater.		
			Possible interventions and actions		
			We will carry out a cleaning with high pressure water to clean the soot bricks.		
Location of the lesion					
					

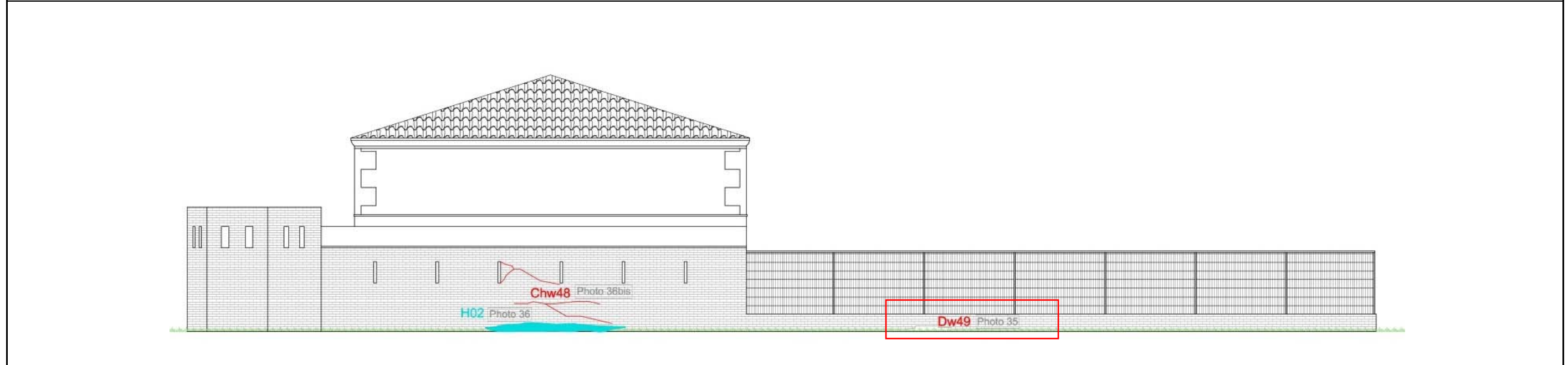
File	6	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Booth of the non-structural wall of the outside		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 18		Perimeter booth	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
45		C01	LOW	MID	HIGH
Photographs			Description injury		
			It can be seen that in the rear guard post of the exterior wall that surrounds the building, the roof has disappeared and inside it is dirty and with debris from the roof.		
			Analysis and possible causes		
			The cover is nonexistent due to collapse and the dirt in the sentry box is due to lack of maintenance and abandonment.		
			Possible interventions and actions		
			The cover of the sentry box will not be rebuilt, but the debris will be cleaned and a pressure washer will be flushed with a pressure washer to disinfect the dirt deposited on the horizontal wall.		
Location of the lesion					
					


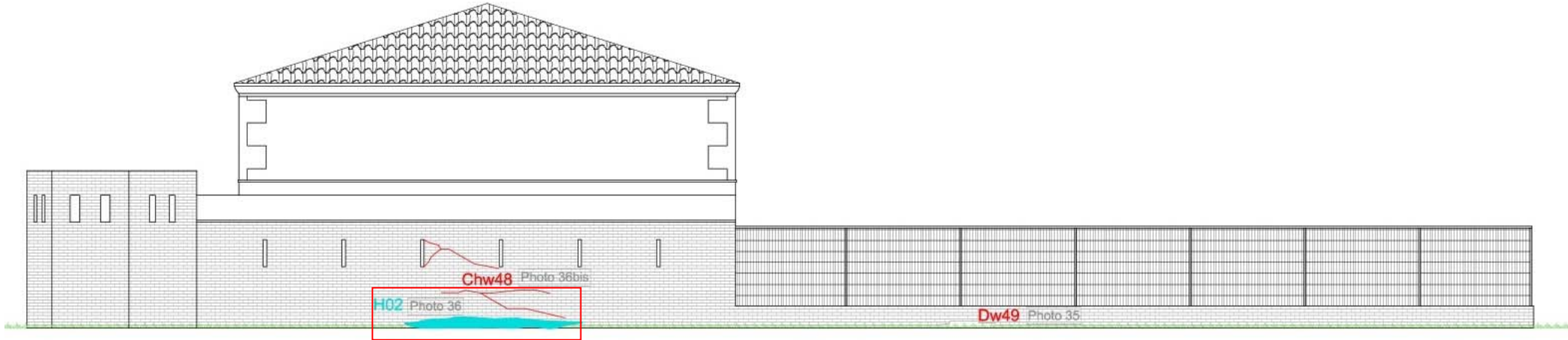
File	7	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Booth of the non-structural wall of the outside		Noroeste	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 18		Perimeter booth	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
45 bis		dw 02	LOW	MID	HIGH
Photographs		Description injury			
		Several painted blue and white are observed, in the intrados of the rear wall and the rear sentry box.			
		Analysis and possible causes			
		The cause is lack of maintenance creating deposits of dirt on the walls and possible erosion by the paint that is part of the surface of the brick wall.			
		Possible interventions and actions			
		Cleaning with special industrial products such as anti-graffiti or removers.			
Location of the lesion					
					



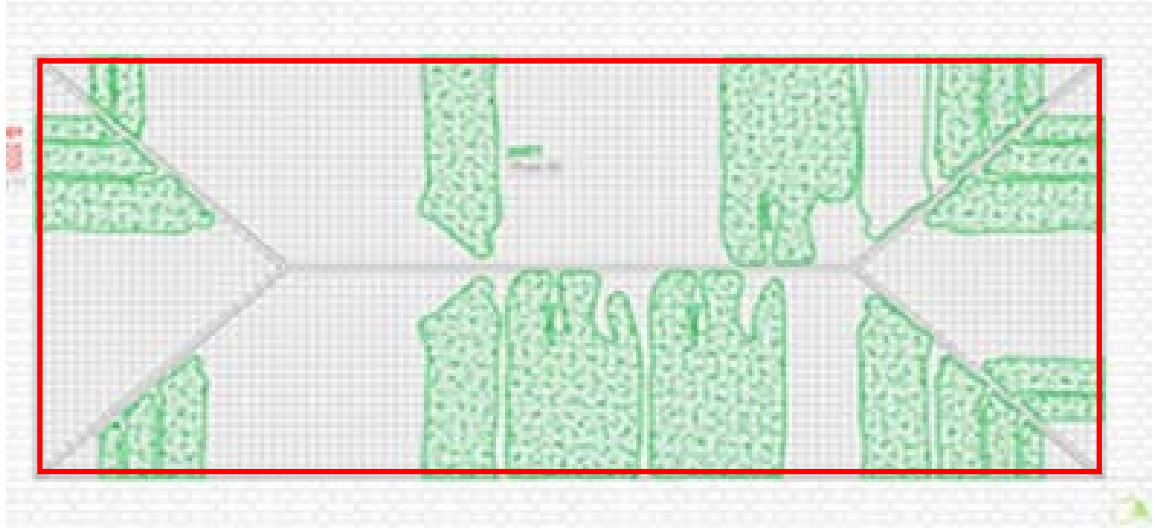
File	8	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Pillars of the non-structural wall of the exterior	Sur		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 17	Pillars		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
37 y 37 Bis	Cvw 43		LOW	MID	HIGH
Photographs			Description injury		
			A vertical crack can be seen in each pillar of the entrance to the enclosure breaking the bricks.		
			Analysis and possible causes		
			The possible cause is the knocks and vibrations that the metallic door of the entrance to the enclosure produces.		
			Possible interventions and actions		
			We will make an intervention of injection, consists of the filling of the crack with mortar, first clean the interior and the labrios of the crack, with air under pressure. The mortar we inject must be very fluid, and it can have an expansive component and addition of epoxy resins to improve its adhesion. The injection can be done with special syringes under pressure.		
Location of the lesion					
					


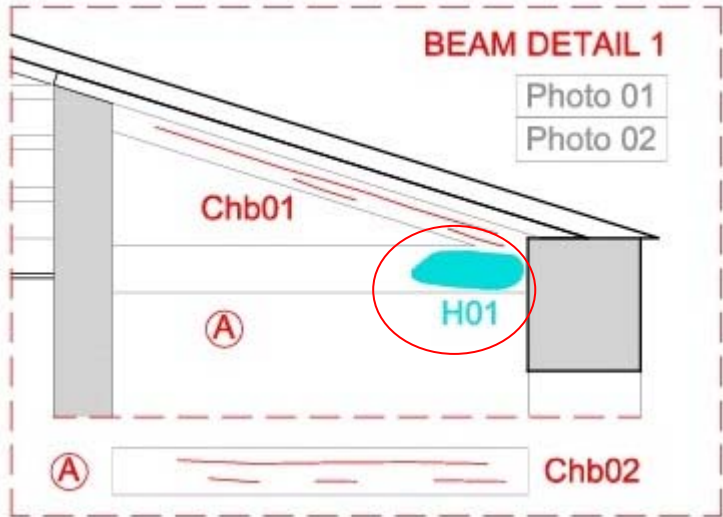
File	9	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Non-structural wall of the exterior		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 18		Perimeter wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
35		Dw49	LOW	MID	HIGH
Photographs			Description injury		
			It is observed that in the left lateral exterior wall, there is loss of section in its lower part.		
			Analysis and possible causes		
			<p>The possible cause in the lack of cohesion between the materials called decemación is the loss of mass in the areas where the wall starts and above all due to the presence of water.</p> <p>It could also be by segregation of the components as the type of pulverization in factory structures that is produced by the loss of the material.</p>		
			Possible interventions and actions		
			A physical Substitution of the damaged area is made in which it consists of subtracting the material from the element, replacing it with the new bricks.		


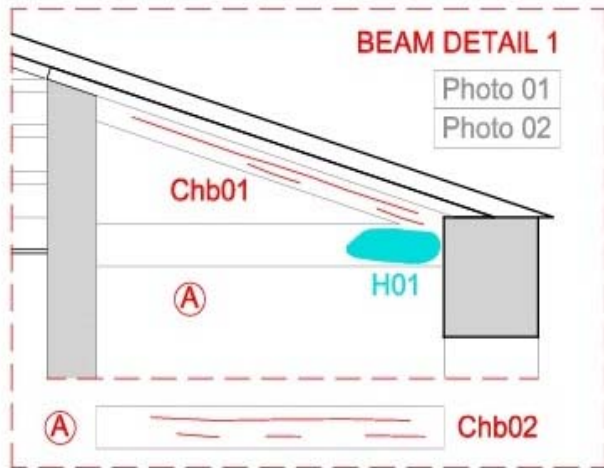
Location of the lesion


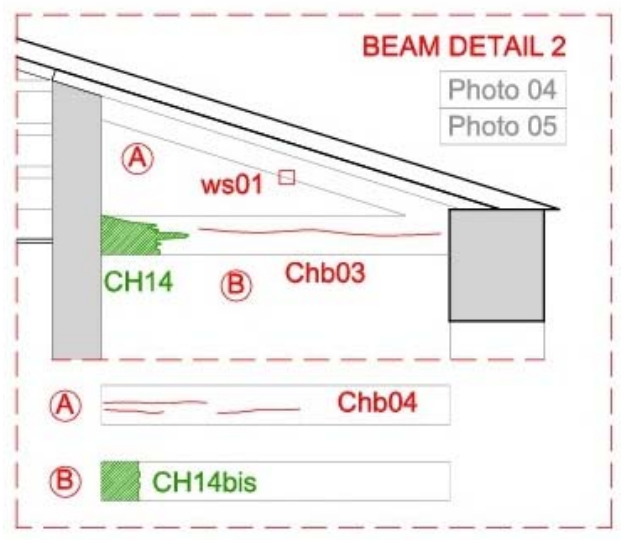



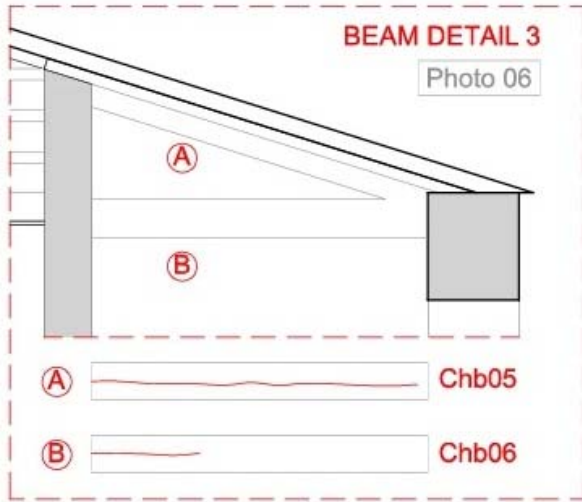
File	10	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Non-structural wall		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 18		Perimeter wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
36		H02	LOW	MID	HIGH
Photographs			Description injury		
			Humidities are observed in the lower part of the perimeter wall that surrounds the building on the south side in the intrados.		
			Analysis and possible causes		
			The possible cause is produced by humidity, present in the ground that rises by capillarity. It manifests with greater intensity in the winter periods and moderates during the rest of the year. The appreciable humidity stain manifests secondary lesions such as efflorescence of the brick. It does not reach much height, that depends on the porosity of the brick, evaporation and the humidity itself.		
			Possible interventions and actions		
			Placement of a drain that prevents the stagnation of water. The injured area will replace the wall enclosure with a safety laminar glass.		
Location of the lesion					
					


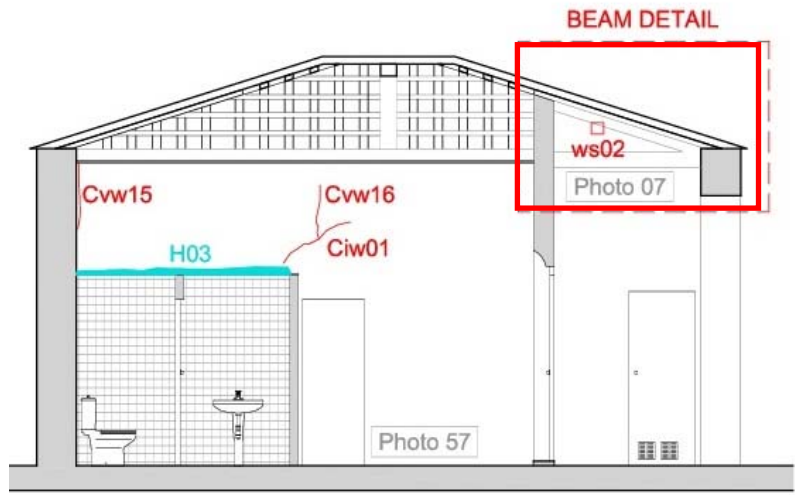
File	11	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	Top of the building		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 19	Tiles		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
43	po01		LOW	MID	HIGH
Photographs			Description injury		
			You can see spots and plant organisms (mosses) located in the darkest / greenish areas throughout the cover.		
			Analysis and possible causes		
			The possible cause is usually due to a lack of maintenance and because in shaded areas where the humidity is maintained for a longer time, it is an ideal situation for the appearance of mosses. These organisms can exert a destructive effect on the tile roof of the study building, reaching a depth of 1 cm.		
			Possible interventions and actions		
			In general, to eliminate the activity of organisms and vegetation on decks, a cleaning should be carried out, which due to the organic character of the lesion, needs the application of chemical products (solvents or fungicides in the case of molds). These can alter the surface of the materials where they are applied, so it is recommended to take precautionary measures.		
			As a preventive measure, to prevent the growth of plant organisms, an inspection and periodic maintenance must be carried out, performing a cleaning that prevents the accumulation of soil in gutters and water.		
Location of the lesion					
					


File	12	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	east		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Wood paneling		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
1	H01		LOW	MID	HIGH
Photographs			Description injury		
			Humidities are observed by filtration in the wooden structure of the roof.		
			Analysis and possible causes		
			The possible cause of this injury is the water that gets to seep through the cover by the materials that make up the cover, and by penetration the water passes through holes, perforations, cracks or cracks caused by deterioration of the wood.		
			Possible interventions and actions		
			Seal where water is filtered and apply the new waterproofing system on the surface of clean, sanitized and dry wood.		
Location of the lesion					
 <p>The diagram, titled "BEAM DETAIL 1", shows a cross-section of a roof structure. It includes labels for "Chb01" (top beam), "Chb02" (bottom beam), and "A" (section line). A red circle highlights a blue oval labeled "H01", indicating the location of the lesion on the underside of the top beam. A legend in the top right corner identifies "Photo 01" and "Photo 02".</p>					

File	13	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	south		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Wooden trusses		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
4 y 2	Chb 01 y Chb0 2		LOW	MID	HIGH
Photographs			Description injury		
			It is observed that most of the trusses present cracks in longitudinal direction, of variable dimensions according to the truss, of different length and thickness in each one and different situation in the section.		
			Analysis and possible causes		
			The possible cause is the constant movements of dilatation, contraction and drying of the wood and another cause could be the fences present in the wood, of the trusses or slats, before placing and loading. Another cause exposure to atmospheric agents that can cause longitudinal cracking.		
			Possible interventions and actions		
			In this case it has been checked the mechanical characteristics of the wood and does not affect its properties. If they will affect the resistance, it would be necessary to intervene reinforcing with metal profiles.		
Location of the lesion					
					

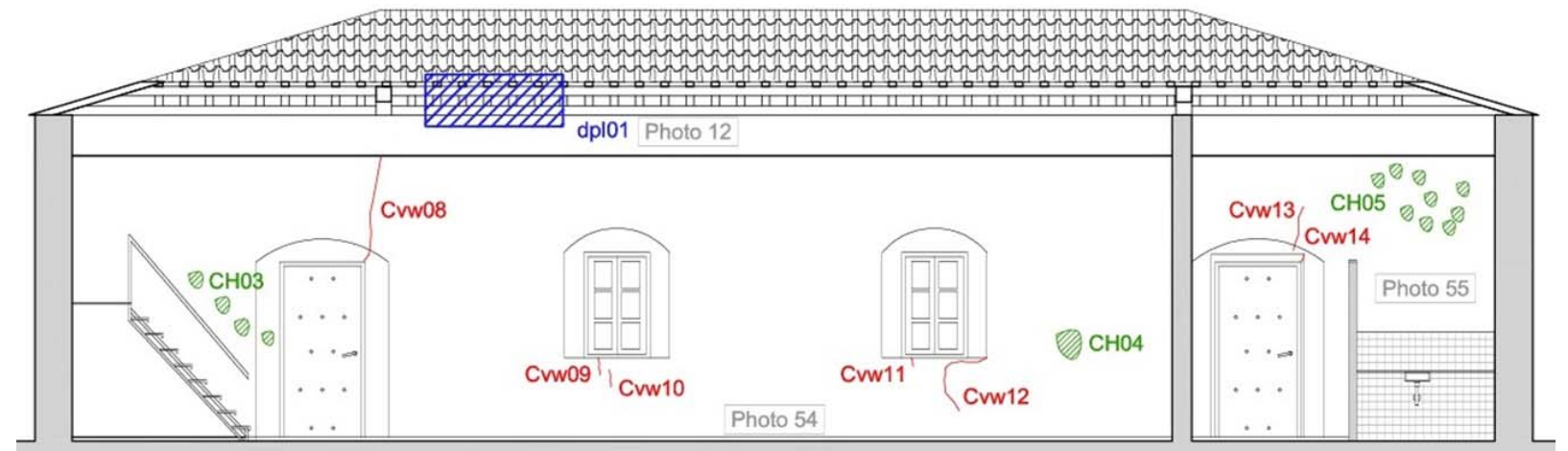
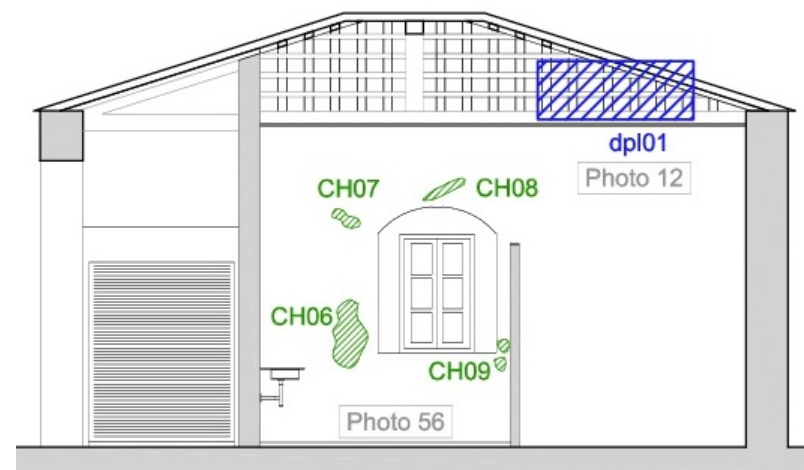
File	14	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	South		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Wood paneling		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
3 y 5	ws01 y ws02 Bis		LOW	MID	HIGH
Photographs			Description injury		
			Curvilinear cracks are observed between the concentric layers of the growth rings that are produced in the wooden slats of the framework (called "inlaws").		
			Analysis and possible causes		
			The possible cause is as a consequence of a defect or alteration of the growth can decrease the resistance and in case of contact it can give off splinters, which in an element seen as our injuries represents a danger.		
			Possible interventions and actions		
			<ol style="list-style-type: none"> 1. The first thing is that the surface to be repaired is clean, dry and healthy. 2. The crack will be sanded: This is done so that the surface acquires more adhesion. 3. The cracked lid putty will be placed. 4. Let it dry waiting for enough time for the putty to harden. 5. And it will be re-sanding. 		
Location of the lesion					
					


File	15	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	south		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Wooden trusses		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
6	Chb 06		LOW	MID	HIGH
Photographs			Description injury		
			A longitudinal crack is seen, which opens in the direction of the fiber, the strut of the truss already has a reinforcement along its entire length.		
			Analysis and possible causes		
			The possible cause is the fenda that by contraction of a layer of wood in relation to another one can not accompany it in its movement and it opens, which produces an alteration in its integrity and can modify its resistance, for that reason it carries a reinforcement throughout of your section. Another cause exposure to atmospheric agents that can cause longitudinal cracking.		
			Possible interventions and actions		
			A metallic reinforcement has already been placed that increases the resistant section of the element, improving the resistant capacities. We have verified that this section has not lost its resistant capacities.		
Location of the lesion					
					

File	16	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Ribbon		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
7	ws02		LOW	MID	HIGH
Photographs			Description injury		
			You can see how a knot has leaped due to a tensional change, it is a discontinuity in one of the battens of the cover frame.		
			Analysis and possible causes		
			The possible cause is that the knot has fallen to dry leaving a gap, are tissues that form the branches which suffer deviations causing condensation of lignified tissue.		
			Possible interventions and actions		
			It consists of using epoxy-type resins mixed with an inert filler, for example silica sand, to recompose the damaged section. The mechanical characteristics of this mixture are very close to those of wood.		
Location of the lesion					
					

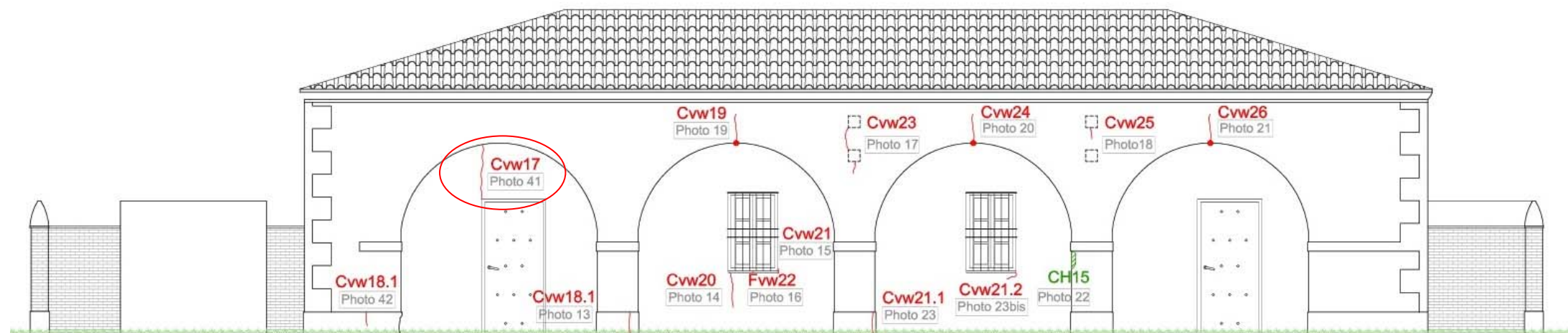
File	17	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Deck	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Wood lattice		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
12	Dpl 01		LOW	MID	HIGH
Photographs			Description injury		
			Dirt is observed on the slats and slats of the wood frame.		
			Analysis and possible causes		
			The possible cause is dirt because of the soot, which has left it completely black, from an old fireplace that no longer exists.		
			Possible interventions and actions		
			Scratching and sanding the element without applying water because when moistening the soot the water drags the pigment inside the wood and the beam will absorb the water with pigment.		

Location of the lesion




File	18	Property	Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		
Location		Situation of the injury	Type of injury		
Main facade	south		Physics	Chemistry	Mechanical
Plan situation	Element		Structural element:		
Plano Nº 14	Masonry wall		YES	NO	OTHERS
Pathology photography	Pathology reference		Danger of stability		
41	Cvw17		LOW	MID	HIGH
Photographs			Intervention urgency		
			Description injury		
			A vertical crack is observed in the left corner top of the door, one of the weakest point of discharge.		
			Analysis and possible causes		
			The possible causes can be due to the appearance of tensions due to material changes and another cause due to thermal origin. That is, by hygrothermal expansions and contractions.		
			Possible interventions and actions		
			We will use injections, a repair system for cracks less than 0.05 mm thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.		

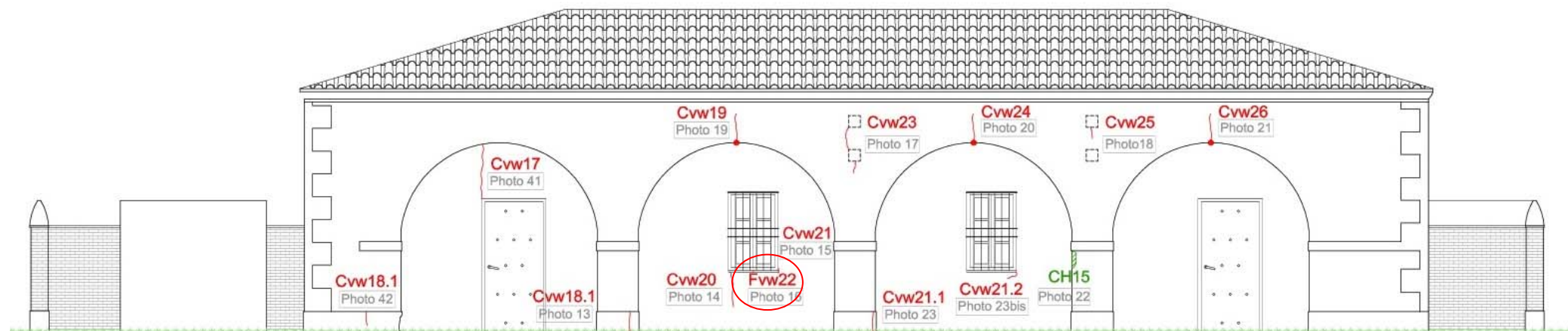
Location of the lesion




File	19	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry
Location		Situation of the injury	Structural element:		
Main facade		south	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 14		ledge	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
15		Cvw21	LOW	MID	HIGH

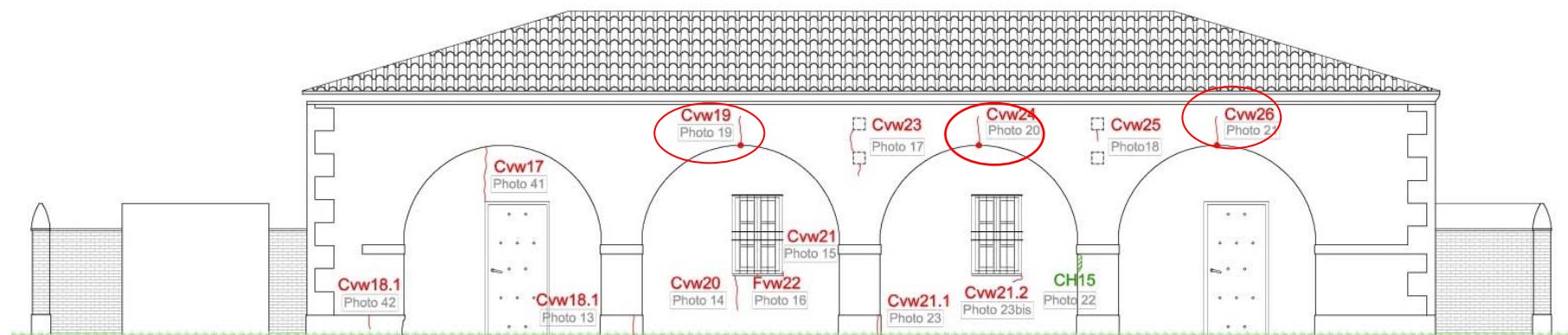
Photographs		Description injury		
		It is observed that there is a crack in the sill open in the middle formed by blocks of ashlar masonry.		
		Analysis and possible causes		
		The cause may be a crack of thermal origin. That is, by dilations and hygrothermal contractions, since it is on the outside and because of its orientation, the sun's rays affect the sillar of the sill.		
		Possible interventions and actions		
		Clean the open space of the crack to fill the crack of sillar labrad with epoxy.		


Location of the lesion



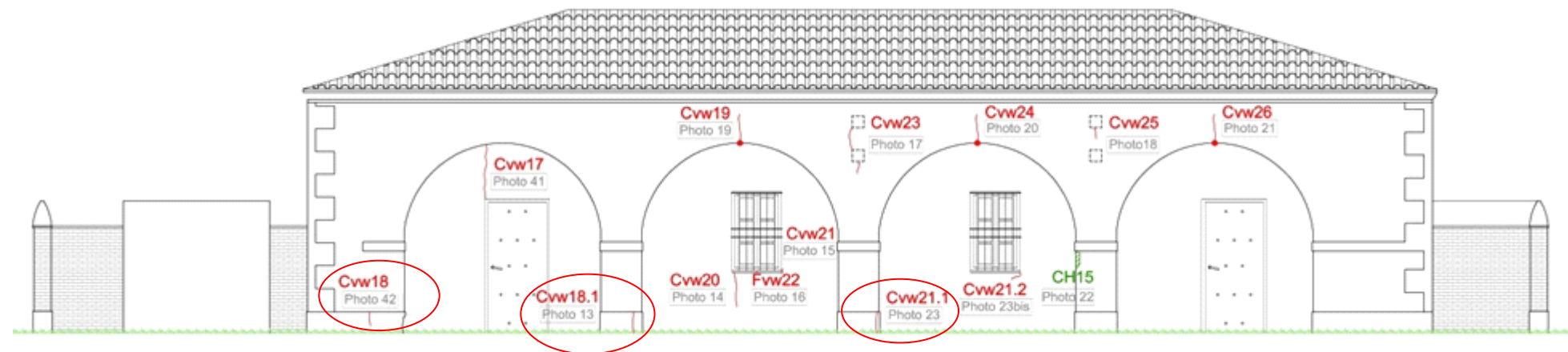
File	20	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry
Location		Situation of the injury	Structural element:		
Main facade		south east	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 14		Half point arch	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
19, 20 y 21		Cvw 24, Cvw19 y Cvw26	LOW	MID	HIGH
Photographs		Description injury			
		We can observe several vertical cracks that start right in the middle of several arcs of half a point and continue along the intrados of the arch.			
		Analysis and possible causes			
		The main cause can be for a specific load, in the weakest part, generated when the constructive element, in this case the masonry wall, receives a direct load that causes a too intense mechanical effort as a result the fissures appear. Other causes could be thermal origin, that is, hygrothermal expansions and contractions or the resolution of the wrong way of certain constructive joints of constructive elements with divergent loads (the trusses are not supported in the center, which is not suitable for the discharge arc.			
		Possible interventions and actions			
		We will use injections, a repair system for cracks less than 0.05 millimeters thick, applicable to concerted masonry walls consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.			


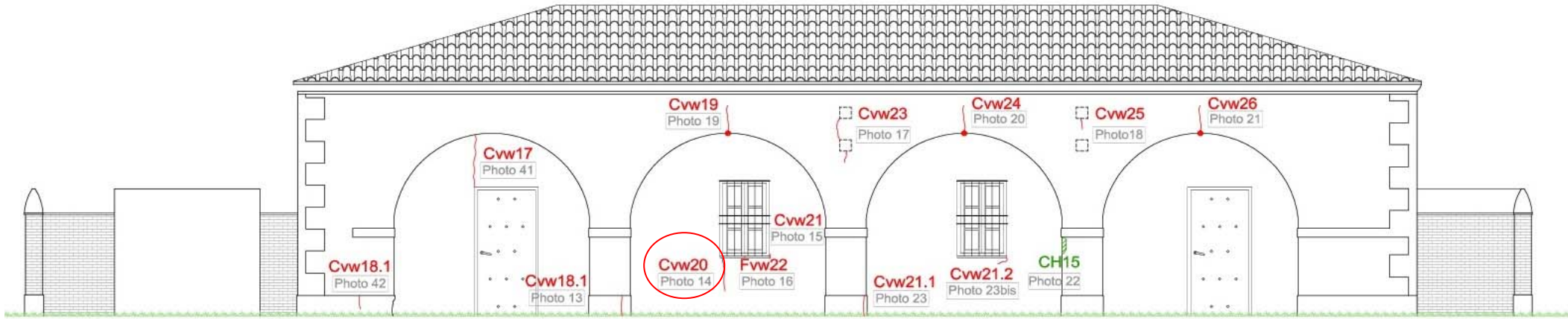
Location of the lesion


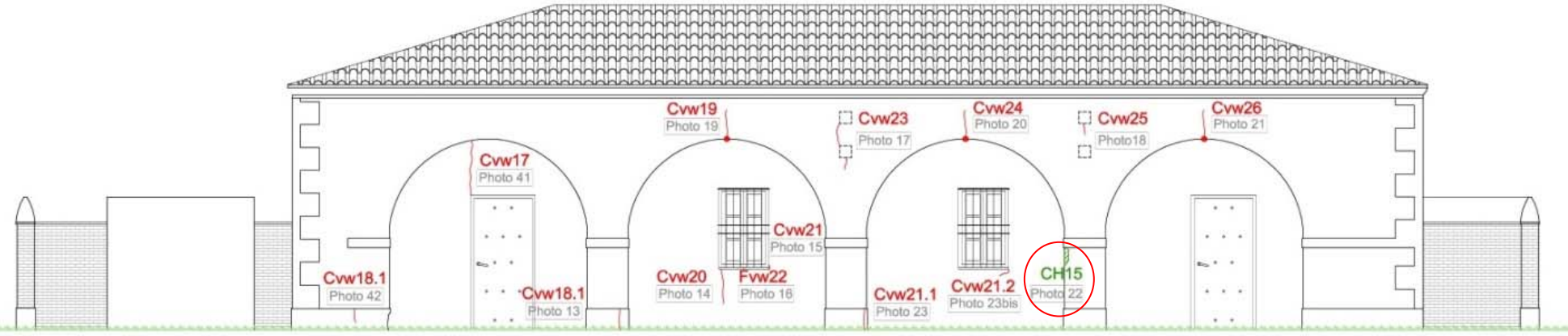



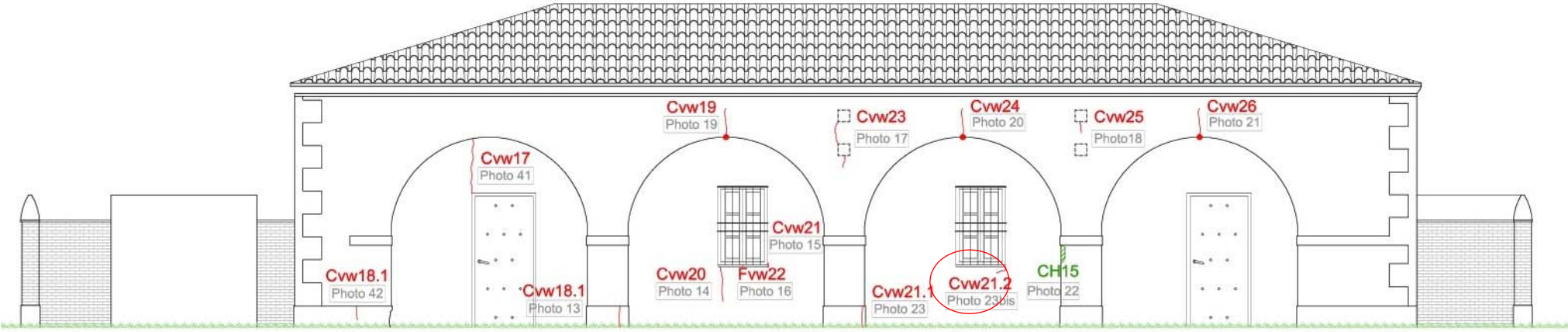
File	21	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Main facade	South		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 14	plinth		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
23 ,42 y 13	Cvw 21.1, Cvw 18, Cvw 18.1		LOW	MID	HIGH
Photographs			Description injury		
		Various vertical cracks can be seen in the pillar, in the lower part the base formed by blocks of ashlar carved by three of its faces			
		Analysis and possible causes			
		The cause may be due to a punctual load and cracks of thermal origin. That is, by hygrothermal expansions and contractions.			
		Possible interventions and actions			
		Clean the open space of the crack to fill the crack of sillar labrad with epoxy.			


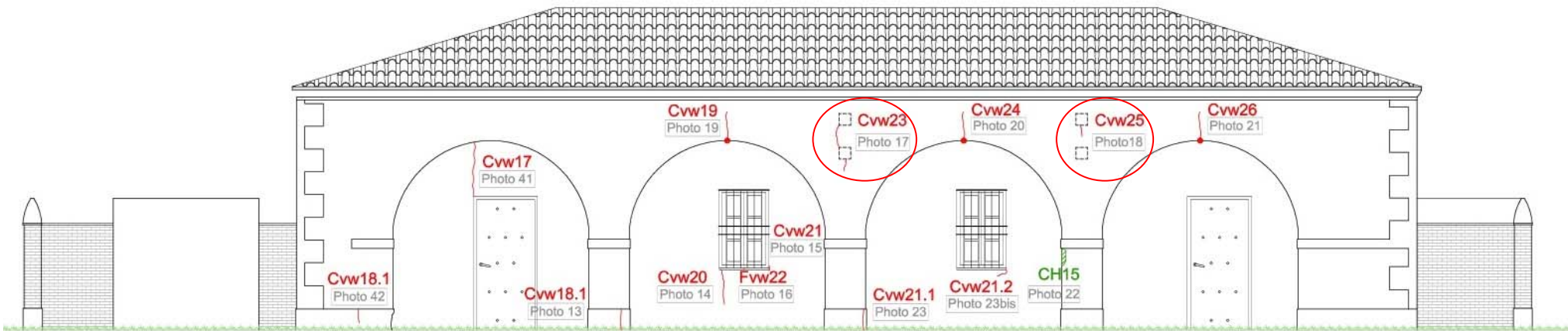
Location of the lesion


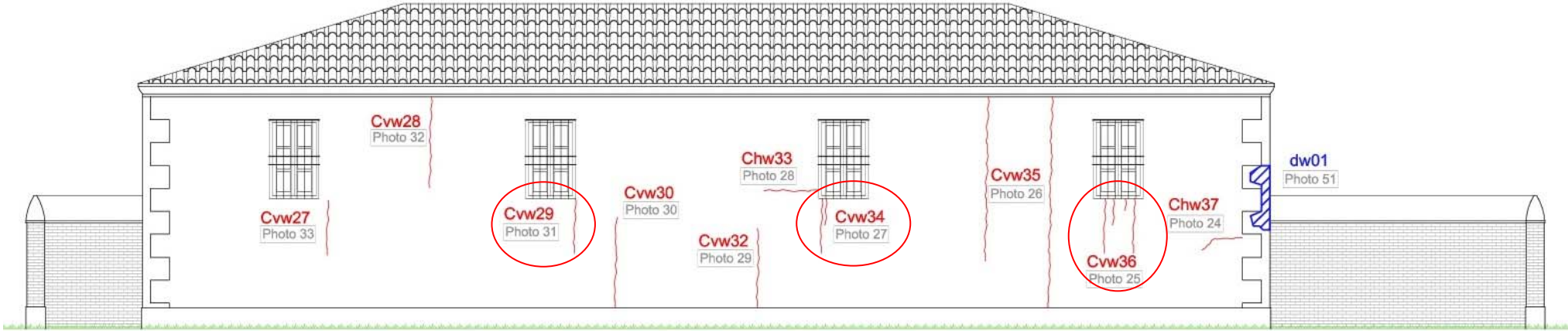



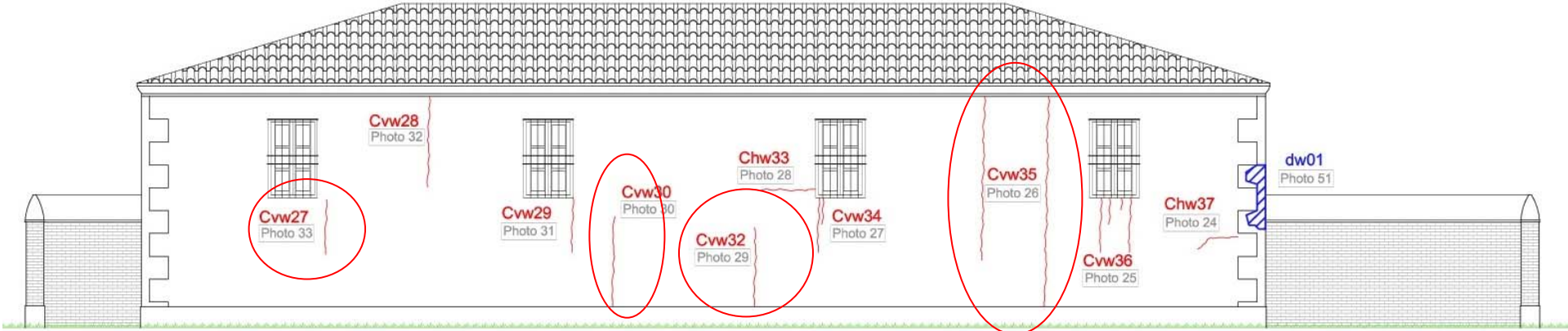
File	22	Property	Type of injury				
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry	Mechanical	
Location		Situation of the injury		Structural element:			
Main facade		south		YES	NO	OTHERS	
Plan situation		Element		Danger of stability			
Plano Nº 14		Masonry wall		LOW	MID	HIGH	
Pathology photography		Pathology reference		Intervention urgency			
14		Cvw 20		LOW	MID	HIGH	
Photographs			Description injury				
			Various fissures are observed in singular points in the windows.				
			Analysis and possible causes			The possible causes are due to the appearance of tensions due to material changes and thermal origin, that is, hygrothermal contractions and expansions.	
			Possible interventions and actions			We will use injections, it is a repair system for cracks smaller than 0.05 millimeters in thickness, applicable to concerted masonry walls consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.	
Location of the lesion							
							


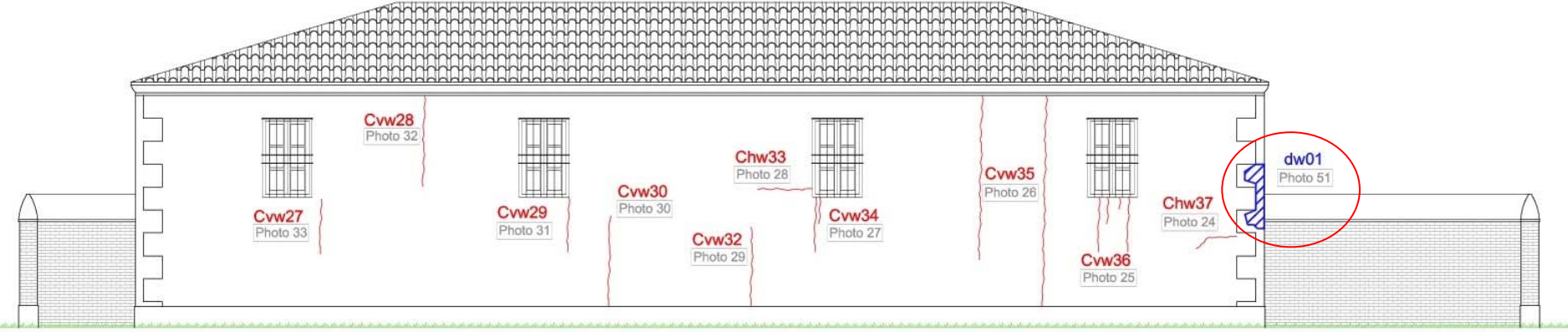
File	23	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Main facade		south	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 14		Bottom of the semicircular arch	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
22		CH 15	LOW	MID	HIGH
Photographs		Description injury			
		It is appreciated how the coating has fallen and the support material is seen in this case the masonry wall taken with mortar.			
		Analysis and possible causes			
		The possible causes can be for the friction continued in the time, the bad quality of the material or when being exposed the facade in the outside the atmospheric agents can cause a deterioration of the coating.			
		Possible interventions and actions			
		We can not act on the friction produced by the passage of people, tools or animals, but we can try to choose a suitable material for a specific transit and also these are usually exposed to wear by abrasion, friction and bumps. They are materials that need more maintenance and must be replaced with a certain frequency. Before applying the material to be coated, it will be repeated until the support is clean and a base mortar will be applied.			
Location of the lesion					
					

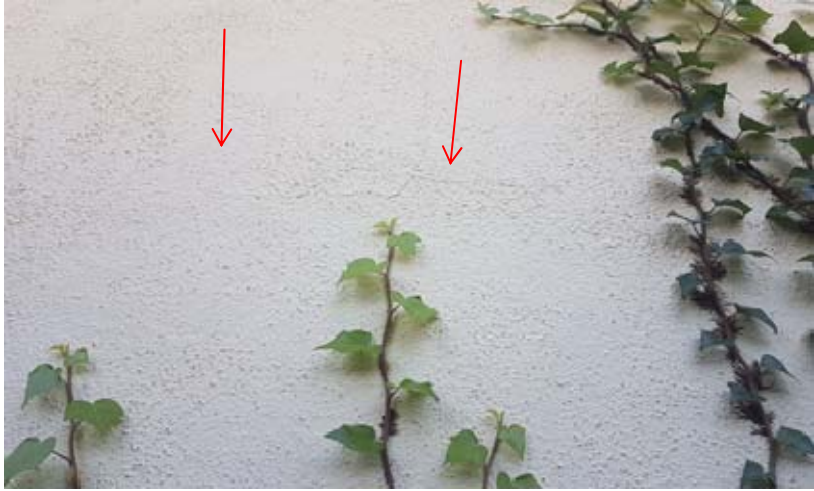
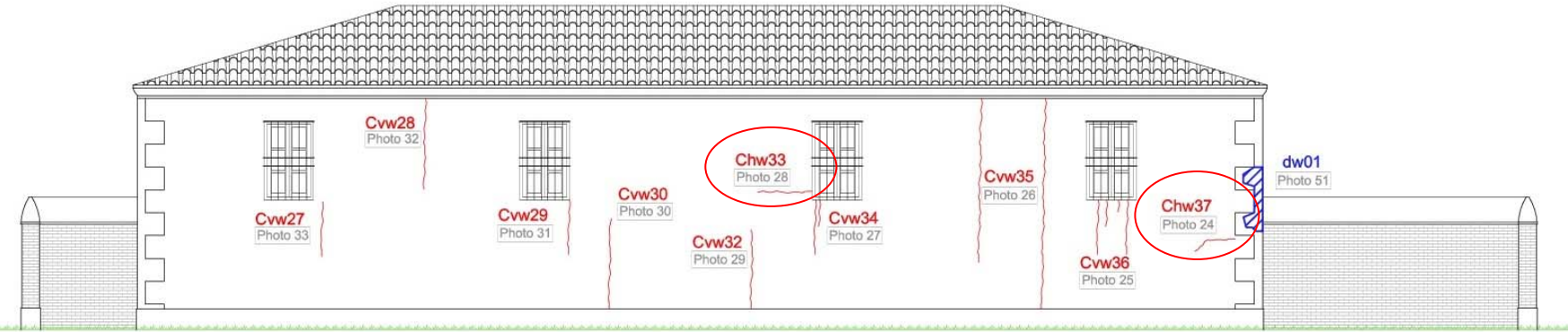
File	24	Property	Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		
Location		Situation of the injury		Type of injury	
Main facade	south	YES		Chemistry	Mechanical
Plan situation	Element	DANGER OF STABILITY		OTHERS	
Plano Nº 14	Masonry wall	LOW	MID	HIGH	
Pathology photography	Pathology reference	Intervention urgency			
23 bis	Cvw1.2	LOW	MID	HIGH	
Photographs			Description injury		
			A crack is observed that comes out at the weakest point of discharge that is the bottom window, at the corner one of the weakest points.		
			Analysis and possible causes		
			The possible causes are due to the appearance of tensions due to material changes and thermal origin, that is, hygrothermal contractions and expansions.		
			Possible interventions and actions		
			We will make a seam of the crack: it consists of drilling holes on both sides of the crack and inserting U-shaped metal elements. Then they must be secured with mortar. It is necessary to reinforce the adjacent sections, since when sewing a crack, the structure tends to become more rigid, and this can increase the global restriction of the structure causing the appearance of cracks in other parts of the concrete. Holes are drilled on both sides of the crack. The holes are cleaned and the legs of the staples are anchored in them, using a mortar or an adhesive system based on epoxy resin. Staples must vary in length and orientation		
Location of the lesion					
					


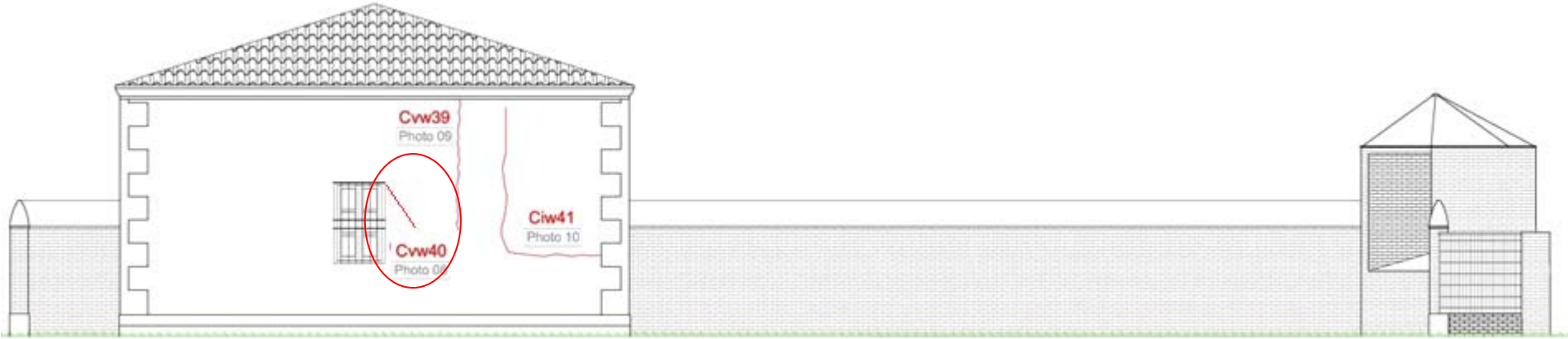
File	25	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Main facade	south		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 14	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
23 y 25	Cvw 23 , Cvw 25		LOW	MID	HIGH
Photographs			Description injury		
			<p>It is observed several fissures and cracks in descending sense that leave the union of the truss, with the tie and the pair, and that affect the vertical paramento producing a loss of verticality.</p>		
			<p>Analysis and possible causes</p> <p>The possible cause is produced when the wooden beam is supported by a masonry load wall. We are matching two structural materials of very different characteristics. Thus, wood is much more resistant than masonry. Then, the load of the beam is transmitted over a very small area. The wall is almost always wider than the wing of the beam. Due to the above, it is easy for the wall not to resist the tension that will produce the beam, appearing cracks and / or cracks. Another cause may be due to the exhaustion of the material that supports the beam.</p>		
			<p>Possible interventions and actions</p> <p>Intervention on the causes in this case is to prop up the heads, we will repeat their support in such a way that we will make a concrete die with some measures that we calculate so that it can support the loads of the beam. Once the cause is solved we can solve the injury by repeating the fissured area and we will re-coat it.</p>		
			<p>Location of the lesion</p>		
					


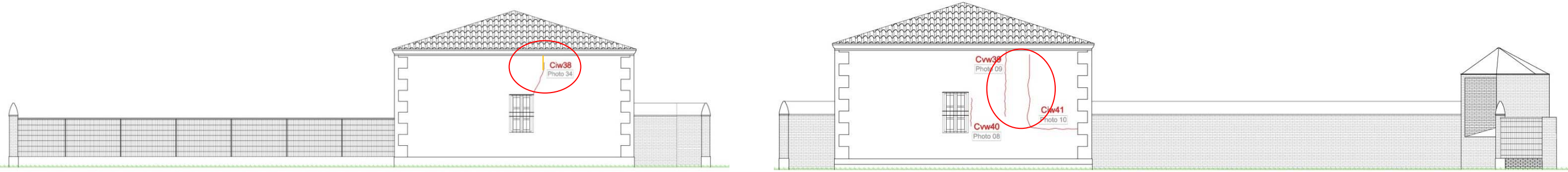
File	26	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry
Location		Situation of the injury	Structural element:		
Back Facade		north	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 15		Masonry wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
27 y 31		Cw34 y Chw 29	LOW	MID	HIGH
Photographs			Description injury		
			Several descending cracks are observed in the rear façade below the windows.		
			Analysis and possible causes		
			<p>The possible causes are due to the appearance of tensions due to changes in the material, also due to the jambs when there is some movement in the structure and it tends to fall causing a fissure in the lower part of the window.</p> <p>Another possible cause could be of thermal origin, that is, by hygrothermal expansions and contractions.</p>		
			Possible interventions and actions		
			<p>Before we would have to solve the cause and then we could act on the injury with this intervention: Injections, a repair system for cracks smaller than 0.05 millimeters in thickness, applicable to concerted masonry walls consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.</p>		
Location of the lesion					
					

File	27	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Back Facade	north		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 15	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
24, 26, 28, 30, 31, 32,y 34	Cvw 30, Cvw 27,Cvw 28, Cvw 33, Cvw 32 y Cvw 35		LOW	MID	HIGH
Photographs			Description injury		
			Multiple vertical cracks are seen on the inside of the entire façade.		
			Analysis and possible causes		
			<p>The deformability that presents the mortar against the masonry pieces, produces an elongation of the same in the direction perpendicular to that of the application of the load. Under excessive vertical loads, the mortar is crushed, subjected to local tractions to the pieces in horizontal direction, and produce their vertical cracking.</p>		
			Possible interventions and actions		
			<p>Before we would have to solve the cause and then we could act on the injury with this intervention: With injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.</p>		
Location of the lesion					
					


File	28	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Back Facade	north		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 15	Carved stone blocks		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
51	dw01		LOW	MID	HIGH
Photographs			Description injury		
			We observe how there is paint on the back façade in the corner in the carved ashlar, in ashlars two and three starting at the bottom.		
			Analysis and possible causes		
			The cause is by a physical action that can produce an erosion in the carved ashlar.		
			Possible interventions and actions		
			Projection of a jet of water under pressure, which may or may not contain an abrasive product, depending on the finish intended to be given to the stone.		
Location of the lesion					
					

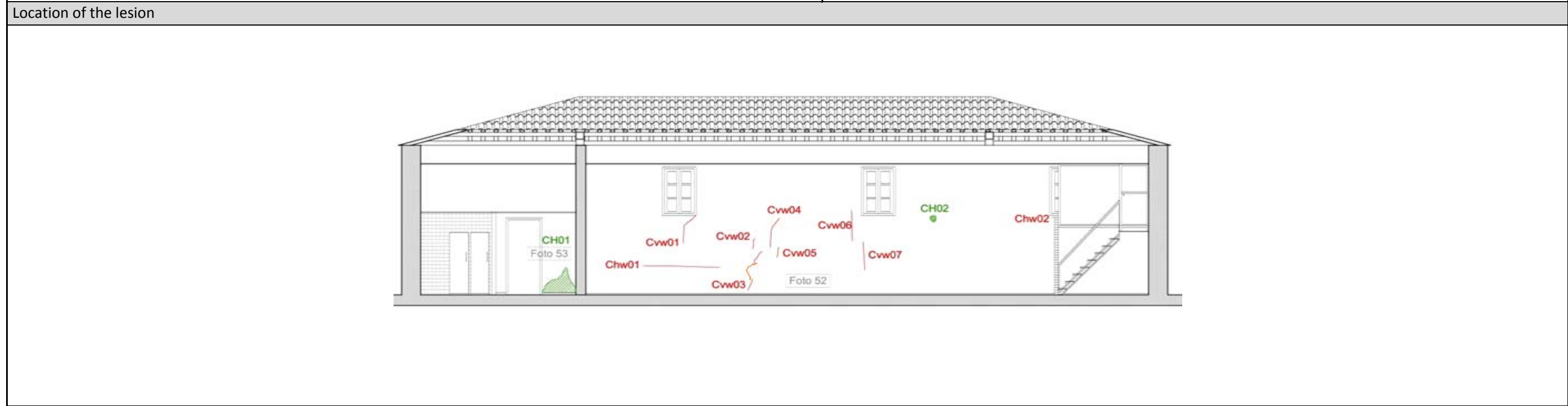
File	29	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry
Location		Situation of the injury		Structural element:	
Back Facade		north		YES	NO OTHERS
Plan situation		Element		Danger of stability	
Plano Nº 15		Masonry wall		LOW	MID HIGH
Pathology photography		Pathology reference		Intervention urgency	
28 y 24		Chw 33 y Chw 37		LOW	MID HIGH
Photographs			Description injury		
			Two longitudinal cracks are observed in the lateral face of the façade.		
			Analysis and possible causes		
			The possible causes are due to the appearance of tensions due to material changes and thermal origin, that is, hygrothermal contractions and expansions. We have also found that in the 1849 plans on this façade there was an embrasure all over it and many of these fissures coincide with these old openings.		
			Possible interventions and actions		
Location of the lesion			Before we would have to solve the cause and then we could act on the injury with this intervention: With injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.		
					


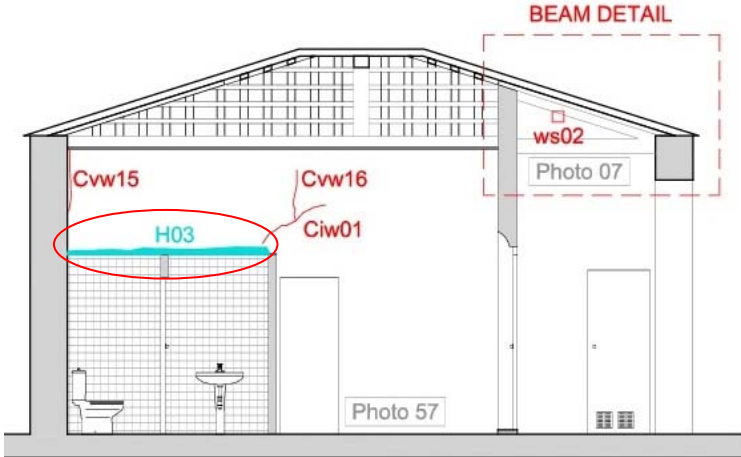
File	30	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Side Facade	West		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 16	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
8	Cvw 40		LOW	MID	HIGH
Photographs			Description injury		
			A diagonal fissure is observed in the wall at the top of the window in a descending manner.		
			Analysis and possible causes		
			The possible causes are due to the appearance of tensions due to material changes and thermal origin, that is, hygrothermal contractions and expansions.		
			Possible interventions and actions		
			Before we would have to solve the cause and then we could act on the injury with this intervention: With injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.		
Location of the lesion					
					


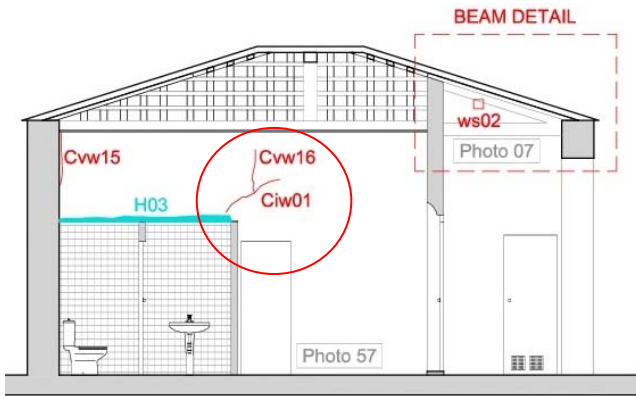
File	31	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Side facade	west and east		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 16	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
9	Cvw 39, Cvw 38		LOW	MID	HIGH
Photographs			Description injury		
			Several vertical fissures are observed in the lateral walls in the near area between the facade and the roof.		
			Analysis and possible causes		
			<p>A possible cause could be the deformability that the mortar presents in front of the pieces of masonry, it produces an elongation of the same in the direction perpendicular to that of the application of the load. Under excessive vertical loads, the mortar is crushed, subjected to local tractions to the pieces in horizontal direction, and produce their vertical cracking.</p> <p>Another cause would be by movements of the cover, elastic type, which being too attached to the façade introduces tractions and shear stresses that break it.</p>		
			Possible interventions and actions		
			<p>Before we would have to solve the cause and then we could act on the injury with this intervention: With injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.</p>		
Location of the lesion					
					


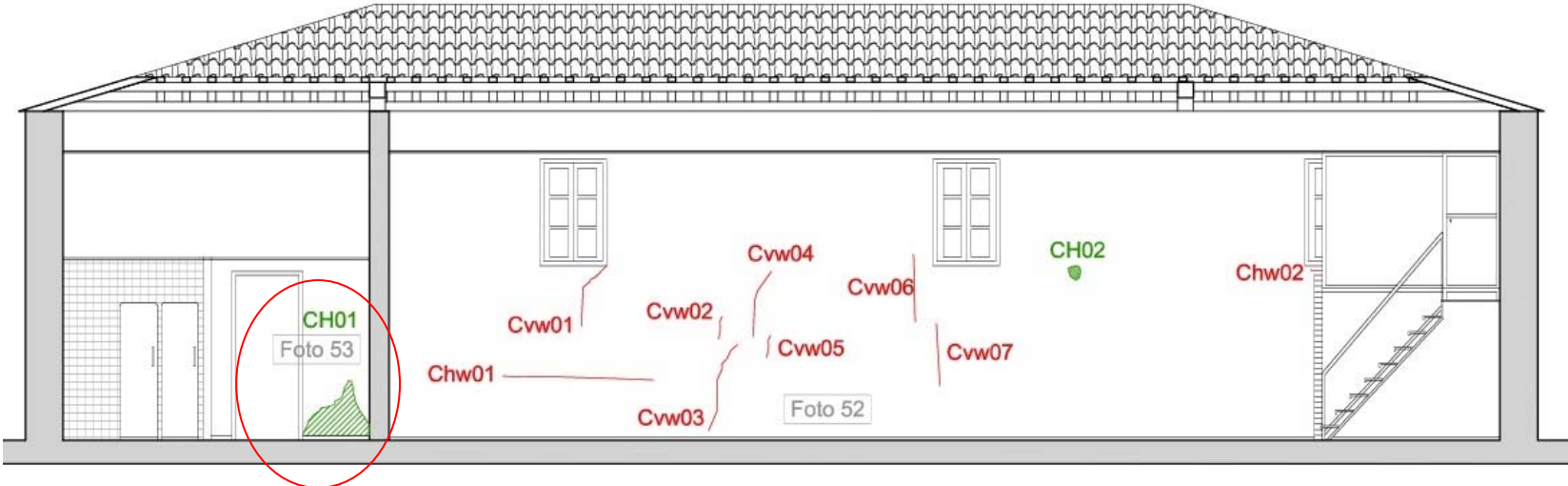
File	32	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		Physics	Chemistry
Location		Situation of the injury		Structural element:	
Inside		south		YES	NO OTHERS
Plan situation		Element		Danger of stability	
Plano Nº 12		Masonry wall		LOW	MID HIGH
Pathology photography		Pathology reference		Intervention urgency	
52		Cvw 01, Cvw 02, Cvw 03, Cvw 04, Cvw 05, Cvw 06y 07		LOW	MID HIGH


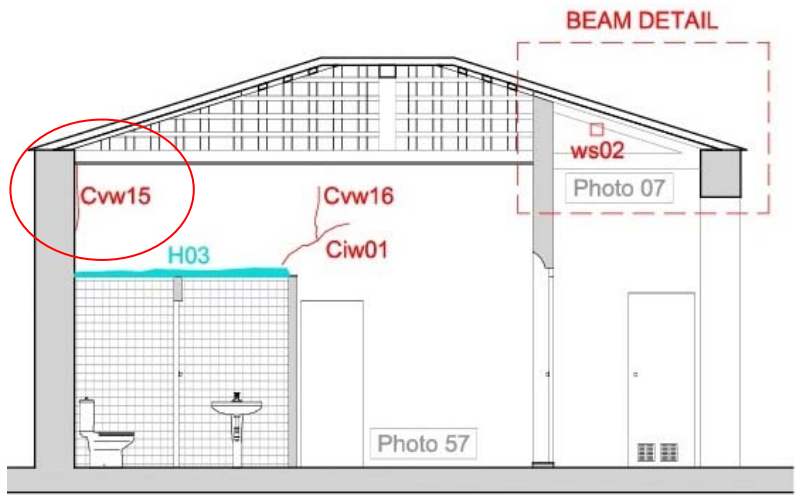
Photographs	Description injury
	Multiple fissures are observed in the upper part of the vertical wall, it can be seen that a moisture treatment has been carried out by capillarity, projecting cement mortar into the wall in order to waterproof one meter from the floor.
	<p>Analysis and possible causes</p> <p>The possible cause is the deformability that presents the mortar against the masonry pieces, it produces an elongation of the same in the direction perpendicular to that of the application of the load. Under excessive vertical loads, the mortar is crushed, subjected to local tractions to the pieces in horizontal direction, and produce their vertical cracking.</p>
	<p>Possible interventions and actions</p> <p>Injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.</p>


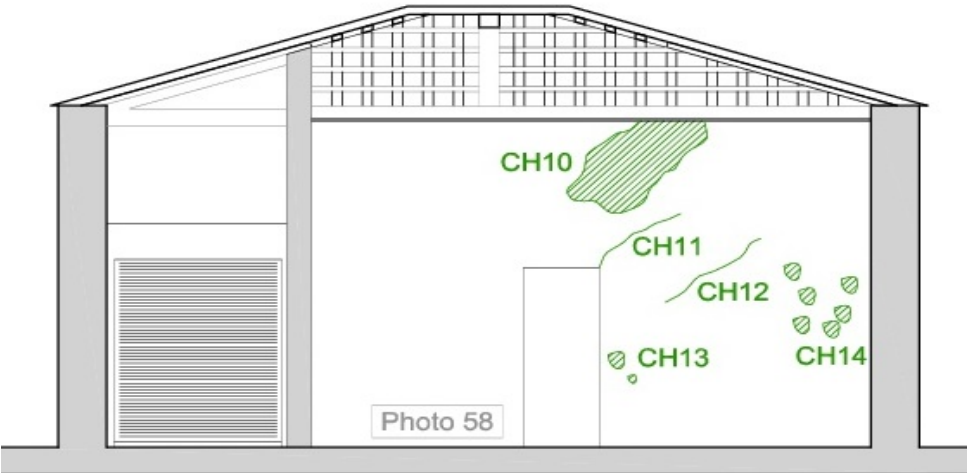



File	33	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Inside	north		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
57	H03		LOW	MID	HIGH
Photographs			Description injury		
			Accidental humidity is observed in a linear and horizontal way in the vertical wall, of the structural wall in washbasins.		
			Analysis and possible causes		
			The possible cause is the loss of water through pores in the pressure pipe and also affects the volume changes of the wall, causing local failures and loss of the load capacity of the mortar..		
			Possible interventions and actions		
			The first thing will be to change the broken piece. The introduction of slack is fundamental in the encounter with structural elements.		
Location of the lesion					
					

File	34	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Inside face of the structural wall		north	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 13		Masonry wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
57		Ciw01	LOW	MID	HIGH
Photographs			Description injury		
			It is observed in the vertical facing of masonry, an ascending crack that is divided in two parts.		
			Analysis and possible causes		
			The possible cause is caused by the filtration of water from the pipe that softens the wall and cracks. That is to say, that the damages have been caused by the rupture of a pipe, that causes damages by the accumulation of water in the facing.		
			Possible interventions and actions		
			Once the pipeline has been solved, we will intervene: Withdrawing those materials that have lost cohesion or are disintegrated and redoing them again and if not have lost their properties we will make a seam of cracks: it consists of drilling holes on both sides of the crack and insert metal elements in a U. Then they must be secured with mortar. It is necessary to reinforce the adjacent sections, since when sewing a crack, the structure tends to become more rigid, and this can increase the global restriction of the structure causing the appearance of cracks in other parts of the concrete. Holes are drilled on both sides of the crack. The holes are cleaned and the legs of the staples are anchored in them, using a mortar or an adhesive system based on epoxy resin. Staples must vary in length and orientation.		
Location of the lesion					
					

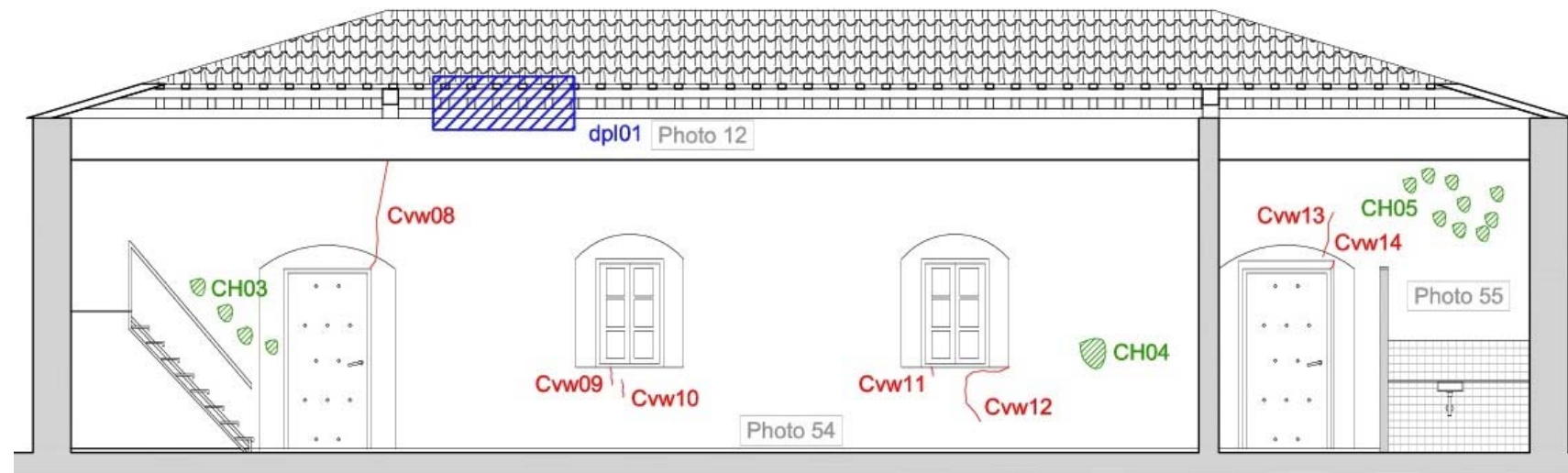
File	35	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Inside wall	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 12	partition		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
53	CH01		LOW	MID	HIGH
Photographs			Description injury		
			It is observed that in the zone, the passage from the open space to the services is seen as the covering has fallen, leaving the masonry facing taken with mortar.		
			Analysis and possible causes		
			The possible causes can be for the friction continued in time and another for the quality of the material.		
			Possible interventions and actions		
			We can not act on the friction produced by the passage of people, tools or animals, but we can try to choose a suitable material for a specific transit and also these are usually exposed to wear by abrasion, friction and bumps. They are materials that need more maintenance and must be replaced with a certain frequency. Before applying the material to be coated, it will be repeated until the support is clean and a base mortar will be applied.		
Location of the lesion					
					


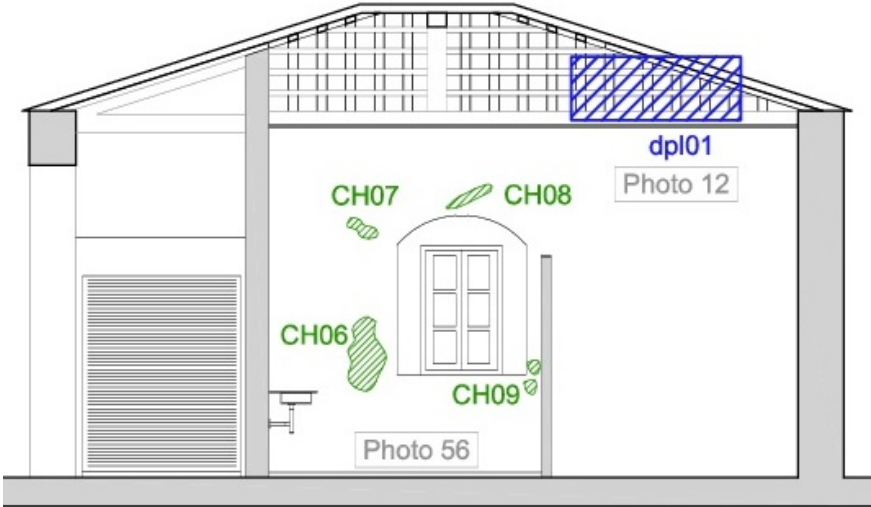
File	36	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Inside		North	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 13		Union masonry wall with brick wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
57		Cvw15	LOW	MID	HIGH
Photographs		Description injury			
		There is a crack in the corner of the junction of two different materials, the masonry wall and the brick dividing wall.			
		Analysis and possible causes			
		The cause is the inability to adapt to deformations the wall are cut by the partition and we also have shear stresses due to the difference of the loading conditions of both walls could be the cause of the crack.			
		Possible interventions and actions			
		We will make a crack seam: it consists of drilling holes on both sides of the crack and inserting U-shaped metal elements. Then they must be secured with mortar. It is necessary to reinforce the adjacent sections, since when sewing a crack, the structure tends to become more rigid, and this can increase the global restriction of the structure causing the appearance of cracks in other parts of the concrete. Holes are drilled on both sides of the crack. The holes are cleaned and the legs of the staples are anchored in them, using a mortar or an adhesive system based on epoxy resin. Staples must vary in length and orientation.			
Location of the lesion					
					

File	37	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Inside	north		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 13	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
58	CH10,CH11, CH12, CH13 y CH14		LOW	MID	HIGH
Photographs			Description injury		
			It can be seen how the inside face of the wall has fallen, leaving the masonry wall visible.		
			Analysis and possible causes		
			The cause is differential dilatations, thrusts in the same direction but in the opposite direction of the coating with the facing that involves the displacement of these causing the separation of the two.		
			Possible interventions and actions		
			We will try to choose a suitable material for a specific traffic and also these are usually exposed to abrasion, friction and shock wear. They are materials that need more maintenance and must be replaced with a certain frequency.		
Location of the lesion					
					


File	38	Property	Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona		
Location		Situation of the injury		Type of injury	
Inside		South		Physics	Chemistry
Plan situation		Element		Mechanical	
Plano Nº 12		Masonry wall		Structural element:	
Pathology photography		Pathology reference		YES	NO
44		Cvw 09,10,11,12		OTHERS	
Photographs		Description injury		Danger of stability	
		They are observed as in the interior face of the wall there are different fissures in the lower part of the window in the masonry wall.		LOW	
		Analysis and possible causes		MID	
		The possible causes are due to the appearance of tensions due to material changes and thermal origin, that is, hygrothermal contractions and expansions.		HIGH	
		Possible interventions and actions		Intervention urgency	
		Before we would have to solve the cause and then we could act on the injury with this intervention: With injections is a repair system for cracks less than 0.05 millimeters thick applicable to walls of concerted masonry consisting of introducing a liquid under pressure in order to entirely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.		LOW	
				MID	
				HIGH	

Location of the lesion

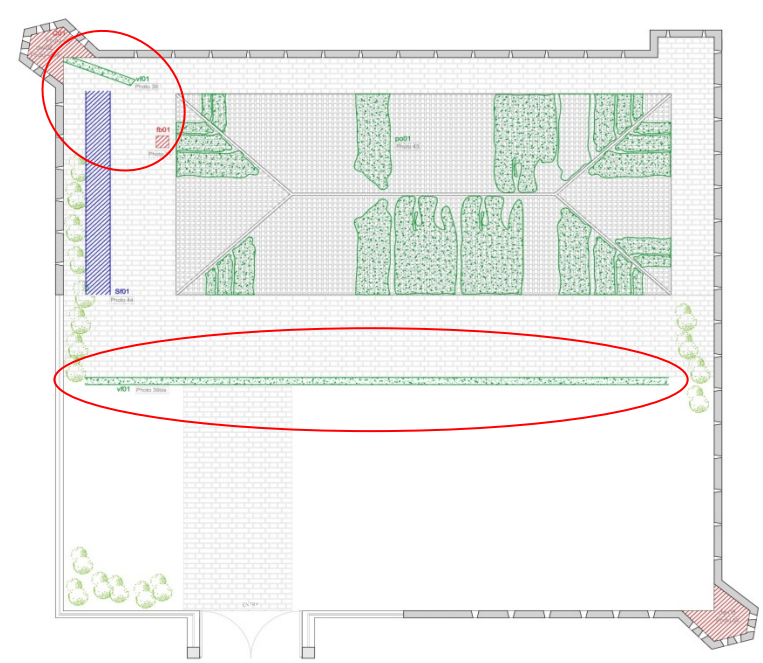



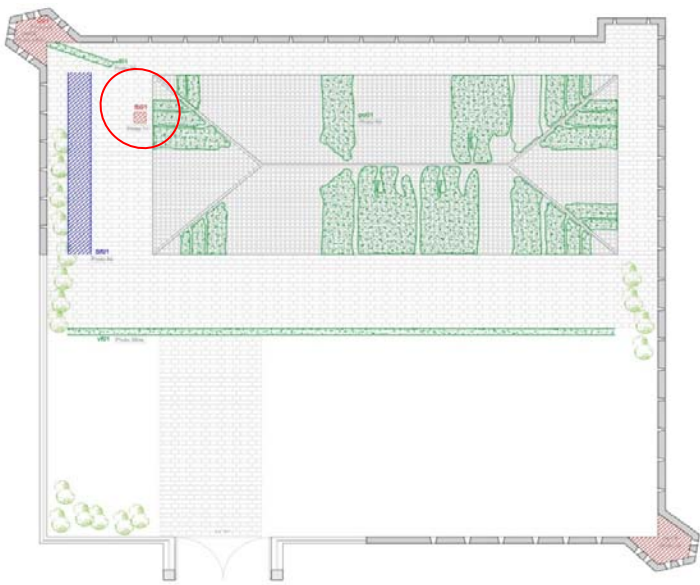
File	39	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Inside		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 13		Masonry wall	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
56		CH 06,07,08 y 09	LOW	MID	HIGH
Photographs		Description injury			
		It is observed how the interior face of the wall has fallen the siding leaving the masonry wall with mortar.			
		Analysis and possible causes			
		The cause is differential dilatations, thrusts in the same direction but in the opposite direction of the coating with the facing that involves the displacement of these causing the separation of the two.			
		Possible interventions and actions			
		Before applying the material, the coating should be repeated until the support is clean and a base mortar will be applied. We will try to choose a suitable material for the kitchen and also these are usually exposed to wear by abrasion, friction and shock. They are materials that need more maintenance and must be replaced with a certain frequency.			
Location of the lesion					
					


File	40	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Outside perimeter	west, southwest, south and southeast		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 19	Water collection installation.		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
39 y 39 bis	vf 01		LOW	MID	HIGH

Photographs	Description injury				
	Canalización exterior obstruida por plantas y tierra, no se drena.				
	Analysis and possible causes				
	The cause is the lack of maintenance and it is not drained by the obstruction of the canal because it has been filled with soil and plants.				
Possible interventions and actions					
A new drainage installation will be made.					

Location of the lesion



File	41	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location		Situation of the injury	Structural element:		
Outside wall		west	YES	NO	OTHERS
Plan situation		Element	Danger of stability		
Plano Nº 19		Recordable cover chest	LOW	MID	HIGH
Pathology photography		Pathology reference	Intervention urgency		
11		fb 01	LOW	MID	HIGH
Photographs			Description injury		
			We appreciate that the outer side chest of the south side is broken.		
			Analysis and possible causes		
			The possible cause is the lack of maintenance.		
			Possible interventions and actions		
			A new lid will be placed and its interior cleaned.		
Location of the lesion					
					

File	42	Property	Type of injury		
		Building of "guardia y custodia" of "Polvorín" - street Segura nº34 Barcelona	Physics	Chemistry	Mechanical
Location	Situation of the injury		Structural element:		
Side facade	west		YES	NO	OTHERS
Plan situation	Element		Danger of stability		
Plano Nº 16	Masonry wall		LOW	MID	HIGH
Pathology photography	Pathology reference		Intervention urgency		
10	Ciw 41		LOW	MID	HIGH
Photographs			Description injury		
			A horizontal crack can be seen in the masonry wall in the middle zone in the exterior lateral face of the façade.		
			Analysis and possible causes		
			The possible cause is an accidental humidity of the water pipe that is in the facing of the inner face, as the material softens cracks in the exterior side of the wall, following the extension of the humidity, in this case horizontally .		
			Possible interventions and actions		
			Once the pipeline has been solved, we will intervene: With injections is a repair system for cracks less than 0.05 millimeters thick, applicable to walls of concerted masonry consisting of introducing a pressurized liquid in order to completely fill the gap between the lips of the opening. Said liquid, when hardening and adhering to the material, returns the continuity to the damaged element.		
Location of the lesion					
