

POLITECNICO DI MILANO



ARCHITECTURE FACULTY

MASTER OF SCIENCE IN ARCHITECTURE

RESTORATION OF ARISTIDES DE SOUSA MENDES HOUSE CABANAS DE VIRIATO, PORTUGAL

Thesis Supervisor: Prof. Giuliana Cardani

Thesis Co-Supervisors: Prof. Sylvie Duvernoy

Arch. Francesco Paolo Chieca

Master of Science Thesis from:
Carolina Luísa de Sá e Brito matt. 767291

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RESTORATION OF ARISTIDES DE SOUSA MENDES HOUSE CABANAS DE VIRIATO, PORTUGAL

(MASTER OF SCIENCE THESIS)

Carolina Luísa de Sá e Brito

POLITECNICO DI MILANO

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ABSTRACT

The subject of this thesis consists on the restoration of Casa do Passal in Cabanas de Viriato, Portugal. This house belonged to a famous portuguese diplomat called Aristides de Sousa Mendes, who saved approximately 30.000 people during the Second World War. Besides his heroic actions, the portuguese government condemned him and he lived the rest of his life in complete poverty, loosing all his possessions including this house. Since then, Casa do Passal, has been abandoned, presenting a high level of destruction.

Taking into account the fact that the house is considered not only a national monument but also an unique example of a combination between the traditional portuguese house with french influences, the aim of the study consists in analysing the actual state of the building and its surroundings, studying the best restoration approach and providing a suitable function, not only to last for the future generations but also to honour the memory of its past owner.

RESTAURO DELLA CASA DI ARISTIDES DE SOUSA MENDES CABANAS DE VIRIATO, PORTOGALLO

(TESI DI LAUREA MAGISTRALE)

Carolina Luísa de Sá e Brito

POLITECNICO DI MILANO

FACOLTA DI ARCHITETTURA

LAUREA MAGISTRALE IN ARCHITETTURA

Ottobre 2013



ABSTRACT

L'oggetto di questa tesi consiste nel restauro di Casa do Passal a Cabanas de Viriato, Portogallo. Questa casa apparteneva a un famoso diplomatico portoghese chiamato Aristides de Sousa Mendes, che ha salvato circa 30.000 persone durante la seconda guerra mondiale. Malgrado le sue azioni eroiche, il governo portoghese lo ha condannato e visse il resto della sua vita in completa povertà, perdendo tutti i suoi beni tra cui questa casa. Da allora, Casa do Passal, è rimasta abbandonata, presentando un elevato livello di degrado.

Tenendo conto del fatto che la casa è considerata non solo un monumento nazionale, ma anche un esempio unico di una combinazione tra la casa tradizionale portoghese con influenze francesi, l'obiettivo dello studio consiste nell'analizzare lo stato attuale dell'edificio e dei suoi dintorni, studiando il miglior approccio di restauro e di fornire una funzione appropriata, non solo per durare per le generazioni future, ma anche per onorare la memoria del suo proprietario passato.

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Chapter I

1. Introduction

1.1 Aim of the Study

Casa do Passal, is a house that belonged to the famous Portuguese diplomat Aristides de Sousa Mendes who saved over 30.000 people during the 2° World War. It is located in a small city called Cabanas de Viriato in the North of Portugal.

Once, this “palace” (as it is called by the locals) was one of the centers of activity in Cabanas, the arrival of the diplomat and his fourteen children was always a big event. This palace was an important center in several ways: 1) Culturally, it was where famous figures of the Portuguese society could have met, like musicians, writers, poets and politicians; 2) Religiously, because the Sousa family was very catholic, they were always connected with the religious events of the town. 3) And socially, because it is known that Thursdays were called the “day of the poor”, and the kitchen’s door would have been opened and everyone who didn’t have enough to eat would have received a piece of bread and a soup, even when the family was absent.

Throughout the War, the house maintained its functions and social importance and we know that some refugees stayed there while waiting for the passage to the United States.

After Aristides condemnation, the family split, each one searching for opportunities in countries more open minded than their own, and with the death of Aristides’s wife, Angelina, the house fell into silence. The years passed and with the death of Aristides, everything was forgotten and abandoned. The Portuguese state was never interested in restoring the house and all the proposals, made by interested buyers were denied.

The aim of this study is to prepare a restoration project for this building in order to bring it back to its original social importance, and to restore as well the image of this person, so important to many people and to the Portuguese history but unfortunately and unfairly forgotten.

1.2 Who was Aristides de Sousa Mendes?

Aristides de Sousa Mendes was born on July 19th, 1885, in northern Portugal. Aristides and his identical twin, Cesar, followed in their father's footsteps and received law degrees. They graduated in 1907 from Coimbra University and both entered into the diplomatic corps. Aristides and Cesar came from a distinguished northern aristocratic family, very rural, conservative, monarchic and above all, deeply catholic, both of them would put these values into practice throughout their diplomatic career along with their thirst to see the world^[1].



Figure 1: a) Aristides and Cesar de Sousa Mendes with their Parents in 1900. b) Aristides and Angelina in British Guinea

Aristides married his cousin Angelina and together they raised their fourteen children in several countries such as Spain, California, British Guyana and Belgium. In August of 1938, the family moved to Bordeaux, France, where Sousa Mendes took the lace as Consul-General. Soon, the family would be caught up with the events of the Second World War II. In the spring of 1940, as German troops invade Belgium, Holland and then France^[2], thousands of refugees fled ahead of the advancing army. These refugees were mainly Jews, defeated soldiers, opponents to Nazism and elderly. They sought safety in neutral countries like Spain and Portugal and the city of Bordeaux, with its port, was a natural destination for thousands of the refugees. However, only the very wealthy were able to afford the high prices for the ship passages. The alternative was to get a transit visa in order to leave France, cross Spain and go to Portugal, an “open door” to America. Knowing this, people thought they would be able to get such a visa at the Portuguese consulate.

To better understand the moral dilemma Sousa Mendes was about to confront, it is impor-

1 FRALON, José-Alain. Aristides de Sousa Mendes, Um Herói Português. Cap. 2. Pg.23
2 Judeus...

tant to take into account the political situation in Spain and Portugal. Franco, the Spanish premier by closing the borders to the refugees, avoided his participation in the war, expressing in this way support to Hitler, as a thanks for his intervention during the Spanish Civil War. On the other hand, Portugal's premier, Antonio de Oliveira Salazar, also followed a policy of neutrality in order to avoid complications with the treaty with England and Spain, both countries pressing Portugal into different directions. In this way, Salazar followed the Spanish dictator by not allowing refugees into Portugal.



Figure 2: a) Aristides de Sousa Mendes. b) Sousa Mendes Family. c) Aristides with Rabi Kruger.

On May 17, 1940, Salazar sent his diplomats in Europe a directive that no visa was to be granted without a special permission from Lisbon. Throughout May, thousands of refugees tried to escape to Spain, but the latter would only allow the passage of those who had a Portuguese transit visa. In Bordeaux, the consulate where Sousa Mendes worked (and lived with his family) was literally jammed with thousands of refugees, and Sousa Mendes was suddenly responsible for the life of thousands of people. As the crowds besieged the consulate, Sousa Mendes sent hundreds of telegrams to Lisbon requesting visas. For three days, Sousa Mendes struggled, torn between service to his country and duty toward his God. According to his own nephew, after those days, Sousa Mendes got up by a “divine power” and began granting visas to all who asked^[3]. The consul was disobeying specific orders but, as he would have told his government later, “I would stand with God against man, rather than with man against God”. The consul set up a work station and enlisted workers, passports were stamped, reasons given for the visas, and Sousa Mendes signed them. If refugees had no documents, visas were stamped on pieces of paper. Their work continued day and night and the crowds began to head for the Spanish border that had to accept the Portuguese visas. ^[4] Once the refugees reached Portugal, they could not be denied entry because the Spanish would not let them back into Spain. The Premier of Portugal was furious; Sousa Mendes had forced Salazar to accept the refugees. On June 19, German planes bombed Bordeaux. On June 26, Sousa Mendes received a cable from Salazar relieving him of his duty and ordering him home. As German troops began occupying Bordeaux, Sousa Mendes began issuing Portuguese passports that would not allow people to cross the border, but would prevent people from being arrested and sent to concentration camps. Ironically, Salazar received a lot of praise

3 FRALON, José-Alain. Aristides de Sousa Mendes, Um Herói Português. Cap.4 Pg.52

4 FRALON, José-Alain. Aristides de Sousa Mendes, Um Herói Português. Cap 4. Pg 59

for accepting all refugees, a policy he continued throughout the war. However, after Sousa Mendes returned to Portugal, Salazar gathered a disciplinary council and declared Sousa Mendes professionally incapacitated. Without being allowed to work nor to retire, he had no income and the family was reduced to poverty. The younger children could not continue their studies and the older ones were unable to find work, so eventually, the family began taking meals with refugees at a soup kitchen run by the Hebrew Immigrant Aid Society^[5].



Figure 3: Refugees in Bordeaux, June 1940. Refugees, in front of Bordeaux' Council in 1940

Shortly before the end of the war, Sousa Mendes had a stroke which left him partially paralysed and Angelina died on 16th August, 1948. She spent the last six months of her life in a coma in a basement apartment in Lisbon. Sousa Mendes survived his wife by six years, never giving up hope that his name would be cleared.



Figure 4: Homage presented by the Portuguese President of Republic, Bordeux 24, May 1994. Sousa Mendes Considered Righteous Among The Nations in the Memorial of Yad Vashem Israel 1966. Homage' Statue in Santarem, Portugal

On April 3rd, 1954, he died at a Franciscan hospital in Lisbon with only a niece at his side. It is believed that at least 30,000 people received visas, including 10,000 Jews. However, Premier Salazar never closed Portugal's borders to war refugees and it is estimated that one million refugees were able to escape through Portugal because of what Sousa Mendes had done.

Only in 1988, thanks to external pressure and to his children's efforts, the government granted

5 Judeus

him total rehabilitation. The Aristides de Sousa Mendes Foundation was constituted in 2000 with the purpose of not only disseminate his actions through the world, but also gather funds to restore his home, Casa do Passal in Cabanas de Viriato.

1.3 Why Casa do Passal ?



Figure 5: Sketch of Casa do Passal made by Julio Rodrigues. November 2010

As previously mentioned, Aristides wasn't just any kind of person, he was special and above all, human, in a time when that simple trace of personality was not a priority. Thirty thousand people survived because of one single person. The same person who died neglected by his own country, but never losing his faith. A person like that should be properly honoured as well as all his belongings. It deserves a proper space where people can see where he lived, how he lived and what his deeds cost him. A place where people can understand and analyse all these elements that built his personality and remember him and his actions. So what better place to do that than his own house? The same house where he lived with his fourteen children, where he tried to live according to his faith and where he lived his last years.

1.4 Methodology of Survey

1.4.1 Available Existing Documentation

Historical documentation about the building is quite limited. The municipality of Carregal do Sal, and the Mayor Dr. Luís Fidalgo, member of the Aristides de Sousa Mendes Foundation, didn't have in their possession any information about the house prior nor after Sousa Mendes' occupancy.

It is known that the property was given as inheritance to Angelina after her wedding. However, the drawings of the original design of the house don't exist and the name of the architect (if any) who drew the actual plan of the house is unknown. Therefore, the only documents given to me by the municipality were copies of paper drawings made by Oscar Santos' studio in 1994, regarding a project for the transformation of the house into a hotel. This proposal was commissioned by the municipality but was never approved by the Aristides Foundation.



Figure 6: Elevation Drawn by Oscar Santos' Studio in 1994

1.4.2 Measured Survey and Photographic Survey

These drawings, apart from several discrepancies with the actual situation, were quite useful as a starting point for the field work.

The direct survey of the house could not be fully completed because of unauthorized access, for security reasons, from the municipality.

Only when and where safety and steadiness of the structure were ensured, the measured survey was partially performed. For the vertical measurements, I used a Digital Laser Distance Measurer taking into account, the 0,00 m level on the Ground Floor

Regarding the floor measurements, the Laser Measurer was used whenever the conventional method consisting in manual survey technique with steel tapes was not possible. This conventional method "hands-on", compared with the digital one, allowed a more precise and accurate documentation regarding some details and deformations of the building.

Taking into consideration the impossibility of a complete measured survey, a serious amount of photographic documentation was collected. This method allowed to record the maximum possible information about the house, all the accessible areas, were documented. The photographs were crucial for a better understanding of the structure and became the second basic data for the architectural drawings.

The Basement, the Second Floor and the dependence building were not surveyed because of lack of accessibility.

1.4.3 New and Updated Graphic Documentation

With the help of the copies of the paper drawings provided by the municipality, the data collected during the measured survey (even though incomplete), the collection of updated photographic documentation, a full set of digital graphics were done, using AutoCad.

This new set of drawings (plans, sections, façades, etc...) provides now an updated documentation about the state of decay of the house at the date of this thesis.



Politecnico di Milano
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Master in Architecture

Restoration of Aristides de Sousa
Mendes House
Cabanas de Viriato , Portugal

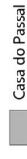
Thesis Supervisor :
Arch. Giuliana Cardani
Thesis Co-Supervisor 's :
Arch. Sylvie Duvernoy
Arch. Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(Nº 767291)



Legend:

Legend:



Casa do Passal

SITE ANALYSIS

GENERAL PLAN

02/10/2013

1





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Master in Architecture

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Mendes House
Cabanas de Viriato ,Portugal





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Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(Nº 767291)



Legend:

-  Casa do Passal Green Area
-  Green Areas
-  Open Spaces
-  Agricultural Fields

SITE ANALYSIS

GREEN AREAS

02/10/2013

2





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Carolina Luísa de Sá e Brito
(Nº 767291)



Legend:

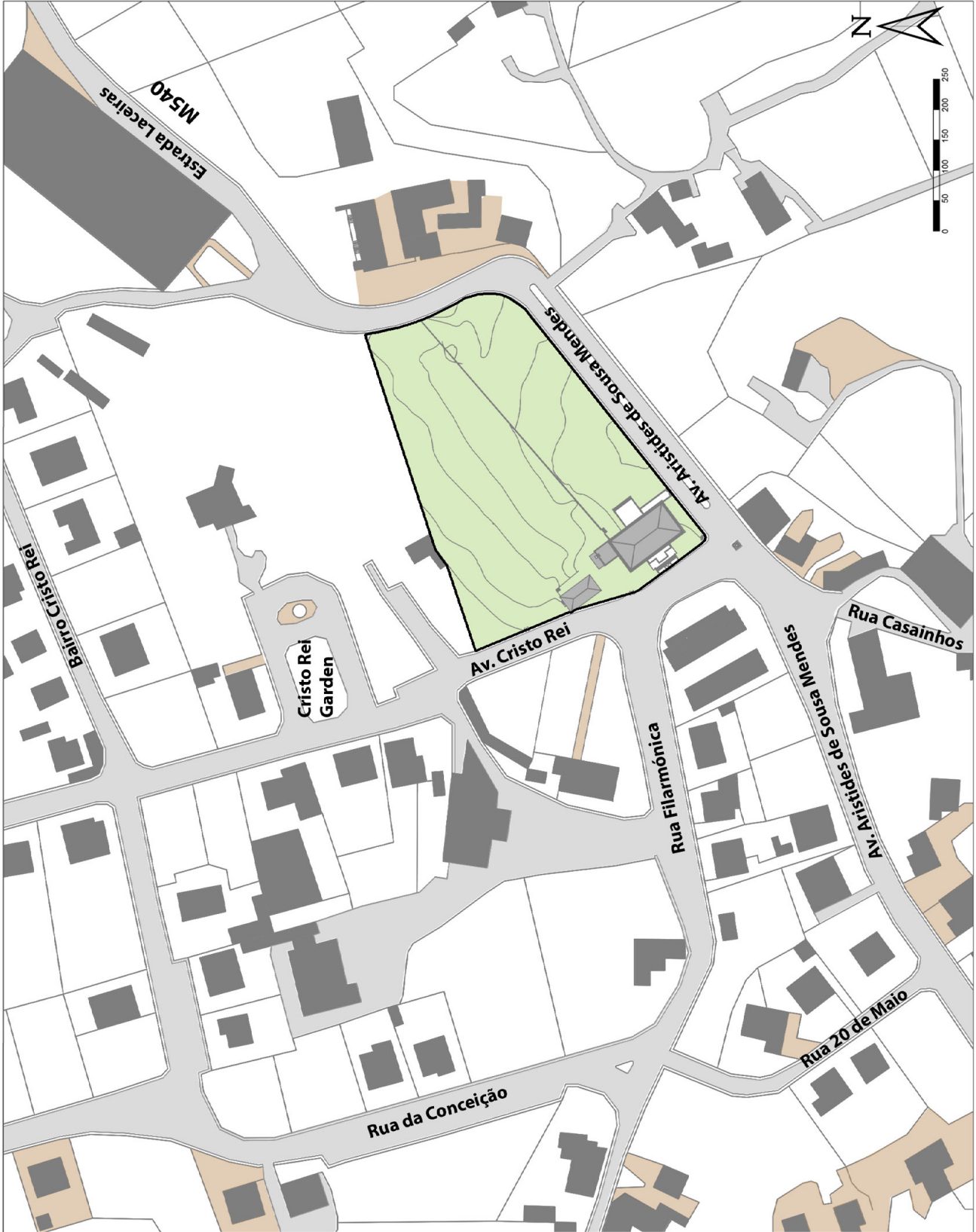
- Road System
- Casa do Passal
- Built-up Space

SITE ANALYSIS

ROADS MAP

02/10/2013

3





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Student:
Carolina Luisa de Sá e Brito
(Nº 767291)



Legend:

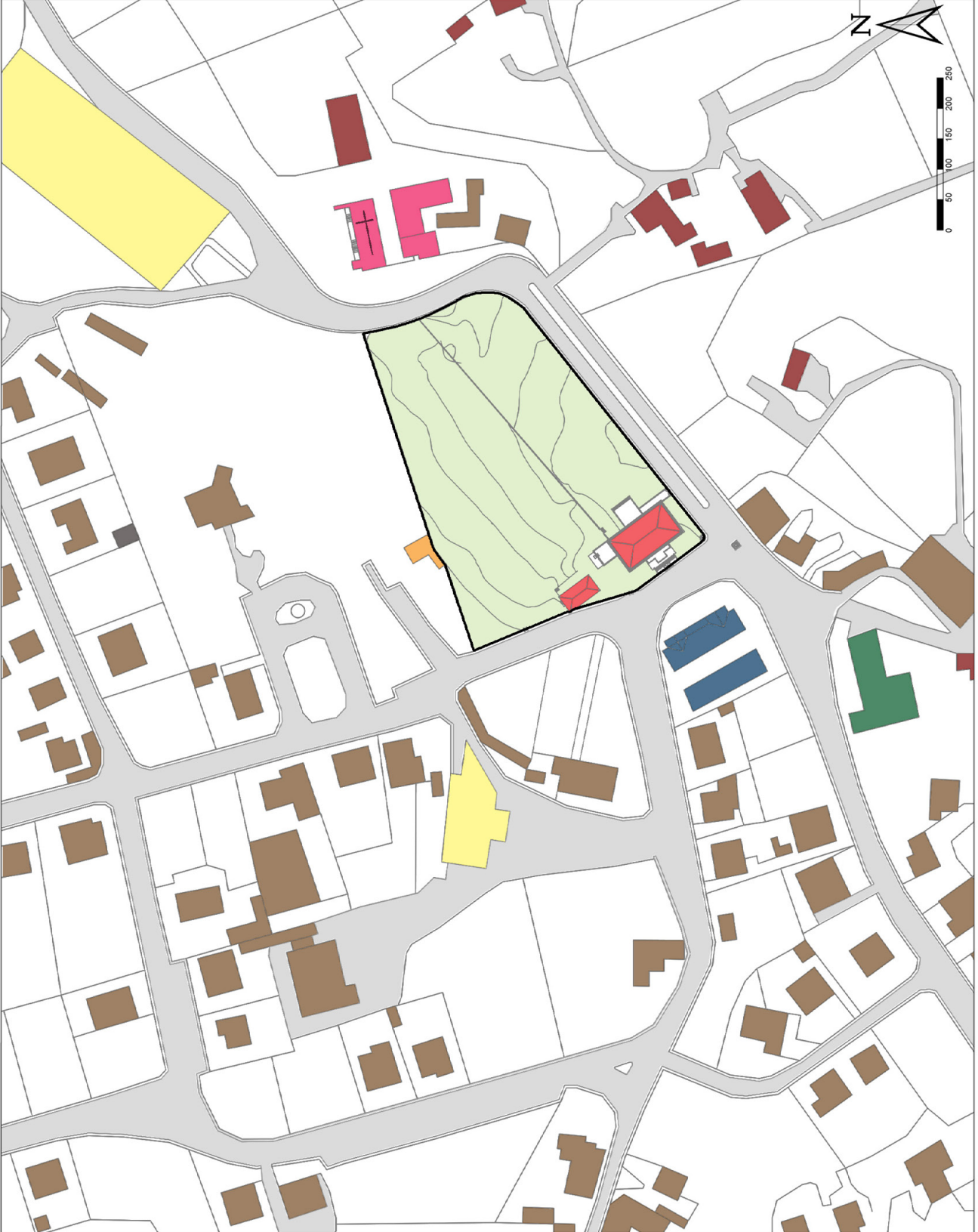
- Casa do Passal
- Residential
- Farms
- Industrial
- Municipality
- Restaurant
- Kidengarten
- Church

SITE ANALYSIS

LAND-USE

02/10/2013

4





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Student:
Carolina Luísa de Sá e Brito
(Nº 767291)



Legend:

- View Pictures VPB
- Ceiling Pictures CPB
- Ground Pictures GPB
- Detailed Pictures DPB

MAP OF PHOTOS

EXTERIOR

02/10/2013

5





VPE_01



VPE_02



VPE_03



VPE_04



VPE_05



VPE_06



VPE_07



VPE_08



VPE_09



VPE_10



VPE_11



VPE_12



VPE_13



VPE_14



VPE_15



VPE_16



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VPE_18



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VPE_20



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VPE_22



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VPE_24



VPE_25



VPE_26



VPE_27



VPE_28



VPE_29



VPE_30



VPE_31



VPE_32



VPE_33



VPE_34



VPE_35



VPE_36



Politecnico di Milano
Architecture Faculty
Master in Architecture

Restoration of Aristides de Sousa
Mendes House
Cabanas de Viriato ,Portugal

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MAP OF PHOTOS

GROUND FLOOR

02/10/2013 6





VPA_12



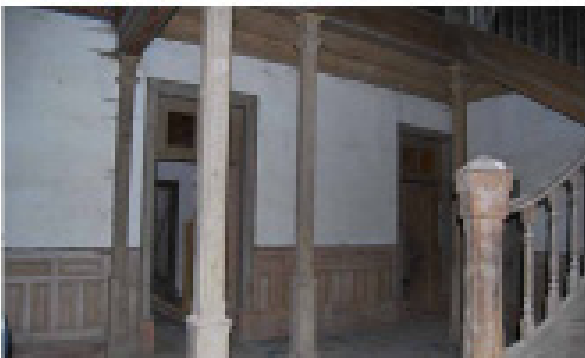
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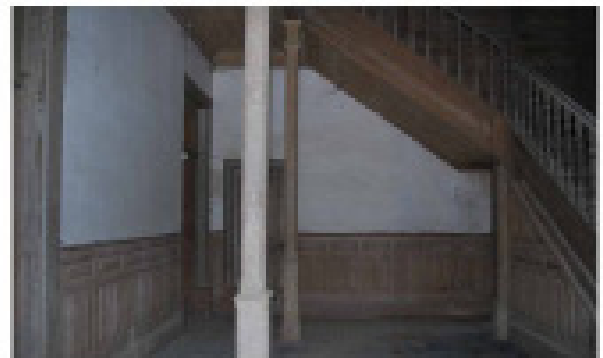
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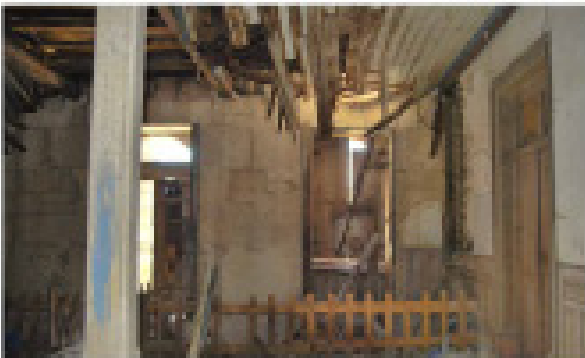
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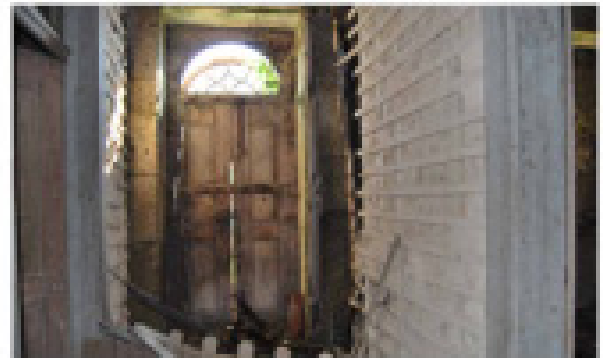
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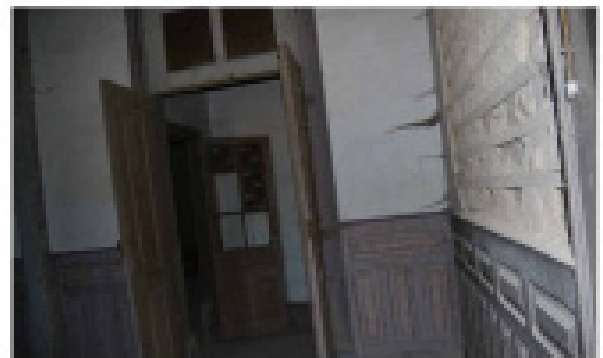
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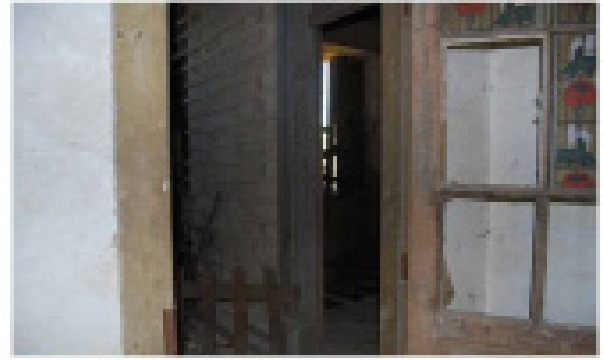
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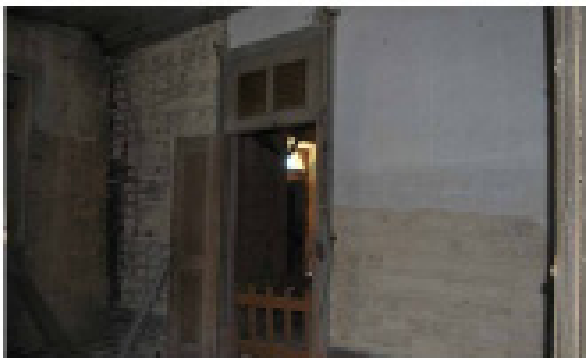
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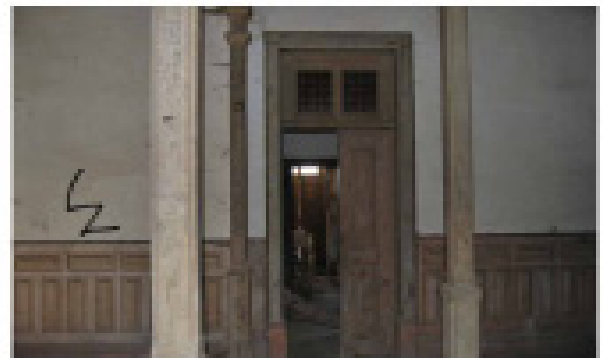
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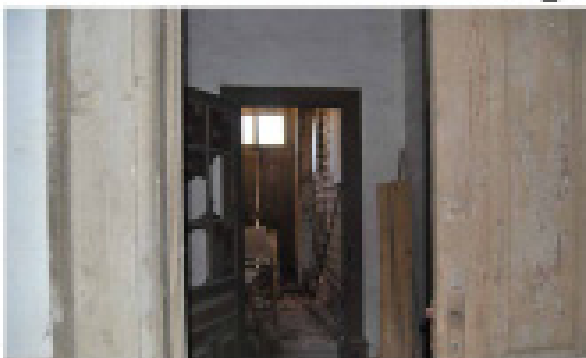
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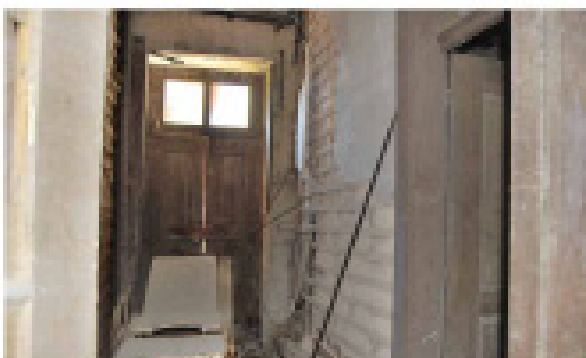
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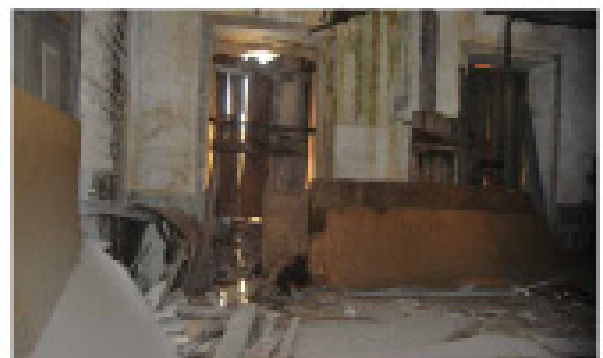
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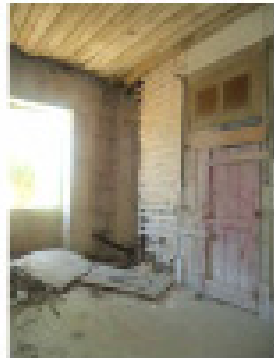
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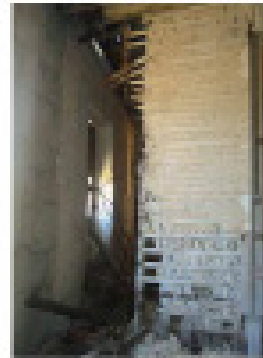
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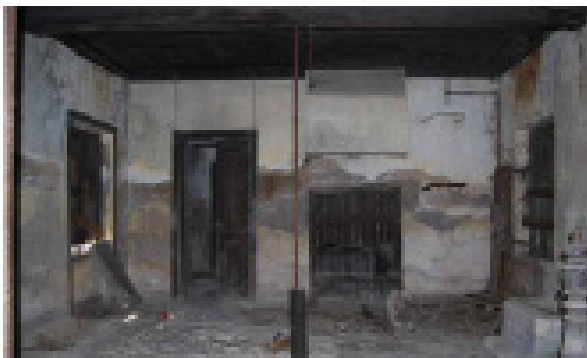
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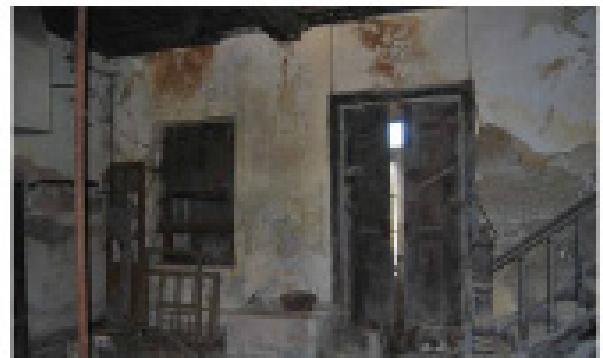
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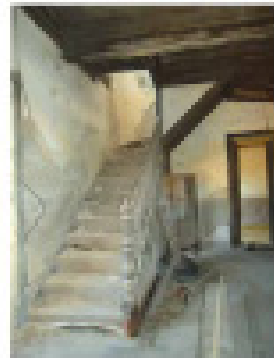
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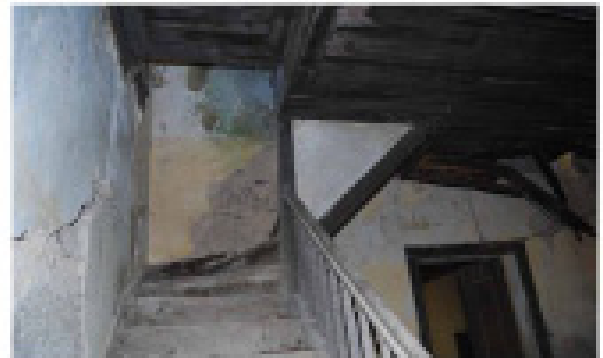
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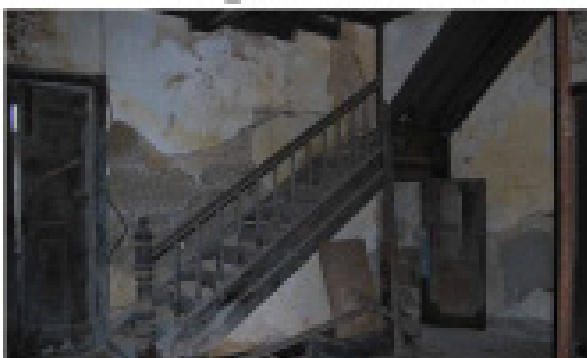
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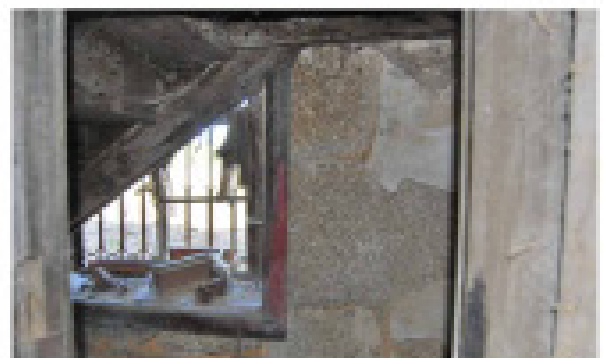
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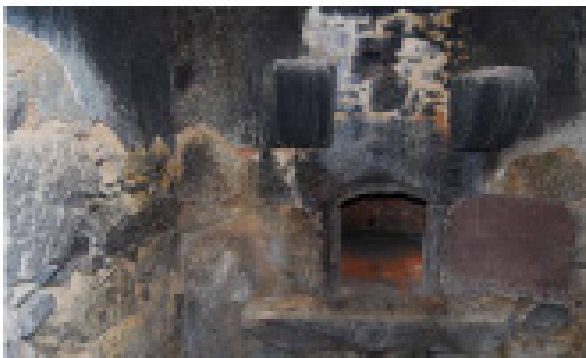
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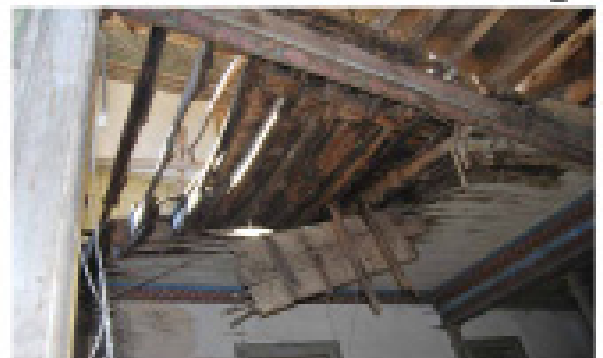
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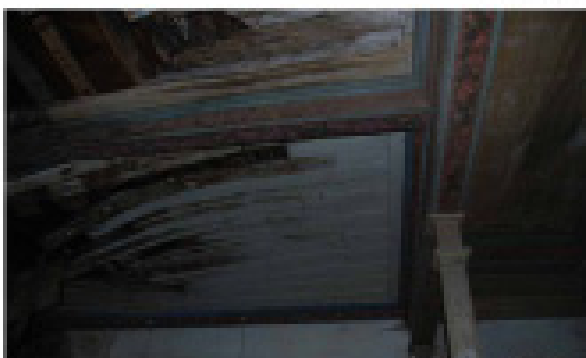
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CPA_02



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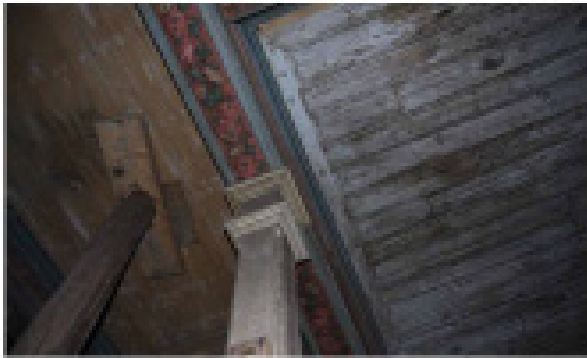
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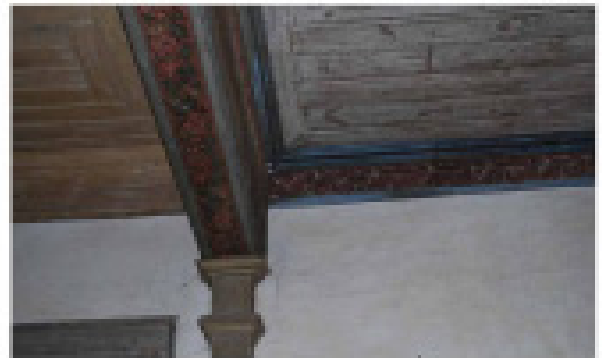
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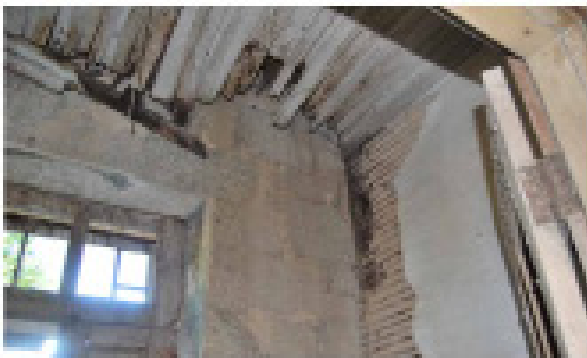
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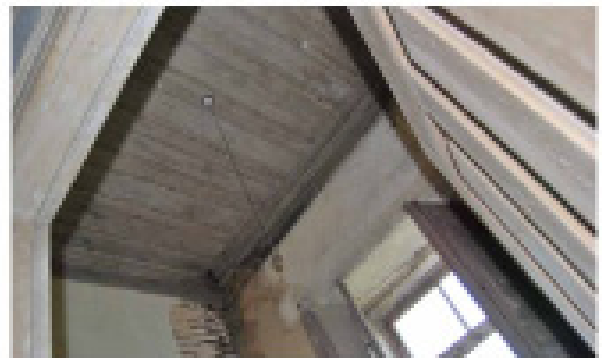
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CPA_12



CPA_13



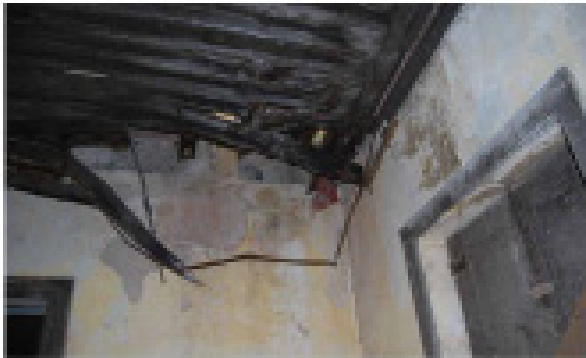
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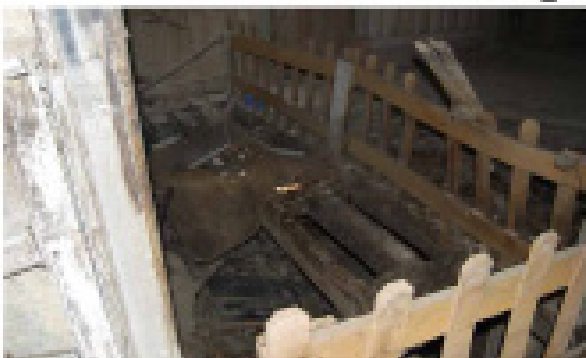
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CPA_19



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GPA_02



GPA_03



GPA_04



GPA_05



GPA_06



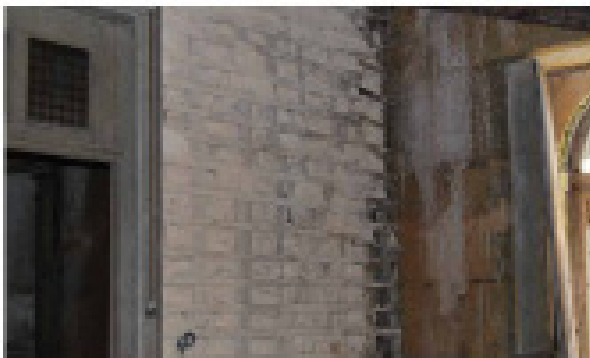
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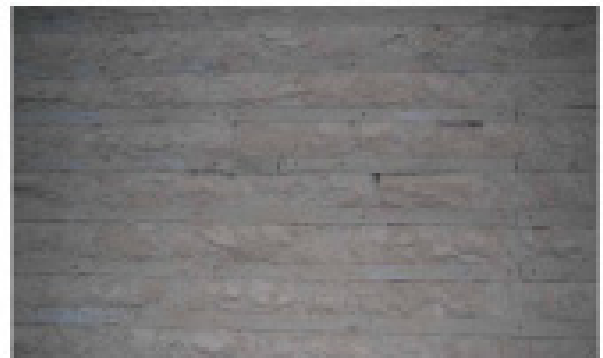
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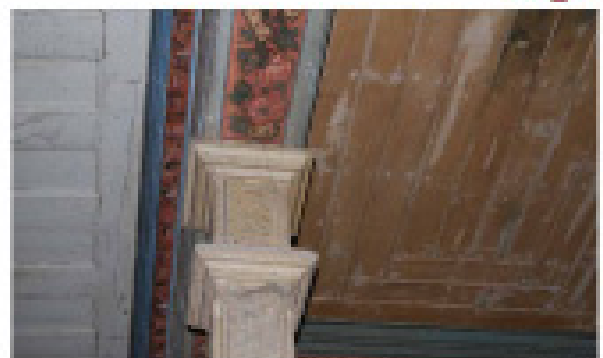
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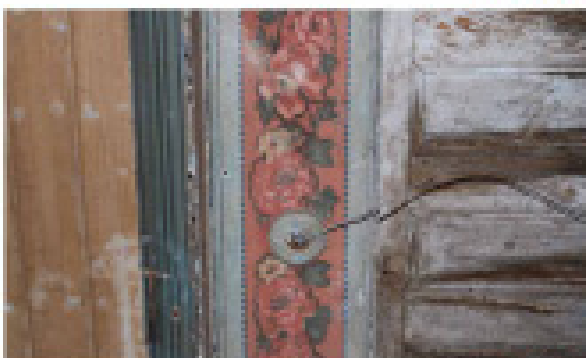
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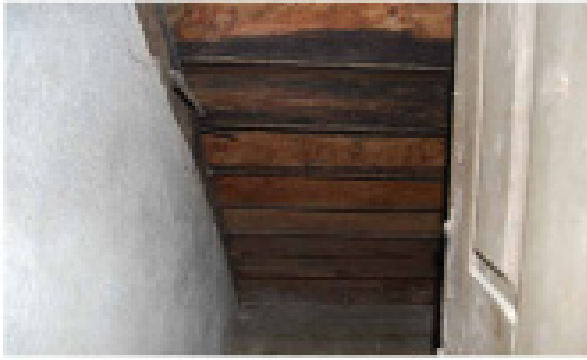
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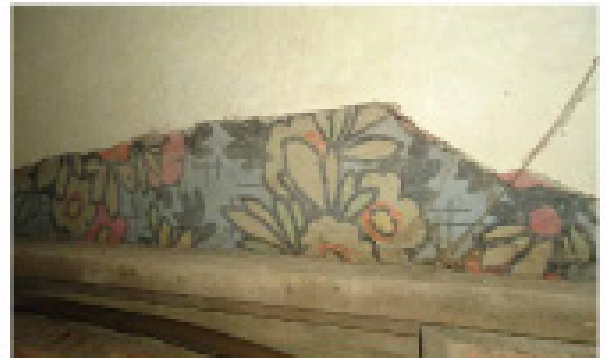
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DPA_14



DPA_15



DPA_16






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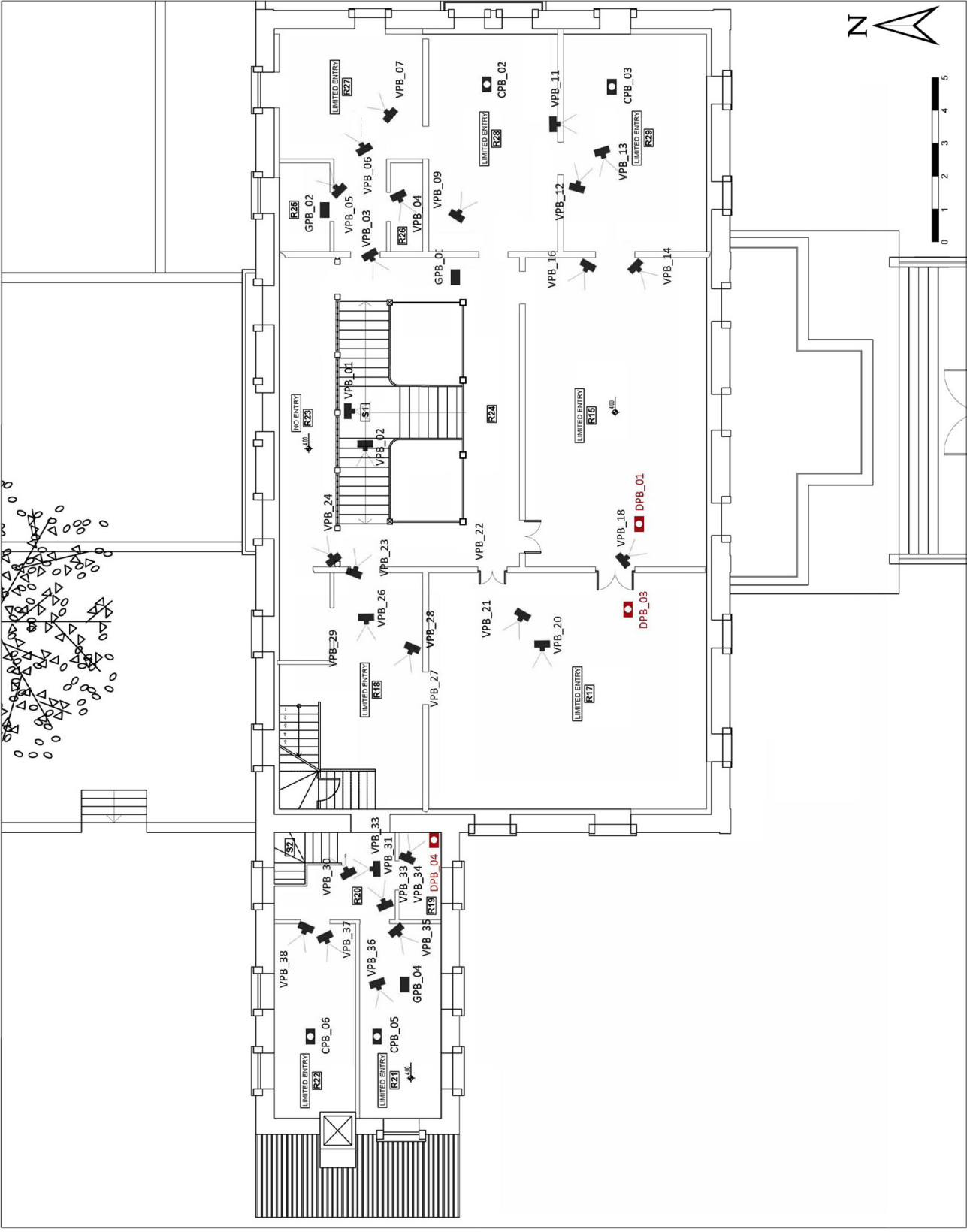


Legend:
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MAP OF PHOTOS

FIRST-FLOOR

02/10/2013 7

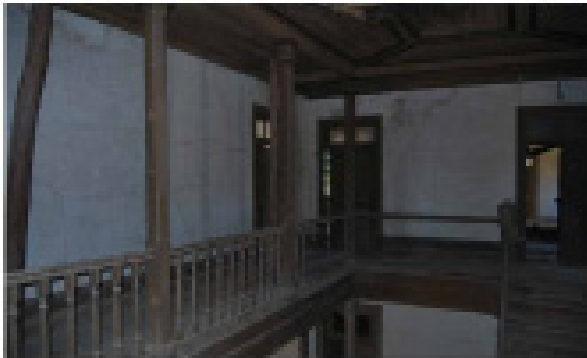




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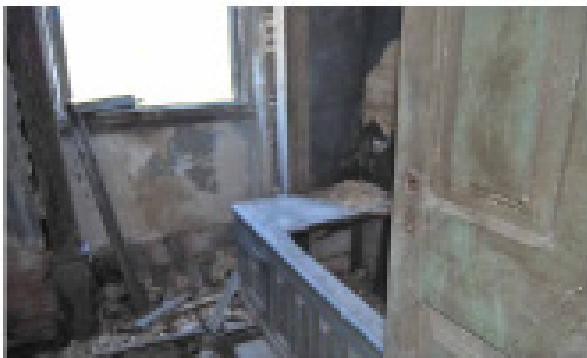
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VPB_17



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VPB_19



VPB_20



VPB_21



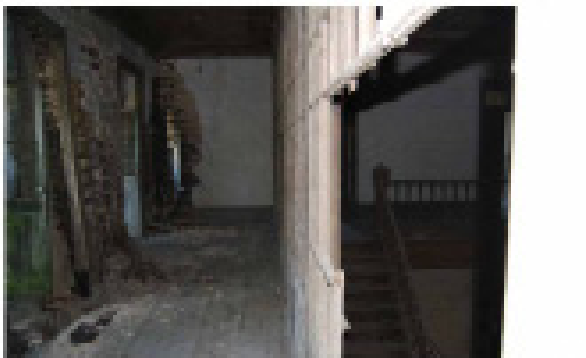
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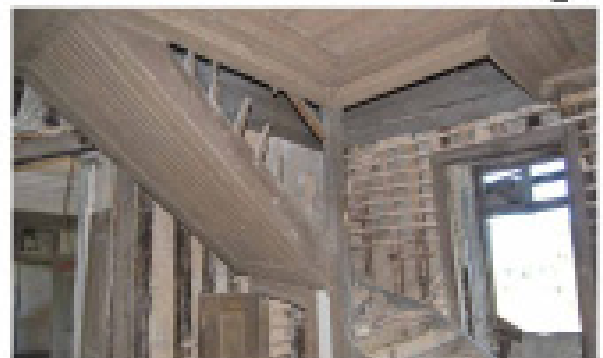
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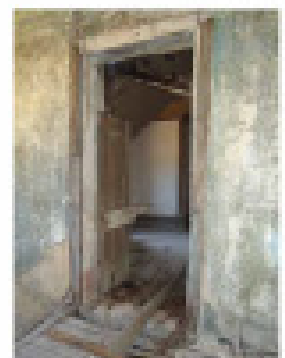
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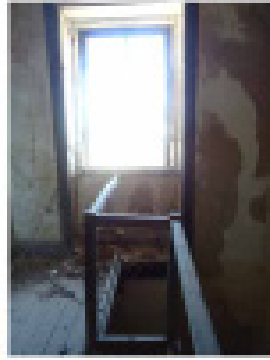
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VPB_31



VPB_32



VPB_33



VPB_34



VPB_35



VPB_36



VPB_37



VPB_38



CPB_01



CPB_02



CPB_03



CPB_04



CPB_05



CPB_06



CPB_07



GPB_01



GPB_02



GPB_03



GPB_04



DPB_01



DPB_02



DPB_03



DPB_04



Restoration of Portuguese
Diplomat Aristides de Sousa
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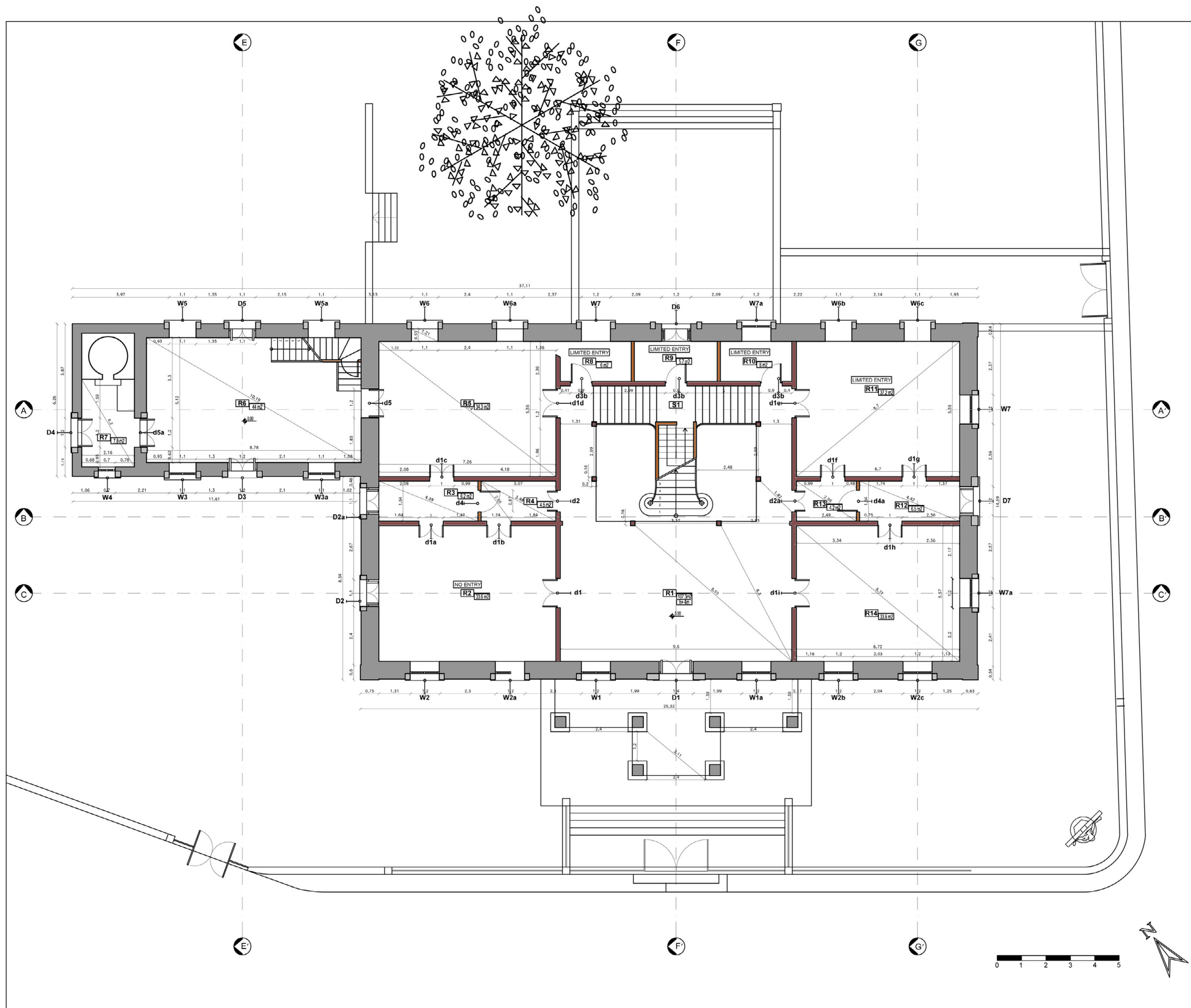
- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall

Survey

Ground-Floor

03/10/2013

08



Restoration of Portuguese
 Diplomat Aristides de Sousa
 Mendes House
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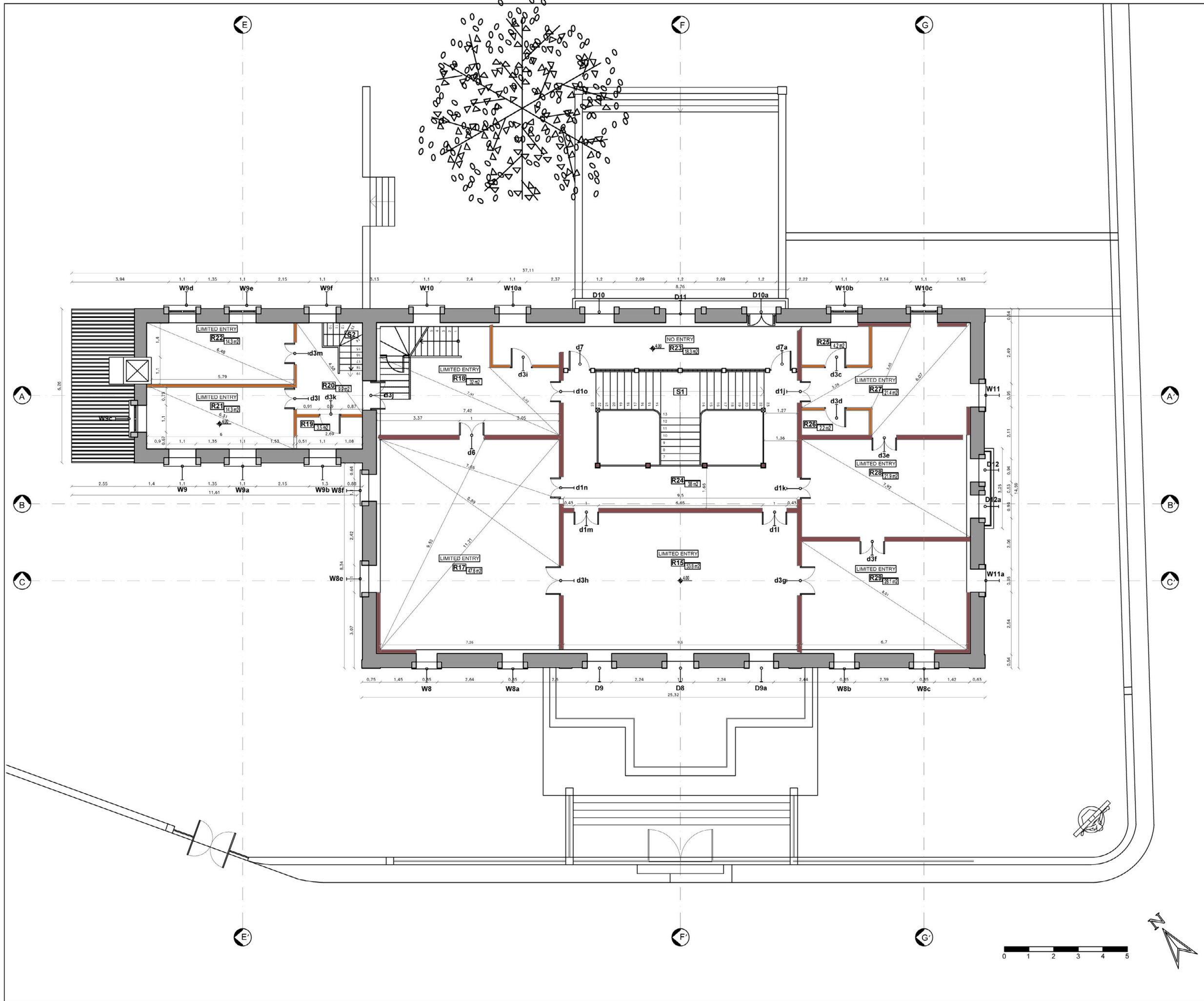
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 - "Frontal" Wall
 - "Tabique" Wall

Survey

First-Floor

03/10/2013

09



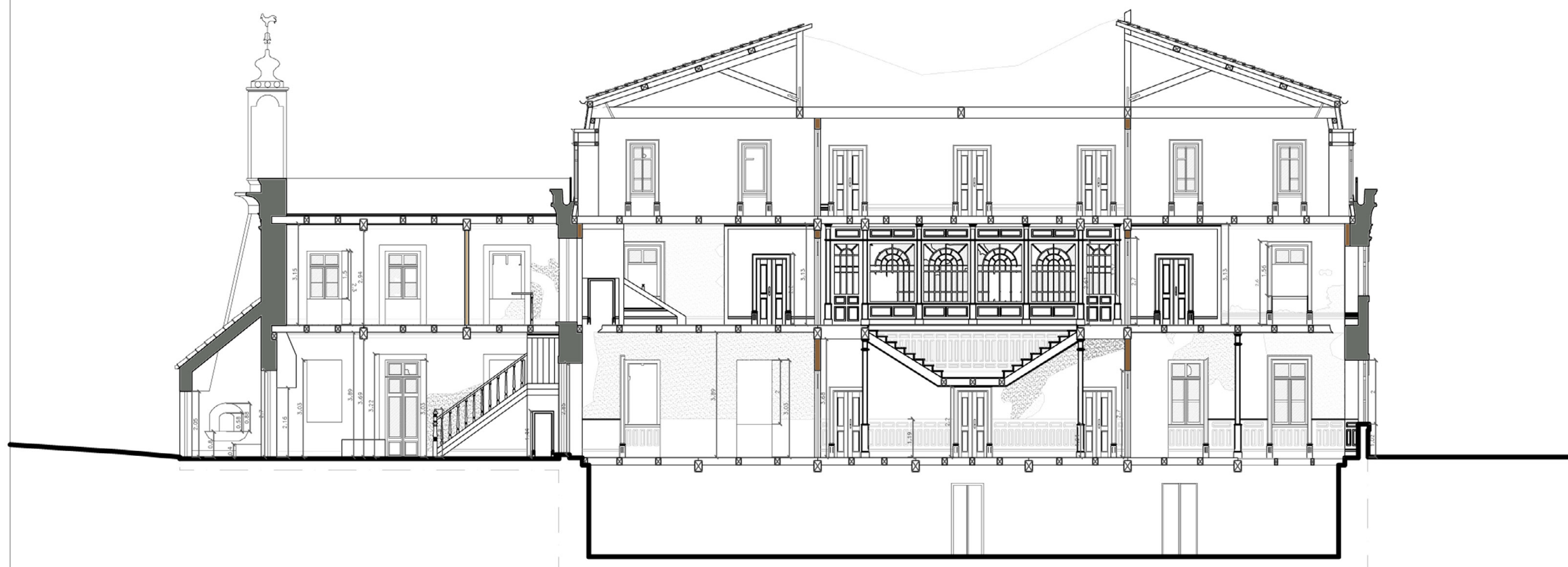


Restoration Aristides de Sousa
Mendes House
Cabanas de Viriato, Portugal




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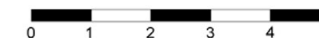


Legend:

-  Masonry Walls
-  "Frontal" Wall
-  "Tabique" Wall

Survey

Section A/A'



02/10/2013

10

Chapter II

2. Description

2.1 Location of the Building.

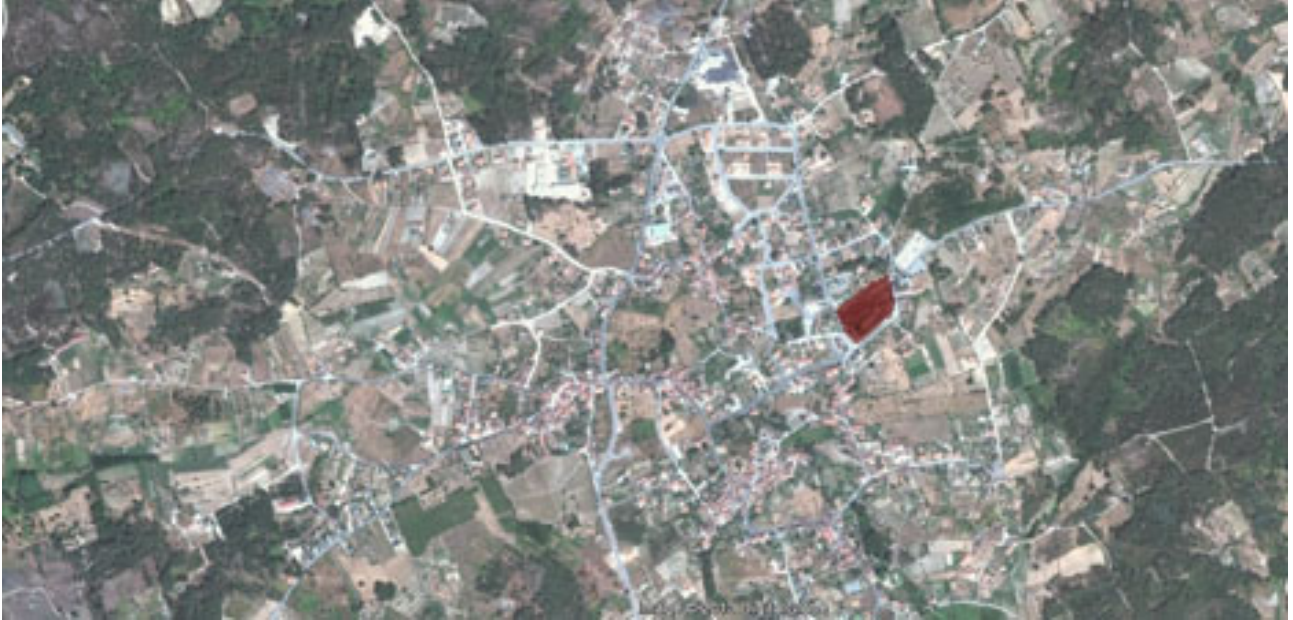


Figure 7: Aerial Photo of Cabanas de Viriato

2.1.1 Cabanas de Viriato



Figure 8: a) and b) Views of two typical Houses of Cabanas de Viriato. c) Main Church façade (the church turned to Casa do Passal).

The house is located in a small town called Cabanas de Viriato. It has 21,94 Km² and approximately 1533 inhabitants. This town belongs to Carregal do Sal Municipality in the Viseu District.

2.1.2 The Municipality

2.1.2.1 Viseu



Figure 9: Viseu's Square. Misericórdia's Church. Old Jewish Neighbourhood

Viseu (located approximately 28 km North of Cabanas de Viriato, about 30 min by car) has a quite central position regarding the entire district. Viseu's district is characterized by an irregular ground which varies from 400 to 700 m altitude. It is surrounded by a mountainous system constituted by several hills, but most important, it is surrounded to the south and southwest by the two main mountains of the country, the Serra da Estrela (the highest) and Serra do Caramulo. Between these two mountains we can find numerous rivers which form three main basins: Dão, Vouga and Paiva. Besides this three main rivers there are several others with less flow.

2.1.2.2 Carregal do Sal

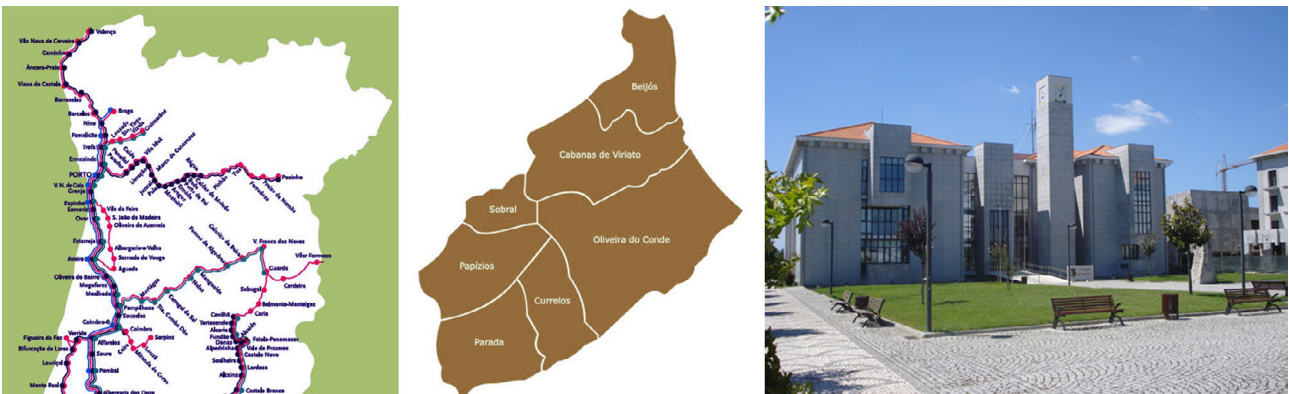


Figure 10: Portuguese Train Connection Map from CP 2012. Map of Carregal do Sal Parishes. Municipality Building.

As previously said, Cabanas de Viriato belongs to the municipality of Carregal do Sal (approximately 8 Km Northeast, about 10 mins far from Cabanas de Viriato), with 10,555 appx. inhabitants, and covers an area of about 120Km2 divided into seven parishes: Beijós, Cabanas de Viriato, Currelos, Oliveira do Conde, Papizios, Parada and Sobral. The town is well served by major transportation networks that allow the quick and reasonable access to the entire country, either through the main road IP5, or by train through the Line of Beira Alta enjoying therefore, a privilege geographic situation.

2.1.3 Climate

Located in a transition zone, this region presents a range of micro-climates. The Caramulo's Mountain, located West of the county, plays an important role regarding the climate mitigating the influences of air masses from West (through the valley of Mondego's River).

However, this particular area is characterized by the existence of wide temperature ranges, with harsh and humid winters, with an average monthly temperatures between 6 and 9 °C, precipitation with a total of approximately 499.4 mm and quite windy specially in January. Occasionally there might be some heavy snowfalls that last only a couple of days. In the first two months of Spring, the precipitation is relatively concentrated and the maximum temperatures vary between 28 to 30 °C, while the minimum ranges from 3 to 5 °C. The Summer is hot and dry, with the temperatures ranging from 30 to 33 °C maximum and 12 to 25 °C minimum. Autumn is quite cold and damp, with heavy rainfalls specially on the last two months of the season, the temperature varies between 4 to 15 °C minimum and the maximum can reach 30 °C in September and 15 °C in November.

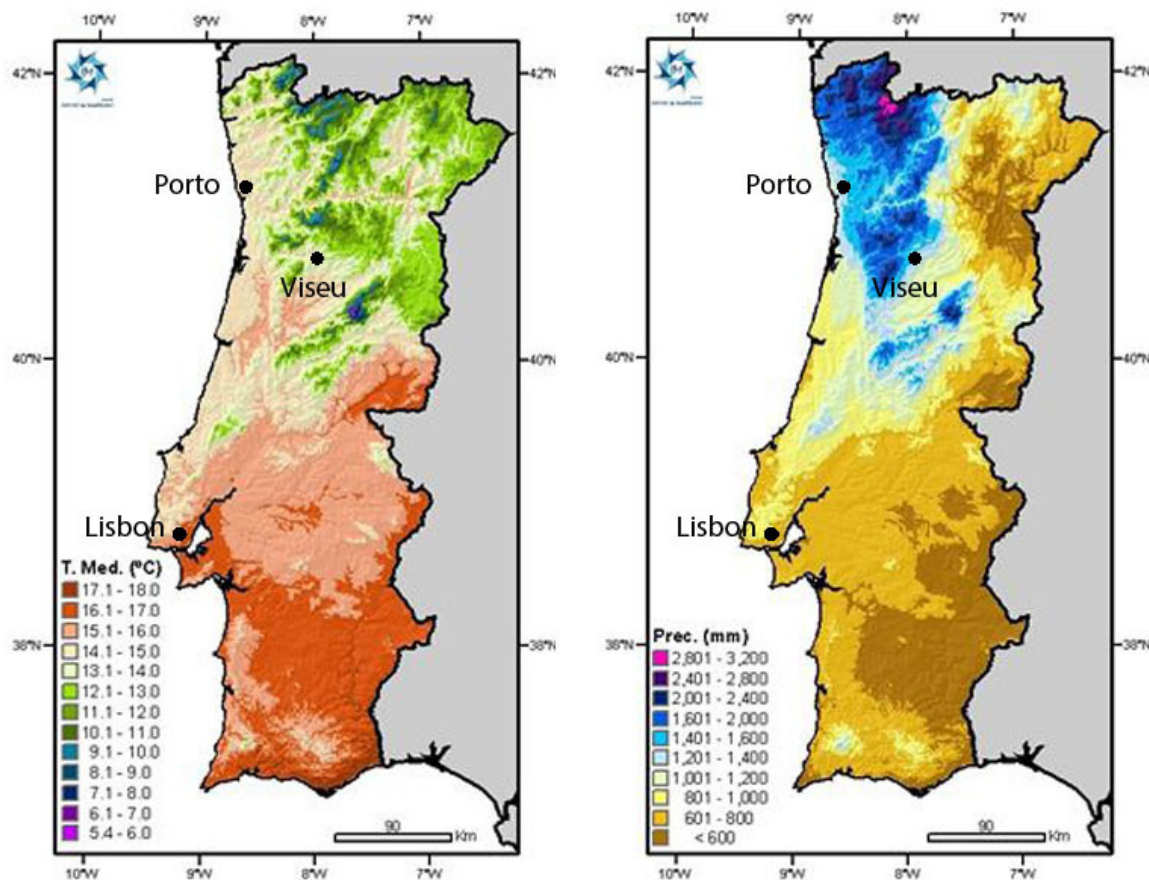


Figure 11: Precipitation and Temperature's Range Maps according to IPMA (Instituto Português do Mar e da Atmosfera, 2012).

2.1.4 Geology and Geophysics Analysis

The major extension of Carregal do Sal Municipality lies on Yellow Granitic soil, this rock is the main perpetrator in the formation of the existing soils that can reach 7 Km depth. On a smaller percentage, quartzite's formations can also be found.

Regarding the Seismic activity, according with IPMA, it is evaluated as level VI - Moderated by the Richter Magnitude Scale.

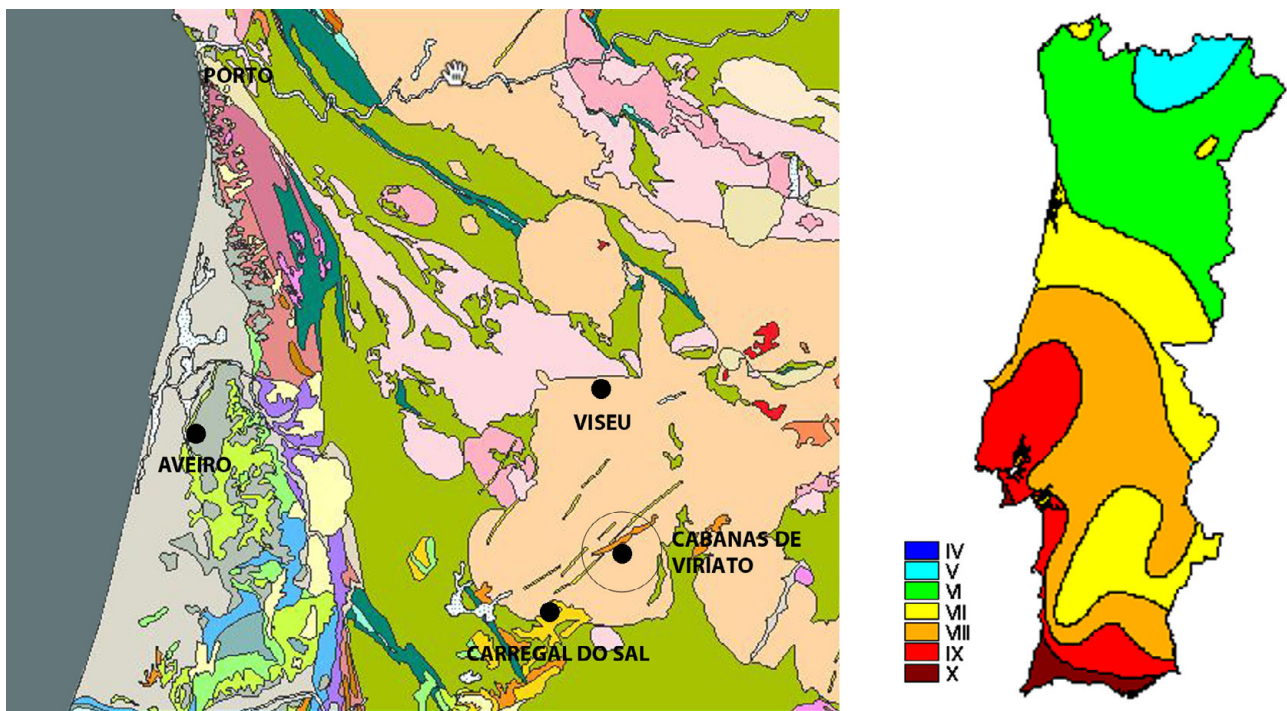


Figure 12: a) Geological Map from GeoPortal LNEG 2010. b) Seismic Activity Map in Portugal from IPMA

2.1.5 Heritage

With its geomorphological conditions, the municipality bears a vast and diverse landscape heritage, both architecturally and archeologically. Among this vast heritage we can mention the grave of the Knight Fernão Gomes de Gois, a masterpiece of the Renaissance, which can be visited at the Mother Church of the Conde de Oliveira; and the Dolmen of Orca, considered one of the best preserved megalithic monuments of this region, both classified as National Monuments. Moreover, its architectural heritage is well represented by their imposing “Solars” (a typical Portuguese mansion) and mansions with medieval origins, all characterized by the typical granite stone of this region.

On the other hand, agriculture has always been a means of survival for excellence in this region; however, this activity was set in second place by the adversities and the evolution of the population over time. Today the agriculture it is still the livelihood of the population above fifty years old.

A region where the landscape is characterized by olive trees and vineyards, only these two products take, even today, a significant importance: the oil and the famous Wine Dão.



Figure 13: Petroglyphs area of Carregal do Sal. Dolmen da Orca. Palheira Dolmen. Oliveira do Conde' Church. Example of a XVIIth century Solar. Alcafache Spa

2.1.6 Interesting Centers Around.



Figure 14: Porto's view. Coimbra's Square. Aveiro Canal. Aveiro's Typical Houses

Besides Viseu's district, this particular region of Portugal is quite developed, and being in the Center-North, it makes this location, a strategic point regarding several key Cities around, such as Coimbra (67 Km Southwest), known as the "University City" and the third biggest centre in Portugal (after Lisbon and Porto). This city is famous for its cultural status much thanks to the students activities; then there is Aveiro (100 Km West), considered to be the "Portuguese Venice" due to its system of canals and boats; and then Porto (140 Km Northwest), the second largest city in Portugal. Porto is

one of the oldest European Centers and was registered as a World Heritage site by UNESCO in 1996, it was also The European Culture Capital in 2001 which turned this city into a cultural fulcrum point for this region.

2.2 Morphological Description of the Building

The building is dated from the XIXth century, but part of the structure already existed in the form of a smaller building that was inherited by Angelina, consisting of a granitic masonry construction, with just one floor. This former construction corresponds to the ground-floor of the main building. When Aristides started the renovation, he expanded the existing building by adding two floors. The first, continuing the existing masonry wall and the second, totally different, built with a mansard wooden structure, influenced by the pombalin buildings in Lisbon. Besides this, another extension on the North-West façade for the services together with the kitchen outhouse were constructed. On this same side, the garage building, with two floors, was added.

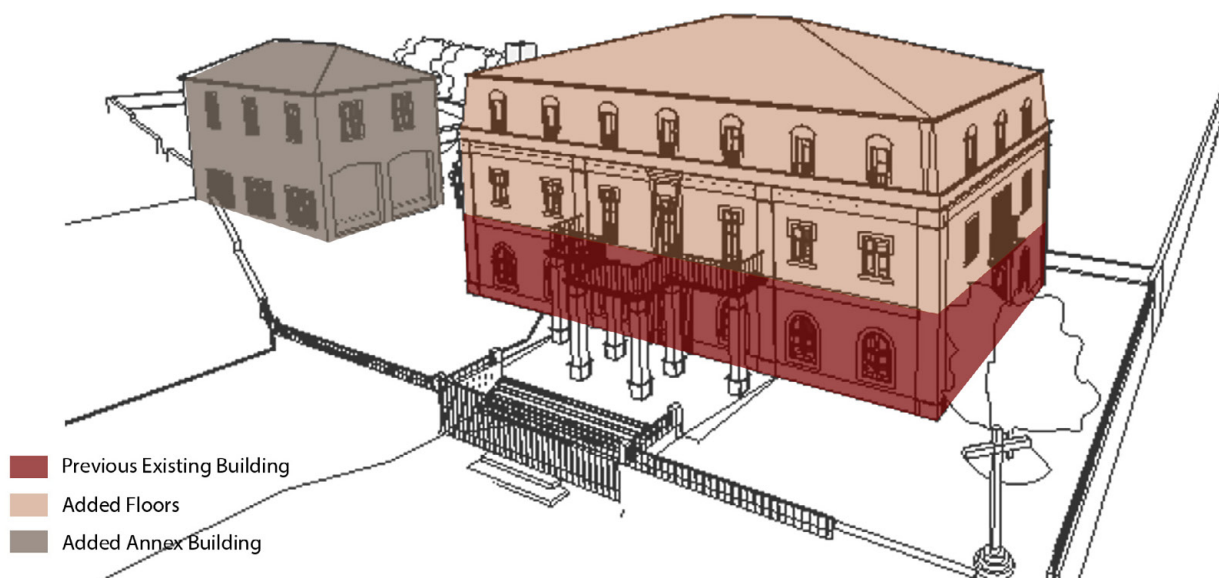


Figure 15: Diagram with the different phases of the house' construction.

The fact that the house is located on the top of a hill, freestanding, gives the impression that it is isolated from the rest of the houses in the vicinity. The total area of the property is delimited by a wall. The main façade is completed by a latticed gate in front of a large set of steps that stresses the monumental character of the house and also, since it is the main entrance, it gives access to the house from a small square. On the other side there are also other gates. On the south-East façade, a door gives access to the basement and on the North-East side, a gate connects the house with the Mother Church of Cabanas de Viriato, where every morning, Aristides and his wife would attend mass. The North-West

side on the other hand is limited naturally by the hill. On this hill, Aristides commissioned and put a statue of Christ with the arms opened. The statue is turned towards the house as if it was embracing it. Aristides wanted to plan a big set of stairs to connect the statue directly to the house' garden. This statue was the second after a first one, very similar, that Aristides commissioned during the construction of the house itself. With smaller dimensions than to the other one, it represents Christ on the cross and it is placed on the corner and turned to the street.

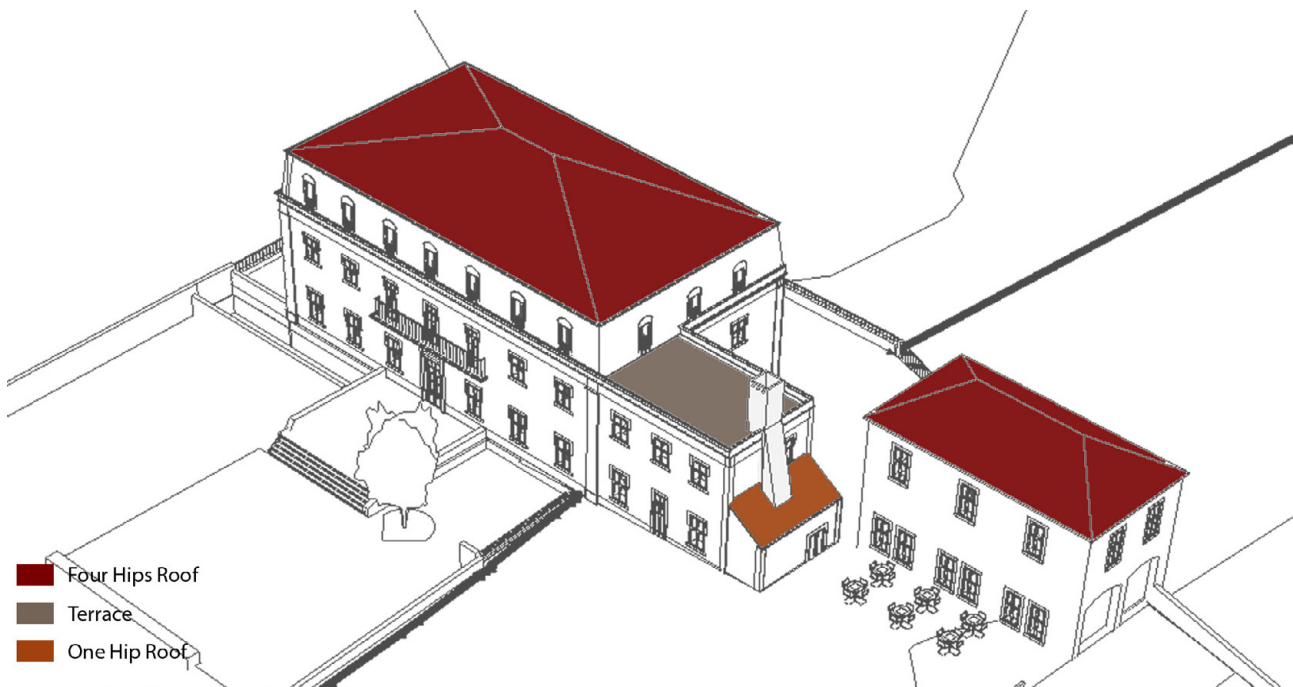


Figure 16: Diagram showing the different types of roof.

Regarding the plan of the house, it is a rectangular structure based on an artificial basement. The roof is characterized by different types, on the main and noble part it is in a Mansard style divided in four hips, after that we have the first annex covered with a terrace and the final annex, the small space for the oven, covered with a roof in one hip.

2.2.1 The Structure and Materials

The structure of this building is the typical kind of structure that can be found in Lisbon's downtown, Baixa Pombalina, constructed after the earthquake of 1755, however it was used long before that across the country.

We can identify it by its two main materials: stone (yellow granite in this case) and wood (chestnut) which, combined, compose a structure that can last for centuries with a high level of performance during an earthquake (essential for Lisbon's region).

The choice of the materials doesn't come just for its structural behaviour but also because they are both quite abundant in Portugal. Easy to find and easy to transport.

The structure is developed by a perimetral granite masonry wall (on the ground-floor previ-

ously constructed), performing a rigid block starting from the foundation till the second floor.

The Timber structure is located in the interior of the block, starting from the ground-floor till the roof. The interior structure of the building is completely in wood, the floor system, interior bearing walls, interior partition walls and roof. Even the second floor, Mansard Floor, is completely built in timber, supported by the Masonry walls of the first-floor.

In Portugal, the use of this kind of structure started declining after the appearance of the reinforced concrete, continuing to be used just for small applications and details. However, it is a fact that its characteristics of resistance, lightness, versatility and even durability, have proved to be efficient. If we take a look at the ancient buildings constructed with these materials, that are in Lisbon's Baixa, Porto's Downtown or anywhere in the world; we can see that they are still very stable even after hundreds of years suffering the natural degradations caused by men's neglect.

2.2.1.1 Exterior Bearing Walls _ Granite Masonry

The bearing walls are very important; they are the ones that have to fulfil all the demands for the structural stability. This structure has a self supporting character, and it is indeed important from the structural point of view since it bears the interior timber structure, floors and roof.

These walls are normally quite wide (around 0,70 to 0,75 m) on the ground floor, becoming thinner on the upper floors (0,60 m on the first-floor). As it was mentioned before, these walls support not only the wooden floor but they also work as a fixed element for the interior bearing walls.

The masonry is characterized by horizontal courses composed by roughly cut granite stone blocks. These blocks are arranged irregularly but well interlocked. In between the gaps between the blocks, we can find pebbles of various dimensions according with the necessity.

The granitic blocks are binded by a hydrated lime stone mortar, with a mixture of sand and pebbles.



Figure 17: Interior views of the Granite Bearing Walls

2.2.1.1.1 Finishing Layers of the Masonry Wall

The finishing elements of the construction are really important since they are the building's skin that assures the protection of the structural elements against the external environment.

The masonry walls are finished in a very simple way, with three layers of mortar, each one with a different composition. The first one, applied directly on the masonry wall, is the “roughcast” mortar applied like splashes to cover all the irregular surface of the wall, in this way the second mortar grasps more easily the first one. The second layer, the first plaster, with a finer composition compared with the mortar, homogenizes the surface for the last layer, this one more finer, creates a plane surface to be painted.

2.2.1.2 Interior Bearing Walls _ “Frontais”

The interior walls of Casa do Passal are of a specific type of wall, very typical in Portugal, specially in this region. These walls called “Frontais”, consist of a timber structure. Apart from the constructions made in Lisbon, these structures are always irregular, depending upon the building, the region, and most important, their manufacturer. In the same building we can find totally different compositions without jeopardizing the final performance of the structure.



Figure 18: View from the Frontal Walls on R01 and R14

2.2.1.2.1 The Timber Structure of the Wall

The “Frontal” consists of a kind of “armature” or “skeleton” in wood, constituted by a group of wooden boards (between 0,11 and 0,18m width) placed horizontally, vertically and diagonally, forming the famous cross called “cruz de Santo André”. These pieces are carved in order to be perfectly fit and adjusted and then nailed to each other and to the groundsel, connecting with the pavement.



Figure 19: View of the Tabique Interior Wall. Detail of the Wall Composition.

In this typology, each wooden piece is different from the others, both in format and length. The constructor improvises and shapes all these elements according with what it's needed, so all of them are perfectly placed. After the "wood skeleton" is finished, the spaces between the boards are filled with stones and rubble together with lime stone mortar that gives the compact surface of the wall. Over this surface, a wood lathing (0,05 m width and 0,02 thickness) system is nailed, whose main purpose is to create a rigid base for the second mortar.

This type of walls was very popular because they work as a building reinforcement allowing a better distribution of the horizontal forces during earthquakes, with the result that the structure would resist even if the external walls yield.

This walls also assure the stability of the main horizontal bearing elements like the pavements, roof and stairs.

2.2.1.2.2 Finishing Elements of the Walls

In the main building, given the composition of the internal walls, the finishing layers of the wall are organized in order to complement that structure. Similarly to the Masonry walls, it is divided in three layers:

a) Filling Layer of the Wall _ Since the main walls are constituted by a lathing wood system , the mortar, based on non-hydraulic lime and sand, had to fill all the empty spaces between the laths and the rubble inside the wooden frames to grasp easily the surface. This was a quite old and slow process, since all the spaces had to be filled carefully and had to dry in order to be ready to receive the second layer.

b) Homogenized Layer of the Wall - The second layer of mortar was necessary to homogenize the surface. This mortar had the same base and characteristics as the one used before, however, since its function was not to bind all the various elements but just create a rigid and straight support for the final layers, a thinner type of sand was used. In this way, its manoeuvre was easier.

c) Final Layer of the Wall - The final layer consists of the plaster, made from a softer

sand in order to create a thinner layer on the wall. This layer is the main protection of the wall and is the base for the paint used in the service area, or the paper wall chosen in the main building.



Figure 20: First, Second and Third Layers of the Wall's Filling Respectively.

2.2.1.3 Interior Partition Walls “Tabiques”

The “Tabiques” structure is very similar to the “Frontais” the only difference is the dimension and composition of the wood “skeleton”. Since it is not a bearing structure, the wood boards are narrower, between 0,08m to 0,11m width and 0,02 to 0,035 m distance between boards. These boards are placed vertically and work as the skeleton in which the joints are filled with lime stone mortar. The wood lathing is nailed directly on these boards. Afterwards the layer of plasters are applied.

2.2.1.4 Floors

On the upper pavements mainly wood was used. The rooms of the noble area of the first floor, have a quite wide span so it was necessary to have more than one alignment of beams. This alignment was crucial to ensure the stability of the floors As it can be easily seen from the picture bellow, the structure is composed of the primary beam which is aligned with the main axis of the house and supported by the granitic pillars on the basement; and the secondary beams, placed transversely to the first one at regular intervals. Following the tradition of the Portuguese floors and to assure a more steady structure, between the secondary beams the “Tarugos”, wood “beams” with the same height and thickness as the secondary beams, were placed (see material abacus, page 64).

It was very common to follow the so called “tant plein que vide” method, a French term meaning “as solid as void” which means that the width of the beam has the same measure as the interval between one beam and the other. So basically the beams with 0,15 m width corresponds to 0.15 m of interval (0,30 from each of the axes).



Figure 21: Detailed Pictures of the Wood Structure of the Floors

2.2.1.4.1 Connections between the structures



Figure 22: Detailed Pictures of the connection between the bearing wall and the wood structure of the floor

The connection between this wood structure and the masonry walls is also an important point to stress. Basically the Primary Beams are anchored and preched inside openings in the masonry wall, above the beams is attached a wooden groundsel that circles the walls and at the same time is supported by the corbel of the wall. Finally, the secondary beams would be attached to this groundsel and this particular joint becomes the support for the wall finishing.

All these wooden elements are previously trimmed in order to, on the superior part be ready for the planking of the flooring and on the inferior support the ceiling of the floor underneath.

2.2.1.5 Roof

The typology of the Portuguese roof changes according to the region and climate where it is built. The Viseu district its located in Center-North of Portugal where a high level of rain and casual snowfalls, influence the architecture morphology. Therefore, the roof is divided in four inclined hips and following the style of the house,it was covered with Marseilles tiles.



Figure 23: View of the Main Roof. Detail of the roof structure on the Annex Services Building.

2.2.1.5.1 Structure of the roof

The structure of the roof is quite simple, it's called a Typical Truss and is constituted by three truss webs (the Top chords), whose upper extremities are attached to the king post and the lower extremities to the edges of the bottom chord, performing a triangle. Then two webs are attached diagonally from the top chords to the king post and the bottom chord, closing a rigid frame. Normally, in order to have a wider span metal “stirrups” were used to reinforce the joint between the king post and the bottom chord.

Being in contact with the exterior, the roof is a very complicated structure, and very important to achieve successfully. Very often it creates problems and is the main reason of the destruction or premature decay of a building, which is exactly the case here.

2.2.1.5.2 The Eaves Typology

The Eaves typology of Casa do Passal is very simple; basically the roof tiles are supported and attached to the cornice of the masonry wall. This attachment is made by using of mortar. Besides the eaves, we can find the iron gutters all around the main house, both right under the roof and also after the mansard (since this one has also a slight inclination, a secondary system to collect water was needed).

2.2.2 Materials Description

As its was mentioned previously, Aristides chose always local materials and techniques for his own house. All the materials used can be easily found in any other house in this region. Each material differs according with the function and placement.

2.2.2.1 Yellow Granite



Figure 24: Detailed Pictures of the Granite Walls

Yellow Granite is the typical stone of this region, it is part of the elements of the vernacular architecture of Beira Alta. In Casa do Passal it is used in three different ways. First in the blocks composing the masonry of the external walls as well as the foundations of the building. Secondly, it is used both as an external and internal pavement material, on the entrance porch and the outdoor steps and then, internally, on the underground floor. Finally, regarding the decoration, it is also used on the decorative stonework elements of the external façades.

2.2.2.2 Chestnut Wood



Figure 25: View from the structure on the Ground Floor. View from the second-floor ceiling.

Wood is the main material used in the house, it is basically used everywhere. Its main use is for the beams, walls and stairs. Then it is used also as a finishing element for the pavements, ceilings and walls, being painted and composed in intricate ways to perform decoration. It is also used for the doors and windows, both external and internally.

2.2.2.3 Hydrated Lime Mortar



Figure 26: Detailed views from the Binding Mortar and Plaster on the Walls.

Used as a binding material both in the infill of the “Frontal” and “Tabique” internal walls as well as in the masonry granite walls. The average thickness of the joints is around 0,05 m, however it changes according to location and use.

The lime is also used as a finishing material for the plaster and the composition of the paint.

2.2.2.4 Ocre Paint

On the exterior walls the last layer of the wall composition is the ocre paint, a colour very typical of this period. Nowadays, it is possible to find some remains on the main façade, specially under the balcony where it was protected from decay. Regarding the rest of the building, this paint is no longer visible.



Figure 27: Detailed views from the remains of the ocre paint under the main façade's balcony.

2.2.2.5 Slate Tiles



Figure 28: Views from the Tiles used on the Mansard.

The Slate Tiles are present on the Mansard Exterior Walls, They are used as an exterior finishing and a more efficient way to assure the impermeability of the wood structure in the interior. This kind of Tiles is very typical in this region, not only because it is an abundant material in this area but also because it became a final decoration and a trade mark of the vernacular architecture in the North of Portugal.

2.2.2.6 Brick Tiles



Figure 29: View of the tiles on the roofs.

The roof of Casa do Passal is typically in French Style. Marseille tiles with approximately 0,24m width and 0,38m length, cover the roof of the main house and the annex building as well.

2.2.2.7 Cement



Figure 30: Cement of the floor of the front balcony. View of the floor of the kitchen.

Although not meant to be seen, the cement was used mainly on the floor of the services building, and on the Balconies floors. It was used as a binding material between the structure base and the final flooring, no longer existing. On the services building it was also used as the final layer of the terrace.

2.2.2.8 Metal _ Wrought Iron

Around the house we can find several uses of Iron, not easily detected at first sight. It is used as an attachment element, fixing the wood elements to the masonry walls and fixing the different pieces of the timber structure. It is also used for the grating and the gates around the house and terrace as well as in some decoration elements like the figure of the fowl on the top of the chimney.

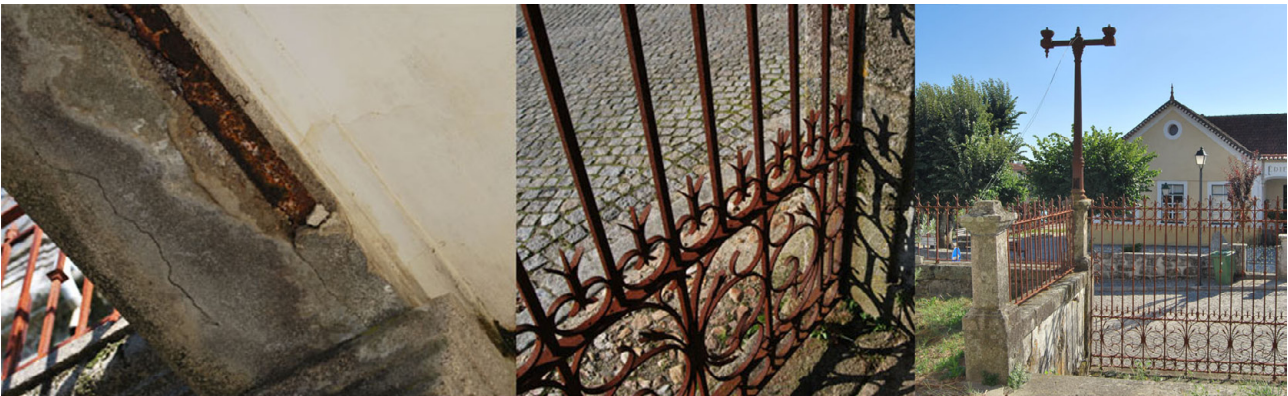


Figure 31: Detailed view from a piece of iron used structurally. View of the front gates and the entrance lamp.

2.2.2.9 Metal_Zinc



Figure 32: View from a bathroom pipe inside the house. View from the external drainage system on the Garden Façade. View from the Gutters on the North-West Façade.

It is also the material chosen for the technical elements like the gutters of the façade, (having not only the function of draining the water but also decorating the façade with flourished elements typical from the Art Nouveau) and the plumbing system of the house.

2.2.2.10 Stained Glass



Figure 33: Detailed View from the d4a doors in room R12 on the Ground-Floor. View from the windows on the top of the interior doors in R29 on the First Floor. Picture taken by Gastão de Brito e Silva in 2010 on the second floor.

The stained glass was part of the interior decoration. It can be found on the doors and the windows on top of them. Its motives and colours would change according with the rooms decoration , presenting flowers like in the doors d4a and d4b or geometrical composition like on the doors d1a... and d2a... The presence of the stained glass its part of the Art Nouveau influences.

2.2.2.11 Coloured Glass

The coloured glass can be found on the wood window panel of the main stairs in R01. Each window row is painted with a certain colour (yellow, green, blue and red). The Glass Panels cover the entire length of the wall, 7,3m width and 3,1m height, being divided into 4 windows with two doors on each side.



Figure 34: View from the wood panel behind the main stairs decorated with coloured glass.

2.2.2.12 Wallpaper



Figure 35: Detailed Picture of the Last two Remains of the original paper wall used in the house.

The Wallpaper was the finishing layer of the walls. Nowadays there are only two small remains in R05, Ground Floor. It is documented that each room was decorated differently using the wallpapers with different colours and patterns as part of the walls decoration. The use of the Wallpaper is another trace of the Art Nouveau influences.

2.2.3 Architectural Features

2.2.3.1 Façades

The façades are a really important feature of any noble palace, it acts as a status symbol for the population and it is also fundamental to show the social level of the family living there.

This house is no exception. Even knowing that Aristides was a very simple and humble person, we also know that he had his noble background in a very high account. He was a big supporter of the Portuguese monarchy, therefore, all these feelings are shown on his house façade. They show in the grandiosity of the house related with the surroundings, in the pomposity of its elements and in the

decision to put the Coat of Arms, that he himself commissioned, joining the coat of arms of all his family names, right in the centre.

Nevertheless he found appropriate to use the local materials and the local structure type instead of importing a foreign and eccentric one, which someone of his post could easily have done. Therefore, the façades are very typical, the division of the three floors is clearly perceptible from the exterior. Each floor has a different style of windows, some rectangular, others arched. This division is also made by the friezes that perform an unifying element of the four façades as well as the use of some elements like pillar to stress the important areas. The fact that the house was an extension of an existing structure might also have influenced this kind of division.

2.2.3.1.1 South-West Façade_Front Façade

The SW façade, the main one, stresses the clear division of the three floors, the ground floor with six roman arched windows, three on each side of the main entrance door, symmetrically put in the middle. This door is also a perfect roman arch preceded by a portico emphasized by a group of six pillars that support the noble terrace on the first floor. This upper terrace is accessible through three central doors, the middle one with the coat of arms on top, followed by four rectangular corniced windows, two on each side. The third floor is in Mansard style, has three main ogive arched windows in the centre, to give the continuity of the symmetry of the entrance, and two windows in abated arch on each side. The Services Building, is not aligned with the main one, it it places slightly backwards compared with the main entrance façade. IT is accessed by a rectangular door in the middle, the five windows of the façade are all rectangular, the ones on the first floor smaller compared with the ones on the ground floor. The part of the façade corresponding with the oven room, has a small square window.



Figure 36: View of the South-West Façade. View of the Services building.

2.2.3.1.2 North-East Façade_Garden Façade

On the NE façade, the main building and the services annex are aligned, therefore the NE façade is clearly divided in two, the part of the façade corresponding to the main building and the other corresponding to the annex of the service part. On the main part of the façade, the noble part, we can see six windows and a door, all rectangular, with a small terrace that gives access to the entrance door. On the first floor, we can see four rectangular windows, two on each side and in the centre, three doors, also rectangular. On the second and last floor, there are six windows in abated arch similar to those of the front façade. The annex has two floors. On the ground-floor there are two windows and a door in the middle, and on the first floor, three windows, all rectangular.



Figure 37: View of the South-East Façade. Coser view of the central structure of the façade.

Comparing the two main façades, the street façade and the garden façade, we can find several similarities, both are designed with a mirrored symmetry respecting a central axis on which the main door is located. Both façades have a balcony on the first floor accessed by three doors, with the family coat of arms present in the centre one.

2.2.3.1.3 South-East Façade

On the SE façade we can find, on the ground floor two windows and a central door, all of them with roman arch. This door is also one of the four entrances to the main building and besides the roman arch; it is also framed with pillars and an epistle. The first floor has two doors in the centre, opening to a small balcony, with two windows on the sides. In the second floor we can find three windows. In this façade we have the peculiarity of having abated arches on the first and second floor. This façade is also one of the most important because it is the one that gives a perfect view towards Serra da Estrela, the highest mountain of the country.



Figure 38: View from the South-East Façade. Closer view of the balcony. View from the opposite side Avenida Aristides de Sousa Mendes

2.2.3.1.4 North-West Façade

The NW façade has two added bodies leaning on the original façade, both corresponding to the services. The first has two floors, giving continuity to the frame of the main building, and the second body is just one floor.

The windows and doors follow the same lines of the ones of the main façade, ground-floor and first-floor rectangular and the second floor with abated arches.



Figure 39: View from the North-East Façade. View from the oven building.

In the middle of the two external bodies, we can find a chimney topped by a weathervane with the shape of a rooster, a traditional element on the Portuguese houses.

2.2.3.1.5 Façades Stonework



Figure 40: View of the Coat of Arms of the main façade. Detail of the decoration flower. Stone work of the window.

The use of stonework was most widespread in old buildings performing two main functions; structurally, as a support like pillars, pilasters, window and door frames and cornices protecting the wood elements from the external environment; decoratively, quite important, marking the quality of the building and the economical power of its proprietors. We can assume that the external image, its value and nobility, is given by the quantity and quality of the stonework used.

The material chosen in Casa do Passal was, again, the granite for its quality and mechanical resistance.

The stonework, in this house is used to underline the shape and typology of the windows, explained above on the description of the building, that can be either in perfect or abated arch or rectangular. The use of decoration helps to organize the hierarchy of the importance of the interior spaces. In this way, from outside, one can easily distinguish and recognize the noble areas and the public rooms from the private ones.

This building shows an obvious influence from the neoclassic period. It is constituted by three different bodies, the central one more stressed and enhanced than the others by a front portico as well as pilasters and friezes on the façade. The stonework on this part has more intricate decorative elements than the others, on the opposite façade.

2.2.3.2 Pavements

EXTERIOR BEARING WALLS_MASONRY GRANITE WALL

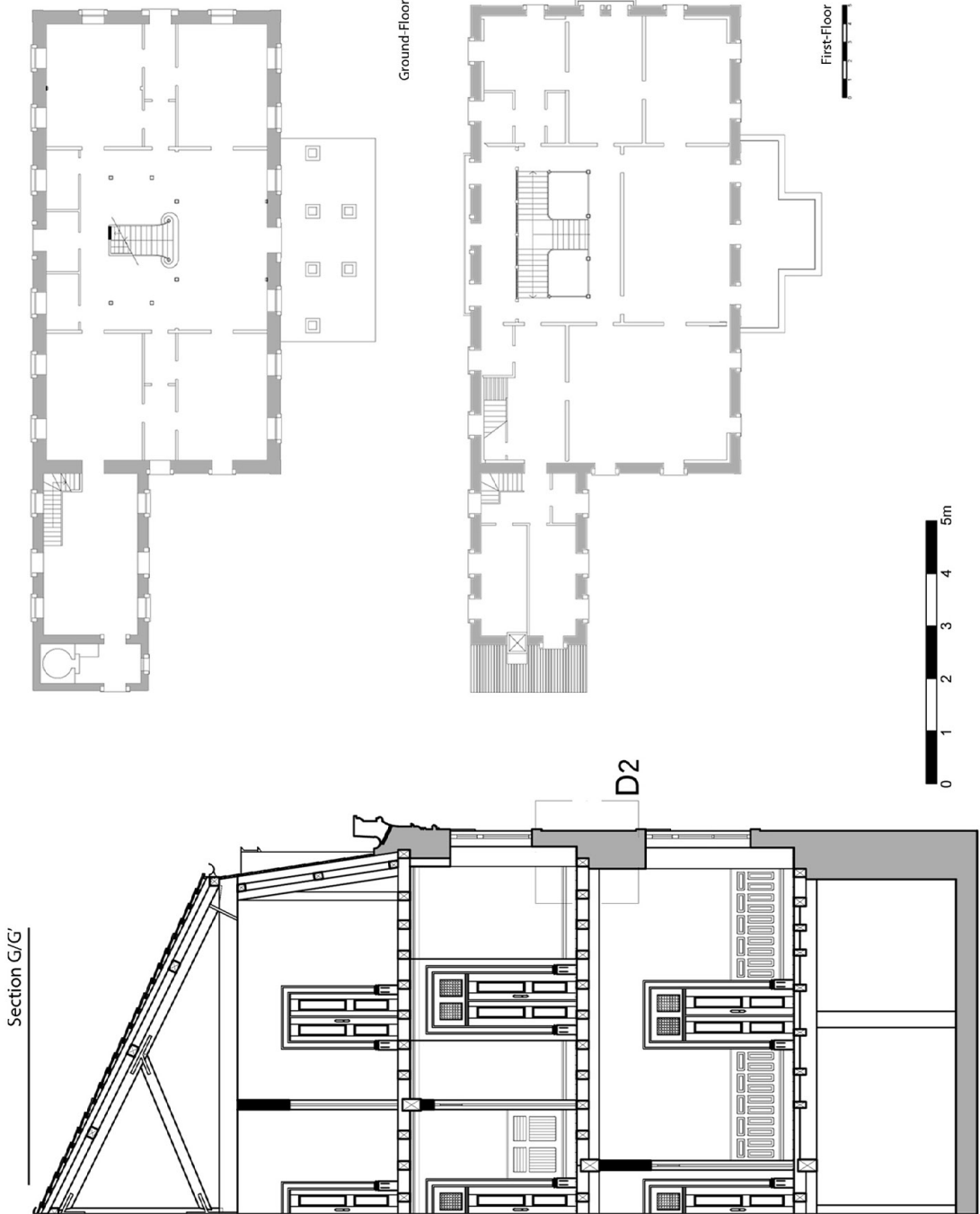
The Granite Masonry Wall is a continuous structural element, part of the total building's envelope, that starts on the foundations and ends on the beginning of the second floor. These walls are normally quite wide (around 0,70 to 0,75 m) on the ground floor, becoming thinner on the upper floors (0,60 m on the first-floor)



The Wall is characterized by roughly cut granite stone blocks, approximately 45 cm height and 72 cm length and when there is two vertical courses, 32 cm width, well interlocked and arranged irregularly. Its arrangement performs mainly horizontal courses. Given its irregularity, we can find pebbles, filling the spaces between the big blocks.



On the openings, like windows and doors, its possible to find some regularity and the dimensions of the blocks are bigger in order to sustain the forces.

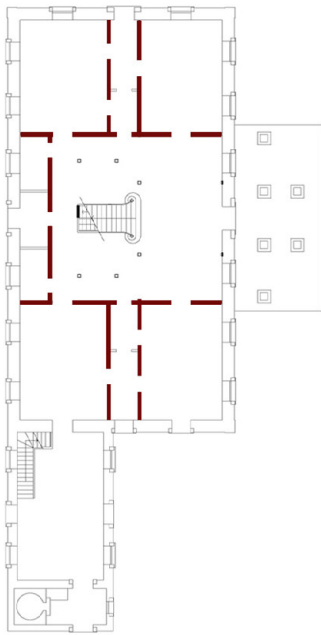


INTERIOR BEARING WALLS "FRONTAIS" I

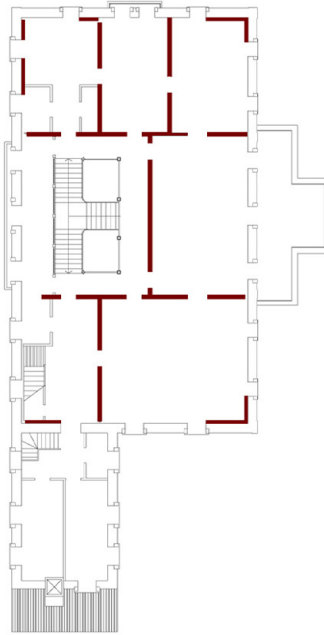
MATERIAL ABACUS



View from a "Frontal" Wall on the Ground Floor.



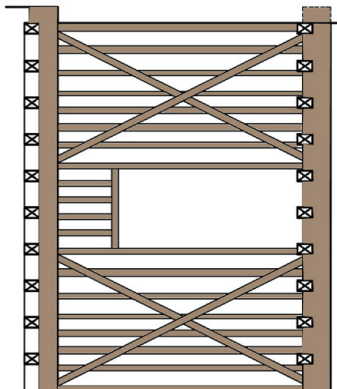
Ground Floor



First-Floor

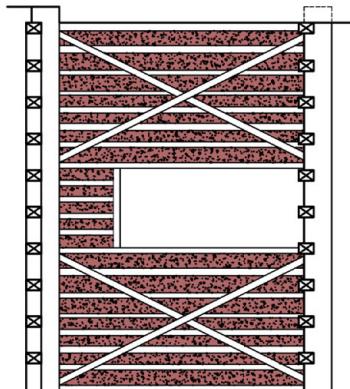
1

The "Frontal" consists on a kind of "armature" or "skeleton" in wood, constituted by a group of wooden boards (between 0,11 and 0,18m width) placed horizontally, vertically and diagonally, forming the famous cross called "cruz de Santo André". These pieces are carved in order to be perfectly fit and adjusted and then nailed to each other and to the groundsel, connecting with the pavement.



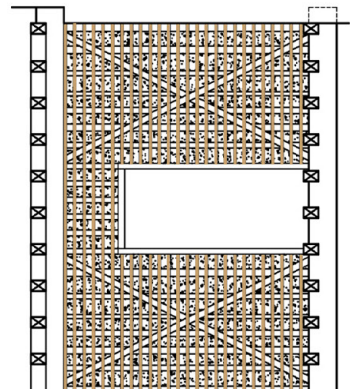
2

The spaces between these wood elements are filled with stone rubble and lime stone mortar creating a rigid element that gives a compact function of the wall.



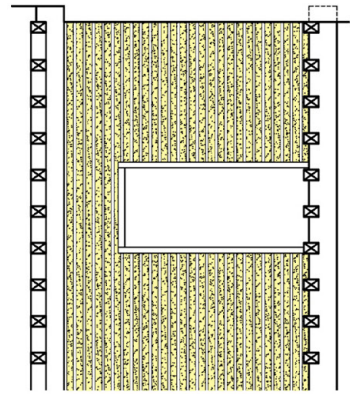
3

After the mortar, it is nailed to the main wood skeleton several wooden strips called "fasquiado" with approximately 2 to 3,5 large and 1,5 cm thickness. Separating each other will be approximately 3 to 5 cm.

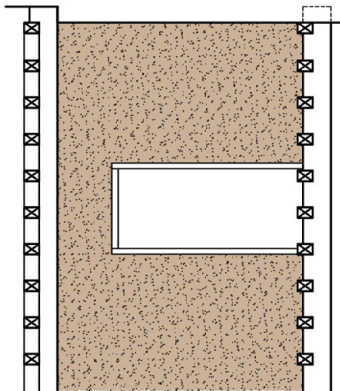


4

In between the "fasquiado" it is applied the first layer of plaster. This layer can be considered as the rough plaster since its main function consists on protecting the wood skeleton and get attached to the "fasquiado" creating a compact surface.

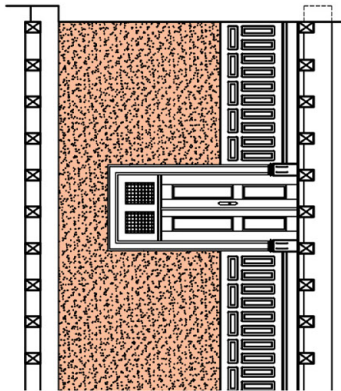


INTERIOR BEARING WALLS "FRONTAIS" II



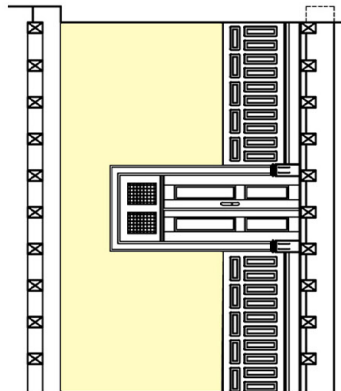
5

The second layer of Plaster, finer compared with the first one, covers the entire wall creating an homogeneous surface in which the final layer with me applied.



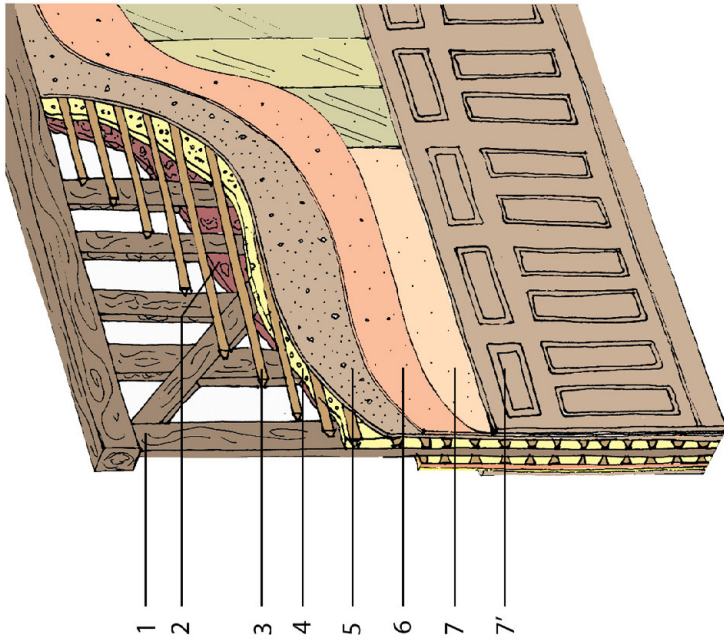
6

The final layer of the plaster is the finest one. It forms an underlying plane surface where the last layer of the wall will be applied.



7

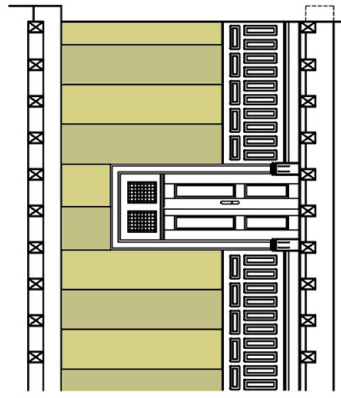
On the house it can be found two types of the finishing layer, being the White Paint on of them.



1
2
3
4
5
6
7
7'



View of the "Frontais" Wall with the different Plaster layers.

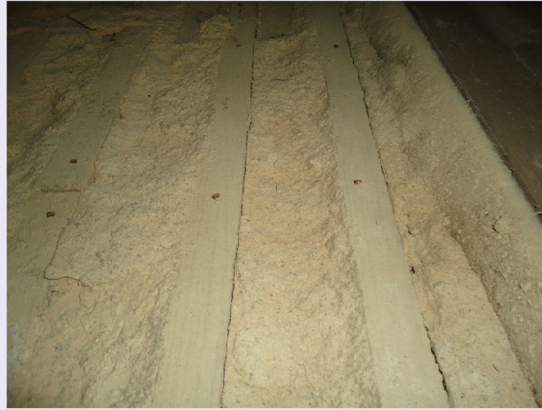


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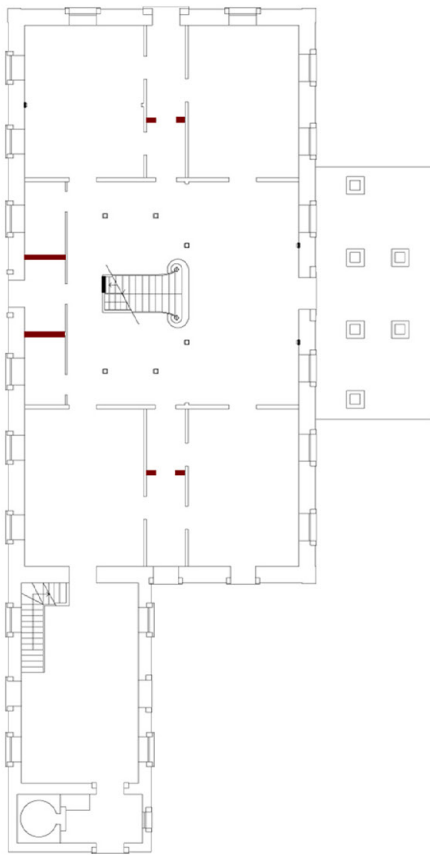
Although is no longer present except for some occasional pieces, the Wall Paper was the second layer of the wall. Its patterns would match the decoration of the different rooms.

INTERIOR PARTITION WALLS "TABIQUES" I

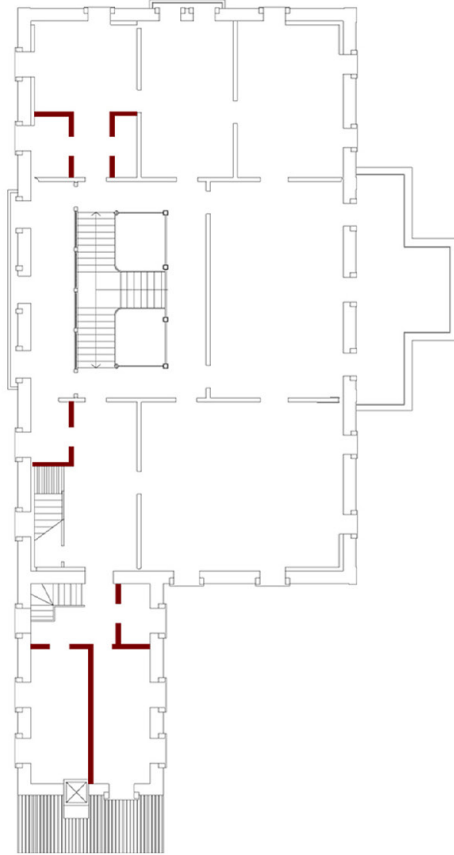
MATERIAL ABACUS



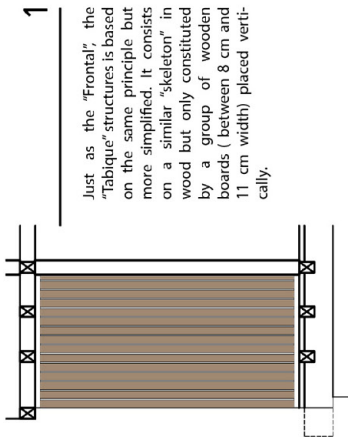
Detailed views from a "Tabique" Wall on the Ground Floor.



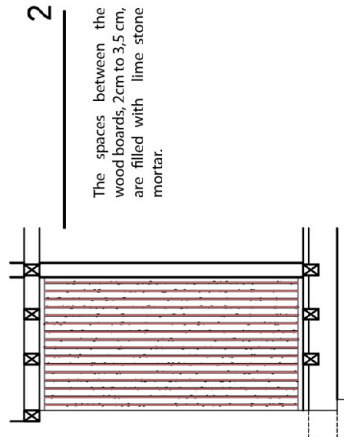
Ground-Floor



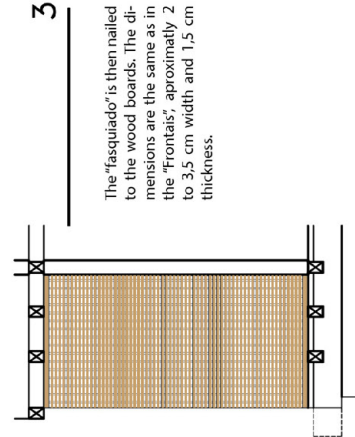
First-Floor



1 Just as the "Frontal", the "Tabique" structures is based on the same principle, but more simplified. It consists on a similar "skeleton" in wood but only constituted by a group of wooden boards (between 8 cm and 11 cm width) placed vertically.

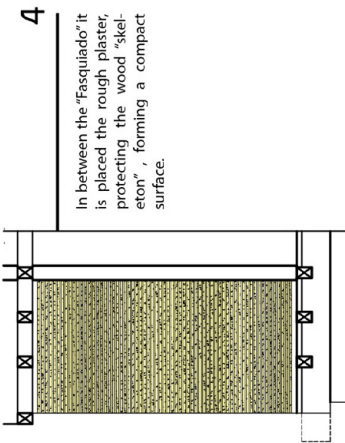


2 The spaces between the wood boards, 2cm to 3.5 cm, are filled with lime stone mortar.

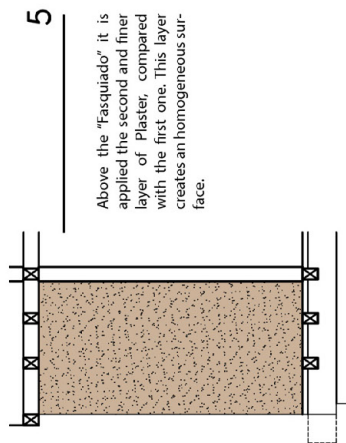


3 The "fasquiado" is then nailed to the wood boards. The dimensions are the same as in the "Frontals", approximately 2 to 3.5 cm width and 1.5 cm thickness.

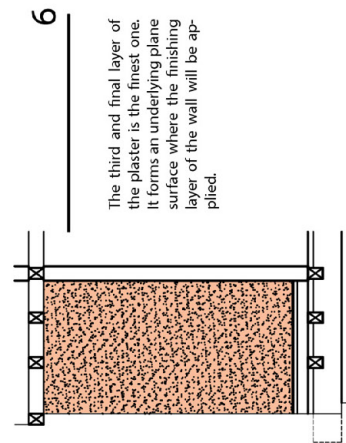
INTERIOR PARTITION WALLS "TABIQUES" II



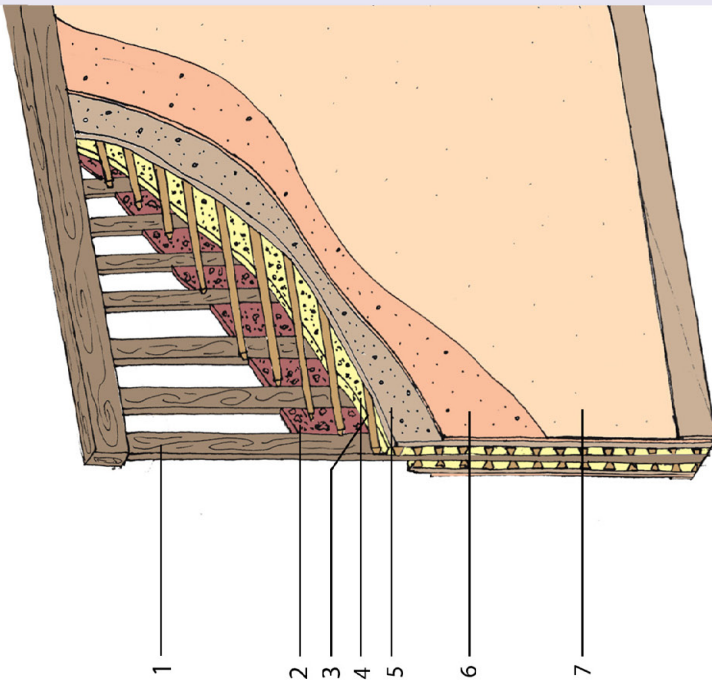
4
In between the "Fasquiado" it is placed the rough plaster, protecting the wood "skeleton", forming a compact surface.



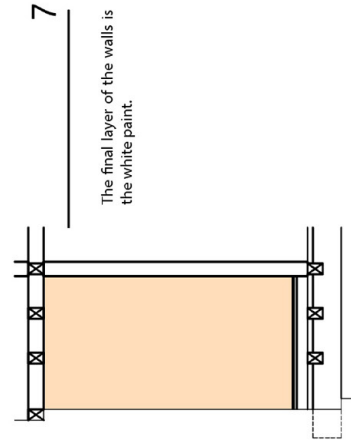
5
Above the "Fasquiado" it is applied the second and finer layer of Plaster, compared with the first one. This layer creates an homogeneous surface.



6
The third and final layer of the plaster is the finest one. It forms an underlying plane surface where the finishing layer of the wall will be applied.



View from a "Tabique" wall, part of the partition on the Services Building.



7
The final layer of the walls is the white paint.

MATERIAL ABACUS

OAK WOOD FLOOR

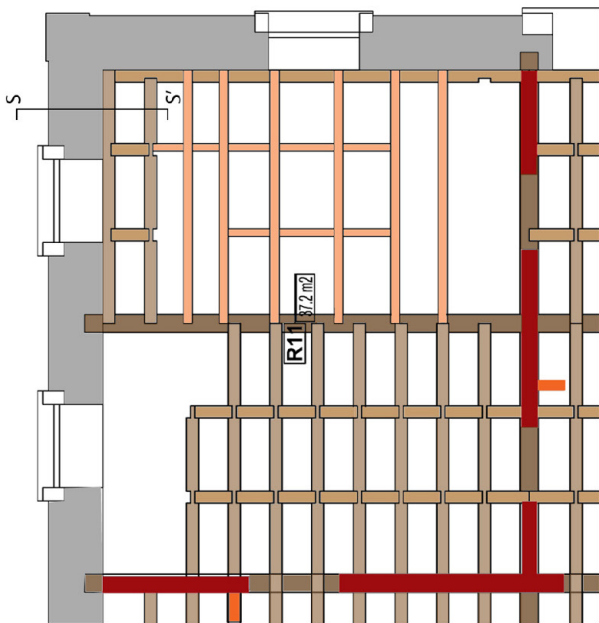
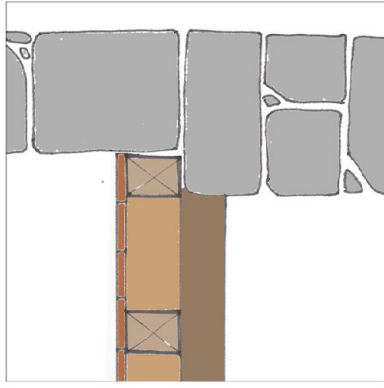


The floor structure is divided in two sections, the first corresponding to the primary beam which is aligned with the main axes of the house and supported by the granitic pillars on the basement and the secondary beams, placed transversally regarding the first one and repeated following always the same metric.

It was very common the use of the so called "tant plein que vide" a French term meaning "as full as empty" which refers that the width of the beam has the same measure as the interval between one beam and the other. So basically the beams with 0,15 m width corresponds to 0,15 m of interval (0,30 from each of the axes).

Sketch S/S'

Connection between the Masonry wall and the wood floor.



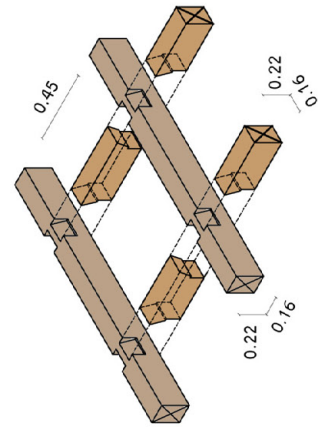
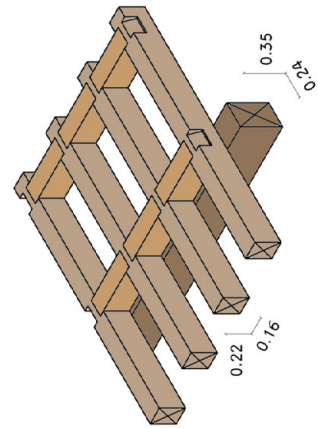
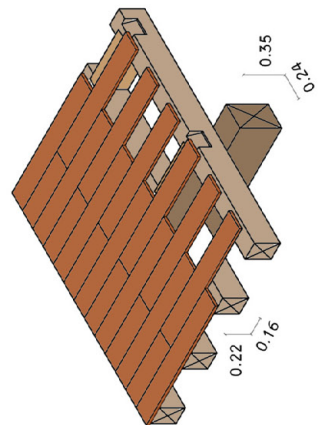
- Primary Beam
- Secondary Beam
- "Tarugos" Beam
- Primary Beam
- Interior Bearing Wall "Frontal"
- Partition Wall "Tabique"



1

2

3

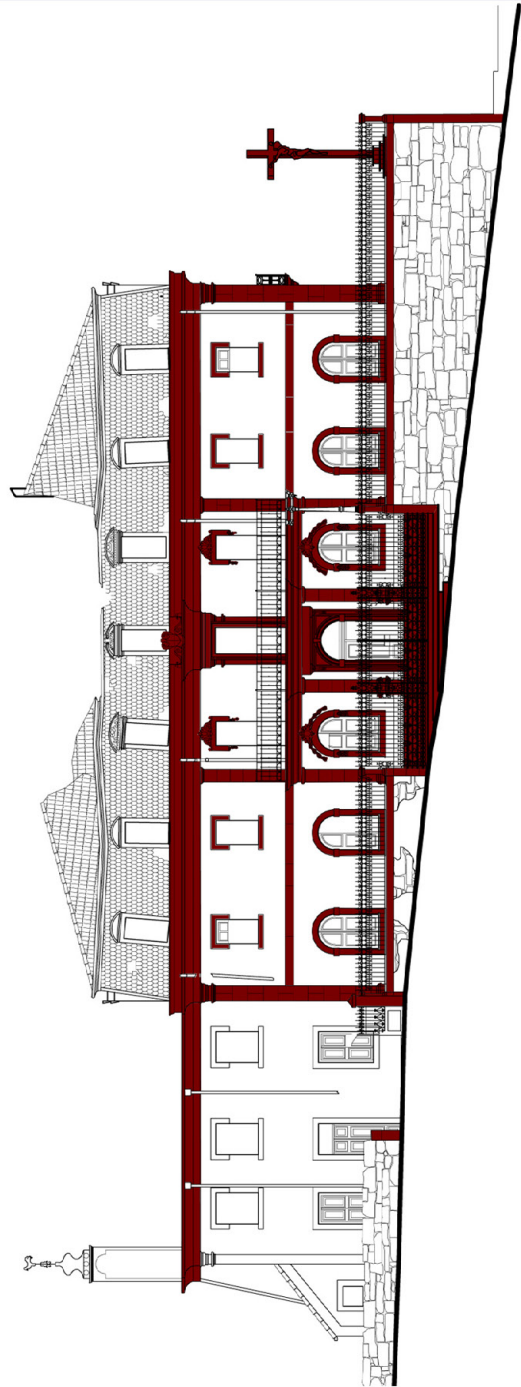
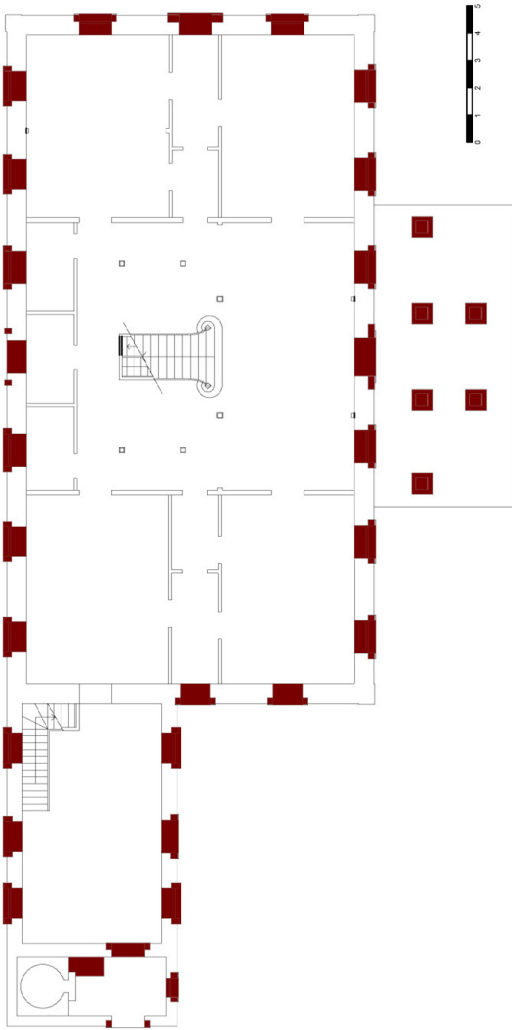


GRANITE

MATERIAL ABACUS



The Yellow Granite, used in the house it is typical from this region. It is used mainly on the frame work of the façades as well as the balconies floor and pillars.



WOOD: CHESTNUT

MATERIAL ABACUS



View from R05 Wainscot.



View from the Wood elements on R01, the main stairs, pillars and handrails.

The chestnut is used in all the interior wood elements such as Doors, Windows, Wainscot and Footers. It is also part of the decoration since in R01 it can be found, covering the beams and decorated with paintings.

- █ Windows and Doors
- Wainscot and Footers.



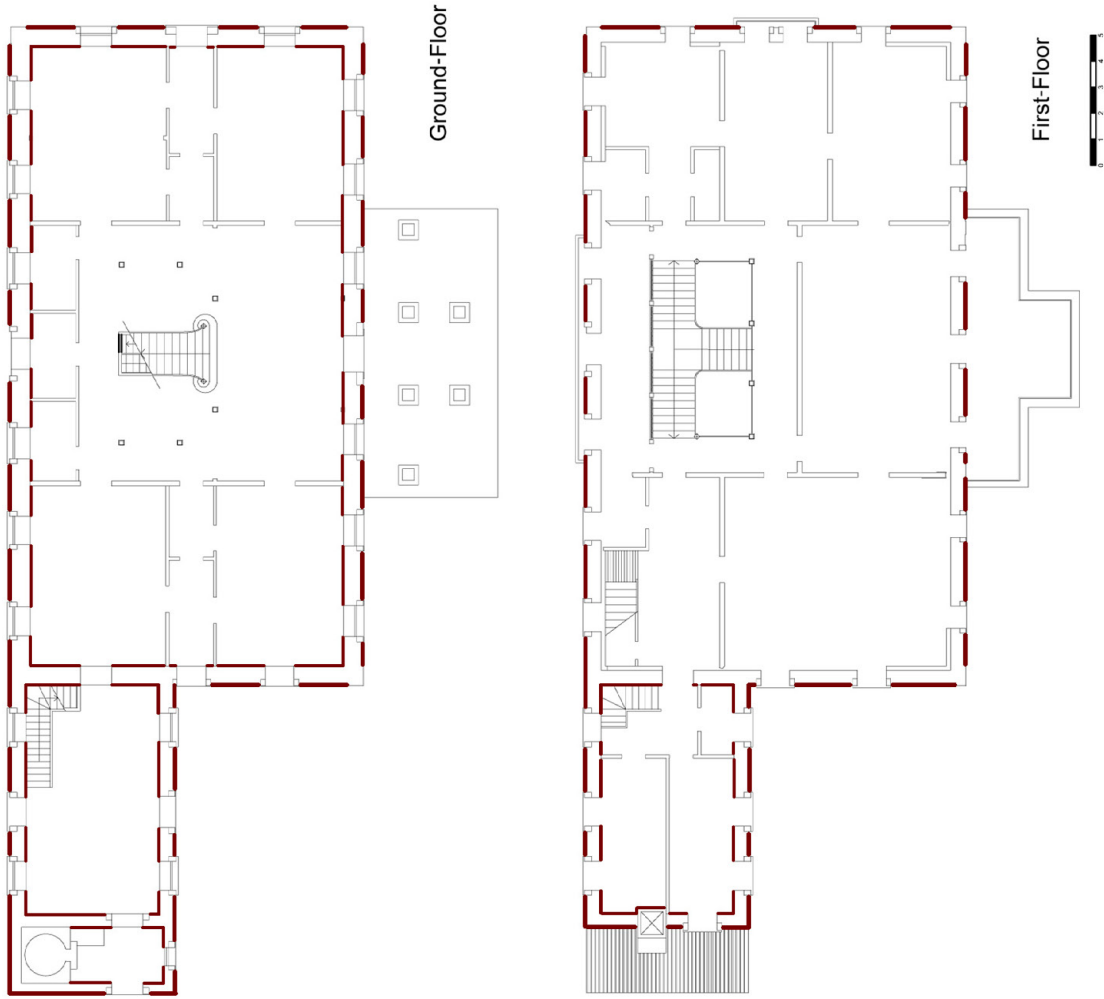
HYDRATED LIME STONE PLASTER

MATERIAL ABACUS



The Mortar is divided in three layers, each one with a different composition. The first one, applied directly on the masonry wall, is the "roughcast" mortar applied like splashes to cover all the irregular surface of the wall, in this way the second mortar grasps more easily the first one. The second layer, the first plaster, with a finer composition compared with the mortar, homogenizes the surface for the last layer, this one more finer, creates a plane surface to be painted.

— Interior Plaster
— Exterior Plaster



OCRE PAINT



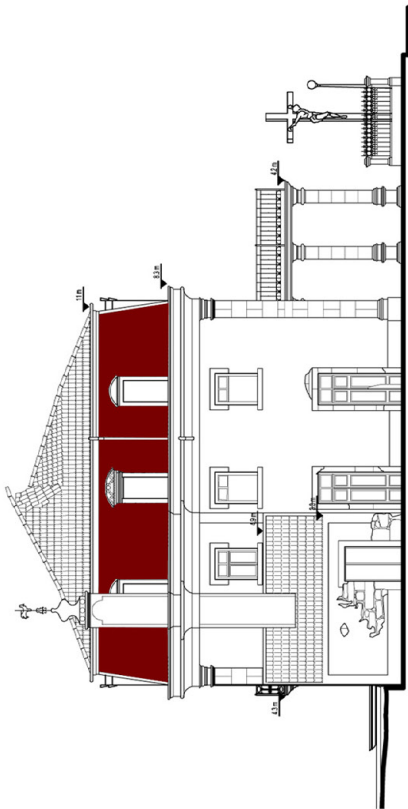
The Ocre Paint can be found on the walls for the main house' façade. On the services building, it is used on the window frames, a very typical decoration of the portuguese houses. Given the level of decay of the façades, its hard to find any trace of this paint, except on the protected areas like under the balconies.



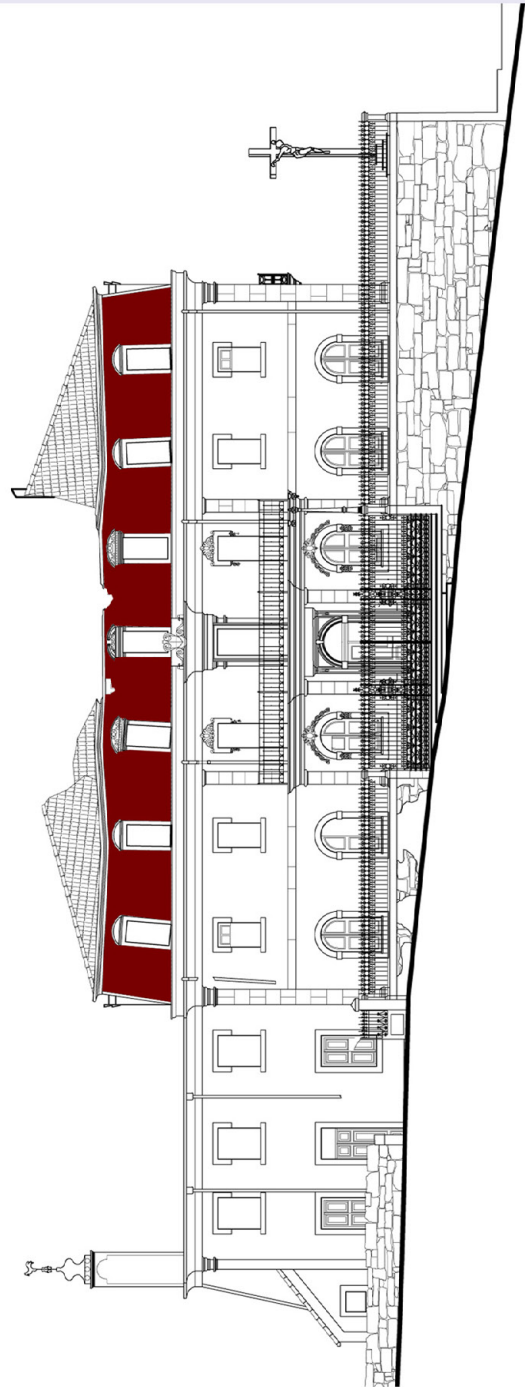
SLATE TILES



The Slate Tiles are part of the envelope of the Mansard Floor. It protects the wood structure of the floor. Each slate is nailed on the wooden stripes of the roof. Its dimensions are: 30 cm length, 14 cm large and 0,7 cm thickness.



North-West Façade



South-West Façade

BRICK TILES

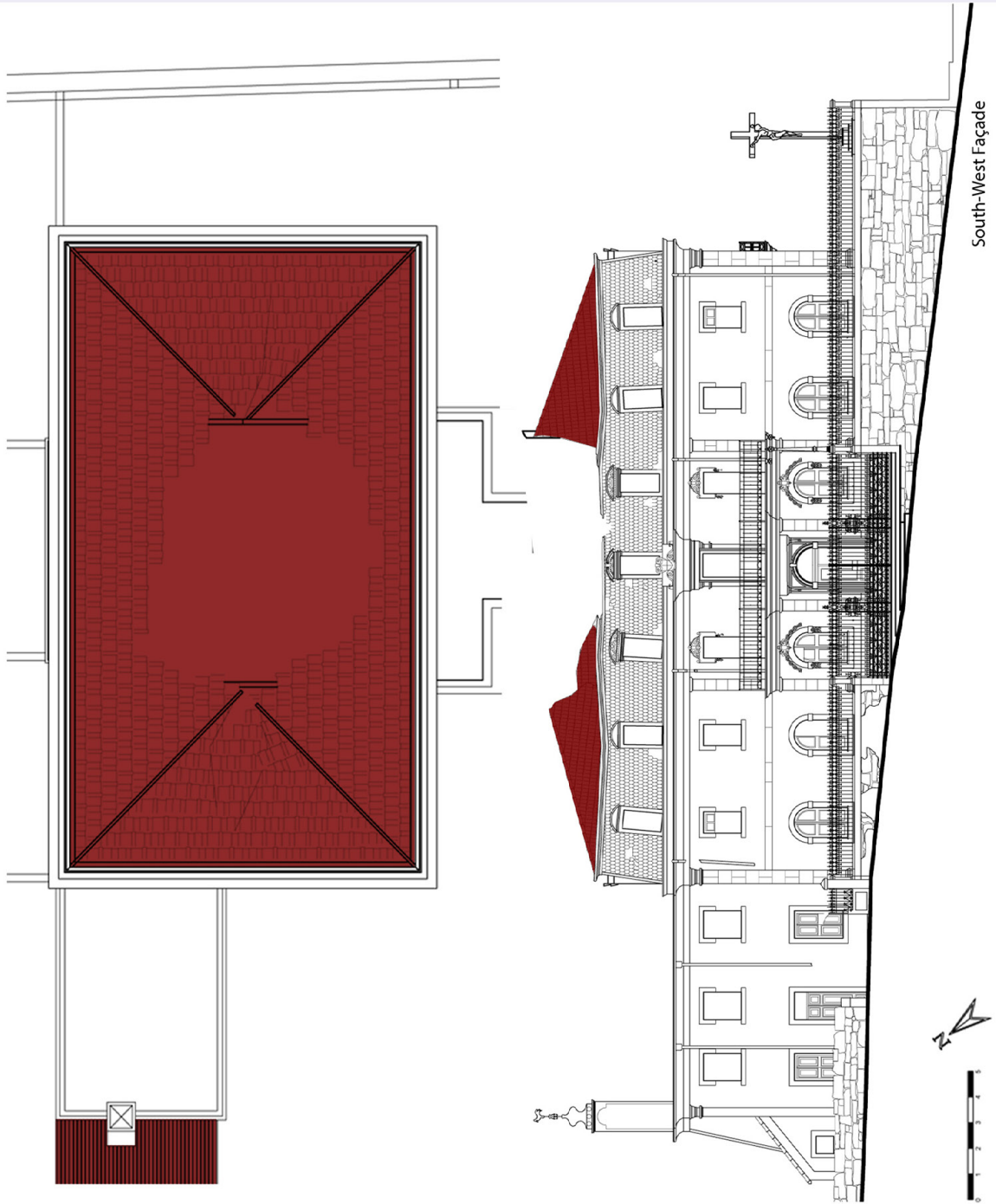


Roof's view from the North-East Façade.



View of the three roofs, the main house, the oven and the annexed buildings.

The Roof of this house is a typical French style. It was used the Marseille tile type with approximately 24 cm width and 38 cm length and it covers the main house' roof, the oven's building and the annexed one.



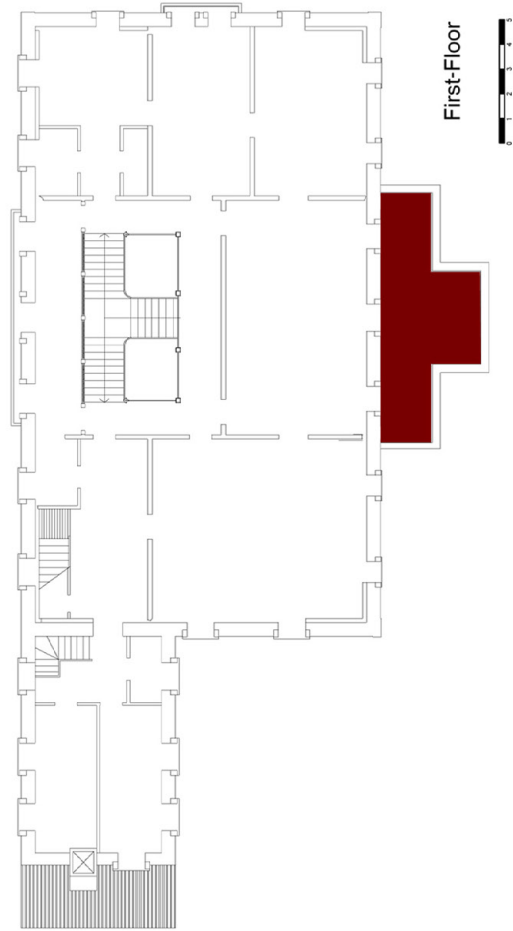
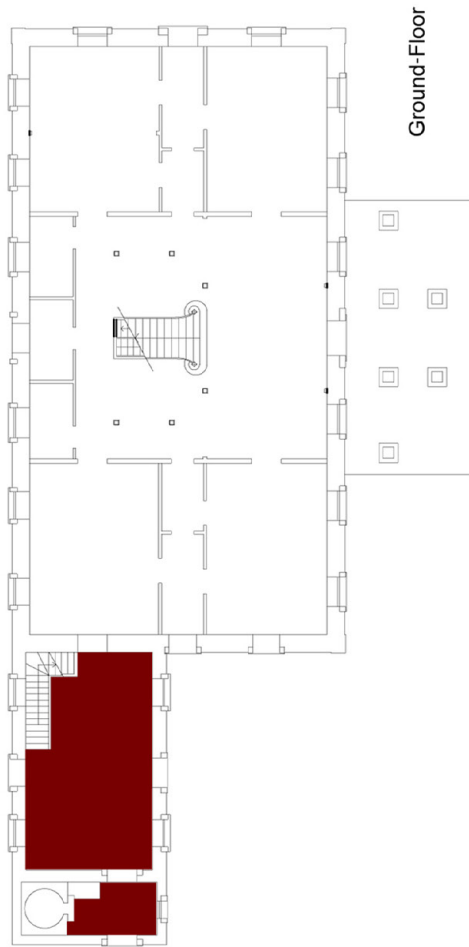
South-West Façade



CONCRETE FLOOR

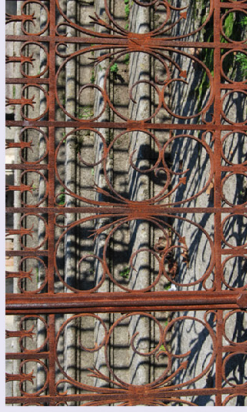


The Concrete Floor can be found on the kitchen and on the main Balcony' pavement. It can be presumed that it was used as a underlying material for a supposed floor, no longer present in the building.



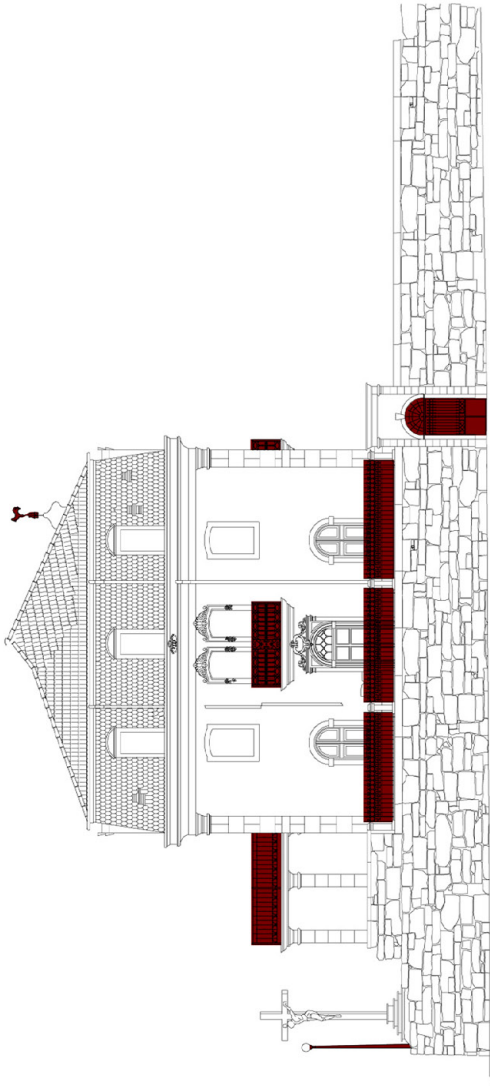
Metal: WROUGHT IRON

MATERIAL ABACUS

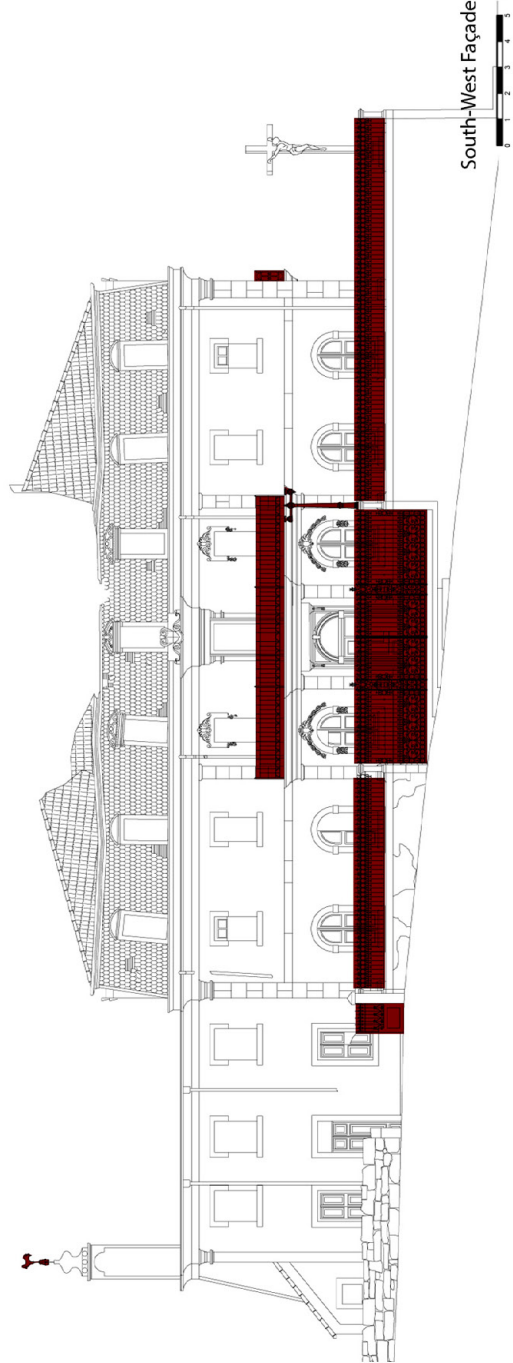


The iron is used mainly on the grating and exterior gates around the house. It is also used on some decoration elements such as the figure of the fowl on the top of the chimney and the stems on the roof.

Structurally, and less visible, it is also used as an attachment element, fixing the wood elements to the masonry walls and the different pieces of the timber structure.



South-East Façade

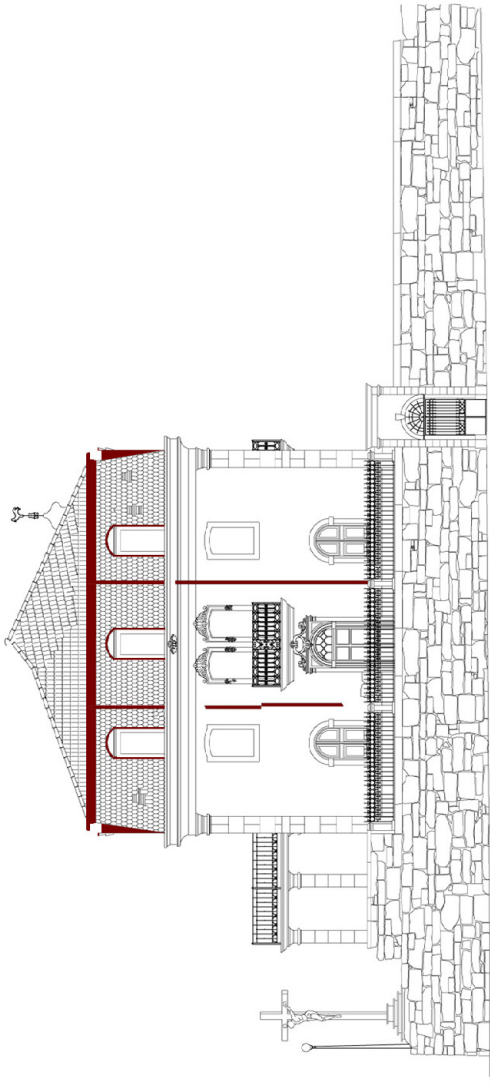


South-West Façade

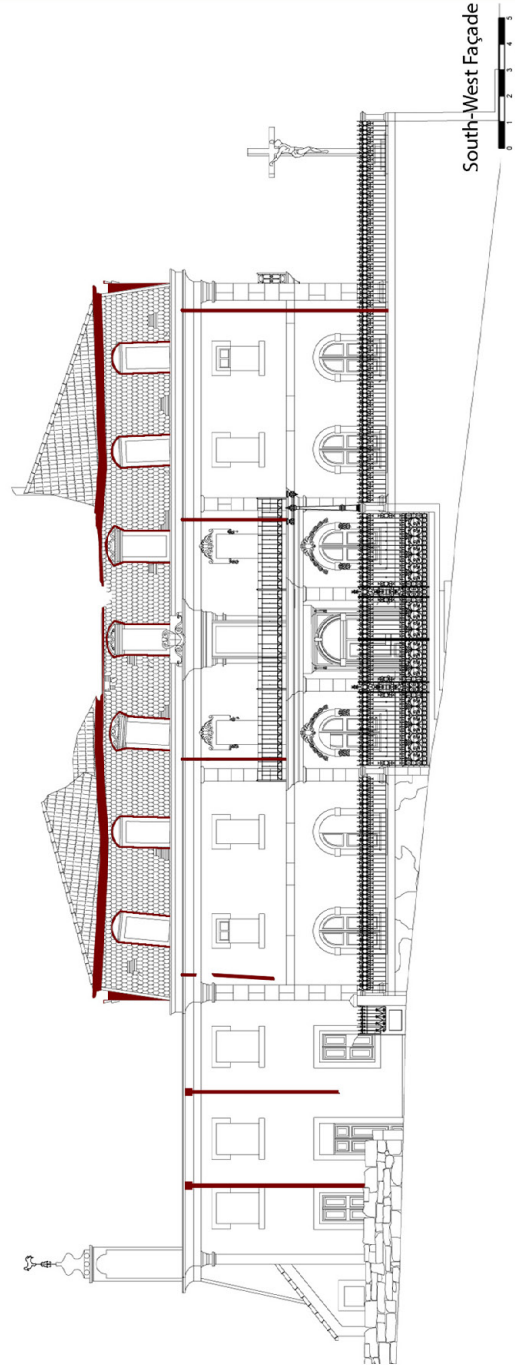
Metal: ZINC



The Zinc is used in some technical elements such as the gutters and as a "protection coat" for the windows on the mansard floor (it covers the wood in order to protect it against the rain).
In the interior of the house it is also used for the plumbing elements.



South-East Façade



South-West Façade

STAINED GLASS

MATERIAL ABACUS



The stained glass is used on the doors decoration. Every door on the main building has two upper windows with a geometric stained glass decoration in red and yellow. The only exception is on the ground floor in which we can find two doors, d4 / d4a, with a more complex decoration, flowers and leaves, resembling some art nouveau piece.



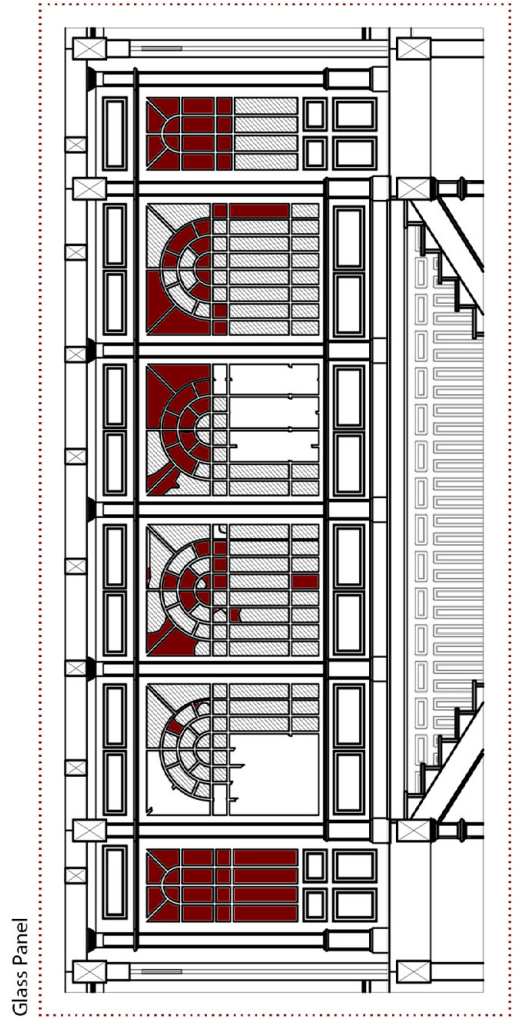
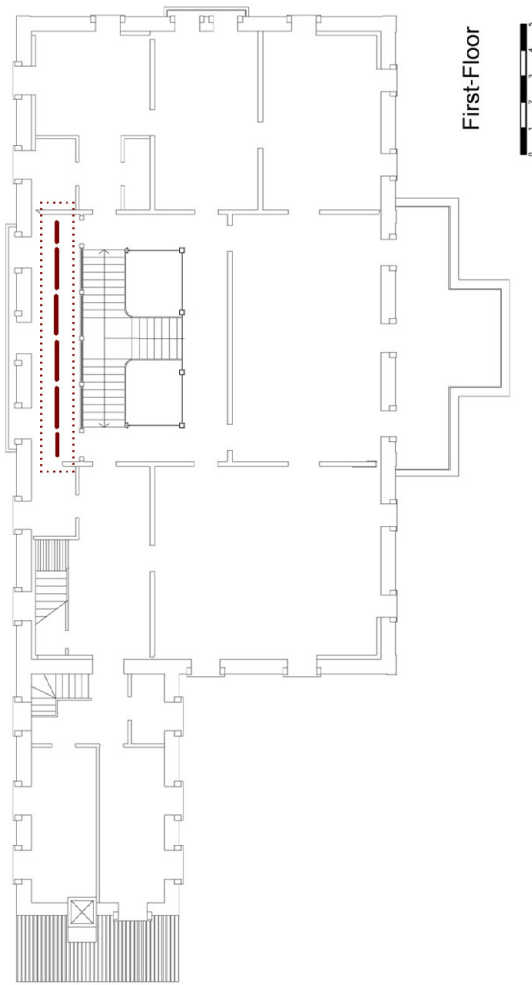
COLOURED GLASS

MATERIAL ABACUS



View from the Glass Panel

The Coloured Glass can be found on the Glass Panel on the entrance room R01. Each glass row is coloured with a different colour, changing from orange, red, green and blue. This glass panel, with 7,3 m width and 3,1 m height, is divided in four "windows" in the center and two lateral doors.



WALLPAPER

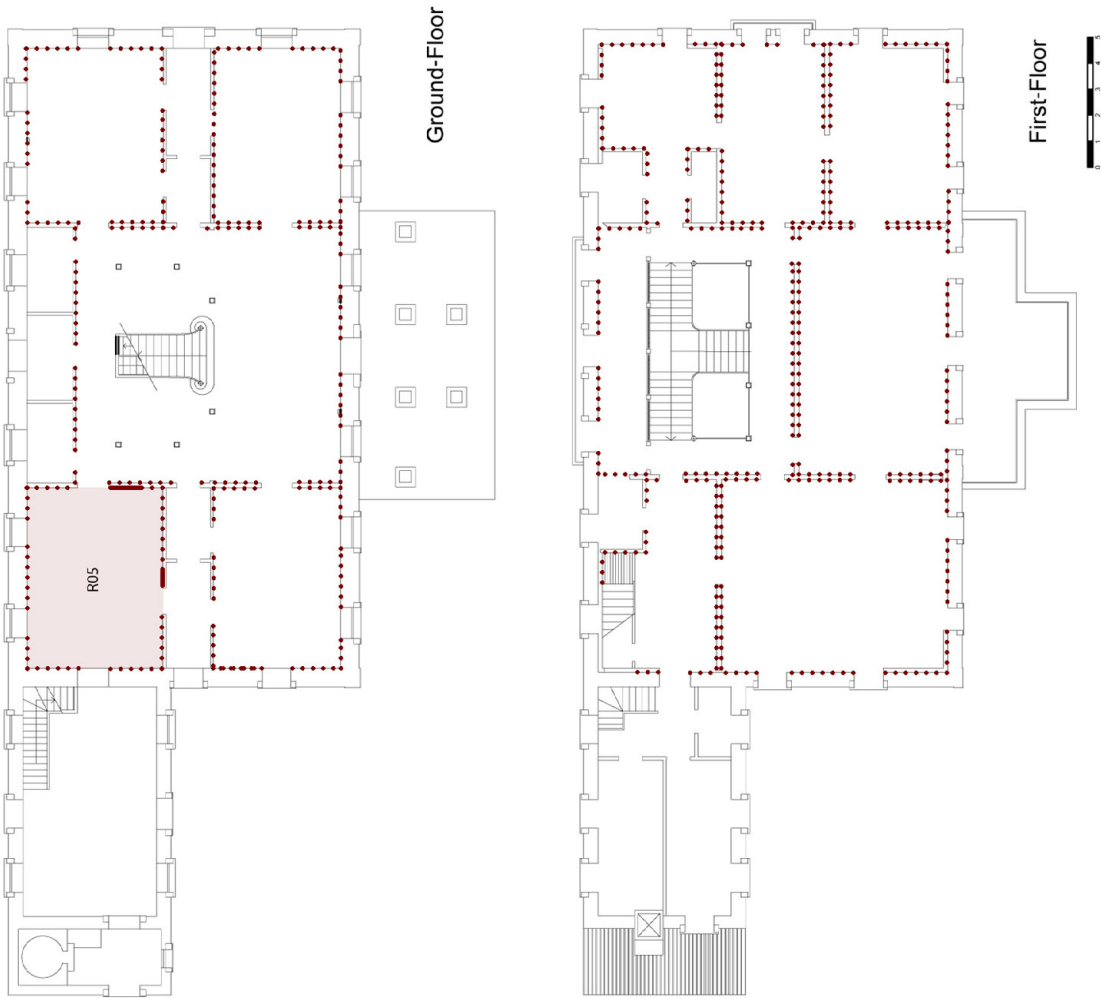
MATERIAL ABACUS



View from the two remaining pieces of the wallpaper left in the house.

The Wallpaper was part of the finishing layer of the Interior Walls. It was part of the decoration, changing the colours and patterns according with the decoration of the room. Today there is only two pieces remaining on R05 on the Ground Floor.

- Wallpaper traces remaining
- Wallpaper according with the original state of the house





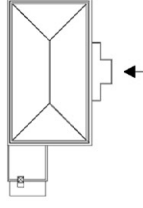
Politecnico di Milano
Architecture Faculty
Master in Architecture

Restoration of Aristides de Sousa
Mendes House
Cabanas de Viriato ,Portugal

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Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(N° 767291)



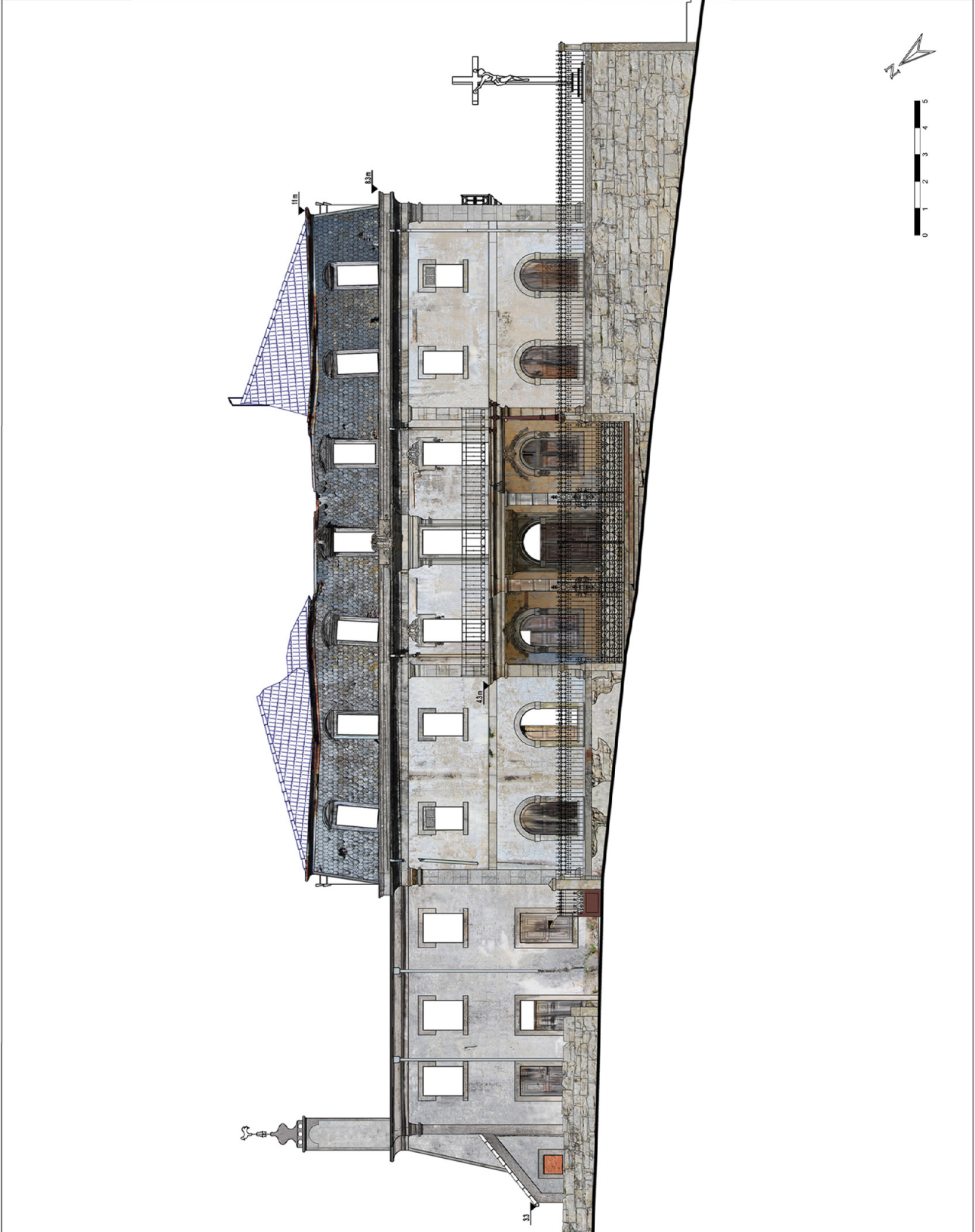
Legend:
 Design Hypothesis

Façades
(Actual State)

South-West Façade

02/10/2013

11





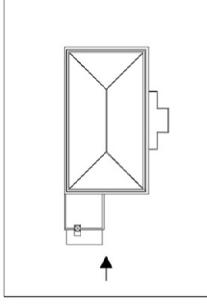
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Legend:

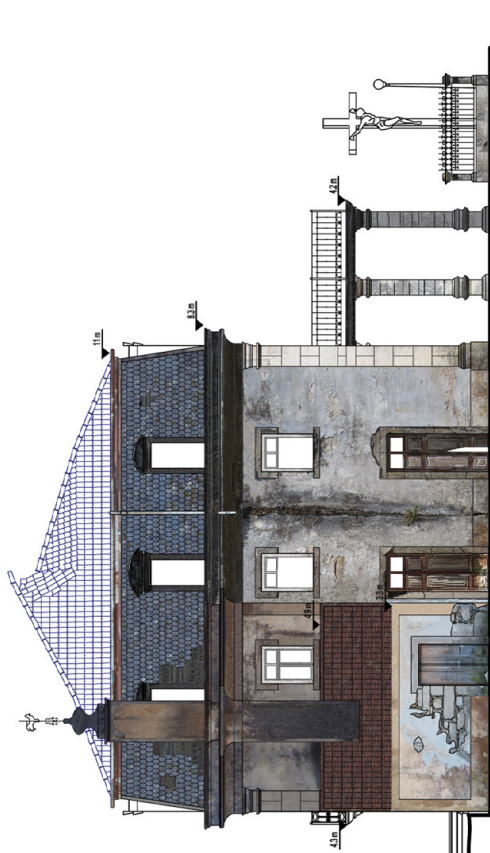
Design Hypothesis

Façades
(Actual State)

North-West Façade

02/10/2013

12





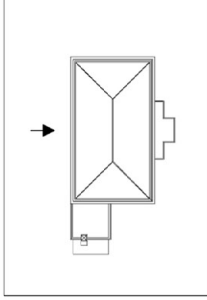
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Legend:

 Design Hypothesis

Façades
(Actual State)

North-East Façade

02/10/2013

13





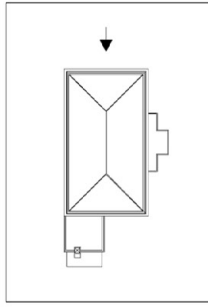
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Legend:

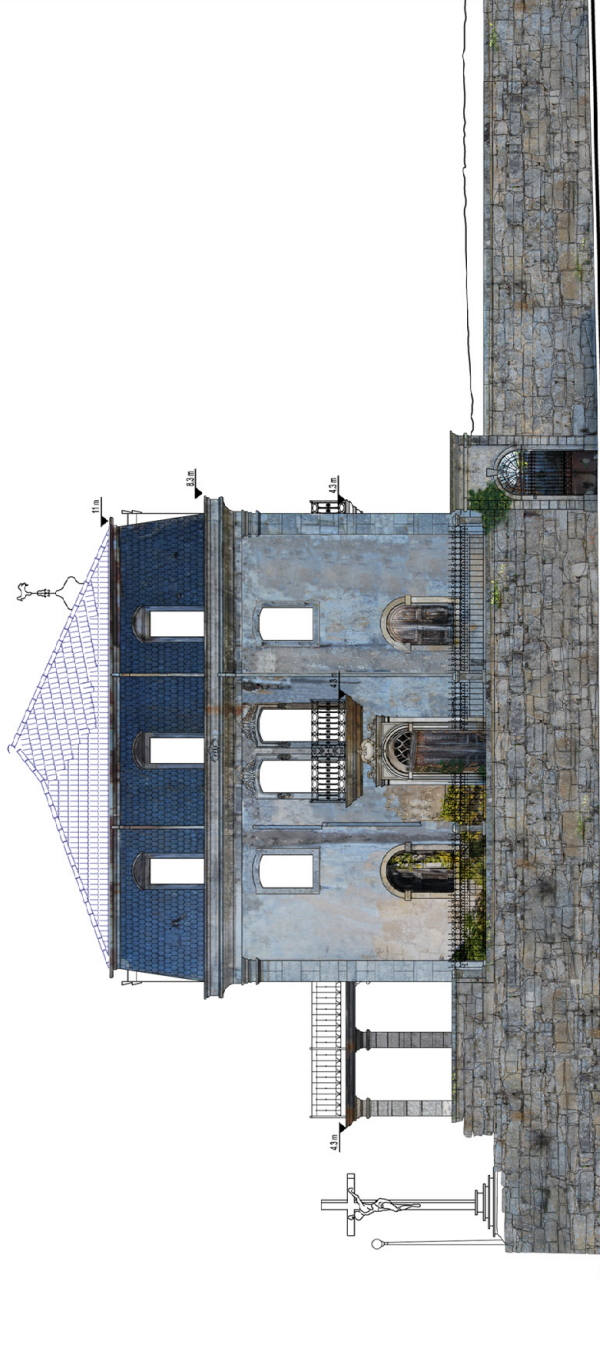
Design Hypothesis

Façades
(Actual State)

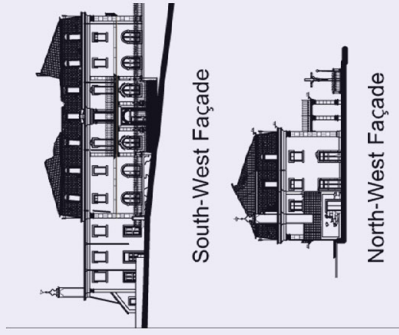
South-East Façade

02/10/2013

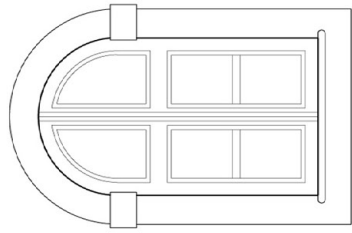
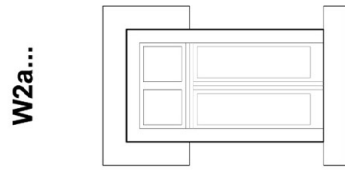
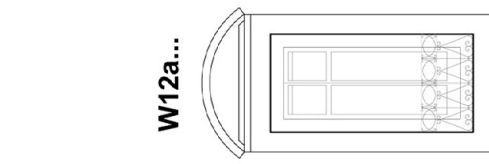
14



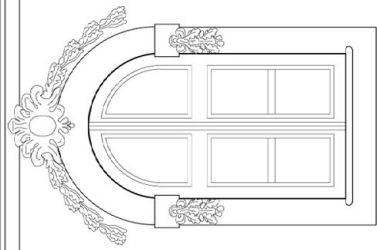
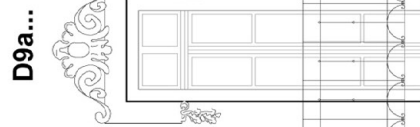
ARCHITECTURAL ABACUS



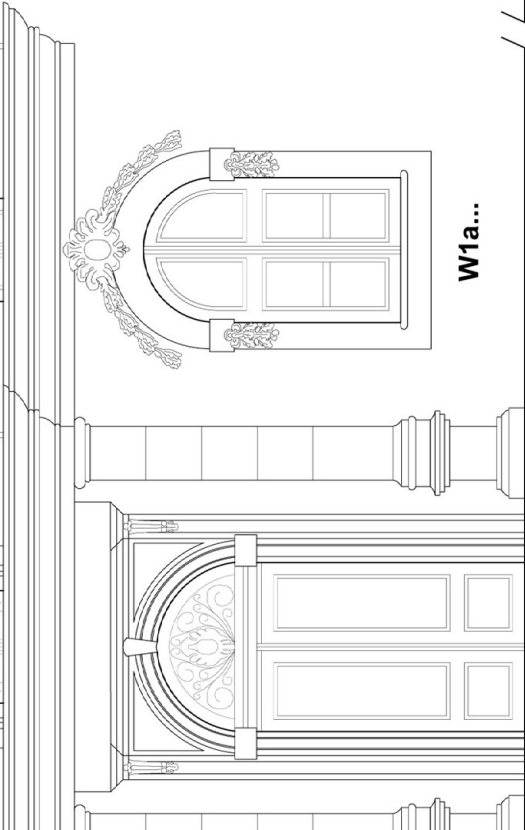
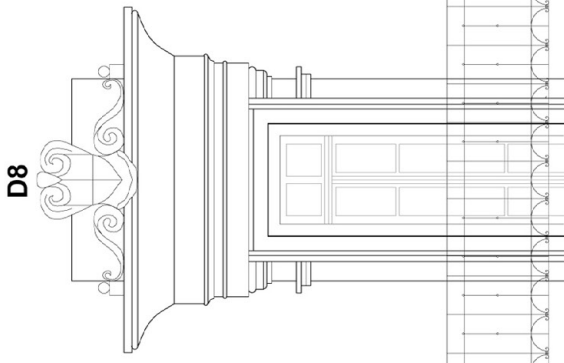
Legend:
— Missing Elements



W2a...



W1a...

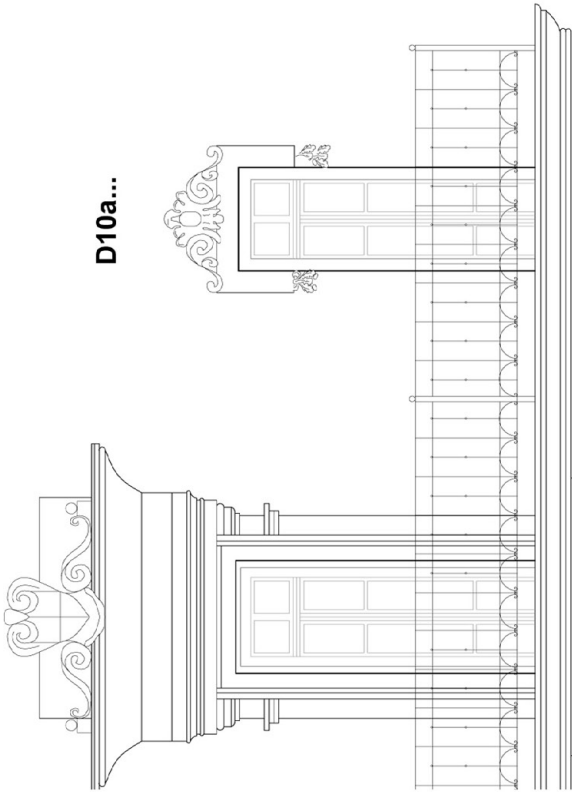


D1

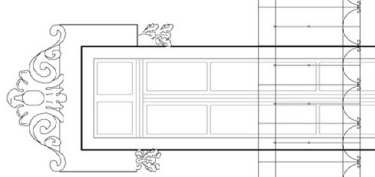
DOORS AND WINDOWS_FAÇADES

ARCHITECTURAL ABACUS

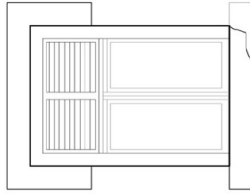
D11



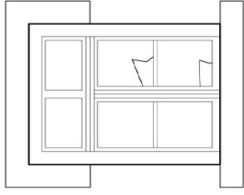
D10a...



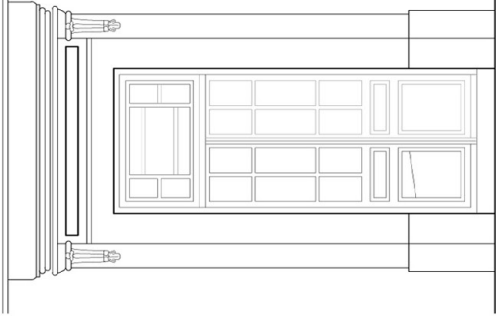
W10a...



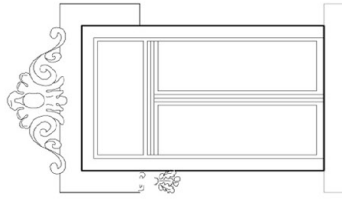
W8a...



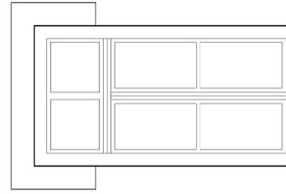
D6



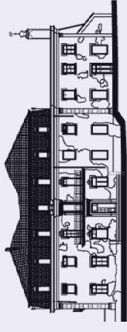
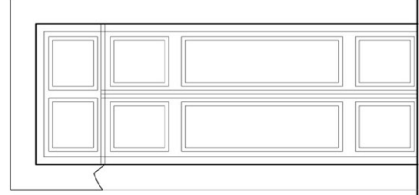
W7a...



W6a...



D2a...



North-East Façade



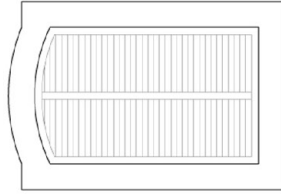
North-West Façade

Legend:
— Missing Elements

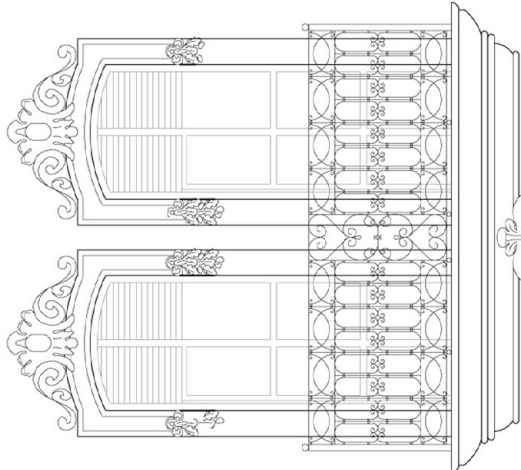


ARCHITECTURAL ABACUS

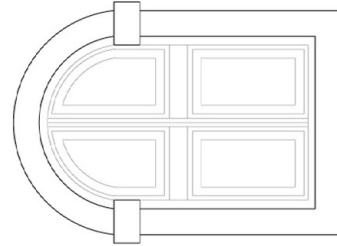
W11a...



D12a

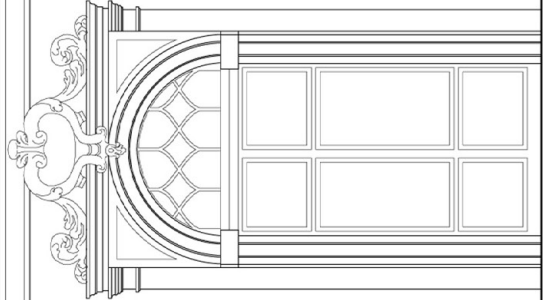


D12

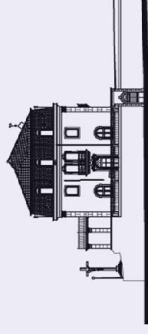
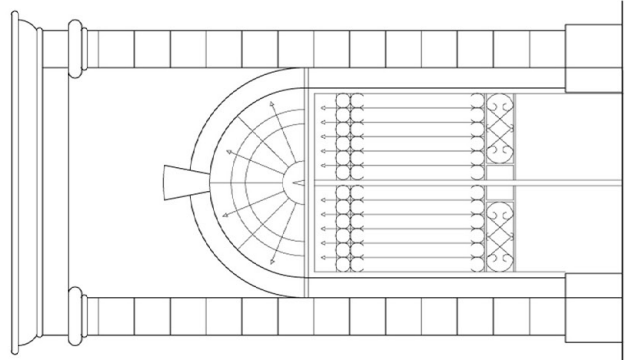


W7a...

D7



G4...



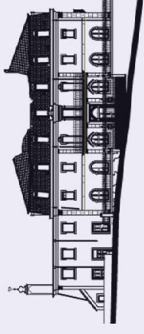
South-East Façade

Legend:
— Missing Elements



DOORS AND WINDOWS_FAÇADES

ARCHITECTURAL ABACUS



South-West Façade

Legend:
— Missing Elements

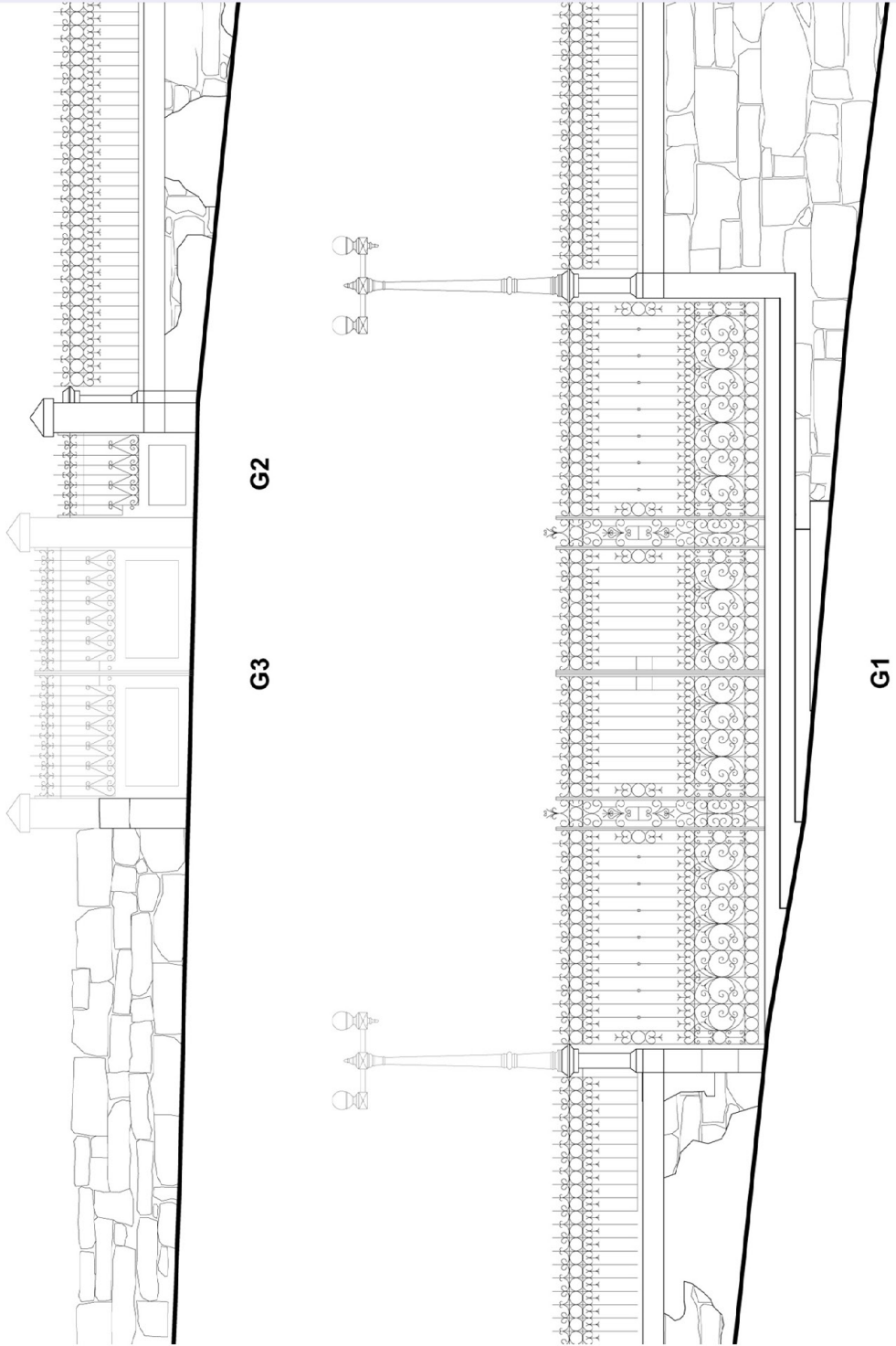




Figure 41: View of the Typical Pavements on the Services Room and on the main Hall.

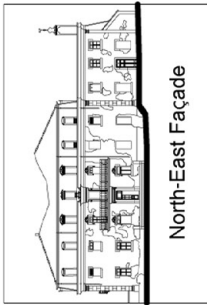
The pavement has two main functions, decorate and protect the floor structure. Being totally in wood, a plain planking was chosen characterized by what is called “lay joint” in which the thickness of the board (around 0,02 m) is divided in two, one more advanced than the other in order to fit the other board in the negative way to be perfectly connected. The composition of the pavements differs according to the rooms and their functions. It could be put simply linear, a simple way for the service floors or with more complex compositions on the noble rooms like mixing diagonal boards with horizontal, etc.

2.2.3.3 Ceilings




The ceiling, much like the pavements, are a wood structure composed by boards (around 0,02 thickness) arranged in different ways. The ceilings present a more intricate solution than the pavements. The most typical composition is the one called “saia e camisa” (skirt and shirt) which consists in overlapping the boards. This composition is more frequent in the main rooms. In the entrance we can find a composition made with coffered elements. All the ceilings are varnished with different tones or even painted, like in the entrance, to enhance the composition.



Figure 42: View from the 2° Floor Ceiling and details of the Hall’s Ceiling.



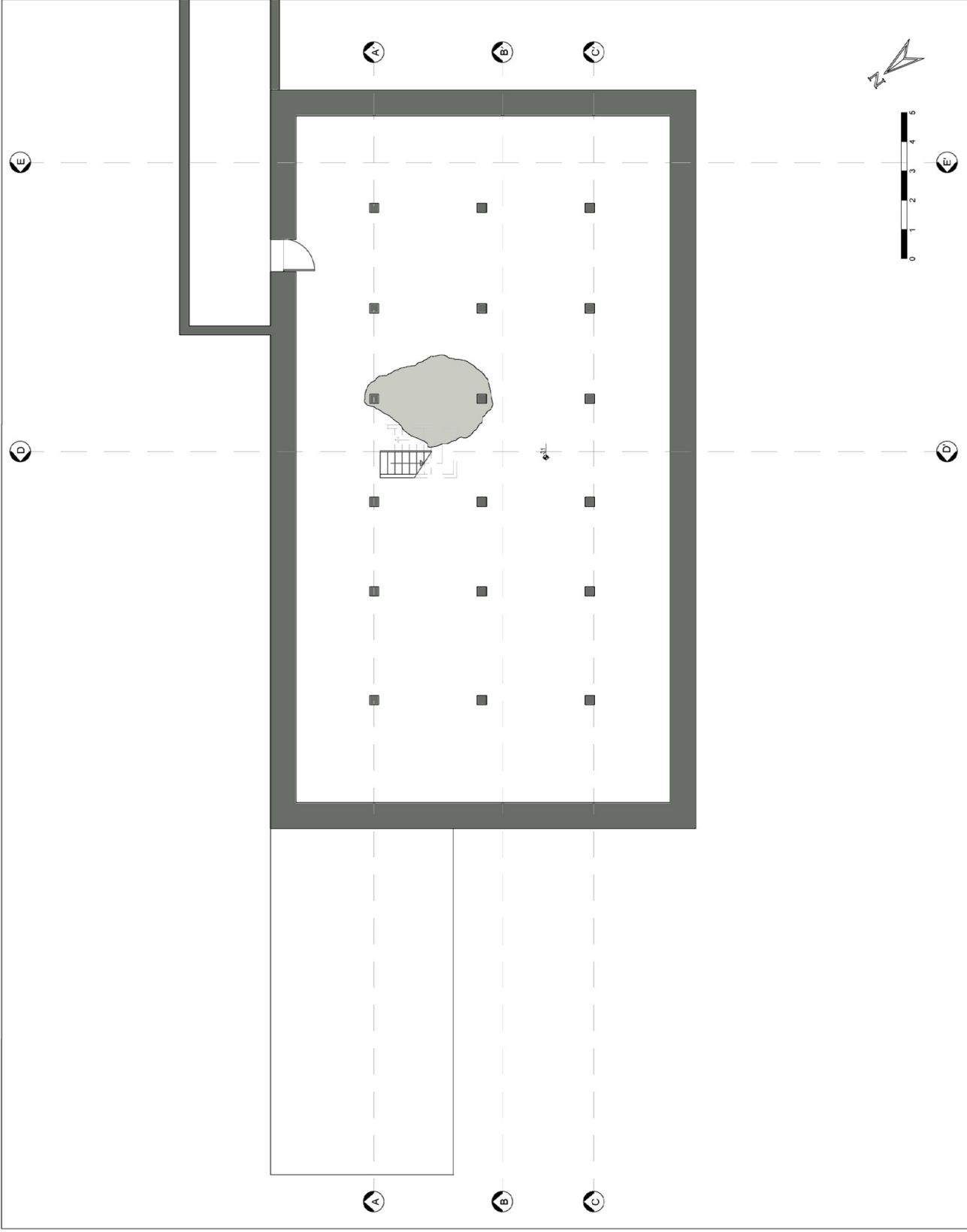
Legend:

-  Masonry Walls
-  Horizontal Floor
-  Granite Rock

Plans
(Actual State)

Basement Floor

02/10/2013 15





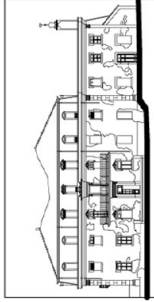
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North-East Façade

Legend:

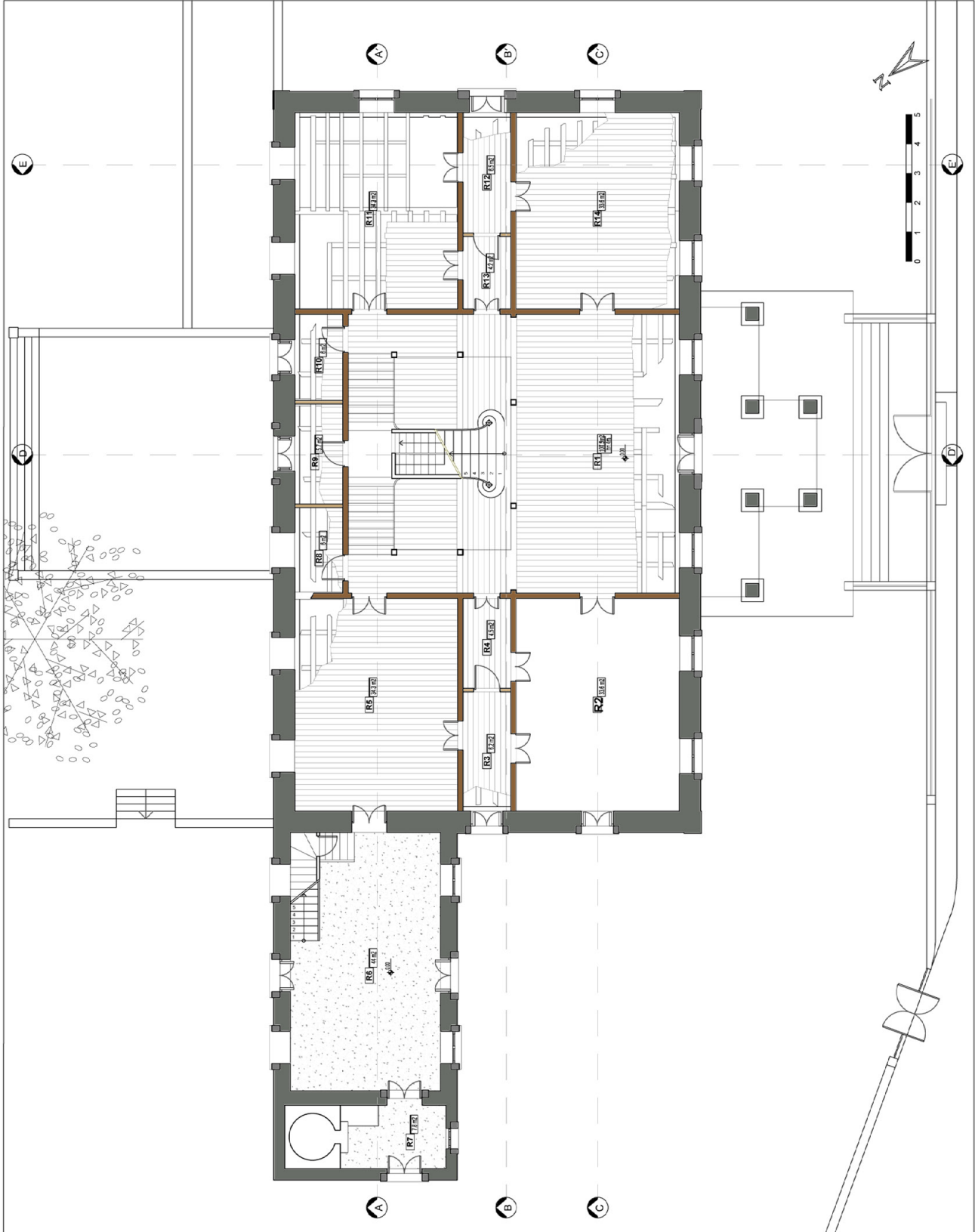
- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall
- Wood Flooring
- Cement Floor

Plans
(Actual State)

Ground-Floor

02/10/2013

16





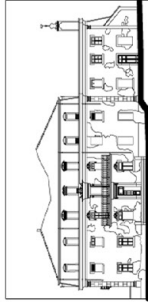
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Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(N° 767291)



North-East Façade

Legend:

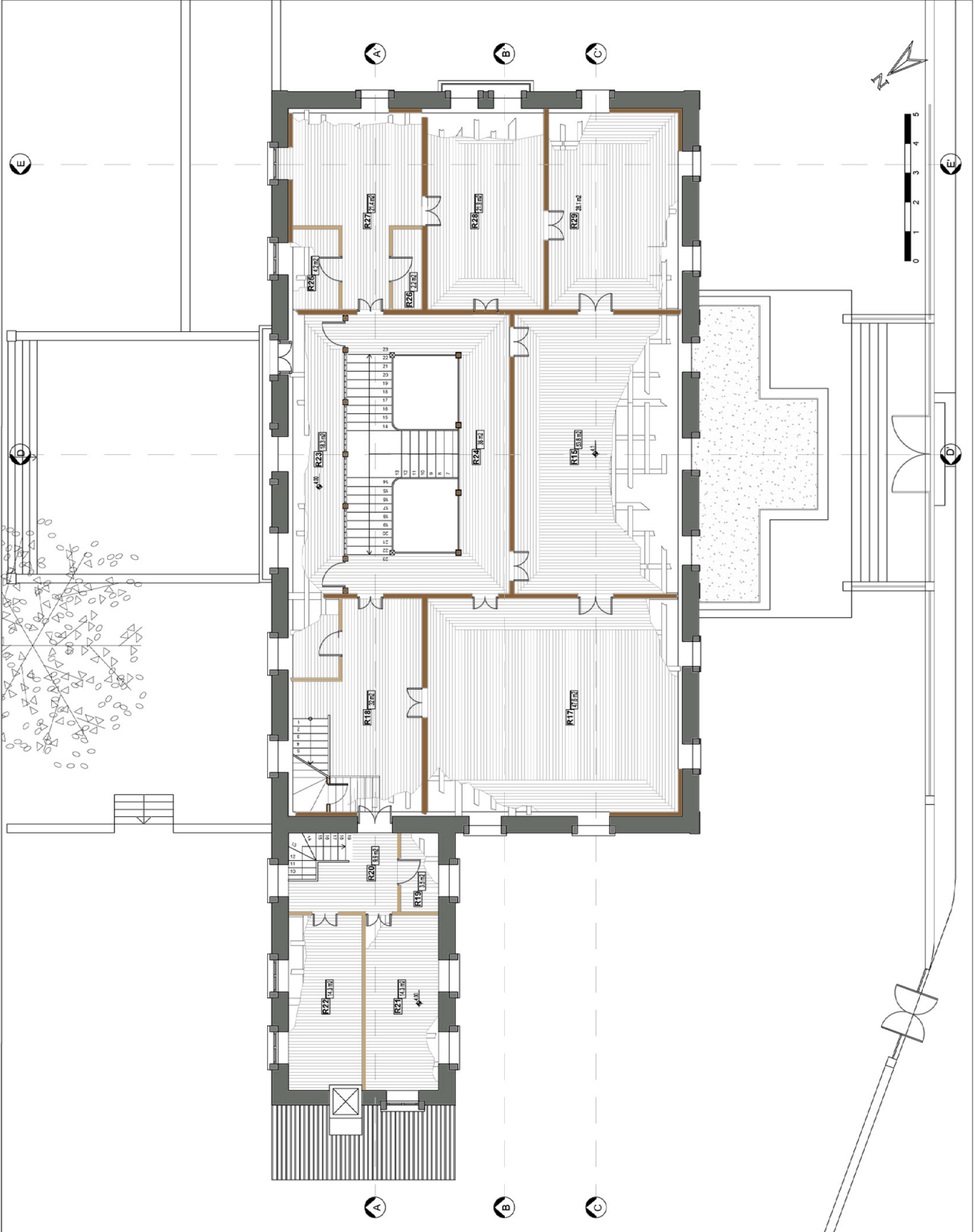
- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall
- Wood Flooring
- Cement Floor

Plans
(Actual State)

First-Floor

02/10/2013

17





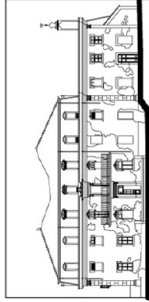
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


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North-East Façade

Legend:

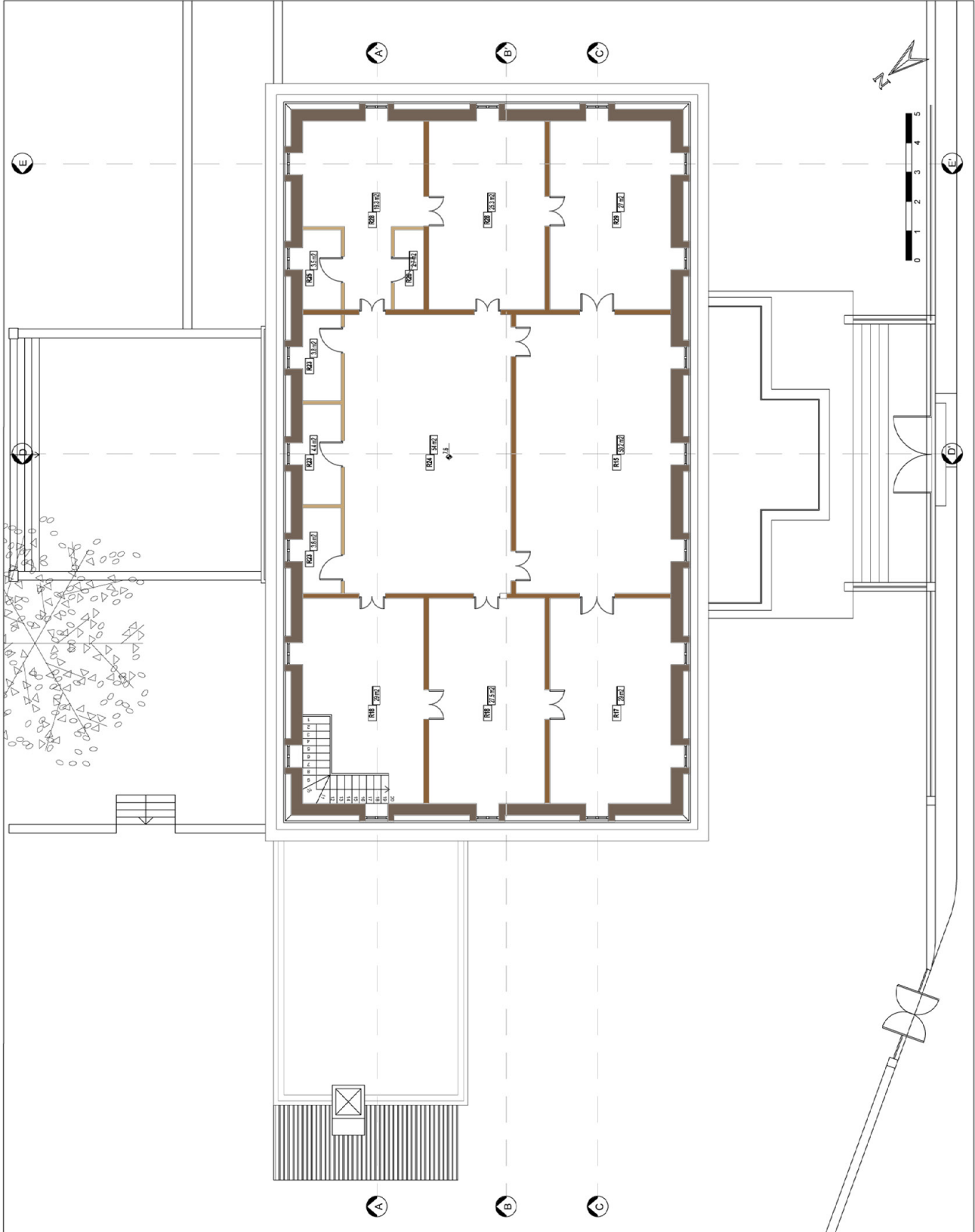
-  Mansard Walls
-  "Frontal" Wall
-  "Tabique" Wall

Plans
(Hypothesis)

Second-Floor

02/10/2013

18





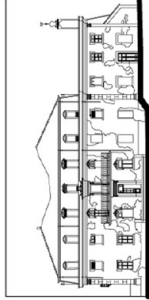
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North-East Façade

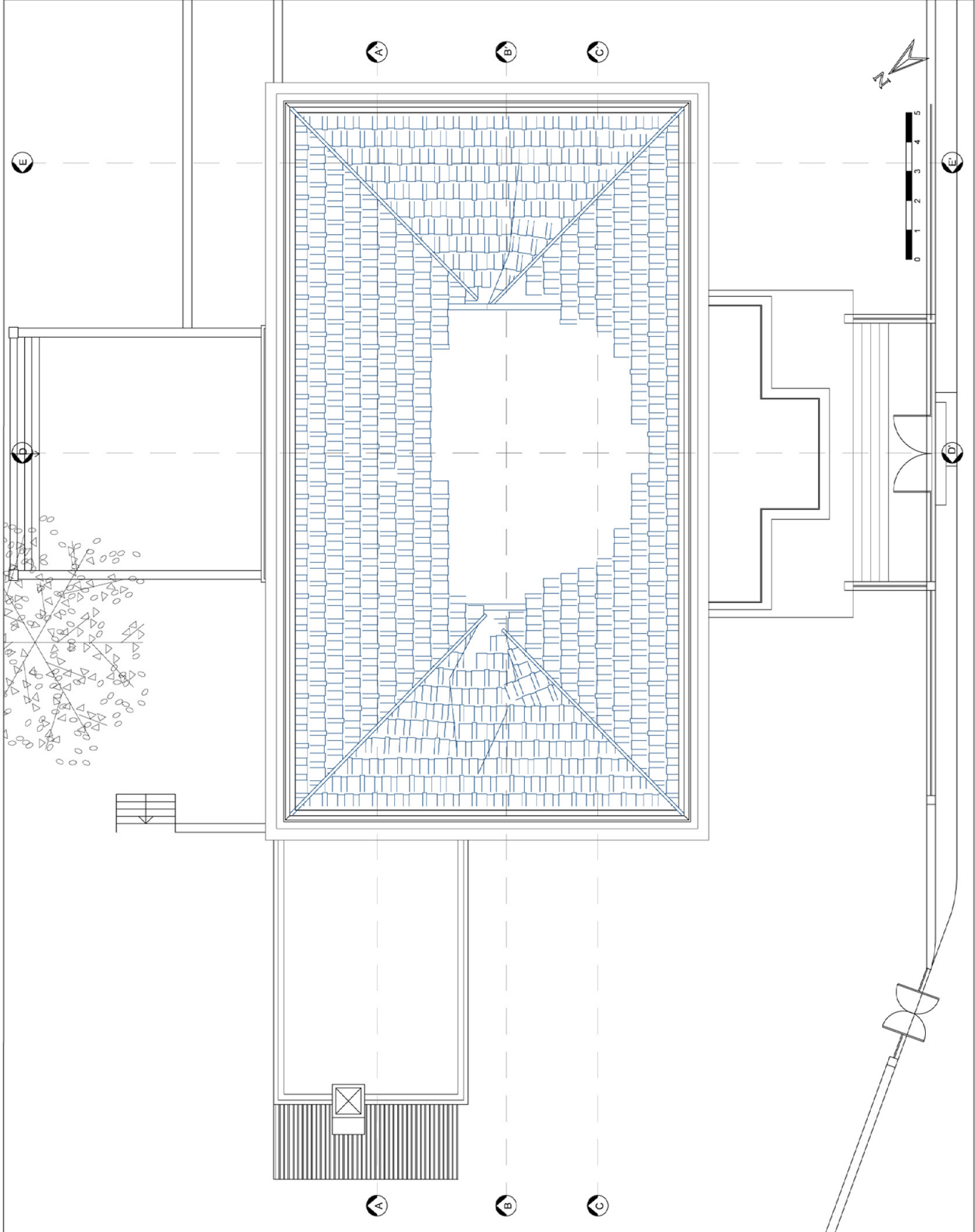
Legend:
■ Design Hypothesis

Plans
(Hypothesis)

Roof

02/10/2013

19





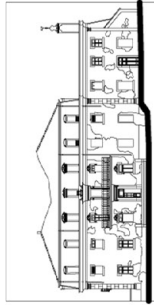
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






Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(Nº 767291)



North-East Façade

Legend:

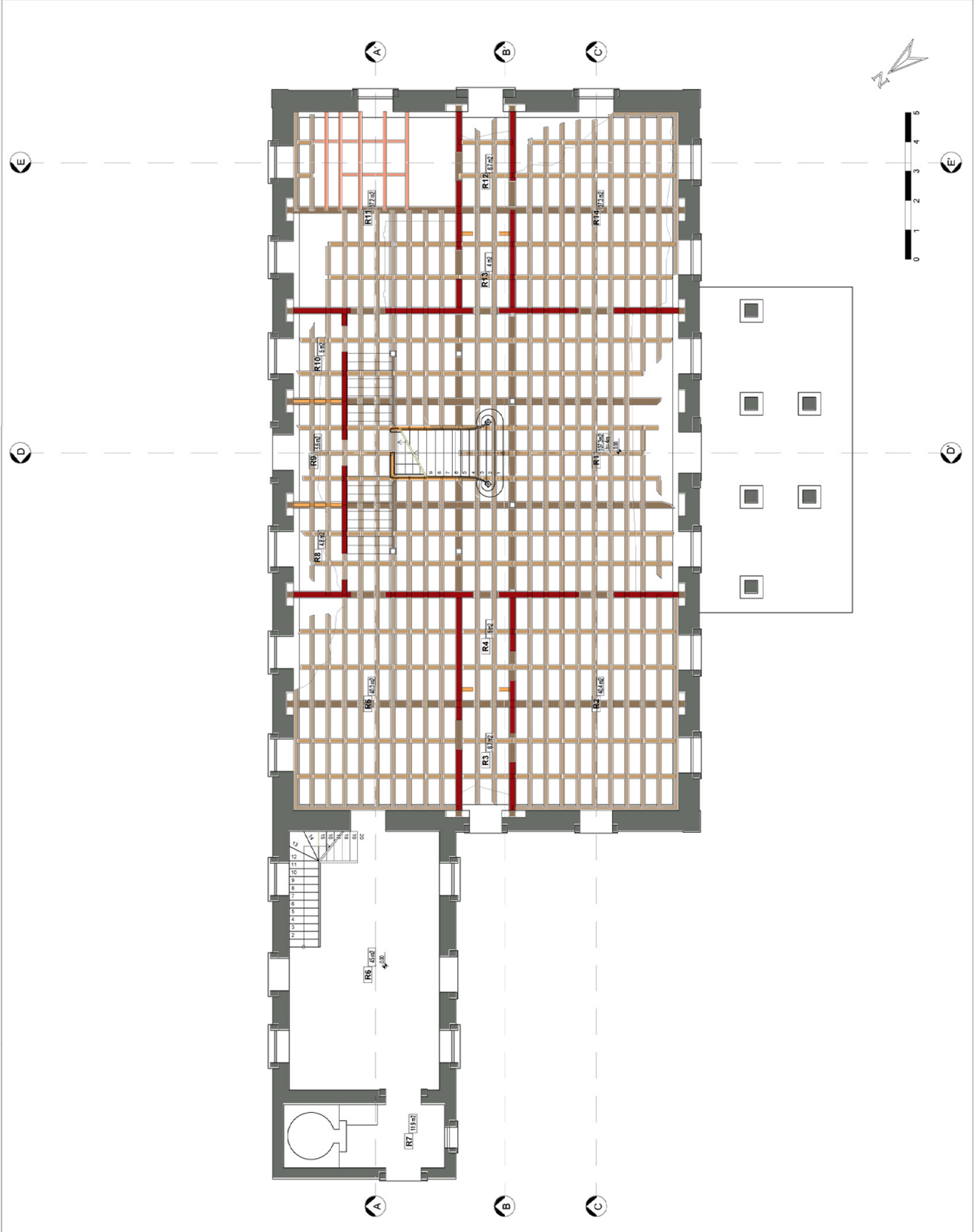
-  Primary Beam
-  Secondary Beam
-  "Tarugos"
-  Masonry Wall
-  "Frontal" Wall
-  "Tabique" Wall
-  Flooring Line

Floor Structure Plans

Ground-Floor

02/10/2013

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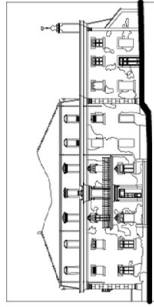
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North-East Façade

Legend:

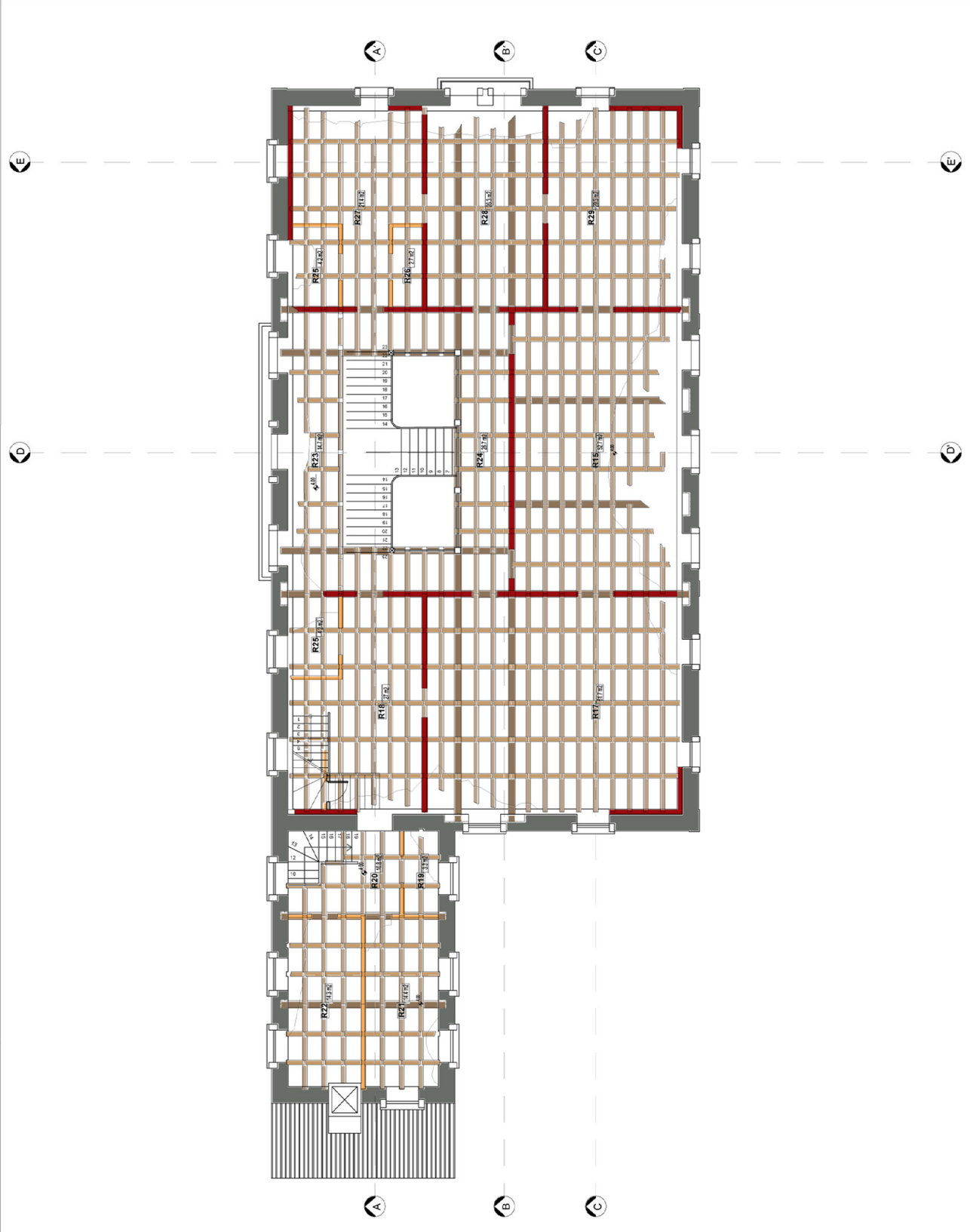
- Primary Beam
- Secondary Beam
- "Tartugos"
- Masonry Wall
- "Frontal" Wall
- "Tabique" Wall
- Flooring Line

Floor Structure Plans

First-Floor

02/10/2013

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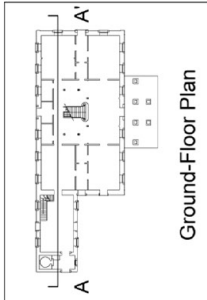
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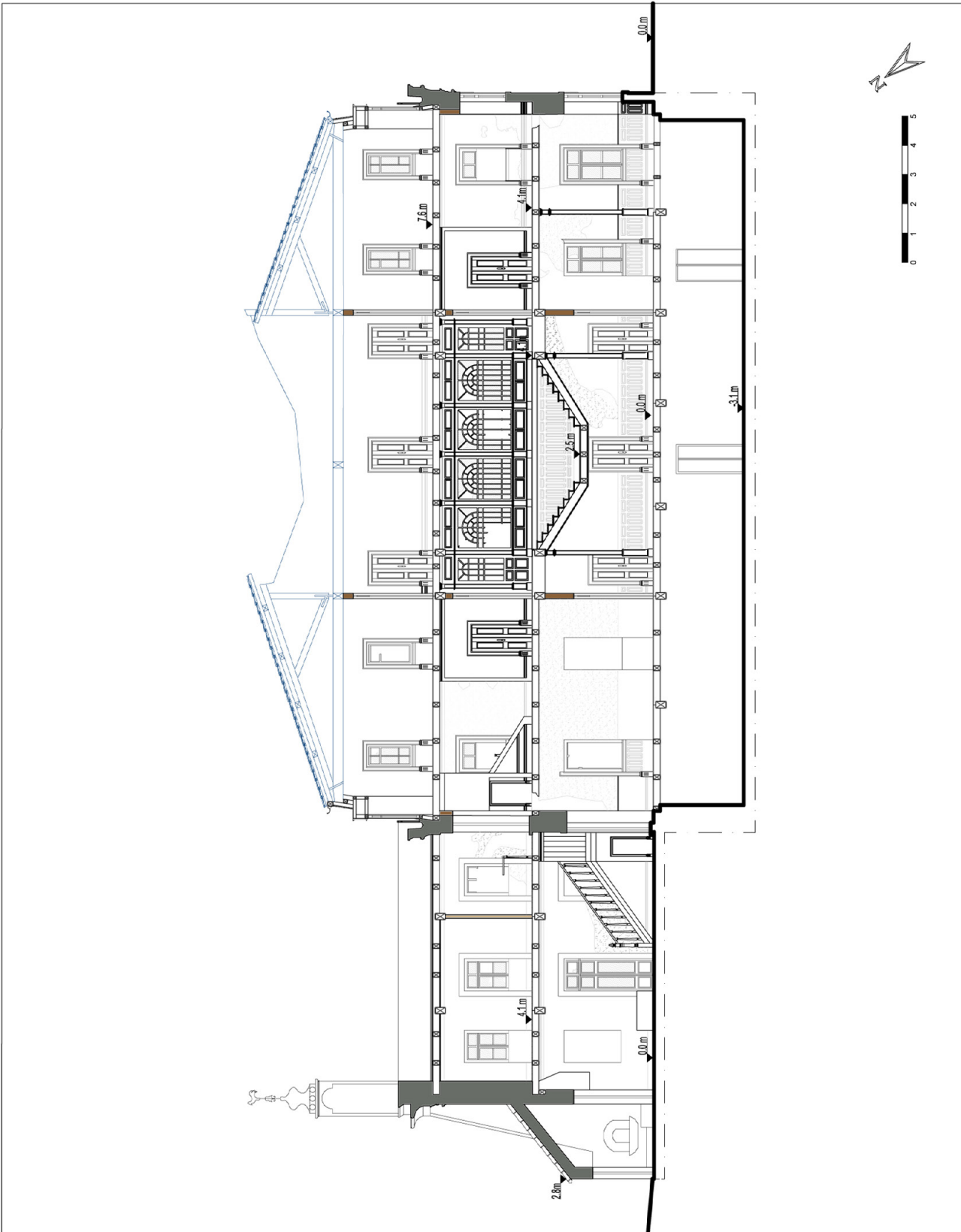
- Legend:
- Masonry Wall
 - "Frontal" Wall
 - "Tabique" Wall
 - Loss of Material
 - Design Hypothesis

Sections
(Actual State)

Section A/A'

02/10/2013

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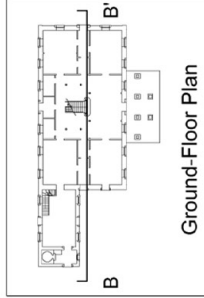
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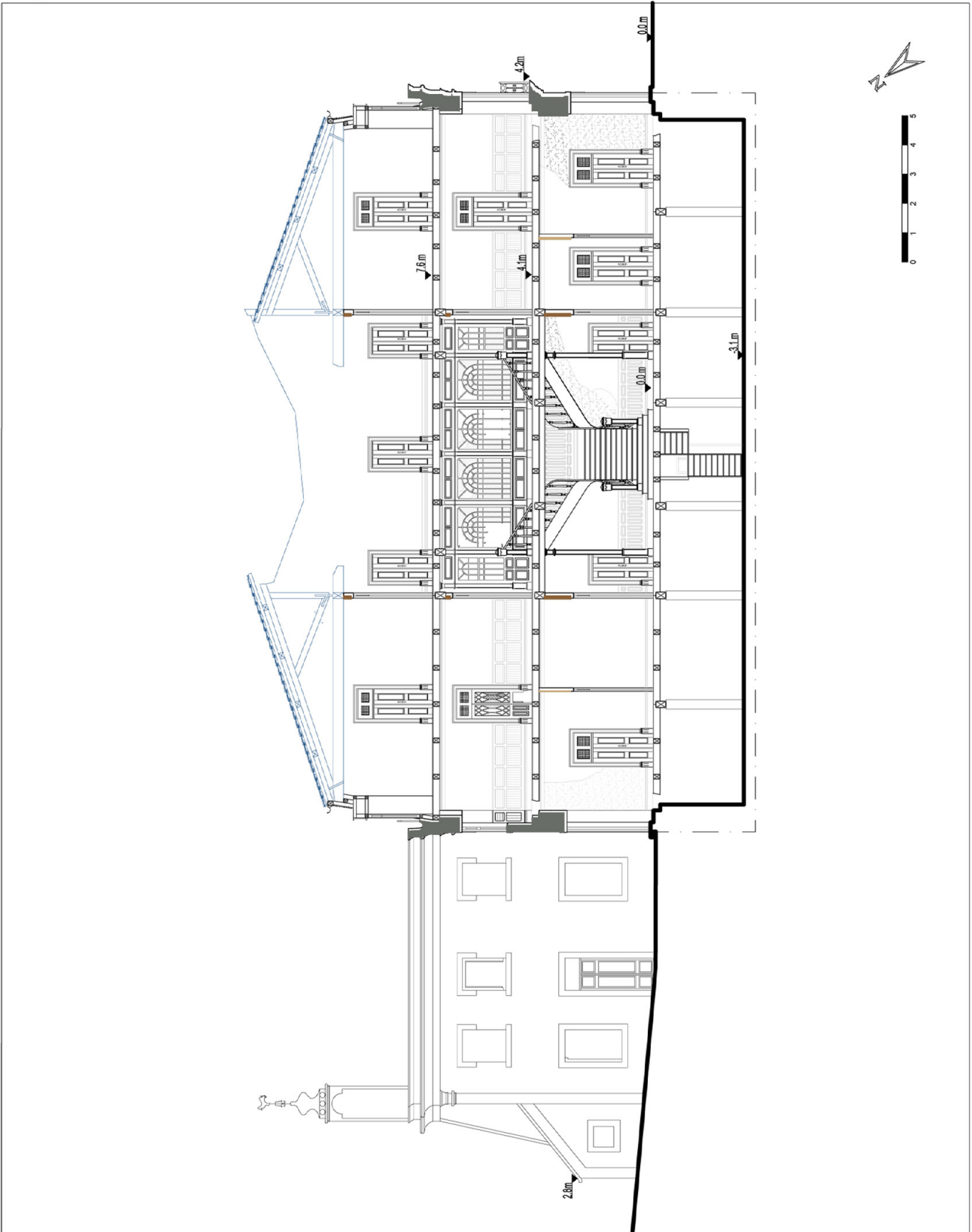
- Legend:
- Masonry Wall
 - "Frontal" Wall
 - "Tabique" Wall
 - Design Hypothesis

Sections
(Actual State)

Section B/B'

02/10/2013

23





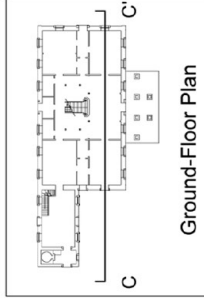
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(N° 767291)



- Legend:
- Masonry Wall
 - "Frontal" Wall
 - "Tabique" Wall
 - Design Hypothesis

Sections
(Actual State)

Section C/C'

02/10/2013

24





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Ground-Floor Plan

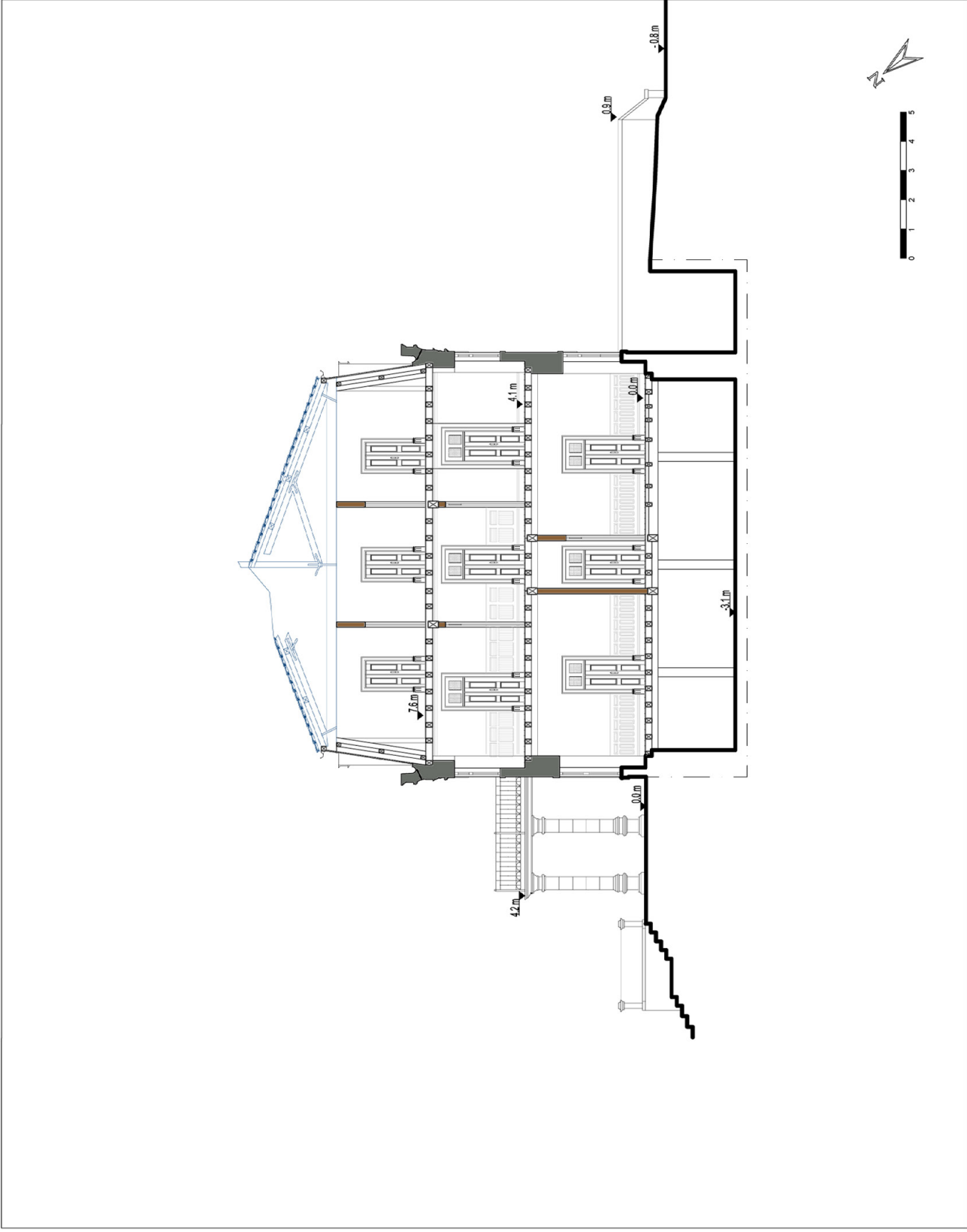
- Legend:
- Masonry Wall
 - "Frontal" Wall
 - "Tabique" Wall
 - Design Hypothesis

Sections
(Actual State)

Section D/D'

02/10/2013

25





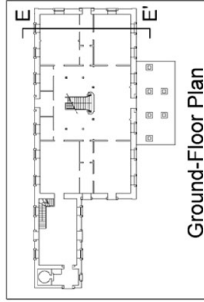
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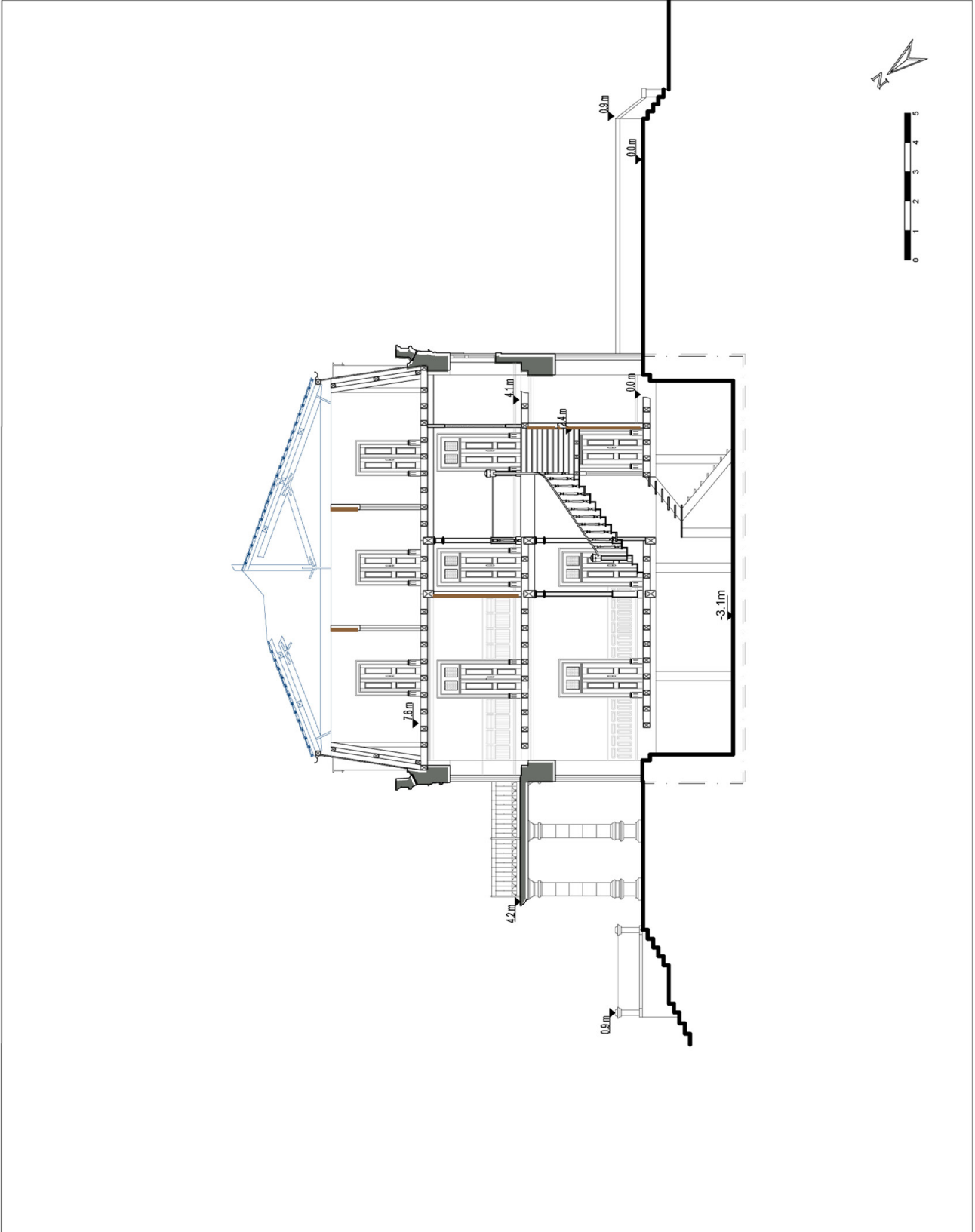
- Legend:
- Masonry Wall
 - "Frontal" Wall
 - "Tabique" Wall
 - Design Hypothesis

Sections
(Actual State)

Section E/E'

02/10/2013

26





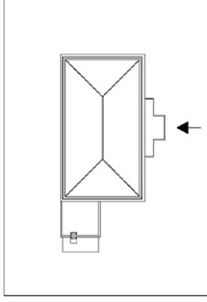
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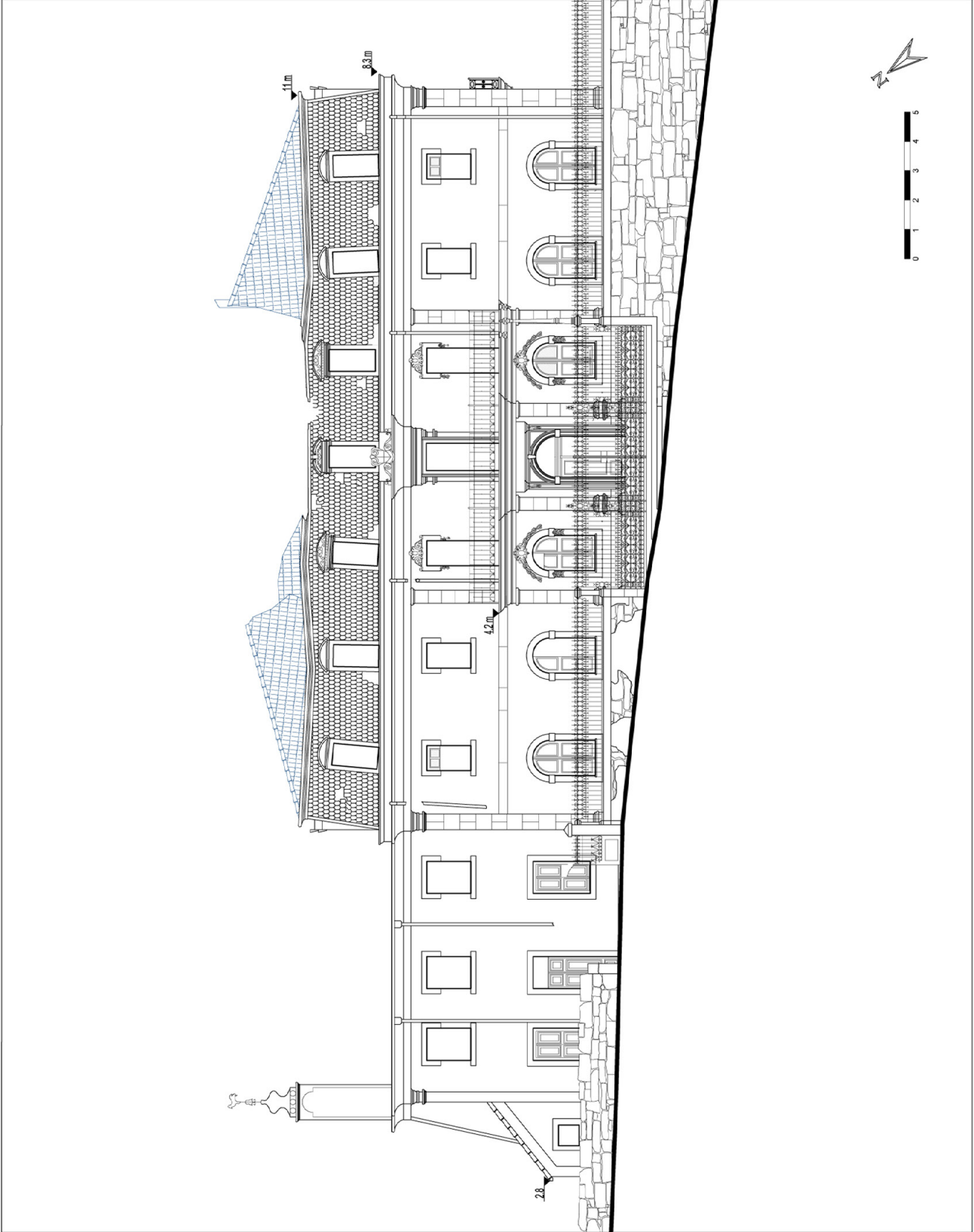
Legend:
■ Design Hypothesis

Elevations
(Actual State)

South-West Façade

02/10/2013

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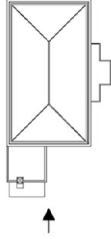
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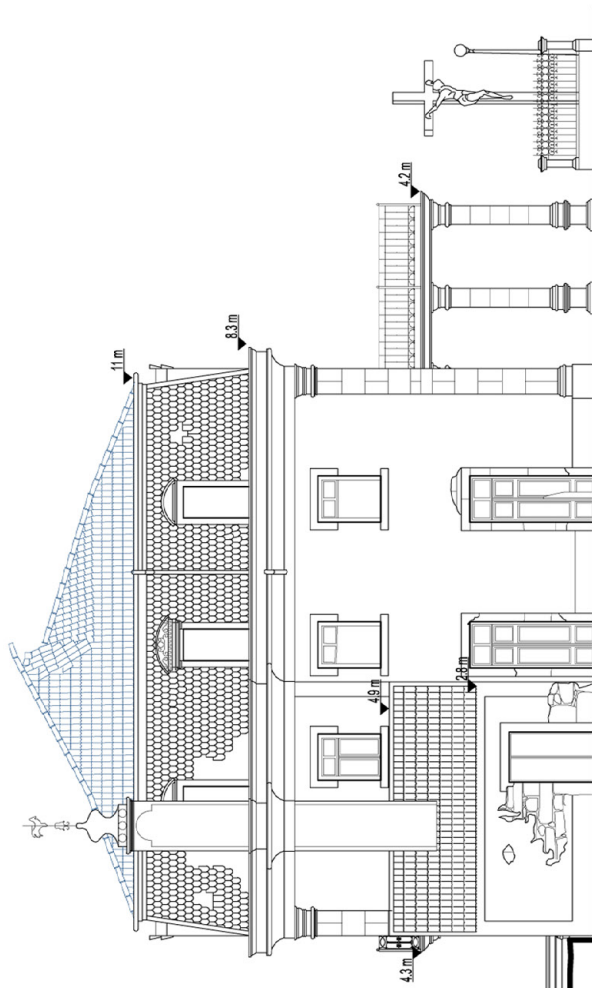
Legend:
■ Design Hypothesis

Elevations
(Actual State)

North-West Façade

02/10/2013

28





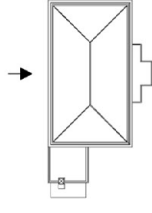
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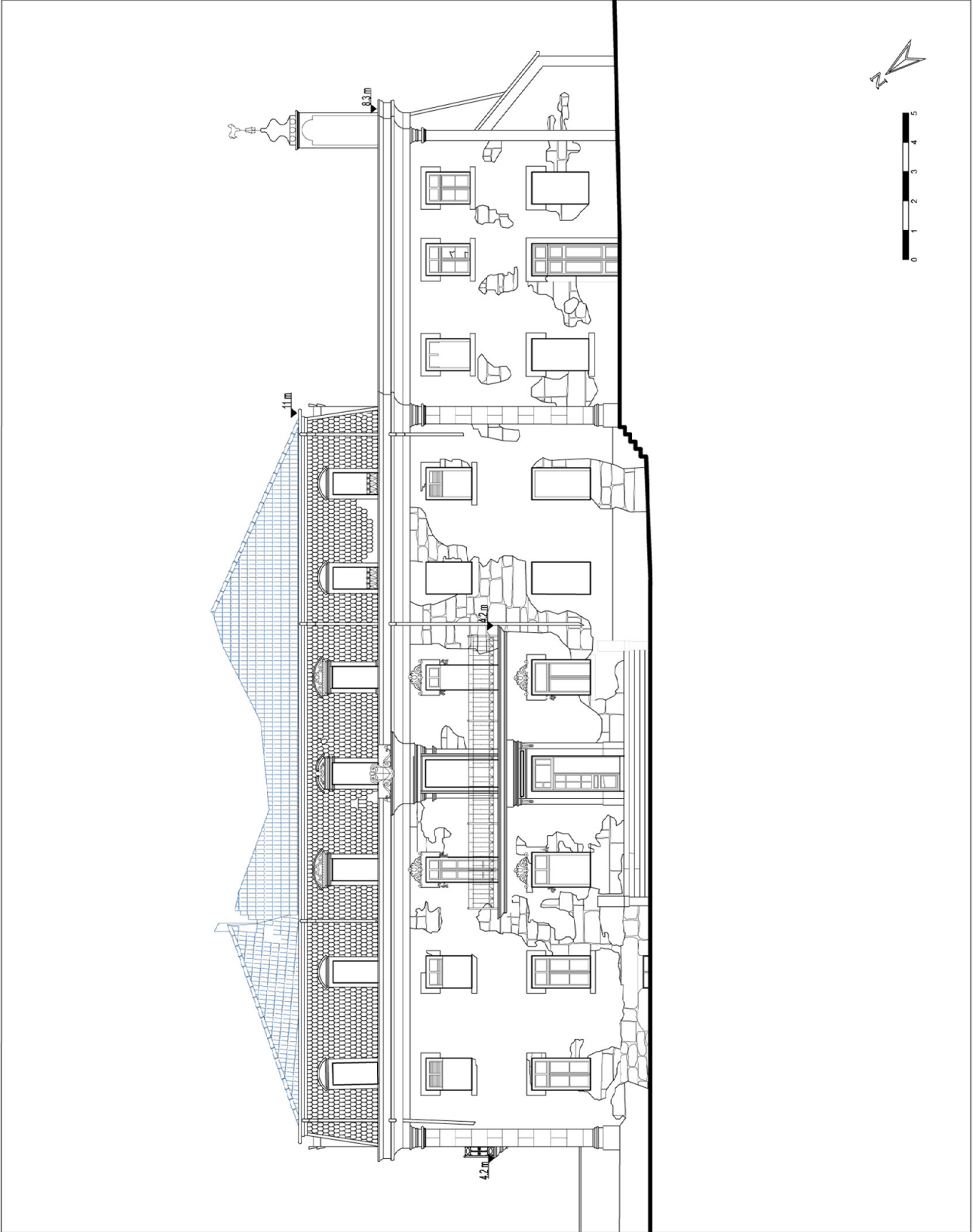
Legend:
■ Design Hypothesis

Elevations
(Actual State)

North-East Façade

02/10/2013

29





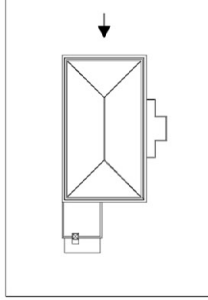
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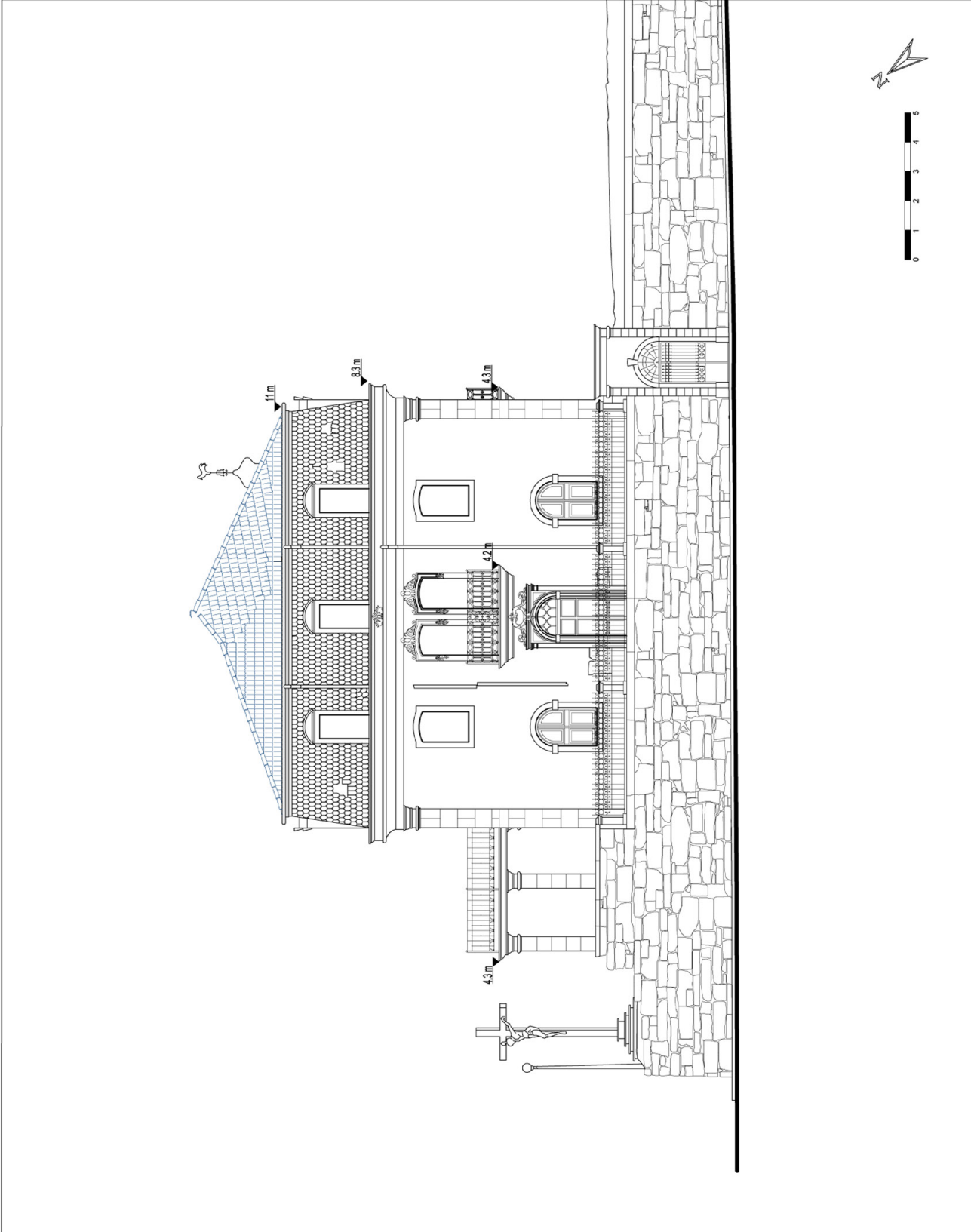
Legend:
■ Design Hypothesis

Elevations
(Actual State)

South-East Façade

02/10/2013

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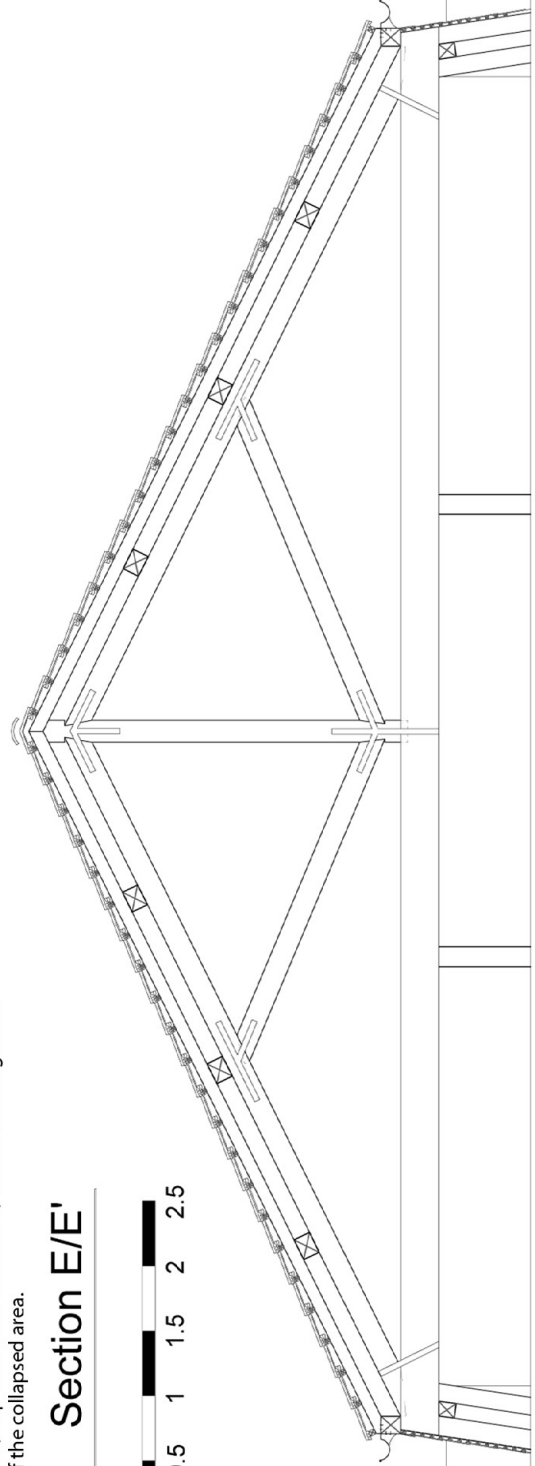


Roof View

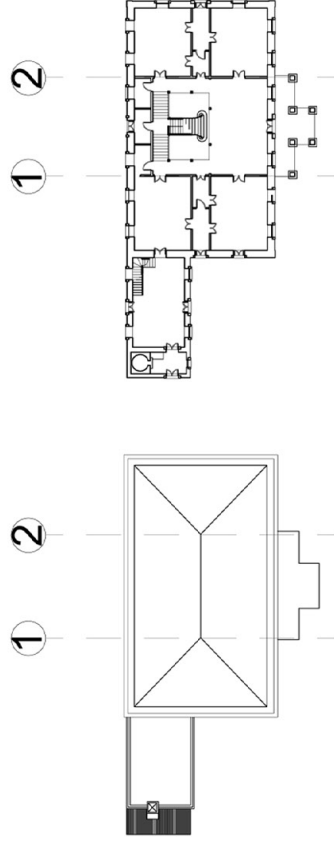


Figures: a) Top view from the roof. b) View from the ground-floor of the collapsed area.

Section E/E'



The Trusses



There are two trusses in the roof, both aligned with the "Frontal" Walls, part of the interior bearing Structure of the House.

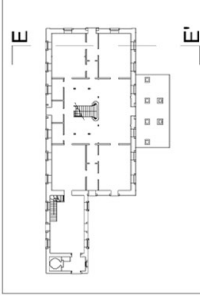


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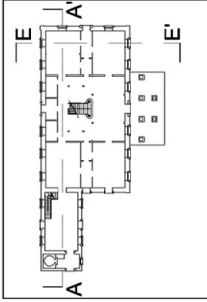
Legend:



Detail I
(Hypothesis)

Roof

02/10/2013

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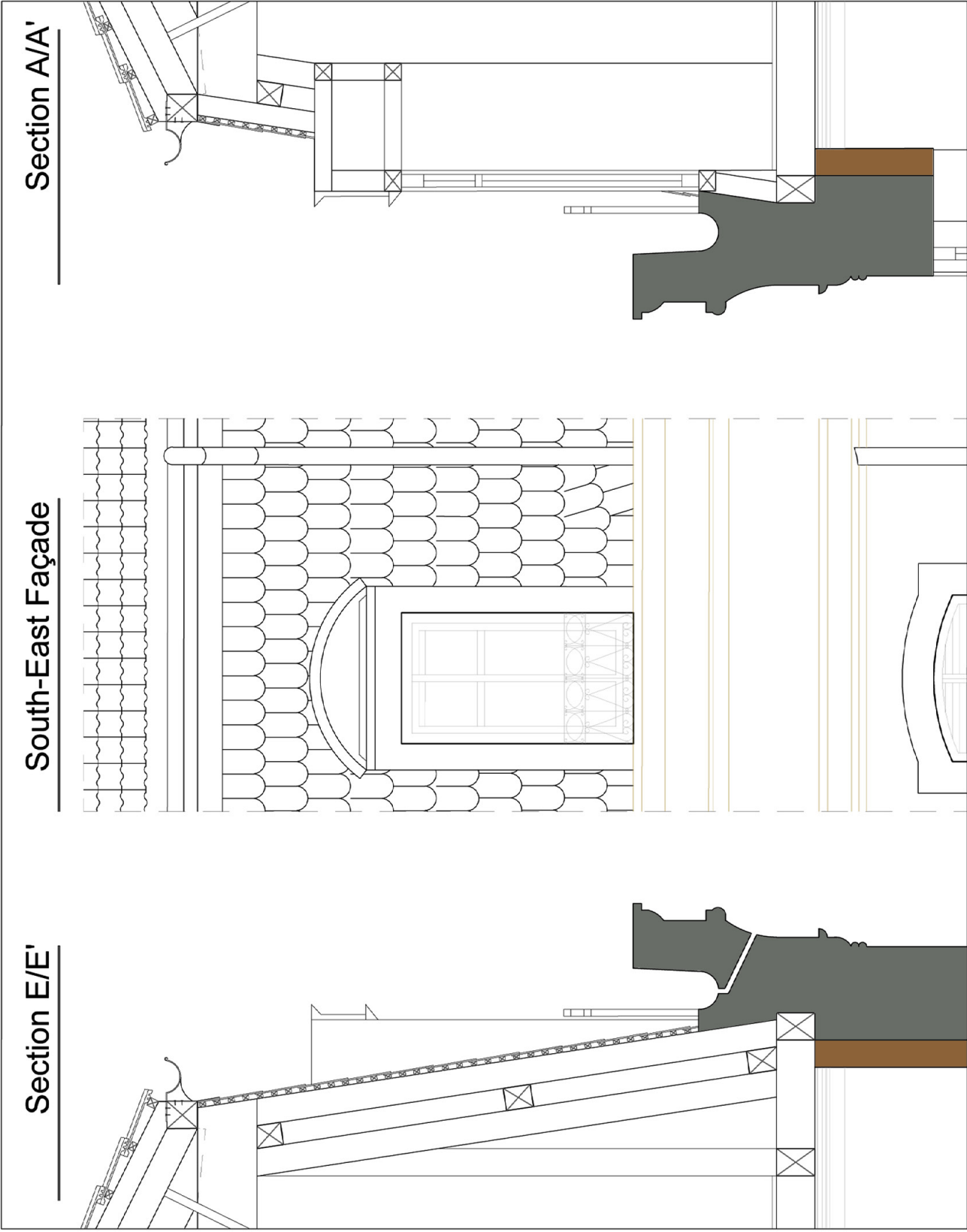


Legend:
 Masonry Wall
 "Frontal" Wall

Detail II

Mansard Floor Hypothesis

02/10/2013 **32**



Section A/A'

South-East Façade

Section E/E'

2.2.3.4 Stairs

In casa do Passal there are three different types of stairs differing according with the location, function and users.



Figure 43: Main Stair's Picture. Secondary Stairs of the Kitchen and Access to the second Floor respectively.

2.2.3.4.1 Main Stairs

The main stairs, like in any other palace or noble building, perform a task of communication and connection between different levels of the building, and of decoration as well. These stairs are often seen as a symbol of the power and status of their owner, a way to impress the visitors. In casa do Passal it is no different, these stairs are not characterized by their decoration but by their dimension in relation with the scale of the elements around. Together with the painted stained glass behind, the main stair, presents a quite powerful apparatus. The total structure is made of wood and directly supported by the granite pillars from the basement and the primary beams of the first floor. Being the main stairs, they are located on the entrance lobby, right in the centre, along the middle axis of the structure.

2.2.3.4.2 Secondary Stairs

On the first floor we can find the second set of stairs that leads to the second floor. These stairs are quite smaller compared with the main ones since they are meant for the use of the family, so it has a more private function: access to the rooms. The structure of these stairs is supported by the masonry wall on which they lean. Similar to these are the stairs of the services part that connect the ground-floor, the kitchen, with the servants' rooms.

2.2.3.4.3 Tertiary Stairs

On the ground floor we can find the interior access to the basement located behind and under the main stairs. With a secondary function, these stairs are really simple built of a light wooden structure supported by a granitic block on the basement.

2.3 Description of the State of Conservation of the Building

As it was mentioned previously, after Sousa Mende's death, the house was taken by the bank to cover the debts assumed by Sousa Mendes when he was still alive. Since then, the house has been empty, there is no information about a different owner. However, it is known that during the last years of Sousa Mendes' life, he started taking things from the house, such as valuable decoration pieces and furniture in order to sell them and pay his creditors. It is also known that the house was invaded a couple of times and subject to vandalism. The wallpaper, part of the rooms fine decoration, was torn off the walls, the windows were broken together with the coloured glass from the front panel on the main stairs.

2.3.1 Main Degradation Causes

The main causes of the level of decay and destruction of Casa do Passal can be resumed in three:


a) Lack of Maintenance. This is the most important cause since the house was abandoned for such a long time, without being subject to periodical maintenance. It jeopardized the integrity of some fundamental elements such as the roof and drainage systems. Without the proper cleaning and care for conservation, the materials, especially wood (the prime material inside the house), decay exponentially faster than normal.

b) Vandalism is the second most important cause of decay, as mentioned before, the broken windows and stolen elements affected the protection of the house' envelope. The missing windows are the main reason for the presence of water on the wood elements inside the house. The removal of the wallpaper, an element that protected the inner layers of the wall that now are completely exposed, also caused damage.

c) Natural Aging of the Materials. Throughout time, the materials suffer certain natural altera-




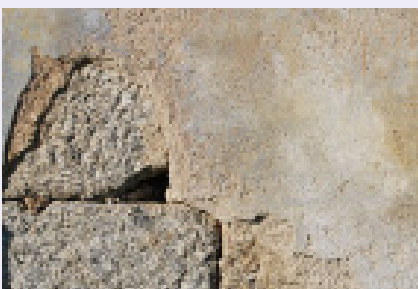
LIST OF DECAY


MECHANICAL DECAY




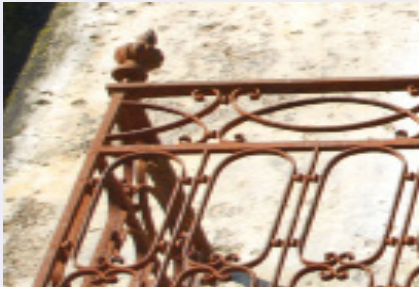


	IMAGE	DESCRIPTION
CRACKS		Present on the annexed building, which was built shortly after the main one, specially on the joint between the two buildings. These cracks are characterized by vertical and diagonal alignments, sometimes causing the break of the wall.





PHYSICAL & CHEMICAL DECAY

CRACKS & DETACHMENT

MAP CRACKING		It consists on the appearance of several vertical and diagonal fissures or cracks without being related with any structural problems. Given the “age” of the plaster and the lack of maintenance, the plaster started to create cracks along with intersections such as the window frames and lath lines.
BLISTERING		Loss of adhesion between the paint and the underlying surface. It is characterized by the appearance of blisters and bubbles of the paint. It is caused by the exposure from the atmospheric conditions and lack of maintenance.
DISINTEGRATION		Loss of cohesion, in which the composition of the material, the single grains or aggregates start to disintegrate . It is caused by the exposure of extreme atmospheric conditions.
MATERIAL DETACHMENT		Caused by the constant exposure to the atmospheric conditions and lack of maintenance, it consists on the detachment, partially or totally, of the material from its underlying surface.

MATERIAL LOSS		
	IMAGE	DESCRIPTION
EROSION		Loss of the superficial material caused by the constant exposure to the atmospheric conditions, therefore it can be found mainly on the external façades of the building. It's appearance consists on the loss of the external paint leaving the plaster completely exposed. This exposure leads to the loss of the integrity of the material, becoming powdering with the passage of a hand.
WOOD DECAY		Caused by a variety of fungus that digests moist wood, causing it to rot. It can be classified according to the type of decay that they cause: the brown rot (that causes a dry and crumbly appearance it develops on damp wood) and white rot (consists on the funghi break down the lignin in wood, leaving the lighter coloured cellulose behind).
MISSING ELEMENTS		Caused by extreme atmospheric conditions like storms and also by some acts of vandalism. It causes the exposure of the underlying materials that were not supposed to be exposed and consequently potentiating a faster decay of the structure.
DISCOLOURATION & DEPOSIT		
DISCOLOURATION		Loss of the original appearance and integrity of the paint given to its exposure to the atmospheric conditions. Some parts of the original paint can still be found in some protected areas such as under the balconies, but apart from there, the colour is fading or completely lost, showing the underlying plaster.
EFFLORESCENCE		The appearance of a superficial layer of a fine, white, efflorescent salt deposits on the granite elements. It is characterized by several circular white spots on the stone, sometimes with a yellow colour as well.

<p>PATINA</p>		<p>Chromatic modification of the material, generally resulting from natural ageing for and not involving, the deterioration of the material surface.</p>
<p>BLACK CRUST</p>		<p>A form of soiling caused by the exposure to atmospheric conditions and constant humidity this case it can be found around the broken gutters. Its black colour comes from the dust and pollutants present in the air.</p>
<p>LEACHING</p>		<p>Leaching stains are caused by the constant presence of water leaks upon a surface. It changes the colour the the integrity of the materials, potentializing their degradation. It can be recognized as vertical continuos stains regularly in green colour.</p>
<p>CORROSION</p>		<p>Gradual chemical alteration of the metal subject to its environment, specially when exposed constantly to water. It can be found special on the handrails of the house. This phenomenon can cause the permanent loss of the material.</p>
<p>STAINING</p>		<p>Given the corrosion of the metal and its frequent contact with water, the leaks coming from it, creates these rust stains that change the colour of the base materials.</p>
<p>SOILING</p>		<p>Superficial layer composed by mainly dust, not particularly harmful except on the appearance.</p>

<p style="text-align: center;">ASHES DEPOSIT</p>		<p>Present on the oven's room, it is characterized by a superficial deposit of ashes on the walls, giving its black appearance.</p>
<p style="text-align: center;">MATERIAL DEPOSIT</p>		<p>Materials left piled up outside the house, mainly composed by broken pieces of the house materials, specially in the interior of the house.</p>
<p>BIOLOGICAL COLONIZATION</p>		
<p style="text-align: center;">ALGA</p>		<p>With a soft texture, consists on a superficial biological layer that can be found in every type of surface specially if humid.</p>
<p style="text-align: center;">PLANT</p>		<p>Growing mainly because of lack of maintenance and the constant presence of water. These wild plants start growing and their roots can cause permanent damages in the structure such as on the masonry wall.</p>

tions of their fundamental properties, even without being directly exposed to external factors. These alterations can lead to changes on characteristics, such as strength (elasticity and mechanic resistance) of the wood, or deep degradation and loss of the materials.

2.3.2 Deterioration and Destruction Analysis

To better understand the severity of the level of deterioration and destruction of Casa do Passal ,it was necessary to create an evaluation system dividing each element into different levels according to its own damage importance. In this way it is easier to specify a specific determinate approach for each one of them. The evaluation system is divided into four levels of damage:

1º) Collapsed or missing, it regards all the destructed structures such as the roof.

2º) The second level is related with all the damaged and partly missing bearing elements that are important for the proper stability and behaviour of the structure such as the wood structure (mansard floor, walls, floors, stairs...) inside the house.

3º) The third level regards the missing elements that jeopardize the protection of the house's façade elements against the external actions such as windows, doors and external plasters and coatings.

4º) The final level regards the unique features of the house, its decorative elements that classify this house into its own artistic and cultural value (the painted elements, the painted doors, wainscoting,...).

2.3.3 Decay Analysis

As it can be seen on the Drawings number 29 to 34, a Decay mapping of the façades and internal walls was made in order to properly identify the different types of decay of the house.

Analysing those maps, it is possible to distinguish clearly certain types of decay different in each façade and others types common in all of them.

The main Façade, turned to South-West, is the most exposed to the sun light and East-West Winds. It shows a level of Erosion higher than the other façades that are more protected against these two factors. The ocre paint has almost disappeared except in some protected areas under the balcony. On the mansard floor we can see that the deformation of the wood structures caused by the collapsed roof was more accentuated next to this façade. The rust stains on the granite elements caused by the handrail of the balcony are more frequent in this façade given the extension of the balcony itself. On the façade of the service building, being constructed in a different time compared with the main one, shows cracks on the joint between the building of the house' oven and the kitchen. Much like the main façade, the level of erosion is also high.

On the North-West façade, the one of the Services building, much like the main façade, also has a high level of erosion and discolouration with more punctuated cases of blistering. The number

of missing elements is higher. On the mansard floor, although the level of deformation is lower than the main façade, many slate tiles are missing, exposing the wood structure behind.

The garden façade, the one turned to North-East doesn't get to much sunlight so the level of humidity is quite high resulting on more presence of plants and alga. The external plaster is almost inexistent, exposing completely the masonry walls. The presence of efflorescence on the granite is higher as well as the level of the wood decay of the existing window frames.

On the South-East façade, the first thing noticeable is the presence of vegetation. This vegetation starts from the external ground and reaches the interior of the house on the first floor. Much like the main façade, there is also rust stains on the balcony and the level of erosion it is quite similar to the North-West façade.

Furthermore, it is possible to point out some general types of decay present in all the façades such as missing elements, the presence of black crust and alga on the areas near the broken drainage systems (a problem more accentuated on the garden façade). The corrosion of the metal elements (handrails and gutters) is also equally present.

Regarding the interior of Casa do Passal, the presence of humidity due to the missing windows, accentuated the progressive wood decay that lead to the loss of some elements and disintegration of the "frontal" and "tabique" walls. The internal part of the garden façade walls is also partially covered with plants coming from the exterior.

The disintegration of the plaster is also a common phenomenon along with discolouration of some painted wood elements like the window frames and the wainscoting of the walls.

The presence of soiling is general in all the rooms, every single element is covered with a thin layer of dust a occasionally material deposit.

Chapter III

3. Historical Research

3.1 Baixa Pombalina, Lisbon

3.1.1 The Story

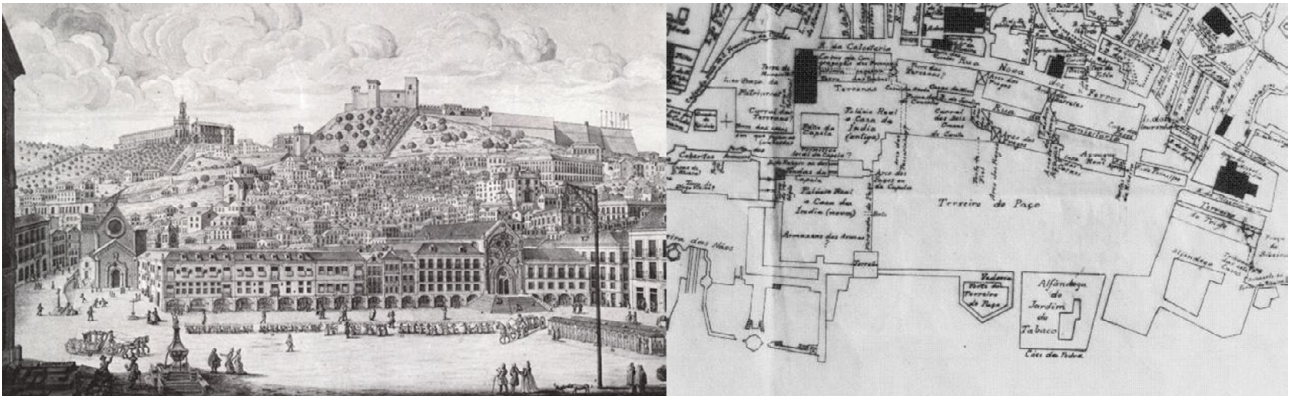


Figure 44: Drawings and Map before the Earthquake

In 1 November 1755, the downtown of the city of Lisbon was hit by a severe earthquake and tsunami. Immediately following the earthquake, a complex reconstruction process began, which introduced new urban, architectural and constructional concepts.

Before the earthquake, Lisbon was a sort of a medieval city that faced very few changes over the centuries. If we analyse the panoramic views of Lisbon from the sixteenth century until 1755, soon we realize that the city, while growing significantly, never changed its structure. Without plan or scale, it was consisting in a big messy urban structure with the exception of Bairro Alto. The reference points for the new district were the convents from which all the construction would saddle around sided by roads too narrow for the intense traffic.



Figure 45: Paintings Showing Lisbon's state after the Earthquake

3.1.2 The urbanization



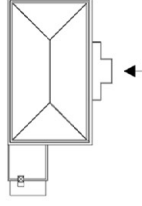
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Master in Architecture

Restoration of Aristides de Sousa
Mendes House
Cabanas de Viriato ,Portugal

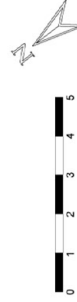
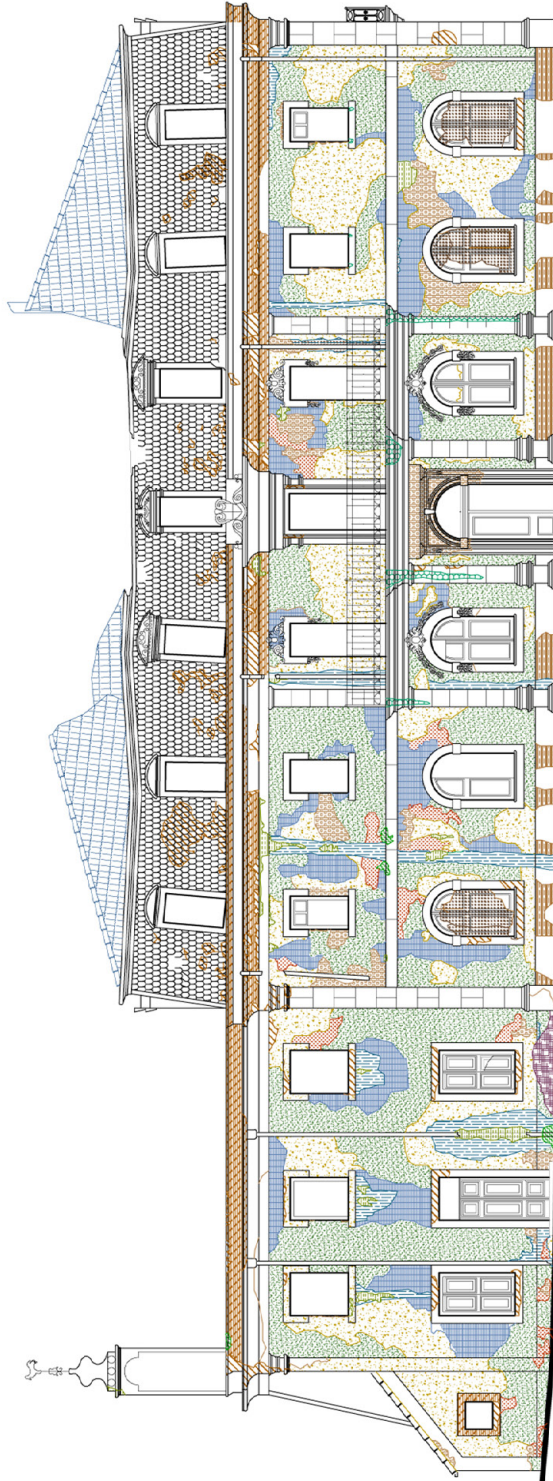
Thesis Supervisor :
Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(Nº 767291)



Legend:
■ Design Hypothesis



Legend

Physical and Chemical Decay

Biological Colonization

- Cracks & Detachments**
- Blistering
 - Disintegration
 - Material Detachment
 - Map Cracking

- Material Loss**
- Erosion
 - Wood Decay
 - Missing Elements

- Discoloration & Deposit**
- Discoloration
 - Efflorescence
 - Patina
 - Black Crust
 - Leaching

- Rustyness
- Soiling
- Ashes Deposit
- Material Deposit

- Alga**
- Plant

Decay
Elevations

South-West Façade

02/10/2013

33



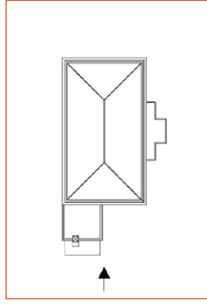
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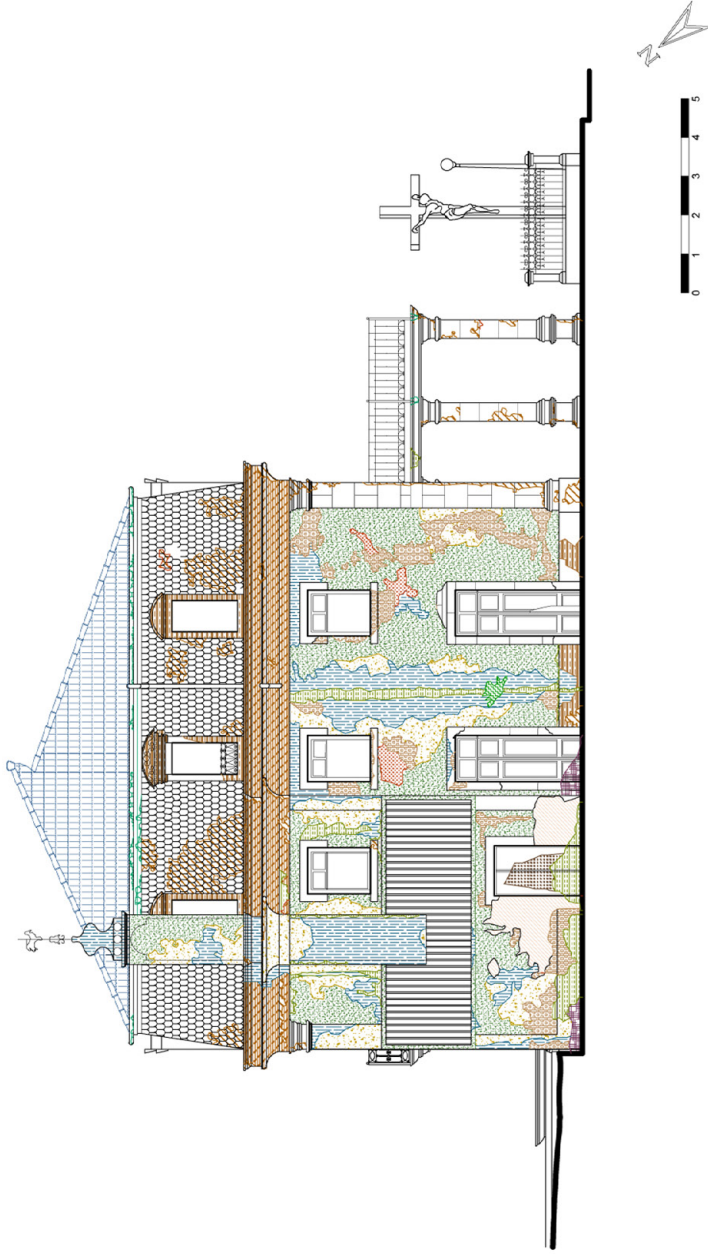
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Legend:
■ Design Hypothesis



Legend

Physical and Chemical Decay

Material Loss

- Blistering
- Disintegration
- Material Detachment
- Map Cracking

- Erosion
- Wood Decay
- Missing Elements

- Discoloration
- Efflorescence
- Patina
- Black Crust
- Leaching

Discolouration & Deposit

- Rustyness
- Soiling
- Ashes Deposit
- Material Deposit

Biological Colonization

- Alga
- Plant

Decay
Elevations

North-West Façade

02/10/2013

34



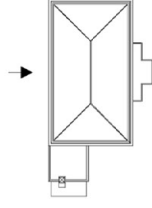
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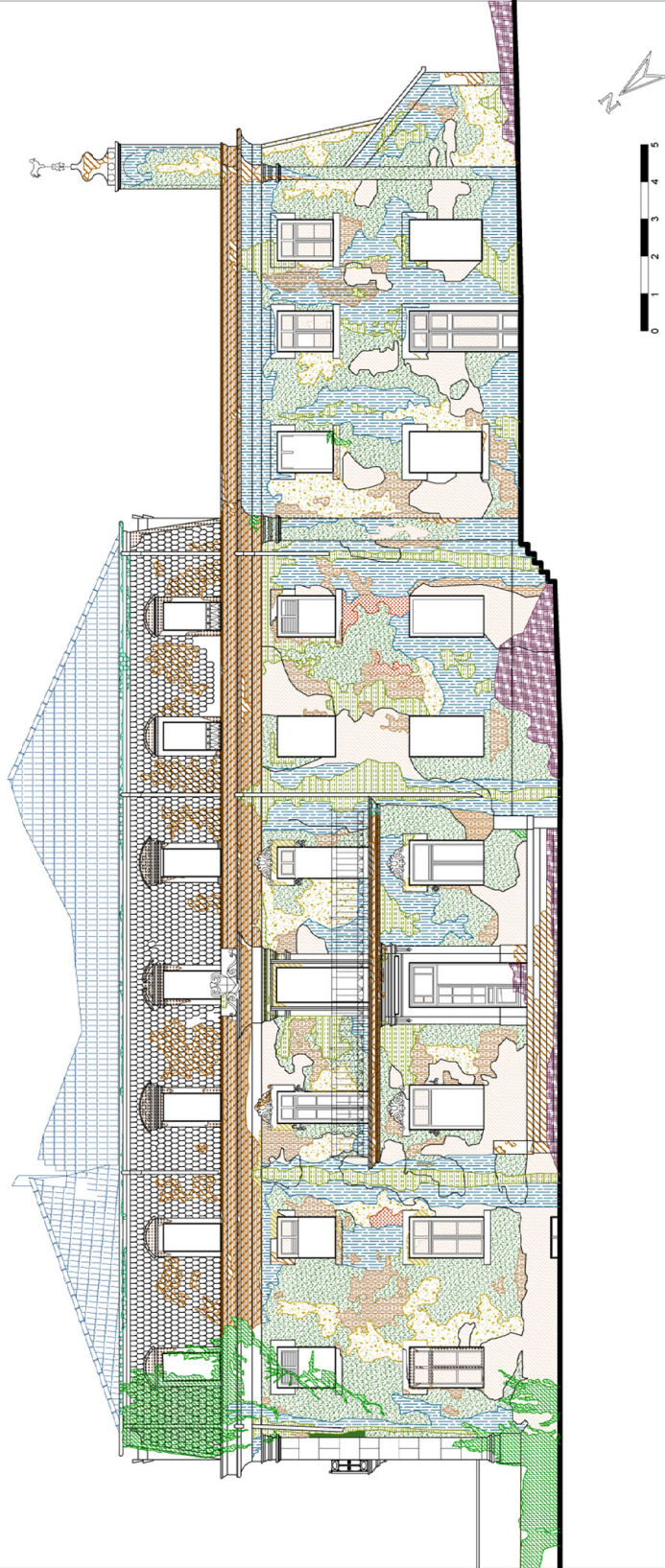
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Legend:
■ Design Hypothesis



Legend

Physical and Chemical Decay

Cracks & Detachments

- Blistering
- Disintegration
- Material Detachment
- Map Cracking

Material Loss

- Erosion
- Wood Decay
- Missing Elements

- Discoloration
- Efflorescence
- Patina
- Black Crust
- Leaching

Discolouration & Deposit

- Rustyness
- Soiling
- Ashes Deposit
- Material Deposit

Biological Colonization

- Alga
- Plant

Decay
Elevations

North-East Façade

02/10/2013

35



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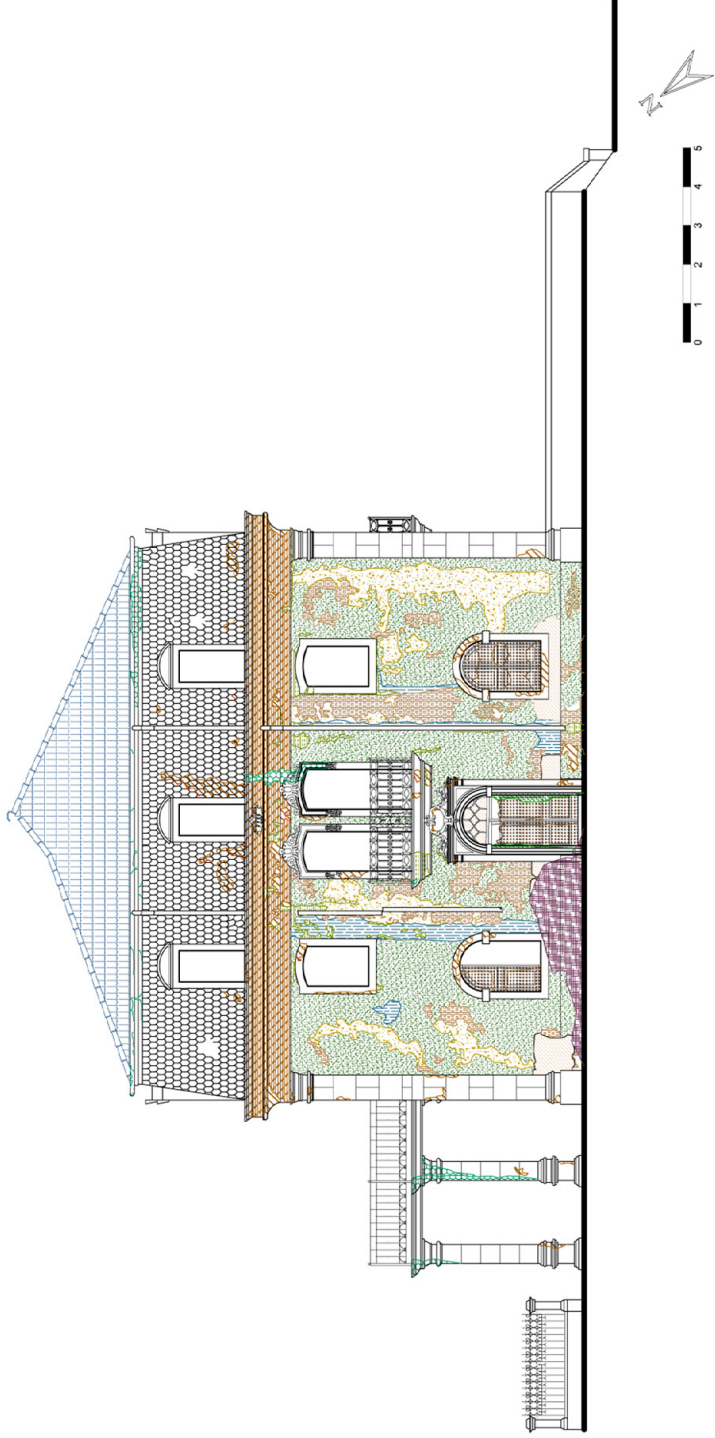
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Legend:
Design Hypothesis



Legend

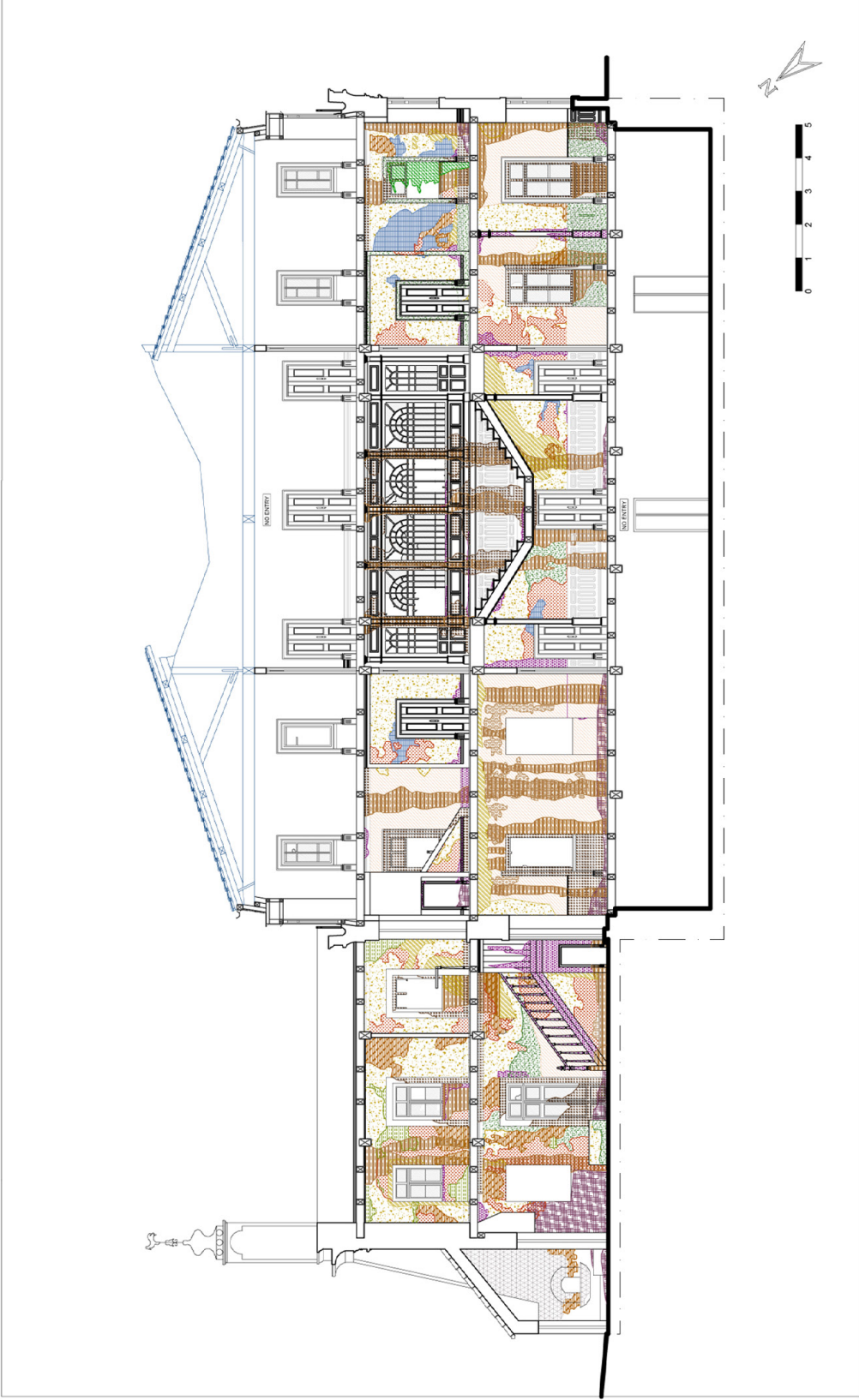
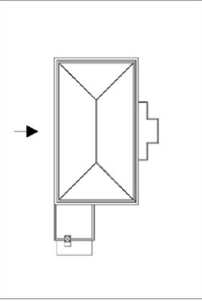
Physical and Chemical Decay		Biological Colonization	
Cracks & Detachments	Material Loss	Discolouration & Deposit	
Blistering	Erosion	Discoloration	Alga
Disintegration	Wood Decay	Efflorescence	Plant
Material Detachment	Missing Elements	Patina	
Map Cracking		Black Crust	
		Leaching	
		Rustyness	
		Soiling	
		Ashes Deposit	
		Material Deposit	

Decay
Elevations

South-East Façade

02/10/2013

36



Legend			
Physical and Chemical Decay		Biological Colonization	
Cracks & Detachments		Discolouration & Deposit	
Blistering	Erosion	Rustyness	Alga
Disintegration	Wood Decay	Soiling	Plant
Material Detachment	Missing Elements	Ashes Deposit	
Map Cracking		Material Deposit	
		Discoloration	
		Efflorescence	
		Patina	
		Black Crust	
		Leaching	



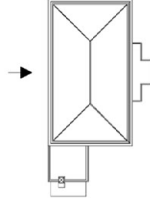
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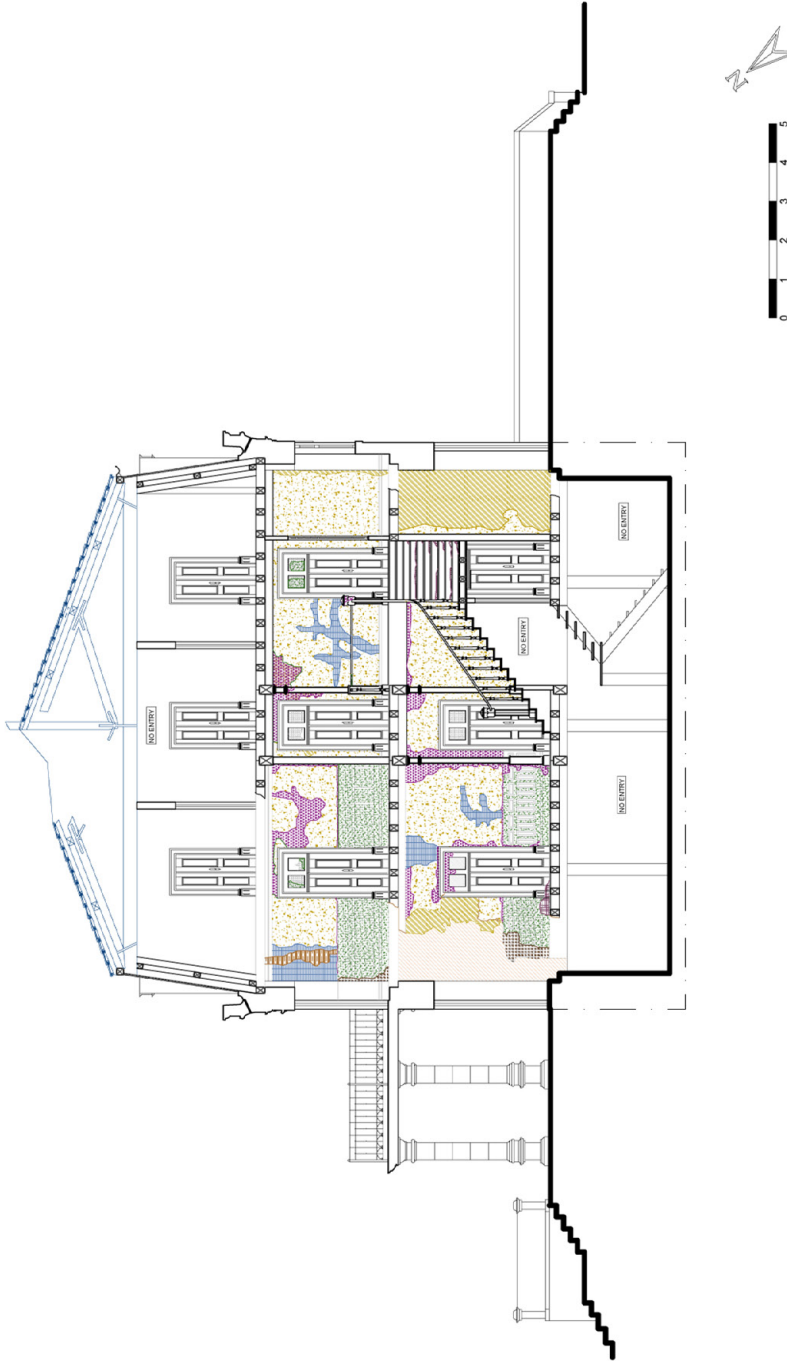
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Legend:
■ Design Hypothesis



Legend

Physical and Chemical Decay

Cracks & Detachments

- Blistering
- Disintegration
- Material Detachment
- Map Cracking

- Erosion
- Wood Decay
- Missing Elements

- Discoloration
- Efflorescence
- Patina
- Black Crust
- Leaching

Discolouration & Deposit

- Rustyness
- Soiling
- Ashes Deposit
- Material Deposit

Biological Colonization

- Alga
- Plant

Elevations
(Actual State)

North-East Façade

02/10/2013

38

The solution for the future of the destroyed city was given to the main architect of the kingdom, the General Lieutenant Manuel da Maia who later, together with Eugénio dos Santos and Carlos Mardel created a kind of a triangle of forces converged in a common task: the new Lisbon.

After several deliberations, proposes two main choices: the design of the new city in the Belém's area, which he preferred and the reconstruction of the central part of the ancient city.

It should be emphasized that the plans which envisaged the development of the city enclosed innovative ideas that had never been known regarding the field of urban planning during the eighteenth century in Europe. Taking into consideration that Lisbon was “far away” from Europe, its experience took place behind closed doors, in difficult conditions, also subject to budgetary constraints that limited the urban design.



Figure 46: Proposal Plan for the Baixa Pombalina.

This new plan (the current Baixa Pombalina area) was organized by a grid plan with the roads and pavements fixed at 12 m wide. The previously standing royal palace was replaced with the Praça do Comércio, which along with Rossio square defines the limits of the new city. Maia and Santos also outlined the organization of the facades of the streets, conceived on a hierarchical way, where the amount of details and size were delineated according by the importance of the street. These were in a notably restrained neoclassical style partly the result of limited funds and the urgency of building but also thanks to the enlightenment concept of an architectural rationality coming from Marquês de Pombal. A standardized system of decoration was applied both inside and out with a simple application of tiles, now a trademark of Lisbon's façades.



Figure 47: Example of a Façade Design by Eduardo dos Santos.

With thousands of people without homes and living in peccary conditions, it was needed to find a solution for a fast construction. In a city practically destroyed and without sufficient labourers, it was necessary to hire builders from the neighbouring cities and work on a design that could be easily multiplied.

Therefore, the uniformity of the architecture was the result of the demands of production: all constructive elements were clear-cut a priori in the project, from the wood pieces to masonry, doors, windows, bars, nails, ...

With this system, the regular contact between the artisan and the final work vanished: the constructor began to build abstract pieces-type, far from where other constructors would use them. It was an initial prefabrication and standardization.

Everything was predetermined, the shape, the measures, the materials etc... All the construction elements were decided and designed in Lisbon and fabricated elsewhere, sometimes by constructors completely unaware of the capital that they have never seen.

Each element was designed to be combined with others: it was thus possible to obtain compositions according to the size wanted.

In this way, we can assume that the main concept was to create “inhabit machines” designed to be built in a quickly and economically way, concepts very familiar to the military strategies.

The importance of the Pombaline architecture took more than a century to be understood, and in fact, its construction was always put aside. Its complexity and technical exigencies were seen, especially in the end of the XIX century, as an obstacle for the speed of the construction imposed by the cities expansion period.

Nevertheless, the Pombaline construction is in fact an exceptional act of depuration, achieving a degree of an extraordinary comprehension about the structure behaviour.

The technical melioration is such, that nowadays it would be difficult to upgrade with the available materials and achieve this same kind of robust and durable structures, inexistent in contemporary architecture.

The ex-libris of the Pombaline construction is the use of the famous “Cruz de Santo André” (Saint Andrews Cross), a component of the wooden frontals (tabiques). It’s a remarkable combination of the heavy masonry elements, rigid and fragile, with the light wood, flexible and resilient, which

together, assure a remarkable performance upon the vertical loads and horizontal forces.

The real prove for the excellence Pombaline construction relies on the fact that it survived for around 250 years of complete negligence and abuse, continuing standing and stable and proved capable of outline another earthquake in a more secured manner than the modern buildings constructed on the past few decades.

3.1.3 The Pombaline Structure

The main feature of the Pombaline structure it's the so called "Gaiola Pombalina" (Pombaline's Cage), a wooden structure capable of resisting the horizontal and vertical forces in any direction.

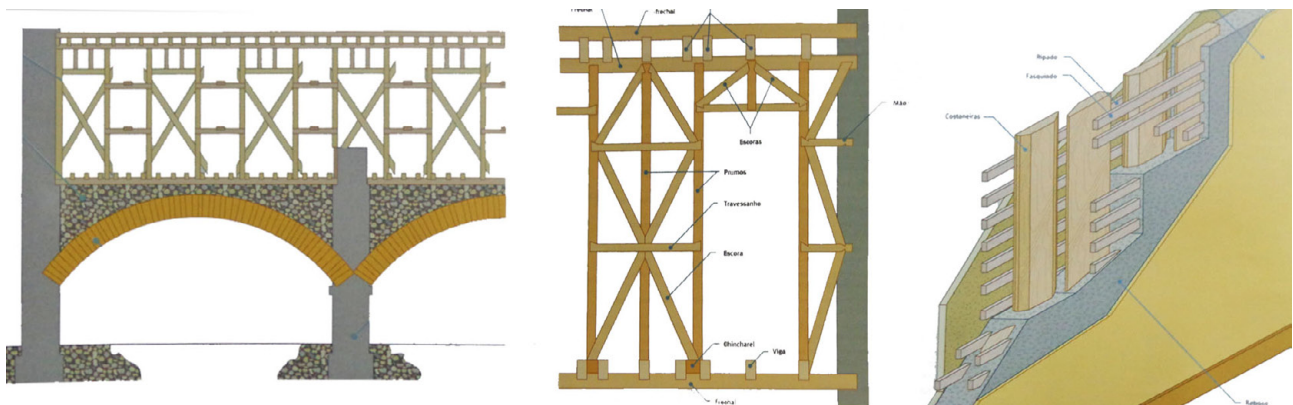


Figure 48: In Appleton J. Reabilitação de Edifícios a) Foundation Structure and Frontal Structure. b) "Frontal" Composition. c) Layers of a "Frontal Wall"

The Gaiola is constituted by several plain panels "frontais" that work with the common vertical posts. Geometrically, each panel was constituted by a group of triangle, similar to the actual metal trusses. Since the triangle it's the only geometrical figure that cant be deformed without changing the length of one side, the panels mobilize the axial resistance of the wooden bars in order to resist both vertical loads and horizontal forces.

TIPOS DE UNIÃO DE PEÇAS DE TABIQUE

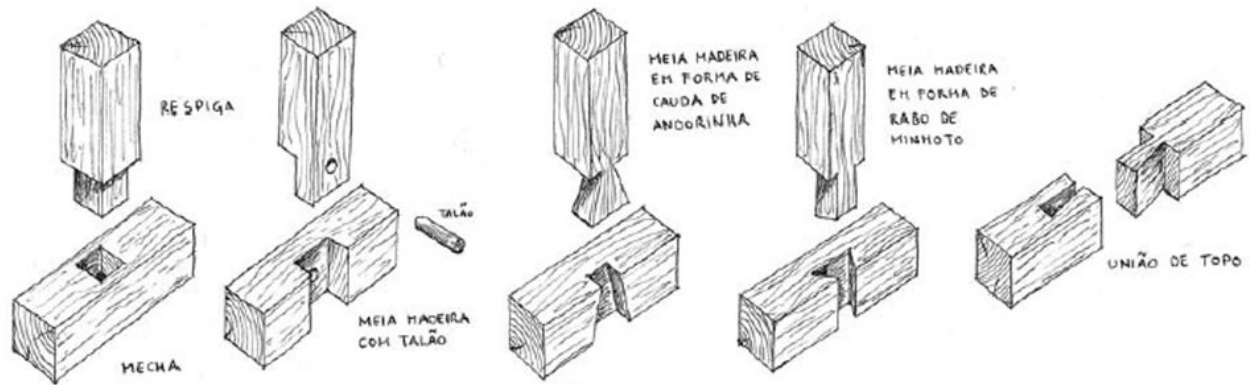


Figure 49: Detail of the Joints of the “Frontal” Walls

The compabilization of the several orthogonal plans along the vertical common bars, leads to a tridimensional truss, able to resist the loads from any direction. The “frontais” are normally hidden inside the panels and filled with masonry and the external finishing, in which generally the wood structure its not visible.

The “Gaiola” normally exists on the internal walls above the 1º floor, having the façades and gables done in masonry.

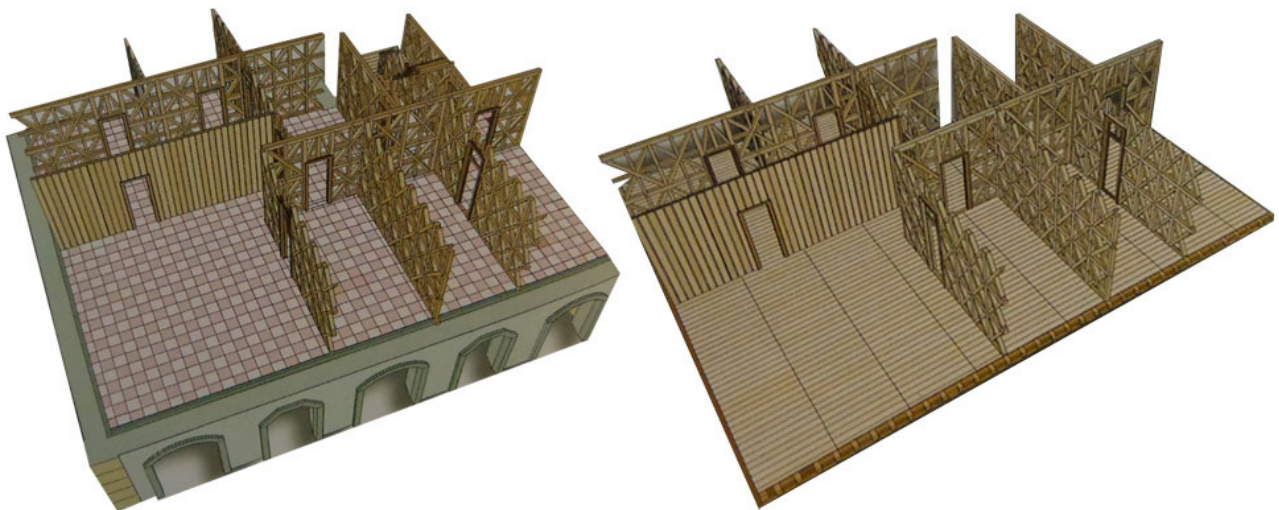


Figure 50: In Appleton J. Reabilitação de Edifícios. a) Example of the plan layout on the first floor. b) Example of a plan layout of the wood structure of the superior floors.

The pavements of the 1º floor are constituted by wood beams supported by transversal secondary beams, that are supported on the external walls and the “frontais”. On the best constructions, the primary beam would be consisted on a unique piece of wood crossing the structure from side to side, otherwise, it’s divided in two or more elements attached side by side without any continuity.

The secondary beams and the panels are attached inside the masonry walls, this connection is assured by metal notches and nailing.

3.1.4 The French Influences

The early Pombalin architecture, designed by the architects, Eugénio dos Santos and Carlos Mardel has been modified in many cases, especially on the ground floors, roofs and interior, as a consequence of new business and commercial functions developed in XVIIIth and XXIth centuries.

The Pombaline architecture is essentially shaped by a repetition of the same block that could be repeated endlessly, a kind of methodological abstraction. Therefore the main features of the Pombaline building are not in the plan but in the prospects. The plans of the building were an urbanists result.

The main typology of the Pombaline building comes from the previous typologies built prior to 1755. However, analysing more further, we can see that these influences come from some typologies created by an Italian architect Sebastiano Serlio (1475-1552) who worked in France and is the author of several known palaces. Serlio influenced all the generations of Portuguese architects since XVIth century, his numerous drawings were so suggestive that the architects basically copied, altered, added templates and suggestions, often simplifying the proposals.

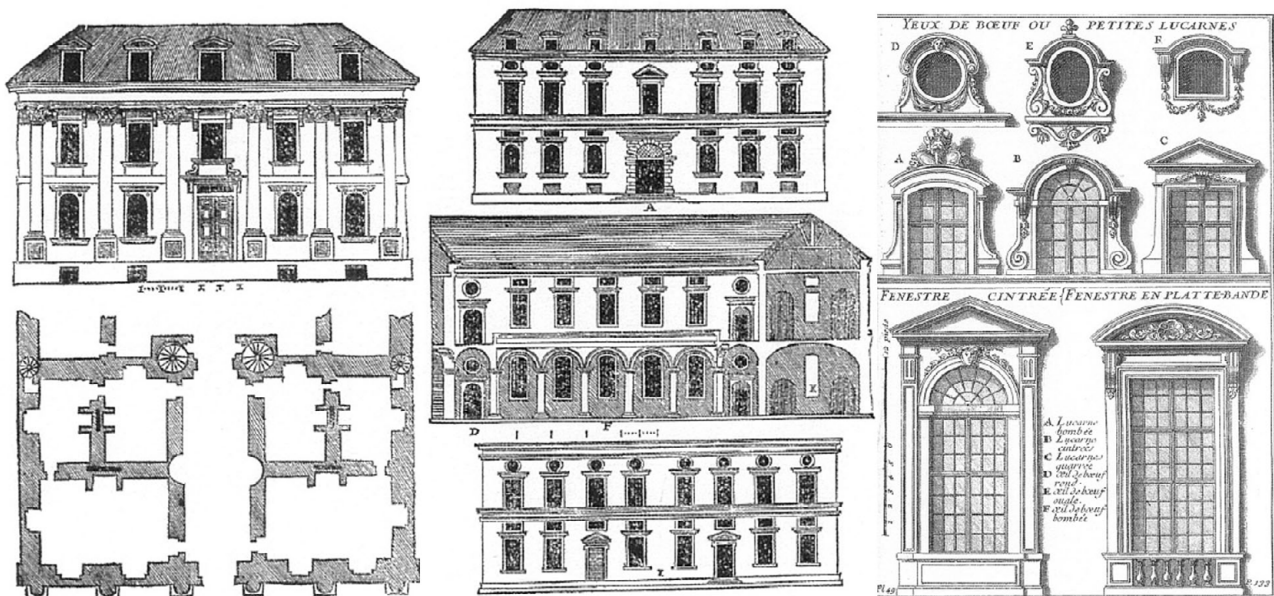


Figure 51: Prospects in Sebastiano Serlio, Tutte l'Opera d'Architettura et Prospetiva, 1600, VII book, p. 105

Eugénio dos Santos and Carlos Mardel imposed other influences coming from their vast collection of texts and treatises and contemporary French engravings of the XVIIth and XVIIIth centuries. One of the treaties was the work of Charles Augustin d'Aviler: "Cours d'Architecture qui comprend les Ordres de Vignole" dated from 1691.

3.1.5 Doors and Windows.

“The doors and windows are like the mouth and eyes of the buildings, for introducing light inside” Vincenzo Scamozzi

This is an affirmation used by d’Aviler to whom, doors and windows should be carefully placed, since large walls would weaken and change the thermal behaviour of the interior environment, and too small don’t allow the entrance of enough light creating dark interiors. For him, the correct opening’s distribution is the one where the width between wall and the window should follow the ration (1+1+1+1+1....) as found in pombaline buildings.

The doors feature arches very slightly slaughtered (the circle centre is in the middle of the sills), alternating with angular truncated arcs, it reveals some rhythm and great taste in the formal “style floor”. The openings abroad, seem to indicate even the arches and domes inside. Most doors have the truncated angular arches, the design of these openings, cutted into angles, had already been used in Early Baroque, especially at the plants.

On the Noble floor (bel estage according to d’Aviler) windows should be higher than those on the upper floors and the height of these should decrease according with certain mathematical proportions, which the Pombaline architects naturally followed. The width of all the windows of several floors should always be the same. Regarding the decoration, as expected, it was opted for the simplest type. The windows on the top floor, beneath the cornice, have a slight bend that animates the rhythm of the rectangle façade, repeating symmetrical, the openings of the ground floor presenting the same arcs.

3.1.6 The Roofs

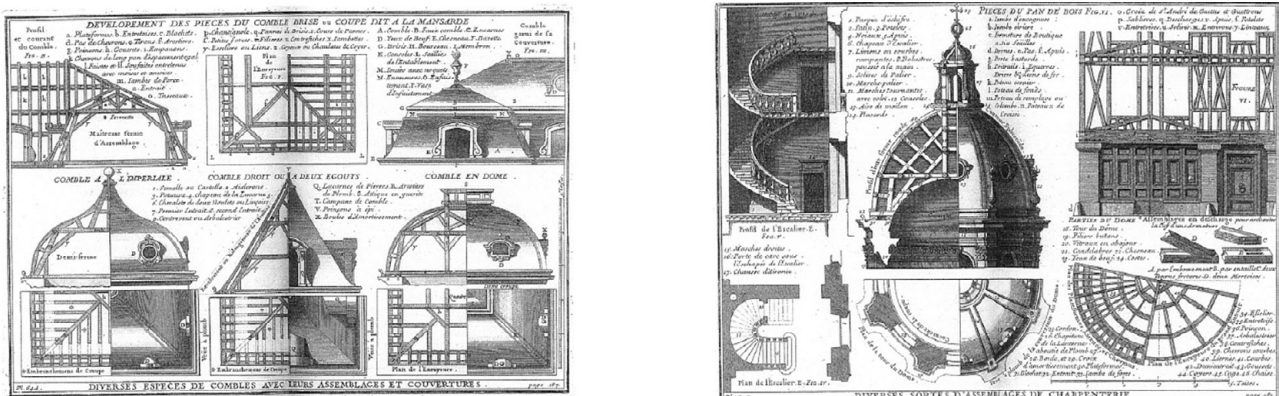


Figure 52: Drawings from Augustin Charles d’Aviler, Cours d’Architecture 1691, p. 49

As for roofs, they assume a great importance in the Pombaline Architecture. At this point, both Ludovic and Mardel, originally from the Astro-Hungarian Empire, would have brought the famous “Germanic Roofs” or the “Mardelianos Roofs”, whose paradigm arises on the Rossio Buildings.

As for the other pombaline’s roofs, these follow the tradition of two Portuguese waters, also influenced by Serlio, always present, but whose origin dates back to the Portuguese architecture of

Romanesque and Gothic wooden roofs covered with tiles.

Regarding other Pombaline Architectural drawings, the good traditional Portuguese style along with the military engineers, it was used wedges and Tuscan style pilasters, with some variations and simplifications, the result of the delay during the construction of some buildings. The pilasters in Pombaline buildings, unlike the indications of Aviler, never defined odd openings on the buildings, organizing themselves randomly throughout the Baixa. This is, once again, the witness of the preponderance of the block towards the building.

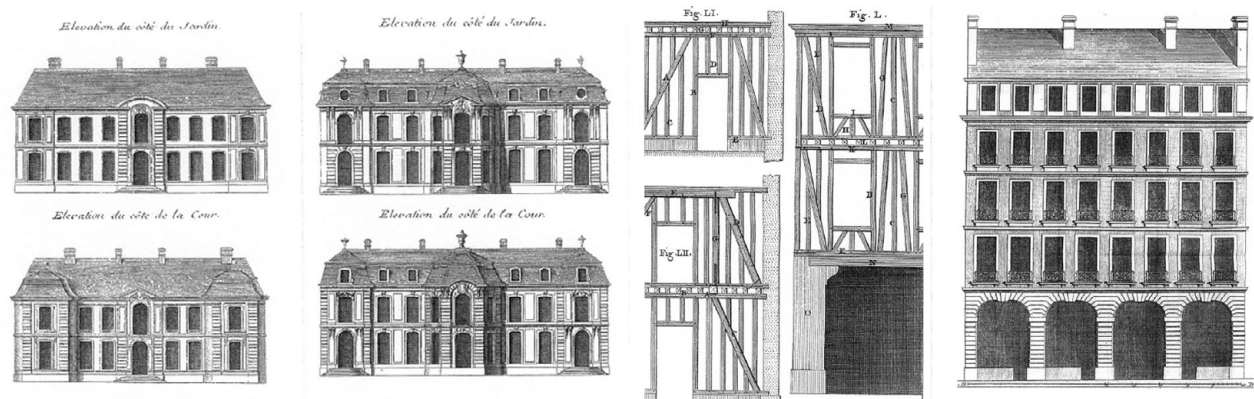


Figure 53: In Jacques François Blondel, Cours d'Architecture, 1777, IX, p. 124

It accurate to say that the Pombaline's building has a conception of "modern" in its simplicity. Based on the categories created by Blondel, its possible to consider the pombaline architecture as : symmetrical, pyramidal in the use of roofs and dormers; convenient for its function and economy, the adequacy of each element to its place, the symmetry and regularity; with unit, due to its solidity, convenience and relative ordering in which all members should have the same origin; and exclusion of different architectural orders and diameters on the same floor; masculinity by the weight, massive aspect and materiality.

3.2 Case Studies of Restoration and Memorial Designs

3.2.1 Villa Tarabya_ The Italian Summer Embassy in Istanbul.

Tarabya is an Istanbul area where several western European countries established their embassies starting from the XVI century. In XVIII, they started constructing summer embassies on the shores of the Bosphorus, one of these embassies, the italian, was constructed by Raimondo D'Aronco in 1905-6 is characterized by a typical timber structure, a reference to the traditional Ottoman architecture, the *YaZz*, also noticeable from some elements such as the overhanging eaves and the support of the third storey by wooden brackets. The Ground Floor is constructed with Masonry walls reaching, in the North Façade, the second floor in order to support the roof and the terraces.



Figure 54: a) East View of Villa Tarabya. b) Interior Pictures from 1995.

In 2004, Villa Tarabya was considered a building in a very delicate physical condition, in such a state that its collapse was considered a serious possibility, the restoration of the building would cost a substantial amount. However, the ICOMOS International Wood Committee along with the Turkish Timber Association, after several tests and evaluations, concluded that apart from some minor structural problems, the building was in a relatively good condition and the repair wouldn't achieve the values previously determined.



Figure 55: a) View from a Box gutter that divides the North slope into upper and lower halves. b) Picture of the deflection of the frame. c) Decay of the Iron protection.

The main damages of the building were caused by lack of maintenance, specially on the roof drainage system; lack of some tiles on the cover caused by storms; vandalism and Theft of some architectural details. Regarding the structure, the comity realized that some columns were not directly supporting the beams; the periclitant state of the area of the main staircase.

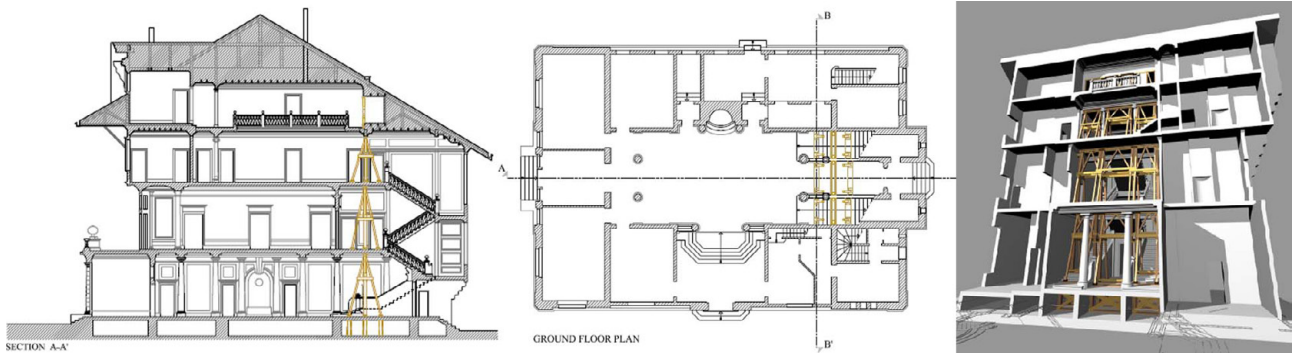


Figure 56: a)Section from the new system of emergency propping. b)Ground Floor Plan. c) 3D view of its placements.

With the preliminary proposal it was decided to replace all the missing materials, stabilize the structure and check all the joints to fulfil the requirements regarding the buildings performance during an earthquake . For this, the last two points it was designed an emergency repair structure for the full conservation part of the project.

3.2.2 Vietnam Veterans Memorial in Washington, DC, 1982

The Vietnam Veterans Memorial, located in Washington, D.C. was built to honour the U.S. army forces who fought in the Vietnam War and the soldiers who died in service during the War.



Figure 57: a) Top view from Vietnam Veterans Memorial Washington, 1982. b)View from one of the Wall edges.

The design was subject to several critics but the final project, designed by Maya Lin consists on two black granite walls, with around 75 m long, engraved in chronological order with the names of the men and women who fought and died during the Vietnam War.



Figure 58: a) Vietnam Veterans Memorial Washington, 1982 View. b) Detailed view from the reflection of the engraved panels.

The walls penetrate the ground like a wound, a concept that the architect wanted to emphasize. At the point where the two walls meet, the dates 1959 and 1973 (marking the beginning and end of the war) “meet” thus closing the circle of the time span of the war. In this point, the walls are 3 m high and start shortening till they reach the two edges with around 20 cm. The stone chosen for the walls came from India, given its reflective quality. This feature was really important conceptually, in this way, the visitor is able to see his reflection simultaneously with the engraved names, which symbolically, merges the past and the present together. The angles of the wall were also designed carefully to be perfectly aligned with the Washington Monument and the Lincoln Memorial.

3.2.3 Empty Sky 9/11 Memorial

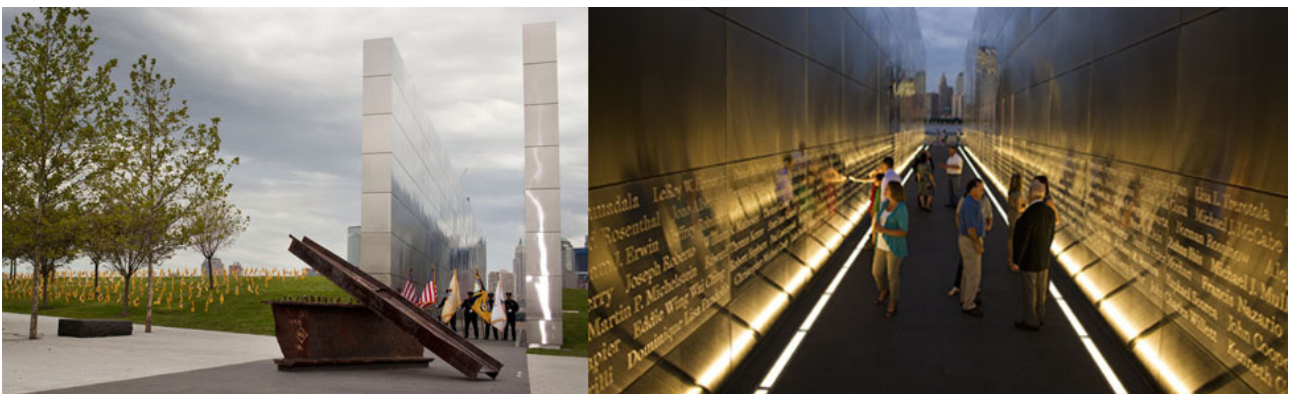


Figure 59: a) View from the Empty Sky 9/11 Memorial. b) Detailed view from the inscriptions on the walls.

Empty Sky is a memorial to the victims of the September 11 attacks on the United States. It is located in the Liberty State Park in Jersey City at the mouth of Hudson River across from the World Trade Center site. The design was made by Jessica Jamroz and Frederic Schwartz, it was inaugurated on September 10, 2011, a day before the tenth anniversary of the attacks.

The design was chosen by the Families and Survivors Memorial Committee, and it is specially

dedicated to the 746 New Jersey's innocents who perished in the attack. The design consists on two walls, transecting a gently sloped hill anchored by a granite path aligned towards the Ground Zero. Two rectangular stainless steel towers have the exact width of the World Trade Center towers, this proportion of the walls is a symbolic representation of the buildings as if they were lying on their sides. The name of each of the 746 victims is engraved in the stainless steel walls.

3.2.4 Flight 93 National Memorial



Figure 60: View from the complete complex of the Flight 93 National Memorial.

This Memorial, located at the site where the United Airlines Flight 93 crashed. This flight was hijacked during the September 11 attacks. The memorial was made to honour the passengers and crew, who stopped the terrorists from reaching their target. The design consists on a “Tower of Voices,” containing 40 wind chimes, one for each person who died. A plain circle is bisected by the flight’s trajectory.

The choice of the circular shape was chosen in order to emphasize the crash site. A break in the trees symbolizes the path the plane took plain shape of a circle bisected by the flight’s trajectory. as it crashed.



Figure 61: a) Views from the tree's path. b) View from the Inscription walls.

This circular path is lined with red maple trees, that follows the natural bowl shape of the land. Forty groves of red and sugar maples and eastern white oak trees were planted behind the crescent. A black slate wall mark the edge of the crash site, where the victims are buried.



Figure 62: a) Detailed views from the inscription Wall.

The walkway eventually widens in from a ceremonial gate, shown in bronze, and the wall of names, composed of 40 panels of 7.6 cm, thick slabs of polished white granite, 2.4 m tall, each inscribed with a name of the 40 heroes. Two walls flanking the gate are clad in polished white granite and the flight path is paved with black granite. Beyond the gate is the impact site, shown planted with wildflowers, and the hemlock grove beyond.

Chapter IV

4. Restoration and Intervention

In term of Restoration, it is necessary to point out that further investigation should be carried in order to check the integrity and damage of the structure, which was not possible to survey until now because of accessibility problems.

4.1 The Restoration of Casa do Passal

As a result of all the previous analysis, Casa do Passal, a “monument” of Pombaline architecture, with its original plan layout, the features of the façades and the architectural elements, is a unique example of a combination between the traditional Portuguese “solares” with french influences. The architectural features on the building, make it unique in the context of the Portuguese architecture, For this reason, the building must be restored and must be provided a suitable function to stand for the future generations.

4.1.1 The Restoration Principles

To determine the basic frame of the interventions during the restoration process, a group of restoration principles are presented below.

1. The proper function must be assigned to the building in order to provide periodical maintenances and/ or repairs to transfer it to the next generations. During the process of selection of the building’s function, it was not taken into account just the building itself, but also it’s surroundings, so it was carried out a general research about the potential direction that could be explored in this house. Taking that into account, the garden, surrounding the building must also be potentialized and serve as a support of the house new function.

2. The uniqueness of the building comes from its original features. Therefore all of the interventions must be based on the levels explained in the Deterioration and Destruction Analysis on the chapter II. The elements mentioned as 1° degree, will be reconstructed, following the same design and typology, using completely new materials when the remaining one can not be used, in this way, since the original structure is no longer present or its too damaged to be conserved, the new one will resemble it in shape and dimensions but its appearance will be new. In this way, the visitor will be able to distinguish clearly the new structures from the original ones, but at the same time, they will be able to see the “essence” of what was there. The 2° degree elements, the ones where in some parts, the level of damage is so advanced that there’s no hypothesis of any kind of conservation approach, will be, when possible, partially reconstructed with new compatible materials, following the same or improved technique and dimensions, taking into account the new public function of the building.

3. The missing elements that are mentioned 3° degree will be reproduced, only when accurate documentation of its original features is obtained. If such documentation doesn't exist, the elements classified, will be consolidated when present and reconstructed, if necessary, using a different technique in order to be visually perceptible. The reason for this attitude is that none of these proposals are obtained from the building itself. Therefore, these proposals might be categorized as speculative proposals. At this point, a kind of completion which is based on the 1° and 2° degree, definitely damages the originality of the building. However, at these points, minimal solutions that can easily be separated from the original in perception will be used if any intervention is necessary because of the new function of the building.

4. The elements described on the reliability level 4°, similarly like the ones on level 3°, will be conserved if still present in the house, however in case of missing elements, they will not be reproduced if they are not structurally important.

5. All of the additions that are due to the new function of the building will be made of new and different techniques so it can be easily differentiated.

4.1.2 The Preservation Intervention

As it was explained on the Deterioration and Destruction analysis, some elements were divided into different levels of damage in order to better identify the best approach for each one of them. According with the level, if its less or more reliable, a different solution is proposed, taking into account the restoration principles explained on the previous paragraph. Totally it was divided in 4 levels, each one corresponding to a certain element or structure:

4.1.2.1 1° Level



Figure 63: Views from the whole in the centre of the roof.

- **The Roof** - At this moment, the roof is the most prominent problem in the house since it fell down several years ago and the temporary repair didn't solve the situation, since then, there is a big hole on the roof of the house where all the water of the rain and snow enters. This presence of water is the main reason of the level of destruction of the consequent floors.

Taking that into account, it is proposed a reconstruction of the roof, using new structural materials since it is not possible to use the remaining ones. except for some brick tiles that can be used in the reconstruction. Following the principles of restoration listed above, the type of materials used for the reconstruction will be compatible with the original ones, following the same shape and dimensions. For the covering layer of the roof, it will be reused the existing brick tiles, however the area where the original roof collapsed, it will be covered with a glass, indicating that once existed a whole there. In this way, the glass surface will illuminate the central room of the second floor, creating a new atmosphere for the exhibition and at the same time, with this new structure, visitors will understand that it is not part of the original design but it resembles it.

4.1.2.2 2° Level



Figure 64: Closer View from the state of the Mansard Floor.

- **The Mansard Floor** - Located exactly under whole of the roof, it has, not only been directly exposed to the atmospheric factors as well as it suffered the impact of the roof's collapse. Taking into account that the Mansard Floor is completely constructed with a wood structure, (much similar with the "frontal" walls) being exposed to water, lead to a serious deterioration of the materials. The external wall facing the main façade (South-West) is bending down, part of the structure is missing in some areas, specially near the windows. Also the areas where the floor connects with the masonry walls, if still present in the house, is quite deteriorated.

So, following the 2° principle of restoration, it is proposed the reconstruction of the damaged and missing parts of the mansard structure, using all the "healthy" remaining materials and when it is not possible, the new ones will be compatible, following the same type and construction, used on the original structure. Some elements can be availed such as the Slate tiles and the remaining handrails of

the windows. Regarding the interior elements of the mansard floor, since it could not be accessible, the evaluation of the internal elements could not be performed.



Figure 65: View from the Interior Bearing Walls on the First Floor.

- **Interior Bearing Walls “Frontais” and Partition Walls “Tabiques”** - The majority of the internal walls are still in a good state, apart from some missing parts. The main problem is, like in some structural elements explained previously, on the perimeter area of the house. All the “Frontal” walls of the first floor, the ones covering the masonry wall, are missing or incomplete, the wall infill and mortar are disintegrating and the plaster is totally missing. Regarding the internal and partition ones, all the edges are deteriorated, already missing some fundamental elements of its structure. These missing elements affect the stability and the proper behaviour of the structure.

Taking that into account the 2^o principle, regarding the missing “frontais” covering the masonry wall, a reconstruction is proposed using the structural elements that can still be availed, and in the case when the materials are too decayed, it will be used a compatible new material for the repairs, with the same dimensions and application’ method. On the internal “frontais”, since the wall is almost intact except the edges next to the masonry wall, only the decayed elements will be substituted for new ones in order to assure the proper structural behaviour of the wall.

- **Floors** - The interior wood floor structure, much similarly with the interior bearing walls, it has been affected specially next to the perimeter of the house. The missing windows, are the main cause of the level of deterioration of the floor system, being almost completely missing in R11 and R15 as well as in R01, in front of the entrance door.

In this case, since its a element so important for the correct and safe use of the house, all the “healthy” elements will be maintained and properly reinforced. The missing and damaged elements, in this case the beams, will be reconstructed and if necessary, redesigned and dimensioned in order to be evaluated correctly according with the new standards of the new public function of the building.

Regarding the flooring, all the “healthy” areas will be maintained and the damaged one will be replaced with new and compatible material, following the same flooring composition but visible

distinguishable from the original boards.



Figure 66: S03 Staircase Views

- **Staircases** - Inside the house there's three different staircases, the main one S01, right in the centre of the building, have been protected by the fact the pavement of the second floor is still almost complete, fact that protected the core of the house from the rain and snow coming from the whole in the roof. However there is still some leaks that caused the presence of humidity on the steps and consequently some punctual cases of wood decay. The second S02 is located on R6, the Kitchen of the Services Building. Much like the Main Staircase, the S02 have been exposed through minor leaks, therefore, its structure is intact except in some small areas, like the contact between the stairs and the first floor.

Considering both Staircases, their structures and supports will be maintained and reinforced, some broken or uneven steps will be replaced (using a compatible material) and all the missing elements, such as the handrails, will be replaced with new ones but with a complete new design in order to be clearly distinguishable the new elements from the original ones.

The third staircase S03 in R18 on the First-Floor is completely destroyed. The wall where it was supported collapsed and consequently damaged all the steps and the staircase structure. Given the fact that it is located next to a window (that is missing), it was exposed to the atmospheric conditions, therefore the wood is in a developed state of decay.

Since it is the only original access to the second floor, it is an element of a fundamental importance. It is proposed the reconstruction of the Staircase, also to assure the security of the access. However, some decorative elements can remain, such as the handrails.

To secure a fluid accessibility of the house, it was introduced an elevator that gives an easier access to the second floor but also to the basement. This elevator allows the access of people in wheel-chairs to all the floors.

4.1.2.3 3° Level

- **Windows and Doors** - Exposed to the Atmospheric actions without maintenance and subject to acts of vandalism, several windows and doors are missing or partially broken. This fact left the openings unprotected allowing the water enter inside the house. This is the main reason for the level of deterioration of all the wood elements (floors, walls,...) on the perimeter of the masonry wall. This problem is more prominent on the areas of the main façade, the most exposed to the atmospheric actions, being the pavement of the first-floor, specially on R15, completely deteriorated.

Given the fundamental importance of these missing elements regarding the proper protection of the house envelope, and following the restoration principle nº3, it is proposed the reproduction of the elements when missing or when the level of deterioration is too high in order to be repaired. In the case when the elements are in a satisfying condition, the proper measures for its conservation will be taken care.

The reproduction of these missing elements will be proposed because not only the proper documentation of its original features is available but also because these elements give a visual continuity of the façades.

- **Exterior Plaster** - Given the level of Decay that can be seen on the Decay Analysis of Chapter II, the external plaster still remaining on the façades is quite limited and disintegrating from its surface. Regarding the Ocre Paint, this one is almost vanished, except in some areas where it was more protected such as under the balconies.

Taking that into account, all the well bonded remaining plaster and paint will be preserved. All the disintegrated parts will be filled and then covered with a new compatible mortar. The parts where the plaster is completely missing, and the granite blocks of the masonry wall are exposed, it will not be proposed a new application, in this way, visitors can differentiate the different materials and understand what the house have been exposed to throughout time.

The plaster used to fill the gaps will be done, using the same composition of the original one as well as the ocre paint as the finishing layer.

Regarding the application of the new plaster, further investigation must be carried out to understand the chemical and physical properties of the original plaster composition and application technique in order to choose the most compatible material to be used.

- **Interior Plaster** - Very similar compared with the “Frontal” and “Tabique” walls, the plaster inside the house is mainly in a good condition except on the edges with the masonry wall and some punctual case where it was exposed through water leaks and humidity.

Following the Restoration Principle nº 3, the Plaster on all the Interior Walls will be maintained if its still consistent, only some cleaning measures will be taken. On the areas where the plaster is partially missing or the wall had to be partially reconstructed, a new compatible plaster will be

added. Even using the same material composition, the difference between the new and original plaster will be easily perceptible, in this way, the visitor will be able to distinguish the original traces of the house structure from the new ones of the restoration work.

On the ground-floor, since its function will be related with the restoration process of the house, the walls in which the plaster is totally missing but its underlying surface is in a good condition, like in R05 in which the blocks of the masonry wall are visible and in R01 where the wood structure of the frontal wall is exposed but in a good state, the application of a new plaster will not be proposed in order to allow the visitor to see the different structural elements of the house, as part of the exhibition.

- **Wainscot** - All the walls of the house, except on the services building, are finished by a wainscot around the perimeter of the rooms. Generally, this element is in a good condition, however when subject to the leaks coming from the top floors and when its located under the windows, exposed directly to the presence of water, when presence, the level of decay is quite high.

Taking that into account, the missing panels will be reproduced in order to give a visual continuity in the walls of the rooms, however, the new elements will not be painted as the original ones, they will be left with the natural wood. In this way, following the 3° principle, the new elements will be clearly distinguishable from the original ones.

4.1.2.4 4° Level

- **Painted Elements** - Part of the house was decorated with occasionally painted elements such as the ceilings and the beams of the Ground-Floor and some doors. Given the humidity coming from the windows, part of these paintings are fading but clear enough to be maintained.

Following the 4° Restoration Principle these elements will be subject to cleaning and conservation measures but the missing parts will not be reproduced. In the case of reproduced doors, no paint will be applied. In this way the visitor can distinguish the new elements and regarding the painted elements, he will be able to understand its authenticity.

- **Stained Glass** - Located on the ground-floor doors d4 and d4a with an elaborative composition with flowers and geometrical on the other doors, it was part of the rooms decoration.

The remaining glass will be maintained and cleaned but in case of missing elements, it will not be reproduced, however, the empty space of the window will be applied a new and simple glass for security of its visitors. The same with the coloured glass of the Glass Panels on top of the main staircase.

4.2 Function

As part of the 1° Restoration Principle, in order to rehabilitate Casa do Passal into an active self-

sufficient building, a new function must be assigned. Since the main reason for restoring this house came with the fact that it belonged to Aristides de Sousa Mendes, it was assured that the new function had to be related with his person and his actions.

Taking into consideration also the recent activities and events organized in the house by Aristides de Sousa Mendes Foundation along with the Municipality of Carregal do Sal, it was important to analyse those events and relate them with the new function.

4.2.1 Recent Activities:

- **Work Towards Fairness: Cassa do Passal by Eric Moed** - From 20th June till 1st August 2013 it was exhibit is a semi-permanent installation composed by three pavilions placed at the entrance of Casa do Passal. The construction contained information about Sousa Mendes and the holocaust story. The documentation of the exhibition was gathered closely with the Sousa Mendes Foundation, in which direct descendants of Aristides de Sousa Mendes and several individuals whom he rescued were invited to attend the inauguration. Totally 3000 people were present.

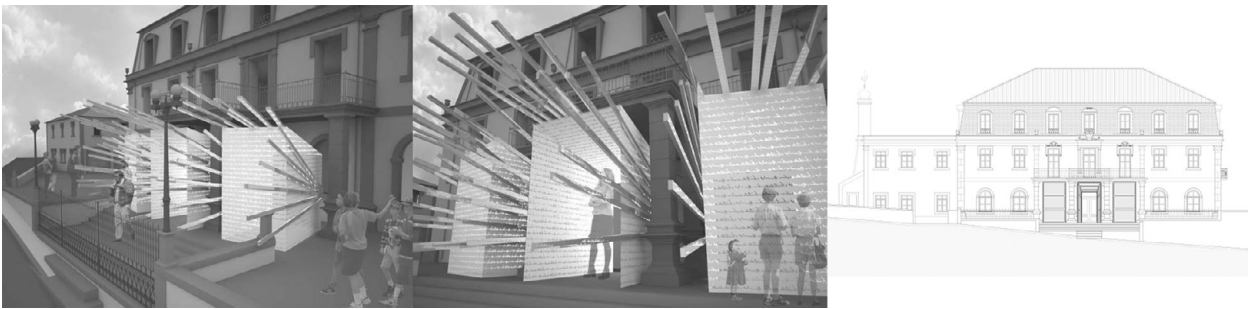


Figure 67: 3D and Elevation views of Eric Moed Proposal

The designer of the installation was a recently graduated architect from New York, Eric Moed, who discovered that his family was saved during the World War II by Sousa Mendes. Having that, he decided to dedicate his thesis to him.



Figure 68: Photos of the structures at night. Photo of the inauguration day with the architect Eric Moed.

The project consisted in three temporary independent structures inserted on the three openings of the front porch. These structures made in steel, wood and plastic panels would function as a pop-up museum about Sousa Mendes story, the context of World War II and current world prob-

lems.^[6]

- **Journey on the Road to Freedom**- an event organized by the Sousa Mendes Foundation, the Comité national français en hommage à Aristides de Sousa Mendes and the AJPN (Society for the Remembrance of Righteous and Persecuted Persons of the Nazi Period), that consisted in a trip following the footsteps of the Sousa Mendes visa recipients. It started on June 9 in Paris stopping in Bordeaux on June 11, passing from cities like Bayonne, Hendaye, Salamanca, Coimbra and stopping in Cabanas de Viriato, right in front of the house^[7].

- **Rotas de Judiarias_Rotas de Sefarad** - The Portuguese Secretary of State for Culture, Jorge Barreto Xavier, announced a €4.3m project aimed at restoring and renovating Portugal's Jewish heritage sites. The project, called Rotas de Judiarias – Rotas de Sefarad, focuses on Portugal's Jewish cultural heritage in order to stimulate its tourism, expected to attract over 300 000 tourists, and restore this forgotten aspect of Portugal's history. Among the first projects to be funded are the revitalisation of the ancient synagogue of Tomar; the restoration of the shuls in Almeida and Vilar Maior; the creation of a memorial for the “Portuguese Schindler”, Aristides de Sousa Mendes, in Vilar Formoso; and the establishment of a Centre of Interpretation of Sephardic Culture in Bragança. ^[8]

It is crucial to mention that these three events and projects are extremely important regarding the future direction and opportunities for Casa do Passal, regarding its function and international relevance. So, the new function will take in consideration the objectives of Sousa Mendes Foundation, settling a fixed place for its head offices in the house, create a place to honour Aristides de Sousa Mendes and his family, where his personal belongings will be exhibit along with pieces of the documentation, proof of his actions such as the letters to the government, private letters and signed passports. Becoming a museum connected with the new proposals for the Jewish community, it makes sense to reserve an area where some temporary exhibitions can be performed , turning this house in one of the stopping points of the Sefarad Routs.

In addition, as it was mentioned before, Sousa Mendes saved around 30.000 people during the WWII. In that list includes the names of several famous people that would be part of our history if they were not saved by him, people such as the Hapsburg and Luxembourg royal families, the spanish painter Salvador Dalí and his wife Gala, Madeleine Lebeau (the actress in the film Casablanca), the writers Margret and H.A. Ray, a belgium politician Albert de Vleeschauwen, Alexander Liberman (Artistic Director of Vogue magazine from 1941-1990s), Oscar Straus (composer of “The Chocolate Soldier), Antoni Slonimski (Major Polish Writer), Marcel Dalio (famous French Actor), the Fashion designer Nelly de Grab and many others.

6 http://ericmoed.com/thesis/wtf_online_proposal_page_3/

7 <http://www.publico.pt/cultura/noticia/portugal-tera-uma-rota-das-judiarias-para-reabilita-e-divulga-cultura-judaica-1601220>

8 http://comunidade.sol.pt/blogs/olindagil/archive/2013/08/17/Com-a-ajuda-da-Noruega_2C00_-Portugal-recupera-a-sua-heranca-judaica.aspx



Figure 69: a) Salvador Dali and his wife, b) Madeleine Lebeau, with Humphrey Bogart in the film Casablanca, c) Alexander Liberman: Artistic Director of Vogue magazine, d) Oscar Straus, composer of “The Chocolate Soldier,” in a Nazi caricature as “the eternal Jew” from 1938, e) Marcel Dalio.

Even the fact that he saved so many prominent people of our history its own story and hi own act of bravery were never enlighten and were never told to the world, therefore, complementing the permanent exhibition about his life on the main house, it is proposed a new structure located in the house’ garden that will show the name of all the people saved by Sousa Mendes. It will work as a mark of his actions, a physical statement of freedom, where the religion, politics and nationality has no boundaries and that in the end we are all human beings. This fact will not only be important for the Jewish community, given the number of jewish writers and artist saved by Sousa Mendes, but also for the families of the rescued people that might feel curious to visit the house and see the name of their relative as a proof of their own family history.

4.2.2 Function Distribution

Taking into account the new purpose of Casa do Passal, the functions are divided in three, the Exhibition Areas (divided in three themes: “Casa do Passal”, “Temporary Exhibition” and “Aristides de Sousa Mendes”), The Foundation Quarters and The Memorial.

4.2.2.1 The Museum

The main entrance to the Museum it is on R06 where it will be the Tickets Office , directly connected with R05, the reception with a small souvenir shop where is located the elevator that gives the access to the other floors.

The second entrance, the original main entrance of house, it accesses R01, the main hall. This room is the central core and it will be part of the exhibition area related with the restoration process of the house.

In R02, R11 and R14, is where the “Casa do Passal” exhibition will be located. This exhibition will be permanent and it will be related with the restoration work of the house, showing some pictures of the state of the house before and after the intervention as well as panels explaining the type of struc-

tures and decorations. The main purpose for this exhibition is to educate people about this special kind of construction, so typical in Portugal but so undervalued.

The rooms from R03, R04, R12 and R13 given their dimension will be part of the distribution system of the house, along with R08, R09 and R10 that for the same reason will be left open to give access to the exterior of the house.

On the first floor, R16 and R24, the areas around the stairs, will be the distribution areas that gives access to the other rooms and will be places where the visitors can see the house. The room R18, since its located on the joint between the main part of the building and the services part, it will be the access point between the two parts and it will hold the reception for the Foundation Quarters and the “Aristides de Sousa Mendes” Exhibition.

The rooms R15, R17, R22, R23, R28 and R29 will be for the temporary exhibition. This exhibition will change periodically but the theme will always be connected with Sousa Mendes and the World War II. Its a space that can be used by the Jewish Community for their expositions or even events that they might held. In this way, these rooms will always have a different exhibition with different things to show, allowing people to visit the museum periodically to see the new things.

On the same floor , R26 will be reserved to the administration office of the museum.

The main storage of the museum will be located on the basement floor, R51, since it has a direct entrance from Aristides de Sousa Mendes Avenue, in this way, the transportation of the exhibition pieces it is easier. On R49 and R50 will be located the research room and the archive, respectively, containing documents, bibliography related with the theme of the museum and some books once belonging to Sousa Mendes private collection. The central room R48, will be used for workshops and reunions. These rooms will be opened to researcher and school groups where they can use these rooms for their activities and learn about Sousa Mendes life.

R43 and R44 will be technical rooms where the technical systems such has the electricity and heating systems will be located.

The rooms R45, R46 and R47 will be the museum bathrooms, given the small dimension of the original bathrooms of the house, it was necessary to create new ones more suitable for a museum.

On the Exterior, the Annexed building, once used as the garage,will locate the coffee shop, R52 on the ground floor and a restaurant, R53 on the first. The location of this building in relation with the main one performs a shape of a piazza right in front of the entrance of the museum. On the garden side of the building a ramp gives the access from the parking lot performing another piazza where it will be located the esplanade of the coffee Shop.



Figure 70: 3D view from R01.



Figure 71: 3D view from the Temporary Exhibition



Figure 72: 3D View from R16

4.2.2.2 Foundation Quarters

The Second-Floor will have a more reserved and exclusive rooms for the Sousa Mendes Foundation’ offices, located in R39 and R40.

R30, R31, R32 and R42 will be the “Aristides de Sousa Mendes” Exhibition in which the story of Sousa Mendes will be explained and some of his personal belongings will be exhibited.

The central hall of the Second-floor R37, will be used as a common room as well as for conferences and small events. Given its centrality it is characterized as a versatile room, where its function can change according with the needs of its users.

4.2.2.3 The Memorial

The Memorial will be located on the garden of the House and it will consist into two enclosed spaces, M01 and M02, that will held the memorial walls with the name of the people saved by Sousa Mendes. These two spaces will be like small gardens where people can sit and relax, it will work like another public space in Cabanas de Viriato.

4.2.3 The Memorial and Landscape Approach

4.2.3.1 The Inspiration

Kinetic Walls _ It is known that living entities are far more adaptable to a changing environment than anything produced by Human Design.^[9] A Kinetic wall is a system adapted to work as a sculptural internal space divider, a façade for an existing building or a large scale dynamic roof. This system seeks to give to architecture, the capability to adapt and change to a certain environment, that means, become more natural and dynamic, responding to any number of Human and environmental generated variables such as the sun, wind, shadow, desire or impulse.



Figure 73: Ned Kahn_Technorama Façade (The Swiss Science Center, Winterthur, Switzerland, 2002)

The inspiration for the Memorial is based on the Kinetic Walls, specially the works of Ned Kahn, an environmental artist and sculpture. His projects are always connected with the natural elements such as water and wind. On his works he tries to recreate the wind movements or the different states of the water. One of his most famous projects, Technorama Façade (The Swiss Science Center, Winterthur, Switzerland, 2002), which is composed of thousands of aluminium panels that move in the air currents and reveal the complex patterns of turbulence in the wind. These thousands of aluminium panels moving together, create a sound that is a personification of the music of the wind. This structure turned the façade as a “living element” of architecture.

This fact is the main reason why this project is an inspiration for the new memorial of Casa do Passal. Since it is a memorial to remind the people who survived because of Sousa Mendes, the memorial had to consist in a “living element” that not only would work as a reminder of the people saved, but also, had to become an element that would work on a new public space with which people could interact with.

9 <http://dspace.mit.edu/handle/1721.1/9825>

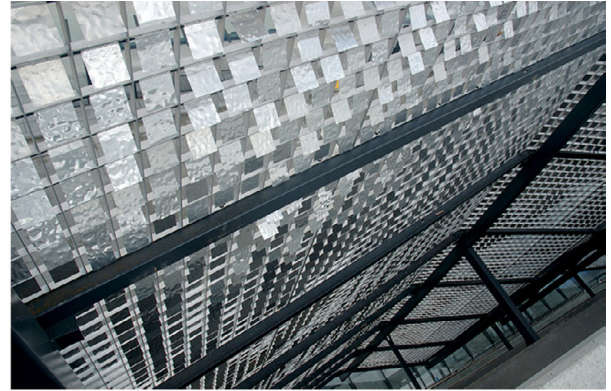
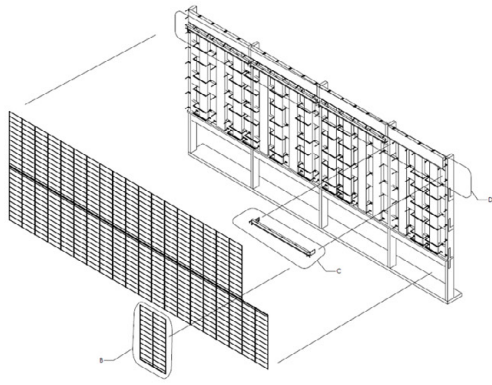


Figure 74: a) Perspective of the Technorama Wall Structure. b) View behind the wall.

Based on that, the memorial walls will follow the same logic. They will be constructed with the same system, a steel frame divided by a grid with approximately 0,5 m, in which will anchored the aluminium squared plates of 0,04 m, that will move with the wind currents, creating different visual patterns and producing a characteristic, yet subtle, metallic sound. In each one of the metal squares will be engraved the name of the person or family saved by Sousa Mendes.

In this way, the familiars of the rescuers will feel compelled to visit Casa do Passal to see the name of their relative as well as visit the museum and learn more about the person who saved their family.

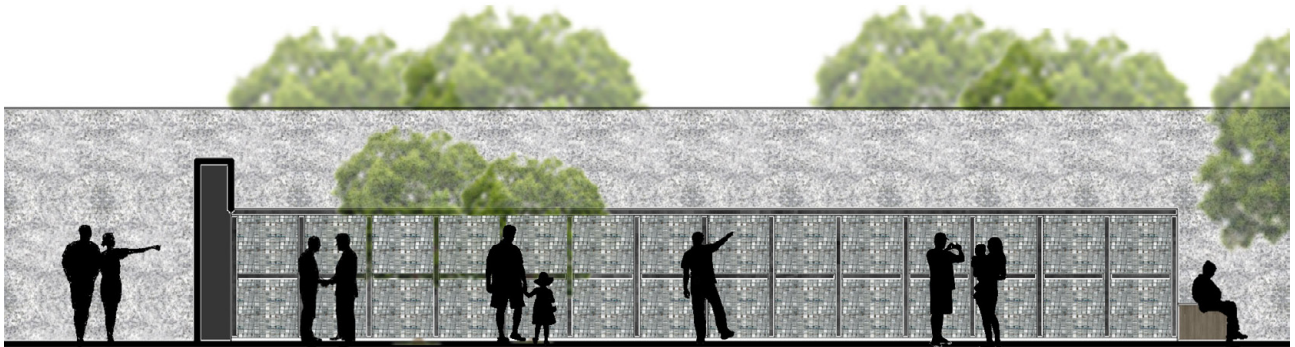


Figure 75: The Memorial Wall.

These walls will be enclosed by the parallel and perpendicular plans of the new landscape desing. These enclosed spaces will work as small gardens with water elements (an element always connected with Ned Kanh works), trees and benches that follow the total length of the memorial walls in which the visitors can observe the effects of the kinetic wall and enjoy the environment surrounding it.

4.2.3.2 The concept

The landscape design is developed according with 2 different axis. The first one, already existing, regards the path that connects Casa do Passal and the Mother Church of Cabanas de Viriato, a special request from Sousa Mendes. The Second axis connects the house and the statue of the Christ located in a hill on the North-West side of the house, also commissioned by Sousa Mendes. This connection was a future plan of Aristides, he wanted to built a set of stairs that would connect the statue and the Garden of the House, a wish that he didn't had the opportunity to concretize^[10]but will be part of the new project.

The first axis mentioned above will be maintained as the main path that will work as the main guide line from which the new landscape elements will be developed. This axis, nowadays and according with the original plan, separates the garden in two different areas, the one in front of the house (0,80m lower compared with the other area that is at the same level as the Ground-floor of the house, 0,00m) and the other turned to the Christ Statue. The area in front of the house will be a grass lane in order maintain the visibility of the North-East façade of the house from the surrounding streets. This grass lane will be used as an exterior temporary area for exhibitions, possible conventions and public events that might be held here.

The second area of the garden is where the new spaces of the landscape project will be located. Since its level is the same as the main house, it allows a more direct connection from the main entrance, with the reception building and the proposed restaurant, and the church.

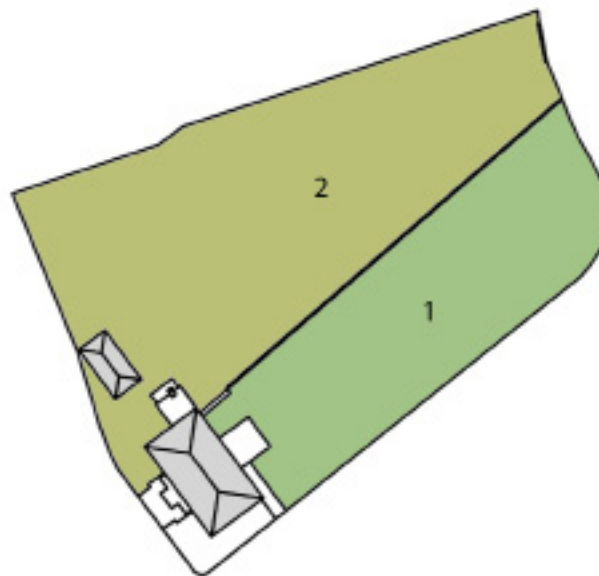


Figure 76: Areas divided by the first Axis.

The second Axis, will start from the centre of the Christ Statue and cross the first axis perpendicularly, creating a crossing point from which the visitors will be directed to the statue. This axis will be a visual connection instead of a physical one, pretended by Aristides. This visual connection will be guided by two walls, with 3,5 m high, perpendicular with the first axis and oriented to the statue, start

deviating 15° from the central axis in order to give an impression of an opening to the statue. These two walls will work as an exception compared with the regularity of the memorial spaces.

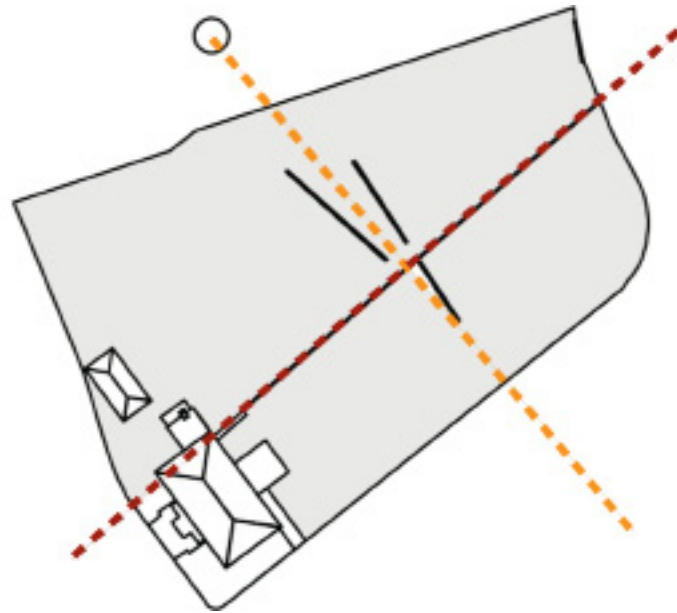


Figure 77: Second Axis Perpendicular to the first one and the Walls oriented to the statue.

The Memorial Spaces of the project are characterized by two enclosed areas, one on each side of the walls mentioned above. These two areas are enclosed by vertical plans (walls) that work parallel and perpendicularly, like offsets, of the house perimeter lines.

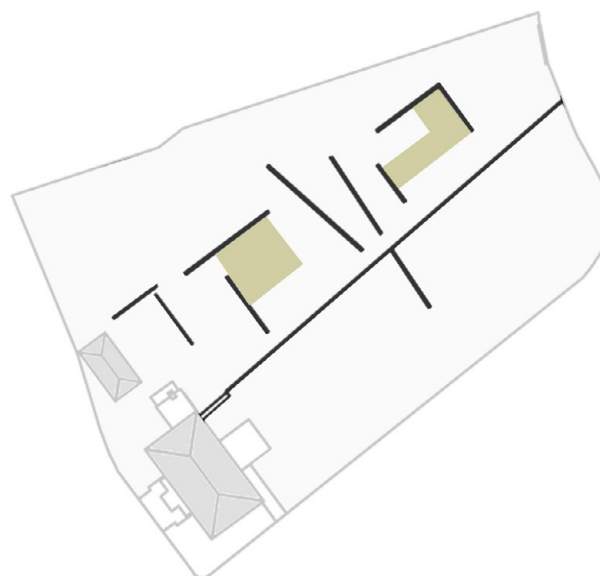


Figure 78: Enclosed areas on each side of the exceptional walls.

The composition of the walls, create different spaces inside those areas, as well as different point of views from the surrounding garden. These vertical plans can be wall with 2,7m high or simple benches that help dividing spaces inside this areas in which people can sit and look at the memorial or just enjoy the space as itself.

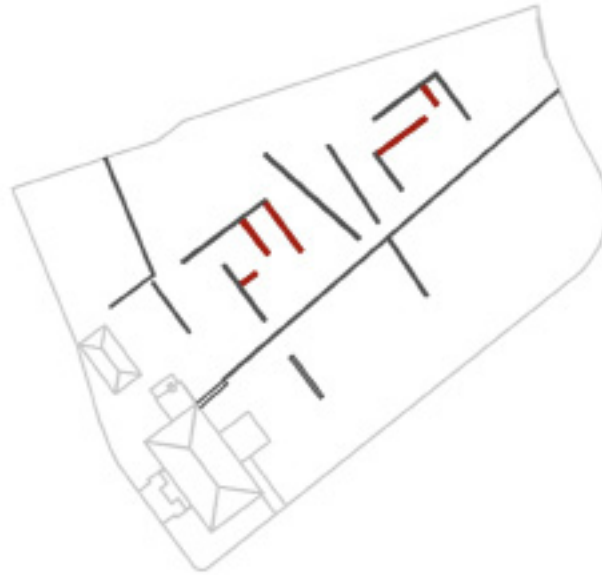


Figure 79: Benches Composition regarding the walls.

The enclosed areas its where it will be located the Memorial Walls with the name of the survivors. Around the Walls, the space will be divided in different environments, one characterized by a small garden where people can sit on the ground under the shadow and relax, and the other being a water mirror, that not only will cooler the air during the hot summers as it will give a more natural ambiance to the space.



Figure 80: The Memorial Walls integrated on the walls composition.

The presence of the water will also interact with the memorial wall, since, with the sun light, the small metal panels will reflect the light, projecting little squares of light into the surrounding walls. All these elements, the patterns created by the wind, the sound coming from the movements of the small panels, the presence of the water and the little spots of light surrounding the place, all together, create a kind of an ephemeral place quite comforting and relaxed.

4.2.3.3 The Materials

The materials used on this new landscape design are exactly the same that we can find on Casa do Passal. For the walls and pavement will be used the granite. The walls will be finished with rough cut granite to give the impression of a granite block, dividing the spaces. In this way, these walls also continue the same purpose of Casa do Passal, built up a space and protect the area.

The pavement around the memorial walls will be in wood, just like in the house, using the remaining and “healthy” pieces of wood from the house. In this way, part of the pieces of the house will be part of the Memorial wall composition.

The third material used will be the iron on the memorial walls. In Casa do Passal, the iron is used for the handrails of the balconies. Its decoration gives the final touch of the house and also work as a contrast between the rigid lines of the façade. In the same way, the Memorial Walls will work like that, the final touch of the landscape design in which, with the movement and sound, becomes the decorative element of the entire composition.



Figure 81: 3D View from the Front Façade till the end of the garden.



Figure 82: 3D View from the garden façade.

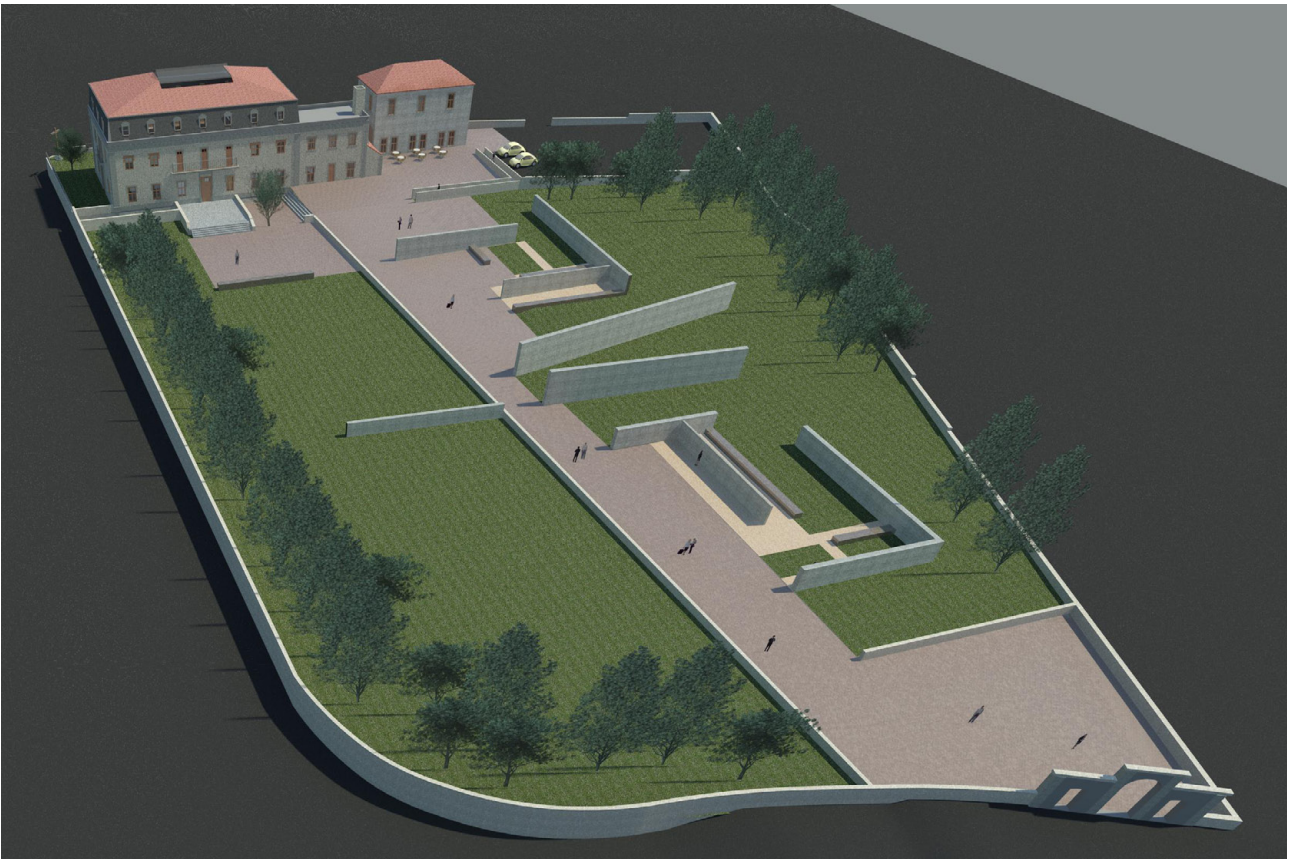
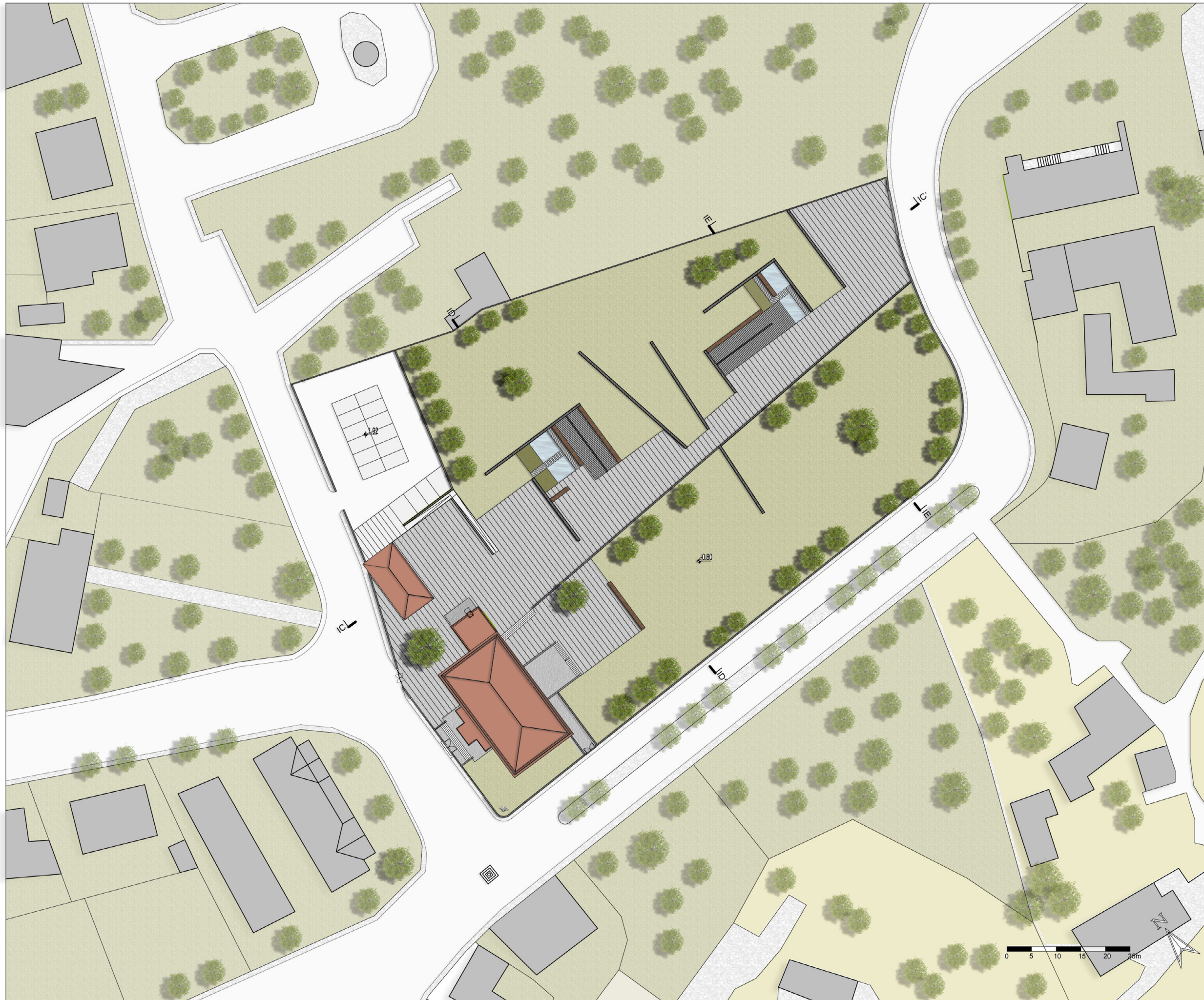


Figure 83: 3D View of the garden, showing the walls composition.



Figure 84: 3D view from the South-West and South-East façade.



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Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(Nº 767291)

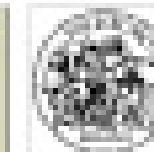
Legend:
 "Frontal" Wall
 "Tabique" Wall

Intervention

General Plan
Ground-Floor

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Thesis Supervisor:
Arch. Giuliana Cardani

Thesis Co-Supervisors:
Arch. Sylvia Duvernoy
Arch. Francesco Paolo Chioca

Student:
Carolina Lobo de Sá e Brito
(N° 767291)

Legend:

Intervention

General Plan
Ground / First-Floor

02/10/2013

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Restoration of Portuguese
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Cabanas de Viriato ,Portugal

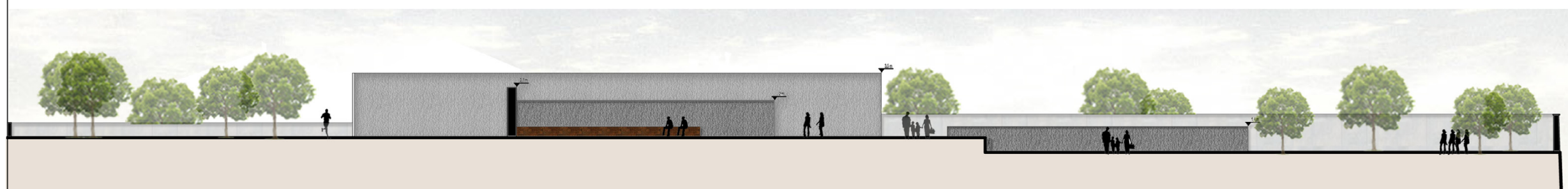
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Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(N° 767291)



Section E/E'



Section F/F'

0 5 10 15m



Section C/C'

0 5 10 15 20 25m

Legend:

Intervention

Sections

02/10/2013

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Thesis Supervisor :
Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(N° 767291)

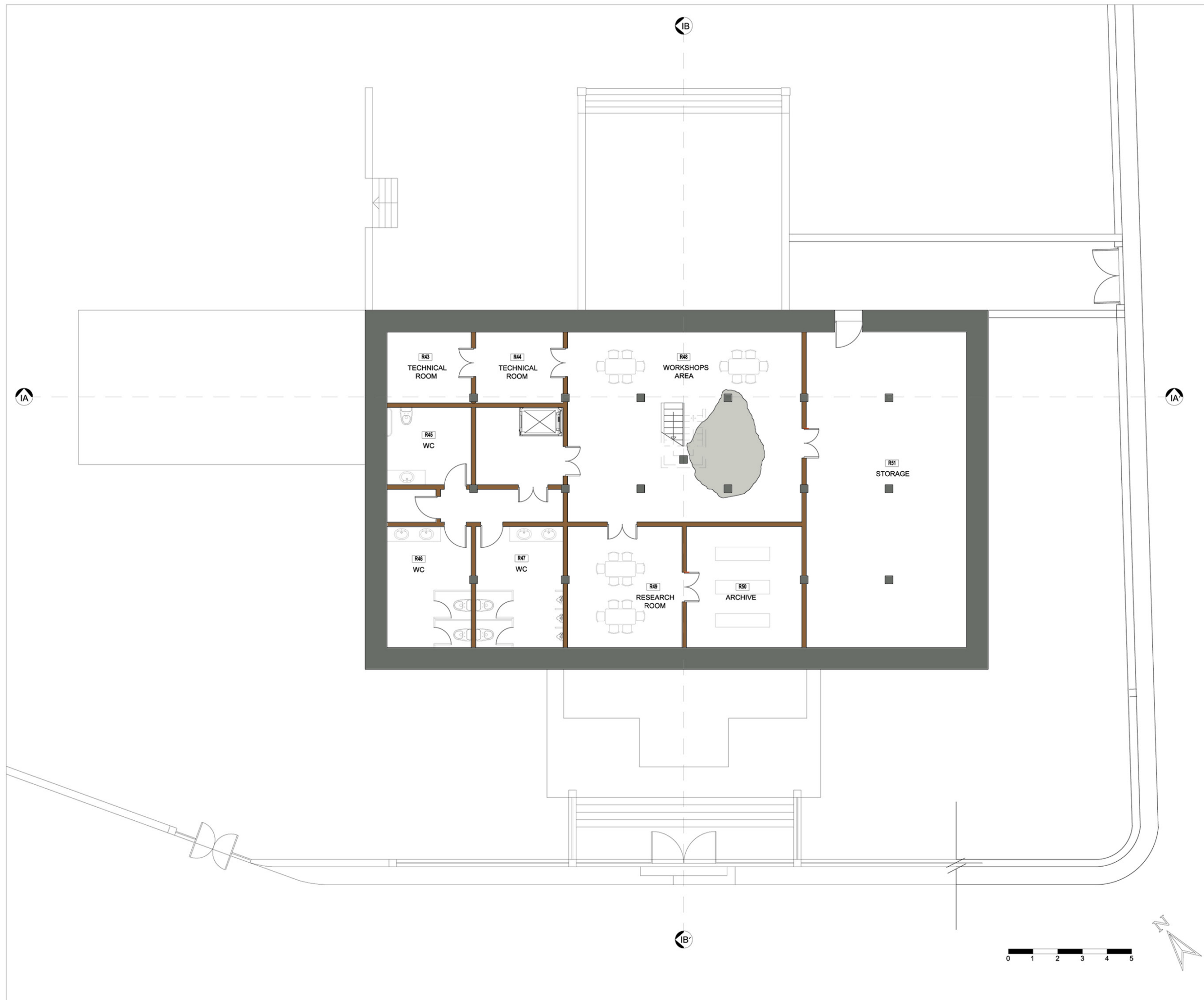
- Legend:
- Masonry Walls
 - Granite Rock
 - "Frontal" Wall

Intervention

Basement Floor

02/10/2013

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Thesis Supervisor :
Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(N° 767291)

Legend:

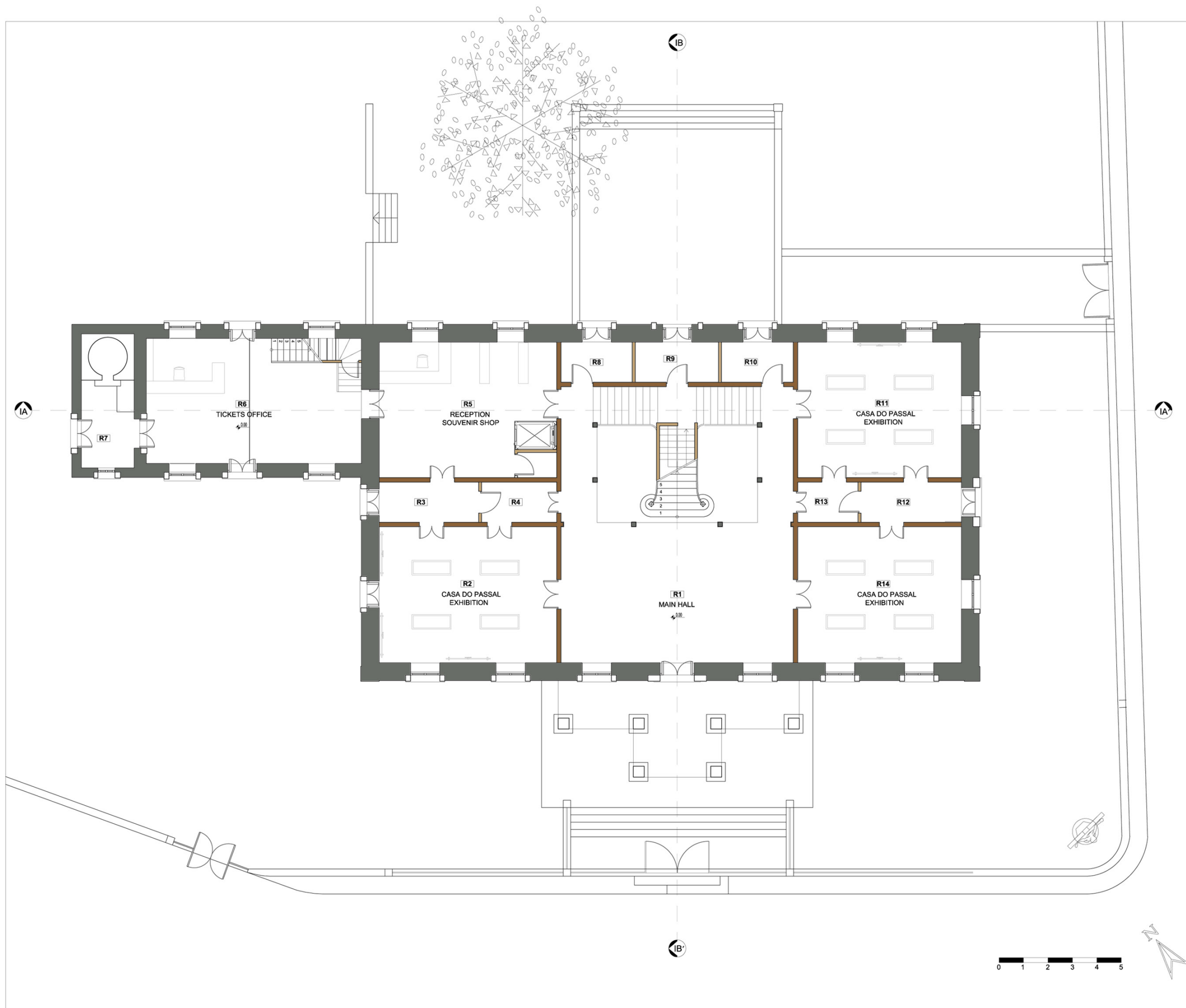
-  Masonry Walls
-  "Frontal" Wall
-  "Tabique" Wall

Intervention

Ground-Floor

02/10/2013

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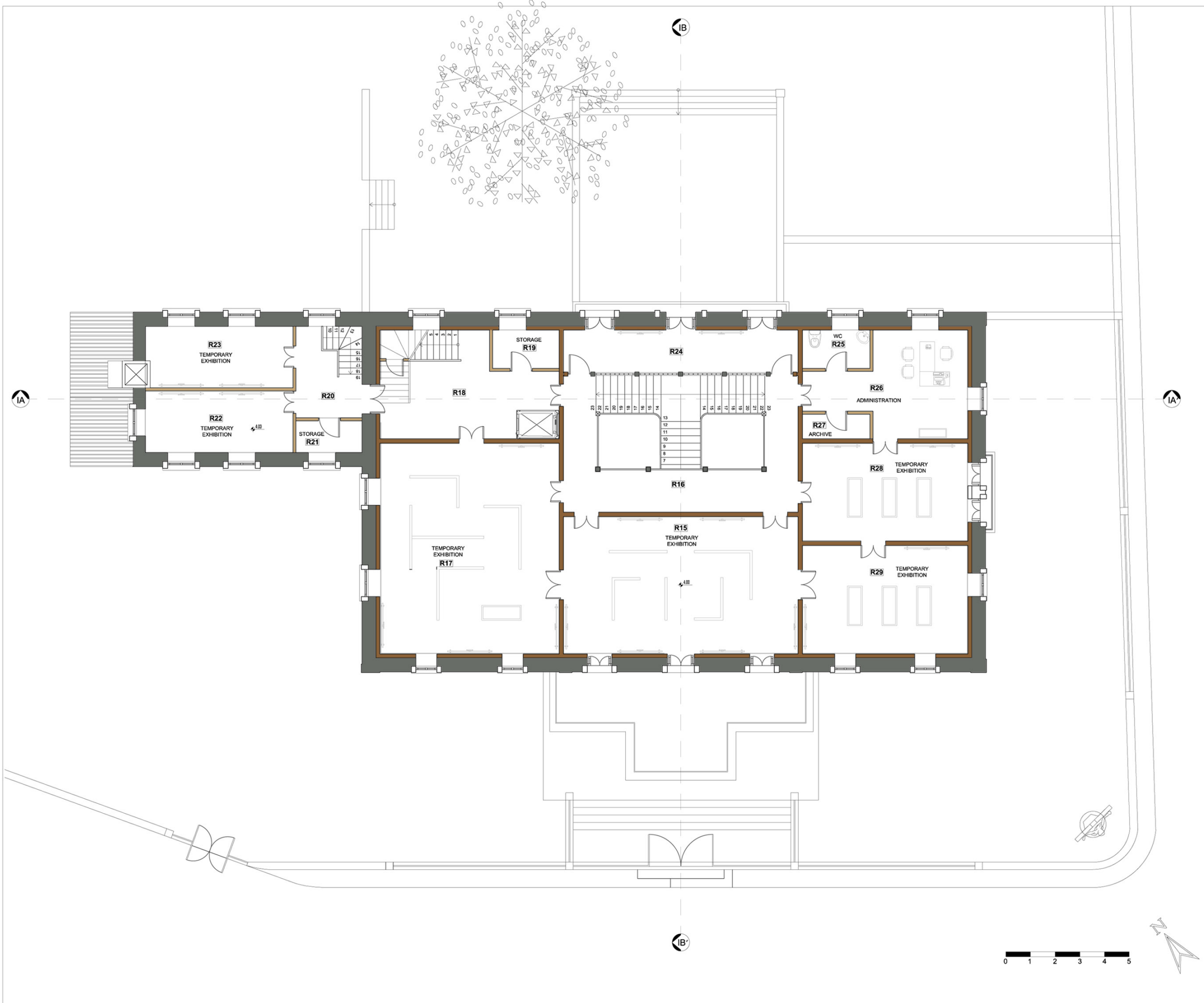


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Thesis Supervisor :
Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(N° 767291)



Legend:

- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall

Intervention

First-Floor

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Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(N° 767291)

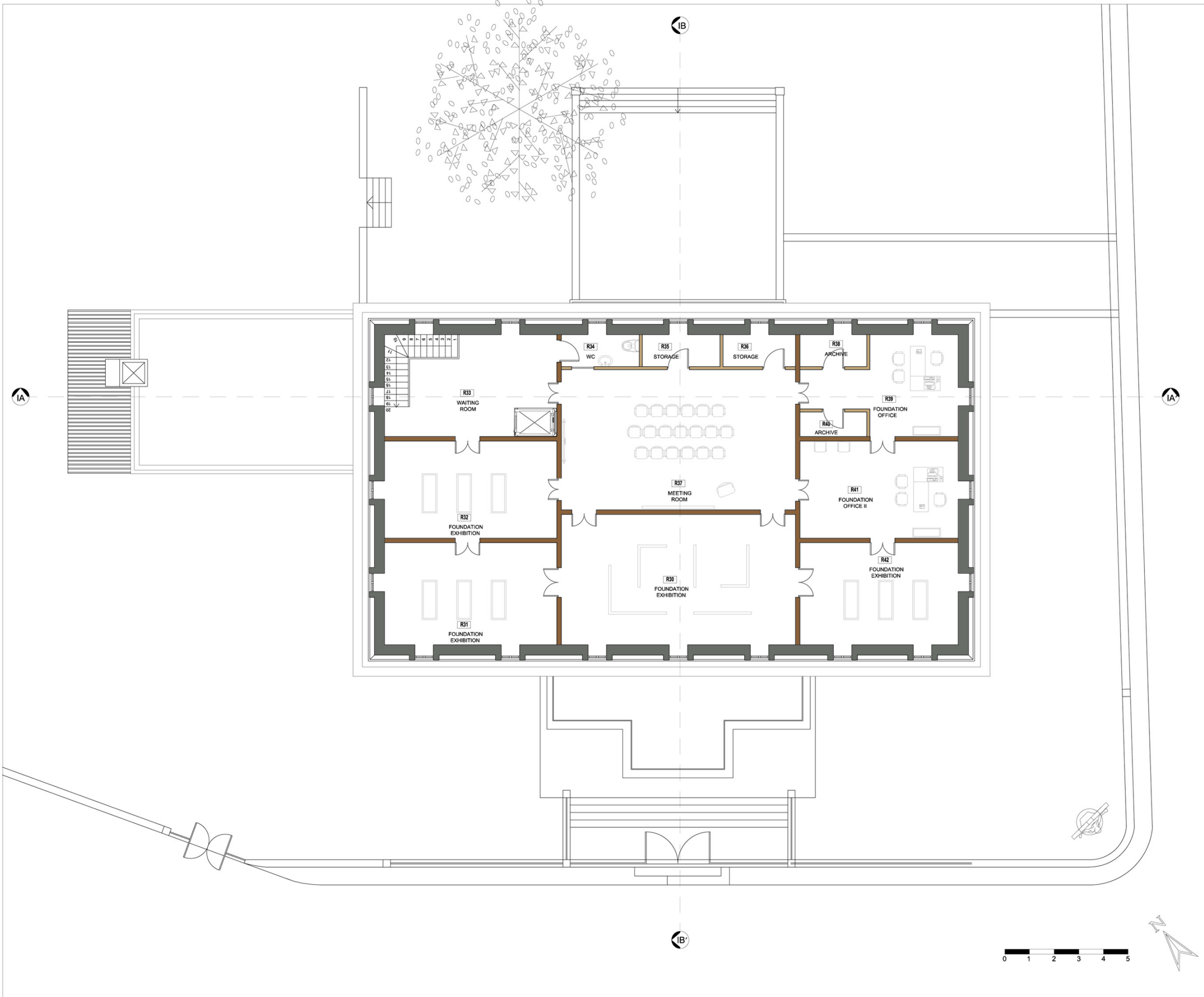
- Legend:
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 - "Frontal" Wall
 - "Tabique" Wall

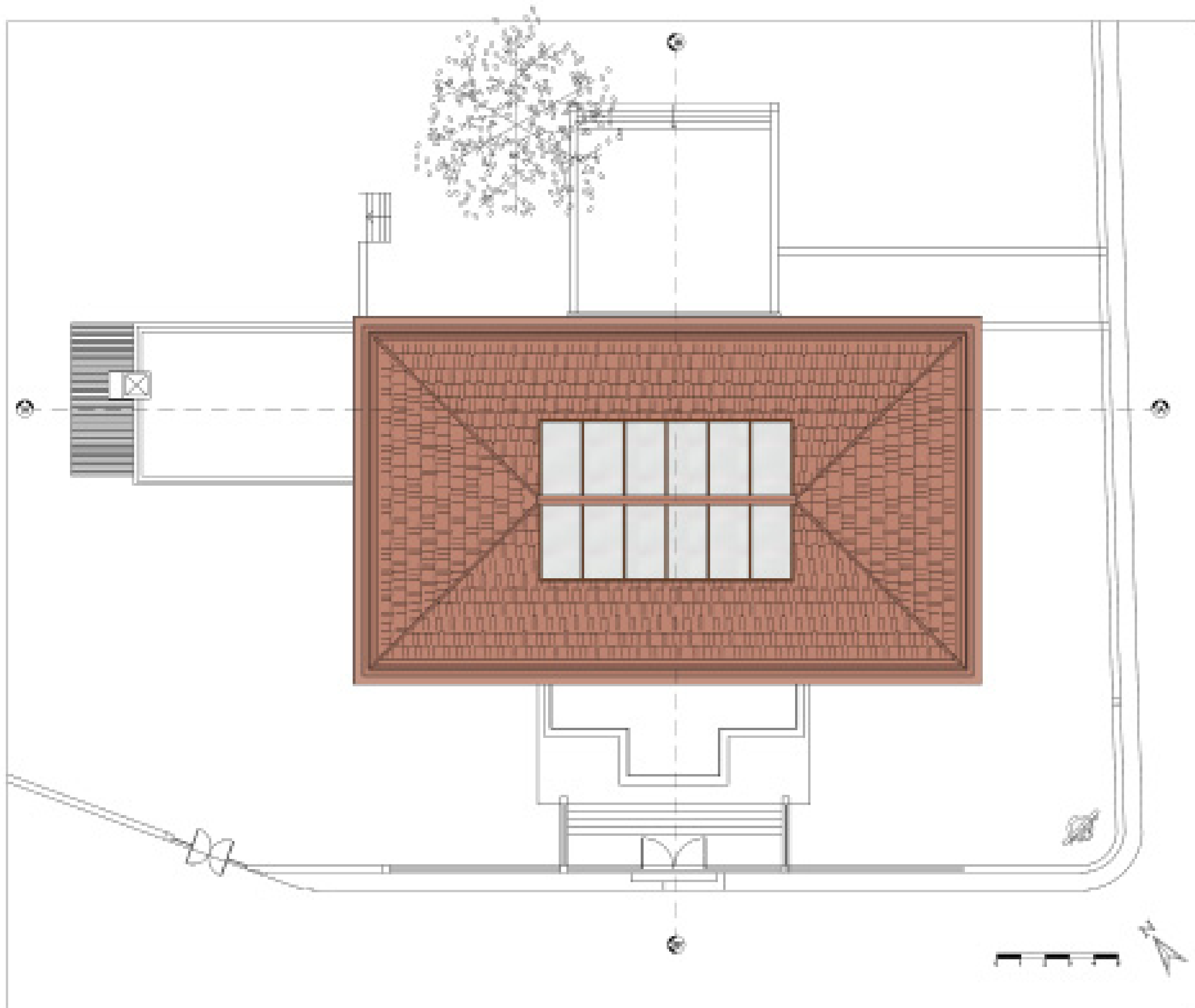
Intervention

Second-Floor

02/10/2013

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Restoration of Ariéides de Sousa Mendes House
 Cabanas de Viriato, Portugal

Thesis Supervisor:
 Arch. Giuliana Cardini

Thesis Co-Supervisor's:
 Arch. Sylvia Duvernoy
 Arch. Francesco Paolo Chioca

Student:
 Carolina Luísa de Sá e Brito
 (N° 787291)

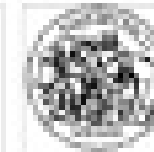


North-East Façade

Legend

Intervention

Roof

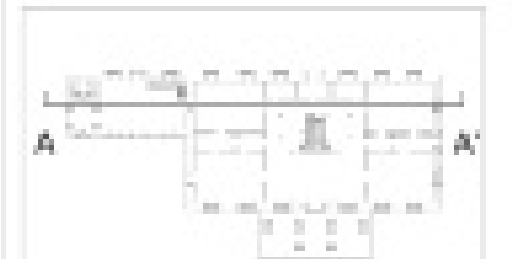


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Mendes House
Cabanas de Viriato, Portugal

Thesis Supervisor :
Arch. Giuliana Cardani

Thesis Co-supervisors :
Arch. Sylvia Duenenoy
Arch. Francesco Paolo Chioca

Student:
Carolina Luísa de Sá e Brito
(N° 767264)



Ground-Floor Plan

Legend:

- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall

Intervention

Section A/A'

02/10/2013

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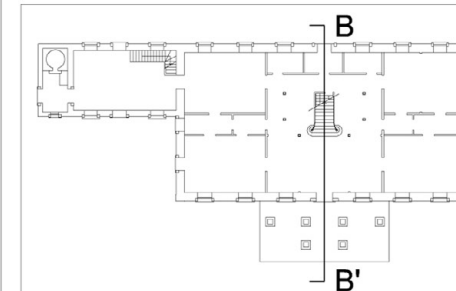


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Cabanas de Viriato ,Portugal

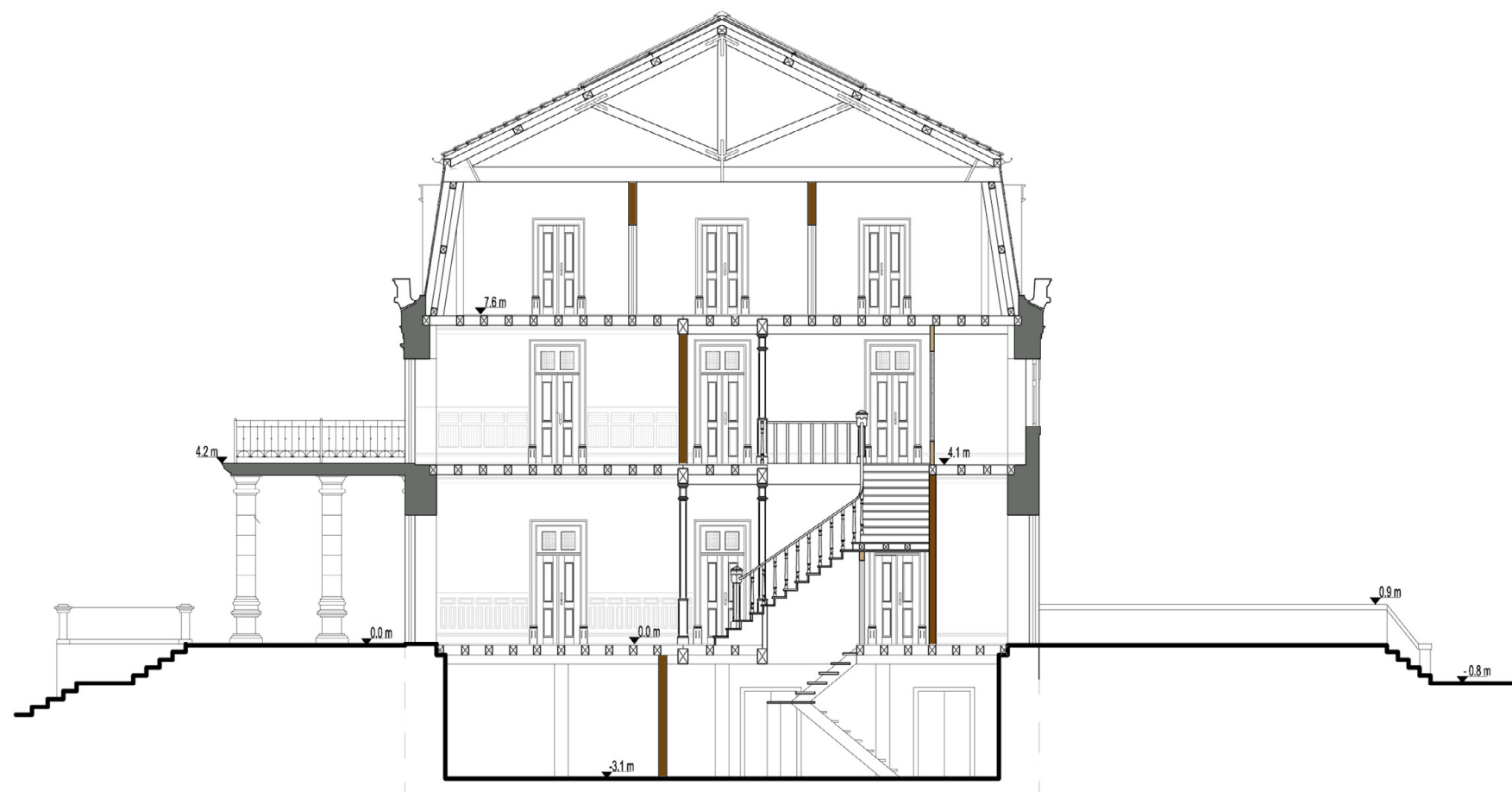
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Arch .Giuliana Cardani

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Arch.Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(Nº 767291)



Ground-Floor Plan



Legend:

- Masonry Walls
- "Frontal" Wall
- "Tabique" Wall

Intervention

Section B/B'



02/10/2013

48

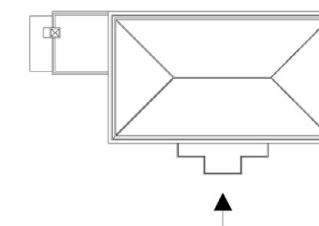


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Carolina Luísa de Sá e Brito
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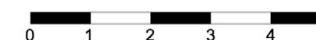
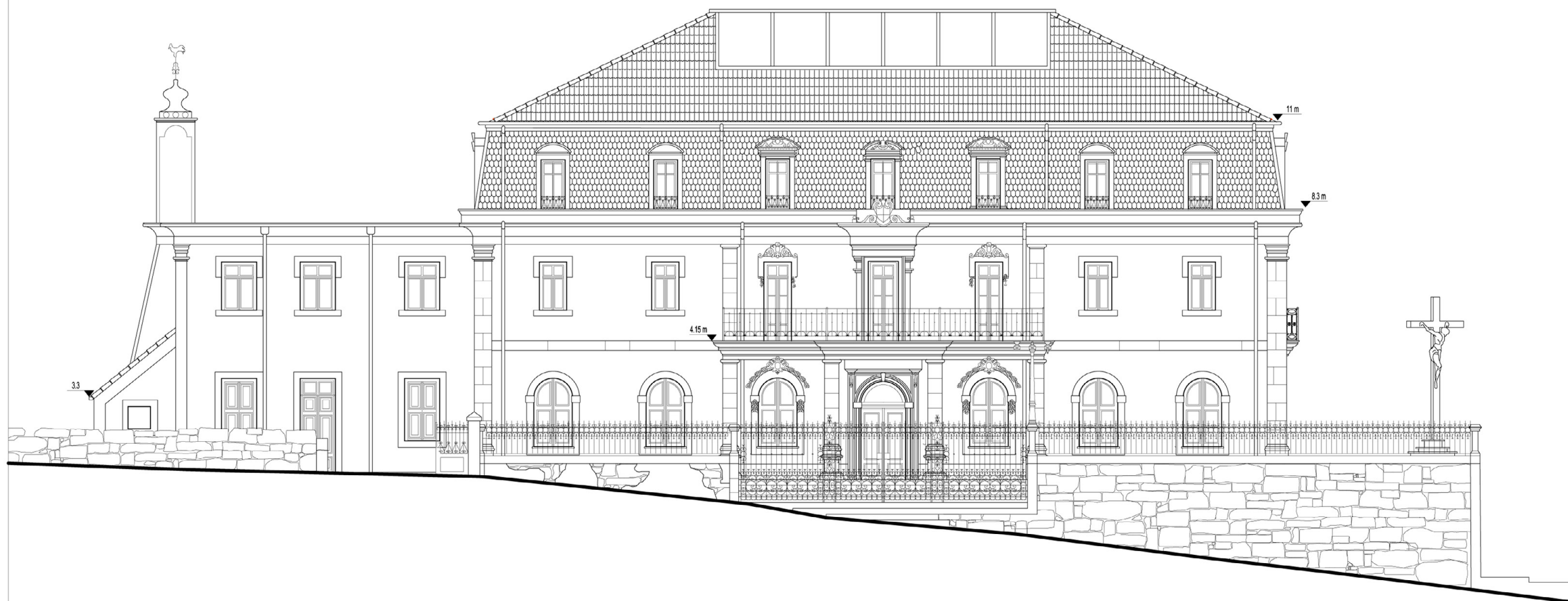
Legend:

Intervention

South-West Façade

02/10/2013

49



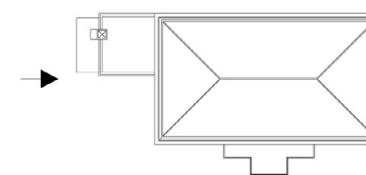


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Student:
Carolina Luísa de Sá e Brito
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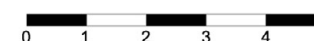
Legend:

Intervention

North-West Façade

02/10/2013

50



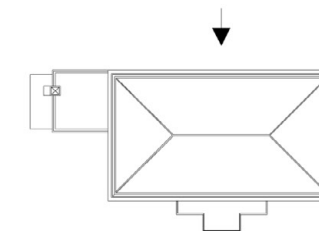


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(Nº 767291)



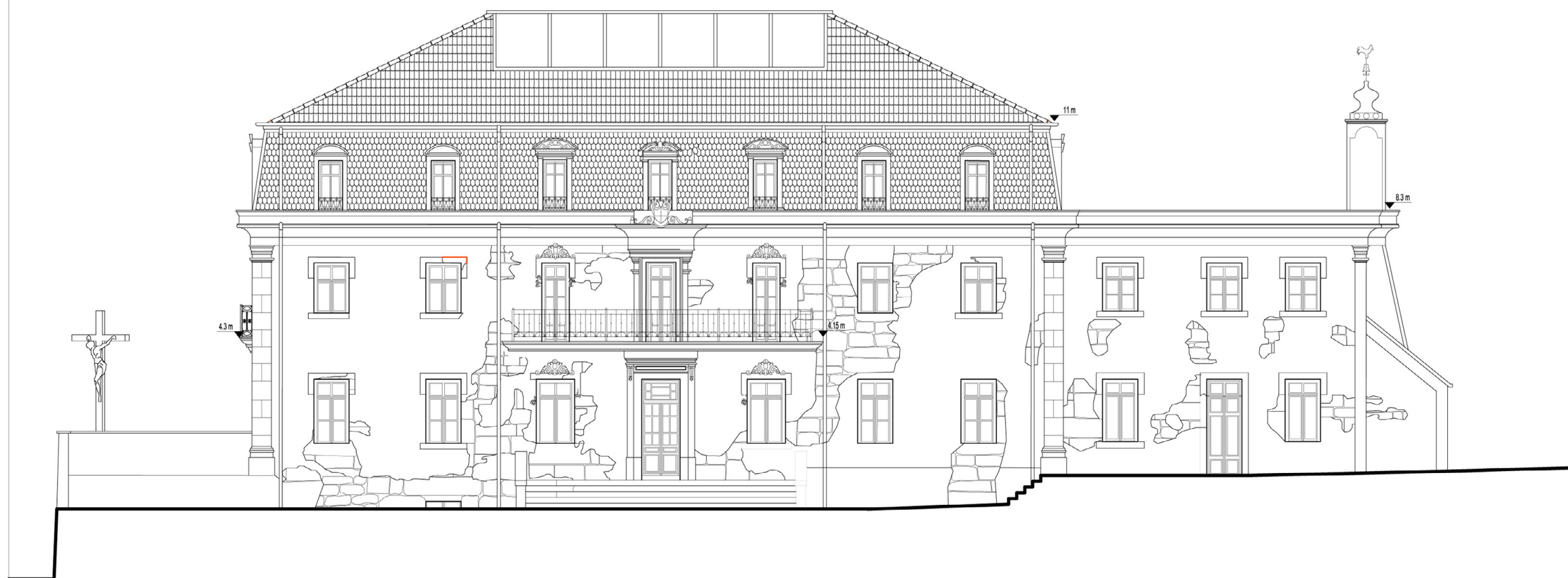
Legend:

Intervention

North-East Façade

02/10/2013

51



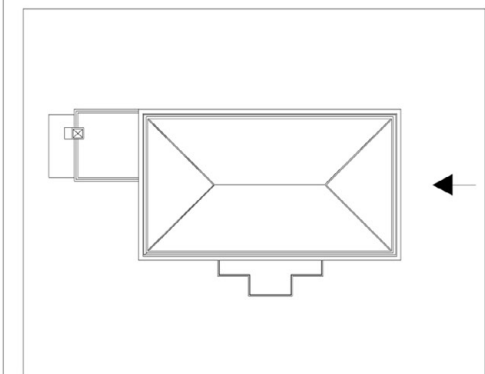


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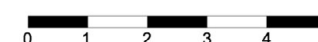
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Carolina Luísa de Sá e Brito
(Nº 767291)



Legend:

Intervention

South-East Façade



02/10/2013

52

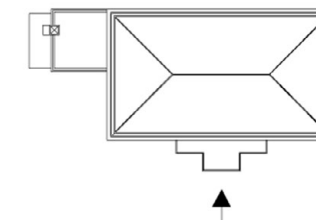


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Carolina Luísa de Sá e Brito
(Nº 767291)



Legend:

Façades
(Intervention)

South-West Façade



02/10/2013

53

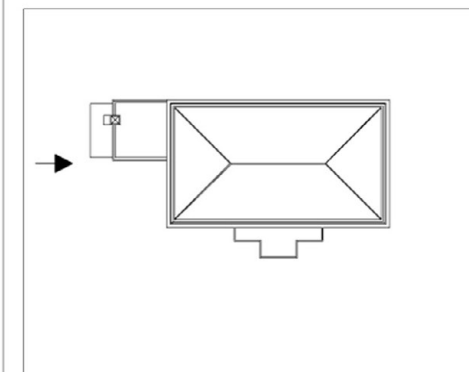
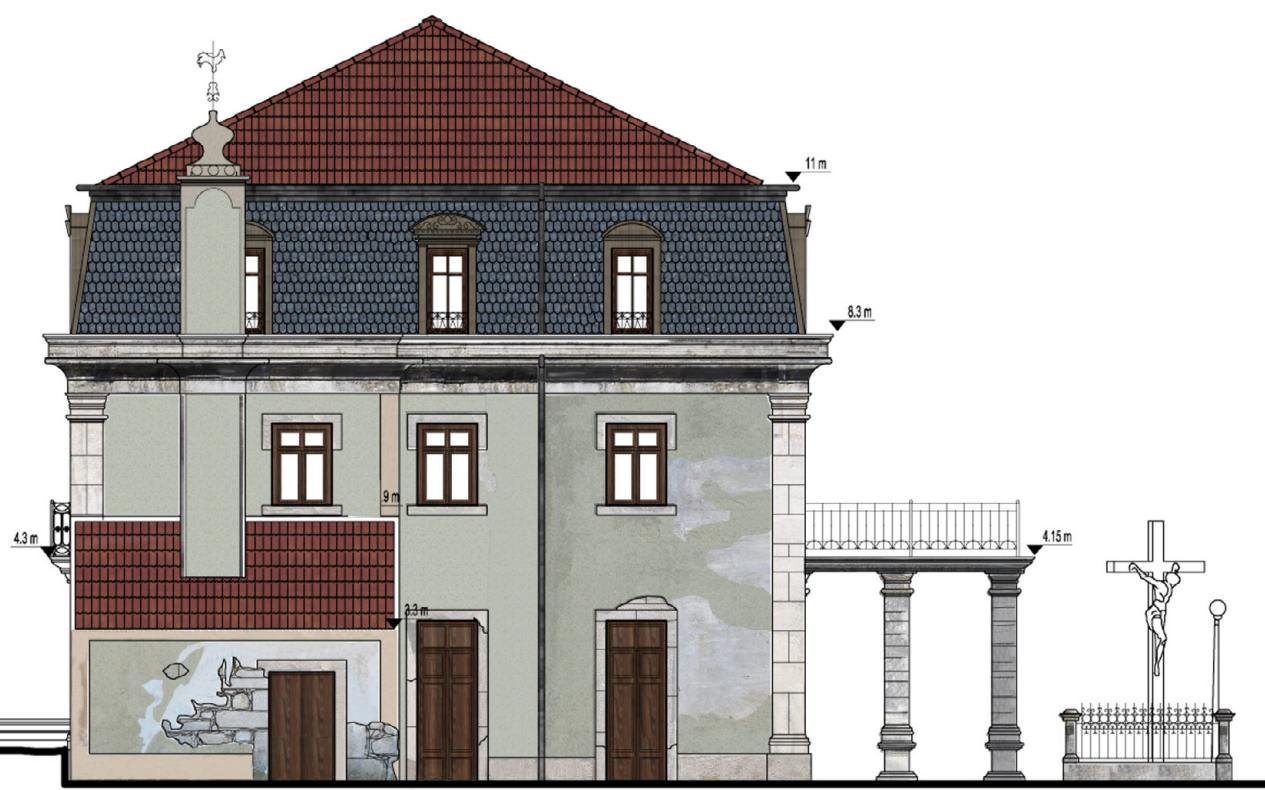


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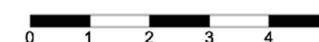
Student:
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(Nº 767291)



Legend:

Façades
(Intervention)

North-West Façade



02/10/2013

54



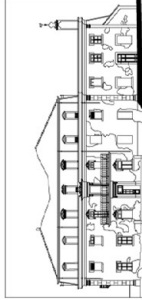
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Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(N° 767291)



North-East Façade

Legend:

- New Construction
- Demolished

Intervention

(New Construction/Demolished Map)

Basement Floor

02/10/2013

57





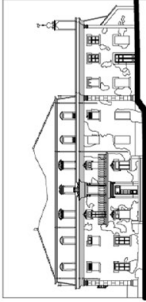
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(N° 767291)



North-East Façade

Legend:

- New Construction
- Demolished

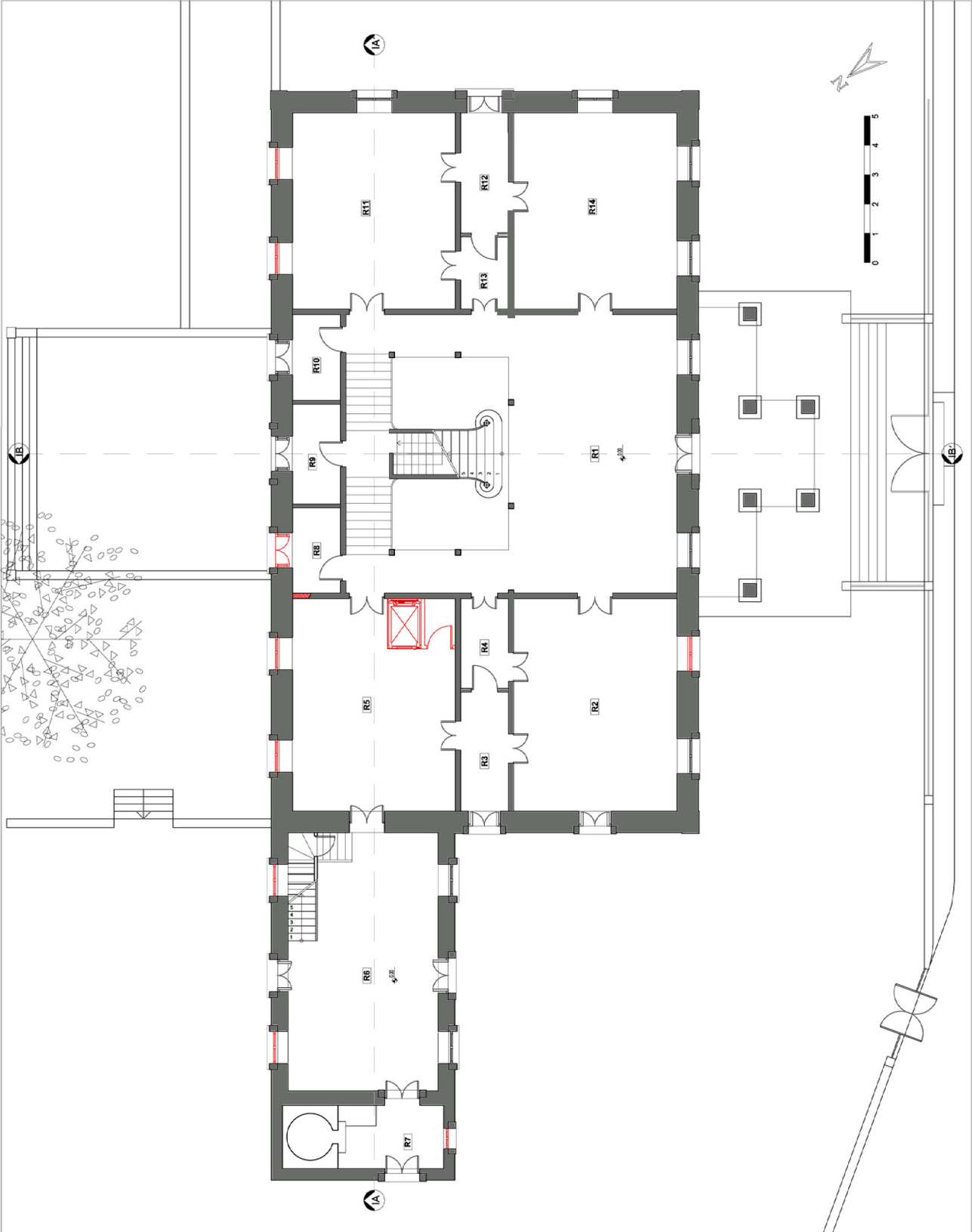
Intervention

(New Construction/Demolished Map)

Ground - Floor

02/10/2013

58





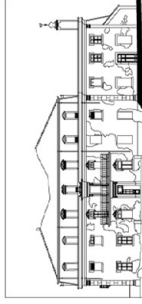
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Student:
Carolina Luisa de Sá e Brito
(N° 767291)



North-East Façade

Legend:

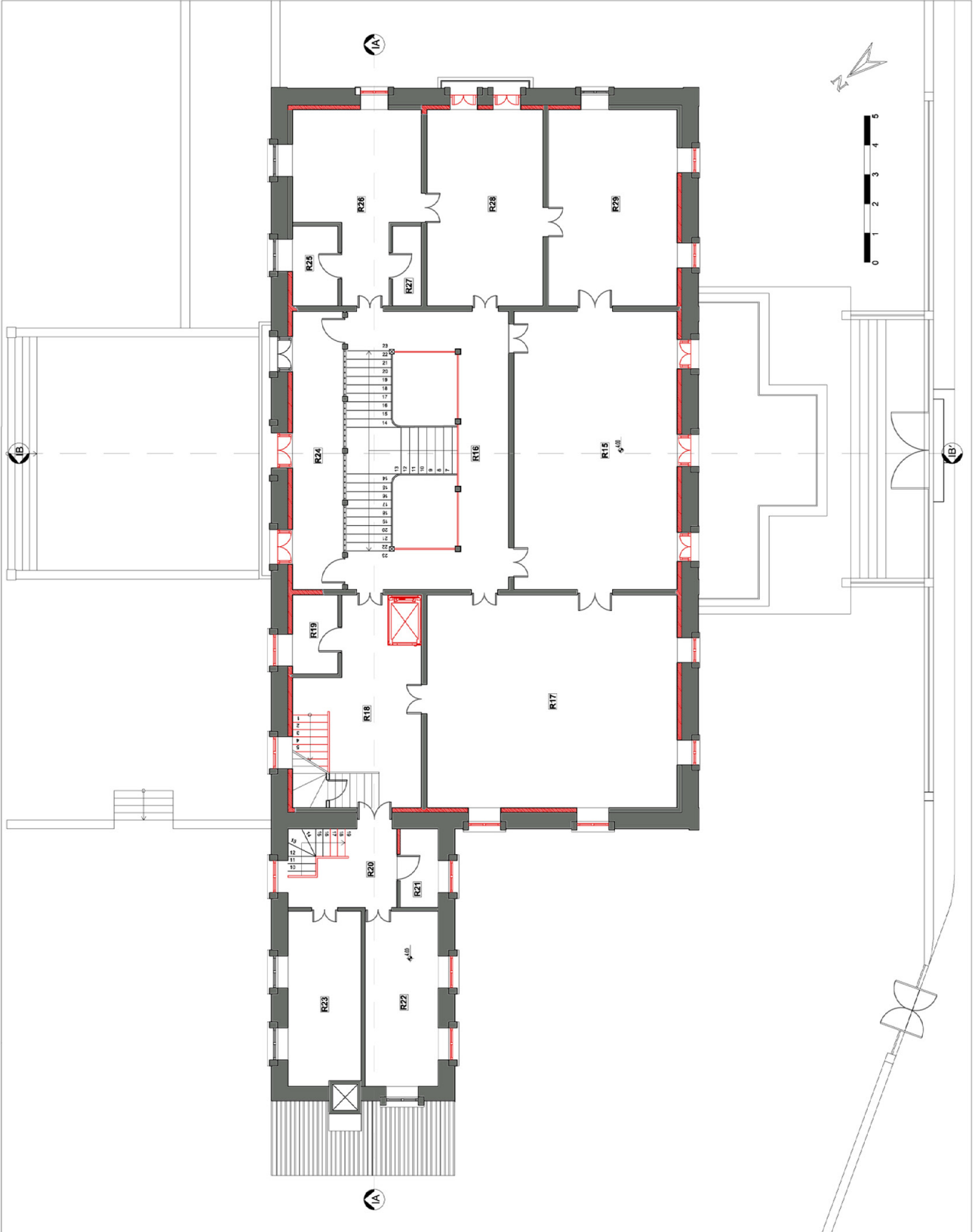
- New Construction
- Demolished

Intervention

(New Construction/Demolished Map)

First - Floor

02/10/2013 **59**





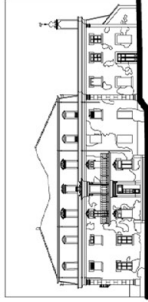
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Student:
Carolina Luisa de Sá e Brito
(N° 767291)



North-East Façade

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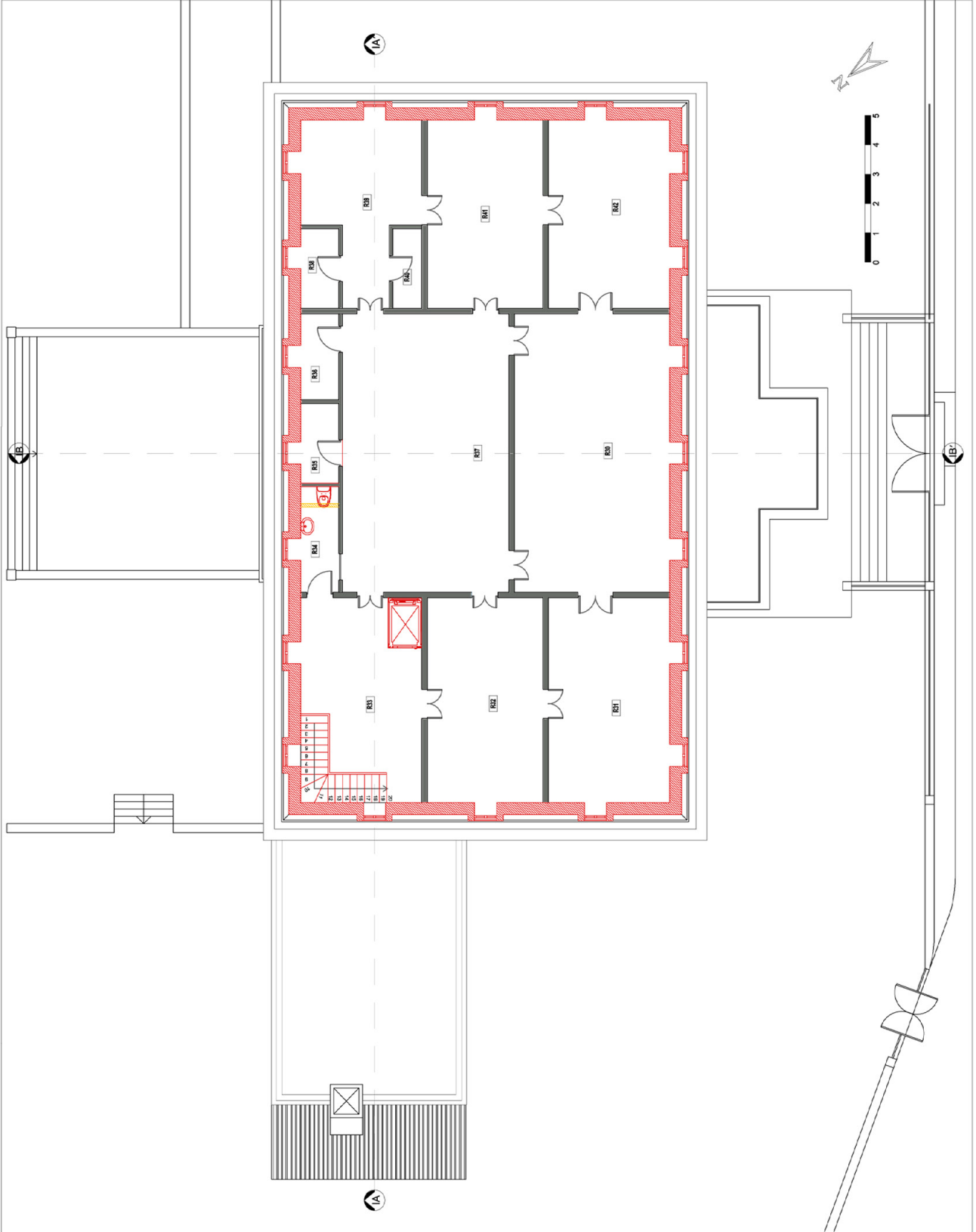
- New Construction
- Demolished

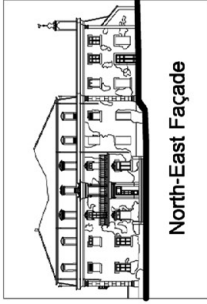
Intervention

(New Construction/Demolished Map)

Second - Floor

02/10/2013 **60**





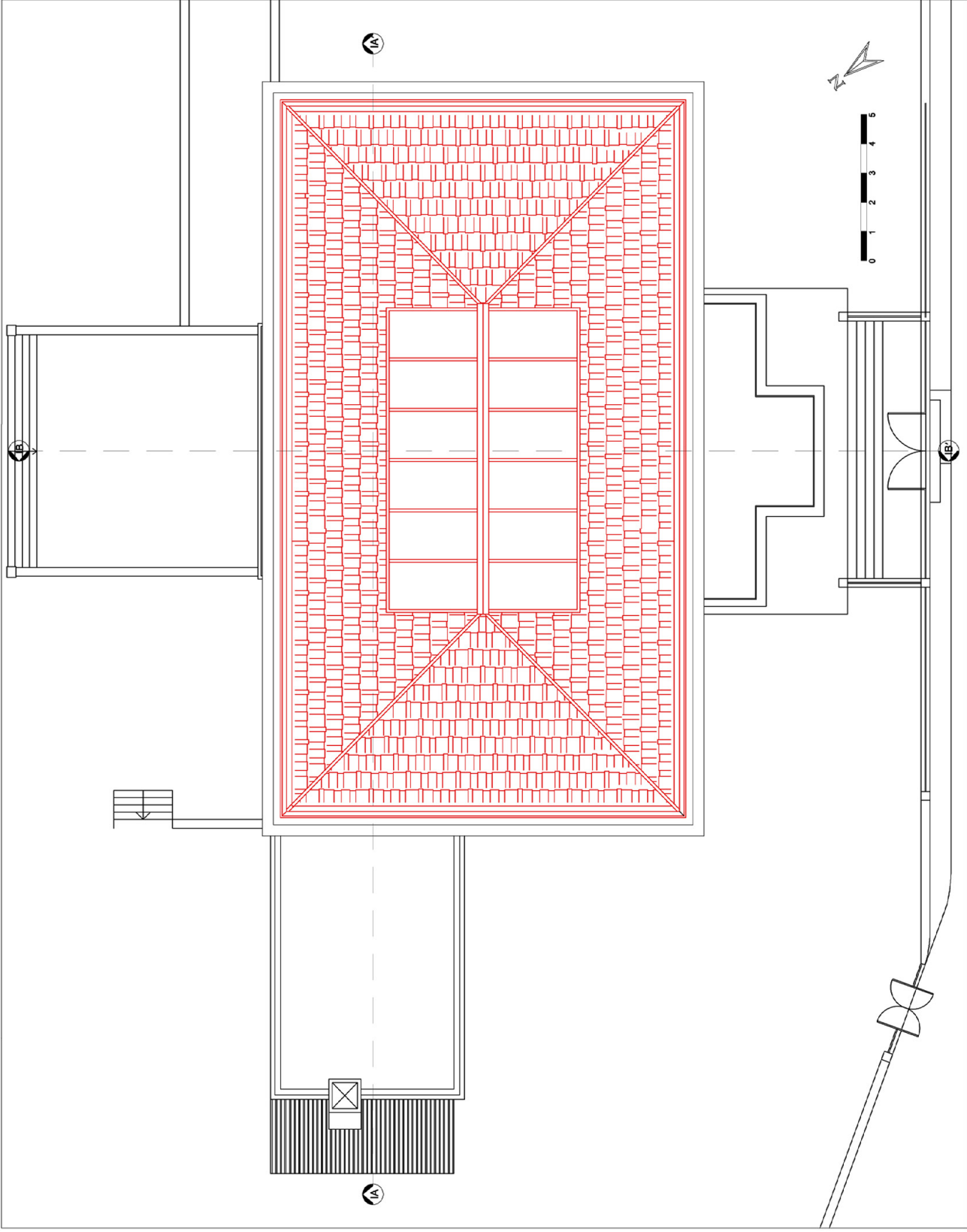
Legend:

- New Construction
- Demolished

Intervention
 (New Construction/Demolished Map)

Roof

02/10/2013 **61**





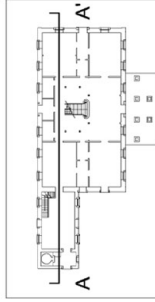
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Arch .Giuliana Cardani

Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luísa de Sá e Brito
(Nº 767291)



Ground-Floor Plan

Legend:

- New Construction
- Demolished

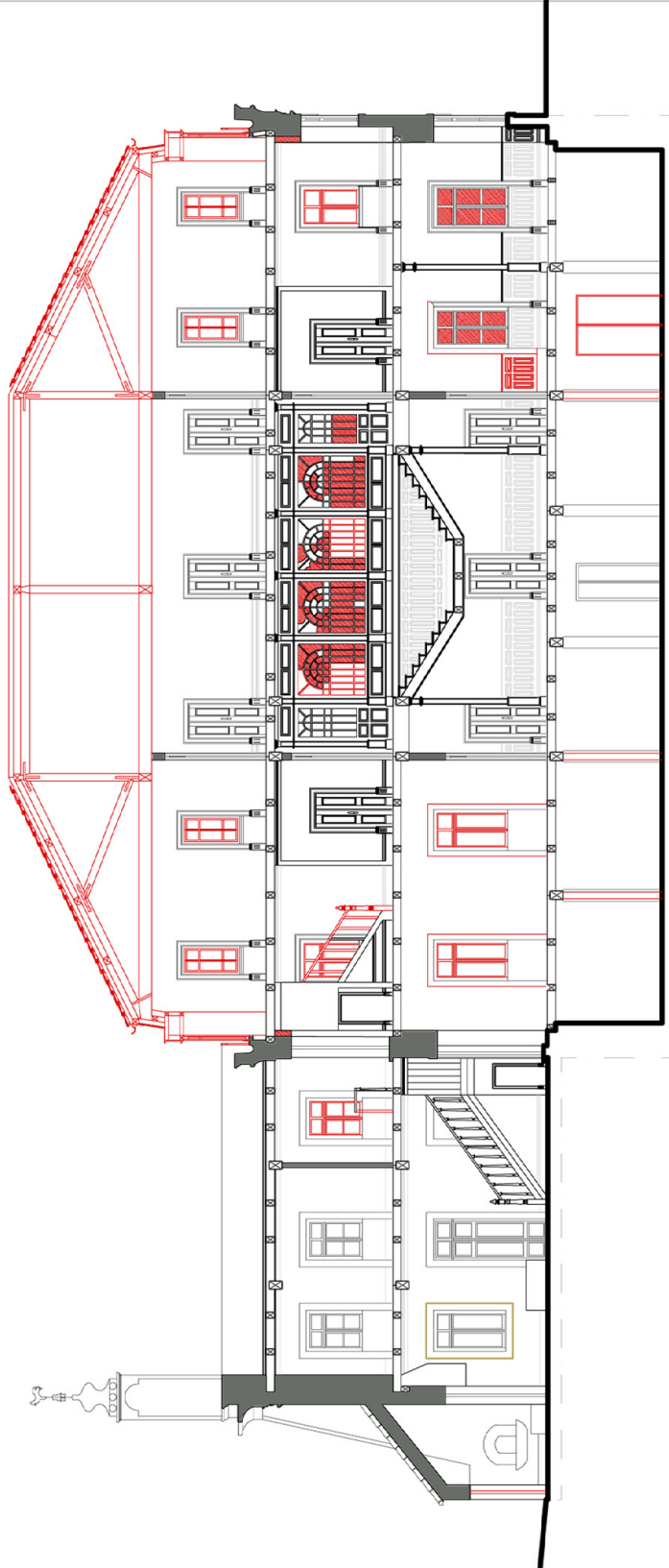
Intervention

(New Construction/Demolished Map)

Section A/A'

02/10/2013

62





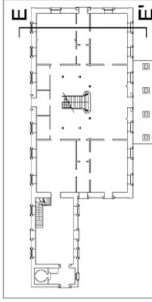
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Carolina Luisa de Sá e Brito
(N° 767291)



Ground-Floor Plan

Legend:

- New Construction
- Demolished

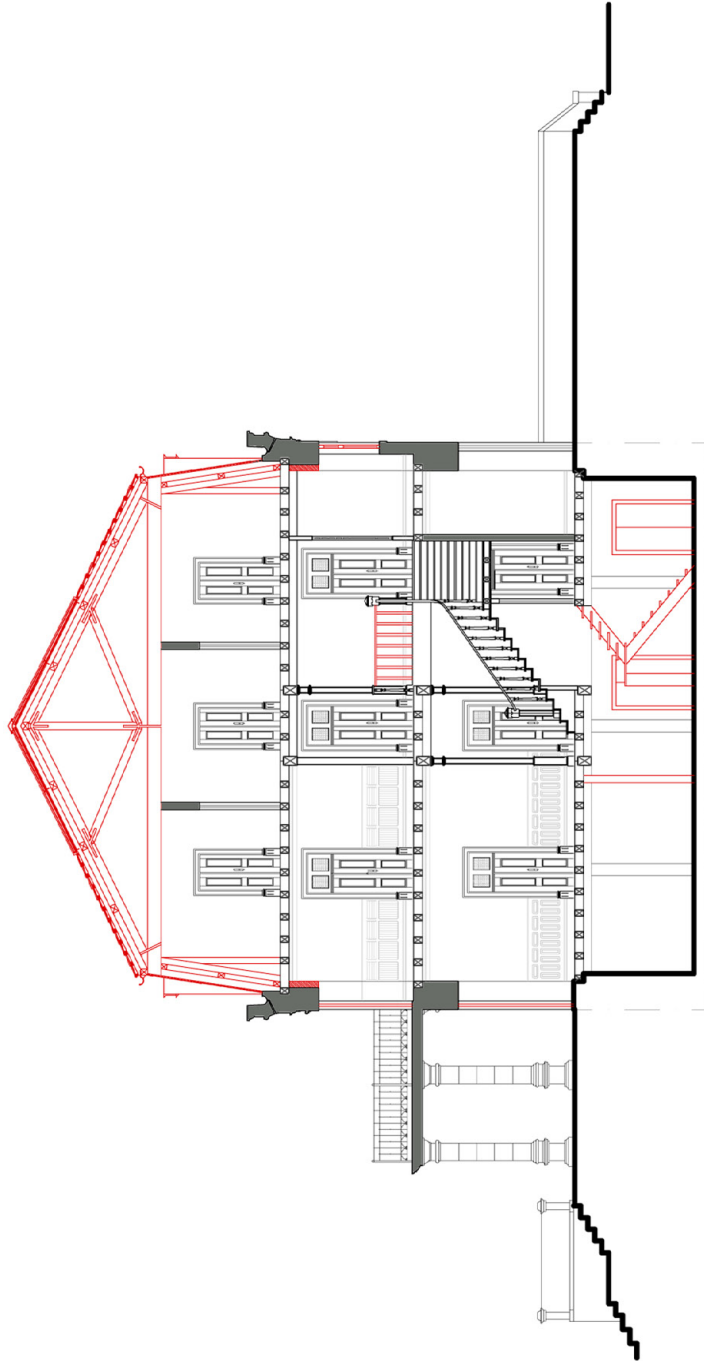
Intervention

(New Construction/Demolished Map)

Section B/B'

02/10/2013

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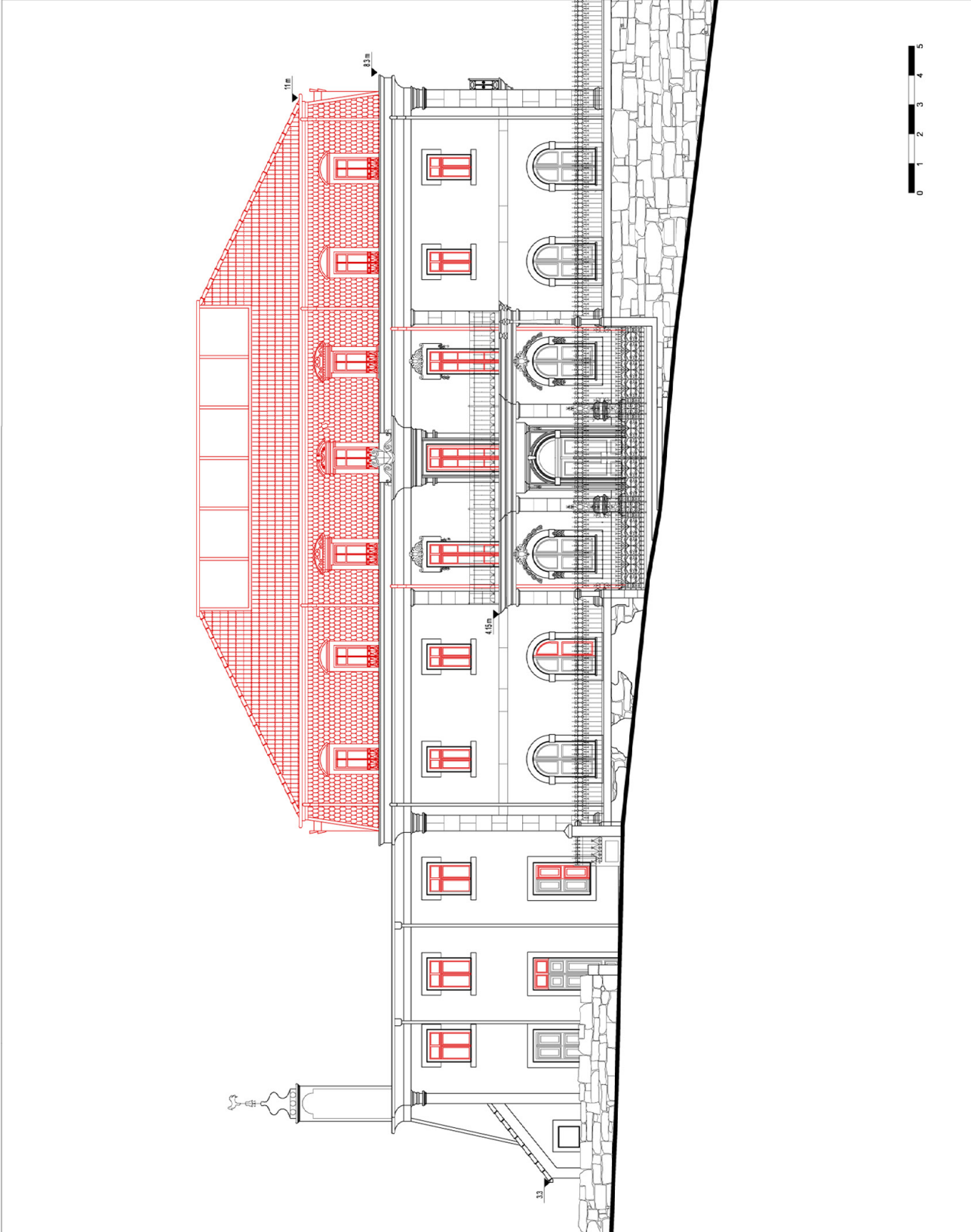
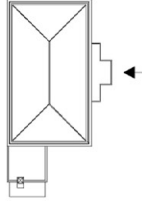
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Master in Architecture

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Mendes House
Cabanas de Viriato ,Portugal

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Thesis Co-Supervisor's :
Arch .Sylvie Duvernoy
Arch .Francesco Paolo Chieca

Student:
Carolina Luisa de Sá e Brito
(N° 767291)



Intervention
(New Construction/Demolished Map)

South-West Façade

02/10/2013 **64**



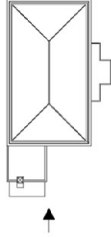
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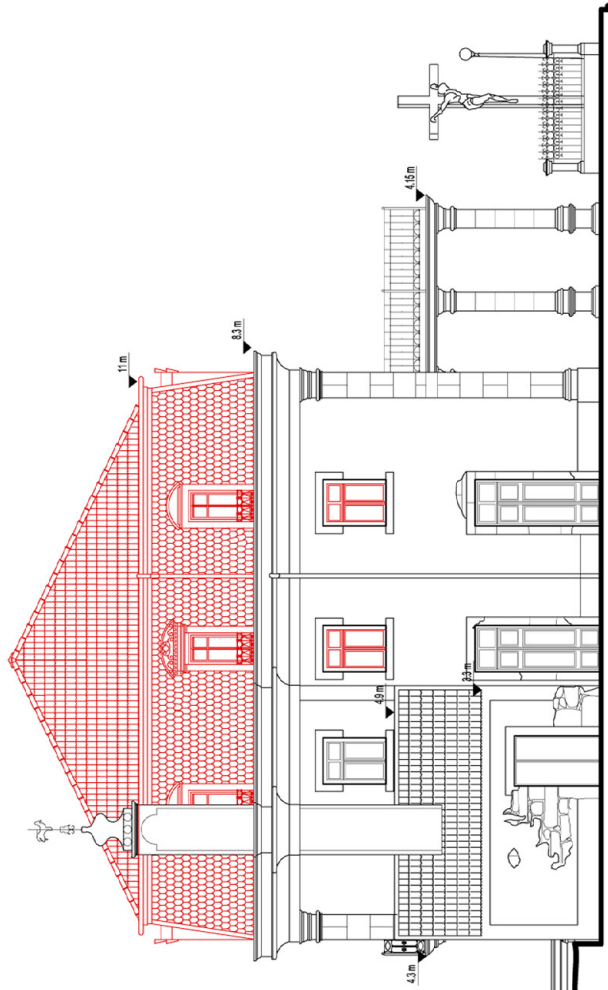


Legend:
New Construction
Demolished

Intervention
(New Construction/Demolished Map)

North-West Façade

02/10/2013 65





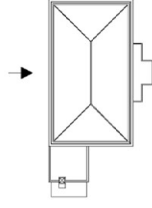
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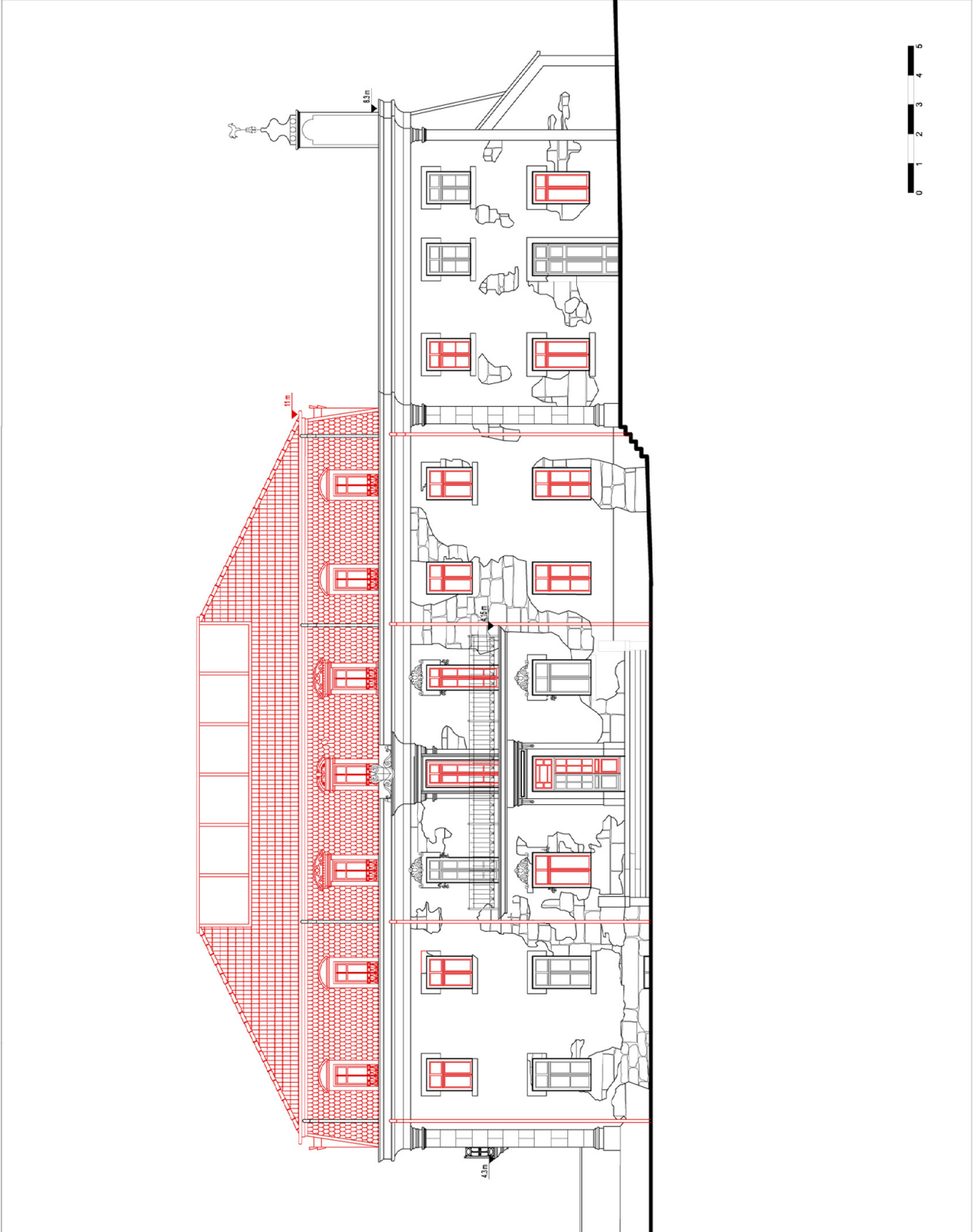


Legend:
New Construction
Demolished

Intervention
(New Construction/Demolished Map)

North-East Façade

02/10/2013 66





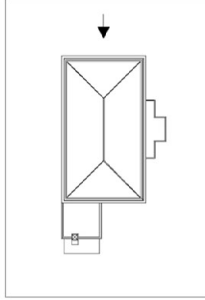
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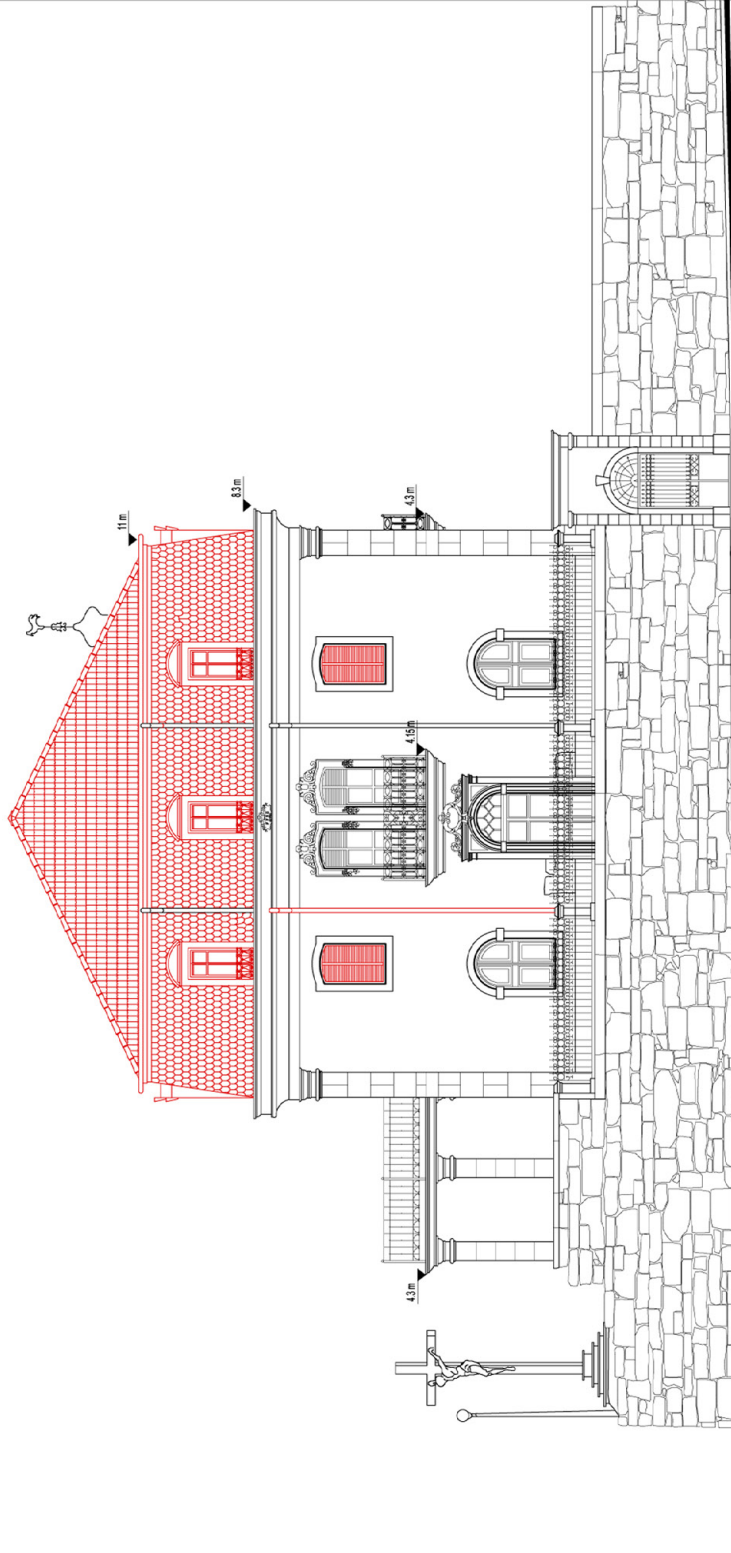


Legend:
New Construction
Demolished

Intervention
(New Construction/Demolished Map)

South-East Façade

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