HAVANA GREAT THEATER

Conservation Project

Training program Historic buildings and Conservation Management

List of contents

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1.Abstract

The preservation of architectural monuments and with them our cultural values is an important issue that have been cited in several documents which have transcended in the history. The old par tof Havana (Old Havana) was declared in 1982, World Heritage. Important buildings are located in this part of the city, which form part of our history. Nowadays they are being object of constructive interventions in order to conserve them.The present work is part of this plan and in it several studies have been carried out on the main problems of deterioration of the Havana Great Theater. We propose an approach for the rehabilitation project and a manual of preventive maintenance that will helps to conserve its properties and functional capacities, after the repairation of the building. It will also be oriented to solve the deficiencies or affectations that are caused by the action of different agents.

2.Introduction

In the first part of the XX century (1907) a Cultural Center was built surrounding the ancient Tacon Theater, built in 1837. Its purpose was to serve as Social Galician Center.
It is the most prestigious coliseums in Cuba and one of the oldest cultural institutions in America. Visited by many people that enjoy the different artistic manifestations. It is included in the Monuments Register of the Havana City, and according to the Master City Plan, categorized with Protection level N. 1

3. Location

It is located in Old Havana, a World Heritage site (fig.1).

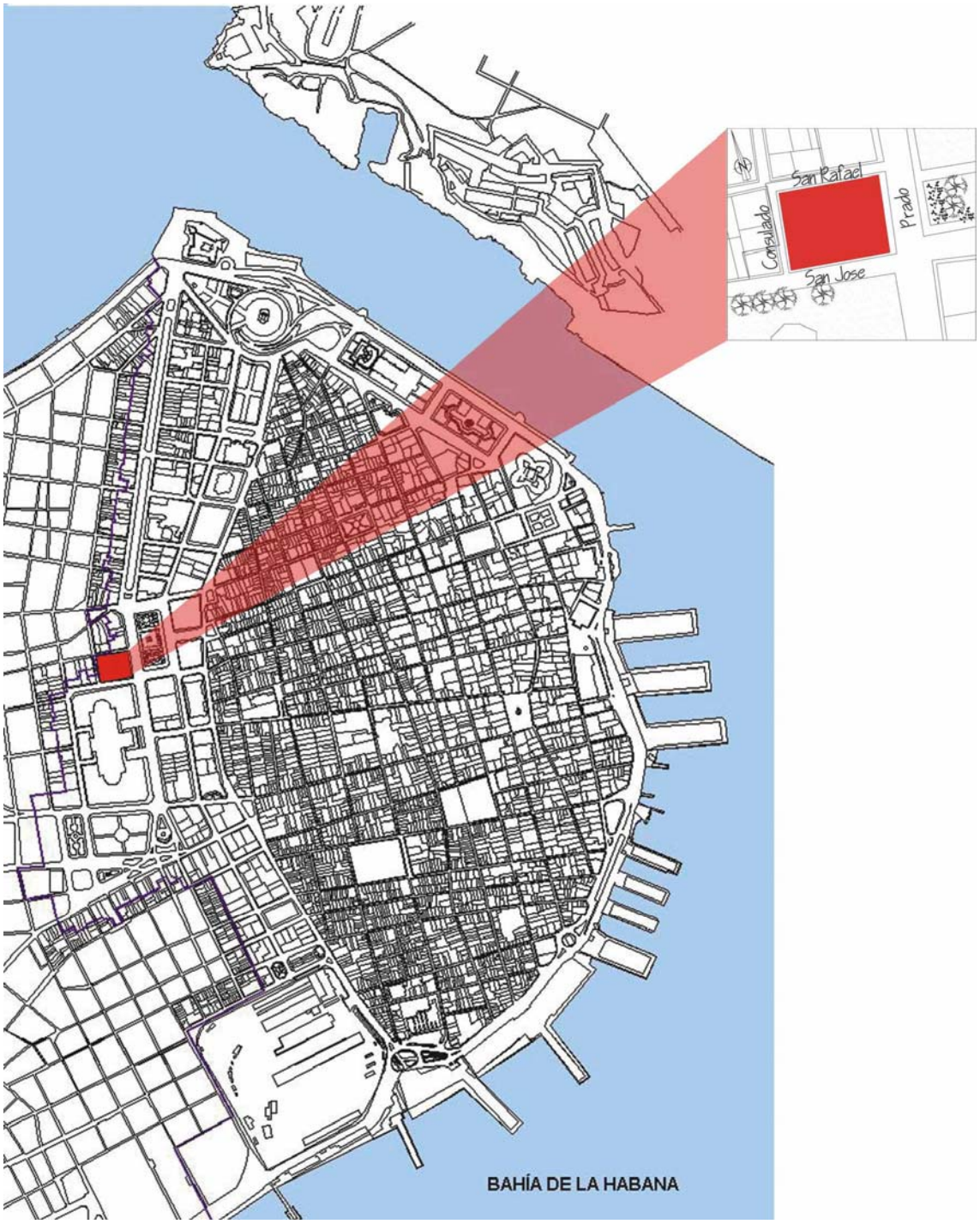


figure 1- Havana city

The building was built in the corner of Paseo del Prado and San Rafael street. "Although outside, it was located in front of the door of Monserrate and the park where it was Isabel's statue II " (de las Cuevas, 2001) It occupies the whole block, between Paseo del Prado and San Rafael street, and San Jose and Consulado streets.

It is surrounded by important public buildings:

- **National Capitol, today Cuban Academy of Sciences, opened on May 20, 1929 (fig.2 and 3)**

figure 2: National Capitol

figure 3: Top view- National Capitol

- **Asturian Center, today National Museum of Fine Arts, opened on November 20, 1927 (fig. 4)**

figure 4: Fine Arts National Museum

- **Alameda de Extramuros (Boulevard of Outside), today Central park, builted in 1841 (fig.5)**

figure 5: Central park

- **Inglaterra Hotel, opened in 1856 (figs. 6 and 7)**

figure 6: Boulevard

figure 7: Inglaterra Hotel

This area is characterized by :

1. **"An open area, with buildings that reaches 30 m of height and occupy large blocks, of high architectural quality.**
2. **Low populational density (24%).**
3. **High smooth traffic due to important vehicular arteries" (Arencibia, 2004)**

4.Brief historical review

In the first half of the XIX century there was an extraordinary economical development in the Island. All these was propitiated by a series of measures that the Metropolis was forced to implant in order to protect the island from being taken by the Englishmen. In this moment the developments of construction projects acquire true importance,mainly due to the increment of the sugar production.(de las Cuevas, 2001) Havana in the year 1834 only had the Main theater or Coliseum, located beside Paula's Boulevard, far from the population of outside. This constructionhad a limited capacity and it had been reformed in several occasions , that's why the captain general Tacon took charge the construction for another theater to Francisco Marty and Torrens, (de las Cuevas, 2001) It's inauguration was on April 15, 1838 (figs 7 and 8) and it took thename of the Tacon general (de las Cuevas, 2001)

figure 8: Tacon Theater

figure 9: Tacon Theater

"The room's environment was developed in horseshoe shape, it was formed by three orders of theater boxes, ninety in total, and two bleachers: the corridor in the high level of the theater at that time denominated "Tertulia" (Gathering) and the group of seats of the highest floor that receive the name of "Paradise" or " Pan ". it also had two roomy and elegant theater boxes for the General Captain and for the Presidency. It's normal capacity was 2000 spectators, but it could admit up to 500 more people. It had a hipped roof and the front had a portal frame of three arches on pillars with embedded columns, simple columns in the center and double in the corners. In 1859 the roof of the room was substituted by a pitched roof" (de las Cuevas, 2001) (fig.10 and 11)

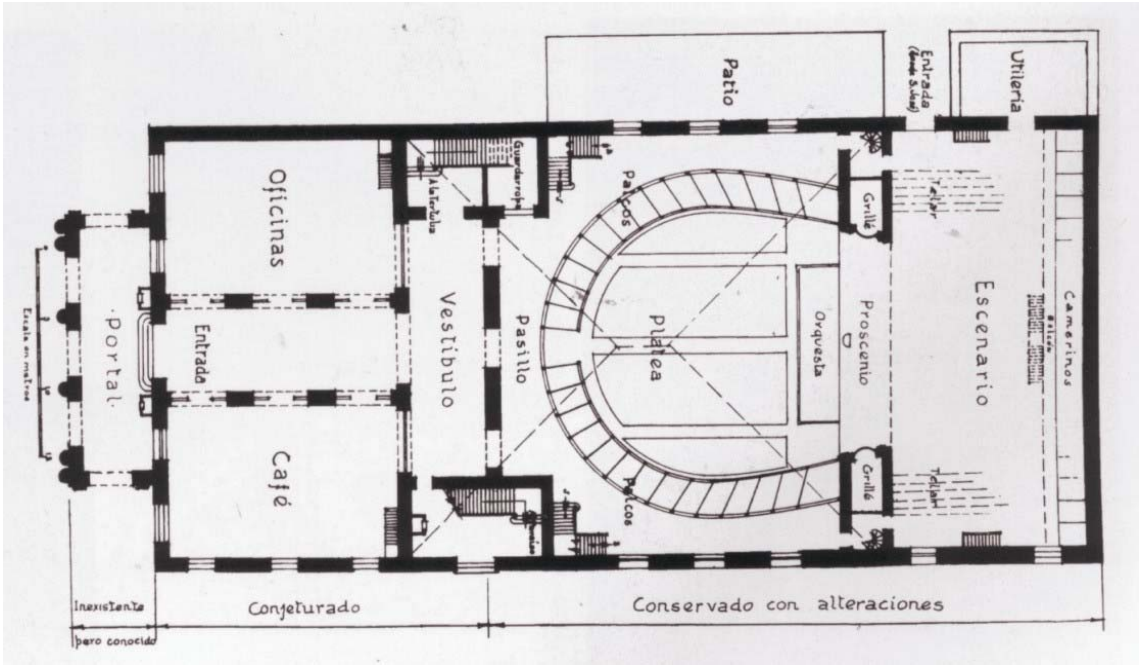


figure 10: First storey, Tacon Theater

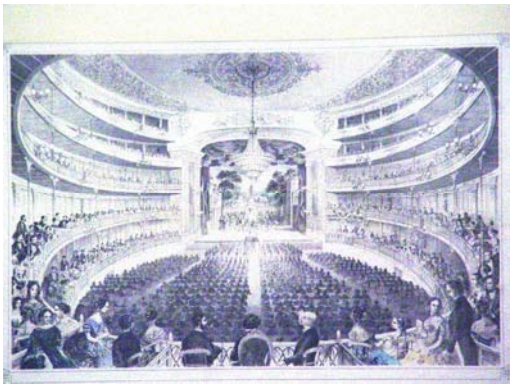


figure 11: Platea

" In 1879, the Galician Center is constituted and its prupose was to give instruction to the immigrants of that area and also as place for entertaiment to those residents in Cuba" (de las Cuevas, 2001)

In 1906 the Galician Center of Havana acquired the property of the building, with the aim of building a great social palace there, with the commitment of respecting the internal configuration. However, the modifications they carried out in its structure and in other aspects altered its originalcharacter (de las Cuevas, 2001)(Archivo, 1882). With the bases agreed in 1907,a competition was summoned for the project of a new social building, where the old Tacon Theater was included, at that time denominated National Theater.
A project of the professors Eugenio Rayneri, Aurelio Sandoval and Andres Castello was selected. On December 8, 1907 it was placed the first stone and the works were begun with their drawings, but finally they decided to carry out the building using the Belgian architect's design Paul Belau, admitted outside of competition, which ended in the year 1915 and it costs 1,800000 pesos.(Weiss, 1967)(Weiss,1979) The Galician Center is the oldest of the mutual societies Spaniards of Cuba (Oficina historiador,1998)
It consists of three stories and its facade is garnished with several sculptural groups. "Although externally they are assimilated to the formal codes of the Baroque, their interior constitutes open spaces of big spans, of separates rooms divided by timber frame wall panels with glass. Inthe main story there were the casino room, the games rooms and several offices; and in the low story were the Savings Banks, offices of the Treasurer, restaurants, coffee rooms and otherdependences. The top level was occupied by a highlighting big dance hall with decorations in it roof.
The majestic stairway of the lobby is crowned with the lantern light or skylight, surrounded of windows and six angels sculptures. (de las Cuevas, 2001) (fig 12 and 13) "The theater remained in its original form, but the lobby and the coffee rooms were eliminated and were added devices against fires such as metallic curtain for the isolation of the stage" (Rey, 1988)

figure 12: Left view- Social Galician Center

figure 13: Front view- Social Galician center

5.Values

5.1.Culturals

Great Tacon Theater was inaugurated in 1938, it constitutes the oldest theater of Latin America still active; ballet shows, dances, opera and operetta are played, as well as concerts and lyrical recitals. This Theater was considered as the most important theater of the country

in the XIX century. At the moment of its construction it was described as "a building which the comfort in it interior could be compared to the best coliseums in Europe, also that it had the structure, elegance and capacity of the Real Theater of Madrid and of the Barcelona Liceum ". (de las Cuevas, 2001)

5.2.Artistics

Its ellegant decoration, acoustics and architectural functionality were exalted in several moments of the history by figures of the universal art that have performed in its stage. The performance of dramatic figures as Sarah Bernhardt; Josephine Baker, dancers like Fanny Essler, Anna Pavlova, Maya Plisetskaya; singers like Jenny Lind, Enrique Caruso, dancers like Antonio Gades, musicianslike Arturo Rubinstein; Teresa Carreno and an endless list of Cuban relevant artists such as Alicia Alonso, Rita Montaner, Ernesto Lecuona, Jose White, Ignacio Cervantes, Brindis de Salas, Benny More, Amadeo Roldan, Rosita Fornes, Silvio Rodriguez and Frank Fernandez (Rey, 1988) Last year, took place a great performance of the important figure of the mime art: Marcel Marceau.

In recognition to the history of this institution, heiress and follower of one of the longer artistic trajectory of Latin America, the Ministry of Culture of the Republic of Cuba established the Prize and the Book of Honor of the Havana Great Theater, like a tribute to the personalities, groupings and relevant , excellent artistic events happened in its rooms. At the present time it is headquarters of the National Ballet of Cuba, of The" Print of Spain" Festival, and of the Havana International Festival of Ballet, Theater and Lyrical Art.

5.3.Historical - Political - Social

Parallelly to these presentations were taken place political events of great importance such as the First National Juridical Congress, First National Congress of Women, the First National Congress of Workers, Tribute to Antonio Maceo, Maximo Gomez; the first recording of the Hymn of July 26 movement.

Social events such as the decoration to Gertrudis Gomez de Avellaneda and speeches of Fernando Ortiz and Alejo Carpentier. (Rey, 1988) Badges and prizes given to importants figures of the Sport and the national Culture.

Also in this Theater was put into practice the discovery of the electric transmission of the sound andthe use of one of the first telephones in the world.

6.Building's description

The Garcia Lorca Theater, (old National Theater) the Rooms of the Great Theater and the Galician dependences, as well as the National Cabaret conforms what is known nowadays as Havana Great Theater.

It's a 3 stories building with basement, the facades are in eclectic style and with large ornamental or sculptural ensembles. (fig.14)

figure 14: Havana Great Theater

It has stonework walls of 1.50m wide (fig.15) and the other walls are brickwork masonry, finished with a mortar of lime.(fig.16)

figure 15: Stone walls

figure 16: Brick wall

The stone that was used in this building is sedimentary,of type limestone, composed by glasses of small size joined by a cement that it contains in its stratification remains of fossils. It constitutes one of the rocks that are affected by the different agents (chemical, physical, mechanics, biological and microbiological)" (Arencibia, 2004). "It was used as ashlar masonry, being this, the more finished,stable and solid of those produced at that time and, for its high cost was limited to the big and magnificent military buildings, religious, of the government and the population's rich neighbors" (Fernandez, 1956)

The building has spans of 6 and 7 m., and room heights over 7m.

The structure is of load walls and has steel columns covered by concrete. The roof is of a steel structure (fig.17) and the cover is made with tiles of asbestos cement (fig.18) for the area of the Theater's room and of concrete slab finish with ceramic tiles (fig.19) for the rest of construction.

The roof is divided in several sections, it has flat slabs, pitched roofs (fig 19) and Mansarda vaults.

figure 17: Steel structure

figure 18: Asbest tiles

figure 19: Pitched roof, ceramic tiles

The floor slabs are made of reinforced concrete.
In the lobby steel columns and beams covered with concrete are used.
The interior is designed as a luxurious place. (fig.20) The stairways are majestic and sculptural pieces also made of concrete and have marble floors and balustrades. (fig. 21 and 22)

figure 20: Interiors

figure 21: Stairs, Theater Lobby

figure 22: Stair, Galician Center Lobby

The porch, located at the Prado street, is characterized to be free in its all extension, for public use, is 7m high, and have an excellent design of granite floor (fig.23) and carpentry works.

figure 23: Porch floor

In the interior the building has a courtyard (fig.24) paved with natural stone, for the spectators that attend the shows and also have interior patios to provide the building with natural ventilation and lighting.

figure 24: Central courtyard

The doors (fig.25) and windows (fig.26) are designed in larges sizes. They are French windows made of hard wood and have glass with an elaborated wooden filigree.

figure 25: Main door ***figure 26: Window***

The upper part of interior walls are finished with scotias elaborated in plaster and the columns with Corinthian capitels. (fig.27)

figure 27: Interiors walls- Lobby

It has a wide range of forge works expressed in railingss and iron works. (fig.28 and 29)

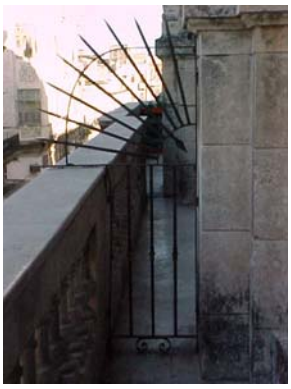


figure 28: Iron works ***figure 29: Iron works***

Nowadays, the whole building is used as a cultural center, with small theater rooms, art galleries, offices and essay rooms for various ballet companies.

7.Object study

For this particular work , keeping in mind that the dimensions of the property and the affectations that present are so big and varied, a part of the building has been selected: we will focus on the " Federico Garcia Lorca" Theater (name have been given at the present time) (fig. 30)

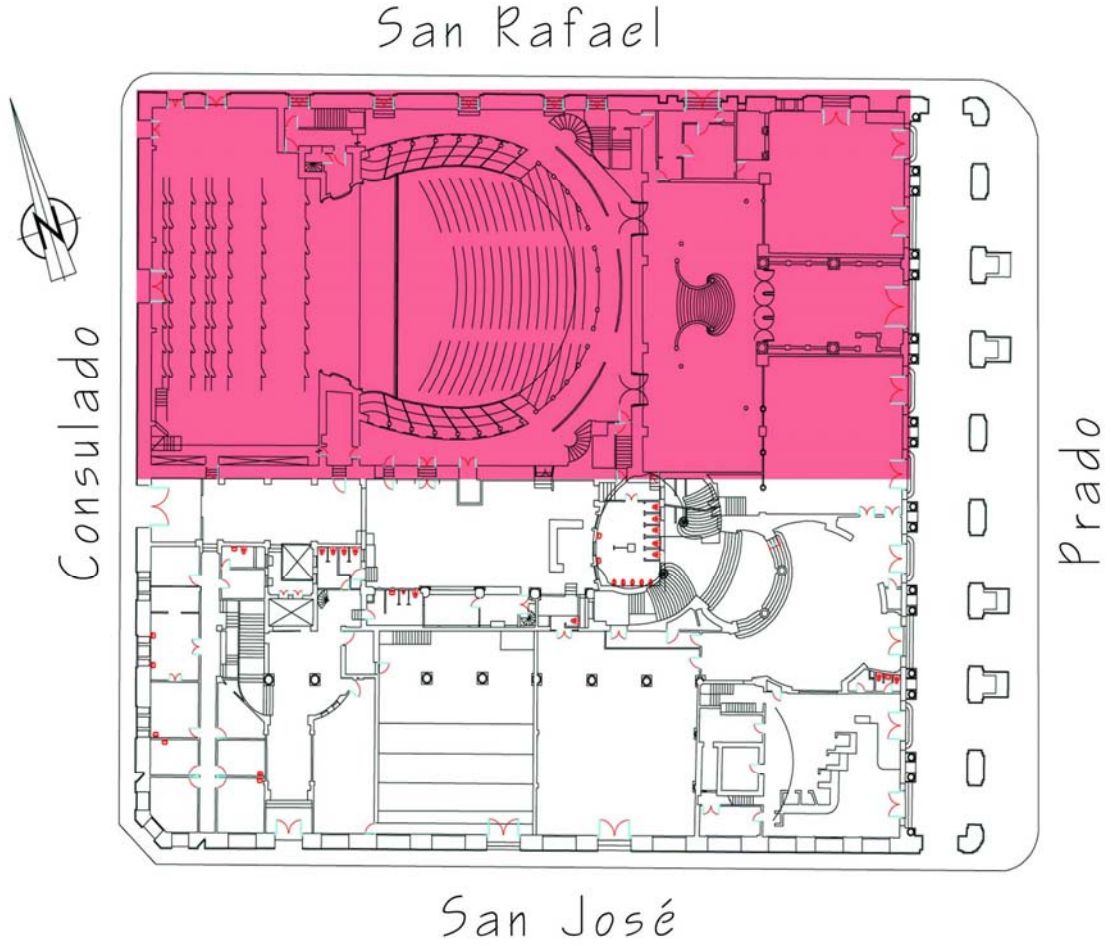


figure 30: Garcia Lorca Theater

As it was previously mentioned, the theater is structured in horseshoe form. It has a first level called "Platea" with 500 seats and 4 balconies sustained by columns arranged in radial form finished by squinches that connect them with the edge beam. (fig.31)

figure 31: "Tertulia" and "Paradise"

These balconies have around 100 seats each one, and in the front part they end with a railing of fused iron. Each floor slab are covered with wooden false ceiling and the main roof exhibits a frescoe in the center, from where hangs a big lamp that offers zenithal light to the room. (fig.32)

figure 32: Central lamp

The room has been modificated along its service life, in the year 1933 the central boxes of the first and second floor were suppressed to give bigger capacity to the room and also was installed a cabine for the cinema projectors in "Gathering". (Rey, 1988) (fig.33 and 34)
In 1955 it was carried out the most important transformation that has have the Theater,the movable timber floor slab of "Platea" was substituted by a concrete one , the audience was arranged in 2 lines : 1 central and 2 lateral, (fig 36) the armchairs were substituted by cinema chairs, the louver doors of the boxes were eliminated, (fig. 37) the tiers of the high floors were substituted by individual seats (fig. 38) and the lobby area was reduced in order to use of the air conditioner system and also to be able to locate the offices. (Rey, 1988) (fig.35) In this time were built some steps of concrete in the seats area of each floor, in these steps is contained the air conditioner duits. Also the circulation corridor behind the last line of seats was reduced to be able to place 2 or 3 additional lines of armchairs and masonry walls were built to limit this space. (fig. 38)

figure 33: Original design

figure 34:Original Design

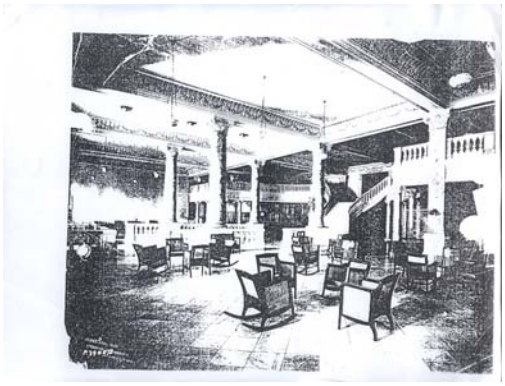


figure 35: Original Lobby

figure 36- Boxes

figure 37: Seats distribution

In "Platea" , 1st and 2nd balcony remained the original boxes in the lateral sides, but those in the central part were eliminated .

In some moment the alignment of the San Rafael's facade was broken, to create an entrance to the National Cabaret and the original window was substituted by a door that,from the architectural scale and design, doesn't keep any relationship with the monument. (fig. 39 and 40)

figure 38: Corridors, masonry walls

figure 39: National cabaret entrance

figure 40: Post office entrance

The stage is formed by columns, beams and wooden boarding, it had been also modificated: the proscenium was enlarged forward (in order to have the artists get closer to the public) that's why a part of the orchestra's pit is contained under this enlargement. (fig.41 and 42)

figure 41: Original stage

figure 42:Real Stage

The access toward the first and second balcony is through stairways inside the own room and the entrance toward the other 2 levels: "Gathering" and "Paradise" is by other stairs, located in San Rafael's facade.

8. Current state

In general we can say that the superstructure is the fewer affected, in contradiction with the finishing of the walls, the furnishing, and the services systems, like, electric, sanitary and hydraulic facilities.

The building has a deterioration increase in the last time, caused by environmental factors (weather,vehicles circulation,etc) the lack of maintenance and the successive constructive interventions that have taken place in it.

Next we relate the main problems found in each one of the specialties that have participated in the project:

8.1.Superstructures and wall's structures

The structure doesn't have big affectations, only some concrete detachments in the areas with moisture surfaces. Deformations, deffect or collapses are not appreciated in any element (fig. 43). Big problems of rust doesn't exist in the steel elements, except in some specific areas.

figure 43: Steel structure, good state

The roof have great deterioration because of the filtrations of rain water, causeed by blocked gutters and conduits or bad solution of drainages. For this same cause the tiles are broken and in many cases, there is not joint materia. (fig 44)

The infiltration of water has caused stains of moisture in the interior walls, mainly in the area of the rainwater vertical discharges or gutters. (fig. 45 and 46)

figure 44: Tiles broken and loss of joint material

figure 45: Moisture surfaces

figure 46: Interior walls - Moisture surfaces

The wooden structure of the stage is damaged in 50% due to the termites. (fig.47 and 48)

figure 47: Structure affected by termites

figure 48: - Wood affected by termites

In thesis made on the study of the existent pathologies in the facades, it exposed the main alteration indicators observed in the facades of the Great Theater of Havana are:

1. **Surfaces modifications: paõtinas and black scabs that cover the parts fewer exposed to the sun and moistest of the wall; and saline efflorescences in the surfaces next to the sidewalk.(fig. 49)**
2. **Elimination or loss of the material: Surfaces erosion, presents in a large part of the exposed garnishes; and alveolization, located in the most projected figures in the geometry of the facades and in the areas more affected by the rain and the wind. (fig 50 and 51)**
3. **Ruptures and disjunctions: Detachments, mainly of the ornamental elements, balustrades, shields, etc.(fig 52)**

Other problem that often can be often found are the antropics modifications, superior plants and liquenes colonies. The first ones are caused by inadequate solutions such as the use of Portlan cement mortars (that come off eassily) and some cleaning techniques used. The growth of superiors plants make cracks, because of its vital activity, introducing its roots in the wall. The liquenes colonies appear in moist surfaces , they are associated to the patinas. (fig. 53 and 54)

figure 49: Black patina- San Rafael facade

figure 50: Loss of joint material.-San Jose facade

figure 51: Alveolization- San Rafael facade

figure 52: Rupture- Prado facade

figure 53: Birds nest- San Jose facade

figure 54: Superior plants- San Jose Facade

8.2.Finishings

In general the marble floors are in a good state, but the porch's floor granite have some cracks and fissures.

Some of the original interior doors and windows have been changed, like the entrance doors from the lobby to the Platea(fig. 55). The externals doors and windows remained the original one in regular state.

figure 55: Entrances to Platea

The stucco of the lobby columns have cracks caused by the rust of the steel contained in its interior, and the scotia at the higher part of the interior walls have peelings and lack of painting

8.3.Furnishing

The carpets that cover the seats floors areas are dirty and frayed, and the seats are deteriorated and their designs aren't incorrespondance with their specific uses.

8.4.Electricity

The electrical facilities are in critical situation.First of all the capacity of the volt transformer camera that feeds the installation is at the present time insufficient, keeping in mind the requirements of power of the technological equipment that has been introduced lately.

The loads center is constituted by switches of iron boxes with fuses, obsolete for this time and its ducts are exposed in a disordered manner.(fig.56)

figure 56: Loads center

It is not known accurately the state of the embedded facilities, it is presumed that in most of the cases they are iron pipes and as a consequence of its rust the plaster is exploited. The wires are covered with textiles.

Countless adaptations and additions of facilities without order have taken place and they are exposed in not well state increasing the risk of possible fires.

The lighting of the building is not enough, due to the lack of many lamps of different types that havenot been replaced, like the incandescent lights of the balconies and the rosette of the main roof. (fig.57)

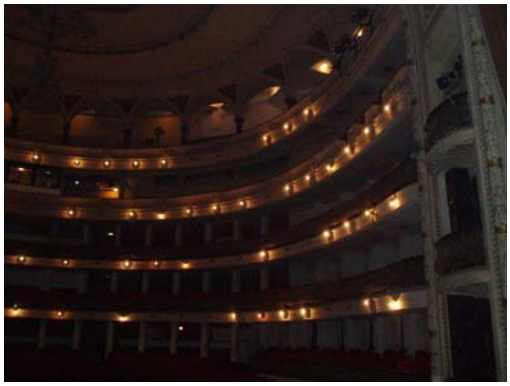


figure 57: Theater lamps

The power installation has also required of adaptations that have been made in exposed canalization that affect the aesthetics of the local.

8.5. Comunications

There is a phone central of 15 extensions that it doesn't satisfy the present necessities of the theater due to its little capacity, and that it doesn't fulfill the established technical characteristics.

The wires and registers are exposed in entangled way, without any order.

Neither detection of fire automatic system exist or alarm against intruders, indispensable requirements for an installation where a huge quantity of public attended.

8.6.Water service

The state is quite critical, although it has been carried out some maintenance works, they haven't solved the existing problems.

The water supply takes place through a cistern that pumps water toward some tanks located on roof and from there by gravity to the different places, but, as it is not enough the supply, that's why in each lavatory there is an independent tank with exposed installations to give service to the sanitary appliance of each area.(fig. 58 and 59)

figure 58: Publics Lavatories

figure 59: Public lavatory

Reservation pump doesn't exist.

8.7.Sewer System

The sanitary installation is in very bad state, the vertical discharge are blocked and sometimes, pour off of sewer water in some places of the building.
The pipes are made of fused iron and its rust causes peeling of the walls.
The sanitary appliances, are left or broken and the fitment are incomplete.
It is also insufficient the quantity of the appliances, keeping in mind the percapita settled down in the rules for buildings with this use, such as the Platea with a capacity of 500 people that only has a lavatory (toilet room) for men or, the first balcony has a lavatory (toilet room) for women which gives service at this level and the following one.
The rainwater discharges are blocked and there are not grating in the roofs.(fig 60)

figure 60: Loss of gratings

8.8.Scene mechanics

It is formed by several systems:

- **Superior scene mechanism: Formed by:**

1. **The boarding, in quite good state.**
2. **The sticks that support the backcloth that configures the scene space, manual work in this moments.**
3. **The system of the first curtain that has damaged parts.**
4. **The work galleries.**
5. **The amianthus curtain that closes the stage.**

- **Inferior scene mechanism: Formed by several wood platforms and a movable mecanism that rise and down. Those platforms still works.**
- **System of curtains: Not in good state**

8.9.Acoustics

The theater was object of acoustic measurement by the Swedish enterprise -Akustikon and they said that the architectural conditions at the present time have deteriorated the system that originally had and it doesn't fulfill the technical parameters required by Opera and Ballet shows.

8.10.Light technic

The technical light system is not enough at the present time, keeping in mind the different artistic shows that are played in the theater and for the filmings, recordings and television transmission. The equipment doesn't fulfill the luxes and lumenes requirements and the different lights stations : frontals, lateral, zenithal, back lightings, environmental, etc does'nt embraces the different performance areas and the public room.

8.11.Air conditioning

The supply ducts of air conditioner comes out from the equipment room located in the basement and below the central patio emerging attached to a wall to the roof, from where it injects the cold air to the room, also above the false ceiling where there are embedded gratings for cold air injection .

This duct in general is in good state except the exterior part that presents remarkable affectation for the moisture. (fig. 45) The return is trough litle patios or court and the platea basement.

In technical local, such as cabines or protocol area there are room coolers they affect the room aesthetics and pour the condensed water in the interior corridors where the public circulates.

9.Expectatives

- **The main objective of the investors is to rescue the most of the architectural characteristics of the original building, using modern restoration techniques and similar materials as the one used in its construction, taking into account the historical political and cultural values of this institution.**
- **They proposed the adjustment of spaces to new social purposes, it means, to eliminate all the elements that were introduced by several previous works that affect the performance of the theater.**
- **Another important aspect is to create environmental, hygienic-sanitary conditions, of security and comfort to the workers, artists and the public that enjoy the shows of different artistic manifestations are offered there.**
- **The other design objective is to provide this ancient building with the modern technical advances and services according to the specific needs of each room.**

10.Project proposal

10.1.Architecture

The conservation project was based on rescuing most of the architectural characteristics of the original building, using appropriate techniques of restoration in each case and original materials orinstead materials with similar characteristic similar to those.

The starting point for the restoration was the physiognomy the Theater had in 1953, when it took place the biggest architectural intervention.

Based on these approaches the restoration and conservation actions for the main elements of the building were coordinated. Some of them have been made already, given the fact that the restoration of the building is been carrying out in a progressive way.

- **10.1.1. Roofs:**

1. Asbests tiles : The broken units will be restored, using some that are stored in the basement of the building. (fig.61)

figure 61: Restaured roof- asbest tiles

2.Ceramic tiles:The broken units will be substituted for new, the joints will be pointing, using special watertightness mortars with high adherence and durability and without retraction (fig.62

figure 62: New ceramic tiles

- **10.1.2. Facades:**

In previously mentioned thesis the following proposal was made:

1. Treatments for the Preservation and Consolidation.

The way of perform the works will include the conservation stages,that are described bellow:

a. Preconsolidation

b. Cleaning

c. Consolidation

d. Protection

e. Substitution of elements

2. Plan of Maintenance.

It is necessary to keep in mind the aggression by inadequate treatments plays a fundamental rol in the changeability of the stone; for this reason we can't use:

1. Products water repelents that protect the faces of the stones but don't protect it's base,or they avoid the natural transpiration of the stone.

2. Addmixtures whose chemical composition are incompatible with the stone or with its content of water or salts.

3. Partial substitutions with stone, natural or artificial, which can present different characteristics that those of the original one. (Arencibia, 2004)

In the same way it has been dangerous the employment of synthetic resins applied to the surface of the stone that, aging it, they change color or they modify the superficial structure ofthe material, removing it after some time. It would be also harmful the cleaning of the facades with sophisticated technologies as the jets of sand that, if they are not controlled, could be cause the break of the pores of the stone increasing its deterioration. Also it is not advice at the present time the use of any system that supposes a physical or chemistry aggression to the stone. .(Arencibia, 2004)

These recommendations are the bases for the work of restoration and repair of the stones facades and ornamental elements of the roofs that is being developed at this moment, using products there are in the Cuban market, such as special mortars for repairs with set accelerating addmixtures without retraction, bigger adherence with the old element, workable, bigger compressive, flexion and traction strength and high ressistance to the chemical agents and the weather. (fig 63, 64, 65 66, 67 and 68)

figure 63: Damaged elements on the roof

figure 64: Damaged elements on the roof

figure 65: Restored elements on the roof

figure 66: Restored elements on the roof

In facades we are applying mortars of powder of natural stones and strenghten add mixtures

figure 67: Damaged facade

figure 68: Facade in restoration

In steel structures we are using passive and protective paintings against the rust.
In interior walls affected by moisture we are aplying mortars with the same characteristics before explained. (fig. 69 and 70)

figure 69: Damaged wall

figure 70: Restored wall

- **10.1.3. <u>Floors</u>: In the public areas the broken marble flagstones have been substitute d by others that have been recovered of other areas of the building where there is no publicparticipation. The Platea floor will be veneered with wood, according to the requirements of the acoustic project. In Gathering and Paradise it will be placed a new carpet.**

The boarding of the stage will be painted with silicona base product.

- **10.1.4. Casings: Inside the Theater the wood of the corridors that are affected by the t ermites will be substituted and veneer these surfaces with similar material.**
- **10.1.5. False ceilings: Keeping in mind that the exist are the originals, it will be substit uted only those that have been affected by termites or broken.**
- **10.1.6. Furniture: In Platea, first and second balcony fixed armchairs will be located w ith wooden arm and upholstered seats and backs.**
  In the Theater Boxes mobile armchairs will be located with the same characteristics of the previous ones.
  In Gathering and Paradise fixed armchairs will be located, with wooden arm and back and upholstered seats.
- **10.1.7. Forge: The existents railings will be cleaned, rubed and painted. (fig.71)**

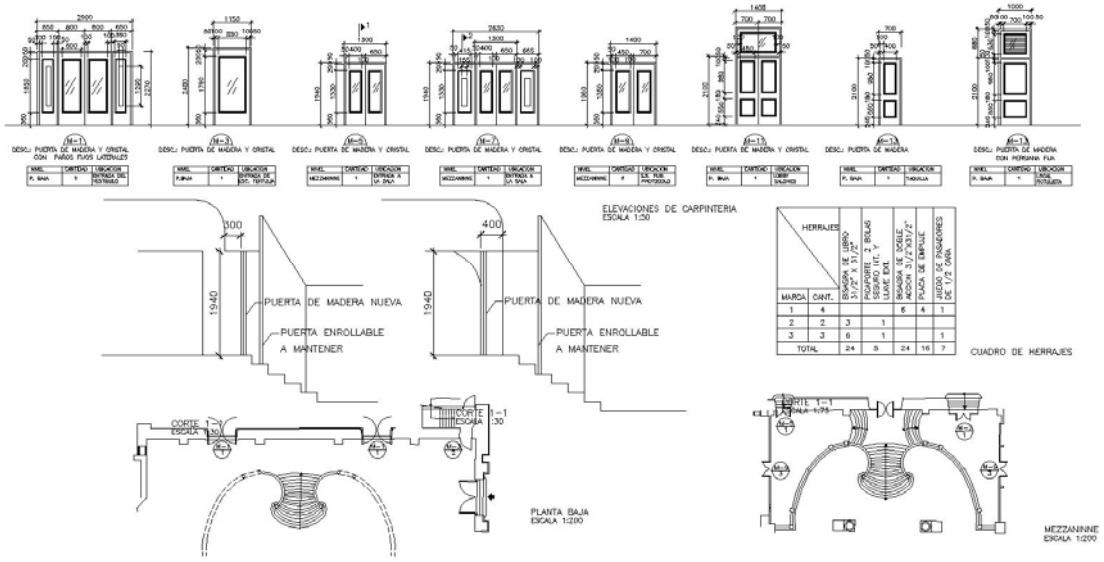
figure 71: Existing railings

- **10.1.8. Doors and windows: The external, those that have been eliminated or altered will be restored with the same design and all of them will be painted with the patter ns of colors that its traces has indicated.(fig. 72 and 73)**

figure 72: Real state - window

figure 73: Restored window

The internals ones , those which are susceptible of restoration we will use the same approach mentioned before. Those that are very damaged or those that are new proposals of the project will be built using the existing design as reference. (fig. 74)



Carpinteria Lobby

figure 74: Drawing for internal doors

- **10.1.9. <u>Spaces:</u> The space of the Lobby will be changed, recovering its original measur es. (Fig.75, 76 and 78) Taking into account the wall paintings of the main walls, althou gh theyare not original but they belong to a recognizer painter (Tarragona) and the y are part of the historical memory of the theater. (fig.79)We are studying the possib ility of their transfer to other walls of the building.**

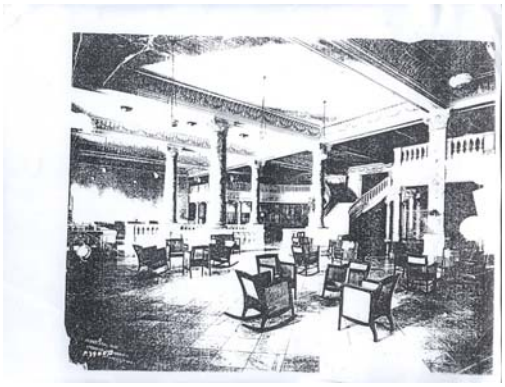
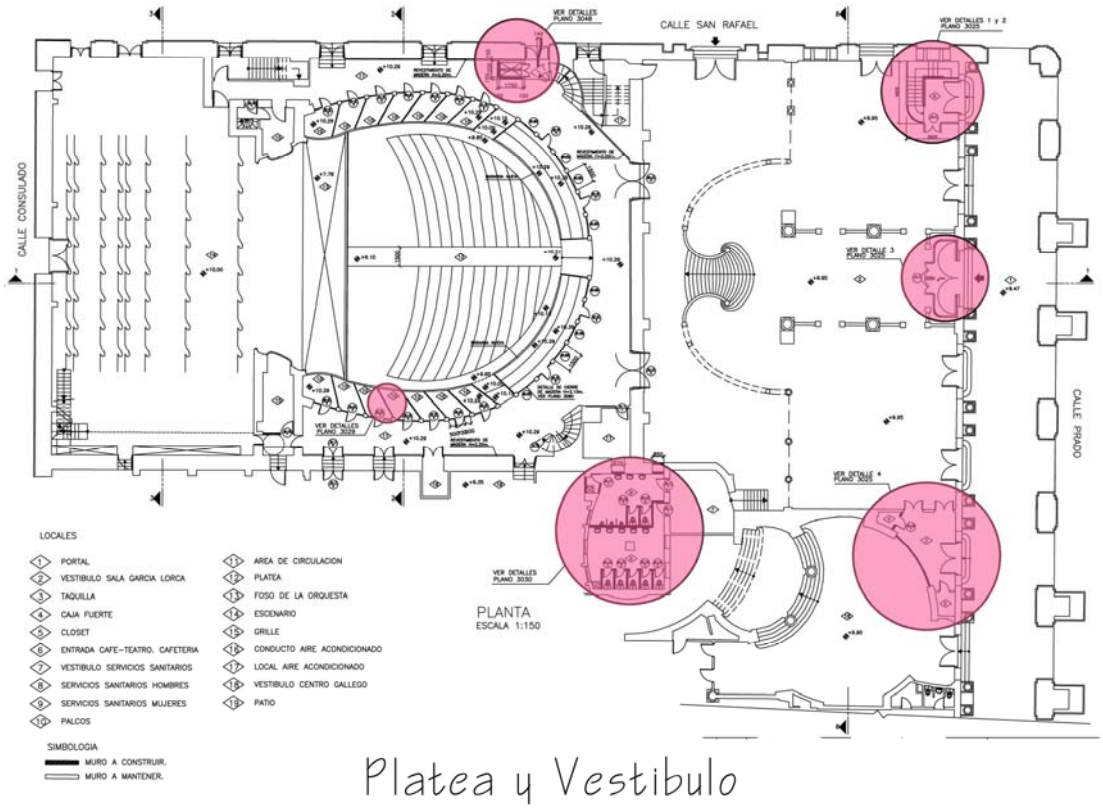


figure 75: Original Lobby

figure 76: Lobby - Real state - year 2003

figure 77: Wall paintings- Lobby



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The horseshoes shape of the audience area will be recovered, starting with the elimination of the seats lines that were added and the masonry walls. (fig 79 to 88)

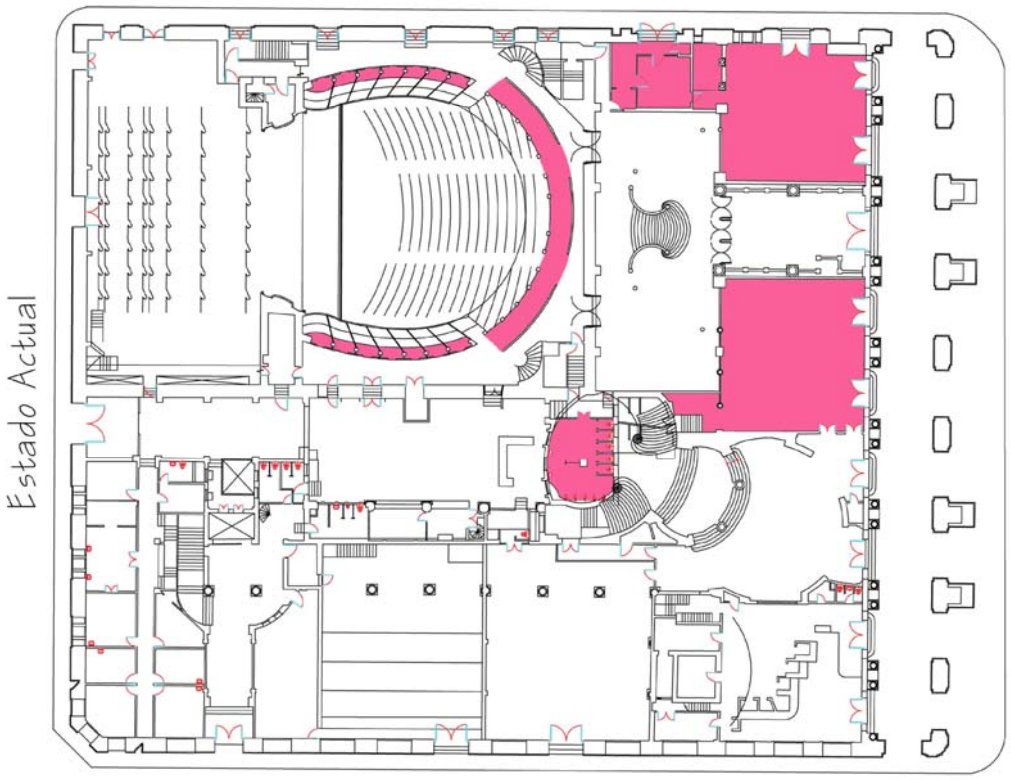

figure 78: First floor- Real state

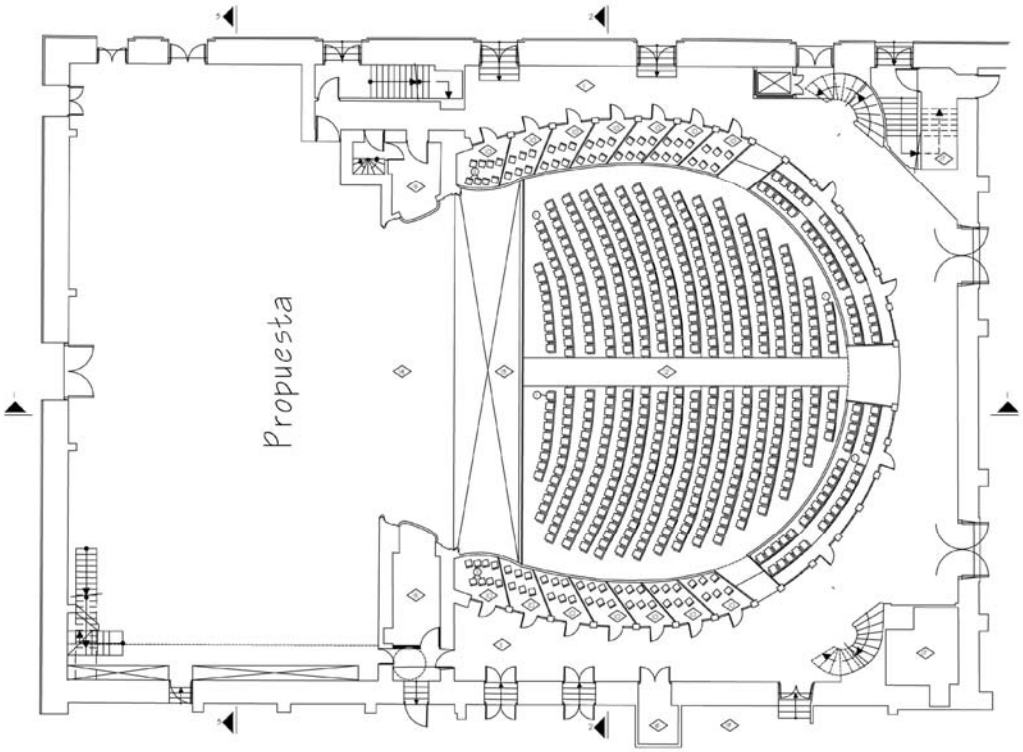

figure 79: First floor - Proposal

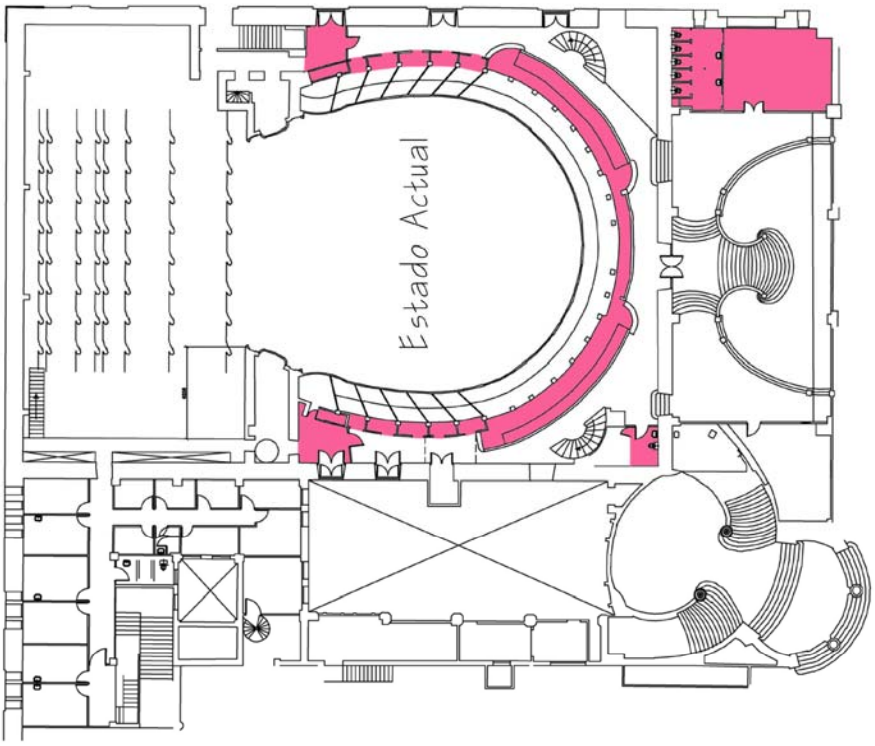

figure 80: First Balcony- Real state

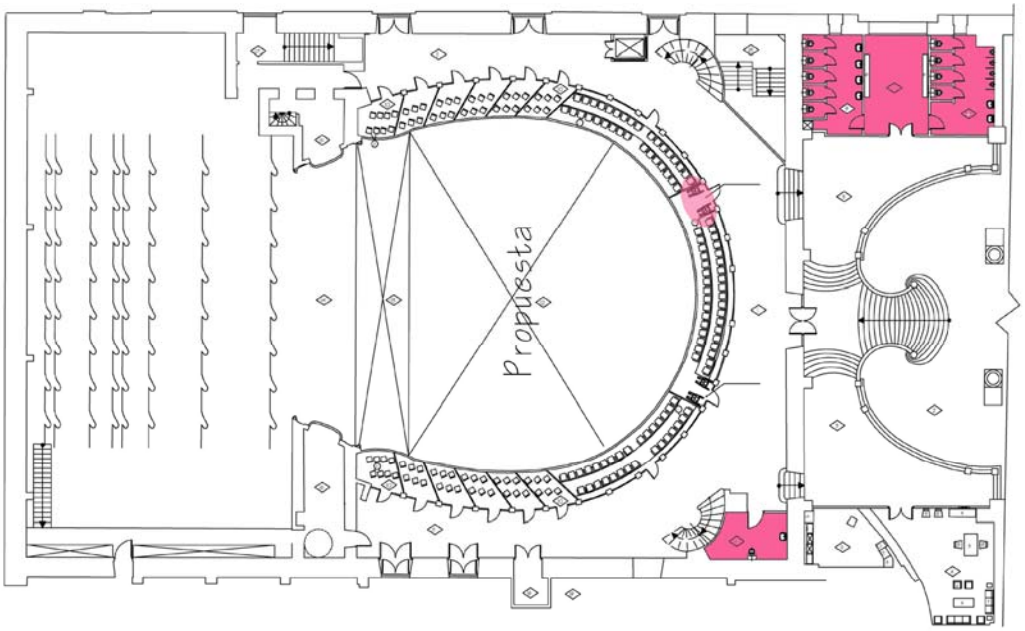

figure 81: First balcony- Proposal

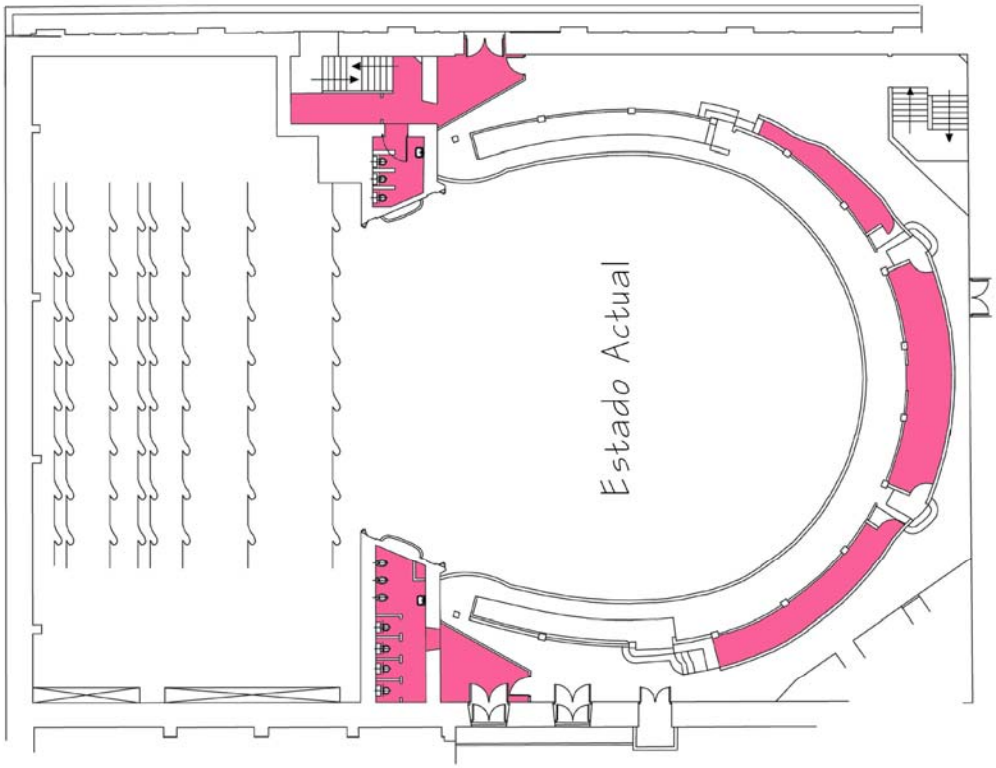

figure 82: Real state- Tertulia

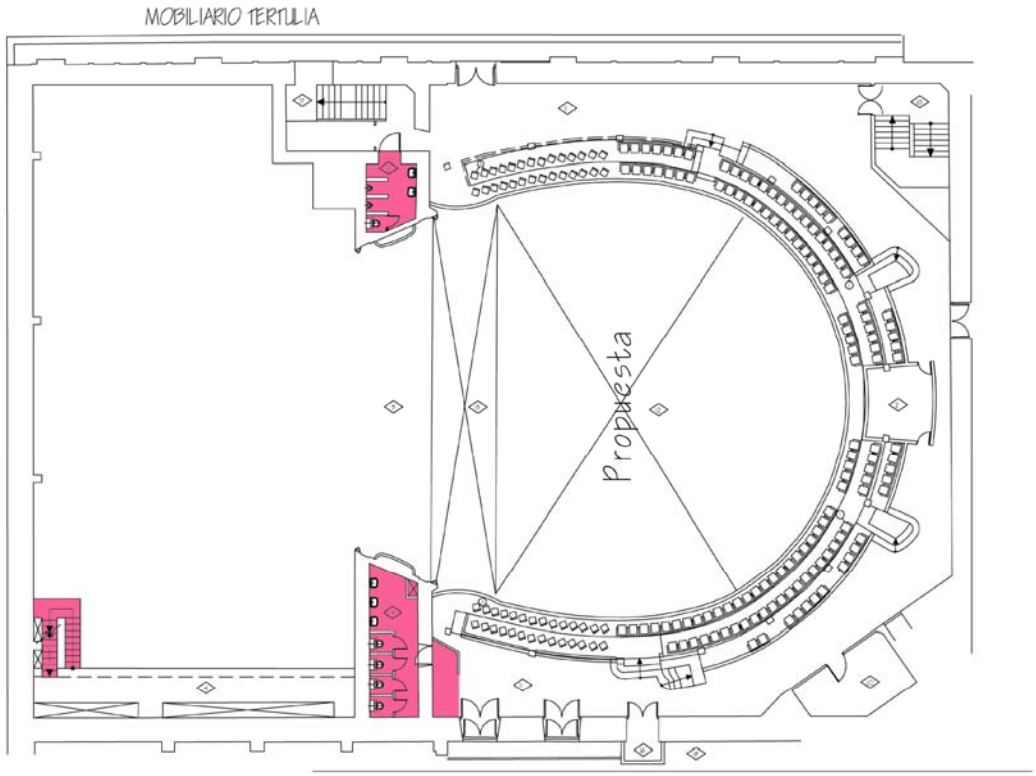

figure 83: Tertulia - Proposal

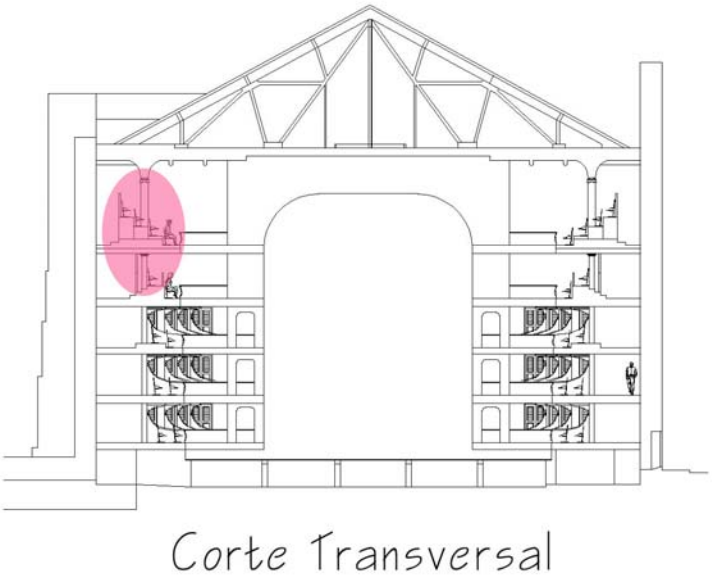

figure 84: Proposal

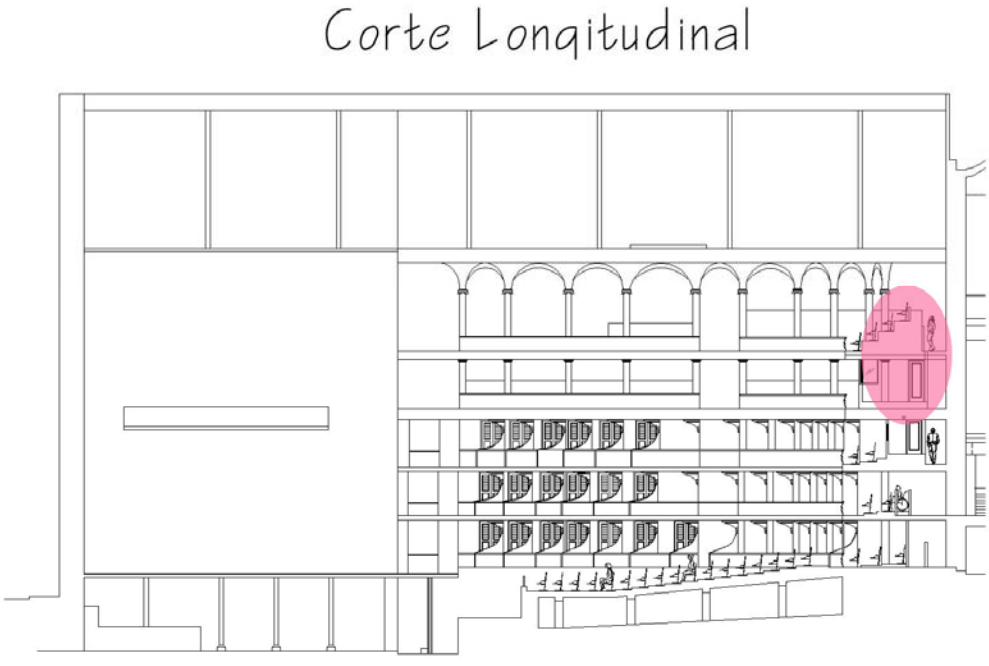

figure 85: Proposal

figure 86: Paradise- Real state

figure 87: Tertulia- Real state

The timber divisions among the boxes will be restored. (fig 89, 90 and 91)

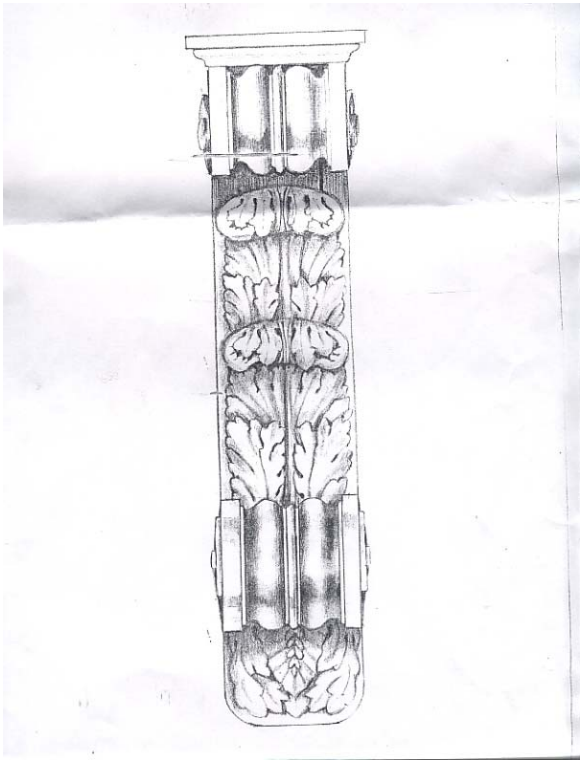

figure 88: Boxes-Original divisions

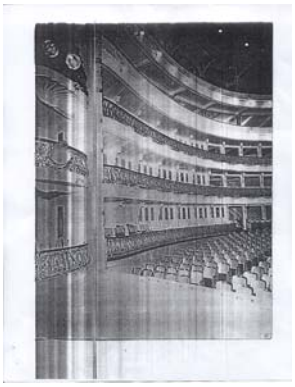

figure 89: Theater- Original boxes

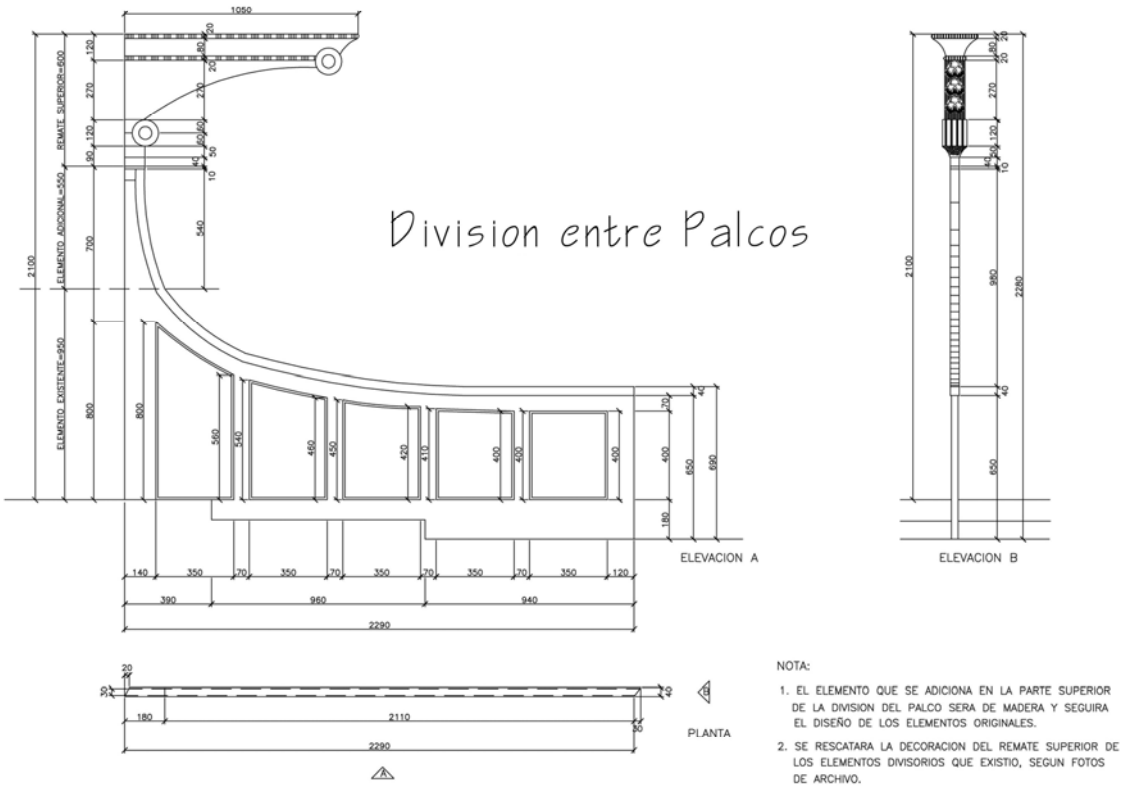

figure 90: Boxes divisions- Proposal

The solutions for the stage and the orchestra's pit are still under study, two possible solutions are under consideration:

1. To maintain the stage in the current dimensions, keeping in mind the reasons for it was enlarged. And in order to achieve the sound arrives in real time to the dancers in the stage is necesary to enlarge the orchestra's pit toward behind and to perforate holes in the wall between this and the stage's basement .

2. To reestablish the original dimensions of the stage and the pit, which will increase the quantity of armchairs in the audience and with this action it would improve the communication conditions between the orchestra's pit and the stage. (fig. 92)

figure 91: Stage - original dimensions

The remodeling part embraces all the adaptations that are necessary for the correct development of the activities that are carried out, keeping in mind, the technological advances and the ne spaces that are required in the Theater. In order to achieve that we will take as premise, all the elements that would be added will have a marked modern aspect, given the fact that we are using in general light and transparent material.

The main modifications proposed in the drawings are:

- **To relocated the ticket-office to other place (today is next to the main entrance in the Lobby) in order to not interfere with the public arrivals.**
- **Interior door in the main entrance in order to avoid that the air conditioner goes out of the lobby area . (fig. 93, 94 and 95)**

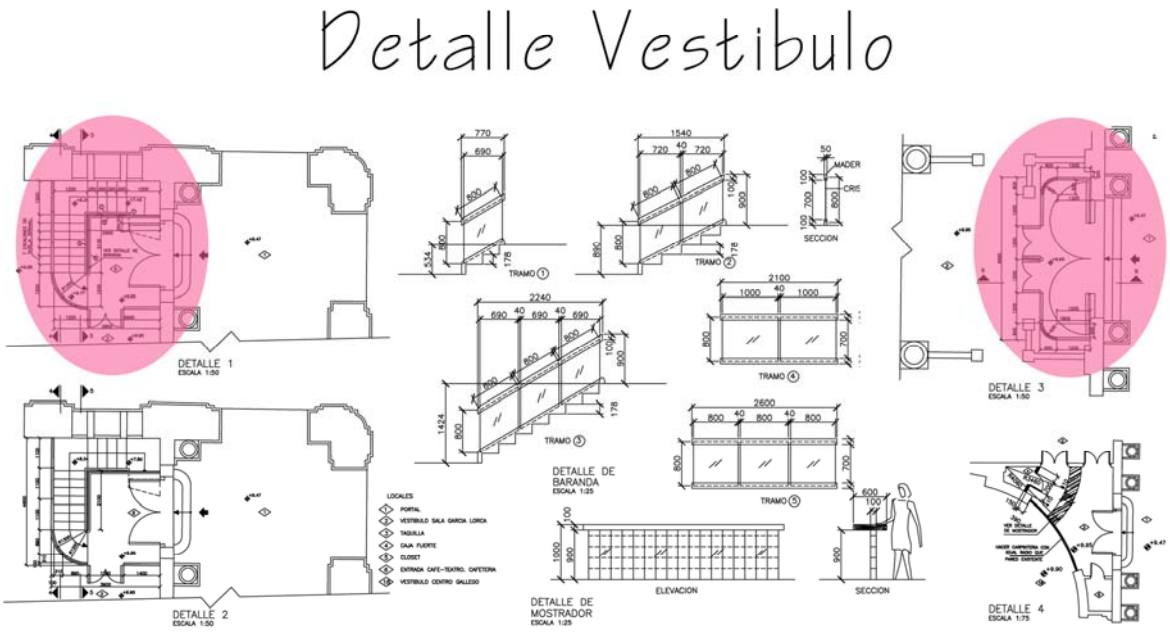

figure 92: Lobby- Proposal

figure 93: Main entrance- Proposa (1st step)

figure 94: Main entrance - Final proposal

- **Entrance from the interior of the lobby to the area of the National Cabaret, which will be incorporated to the Theater to give gastronomic service when the show is taking place in the Theater. It will be also used in other moments as small theater for Flamenco Tablao shows. (fig. 93, 96 and 97)**

figure 95: Cabaret entrance- Proposal

figure 96: Cabaret entrance- Proposal

- **Redistribution of the public lavatories of all the levels of the theater. (fig. 98)**

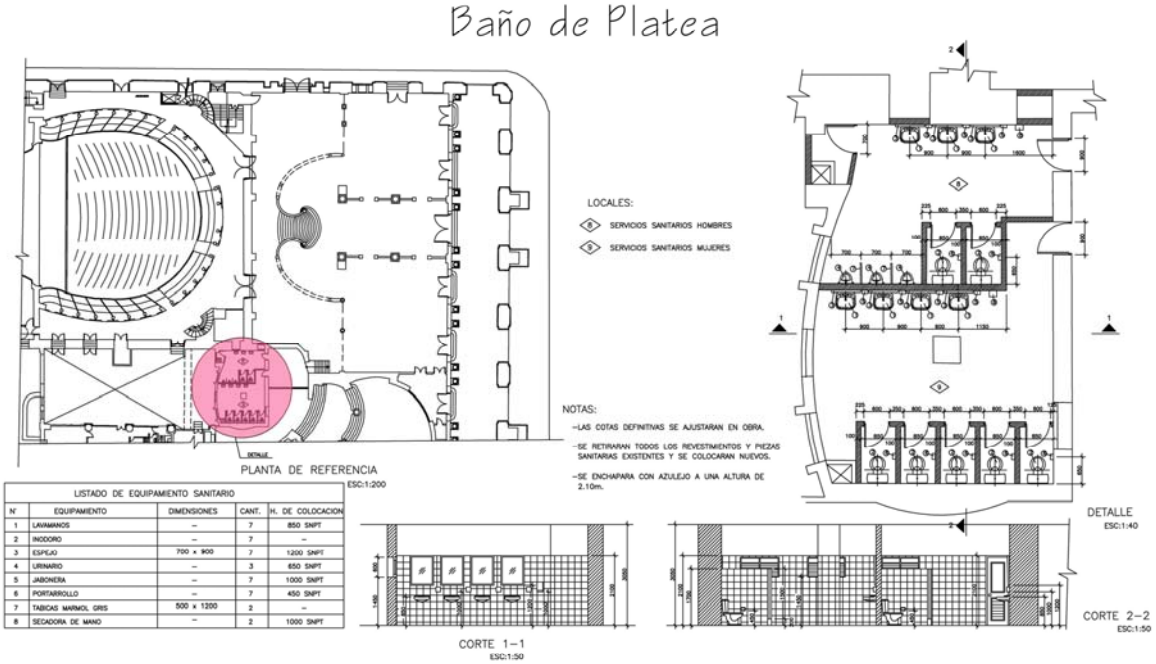

figure 97: Platea- Lavatories proposal

- **Creation of an entrance for handicapped persons and to place a passenger elevator for their transfer to the first balcony, we decided to make it in one of the lateral entrances of the theater in order that not affecting the main entrance and also due to the fact that all the entrances to the theater have physical obstacles for these people(fig. 99, 100, 101 and 102)**

figure 98: San Rafael door- Year 2003

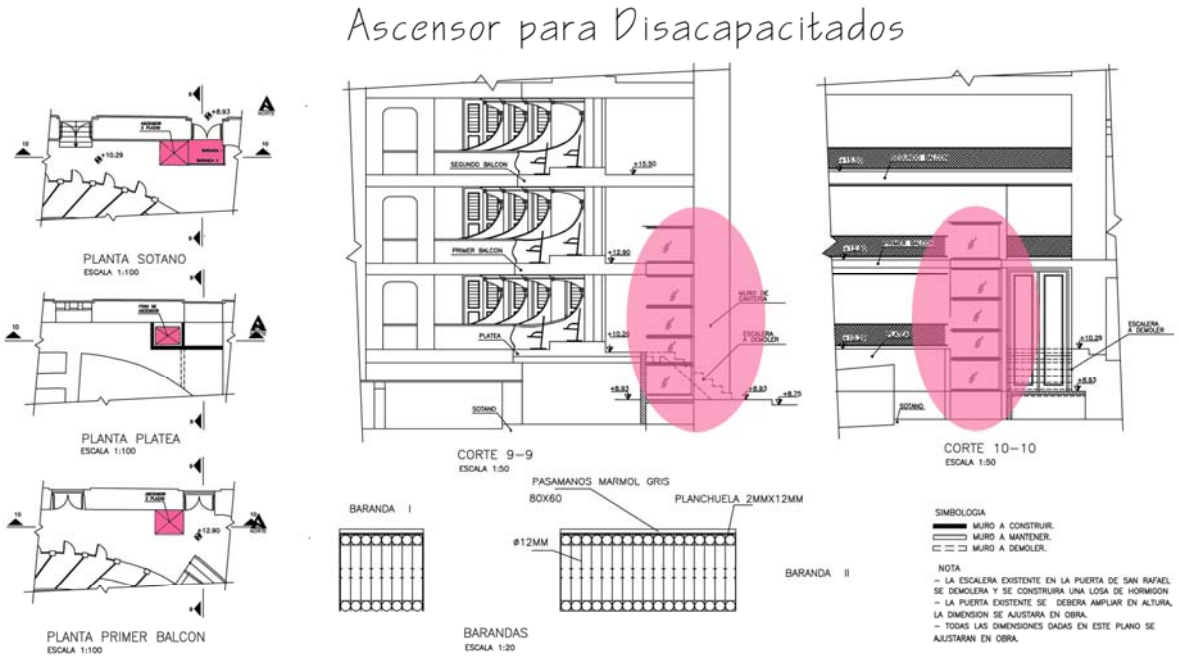

figure100 Entrance and lift for handicapped person

figure 991: Handicapped person entrance
San Rafae street- Year 2005

figure 100: Handicapped persons entrance
Internal view

- **Creation of a space for the placement of wheels seats and a lavatories for handicapped persons in first balcony.**
- **Location of an audio cabine in Gathering, maintaining the one already exists in the second balcony for the lights system room and to provide the necessary spaces for the modern equipments.**
- **To maintain the space created in the Lobby mezanine to be use as Protocol room, where meetings, interviews, filmings with important personalities, and other activities will be carried out. (fig. 103 and 104)**

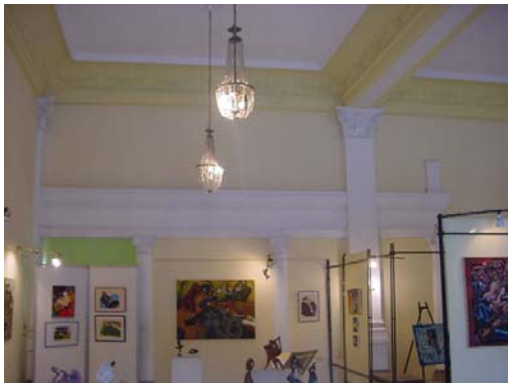

figure 103: Mezaninne- Real state

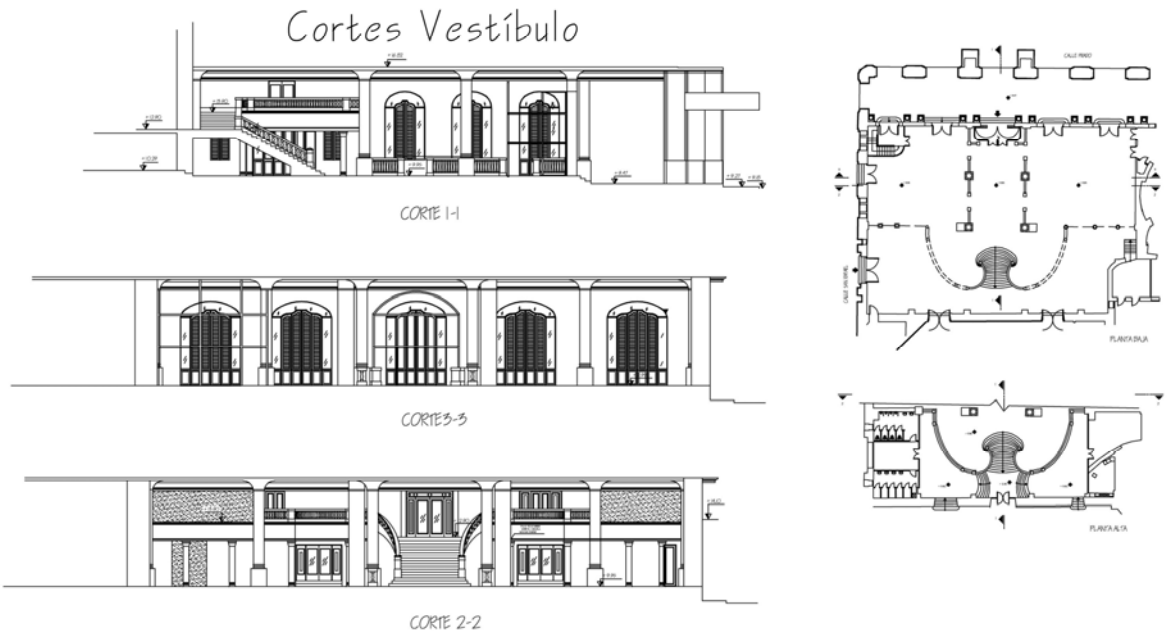

figure 104: Mezaninne- Proposal

10.2. Electricity

At this time this specialty is being study.

To change the main feeders wires of the building.

To guarantee the light's levels required in each room, according to the visual task we will place lamps with the appropriated aesthetic characteristics.

Copper wires and plastic pipes will be used, with protection for overload and short circuits.

A system type TN-C-S will be used as grounding system.

10.3. Phone system

This installation will have a digital phone power station, with stored program. The local in which the phone central will be placed will be provided with air conditioner and connected to the emergency electric system and will have a system of batteries.

We will use flexible plastic pipes located above the false ceilings to protect the wires.

10.4. Automatic system of fires detection

We proposes an intelligent system with central station model AFP composed for smoke detectors (ionic, optic and temperature) located in the false ceilings will be used. The detectors will be of the interchangeable type.

The warning manuals were located in the stairways. The insulating modules were placed at the beginning andat the end of each knot and each 20 detectors.
The audience will be protected with optic smoke detectors by the aspiration principle using a control module.

10.5. Automatic system of intruders' detection

The system will be composedd by the Signaling Central Stations which will be located in the comunications room. It will be feed from the net of alternate current with an appropriate tension, commuting to the work regime with batteries in the case of shortcircuits in the electro-energy supply.
The system will be conformed by a number of partitions which will be distributed in the most convenient way to protect the rooms.
The passive infrared detectors (PIR) will be embedded in wall or false ceilings.
The magnetic detectors of wide breach will be located at the doors according to each case.
It's ducts will be above the false ceilings.
We will use an independent circuit per sensor in each local or space.

10.6. Sewer system :

Before starting with the construction of the project, all existent sanitary facilities will be extracted and those that cannot be retired will be disconnected of the system and corked.
The sanitary facilities will be done with tubes and sanitary pieces of PVC under the floors.
The sanitary installation will be embedded in walls or attached to them recovered as false columns and they will go up as ventilation whenever it would be possible.
All the residual waters will go to the basement and from there to the sewer system by pumping

10.7. Rain drainage

The rainwater discharges will be checked, and in the areas where the moisture affect the walls and the roofs, the tubes will be replaced .
Caps will be placed in each grating to avoid introduction of solid objects that cause block in vertical discharges.
The pipelines embeded in the San Rafael facade will pour free below the kerb to the street.
The sidewalk should be broken and they have to look for the existent tubes because when the Boulevard was made these discharges were covered and there is not a correct drainage of rain water.
Before closing the system, it will be flooded, corking all the pipes to check if they are watertight

10.8. Water supply

The purpose of the hydraulic project is to provide an efficient distribution of the water for social consumption, establishing a rational use of it.
The water capacity will be enlarged by the construction of other cistern with 2 days reserve of water supply.

To supply water to the appliances the pipelines will be under the floors, hung above the false ceilings or into the walls.

For the maintenance of hidraulic instalation and to create independents systems for each space, at the entrance of the principal conducts, valves will be installed.

The W.C. installed will have flux valve of low factor.

10.9. Fires protection system

The system will be composed of fire cabinets hoses, hoses of 20 m with angle valves and adjustable mouthpiece of 3 effects (closes, nebulizer, compact jet). They will be placed in the internal and external corridors.

The distribution will be from the bottom to a top through the technical duct.

The pipelines of this system will have tubes and pieces of CPVC Blazer Master or steel galvanized under the floors or embeded in the walls.

10.10. Scene mechanics

- **Scenic superior mechanism: It will be automatized the 5 sticks of lights, the rest will be kept manually handled and its runnings cables and pulleies will be changed. The curtain fire wall was reported to the specialized entity that have to carries out atechnical inspection.**
- **Inferior scene mechanism: To give maintenance to the lift mechanism and the unmovable part of the boarding of the stage will be substituted.**
- **System of curtains: Substitution of all textiles.**

10.11.Lighting engineering

It is proposed to use an equipment integrated by reflectors, projectors, followers and other equipments of varied effects of advanced and automatized technology. They should be regulated by Dimers to obtain a more profitable, sure and effective results with luxes variations that offer a more colorfull and brightness lighting. The control will be made from the booth of lights located in the second balcony.

The effects equipment proposed will hve flashing, black light, smoke and images embraces all the areas each show require.

10.12.Acoustics

The acoustic properties should satisfy the opera and ballet programs , dissimilars in terms of requirements.

The first proposal is related to the architectural modifications that should be reestablished such as floors, closings of balconies, armchairs and seats, and it is supplemented with a system of electroacustic reinforcement integrated by various technological systems:

1. Technological Intercomunication

2. Call to dressing rooms and technical areas

3. Recording system

4. Technological CCTV

5. Electroacustic system for the accompaniment of shows

6. Set of filming and projection of videos

7. System of wireless microphones

Two prposals are being studied for the placement of the equipments:

- **The Grilles, that have no function for the audience.**
- **System of Central Cluster hang from the ceiling.**

The acoustic treatment of the theater will included the isolation of the external walls against the enviromental noise.

10.13. Air conditioning

It is proposed to use a centralized system of cold water production, using two coolers of water by air condensation.

The cold room will be used changing existent centrifugal fan and substituying the serpentines of direct expansion for similar ones of cold water.

Will be used the existents ducts and gratings for air conditioner injection and for the warm air return.

Connection between the equipments will be done by pipes through the central courtyard.

The lobby will have an independent system control.

For the stage its proposed a ventilation system composed by a fan located in the attic and will be connected to a system of ducts which will extract the air through gratings placed in the walls. This extracted air will be used to ventilate the attic.

11.Plan of maintenance

Once the general repairment of the building is executed, maintenance must be started with periodic inspections to appreciate the evolution of the intervention, to check the degree of effectiveness of the treatments and applied solutions, and to control the perfect drainage of the water that can affect the facades.In order to achieve that, in the thesis previously mentioned, a maintenance manual has been made that embraces the periodic revision and the cleaning of the dirty due to the enviromental factors (see appendix)

12. References

- **De las Cuevas Torraya, Juan . 2001 *500 Años de Construcciones en Cuba, Siglo XIX y XX,* Centro de Información de la Construcción, La Habana, Cuba.**
- **Arencibia Iglesias, Raymant. 2004 *Estudio de los deterioros presentes en fachadas del GTH,* Tesis para Master, ISPJAE .**
- **Archivo Nacional de Cuba. 1882 *Miscelanea de expediente 3428*, Legajo 1494, Número Bd, Cuba.**
- **Weiss, Joaquin. 1967 *La Arquitectura Colonial Cubana. Tomo I*, Editorial Arte y Literatura, La Habana, Cuba.**
- **Weiss, Joaquin. 1979 *La Arquitectura Colonial cubana. Tomo II*, Editorial Letras Cubanas, La Habana, Cuba.**
- **Oficina del Historiador, Junta de Andalucia. 1998 *Guia de Arquitectura Cubana*, La Habana-Sevilla.**
- **Rey Alfonso, Francisco. 1988 *Gran Teatro de la Habana, cronología mínima 1834-1987*, Banco Nacional de Cuba, Cuba.**
- **Fernández Simon, Abel. 1956 *La Habana del ayer*, 615 p, La Habana, Cuba.**

MAINTENANCE PLAN- REVISIONS

PARTS	ELEMENT	FRECUENCY	ACTIONS	DESCRIPTION	RESPONSIBLES
ROOFS	Ceramic tiles	Yearly	To revise possible cracks	To empty all the affected joints, to peal and to extract the broken tiles. To eliminate the excess of establishment mortar. To place new tiles of equal dimensions and characteristic, with the appropriate mortar and correct slopes. To repoint the joints with the appropriate mortar. To eliminate the obstacles for the correct drainage.	Workman
	Joints	Every 2 years	To revise mortar lost	To empty all the affected joints, to peal and to extract the broken tiles. To eliminate the excess of establishment mortar. To place new tiles of equal dimensions and characteristic, with the appropriate mortar and correct slopes. To repoint the joints with the appropriate mortar. To eliminate the obstacles for the correct drainage.	Workman
	Rainwater drainages	6 months	To clean after the rainy period	To sweep, to clean gratings. Visual inspection of cover and parapets	Workman
	Grating	6 months	To revise and clean	To sweep, to clean gratings. Visual inspection of cover and parapets	Workman
	Parapets	Yearly	To correct possible lessions	To peel the plaster damaged parts. To cover the wall with mortar of appropriate dosage and similar finish to the original. To paint.	Workman

ASBESTS CEMENTS ROOF	**Tiles**	**Every 2 years**	**Visual inspection of the joints**	**Inspection of the roof**	**Technician**
		Every 5 years	**Visual inspection detection and analysis of possible fissures or ruptures**	**To observe if there are moisture, efflorescence or mould.**	**Technician**
		Every 5 years	**To eliminate inlays of mould and others**	**To rasp manually.**	**Workman**
	Structure	**Every 5years**	**To determine the degree of deterioration of the structure**	**Visual inspection of the elements**	**Technician and professional team.**

PARTS	ELEMENT	FRECUENCY	ACTIONS	DESCRIPTION	RESPONSIBLES
WALLS	Stone walls	5 years	Visual inspection with detection and analysis of possible fissures	Visual inspection, if the moisture appears, will be consulted a specialist to determine the causes and to apply the appropriate solution	Workman
		5 years	To revise if crackor collapses exist and to repair immediately	To peel the cracked parts of the plaster. To cover the walls again with appropriate dosage of mortar and similar finishing to the existent one. In the case of moisture or existing cracks will require to repair (sew) the wall, trough injections or other methods, but in this case it will be consulted a specialist to determine the causes and to apply the most appropriate solution.	Technician
	Sculptures andother projected elements of the facades geometry	Yearly	Cleaning of ornamental elements	Manual cleaning	Specialized brigade
	Walls Facade	Yearly	To revise products that were applied. To revise presence of oranges or another coloration patinas .	To peel the cracked plaster. To repair the walls with similar finish to the existent one. In the case of moisture or existing cracks will require to repair (sew) the wall, trough injections or other methods, but in this case it will be consulted a specialist to determine the causes and to apply the most appropriate solution.	Specialized brigade
	Walls Facade	Every 3 years	Cleaning, not to paint.	To clean and to move away the dirty adhered to the stone.	Specialized brigade

PARTS	ELEMENT	FRECUENCY	ACTIONS	DESCRIPTION	RESPONSIBLES
Sewer system and Hidraulic Instalation	Hoppers and drainages	Daily	To clean incrustation or sediments	To clean with a cloth, sponge or brush and with slight acid. To rinse with water and detergent, to rinse with water and to dry it.	Workman
		Monthly	To clean hoppers. To revise if cracks or joints are well sealed.	To clean with a cloth, sponge or brush with slight acid. To rinse with water and detergent, to rinse preferably with water boiling and to dry it. To revise and to restore the material of the joints in case of necessity.	Workman
	Cistern and water tanks	Monthly	To revise state of the floating	To revise if it is closing correctly.	Workman
		Yearly	To revise entrance valve. To revise cracks in floors, walls and covers. To clean the interior.	Visual inspection of the state of the interior stucco. To revise the entrance valve. To clean.	Workman

PARTS	ELEMENT	FRECUENCY	ACTIONS	DESCRIPTION	RESPONSIBLES
Doors and windows	Doors and windows	Monthly	To shake and to clean with humid cloth.	To clean using a feather duster to move away the powder. To clean with humid cloth	Workman
		Yearly	To grease the fittings. To revise the air and water-tight of the glasses. To revise presence of termites.	To revise the putty state . To revise lack of glasses or if there are broken and recover it. If it is necessary they will recover. To fumigate if it is necessary or to change if the element is very affected . To clean and to grease the fittings	Workman
		Every 3 years	To paint. Inspection of ruptures or lack of thickness.	Using a feather duster to move away the powder. To clean with a humid cloth To remove the loose painting with spatula and to paint.	Specialized brigade
Iron works	Iron works	Every 2 years	To revise if the y are rusted. To paint Restitution of the broken parts.	To make visual inspection to detect the presence of rust and to move away it using a steel brush. In case of lacking some section to restore it. To paint with red oxidize and oil paint.	Specialized brigade.
		Every 3 years	To grease the fixings. To revise the glasses thickness	To revise the putty state. To revise lack of glasses or if there are broken and recover it.	Workman

PARTS	ELEMENT	FRECUENCY	ACTIONS	DESCRIPTION	RESPONSIBLES
Electric Instalation	Fuses	Weekly	To check its pressure and to revise the terminals	To detect false contacts and to press the connections. To revise the presence of the cover protector.	Workman
	Disconnect room	Monthly	To check if there are moisture.	To make a visual inspection to detect the presence of mould, efflorescence or stains of moisture	Workman
	Lamps and lighthouse	Monthly	To revise the bulbs. To substitute those that are faulty. To check if the lamps are well to roofs	Those that are fused should be changed.	Workman
	Plugs and switches,	Monthly	To revise its operation. To check and to substitute those that are in not well state.	To detect false contacts and to press the connections. To check absence of cover plugs and to restore it. To observe that the lamps are correctly fixed.	Workman