

The Solis Theatre

A Methodology for its Care and Maintenance.

Daniel González Pardal

Architect, Maintenance Manager
Solis Theatre, Municipality of Montevideo.
Montevideo, Uruguay



Introduction

“ The concept of heritage, in itself, gathers the relativity of worth and time.

If we can enjoy today the heritage from the activity of preceding generations, we must so be concerned about its preservation and value, as well as the construction of a heritage for tomorrow.

Such thoughts lead us into the Solis Theatre Project.

Montevideo and the Solis Theatre. The Solis Theatre and Montevideo.

These two have developed together through urban history since 1851, and thus has it been recorded in the community memory.

The project in hand, now presented, is a conscious bet and action of historic significance, and not a less conscious bet and proposal of future transformation.

The Solis Theatre, a symbol of our city, will come back to life with a renewed conception, in which a dialogue between the old and the new means a new synthesis, with a clear intention of improvement of previous situations.”

Arch. Mariano Arana.¹

¹ Extracted from “The city’s theatre, and the city as a community’s theatre”, Arch Mariano Arana, pag. 11. Montevideo, A City for a Theatre, a Theatre for a City, IMM, *Ed. Il Poligrafo*.

Abstract

The Solis Theatre, declared Historical Heritage of the Nation in 1975, is the main cultural center of Montevideo. Result of a strong investment of the city, in the years 2000-2004 it has been restored and recovered, adapting the old structure to modern use for plays and concert shows, installing facilities that allows a high standard in security and infrastructure operation (air conditioning, lightning, smoke detection and other systems against fire, etc.).

This is controlled by a maintenance staff whose work is orientated to preventive and predictive routines.

At 5 years from its reinauguration, the purpose of this project is to re - define a Program and Maintenance Plan, more complete and sensitively than the current one, approaching the preventive routines for worth artistic elements.

The goal is to have a more global vision of the building, training the personnel, taking care of the scope, with preventive and predictive works, and to add any correctives works on elements or values that were not considered till now, habitually handled by personnel linked to a museistic or restoring education.



Figure 1: Auditorium

The elements to work on, are listed with the following order of priority:

1. Auditorium's Plafond (ceiling)
2. Facades
3. Front balcony
4. Foyer's Plafond
5. Marble Columns
6. Antique Lamps (Auditorium, Foyer and Entrance Hall)

This Project will implement the maintenance of the Plafond (1) and Facades (2), and then continue with the other items (3 to 6).

Both of them, have not only a high historical and artistic value, but also a symbolic value, representing the image of the building.

These elements have their own specificity and it is necessary to take care of them with the specialists' advice in a preventive way.

Simple routines can be done by trained persons, in a preventive strategy, and not to act just when repair is necessary (corrective maintenance).

The fact of generating and inserting routines linked to goods with artistic value in the actual maintenance management, forces us to resort to Conservation theoretic concepts and Maintenance concepts, trying to harmonize concepts and terms.

We should define these values as equipment, the routines, priorities, responsibilities, etc.

The target is to provide to the public administration a team that can lead with heritage and its preventive conservation management, not only in the theater, yet also in others significant municipal buildings.

Background

The Oriental Republic of Uruguay is located in South America in the basin of the Rio de la Plata, between Argentina and Brazil. Born as an independent nation in 1825, is 176,215 km² with approx 3 million inhabitants, the majority from European immigration, especially from Spain and Italy. There's a minority of black people with a big influence in national culture. Uruguay hasn't indigenous population; exterminated during the nineteenth century.

Its urban population is 92%, where half of it lives in the capital.

Its economy is based on agriculture production (meat and grains) as well as tourism. Its territory is suitable for agriculture, with slightly undulating alluvial plains, very suitable for pasture and planting.

The four seasons have mild climate, warm and humid, with annual average temperatures of 17.5 °C. The minimum media is 0-5 °C in winter and 28-32 °C in summer. The average relative humidity is 75%, being the wettest months with 80% in July and the driest January with 65%. The average annual rainfall is 1300mm, very irregular, without a dry or a wet season.



Figure 2: Uruguay map

Montevideo

Montevideo is located on 34th 5' latitude and 56th 11' west longitude and concentrates half of the population, the main port and commercial and cultural services.

It is the youngest capital in Latin America, founded between the years 1724 and 1730 by the Governor of Buenos Aires, Don Bruno Mauricio de Zavala, for strategic reasons, seeking to consolidate the second stronghold of America.

Montevideo is located in the heart of Mercosur geography, whose geopolitical significance can be increased further if important works of regional interconnection are made, such as road axis Santiago-Buenos Aires-San Pablo, the bridge Colonia-Buenos Aires on the Río de la Plata and the Parana-Paraguay waterway.

Uruguay, from the Asuncion Treaty, has been involved in an accelerated process of regional integration, expressed in the creation of Mercosur, with its neighbours: Argentina, the Federative Republic of Brazil and Paraguay. Based on the agreements of Ouro Preto, in 1994, Montevideo has been designated as the administrative headquarters of the Treaty.

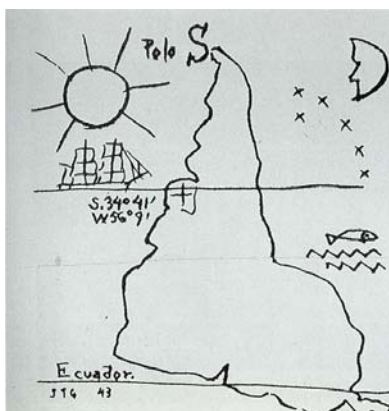


Figure 3: J. Torres García drawing, "South America upside-down".



Figure 4: Montevideo, satellite view.

Old City Neighborhood



Figure 5: Montevideo Old City and Port

Initially called San Felipe y Santiago, Montevideo was founded according to the Laws of the Indies, as a standard grid city, like most of Latin-American's.

Located on a peninsula with the northern side making up the Port, the Ciudad Vieja is the historical center of the City and was once surrounded by protective walls.

These walls are still evident in some street directions and blocks, especially around the Independence Square, where once was the fortress "la Ciudadela". The old walls were the limit between to Old City and the New City.

Actually is the city financial center, and the mayor touristic attraction, with lot of museums and places of interest.

Public investment changed it's decadence situation in the last decades, putting in value many heritage buildings and places, becoming nowadays a Cultural District, due to the existence of a dense net of activities of cultural production and consumption.

For now and the near future, the challenge is to achieve a balance between the preservation or the heritage and the active promotion of economic and social development.

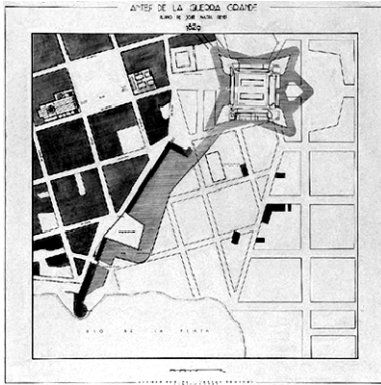


Figure 6: Montevideo, The Old City, the Wall and the Ciudadela. c. 1829.

History of the Solis Theatre

The History of the Theatre can be summarized into 3 main periods:

- a) construction and private management 1840-1937
- b) Public management by the Municipality 1937-1998
- c) Rehabilitation and new management. 1998-today

a) Construction and Private Management



Figure 7: Solis Theatre, "the Central Body", c. 1858

In 1840, relevant citizens of Montevideo, established a society of shareholders for the construction of a theatre, because at that time (despite having around 40,000 inhabitants) the city of Montevideo had only a single room, the old House of Comedy. It is then that the Committee of that Society, composed of prominent individuals of Montevideo's society, begin his duties with the choice of the place for the theatre, according with the three locations proposed by the Italian architect Carlo Zucchi, who also made the first project for the theatre. Arch. Zucchi's couldn't go on with his project, because it was rejected cause of its high costs.

Subsequently, the Society instructed the Spanish architect Francisco Javier De Garmendia, to adapt Zucchi's project to the demands of the costs.

In 1842 the construction began, and it was interrupted in 1843 due to the civil war. Until that point, the foundation and walls were taken "two sticks" above the ground. The Committee was able to save a series of materials like the Siberian wooden structure, columns and capitels of Italian marble and slates for the roof.

After the Great War, in 1851 the work restarted, and the theatre was inaugurated on August 25, 1856, commemorating the date homeland, with the performance of the opera "Ernani" by Giuseppe Verdi.

At the time of its opening, the theatre was not over. The lateral bodies, were built after, between 1869 and 1874, according to the draft prepared by the French architect Victor Rabu, proposing local housing and businesses for rent, unrelated to the main theatre.

Over the years the theatre has experienced several complementary reforms. In 1881 it changed the roof structure to a new metallic one, taken from France in 1882, under the direction of Eng. Juan Alberto Capurro. The stage was made bigger, and between 1905 and 1910 was carried out maintenance work, and renewals in the decoration auditorium's plafond, made by Carlos M^a. Herrera and Pio Collivadino in 1908.

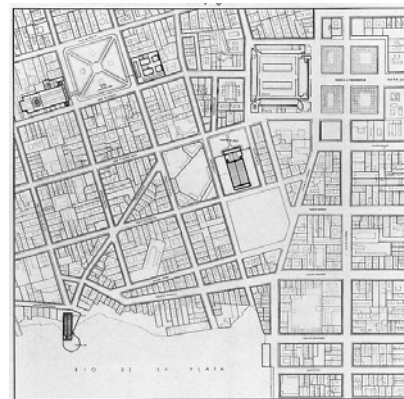


Figure 8: Solis Theatre surroundings, c.1868.

b) *Public Management by the Municipality*



Figure 9: Solis Theatre, Buenos Aires St. esq. Junca!, c.1885.

On January 26 of 1937, The Society signed the commitment of selling the Theatre to the Municipality of Montevideo, who in subsequent years made a number of improvements and facilities that enhance security, particularly in 1943 under the direction of Altamirano and Cohen Architects. In 1965 there was a renewal of the jewels of the theatre, among other things changing the old seats in the auditorium.



Figure 10: Solís Theatre surroundings, c.1937.

The main facade of the Solís seems to be inspired by the Carlo Felice theatre of Genoa. Even though the initial draft of the portico was in Doric style, (as in the Genovese theatre), and one floor high, they were replaced to Corinthian order and in two stories high on advice of the Arch. Cesar Clemente. The auditorium is slightly elliptical, inspired by the Italian architect Piermarini applied at Theatre alla Scala in Milan, although the interior of the Solís has a remarkable similarity to another Italian venue, the theatre Metastasio in Prato, near Florence.

c) A New Management Model



Figure 11: Solís Theatre, 2004

After a fire that threatened to engulf the entire theatre in November 1998, the Solís Theatre was closed for further studies and a project of rescue unpostponable to the risk, wear and damage that showed the building. By its magnitude, this work has no background in the field of heritage restoration in Uruguay.

The rehabilitation of the Solís means not only to put in value the building and its facilities, it also means a complex labour to redefine its administration, the technical and programming management, giving a new relationship with the Philharmonic Orchestra and the National Comedy, both Resident Companies.

The new theatre has its own Director (before was controlled by the Director of the Cultural Department of the Municipality), responsible for the programme schedule and the artistic quality. This brought more autonomy to take decisions, making agreements with the Resident Companies and not depending in other people or institutions interests.

The Rehabilitation / Actual Situation



Figure 12: Rehabilitation Works, the Stage and Lateral Wings demolished, 2003.



Figure 13: Rehabilitation Works, the new structure of the Stage, 2003.

The works were developed in four stages, and we can divide the whole building in 2 sectors clearly identified: the Central body and the Side Wings (east and west, or Juncal and Bme. Mitre). In the first 2 stages, the works took place in the 3 sectors of the Central body: Vestibules, Auditorium and Stage, and also part of the Wings. The third and fourth stage completed and equipped the side wings, which have dressing rooms, offices, camerinos, gift shop, coffee bar, and a small theatre for 240 people, the Zavala Muniz Hall.

First Phase

Corresponds to the work of Investigation and Project, in consultation with authorities and commissions (Honorary Committee of the Old Town and Heritage Commission of the Nation). The work in this phase was finished at the Lobbies sector, where walls were demolished and a new iron structure was erected, released to the old load-bearing walls, reorganizing the spaces, in a more clear and safe way.

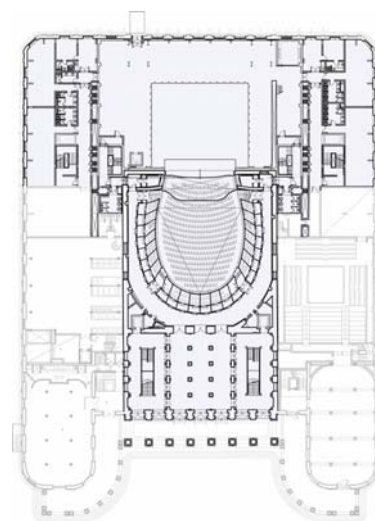


Figure 14: Main level: Lobbies, Hall alla italiana, Stage.



Figure 15: Rehabilitation Works, the Plafond Restoration, 2003.



Figure 16: Main Lobby: Vestibule Principal, 2004.

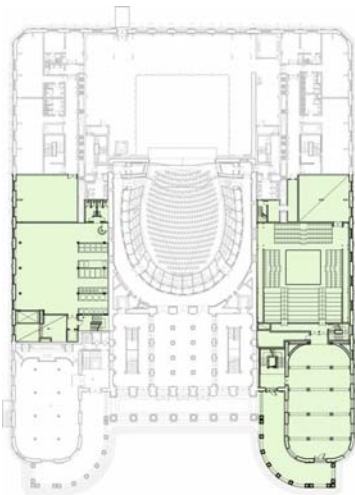


Figure 17: Third and Fourth Phase, 2006-2008.

Second Phase

The second stage was awarded through an international competitive bidding, and consisted of:

- Finish the works for the hall and foyer (flooring, coating, decoration, etc.).
- The restoration of the Main Hall or Auditorium, restoring of all its elements (front boxes, ceiling, chandeliers, lighting boxes, wood paneling of corridor, etc.), incorporating new equipment (chairs, armchairs draperies) maintaining the image of the magnificent horse shoe shape hall, and improving acoustics and security conditions.
- Update the stage in all its equipment and make it bigger, with the expansion of its "shoulders." It was built a new box of concrete and iron structure, expanding 80% in volume.
- In the lateral wings, 7 levels of concrete were built, allowing only to use the lowers levels (stores, offices, dressing rooms, etc.), and leaving the rest in rustic.

The work took over two years and formally ended in August 25, 2004.

Third and Fourth phase

These stages culminated the works in the Side Wings, which provide various services, rehearsal rooms for the National Comedy and the Philharmonic Orchestra, dressing rooms, warehouses, a multipurpose hall for 240 people (Zavala Muniz Hall), Coffee Shop, Conference Room, offices and stores for the Documentation Center of Performing Arts.

Maintenance & Conservation: Concealing terms and concepts

It's very common in an industrial environment and also in Heritage teorical context, to use one word for different concepts. One can see in several articles and books how they use conservation as well as preservation, restoration or maintenance when they want to refer to a work or a project.

Also, the preservation and conservation of the historical and cultural value goods demand the knowledge that is actually not available to the authorities and technicians with responsibility in the topic. Enough information exists at international level generated by government and not government organisms that added to the academics allow to define a theoretical mark on which to work.

This study raises the challenge of expanding a working structure made for the facilities, incorporating the maintenance of important artistic pieces, fundamental parts of the Theatre heritage.

So, previously I pretend to take a look to both libraries or literatures (one about Facilities Maintenance and the other about Conservation of Heritage) so as to clarify or put on discussion terms and to wide vocabulary and concepts.

Maintenance Facilities.

The purpose of maintenance in any company is to preserve operable with the major degree of efficiency its fixed assets.

It constitutes a system which fits, repairs, replaces or modifies the components of an installation inside any organization, in order that this one could operate successfully in quantity / quality during a certain period.

The way that maintenance was done, has changed from the Industrial Revolution -based on correctives actions (run to failure)-, to concepts like TPM, Total Production Maintenance, or RCM, Reliability Centered Maintenance, where maintenance becomes significant for productivity and quality of companies and products.

New concepts emerged: continue improvement, proactive cycle, total production, total participation, guaranteeing quality, reducing costs, times of stop, reliability, focusing improvements.

In the Reliability Centered Maintenance RCM, the process of continuous improvement is developed as a proactive tool cycle: the improvements are not only learning from the failures that occur, but are generated at the speed desired by the organization using all the know-how of its members.

The processes can determinate which maintenance tasks are suitable for any asset. SAE JA1011 standard specifies the requirements to be a RCM process.²

The Total Productive Maintenance TPM, is a system developed in Japan to eliminate losses, to reduce stops, ensuring quality and reducing costs, "just in time" production.

The T of Total means the involvement of all employees.

The goal of TPM is to achieve zero accidents, defects and malfunctions.

Predictive maintenance or "on condition"

Is to search for signs or symptoms to identify a fault before it happens. For example, visual inspection of the degree of wear of a tire, allows to identify the process of fault before the functional fault



Figure 18: Main Entrance Facade, Buenos Aires st., 2004.

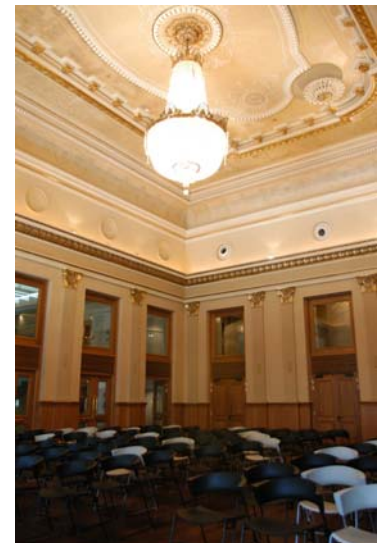


Figure 19: Foyer, 2004.

² The same can be downloaded through the portal of the SAE (www.sae.org).

happens. These tasks involve inspections (eg., visual inspection of wear, vibration, ultrasonic, oil level, etc).

Preventive maintenance (replacement or cyclical reconditioning).

It refers to those tasks of substitution or rework done to fixed intervals independently of the status/condition of the element or component. Are only valid if there is a wear pattern or useful life.

For example, hours of service recommended by the battery manufacturer.

The corrective maintenance work, or work till break.

It's when the fault will be repaired once it happens, this is when the cost of failure is less than the cost of prevention, among other things.

This option is only valid if the fault has no impact on safety or on the environment. For example, replacing incandescent lamps in the front boxes.

Maintenance detective or search for faults.

Consists in search of evidence of protective components under controlled conditions to ensure that these devices are capable of providing the required protection when it is necessary. It is also called maintenance finding faults or functional test. For example, throwing smoke to a fire detector, causing a blackout to check the emergency lighting system, etc.

Preventive Conservation

On the other hand, going to the field of heritage, today the term "preventive conservation" is widely used, as a working method that aims to control the deterioration of works of art before it occurs.

This put things quite near to the "preventive and predictive maintenance" that appears before in this page. The goal is to keep the status of the element, no matter if it is heritage or part of a production system.

We can go on and see the meaning of "preservation. In the Oxford dictionary, is "the art of keep safe" or "keep alive".



Figure 20: Rehabilitation Works, the Front boxes Restoration, 2003.

What distinguishes the concept of conservation?

The International Council of Museums³ defines as follows:

Prevention is defined as the "set of conservation actions, motivated by predictive knowledge, in the longest term possible, about the subject in question and about the conditions of their environmental context."

³ Extract from "Economics aspects of Cultural Heritage Maintenance", Auditoría Pública nº 39 (2006), Ma. Julia Flores Gimeno, Depto.de Economía Financiera y Contabilidad 1, Univ. Rey Juan Carlos.

Preservation is the "action that would be taken to retard or prevent the damage that cultural property are likely to suffer, through the control of the environment and/or the treatment of its structure, to keep them as long as possible in state of stability.

Restoration is the action that takes to make a damaged or altered object is understandable, with the minimum sacrifice to its aesthetics and historical integrity".

Finally, trying to be more generic, preservation, prevention, preventive conservation and preventive and predictive maintenance could refer to similar actions, as well as restoration with corrective maintenance.

Analysis

The actual Solis Theater Maintenance

The Maintenance and Security Area has the purpose of establish technical, political and administrative measures, orientated to the Valuation, Protection and Secure Use of the Solis Theater Heritage.

This means, to guard, to support and to promote the array of the TS (Solis Theatre) as public value, doing all the necessary actions according to national and international standards and codes, with an efficient, creative and trained team, compromised with the public function.

In the developed strategy, acquires special meaning:

Prevention and Awareness of Security and Good Use (in an extended sense) for the all users, as the first measure of safety and maintenance.

Preventive Conservation, like a set of strategies that contemplates the follow-up and the periodic maintenance of the values, establishing priorities of intervention that redound to preservation.

Development of actions that bet on the Putting in Value of the Heritage.

To give technical support for the development of the different dynamics of the Theatre (as "Container"), and in addition taking part in the dynamics of the city, as Historical Monument and Cultural Equipment, pointing at the Putting in Value previously mentioned.

The Maintenance and Security Area is focused towards the establishment of a Prevention Culture.

This culture was clearly adopted by the maintenance workers: responsible, balanced, proactive and flexible to the variants of use and programme, is an efficient and effective team in the utilization of the

available resources, meaning a "plus" in the quality and services of the Theater.

The Area has the responsibility of preserve in good condition and healthy the property and the persons who develop in it.

Basically it's divided in two sections:

- 1) The Security in wide sense
- 2) The Maintenance and Conservation of the Building and Facilities.

In the daily practice, these two sections mean:

Periodic training for Prevention against fires, Evacuation and Emergencies of staff and visitors.

To control and operate the Fire Central Station.

To implement the Labor Security Plan.

To do the Preventive and Corrective Maintenance according to the Annual Plan and the Claims Management.

To do the operation and control of : lightning digital system, Air conditioning and Ventilation system, Engines maintenance, electrical cupboards, groups of pumps, water reserves, emergency lightning, etc.

To be on duty during all the activities.

To control the Security and Cleanliness Companies.

To do the Eco - management (bargage and plague)

To do architectural and furniture projects.⁴

The maintenance staff is integrated by 10 persons: the Manager, the Coordinator, 2 technical assistants, and 7 workmen.

The management has the help of a specific software for the maintenance (G-Mant).

This software contains the necessary tools to handle the information of facilities and equipments, spare parts, inputs and workforce, priorities, joining this information in the definition of the Programmed Operations and the Work Forms⁵. It provides a complete set of reports that allow to see the availability of resources, to simulate the maintenance planning and to access to information of costs and indicators.

⁴ Extract from "Misión y Visión del Area de Mantenimiento, Teatro Solis".

⁵ See Apendix, fig. 31

This management routines, relies primarily on RCM criteria, focusing on the reliability of the equipment.

Values

The Solis Theatre is the most important theatre of Montevideo, and due to its historical and artistic value, is considered one of the most singular and representative building on neoclassical style, declared Heritage of the Nation in 1975.

It is consider the main reference of the performing arts in Uruguay, a symbol for our culture.

The most important performances took place there, and very important artists that came to Montevideo, played there: Sara Bernard, Enrique Caruso, Zubin Metha, and many other international and national singers, musicians and actors.

Actually is very well considered from the citizens, as the main cultural centre in Montevideo, and it is also a tourism attraction.

For the project in hand, we'll start with the maintenance of two elements with a high artistic value, essentials for the image of the Theatre: the Plafond and the Facades.

These will be the first two rows added to the maintenance schedule grid.

Problems

In General:

- Lack of maintenance of specific assets. The approaches were fairly intuitive and very elementary.
- Lack of technical training and knowledge in the maintenance staff.
- Un-organized Documents and information (specially those from the 2004 works)-

In the Facades

A primary diagnosis indicates the presence of problems such as:

- Pathologies unresolved in 2004 works (fissures, erosion, dirt).
- Pathologies generated in the works (bad work).
- New diseases (eflorescences, graffitis)
- Inappropriate cleanliness.

According to this, we recognized 10 problems on the facades plaster:

1. Cracks not restored
2. Stains done by the works.
3. Stains that retains humidity.



Figure 21: Stain in the Bme. Mitre Façade, 2008

4. Stain with mosses.
5. New efflorescences.
6. Pollution.
7. Rain erosion.
8. Ancient graffities
9. Potential new graffiti.
10. New plaster discoloration.

In the Auditorium´s Plafond.

For the case of the Plafond, we don't have technical knowledge beyond the habitual recommendations: (control of environment, control of plagues), so we cannot detect or evaluate possible pathologies. Instead of this, according with the "Recommendations for maintenance" made by the Restorer's Team in 2003, we identified some factors that could count as threats:



Figure 22: Taking a sample for the laboratory, Dec. 2008

- Light and heat effect from the Central Lamp and from Scene lights.
- Changes of temperature and humidity (air conditioning)⁶
- Needs of cleaning over the timber structure.
- Vibrations
- Needs of diagnosis on the oil paint (cracks, dirt, etc).

Immediate Actions

- Consult experts for the diagnosis.

Plafond

- Control of air conditioning:
 - Incorporate new temperature and humidity sensors, near the border (where the scene lights are set) and near the Central Lamp.
 - Restricted schedule for the Central Lamp turned on.
 - Evaluate with Stage Director other place for Scene Lights.
 - Periodic testing (5 years) of paint with experts (depending on the expert advice).
 - Clean timber structure every year.
 - Control of vibrations.
 - Clean the return ducts of the HVAC (Air Conditioned) system.
 - Keep adequate maintenance of the HVAC system.

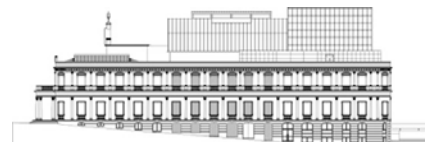


Figure 23: Scene lights near the temple paint

⁶ See in the Appendix, the temperatures table.

Facades

- Recognize the total of problems and define priorities.
- Place witness on cracks.
- Take laboratory tests on new plasters.
- Evaluate cleanliness (test)



Proposal

For the proposal, we found a clear guide in the document generated in the Vantaa reunion in September 2000, "Towards a European Strategy on Preventive Conservation".⁷

This paper strengthens the unity of criteria in Europe in the field of museums and collections, and defines 5 strategic bases for effective policies and action guidelines.

1. Leadership

2. Institutional planning.

Involve all departments in the development of the plans, implement conservation with interdisciplinary groups, distribute responsibilities, establish methods for activities and for emergencies.

3. Training

Introduce the concept of preventive conservation in internal and external personnel, create didactic materials, establishing means to update knowledge and continuous improvement, coordinate with training institutions.

4. Access to Information.

Use internationally recognized terminology, promote exchange, working with other agencies.

5. The role of the public.

To develop programs of participation to foment "shared custody", to have communication strategies for public, authorities, professionals, etc.

The development of these concepts and action lines are very broad and therefore applicable to other fields such as heritage buildings and urban situations.

The challenge is to:

Sensitize authorities and users. The research, especially in the Plafond, can bring us to modify habits and routines of operation.

Incorporate into the work and budget specialists for diagnosis and necessary works.

- Training of the actual maintenance staff, bringing it to preventive conservation, so as to provide not only looking for

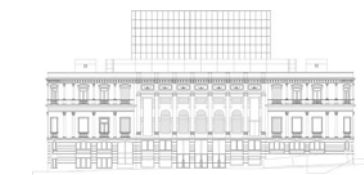


Figure 24: Juncal and Reconquista Facades

⁷ European Preventive Conservation Strategy, Vantaa, 21-22 Sept 2000.

the comfort and security, but also to take care and look for appropriate use of heritage assets.

- Establish stable and sustainable funding sources. Investigate sponsorship, like "The ceiling is kept by DHL", agreements with institutes and restaurateurs, etc.

Once the plan is evaluated, it can be extended to other assets.

To disseminate the methodology of work for a culture of preventive conservation", interacting with other buildings managers, having contact with schools, or publishing experience.

With the full operation of the plan, extending it to other municipal buildings, without need of higher expenses for the Administration.

Method

Phases of the work

1. Gather information.

- Project Reports (1998-2001):
 - Project Drawings.
 - Construction and Advisers Reports.
 - Restoration Projects, Vol I to V.
- Reports of works during the Rehabilitation
 - Notes between Direction and Contracts,
 - Drawings, photographs.
 - Restorer's and Advisers Reports.
- Drawings and Memories according to current situation.
- TS Archive (Archieve for Performing Arts).
- Consultation with experts and committees.
- Analysis in the Site and in laboratory.

2. Contract Specialist/ s.

There was a first approach with the Plafond Restorer's Team. On December they took a laboratory sample.

3. Project - Action Plan.

The new Plan should be fully adapted to the structure of the current one, trying not to change the management, only adding routines. These routines can be completely autonomous and new, or they can modify or even cancel other existing ones. Surely will redefine schedule, priorities and the staff organization.

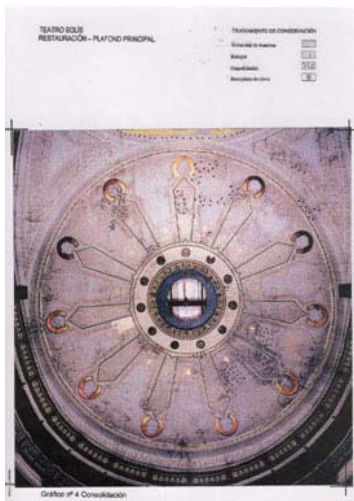


Figure 25: Plafond Restoration Report

To have an effective schedule, and an effective “preventive maintenance”, covering the whole element, is very important the way you define the “equips” or “group of equips” to work on.

Egg. In the case of the facades⁸, as a primary definition, we divide in 4 “groups of equips”, one for each front, and then define each “equip” as its stylistic elements: base, balustrades, cornices, columns, etc, etc. Each element is an equip and will have its regular work orders for preventive or corrective work if it is required. These Work Orders should define responsibility, estimated time, priority, date, and a checklist. Also a work note for the procedure, tools, staff, security conditions.

The new Plan should:

- Identify “group of equips” and “equips”.
- Identify replacements.
- Define immediate action.
- Define corrective actions.
- Define preventive routines.
- Define predictive routines.
- Define investment and resource management.

For each action o routine:

- Define a Checklist
- Define Procedure and Tools
- Define Security Conditions
- Define Frequency
- Define Priority
- Define Responsibility

4. Submission to Authorities, Old City Commission and Heritage of the Nation Commission.

With the authority’s approval, the next phase can start:

5. Implementation of Maintenance Plan.

- Implementation of immediate action.
- Training the staff.
- Scheduling routines, priorities, responsibilities.
- Implementation of routines.

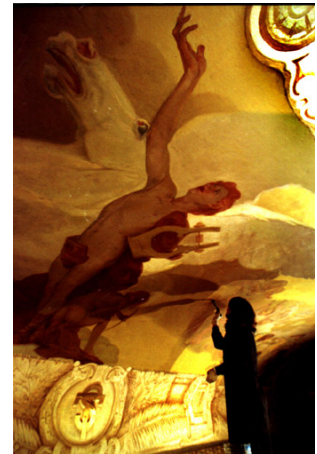


Figure 26: Plafond Restoration

⁸ See on the Appendix, the Facades Table.

6. *Evaluation*

7. *Communication.*

8. *Extending the scheme to other property of the theater.*

9. *Evaluation*

10. *Extension to other buildings.*

11. *Evaluation*

Current Status of the Work

Jul 2009	Inmediate Actions, Training
Oct 2009	Routines Discussion, evaluate with experts Training
Jul 2010	New Maintenance Plan Start up
Dic 2010	Evaluation, revision and diffusion.
Dic 2010	Add other assets (front boxes, marble columns,etc)
Dic 2011	Presentation for Extension to other buildings

Conclusions

This project like the theater itself, summarize the integration between different arts with the building itself.

Now is the time to redefine the profile of the maintenance staff, so as to join knowledge and to care for the Solis with a wider vision and new challenges.

Even though the difficulties that the Public Sector can present for a maintenance project, it seems that we are in the correct place in the right moment just because of:

The Directors are sensitized and takes safety and maintenance topics as important things.

There is great conformity from the political class with the theatre and its management.

The Foundation "Friends of Solis" is being formed and it can be a source of incomes for this plan.

We have contact with persons and technicians who took part in the Rehabilitation works, so as to have access to documentation and information.

There's a bigger maintenance staff, with motivated persons who wants to learn and to develop ventures.

We have a consolidated management structure, flexible and extendable to new "equips" and routines as well as to new buildings.

We trust to be able to develop the schedule that we raise, turning out to be probably the most complex task the personnel training, which in the beginning will be raised only for preventive and predictive tasks. The diagnosis will tell us if the scope of the training and tasks can be more ambitious (for example, to work on corrective tasks).

The purpose is to interact with different stakeholders so as to:

- Share experiences with restoration and museum conservation experts.
- Establish links with workers from the 2004 Rehabilitation (craftsmen, restorers, etc.)
- Generate discussion fields and dissemination about Preventive Conservation.
- Bring to the maintenance staff knowledge related to this.
- Extend the scope of work of this team to other municipal buildings.

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Appendix

PLAFOND TEMPERATURES

Max. Temps of the month, taken at 10, 16 and 21 hours every day.

		10 hs.	16 hs	21 hs	
		MAX TEMP. °C	MAX TEMP. °C	MAX TEMP. °C	DIF °C
FEB	2009	25,8	25,3	25,4	1,8 °C
JAN	2009	25,7	25,6	25,4	2,2 °C
DEC	2008	25,1	25,1	25,1	2 °C
NOV	2008	24,5	24,7	24,5	1,9 °C
OCT	2008	23,2	23,7	23,3	1 °C
SEP	2008		23,1	23,3	0,4 °C
AGO	2008	22,6	22,4	22,7	1,2 °C

Figure 27: Palfond Temperatures table.

"EQUIPMENT" LIST / FACADES

216 equipments are defined for each of this facades

EQUIPO			
FACH JUNCAL	SEC 1 AL 18	BASAMENTO ESTRIADO	
FACH JUNCAL	SEC 1 AL 18	PLANO DE FACHADA	
FACH JUNCAL	SEC 1 AL 18	CORNISA	A
FACH JUNCAL	SEC 1 AL 18	CORNISA	B
FACH JUNCAL	SEC 1 AL 18	CORNISA	C
FACH JUNCAL	SEC 1 AL 18	BALAUSTRADA	A
FACH JUNCAL	SEC 1 AL 18		B
FACH JUNCAL	SEC 1 AL 18	MODILLONES	A
FACH JUNCAL	SEC 1 AL 18		B
FACH JUNCAL	SEC 1 AL 18	JAMBAS Y DINTELES	
FACH JUNCAL	SEC 1 AL 18	PRETIL	
FACH JUNCAL	SEC 1 AL 18	COLUMNAS	

EQUIPO			
FACH MITRE	SEC 1 AL 18	BASAMENTO ESTRIADO	
FACH MITRE	SEC 1 AL 18	PLANO DE FACHADA	
FACH MITRE	SEC 1 AL 18	CORNISA	A
FACH MITRE	SEC 1 AL 18	CORNISA	B
FACH MITRE	SEC 1 AL 18	CORNISA	C
FACH MITRE	SEC 1 AL 18	BALAUSTRADA	A
FACH MITRE	SEC 1 AL 18		B
FACH MITRE	SEC 1 AL 18	MODILLONES	A
FACH MITRE	SEC 1 AL 18		B
FACH MITRE	SEC 1 AL 18	JAMBAS Y DINTELES	
FACH MITRE	SEC 1 AL 18	PRETIL	
FACH MITRE	SEC 1 AL 18	COLUMNAS	

Figure 28: Primary "equipment" definitions for facades Juncal and Bme. Mitre.

			OPERACIÓN	SEMANAL	QUINCENAL	MENSUAL	BIMENSUAL	TRIMEST	CUATRIMES	SEMESTRAL	ANUAL	BIANUAL	TRANUAL	QUINQUEN	
SISTEMA ELECTRICO	OP 1	OP40	Central Eléctrica												
	OP 2	OP41	Transformador audio												
		OP44	Cables de Potencia												
	OP6	OP45	Doble Vía												
	OP7	OP46	Tableros Secundarios Sector A												
	OP95		Tableros Secundarios Sector B												
	OP96		Tableros Secundarios Sector C												
			Cableado												
			Central de Control												
	OP8	OP47	Grupo Electrógeno												
			Instalaciones Complementarias												
			Tablero General												
			Software												
			Apagón												
		Tableros (juncal)													
ASIENTOS	OP33		Butacas Platea												
	OP34		Butacas Tertulia												
	OP35		sillas de camerinos												
	OP36		Sillas altas y bajas												
	OP37		Taburete Alto												
	OP38		Banquetas												
M. AMBIENTE		Amalur													
ASCEN		Otis													
Telefonía y datos	OP92		Nodo 1												
	OP93		Nodo 2												
	OP94		Nodo 3												
	OP112		Nodo 4 (juncal)												

Figure 29: Section of the actual Maintenance Plan Schedule.

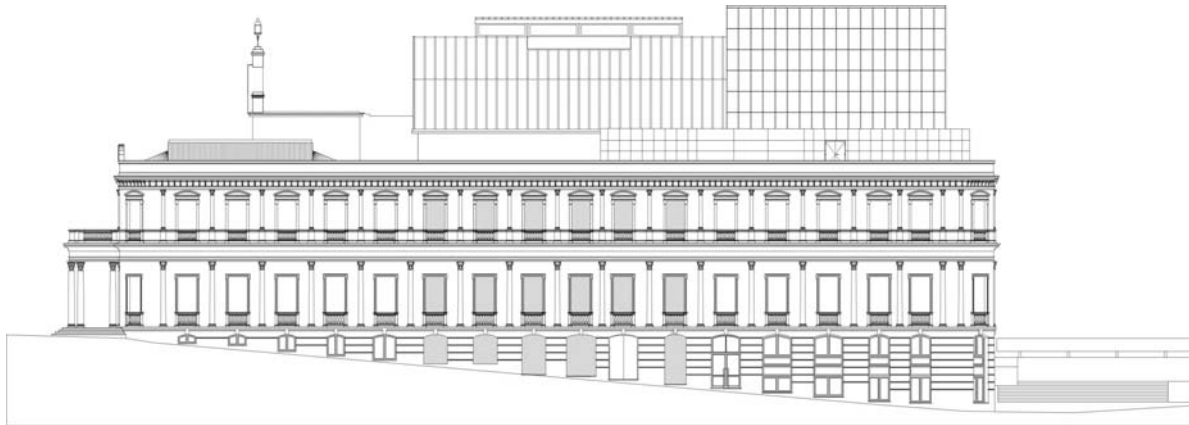


Figure 30: Bme. Mitre Facade. The grey surfaces represent the new plasters.

TEATRO SOLIS
PREVENTIVO

Fecha 06/03/09
Hora 17:10:43
Página 1

ORDEN DE TRABAJO N° 2507

Fecha 15/01/2009 Responsable AUX04 ANDRES ARRELLAGA
Op. Programada 7 Prioridad 3 Periodicidad 180 D
Equipo SELEC_004 TABLEROS SECUNDARIOS
Grupo S ELEC SISTEMA ELECTRICO
C.Costo A REPUESTOS
Tipo Operación MPI MANT. PREVENTIVO INTERNO
Actividad ELE ELECTRICA
Descripción TABLERO SECUNDARIO A
Fecha - Hora de Inic 15/01/09 00:00 Fecha - Hora de Fi

CAUSAS

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1 TAREA A6 CHEQUEAR

TÉCNICO	NOMBRE	HRS. EST.	FECHA	HR.COMIENZO	HR. FINALIZ.	TOTAL
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OBSERVACIONES DEL TRABAJO

Figure 31: Bme. Typical Work Order.

Information to fill in: date, responsible, Programmed Operation Number, priority, periodicity, equipe, group, replacement, type of operation, activity, description, causes, date, start hour, finish hour, observations or comments.