

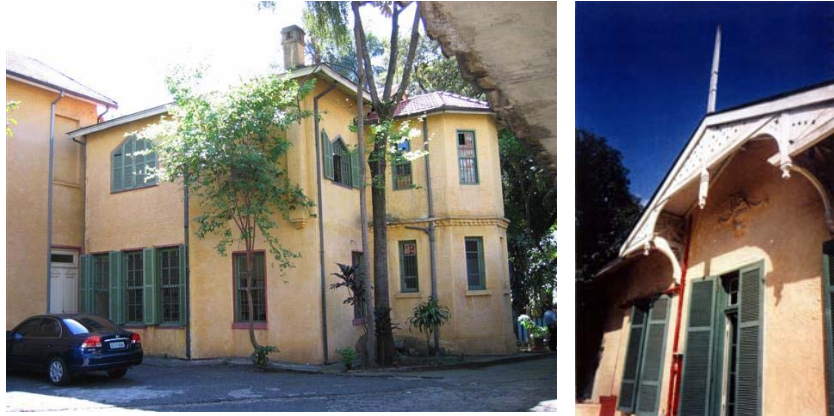
LANE House

Maintenance Program & Plan

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DPH - Department of Historic Heritage/ Municipality of São Paulo/ BRAZIL



Abstract

This is a Program & Maintenance Plan designed for the Lane House for the next five years.

It gives an overview of the present condition of the building, in the context of the Municipal Administration it belongs to. The building location in the city center exposes it to severe attacks coming from air and noise pollution.

The oldest part of the house dates from the last decade of the 19th.Century. It is a two-storey 886,79 m² brick masonry building located in a 1.655,38 m² lot. It has been used as a public library since 1993, when big restoration works took place.

No significant repair work has been done since the 1993 restoration. This lead the building to a situation of deterioration, which will is expected to be solved through conservation works which will take place in 2008, according to a conservation project which was just concluded.

A detailed architectural analysis of the building and of the site is presented in this paper, as well as a condition assessment. This will be the basis for a Maintenance Plan, in the last section of this paper.

The building was designated “cultural heritage” by the City in 2004.



Figure 3: Lane House, main façade (North). Photo: DPH

Introduction

The Lane House has its name derived from its former owner, the Lane Family, who owned those lands for many decades since 1918.

It is a Municipal property since 1944. It has been used as a public library since 1993, i.e. for fifteen years. The Department of Historic Heritage (DPH) of the Municipality of Sao Paulo is responsible for its maintenance and was also the author of the big first restoration works which the house underwent in 1992-1993.

Due to administrative problems, no repair work has been done in the building since 1993. This means that the building needs urgent care. Current problems include leakage, deterioration of plasters and paintings, of windows and doors frames, of electrical and water systems. A maintenance plan was never designed for the building.

During the year 2007 the Department of Historic Heritage developed a conservation project, which comprised also the construction of new architectural elements such as an elevator, to allow the access of disabled people. The project was detailed, according to conservation guidelines defined by us, by a contracted team of private architects (Companhia de Projetos).

The conservation and adaptive use works are expected to begin in June 2008. The Maintenance Program & Plan will be applicable to the Lane House after the conclusion of the conservation works.

The building will be used by the offices of the Secretary of Culture staff.

The City Department of Historic Heritage has the ownership and responsibility to look after 14 designated buildings, among which seven are colonial earthen buildings. The remaining 7 are brick (1890-1920s) buildings or recent (1950s) concrete buildings. The Secretariat of Culture has dozens of buildings to manage, like libraries, cultural centers and theaters. A maintenance plan will certainly be helpful to introduce a “maintenance culture” for the management of all those buildings.

Background

Geography

Sao Paulo is the largest city in Brazil, in Latin American and in the entire Southern Hemisphere. With 1.523 km² and 11,016,703 inhabitants (2006) is the third most populated metropolis in the world. It is located in the southeast of Brazil in a 760m high plateau.



Figure 4: Aerial view of the centre of the city

The central area of the city is bordered by the rivers Tietê and Pinheiros, but its territory spreads out to east, west and south. The northern expansion is limited by a preservation area called Serra da Cantareira. The city is 60 km far from the Atlantic Ocean coastline at the southeast.



Figure 5: Satellite view of São Paulo

Climate

The climate of Sao Paulo is considered subtropical, with a decrease of rainfall in the winter and average annual temperature of 19 degrees Celsius, with mild winters (5-20°) and summers with moderately high temperatures (20-35°), increased by the effect of pollution and the high concentration of buildings. The warmest month, January, has an average temperature of 22 ° C and coolest month, July, 16 ° C. The humidity rate is considered acceptable throughout the year, although the pollution reaches critical levels in the winter, due to the phenomenon of thermal inversion and the lowest occurrence of rainfall from May to September. The average annual rainfall is 1.317 mm, concentrated mainly in the summer. The seasons are relatively well defined: the winter is mild and with scarce rain, and summer, moderately hot and rainy. Fall and spring are seasons of transition. Frosts occur seldom, in the more remote regions far from the center. It also occurs frequently in some neighboring counties.

The situation of the site

The Lane House is situated in the city center, not more than two kilometers far from the city core. It is on a very busy sloppy street of intense and rapid car and bus traffic, what causes the site to be noisy and polluted. Most of the area of the block where the building is located in belongs to a big private university (Mackenzie Institute). Due to this fact, thousands of people from the campus use the bus lines running the Consolação Street.

The neighborhood is a busy area with the Mackenzie Institute campus, high residential buildings, cafes, shops, cultural centers, theaters.

A new subway station will open in the block, 80 meters to the south of the Lane House lot. This new transportation knot will certainly contribute to the growth of users of the neighborhood.

In the 1970s, when the Lane House was sheltering the Municipal Archives, a supplementary building was added to the main building, close to the street sidewalk, in order to respond to the expansion of the archives. Unfortunately, the supplementary building building completely obstructed the view of the Lane House. The beautiful building is presently hidden by the Supplementary building, and cannot be seen from the street.

The demolition of the supplementary building is included in the conservation project.



Figure 6: The Lane House and its gardens. The Mackenzie Institute campus surrounding the Lane House. To the right, the busy Consolação Street.. Photo: Lia Mayumi, 2004.



Figure 7: The Lane House completely hidden by the supplementary building built in the 1970s. The demolition of the supplementary building will allow the house to be seen from the street. Photo: Tatiana Cipoli

The property was originally a villa in the suburbs of the 19th Century city. At that time many wealthy families chose to live in the suburbs to enjoy a rural lifestyle, growing some fruit trees and vegetables but still living close to the city center.

The most ancient information about the property is of a small farm settled there in the end of the 19th. Century by a protestant priest named George Chamberlain, who was also a teacher who used his house as the premises of the American School which was the origin of the present Mackenzie Institute.

Based on the documental research conducted by the historians of the Department of Historic Heritage we know that a land measuring 14.800 m² was bought in the corner of Itambé and Piauí Streets by an American citizen named Lanton Amnesley, George Chamberlain's father-in-law. Some time later, his heirs donated 7.300 m² to the American School (presently Mackenzie Institute), leaving the remaining area to Lanton Amnesley's live in.

In 1906 Lauriston Job Lane bought the Amnesley family's property, which comprised a house. It leads us to suppose that the house was built some time in the past between the years 1890 and 1906.

In the beginning of the 20th century most of the suburban estates, including villas, were divided into parcels and sold, new streets and urban neighborhoods were formed. The Lane House was one of the few to remain in its original situation.

In 1940 Lauriston Job Lane offered the ownership of the villa to the Municipality. The Municipality was interested in expanding the urban area, and finally bought the property in 1944.

According to archival documentation, the property comprised '*a very ancient two-storey dwelling house, in very bad condition, each floor measuring approximately 400 m²*'. The description of the house was as follows:

“Ground floor:

Large roofed terrace

Entrance hall

Dining room

Living room

Snooker room

Small living room

Large Sleeping room

Bathroom

Small dining room

Kitchen

Housemaid bathroom

Second floor:

Large sleeping room and bathroom en suite

Hall
Corridor
5 Sleeping rooms
Sewing room
Closet
Housemaid sleeping room
Bathroom

External complementary buildings (totalizing 180 m²):

Washing room
Sleeping room
Bathroom
Small house for employees
Garage”

The official plans of urban expansion were abandoned two years after, when the City Department of Culture decided to create a kindergarten in the old villa. In 1946 a Municipal kindergarten was inaugurated, after the conclusion of repair works. One year later, in 1947, the Mackenzie Institute receives permission from the Municipality to use the whole villa as a school, and in 1955 the Mayor William Salem gives Mackenzie the authorization to use and occupy a 9.700 m²- large area for the campus premises. The authorization did not include the house of the villa and its gardens, which continued to be used as the premises of the Municipal Historic Archives since 1953.

In 1957 the Mayor Adhemar de Barros transferred the Municipal Welfare Service to the building, but the Service was moved two years later to another place, and the Archives returned to the building.

In 1990 the Archives moved from the Lane House because the growing deterioration had become a menace to the documents and for the users and the officials who worked in the building.

Immediately a restoration project was prepared by the Department of Historic Heritage to save the building from decay. Restoration works took place in 1992-93, supervised by a team of one civil engineer and three architects, myself included.

Restoration

Roofing tiles and trusses, wooden ceilings, wooden floors, wall plasters, windows, doors, water and electricity systems, as well as painting were restored. Special attention was paid to the painting. An accurate investigation was conducted to discover the original colors of frames and walls, in order to restore the original colors of each architectural component. The same was done in relation to the quality of painting: pigmented lime wash was applied on the walls to preserve the original technique.



Figure 8: The Lane House in the block.

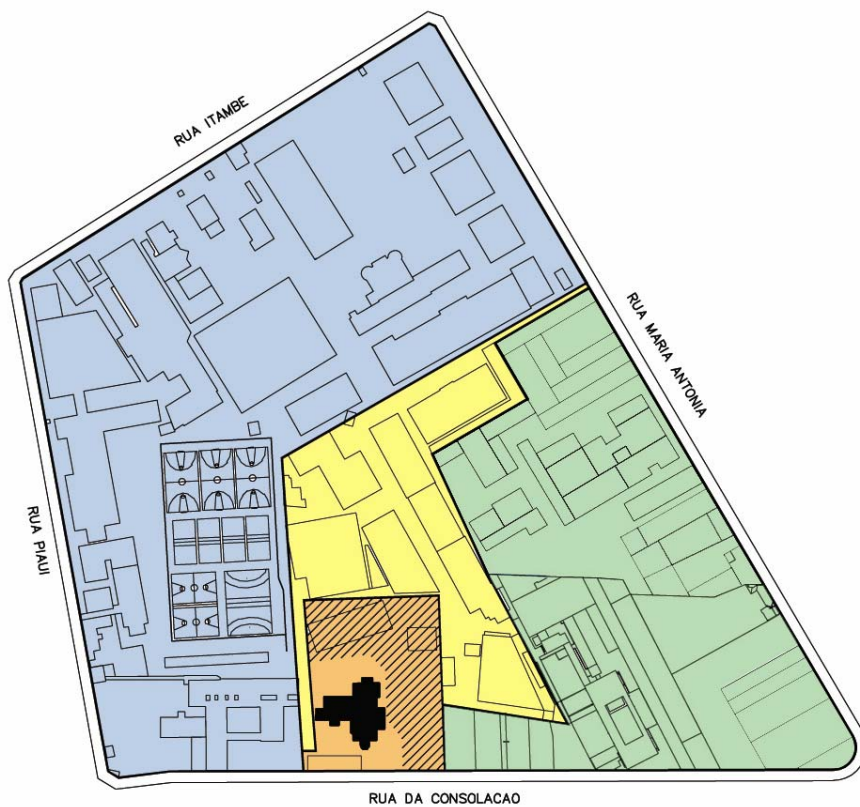


Figure 9: The Lane House in the block. Blue and green are private- owned lots.

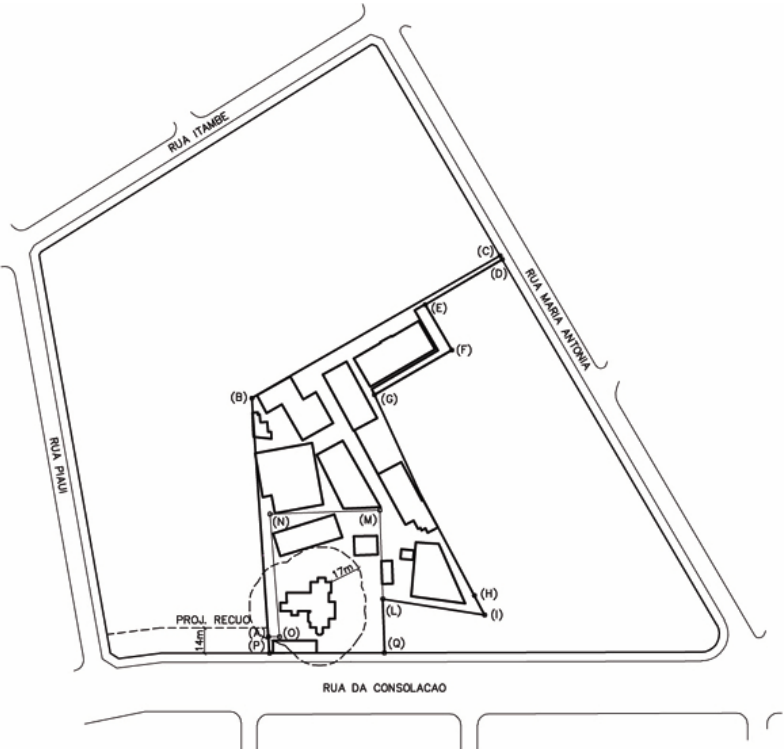


Figure 10: The Lane House and the buffer area of 17meters-radius.

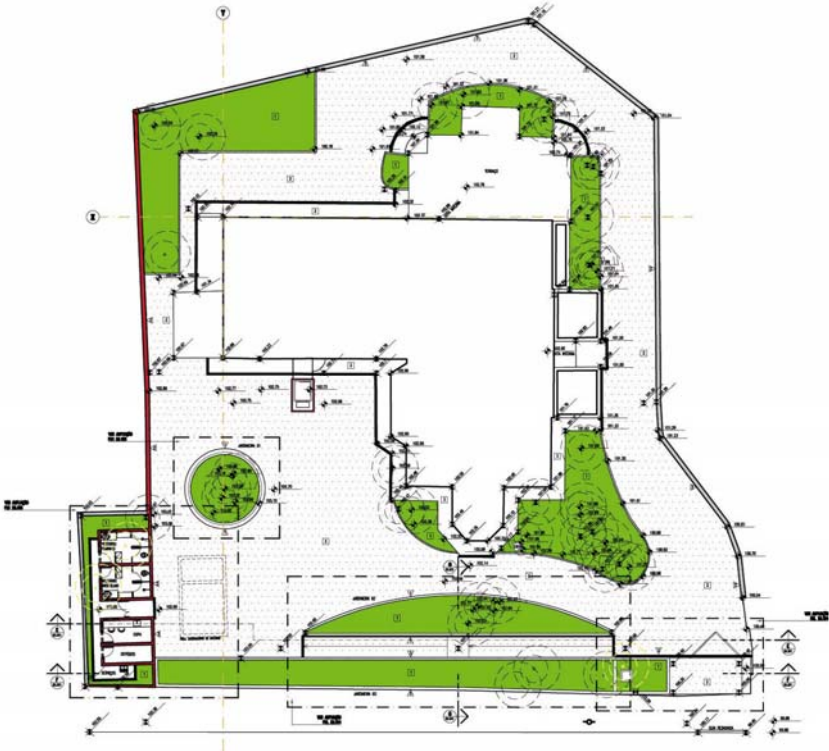


Figure 11: The Lane House and its gardens. The Mackenzie Institute campus surrounding the Lane House. To the right, the busy Consolacao Street.

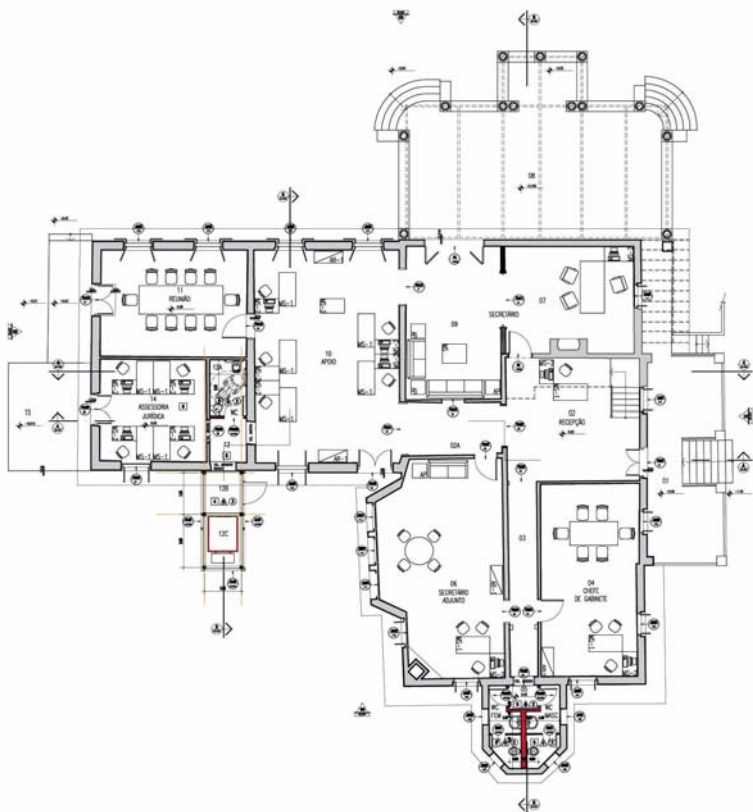


Figure 12: Ground floor plan. The lay out was planned for the Municipal Secretary of Culture staff offices. In red color: new elevator and partitions.

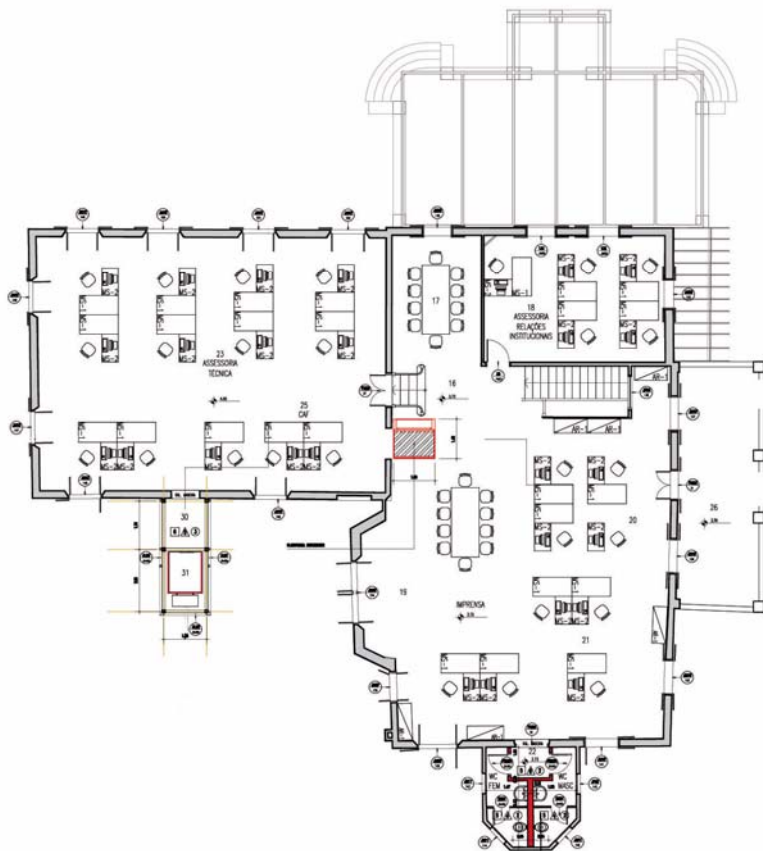


Figure 13: Second floor plan.

Legal protection



Figure 14: Demolition of the supplementary building, prohibition to build inside the buffer zone: measures to enhance the architectural values of the building.

In 2004 the Municipality designated the Lane House a ‘cultural asset’, in order to preserve the architectural values of the house, as well as its setting (gardens vegetated with old big trees).

The designation established some rules such as: 1) the obligation to ask for Municipal permission for any new construction or change in the block; 2) the prohibition to build in a distance smaller than 17 meters from the house building (buffer zone); 3) the prohibition to suppress trees and permeable area from the house gardens.

The Object as such; its function, size, materials, status

Only the main building and the gardens in the lot were designated ‘cultural heritage’ by the Municipal law. The supplementary building was excluded.

The lot has 1.655.38 m², 678,24 m² of which is occupied by the main building plus the supplementary building. The main building occupies 479,61 m² of the lot.

The main building is two-stored, and each floor plan measures 479,61 m², the two floors totalizing 886,79 m², including a small 26,75 m² basement.

The main building was constructed with bricks in 1890 and enlarged probably between 1910 – 1944, while belonging to the Lane Family. As expected for the constructions at that time, no concrete structure was employed. The floors are wooden planks. Masonry was covered with lime mortar and ochre lime wash.

The roof is structured with wooden trusses and covered with tiles. Windows and doors frames and sashes were built with Riga-pine, a

very common wood at that time, which was imported from the Russian city of Riga. They were painted with oil painting.

Bathrooms were added later, probably after the 1940s, because until them it was usual to have them outside, in a separate small building in the rear part of the lot.

Because it was not exactly an urban dwelling, the building has no trace of sophistication, except for very simple decorative paintings on the internal walls with the figure of flowers.

As said before, the building did not receive appropriate care since the 1993 restoration. Almost every architectural element is deteriorated, in varying degrees. No maintenance routine has ever been applied to the building.

Leakage of rainwater is coming into the second floor rooms because of rusted metal gutters of the roof. The leakage penetrates the walls and reaches even the ground floor walls. Moisture can be seen on the painted surfaces of the walls.

Vegetation is growing inside the gutters and inside the small cracks which appeared in the external walls of the terraces. Bigger roots are destroying the stability of the terrace walls.

Unauthorized plastic paint covers the brick walls, causing the bricks disaggregate. Also cement plaster was applied without the permission of the Department of Historic Heritage architects.

Wooden parts of the roof were attacked by termites. Also the windows and doors frames and sashes were attacked by insects.



Figure 15-18: Damages: infiltrations, leakage, humidity, sunlight effects, inadequate plastering.

Analysis

Most of the damages and deterioration processes observed are caused by lack of maintenance (cleaning, constant small repairs...done by persons).

Water is the main active natural element responsible for the deterioration processes. Its effects on the building must be avoided at any cost, and controlled. Moisture on wood propitiates the action of termites, in addition to other deterioration processes.

The North and West façades receive more sun than the two others. Their wooden elements are permanently and exposed to the Sub-tropical sunlight. They need more constant maintenance than the other façades, with relation to the protection against the sunlight attack. More frequent application of varnishes and other sunlight films can help.

The tectonics of the building and the building materials should be understand in detail by the maintenance team. Awareness of the characteristics of the building will help to correctly plan how to use the building. For instance, it is evident that wooden plank floors are too fragile to be loaded with book shelves of a public library.

Proposal

Objectives of maintenance

(according to **SANDBERG , D.: Practical Binder**)

- Keep the property in perfect conditions of use, safeguarding its constructive features and preserving its historical value.
- Avoid damage that adversely affects the health of elements and lead to adulteration and devaluation of the property.
- Fix recurrent problems which extend attacking other parts of the building if not resolved on time.
- Avoid large expenditure on periodic restorations for lack of maintenance.

Other goals

Allow the property, by keeping it in perfect condition, to be valued by users bringing them consciousness and proud of its historical importance.

The Maintenance Plan covers repair services necessary for the proper operation and conservation of the building such as: minimization, control and elimination of threats, correction of problems, accessibility, improvements in comfort and safety, prioritized according to the needs and availability of resources.

When those works were accomplished following the recommendations listed in SANDBERG'S Binder, item 5, the building can be maintained in excellent conditions with only regular maintenance service.

Restoration, again

Actually, the building is presently very damaged due to lack of maintenance. Nevertheless, restoration works which are scheduled to begin in June 2008 are going to solve all the identified damages and deterioration processes.

The works, according to the restoration project, comprise:

1. Treatment of every existing and new timber against termites. Moisture deriving from leakage of rain water from the roof is the main cause of the presence of termites in the roof trusses and door frames. The correction of the roofing system (change of broken tiles and gutters) is supposed to help stopping the water leakage process. Walls: Replacement of deteriorated lime-based plasters, using lime mortar.
2. Roof: Replacement of timber damaged by attack of termites or humidity. Replacement of the totality of metallic gutters. Replacement of broken French tiles (Marseille tiles).
3. Walls: Replacement of deteriorated lime plasters, with application of new lime mortar.
4. Ceiling: All the rooms have wooden plank ceilings. Planks are deteriorated mostly by leakage of rain water. Deteriorated planks will be replaced by new ones.
5. Windows and doors frames: They are made of Riga-pine, relatively termite-resistant, but very fragile when exposed to sunlight. The wooden parts will receive hydration with linseed oil. Damaged sashes will be replaced by new identical ones.
6. Floors: Wooden plank floors are in good shape. They will be cleaned and polished with mineral wax.
7. Floors: ceramic tiles: will be polished.
8. Ladders: Wooden staircases will be cleaned and polished. Its handrails as well.
9. Painting: Walls will be painted again with lime wash, pigmented with ochre. Ceilings and windows and doors frames will be painted with synthetic enamel.
10. Electrical System: The system will be totally modernized: redistribution and resizing of circuit breakers, switches redistribution, infrastructure for telephony and logic, installation of external lighting. 'As-built' drawings will be included in the Maintenance Program Binder.
11. Water supply system/ plumbing: The system will be totally modernized by replacement.
12. Fire fighting system: a new system will replace the existing one.
13. External area/ courtyard/ gardens: Landscaping will correct drainage. Existing supplementary building will be demolished to give place to a new one in the southern side of the lot.

14. New architectural structures inside the main building: some partitions in the Bathrooms will be changed.
15. New architectural structures outside the main building: a new supplementary building will be built with Bathrooms, Kitchen, Closet. Also a metal-and-glass elevator to allow disabled people to access the second floor.
16. Accessibility: the new lift, adapted Bathrooms, ramps in the external are the equipments designed to make the building accessible.
17. Lightning: A new lightning system will replace the existing.
18. Manual for cleaning routine: the restoration works contract includes the elaboration of a manual where all the architectural elements of the building will be listed, including the procedures of their maintenance and cleaning.



Figure 19: Model of the house viewed from the street, showing the structures to be added to the building, mainly the elevator tower (gray colored).

Instructions and restrictions for maintenance

Roof

- Roof must have *fortnightly* and *after storms* inspections to verify its problems in order to solve them (displaced or broken tiles, mortar fixing, for example).
- Broken or cracked tiles must always be replaced by others of same kind.
- Tiles that are displaced must be replaced to its original position.
- Mortar fixing must be redone when necessary.
- The condition of wooden parts of the roof structure must be checked *quarterly* (wilting, sealing, distortion, disruptions, spare parts, etc.).
- Damaged timber must be replaced by others with the same features (type, dimensions, finishing)

- Extremely dry wood should receive treatment for hydration with linseed oil.
- *Twice a month* the leaves that fall on the roof and interrupt the flow of rainwater through the gutters must be removed, to avoid flooding and leaking of water into the building.
- The wooden parts of the building roofing must be painted with synthetic enamel painting *every five years*.
- *Monthly* inspection must be performed to detect the presence of termites. Any damage verified in the timber should be immediately corrected by either the replacement of timber, or treatment of the attacked parts with chemical products.

Ceilings

- Planks and beams of ceilings should be inspected *every three months*, underside inclusive, in order to detect structural wilting, sealing, distortion, disruptions, spare parts, humidity, etc.).
- Damaged parts must be replaced by others with the same features (type, dimensions, finishing).
- Extremely dry parts must receive treatment for hydrating with linseed oil.
- The wooden planks must receive *every five years* painting with synthetic enamel.
- *Monthly* inspection must be performed to detect the presence of termites.

Terraces

- The terraces (both ground and second floor ceramic-tiled) should be swept *daily* to remove dust, fallen leaves, spider nets, etc.
- Terraces floors can be washed with only clean water and neutral soap *monthly*. No abrasive or chemical product will be allowed. Floors should be washed only when necessary. After washed, they can be polished with mineral wax.
- Vegetation should not grow. Young roots should be removed as soon as detected.

Walls

- Dust on internal walls of the house need to be removed *weekly* with feathers duster.
- The external walls must be inspected *monthly* in order to detect cracks in the plaster. When detected, cracks must be immediately filled with lime grout, and painted with pigmented lime wash in the colour of the wall.
- Hanging or sticking any object (posters, frames, conduits, pipes, etc.) on the walls is not recommended.
- Furniture may not lean or touch the walls. Limiters in the feet of tables and cabinets will be glued, if necessary, in order to keep them away of the walls.

- *Every second year*, or whenever necessary, the internal and external walls will be limewashed in the existing colours. Doors, windows, wooden planks of ceilings and floors, as well as stairs and railings should be covered during the lime wash application.
- Lime wash must be made with virgin lime hydrated at least 60 days in advance.
- When necessary, previous limewash layers will be removed with metal spatula and the surface should be sandpapered to eliminate irregularities of the wall surface.
- Repairs and reconstitutions in the coating must be carried out with cement, lime and fine sand (dash 1:6:12) mortar, over spread base of cement, lime and sand (dash 2:6:12), applied with metal plasterer's trowel.

Floors

- The internal ceramic tiles floors must be softly swept *daily*.
- There will not be applied any chemical or abrasive product for cleaning and maintenance. Spots of dirtiness can be removed with humid cloth if necessary, using neutral soap and clean water. They will be protected by *monthly* application of mineral wax.
- Wooden planks floors will be softly swept *daily*. There will not be applied any chemical or abrasive product for cleaning and maintenance. Spots of dirtiness can be removed with humid cloth if necessary, using neutral soap and clean water. They will be protected by monthly application of mineral wax.
- Floors must be protected whenever handling objects that can damage them.
- It is not allowed to make holes of any kind on the floor planks for fixing equipment or for any other reason.

Frames

- Doors and windows frames and sashes should receive synthetic enamel painting *every five years*, or whenever necessary. Older layers can be chemically or mechanically removed after every third application, to avoid the growing thickness of the painted layers.
- *Daily* cleaning must be done with soft duster, dry cloth or, if necessary, damp cloth. During leaning, a quick inspection can be performed.
- Window glasses cleaning must be done with soft duster, dry cloth or, if necessary, damp cloth, *weekly*, or whenever necessary.
- Hardware (hinges, doorknobs...) should be inspected and lubricated *every six months*.
- Broken glasses and hardware should be immediately repaired or replaced.

- All repairs, replacements or transplants must be carried out with wood of the same kind, certified and drought.
- Opened folding casements of windows and doors should have protective hardware or devices to avoid touching the wall coating.
- Whenever necessary, timber will be treated with linseed oil in order to be hydrated.
- *Monthly* inspection will be performed to detect the presence of termites.

Electrical installation

- Lighting equipment must be handled carefully whenever bulbs have to be changed and outbreaks reposed, because they are very fragile.
- Bulbs out of order must always be replaced by similar ones.
- Installation of extensions of lighting, energy points, removal and replacement of equipment or parts of the electrical system will not be allowed without the permission of the DPH.
- *Monthly* inspection should be performed to verify the condition of the electrical equipment.

Accessibility equipment

- Maintenance of the two lifts engines should be contracted. Periodic maintenance should comprise lubrication, screws fastening, electricity tests, replacement of worn parts. *Monthly* preventive inspection is desired.
- Glasses of the lift tower should be washed *every second month*, to removal of dust and grease derived from air pollution.

Metallic structures

- Painted steel elements such as handrails, steel parts of the lift tower and window frames should be inspected *monthly* to detect rust. If detected, the rusting process must be immediately interrupted by removal of the rust spot, and then by the application of a rust-inhibitive primer. Following, synthetic enamel should be applied.
- Aluminium sashes should be cleaned with soft duster, dry cloth or, if necessary, damp cloth, *weekly*, or whenever needed.

External area/ courtyard

- Trees close to the house must be tipped *quarterly* in order to avoid leaves to fall on the roof gutters.
- Garden vegetation should be tipped *quarterly*. During Summer (December, January, February), *monthly*.
- Vegetation as well as grass should not be allowed to grow between the stone pavement joints. It should be cleaned and removed *monthly*.
- The stoned pavement around the house must be washed with water jet under light pressure, *monthly*.

Fire fighting equipment

- Validity of fire extinguishers must be checked and change of those within one month before its expiration.

Maintenance routines will be adopted according to the instructions and restrictions for maintenance above and in the following time ranges: daily (d), weekly (w), fortnightly (f), monthly (m), quarterly (q), semi-annual (s-a), annual (a), every two years (2y), every three years (3y), every five years (5y), after storms (a.s.). The inspections will be followed by a report where of all the results will be recorded in their respective drawings. Appendix 1 shows a table of the routines.

Implementation Method/Operation

Firstly, restoration works expected to begin in June 2008 should be accomplished. The Lane House will undergo works during 12 months. This means that the house will be in good condition in June 2009.

The proposed maintenance program will only be applicable after the end of the restoration works. The maintenance procedures and routines cannot be applied to the house during the restoration because a myriad of activities will be taking place in the site during the restoration. Many architectural elements will be covered by protective panels, laborers will be working in and on the building.

A firm/company will be contracted by the Municipality to execution of the Maintenance Program and Plan. The DPH will supervise the execution of the contracted works.

Results/Current Status of the Work

This maintenance Program and Plan is still being revised in by me and my colleagues of the Department of Historic Heritage. Revision should be concluded in three months (June 2008), when the restoration will be initiating. The restoration will last for twelve months, until June 2009. A contracted firm will then immediately begin to execute the Maintenance Plan and Program. Regarding this contract, year 2009 should already contain the necessary budget for the implementation of the Maintenance Program and Plan.

Discussion & Conclusions

A combination of adequate maintenance and appropriate use is the best way to preserve buildings. Permanent maintenance avoids heavy works like those which characterize a restoration. Also from the economical point of view, permanent maintenance costs less than periodic restoration. And it should not be ignored that repeated restorations cause erosion, and accelerate the weathering process of

building materials, because protective patina is frequently removed in such an invasive operation.

Restoration for practical reasons should be considered in extreme necessity, when for instance the deterioration of the building reached such a degree of intensity that the use of the building becomes unfeasible. In our case, it was shown how lack of maintenance conducted a building restored in 1993 to a complete deterioration condition only fifteen years later. The new restoration which will start this year June is expected to be the last, supposing that a Maintenance Plan will be put into permanent practice from June 2009 on.

A deep knowledge of building techniques and of the tectonics of the building is essential for designing a correct Maintenance Plan and Program. Preservation of the authentic structural behavior and correct treatment of each material help the building last longer.

Correct use of the building is also essential. Equivocated destination can be very harmful to the building. Overloading wooden planks and beams floors with heavy bookshelves can damage the structure of the floors, and in extreme cases, cause the building to collapse.

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- DPH/STLP - Department of Historic Heritage / Technical Section of Survey & Research
- DPH/STCT - Department of Historic Heritage / Technical Section of Criticism & Designation

Appendix 1

Status of the building



Figure 20, 21: North and South façades elevations, showing damaged paintings and plasters.



Figure 22-25: humidity, vegetation, missing parts, provisional electrical system.

Appendix 2

Restoration and Construction Chronogram

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Fev	Mar	Apr	May
Roof	■	■										
New Foundations		■	■									
Reinforced Concrete Structure		■	■									
Walls/ masonry			■	■								
Lifts								■	■	■	■	
Walls/ plaster			■	■	■	■						
Frames/ Sashes					■	■	■	■	■			
Ceilings					■	■	■					
Floors							■	■	■	■	■	
Water Supply and Sewage			■	■	■							
Electricity			■	■	■							
Fire fighting system			■	■	■							
Painting							■	■	■	■	■	
Hardware								■	■	■		
Landscaping										■	■	■
As Built/ Maintenance Manual										■	■	■

Appendix 3

Table for maintenance routine

a.s. (after storm); d (daily); w (weekly); f (fortnightly); m (monthly); q (quarterly); s-a (semi-annual); a (annual); 2y (every two years); 3y (every three years); 5y (every five years).

	a.s.	d	w	f	m	q	s-a	a	2y	3y	5y
Roof	Inspection replacement			Inspection Remove leaves	Inspection termites	Inspection structure					
Lifts					Inspection Fastening Replacement						paint
Walls surface			Remove dust								paint
Frames/ Sashes			Remove dust								paint
Sashes hardware					Inspection		Lubrication				
Ceilings					Inspection termites	Inspection structure					paint
Floors		sweep			Polish Inspection termites						
Water Supply and Sewage					Inspection						
Fire fighting system					Inspection						
Electric system					Inspection						
Lift glass tower						Inspection structure					
Hardware											
Gardens					Cut grass	Tip trees					
Terraces		sweep			Wash polish						