

MAINTENANCE GUIDELINES FOR HERITAGE BUILDINGS

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0. INTRODUCTION

This paper provides guidelines for the preparation of minimum maintenance standards for heritage buildings in the territory of the Municipality of Asmara. Heritage buildings are unique, each having its own special characteristics and history, and construction varying according to age, materials and geographic location.

These guidelines address maintenance problems and solutions common to many heritage buildings. Whether a brick commercial building, a rubble stone or a mud hut, or a wood bungalow, the main causes of deterioration are the same. Timely maintenance will combat the deterioration process.

1. WHAT IS MAINTENANCE?

Maintenance of a building is the required continuing work that ensures the preservation, stabilisation and longevity of the building fabric and therefore the building itself.

The process of maintenance is both fundamental and basic in conserving heritage buildings. Continued, careful and timely maintenance ensures maximum conservation of the original fabric of the heritage building, while preventing costly and unnecessary restoration or renovation work in the future.

“Preventive maintenance and preservation work is less expensive in every way than hopeful neglect followed by extreme measures.”

Sir Bernard Feilden, Conservation Architect
St. Paul's Cathedral

2. MAINTENANCE OF HERITAGE BUILDINGS

Heritage buildings, by their very nature, are special buildings in their community.

The maintenance of a heritage building may require specific maintenance procedures unique to that property which may not be appropriate to another property.

In the case of a heritage building, especially where regular maintenance has been deferred for a period of time, correct maintenance may involve appropriate repair or even minor restoration. For example, rotten gutters may have to be replaced in order to carry water away from the building.

3. PRINCIPLES OF HERITAGE CONSERVATION

There are the six “Principles of Heritage Conservation” for historic buildings and sites in the territory of the Municipality of Asmara.

- 3.1. All heritage conservation work, whether it be on a building, monument, or site, should be based upon and preceded by sufficient historical research, site analysis and documentation to identify and safeguard fully the heritage values to be conserved.
- 3.2. The evolution of the structure(s) and the site should be respected. The contributions of all periods are important to the historical development and merit retention. Decisions about appropriate levels of intervention shall be based upon the heritage values of each contribution.
- 3.3. Long-term protection of the historic resource should be identified prior to undertaking any work.
- 3.4. The approach to all heritage conservation projects should be one of minimal interven-

tion to ensure the maximum preservation of the existing and authentic physical fabric and the retention of the signs of age (also known as the patina).

- 3.5. Conjecture and the falsification of building elements should be avoided in all heritage conservation projects.
- 3.6. A well-defined maintenance plan should be clearly established in order to prepare for an appropriate level of maintenance and care upon completion.

4. PRINCIPLES OF MAINTENANCE

Maintenance forms the foundation for all other work involving heritage buildings.

- 4.1. Maintenance should be planned, and carried out on a regular and timely basis. A maintenance plan is a valuable tool to aid in this work.
- 4.2. Maintenance protects against deterioration of the building fabric. Maintenance work keeps water out of the building; prevents damage by sun, wind, dust, and all weather; protects against vandalism and arson; prevents damage by insects and vermin; and aids in protecting all parts of the building against deterioration.
- 4.3. Maintenance of heritage buildings shall be done in such a way as to not damage any part of the heritage structure that is to be preserved. The protection of the historic building's original materials and details is an important principle.
- 4.4. Regular methodical inspections of the heritage building and site for both current conditions and signs of decay are an important part of a maintenance plan. Referring to notes and reports from these inspections allows the planning and budgeting of future maintenance work.
- 4.5. The successful management of maintenance work involves a comprehensive over-view of a number of trades, budget planning, and practical training. Maintenance is a process, not a product and thoughtful continuity of work by skilled staff, technicians and tradespeople will protect the owner's investment in the building and reduce the necessity for future costly repairs and reconstruction.

5. MAINTENANCE PROCEDURES FOR HERITAGE BUILDING

As stated in the first Principle of Heritage Conservation, all work on a heritage building should be based upon appropriate research, site analysis and documentation.

5.1. Information File

It is very useful to establish a file for each building containing, if available, copies of relevant historic inventories, heritage reports, preservation bylaws, building plans, historic photographs, building permits for construction and alterations, history of use, etc. With a basic background of information, an initial inspection for current condition and possible defects should be carried out.

5.2. Inspection

Inspections should be carried out by a qualified person, preferably with experience in heritage buildings. An inspector needs to be methodical and thorough, covering all aspects of the building and making detailed notes and sketches as the inspection proceeds.

Starting at the NE corner of the building, an inspector proceeds from the top corner and inspects the condition of the roof, gutters, downspouts, walls, foundations, then windows and doors. After completing each facade, the next wall of the building is inspected, continuing around the building in a clockwise pattern.

Noting areas of concern —such as cracks, water staining or rot— on copies of the building's elevation drawings is a clear method of recording. These notes and sketches must be keyed into written observations as well.

The inspection notes need to be short, clear, and concise. Could someone else read the notes and understand which window sill is rotten, or which crack is new at the time of your inspection?

The inspection report must be dated and signed by the person making the inspection. For interior inspections, the same careful recording techniques apply. Start on the top floor, work around each room in a clockwise manner and inspect ceiling, walls, baseboard, doors, and windows; again making notes and sketches of current conditions and possible deterioration.

Attics and basements also require inspection, carefully checking voids and hard-to-reach areas, as well as structural joints and connections.

Services (heating, lighting, water supply, drainage, security, etc.) also require inspection, as malfunctions of any of these services can dramatically endanger the preservation of a heritage building.

5.3 Site and Local Environment Inspection

Heritage sites often encompass historic gardens or other landscape features that require care and protection. These areas also require knowledgeable persons, familiar with historic landscapes, to make appropriate inspections and record their findings for future work on the landscape features. However, heritage buildings, whether they have historic landscapes or not, will have site features that will impact on the preservation of the building.

The site should be inspected for several things, including: ground water runoff which can undermine foundations; leaking water supply lines; appropriate drainage systems and whether they are currently functioning; dead or dying trees near the building; plantings preventing air movement around exterior walls; indications of insect, rodent or other vermin; traffic vibration; nearby industrial uses that affect the building by dust, fumes, vibration, etc.

All current site and local environment conditions should be recorded, signed, dated and form part of the building's inspection report.

6. MAKING USE OF THE INSPECTION REPORT

The *Inspection report* is simply a tool to allow the planning of the current and ongoing maintenance, future repair and restoration requirements of the heritage building.

It is the responsibility of the person charged with looking after the building(s) to actually use the Inspection reports and not merely file them. The Inspection report is the beginning of the maintenance process.

Information can be extracted from the report on several levels: the extent of the work needed, whether specialised reports are required —do cracks indicate foundation settlement? Is a soil test required? Do all the chimneys need repointing at the same time? (saving scaffolding costs; joint projects for scaffold work?)— and so on.

Although establishing an inspection program is time consuming at the beginning, it so-on pays for itself in greater efficiency in maintenance and repairs, and due to timely attention to minor deterioration, can prevent major repairs and reconstruction later, along with preserving more of the original fabric of the heritage building.

All work done on a building should be noted in a log book or recorded in the building's information file.

7. MAINTENANCE OF EXTERIORS

7.1. Keeping the Water Out

Water, in all its forms and sources (rain, rising damp, ground water, leaking pipes, back-splash, etc.) is the single most damaging element to historic buildings.

Water supports all forms of biological decay such as rot, fungus, moss, lichen, termites, powder post beetle, other insects, etc.

Keeping a building dry is the single best method of combating biological decay.

7.2. Roofs and Gutters

The most common place for water to enter a building is through the roof and/or the gutting and downspout systems.

An apparent minor roof or clogged gutter leak that is ignored can introduce enough moisture to support biological decay in a building on a scale necessitating removal of walls and floors, replacement of structural systems and services. Keeping roofs repaired or renewed and gutters frequently cleaned is a more cost-effective option.

Gutters should be cleaned thoroughly semi-annually in March and May, and weekly during periods of leaf falls.

The cost of replacing expensive gutters on an historic building should be reason enough to clean gutters. If gutters are clean and allowed to dry out at intervals, they will last up to 60 years. Left clogged, damp and overflowing, deterioration will set in as little as two years after installation.

Downspouts must drain to a safe area away from the building, either through a functional perimeter drain system or the water conducted away from the building by the natural slope of the land.

In geographic areas where roof gutters are not used, attention must be given to damage from water splashing back onto walls from hard surfaces (decks, walks, driveways) around the base of the building. Back-splash can cause severe deterioration of siding, joists and floor timbers, as well as damaging paint and other surfaces.

On commercial buildings water can often enter at the top of brick parapets and penetrate far into a building through the brick wall. Careful flashing of the top of all parapets is recommended.

At all junctions of walls and roof, chimneys and roof, pipes passing through roofs, etc., extra care of sealing joints with correct flashing techniques is imperative.

Evidence of a small interior leak should be viewed as a warning for a much larger and worrisome water damage problem elsewhere and should be fixed immediately.

7.3. Walls

Walls, depending on their materials, have different maintenance requirements.

Wood walls (siding, shingles, board and batten) generally require checking that all parts of the wall are firmly attached, and there is no place that water can enter. Check for flashing or drip caps over doors and windows; and check that water tables (moulding found at the base of a wall to shed water) are throwing the water away from the wall and not directing it into the wall. If the water table slopes inwards, the wall may have settled due to deterioration, and the situation requires further investigation.

Bowing of wall structure, seen by sighting along the wall, is usually indicative of structural stress or failure and requires further investigation.

When wooden walls have foundations, all wood shall be kept 20cm above ground level. Flower beds or paths may have to be lowered to create this necessary clearance.

Wood walls should be well painted (where appropriate). Paint, besides its colourful aesthetic contribution, also protects wood from both water penetration and ultra-violet deterioration caused by sunlight.

There might be wooden heritage buildings which traditionally were not ever painted. These buildings require special care in their maintenance. Careful attention to how water is shed is important with all building elements (siding, trim, etc.) firmly attached. Sometimes, planting deciduous trees a short distance away from the building on the sunny exposures can shade hot summer sun, lessening direct heat and ultra-violet light damage to the woodwork, as well as slowing driving rain. Deciduous trees will lose

their leaves in winter (clear the gutters!) and allow drying winter sun through bare branches.

Log buildings are susceptible to damp rising through sill logs, especially when they sit directly on earth. Site drainage must be vigilantly maintained in these cases, keeping the area around the log building as dry as possible.

It seems regrettable, but inevitable, that unpainted wooden buildings will require replacement of exterior wall material more frequently than painted wooden buildings.

The walls of masonry buildings have their own maintenance requirements.

Cracks must be carefully checked for age and cause. Bulges in masonry walls usually are indications of dangerous structural stress or failure, and require further professional investigation.

Pointing between bricks and stones should be checked by a competent mason to prevent water ingress into the wall.

Any decorative projection or window sill in the wall of a masonry building may be the entry-point for water. All such areas need to be carefully checked and properly flashed or sealed.

Heritage buildings often have a lesser-grade of brick used on rear facades. Sometimes this brick was intended to be always painted to prevent water absorption. In these cases, maintenance can include repainting if it does not obscure or cover a heritage feature such as an old painted sign on the masonry wall.

Sandblasting should never be used to clean an historic masonry (or wood) building.

Always remember that the fourth Principle of Heritage Conservation states that minimum intervention ensures maximum preservation of original physical fabric, and should therefore be the guiding principle behind all maintenance work on a heritage building.

7.4. Windows

Windows in heritage buildings are generally designed along traditional lines to shed water from blowing rain. Maintaining the original design of the windows is an important part of heritage preservation.

Windows, both because of their several materials (wood, glass, putty, cords and weights or hinges) and their moving parts, are susceptible to deterioration.

Vigilant maintenance of windows usually requires semi-annual or annual attention to ensure all the putty is intact - with a paint covering - to shed rain water. Wood sash on older buildings often shrinks with age, giving rise to rattling windows and drafts into living spaces. This common nuisance can often be cured by a competent woodworker by repositioning and tightening the wooden window stop moulding and, at the same time, taking the opportunity to rehang weights, and oil pulleys or hinges.

In the case of rotten sash, matching sash identical in size, thickness, moulding profile and construction can be made and installed using original hardware.

For installing glass, traditional linseed oil putty is a compatible material to wood sash, with a boiled linseed oil primer applied to the sash prior to puttying.

Exterior window sills are often worn and cracked. They can usually be stabilised, puttyed and painted. Sometimes they require replacement. The original sills are often made of large size lumber. Try to match the original design and lumber size and do not be tempted to build up the sill from pieces of smaller lumber.

Occasionally, a good quality long life paintable caulking is useful for sealing the many joints around a window frame prior to painting. Be careful not to seal the window itself shut, or to seal the exterior sash pockets on double hung windows which are designed to be removable for rehangng weights installed inside the window frame.

7.5. Doors

Of all building elements doors are most subject to wear. Original doors are stylistically

important to the heritage nature of the building; they have to function well at keeping weather out and also have to act as a security barrier.

Maintaining doors, as with any item that is frequently used, is an ongoing process. Ensuring that hardware (hinges, handles, locks, letter boxes) is all oiled and functioning properly is important. Sometimes the lock stile of an original door is split or has shrunk preventing a tight fit in the door frame. If required, a new stile can be fitted, thereby preserving as much of the original door as possible.

In cold-weather or exposed locations, a carefully designed, mostly glass, storm door can provide extra weather protection while preserving and protecting the original door itself.

7.6. Hardware

Original hardware on a heritage building can be viewed as the 'jewelry' of the structure.

Accordingly, careful attention to hinges, handles and locks can be rewarding. Most hardware on heritage buildings has been painted over or caked with dirt inside and out. Careful cleaning and polishing usually renews original hardware, which is frequently surprisingly robust.

If hardware is missing or irreparably damaged, there are mail order companies and shops specialising in replacement period hardware.

7.7. Protecting Heritage Features

Heritage buildings often have special features that are integral to the value of the structure.

These heritage features can be of many different materials, and fulfil many functions. It is essential that they are maintained with the building itself.

Heritage features could include such diverse elements as: flagpoles; clocks; historic signs (electric, painted wood, painted on glass, painted on exterior walls); benches; canopies; and garden features including gates, fences and planters.

It is important to identify the significant heritage features of each building in the building file or inventory so there is a clear understanding of what elements of the heritage building are to be maintained and preserved.

8. THE MANAGEMENT OF MAINTAINING HERITAGE BUILDINGS

The cost of maintaining a heritage building is often seen as an expense which can be cut at almost every turn.

It is more cost efficient for the long-term maintenance of a heritage building to have continuous care and attention by competent people, than to have changing contract workers with no long-term interest or commitment in the building.

Staff members or maintenance workers should be empowered by management to effect immediate repairs when required or noticed (to a pre-approved level) rather than waiting for work requests, budget approvals and repair directives. The efficiency achieved in this type of maintenance ensures the best preservation for the building as well as less of a drain on the manager's time.

The manager should also ensure separate budgets are established for running costs of the heritage building (heat, light, security, cleaning, etc.) and for maintenance (gutter cleaning, painting, roof repair, etc., and replacement of same). If budgets are not established in this manner, maintenance is the first to lose financial support

9. A MAINTENANCE PROGRAM

Establishing a maintenance program allows the planning of appropriate staffing levels for each

component task. Maintenance plans are usually broken down into the following categories, with associated tasks listed. (These tasks should be viewed as basic guidelines, to be altered or added to in order to fit a particular heritage building.)

9.1. Daily

- 9.1.1. Observations noted during cleaning (cracks, damp, dripping pipes, malfunctioning hardware, etc.) to be noted in log book or building file.
- 9.1.2. Check electrical systems and fire protection systems.
- 9.1.3. Security. Check that doors and windows are locked and all keys returned from workers.
- 9.1.4. Usual cleaning, as required.

9.2. Weekly

- 9.2.1. Clean gutters during periods of heavy leaf or needle fall.
- 9.2.2. Clean air filters and locks, as necessary.
- 9.2.3. Check all automatic fire alarm and security devices.

9.3. Monthly

- 9.3.1. Have all rainwater gutters, downspouts, drains cleaned out.
- 9.3.2. Lubricate any mechanical heating, pumps, etc., as required.
- 9.3.3. Monitor the building file on log books for additions or attention required.

9.4. Quarterly

- 9.4.1. Inspect roofs inside and outside including gutters, valleys, downspouts, etc.
- 9.4.2. Check all windows, clean glass, check putty and paint.
- 9.4.3. Check doors for closing and locking.
- 9.4.4. Clean light fittings.

9.5. Semi-annually

- 9.5.1. Thorough cleaning of gutters and downspouts (spring and fall) to cope with winter rains and summer storms.
- 9.5.2. Check fire alarms and fire drills for escape and fire fighting.

9.6. Annually

- 9.6.1. Clean out of all perimeter drains and rainwater systems.
- 9.6.2. Overhaul electric system; change light bulbs and tubes.
- 9.6.3. Check all sprinkler systems.
- 9.6.4. Check all fire extinguishers and access to them.
- 9.6.5. Touch up worn paint on the building exterior.
- 9.6.6. Oil all locks, hinges, etc.
- 9.6.7. Service all mechanical units, including heat/air conditioning/pumps/elevators, etc.
- 9.6.8. Test lighting rods and conductors.

9.7. Quinquennially

- 9.7.1. A full inspection and report should be undertaken every five years.

9.8. As required

- 9.8.1. Storm Inspections--After any storm, inspection must occur for any damage. Gutters and roofs need to be checked and cleaned.
- 9.8.2. Major Maintenance Work--Repainting; re-roofing; gutter, downspout and drain replacement; replacement of deteriorated building materials; etc., etc.

10. DERELICT HERITAGE BUILDINGS

Occasionally, it is desirable to focus stabilisation and maintenance efforts on a heritage building that has been empty for a length of time.

In these cases, it sometimes is not an option to carefully formulate a maintenance plan. There are often strict budget considerations, ownership problems, future uses to be determined, possible structural or code considerations to be dealt with, or even broad planning issues to be resolved.

In the meantime, it is necessary to prevent any further deterioration of the heritage structure. Keeping the building dry; safe from vandals and arson; and secure from theft of valuable architectural elements are all matters for immediate action.

Keeping the building dry may require minor repairs or replacement of gutters and downspouts; roof repairs; or, failing that, temporary covering of leaking areas by large waterproof tarpaulins. Ensuring drains, both inside and outside the building are running free is imperative. Much damage to derelict heritage structures is done by vandals. To prevent such damage, several methods of protection can be used:

- 10.1. Securing access to the building by locking all doors and windows is a good start.
- 10.2. The second line of defence is to fix plywood to all doors and windows from the exterior, being careful not to split or otherwise damage exterior mouldings or window frames.
- 10.3. A further line of defence is more expensive but effective. Installation of chain-link fencing and security lighting is occasionally a necessary deterrent as is the employment of security guards, depending upon the severity of risk to the building. Known instances of heritage structures being the target of arson attacks suggest that a fire alarm system and/or on-site guards may aid in preserving the building in cases of extreme threat such as this.

Securing doors and windows against entry is often seen as taking reasonable precautions against threats to derelict heritage buildings. However, the rare and detailed construction that makes up a heritage building is often the target for thieves as well. Doors, mantels, porch posts, newel posts, hardwood floors, stained glass windows, wood “gingerbread”, tiles, metal roofs, copper wiring and more have all been targets for theft.

A building can be irrevocably stripped of its important and valuable heritage elements in as little as an afternoon or an evening, pointing up the real necessity for securing the site.

11. MAINTENANCE AND DISASTER PLANNING FOR HERITAGE BUILDINGS

Disasters such as earthquakes, floods, and fire can destroy or severely damage heritage buildings.

In the emotionally charged and often disorganised aftermath of a disaster, damaged heritage buildings can often be lost as they are red-tagged as “unsafe” by overworked building inspectors and other officials.

Heritage buildings are often so important within a community that they are worth extra effort and expense to stabilise, maintain and eventually restore them after a disaster. The task is to prevent premature demolition until cooler heads can prevail, and appropriate planning commence.

Heritage interests would be better served by meetings with the building inspectors and other

officials prior to a disaster, to establish parameters and procedures on how to deal with heritage buildings in the event of a disaster.

After preservation procedures are established and public safety concerns are met, then the damaged heritage building can be maintained until repair/restoration/reconstruction can take place.

Maintenance procedures for a building in this situation would be based on those for “Derelict Heritage Buildings” and varied, as necessary, according to the damage suffered by each building.

With prior planning, appropriate construction materials should be stockpiled for use in repairing minor damage caused by a disaster. Rolls of plastic, hammers, nails, lath, etc. would be useful in such an event. For major damage, however, it is necessary to plan for sources and supply of building materials to be available when disaster strikes.

Protecting Heritage Buildings from Disasters is a specialised management area. See the Bibliography for further information.

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