هيئة كفاءة الإنفاق والمشروعات الحكومية
Expenditure Efficiency & Projects Authority

# National Manual of Assets and Facilities Management
# Volume 6, Chapter 24

# Building Fabric Maintenance Plan

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## 1.0 PURPOSE

The purpose of this document is to assist the Entity to form a Building Fabric Maintenance Plan that meets the needs of their Facility. It will articulate those elements that fall under Building Fabric and provide a definition of what constitutes Building Fabric. It will also provide the Entity with key considerations to be included in building maintenance to enable the Entity to determine those activities they should include to ensure that their investment in assets retain their value.

For the purposes of this document, the suggested definition of 'Building Fabric' is:

*The physical material of a building or a structure including components, fixtures, construction materials and finishes.*

This will, therefore, include the materials and components that comprise the physical external envelope of the building, such as roof, floor slabs, walls, windows, doors, external cladding, insulation, and finishes. It will also include internal elements, such as internal walls, partitions, wall finishes, floors and floorcoverings, ceilings, doors (including fire doors), void areas and confined spaces.

## 2.0 SCOPE

This document is applicable to the following six existing facilities/types of building structures:

- Healthcare
- School and Universities
- Office Facilities
- Municipal Facilities
- Housing Facilities
- Parks and Recreational Building Facilities

It is easier to define Building Fabric by what is excluded from the definition. Mechanical and electrical systems are the primary elements within a building that are not part of Building Fabric because they have their own MEP maintenance plans, and these can be found elsewhere in Volume 6 of the National Manual of Assets and Facilities Management.

The typical structural and non-structural components of building fabric are shown in Figure 1 below:

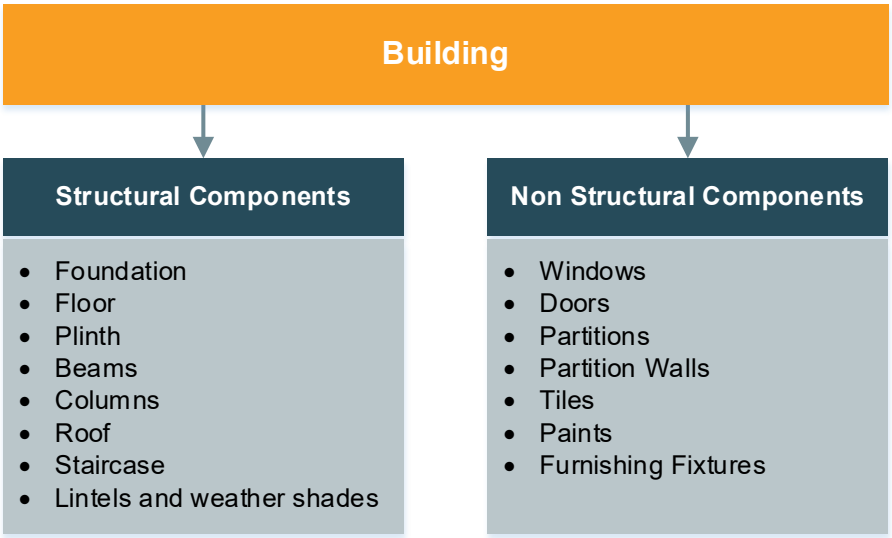


**Figure 1 – Structural and Non-Structural Components of Building Fabric**

Building Fabric Maintenance has often been seen historically as a reactive task. However, this can lead to the deterioration of an Entity's Facility over time, a subsequent reduction in its value, a more significant expense to bring the Facility back up to standard, as well as impacting on the quality of the user experience for visitors and staff or occupants.



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This reactive approach almost inevitably leads to higher costs to replace elements of the building(s) with increased frequency. Consequently, more building owners are now looking to move to a model that protects and maintains the values of their asset investment in the longer term.

This document is designed to assist the Entity in developing a Building Fabric Maintenance Plan suitable to its own needs, by providing the Entity with a framework to enable it to consciously make choices concerning its Facility with a clear understanding of the impact their decisions entail.

It will assist the Entity in understanding their obligations in relation to planning Building Fabric maintenance and provide guidance and information to enable an Entity to make informed decisions about the Plan. It is possible that an Entity that has multiple buildings under ownership or occupation may choose to exercise different plans in different facilities, based on the individual circumstances at each location.

One of the more important considerations in determining the levels of Building Fabric maintenance is the impact that standards have on the perception of building occupants and visitors as well as other members of the public. The public perception of an Entity may or may not be important to the Entity, but meeting the needs and expectations of its stakeholders can have an impact on the stakeholders' perception of the premises they occupy or visit. A well-maintained building, with a favorable environment, will often produce more productive occupants.

## 3.0 DEFINITIONS

| Term | Definition |
|---|---|
| Asset Management System (AMS) | A generic term to cover all types of computerized systems capable of meeting Expro requirement |
| Building Fabric | The physical material of a building or a structure including components, fixtures, construction materials and finishes |
| Cleaning (referred to in CDM under 'construction') | Cleaning activity undertaken to building fabric that involves the use of water, an abrasive at high pressure, or corrosive or toxic substances |
| Contractor | Company (or companies) undertaking the maintenance activities |
| Envelope | The outer skin of the building, including the outer walls and all externally placed components attached to or supported by the outer walls, as well as any external supports required by the outer walls of the stand-alone structure |
| Equipment | An item or items necessary or recommended to ensure the safe and easy execution of a task (i.e., special tools/apparatus/gear used ) |
| Ethylene Tetrafluoroethylene | 'Teflon' like material used as a roof covering |
| Operative | Final user/operator of the equipment |
| Plan | A detailed proposal for doing or achieving something |
| Stakeholders | Any individual who has an interest in or is affected by Building Maintenance activity, whether the Entity client, contractor or occupier |
| **Acronyms** | |
| ACI | American Concrete Institute |
| ACR | Asset Condition Reporting |
| AISC | American Institute of Steel Construction |
| AM | Asset Management |
| ANSI | American National Standards Institute |
| ASCE | American Society of Civil Engineers |
| BESA | Building Engineering Services Association |
| BMS | Building Management System |
| BRE | Building Research Establishment |
| BS | British Standard |
| CM | Corrective Maintenance |
| CMMS | Computerized Maintenance Management System |
| COSHH | Control of Substances Hazardous to Health Regulations (2002) COSHH |



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| | |
|---|---|
| ETFE | Ethylene Tetrafluoroethylene |
| FM | Facilities Management |
| H+S | Health and Safety |
| HASAWA | Health and Safety at Work Act (1974) |
| HSQE | Health, Safety, Quality and Environment |
| HSSE | Health, Safety, Security and Environment |
| IBC | International Building Code |
| ICC | International Code Council |
| ISO | International Standards Organization |
| KSA | Kingdom of Saudi Arabia |
| MEP | Mechanical, Electrical and Plumbing |
| MEWP | Mobile Elevated Work Platform |
| MHSWR | The Management of Health and Safety at Work Regulations (1999) |
| NMA&FM | National Manual of Assets & Facilities Management |
| PM | Preventative Maintenance |
| POWRA | Point of Work Risk Assessment |
| PPE | Personal Protective Equipment |
| PM | Planned Maintenance |
| PUWER | Provision and Use of Work Equipment Regulations (1998) |
| RAMS | Risk Assessment & Method Statement |
| RFP | Request for Proposal |
| RICS | Royal Institute of Chartered Surveyors |
| RIDDOR | Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013) |
| SBC | Saudi Building Code |
| SEI | Structural Engineering Institute |
| SFG | Service and Facilities Group |
| TMS | The Masonry Society |
| UV | Ultraviolet |
| WHSWR | The Workplace (Health, Safety and Welfare) Regulations (1992) |
| WMC | Work Management Center |

**Table 1 – Definitions**

## 4.0 REFERENCES

Maintenance, repair, and alteration of all existing building structures shall be based upon the requirements of this subsection and existing buildings standards; these standards shall be extracted from the International Building Code (IBC) and Saudi Building Code (SBC). The Entity and the contractor are responsible for demonstrating compatibility between SBC and IBC requirements.

The material building codes and standards for all structures shall be governed by those versions referenced by the SBC's and IBC's. Where a code or standard is not referenced by SBC or IBC, but is referenced by a material building code, the adopted version of the code shall be used. If a later version of a code or standard has provisions which improve the safety or quality of maintenance, repair and alteration, such improvements may be implemented with prior approval of the Entity or regulating authority.

Adopted codes for existing building-type structures include:

**Saudi Building Code (SBC):**

| Codes | Description |
|---|---|
| SBC 301 | Loads and Force Requirements |
| SBC 302 | Testing and Inspection Requirements |
| SBC 304 | Concrete Structures Requirements |
| SBC 305 | Masonry Structures Requirements |



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| | |
|---|---|
| SBC 306 | Steel Structures Requirements |
| SBC 901 | Existing Buildings |

**Table 2 – Saudi Building Codes**

**International Code Council (ICC):**

| Codes | Description |
|---|---|
| ICC IBC | International Building Code |
| ICC IEBC | International Existing Building Code |
| ICC IRC | International Residential Code for One-and Two-Family Dwellings |
| ICC IPMC | International Property Maintenance Code |
| ICC IECC | International Energy Conservation Code |
| ICC ICCPC | Performance Code for Buildings and Facilities |

**Table 3 – International Code Council (ICC) Building Codes**

**Structural Engineering Institute/American Society of Civil Engineers (SEI / ASCE):**

- SEI/ASCE11-99 Guideline for Structural Condition Assessment of Existing Buildings
- ASCE 30 Guideline for Condition Assessment of the Building Envelope
- ASCE 31 Seismic Evaluation of Existing Buildings

**American Concrete Institute (ACI):**

- ACI 546R-14: Guide to Concrete Repair
- ACI 562-19: Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures and Commentary
- ACI 201.1R-08: Guide for Conducting a Visual Inspection of Concrete in Service
- ACI 352-13: Guide to the Code for Evaluation, Repair, and Rehabilitation
- ACI 530/530.1: Building Code Requirements and Specification for Masonry Structures and Companion Commentaries

**American Institute of Steel Construction (AISC) and American National Standards Institute (ANSI):**

- ANSI/AISC 360-16 Specification for Structural Steel Buildings Appendix 5 Evaluation of Existing Structures and Section N Quality Control and Quality Assurance
- ANSI/AISC 303-16 Code of Standard Practice for Steel Buildings and Bridges
- Masonry Society – Guide for Condition Assessment of Masonry Façades

**American Society of Civil Engineers – Structural Engineering Institute (ASCE/SEI):**

- ASCE 5/ACI 530 Building Code Requirements for Masonry Structures

**The Masonry Society (TMS)**

- TMS 402/602 Building Code Requirements and Specification for Masonry Structures, 2016

**Building Research Establishment (BRE)**

- Good Building and Good Repair Guides – 2013: BRE

**Building Engineering Services Association (BESA)**

- Service and Facilities Group - SFG 20 (doc. 20)

**British Standards (BS)**

- BS 8210:2012 Guide to Facilities Maintenance Management
- BS EN 13306:2010 – Maintenance – Maintenance Terminology
- ISO 9001: 2015

**UK Safety Legislation**

The following 6 items are UK safety legislation, and while adherence to these in the UK is obligatory, their inclusion here in the list of references and throughout this document is designed to offer the Entity the opportunity to adopt the highest standards of safety as part of their Plans and Procedures. They should not be considered as anything other than a recommendation to the Entity of what constitutes international best practice:



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- Health and Safety at Work Act 1974 (HASAWA)
- The Management of Health and Safety at Work Regulations 1999 (MHSWR)
- The Personal Protective Equipment Regulations 1992 – as amended (PPE)
- The Provision and Use of Work Equipment regulations 1998 (PUWER) (Regulation 5 and Regulation 22)
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 – as amended (RIDDOR)
- The Workplace (Health, Safety and Welfare) Regulations (WHSWR) 1992

**Saudi Safety Legislation**

- The Implementing Regulation of the Saudi Building Code Issued by the Royal Decree No. (M / 43) dated 26/04/1438H

## 4.1 Related Chapters/Volumes

The Entity/contractor should refer to the following relevant volumes, chapters, and sections of the National Manual of Assets and Facilities Management for further guidance when compiling structural and non-structural components of building structure maintenance plans.

- Volume 2, Chapter 3 – Computerized Maintenance Management System (CMMS)
- Volume 3, Condition Assessment/ Inspection
- Volume 6, Chapter 3 - Section 2 – Preventative Maintenance Plans
- Volume 6, Chapter 3 - Section 3 – Predictive Maintenance Plans
- Volume 6, Chapter 4 – Developing Maintenance Plans
- Volume 6, Chapter 24 – Building Fabric Maintenance Plans
- Volume 7, Work Control
- Volume 8, Chapter 7 – Equipment and Tool Control
- Volume 10, Health, Safety, Security and Environment (HSSE)
- Volume 11, Quality Execution
- Volume 11, Quality Assurance Audits

# 5.0 RESPONSIBILITIES

Each Entity shall determine the basis on which they wish to operate their facility, based on the key components of their decision making and personnel structure.

## 5.1 The Entity

The Entity shall ensure that**:**

- The Entity's Policy on Building Maintenance is established, understood and maintained
- The Entity is compliant with the legislative, regulatory and contractual requirements of the occupation of the Facility
- Compliance with the policy is embedded and cascaded to all elements of their, or their occupiers' organization
- There are systems in place to monitor compliance and report progress

## 5.2 The Entity Director

The Entity Director at a Facility shall ensure that:

- The building maintenance takes place in a structured and manage environment, with due attention to the impact on premises and the safety of its users, and visitors
- Audits of Contractor performance take place at defined frequencies with reports provided to Entity senior management



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- Regular liaison and communication with local community leaders takes place in order to measure and monitor feedback from the general public
- Regular liaison and communication with the Facility takes place in order to measure and monitor feedback from the facilities provided

## 5.3 Facilities Manager

The Facilities Manager (FM) at a Facility shall ensure:

- Compliance with the requirements of statutory legislation and Entity policies
- Staff, whether directly employed or provided by subcontractors, are inducted and trained, including any site-specific training required by the Entity. This includes specific induction training
- Staff involved in delivering Building Maintenance services have received the appropriate information, instruction, and training to ensure the safe execution of work
- All training activity is recorded and any refresher training needed is carried out at the specified frequency
- Formal, written Risk Assessments and Method Statements (RAMS) are in place for all work activities
- Staff comply with policies, procedures, and safe systems of work

## 5.4 Facilities Management Health Safety Quality and Environment Officer

The Health Safety Quality and Environment (HSQE) Officer at a Facility shall ensure:

- Compliance with the requirements of statutory legislation and Health Safety Quality and Environment policies
- Appropriate RAMS are in place for all work activities being undertaken by operatives
- Regular reviews of staff safety performance, including use of Point of Work Risk Assessment (POWRA), are carried out
- Staff and Contractors are operating in a safe manner and in accordance with specified operating procedures
- Regular reviews of work equipment are undertaken to ensure their safe performance
- Personal Protective Equipment (PPE) is issued to all operatives and is in serviceable and safe condition for use
- Regular Toolbox Talks are conducted to reinforce the importance of working safely

## 5.5 Supervisors

Supervisors shall ensure that:

- Operatives' work activities are monitored to ensure that tasks are completed in the anticipated time
- Operatives comply with Safe Working Procedures and adhere to the specified activities outlined within the Procedure
- Any deficiencies in safety performance are reported, reviewed, and investigated, where, necessary
- The resources allocated to emergency Reactive Work Requests are sufficient to ensure Stakeholder satisfaction
- Resources are available to meet the needs of work schedules and to plan coverage in the event of planned or unscheduled absences

## 5.6 Operatives

Operatives shall ensure that they:

- Cooperate with all reasonable instructions in relation to their work activity
- Precisely follow the steps in Risk Assessment and Method Statements (RAMS)
- Wear the appropriate PPE at all times for each work activity
- Report completed work activity to the Work Management Center (WMC) to enable the rapid closure of both Planned and Reactive work tasks



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## 6.0 PROCESS

The process of creating a Building Fabric Maintenance Plan is illustrated in Figure 2 below:

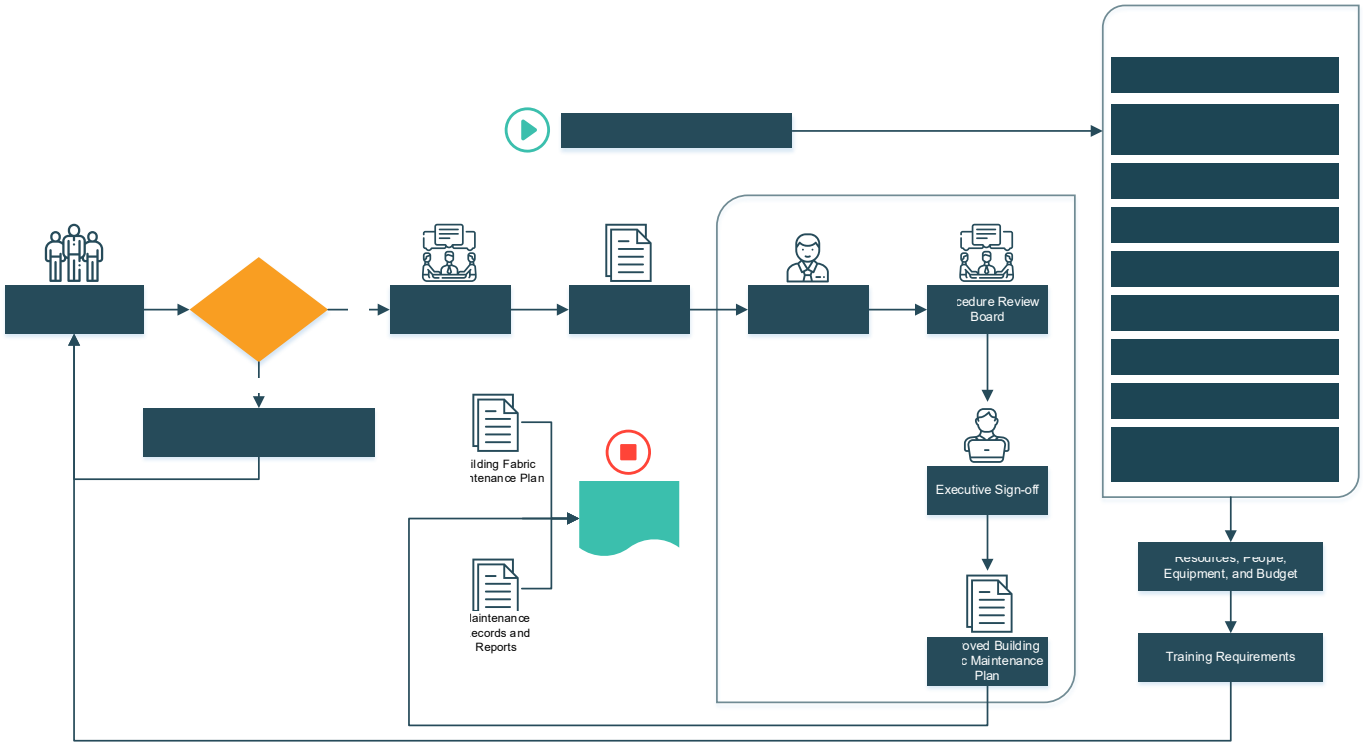


**Figure 2: Building Fabric Maintenance Plan Preparation Process**

The steps comprise:

- Kick-Off Workshop
- Identify Obligations & Compliance Requirements
- Identify Building Fabric Elements
- Identify Budget
- Occupational Health & Safety Requirements
- Building Drawings & Site Maps
- Identify Human Resources
- Identify Tools & Equipment
- Create Inspection & Maintenance Schedules
- Establish Audit Frequency & Content

The first stage of building the plan is to conduct a kick-off workshop, attended by Stakeholders from the Entity, the building occupants (if different from the Entity), and the Maintenance Service Provider.

The Plan Writer shall record Minutes of Meeting for later review to assist in drafting the Plan, and for Quality Audit purposes.

### 6.1 Kick-Off Meeting

In the kick-off workshop Stakeholders shall, as a minimum:

- Agree upon the purpose of the Plan (targets and strategies, aims, key components, and outcomes)
- By means of a flowchart, define a process which shall drive the Plan (i.e. outline the steps which the Procedure should follow)



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### 6.1.1 Targets and Strategies

Targets and strategies within a Building Fabric Maintenance Plan should include the methods for achieving them, communicating progress, and a mechanism for continuous improvement. Targets shall be suitably quantified to be used as input for Key Performance Indicators (KPIs) and shall aid performance reporting. Targets contained within a Building Fabric Maintenance Plan may include, for example:

- Reducing the number of building fabric-related reactive work orders
- Reducing the manpower headcount over time
- Achieving best-practice certification and/or reporting compliance
- Establishing a Waste Management value chain involving materials, Contractors, and transportation

Stakeholders whose activities impact Building Fabric Maintenance should also be considered in the development of an Entity's targets, including:

- Reduced accidental damage to furniture and fittings
- Departmental inspections
- Reporting of concerns about the safety of building fabric elements

## 6.2 Determine and Confirm Obligations & Compliance Requirements

The Entity needs to establish the extent to which they wish to follow the requirements of the legislative/regulatory instruments identified below. It should determine whether it wishes to ensure that the contents of its Building Fabric Maintenance Plan adhere to these requirements in the following legislative instruments. The following legislation, which is applicable in the UK, and incorporates requirements laid down by the European Union, has been demonstrated to produce a safer working environment, contribute significantly to the reduction of workplace hazards, and produce a marked improvement in the incidence of workplace incidents and accidents. Therefore, while there is no obligation on Entities to follow the requirements of non-KSA legislation, it is highly recommended as best practice.

### 6.2.1 Health & Safety and General Guidance

The following sub-sections are not intended to provide detailed Health & Safety Guidance to Entities. They provide a brief distillation of the requirements of the various legislation cited and the Entity should seek further guidance from other relevant Chapters and Sections of the National Manual of Assets & Facilities Management that are mentioned in each of the sub-sections below.

### 6.2.2 The Health and Safety at Work Act (HASAWA)1974

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10. HASAWA places obligations on an employer or building owner to ensure that it is a safe workplace for employees and visitors, and that it provides information, instruction and training to its employees and visitors to ensure their safety (with which they are required to co-operate). It also requires an employer to provide safe ingress and egress.

The requirement for a 'safe workplace' entails that the Entity demonstrate that appropriate safety measures are being observed and implemented. This is best achieved by having a clear Health & Safety Policy in place, along with Risk Assessments to assess any risks associated with the activities that take place in the premises. It is also achieved by being able to demonstrate that maintenance is being undertaken and that maintenance activity is recorded. This documentation is an essential element of all Building Maintenance Plans because it validates the Entity's commitment to universal safety and underpins all of the activity associated with Building Fabric Maintenance.

### 6.2.3 The Workplace (Health, Safety and Welfare) Regulations (WHSWR) 1992

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10. WHSWR covers such elements as ventilation, temperature, lighting, cleanliness, room dimensions, workstations and seating, floor conditions, falls or falling objects, transparent and translucent doors, gates and walls, windows, skylights and ventilators, traffic routes, escalators, sanitary



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conveniences and washing facilities. Although some of these elements fall under Mechanical, Electrical and Plumbing maintenance (MEP), many are related to the safety and integrity of the building fabric.

This legislation, if followed, creates the framework for the Entity's Building Fabric Maintenance Plan because it directs the Entity to consider the premises as a workplace, and places obligations on an Entity to maintain the safe condition of that workplace.

### 6.2.4 Contractual Obligations

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 9. If an Entity is the premises owner, their obligations may differ from those of a building occupier, as the responsibilities for building upkeep may reside elsewhere.

As a tenant, it is possible that contractual obligations may stipulate requirements for the upkeep of the premises. This is especially likely when the premises are licensed for occupation for a lengthy period. This would also need to be considered if an Entity is the owner of a building and licensing its occupation to a third party. Some or all of the responsibility and costs can be passed on to the occupier or can be recharged to the occupier by way of a building service charge.

The basis of occupation is also a likely impact on the decision as to the level of risk to be tolerated. If the Entity is an owner-occupier, they will be more likely to take the long-term health of the building into consideration than if they are a short-term occupant. If the Entity is a tenant, they may have obligations under their contract for occupation.

## 6.3 Identify Building Fabric Elements

### 6.3.1 Service and Facilities Group (SFG) 20

SFG 20 is the definitive standard for building maintenance which is essential in helping contractors, building owners and anyone responsible for maintenance to understand the parameters they are working within, and is instrumental in delivering cost and efficiency savings.

SFG 20 is a standard methodology for maintenance that assists industry professionals in setting realistic lifecycle maintenance budgets and provides consultants, contractors, building owners and FMI Managers with reliable and accurate maintenance requirements for buildings.

SFG20 comprises schedules for every aspect of building management, including Building Fabric Maintenance.

A template for the full list of Building Fabric elements envisaged by SFG 20 is provided in Attachment 1.

In accordance with SFG 20 guidance, a color-coded criticality rating is used to establish a clear prioritization of tasks to streamline budget and reflect Entity risk appetite.

However, in compliance with Royal Decrees, Local Standards, and Regulations, and to ensure consistency of approach in the Entity's decision-making process associated with the operation and maintenance of facilities, the four colors from the SFG 20 methodology have been applied respectively, to the four tiers of linguistic classification used within the NMA&FM as follows:

- **Shall**. This is a mandated instruction which must be followed or adhered to (e.g., a Royal Decree, in country standards such as the Saudi Building Code)
- **Should**. This is an instruction or piece of information which is important and, while it may not be mandated to follow the advice, it is advisable to follow (e.g., international standards which are considered legislation in other countries)
- **Consider**. This refers to advice or an instruction which is considered to be important, is worth following, and fits well for the purpose intended



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**Advise**. This generally refers to good practice and entails practical advice intended to raise standards and enhance quality

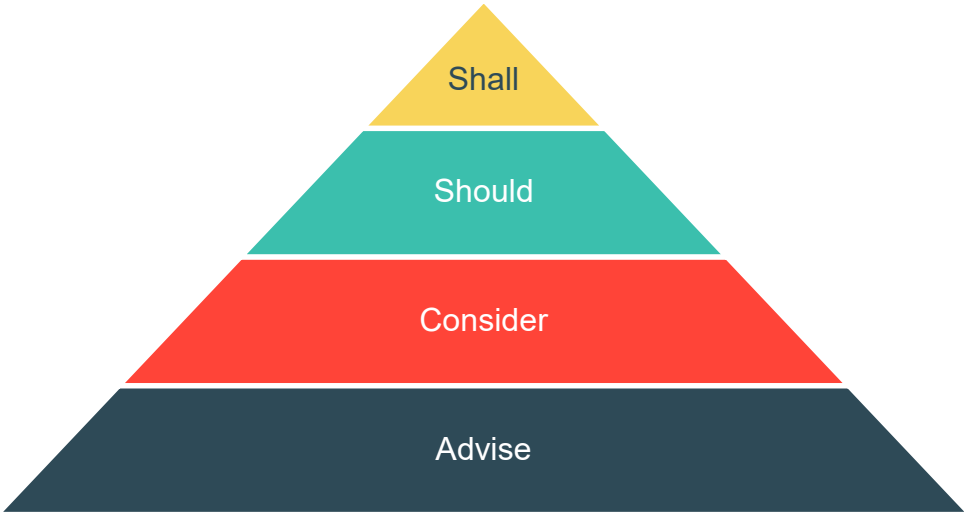


**Figure 3: The 4 Tiers of Linguistic Classification**

## 6.4 Identify Budget

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volumes 4 and 9.

This document assumes that the Entity will employ a specialist Facilities Management Contractor rather than employ their own direct labor organization. Industry best practice entails the acknowledgement of the risk associated with the work being passed to a knowledgeable and experienced contractor.

The Entity will need to determine its available budget for Building Fabric maintenance. Often an Entity may not be aware of the costs to be considered and should either consult professional cost surveyors from the Royal Institution of Chartered Surveyors (RICS), or a similar body of professional consultants, to establish a budget.

The level of an Entity's risk appetite is often directly related to the size of their budget. A significant budget means that most Building Fabric maintenance risks can be mitigated. The costs of ongoing building fabric maintenance should not be underestimated. Deterioration in the condition of an asset is not linear with the costs required to return the asset to an acceptable condition, as the costs of restoring an asset increase the longer the deterioration continues.

It is important to recognize that creation of a budget will require a realistic view of likely costs. Although a procurement process can deliver savings to an Entity's budget, it is important to be aware that the cheapest price may not always offer the best value.

A Request for Proposal (RFP) should seek to benchmark and standardize the responses the Entity receives from potential Contractors.

It is also important to recognize that short-term savings in the operating budget may not prove a worthwhile investment over time and may have an adverse impact on future capital expenditure. It may be that the Entity has a fixed budget available that does not meet the true cost of operating the building maintenance at a Facility. If this is the case, the Entity should consult a trusted contractor to ensure that the budget is spent wisely.



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## 6.5 Occupational Health & Safety Requirements

### 6.5.1 General Safety Obligations

Detailed guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10.

The Entity and the Contractor have a Duty of Care to ensure that their maintenance activities do not cause harm to others. This includes safe access and egress of premises users during these operations.

Only trained and authorized employees must be permitted to operate vehicles and equipment. Staff must be provided with suitable information, instruction, and training in the use of equipment.

First aid supplies must be made available on site for injuries that may occur at the workplace and its location must be known to all employees.

Incidents, accidents and near misses must be recorded, investigated and reviewed for any 'lessons learned' to ensure recurrence is mitigated.

Further guidance on HSSE and environmental protection may be obtained from Volume 10 of NMA&FM.

Building fabric maintenance involves several hazards that can cause harm. These can include, for example, working at height, use of hand tools and equipment, and working in heat.

### 6.5.2 Working at Height

Detailed guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10.

Reasonable care shall be taken when working from ladders or on rooftops. The risk of injury from falls is a significant one to operatives. Wherever possible, working from rooftops should be avoided and working from ladders should be replaced by a more appropriate method such as a Mobile Elevated Work Platform (MEWP) using a scissor lift or similar.

Working at height always requires a formal risk assessment rather than a POWRA. When power lines are in the work vicinity, advice should be obtained from the utility supplier. Key observations in the safe execution of working at height are:

- Never work outside the handrails of access platforms, unless a written risk assessment has been conducted by a competent person, and adequate controls are used
- Individual fall protection systems (e.g. safety harness) must be used when higher levels of control are not practicable
- Anyone supporting the activity at ground level should wear a hardhat to protect from the hazard of items falling from an elevated height

### 6.5.3 PPE

Detailed guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10.

PPE must be worn by all Operatives where the RAMS determine it is a requirement. If not provided, the Operative should not undertake the task until it is available. The Facilities Contract Manager/H&S Manager are responsible for ensuring a suitable and sufficient Risk Assessment is in place and that resources are available to provide appropriate PPE for all operatives, as follows:

- Goggles – Operatives must wear goggles to prevent the hazard of sight damage
- Safety footwear – Operatives must wear safety footwear with a steel toecap, to prevent the hazard of impact on the foot by moving machinery or equipment or loads
- Arm and leg protection – Appropriate clothing should be worn to protect the arms and legs, especially to prevent the hazard of injuries while using power tools or sharp-edged equipment. Torn



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or damaged clothing shall not be allowed to be worn, as it poses a hazard of it being entangled in machinery

- Gloves – Gloves must be worn to protect the hand and wrist, both to reduce the hazard of skin irritation and also to minimize the risk of cuts and abrasions
- Dust Masks or respiratory protection – These should be worn by Operatives carrying out a range of activities, including sweeping, mowing, tree-cutting or any activity likely to produce airborne debris
- Ear Defenders – These should be provided to any Operative using noisy, powered equipment that has the potential to cause hearing damage, or for Operatives working in a noisy area, such as a plant room. Ear defenders should be selected based on the noise they exclude. Cheap ear defenders are available but should be avoided because they frequently do not provide adequate, certified protection from noise
- Anti-vibration gauntlets – These should be worn with machinery that is known to generate high levels of vibration if used. Operatives using this kind of equipment for extended periods should be provided either with adequate protection or have their exposure limited

### 6.5.4 Exposure Limits

Detailed guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 10.

Measures to ensure protection against exposure to the following hazards should be accounted for:

- **Noise** – Operatives exposed to consistently high levels of noise should be routinely tested to ensure no lasting damage to their hearing. Operatives should be removed from such tasks if their hearing is demonstrably damaged

- **Vibration** – Operatives exposed to consistently high levels of vibration through the use of powered equipment should be routinely tested to ensure that no lasting damage to their bodies is sustained and that they are removed from such tasks if they are adversely impacted

- **Temperature** – Working outside can expose Operatives to extreme temperatures. In order to ensure that all work is conducted safely, it is vital that the temperatures associated with various seasons and climatic patterns are taken into account when designing work procedures, as follows:

    - Summer – The risk of dehydration when working in the summer heat is high and the hazards associated with dehydration can be significant and, in some cases, severe. Care should be taken to ensure that regular rest and refreshment breaks are given to ensure that Operatives working externally do not dehydrate. Water replenishes the water that has been perspired by the body as a result of physical outdoor activity

    - Care should be taken to ensure that staff are monitored when they are working in extreme heat. Suitable outdoor clothing should also be selected, including head and neck protection, such as wide-brimmed sunhats and Ultraviolet (UV) clothing that contains minerals like zinc and titanium, which protect the Operative from the severe effects of the sun. Operatives should also be provided with high UV factor sunscreen to protect exposed areas of skin

    - Winter – In areas where winter temperatures can decline significantly from their summer highs, Operatives should be provided with clothing to retain the heat and ward off the cold. These can be lightweight fabrics that do not constrict the Operative, and provide protection from the cold by trapping warm air in the fabric close to Operative's skin

### 6.5.5 Incident Management & Reporting

Detailed guidance on this topic may be found in National Manual of Assets & Facilities Management Volumes 10 and 14.

When preparing Building Fabric Maintenance Plans, the FM provider shall ensure that the following steps associated with incident management and reporting are in place:



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- Procedures and associated documentation (i.e. incident registers, reports, follow-up audits, and work instructions) for near misses, incidents or accidents, including incident analysis and trend reporting
- Emergency response including desktop and live simulations to test the operation of the emergency response to a catastrophic incident, e.g. Flood, Structural Walls collapse, terrorist activity or similar. Refer to EOM-ZE0-PR-000002 – NMA&FM Volume 14, Chapter 2: Emergency Management Exercises & Drills

## 6.6 Documentation, Building Drawings & Site Maps

A centralized filing system compliant with ISO 9001:2015 shall be established by the Entity containing, as a minimum:

- Compliance requirements
- Building fabric maintenance procedures, training and awareness, signage, Contractors, and authorizations
- Details of Risk Assessments and Method Statements (RAMS) associated with the work
- A site map and schedule of inspections and other maintenance activities that provides evidence for work that has been undertaken and any corrective maintenance that needs to be carried out as a result
- Auditing and inspection procedures and schedules

### 6.6.1 Asset Management System

It is recommended that the reader also consults the NMA&FM Volume 2: Asset Management for associated Policies, Plans, and Procedures related to Asset Management:

The Entity/service provider should consider adopting an Asset Management System (AMS) incorporating a Computerized Maintenance Management System (CMMS), or similar, in conjunction with the Mechanical Electrical and Plumbing (MEP) system. The AMS should provide asset lifecycle and maintenance management for all asset types on a single platform including the maintenance for structural and non-structural components.

The Entity should consider incorporation of the following key functions/deliverables within the AMS:

- Asset hierarchy and registration by location and type with unique numbering
- Asset and maintenance management, Planned Maintenance (PM) and Corrective Maintenance (CM)
- More accurate matching of competencies with tasks
- Scheduling work, PM/CM
- Automatic ordering of new parts when stock falls to a minimum level
- More efficient warranty monitoring and claim handling
- Automatic alerts to staff when competencies need to be renewed
- The ability to use mobile devices that support remote inspections and fault-finding
- Provision for bar-coding inventory

### 6.6.2 Work Planning and Work Control

It is recommended that the reader consults the NMA&FM EOM-ZW0-PR-000001 – Requesting, Prioritizing, Planning and Scheduling Work Procedure for information pertaining to Work Planning and Work Control

The Contractor should use either a computerized or paper-based work order system to track the following work activities:

- Planned Maintenance Activity
- Reactive Maintenance Activity
- Emergency Maintenance Activity

Features of the Work Order System should include, but not be limited to the following:



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- Asset locations/plans – This should include defined areas of the premises
- Operative details including training and competencies
- Work order content – Including order or reference number, start date time/close date/time, and total man hours
- Risk Assessments or Method Statements to be followed
- Subcontractor details, where used
- Confirmation of work activity completed

A computerized system of work order management and planning should always be the preferred option, because it provides the Entity and the Building Fabric Maintenance Contractor the option of a searchable system that can produce key reporting information.

This can include, but is not limited to:

- Accurate estimation of work time required to assist in resource management and Stakeholder feedback
- Identification of increased usage of certain types of equipment that may indicate a need to amend the maintenance lifecycle of that equipment
- Calculation of seasonal and total costs for maintaining each area of the Facility
- Identification of variations in costs for maintaining similar area or Facility types
- Identification of differences in labor productivity in a particular job classification
- Estimation of number of materials and supplies used per week or per month for better purchasing, and inventory management

An example of a Workflow Procedure for Building Fabric Maintenance is shown in Figure 4 below:

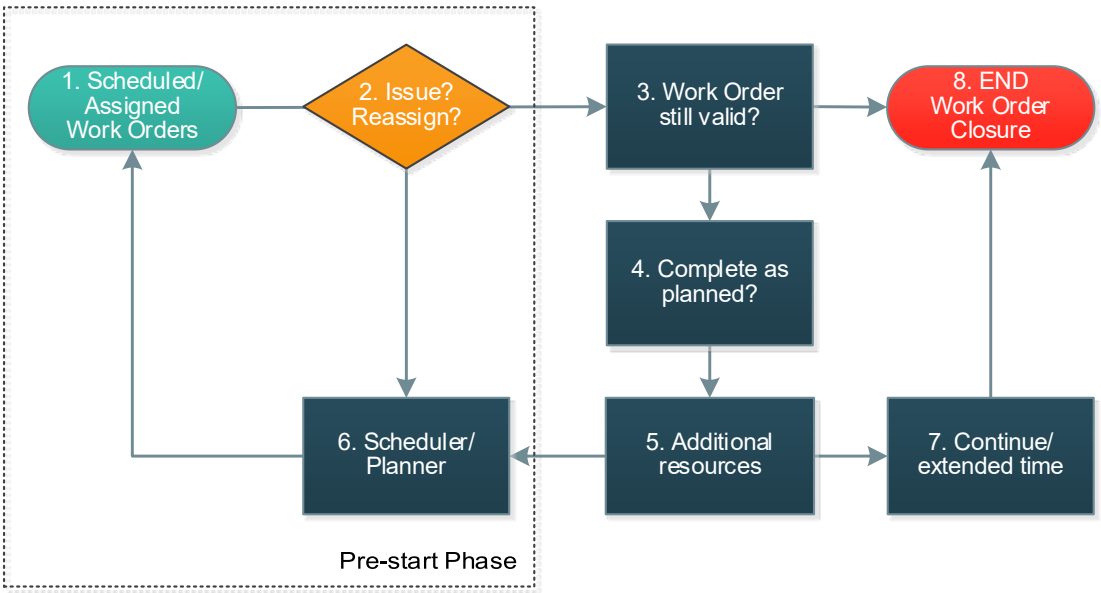


**Figure 4 – Example Workflow Procedure for Building Maintenance**

## 6.7 Identify Human Resources

Resource requirements shall form a critical part of the Building Fabric Maintenance Planning process. A detailed resource planning exercise will help to identify annual budgeting requirements.

The Entity should determine if they wish to employ their own direct labor or use those of a specialist third party contractor. Unless the Entity wishes to invest in the associated costs of employing a direct labor force, it would always be considered more prudent to offset the risks of providing competent manpower to a specialist contractor.



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### 6.7.1 Levels of Competence

Maintenance level refers to the complexity of the maintenance task and therefore drives the skillset level of the maintenance Operative. The maintenance levels associated with building fabric can be described as:

- Basic: Tasks that could be assigned to an unskilled Operative (e.g. training or instruction). Basic tasks are tasks that the Operative is not competent enough to understand the consequences of or make technically and contractually correct decisions on

- Semi-complex: Tasks that require an elevated level of attention to detail or qualified technical skill such as bricklaying or carpentry. Semi-complex tasks require a level of competence that enables the Operative to ascertain when to investigate further or question an instruction, and an ability to objectively and comprehensively describe what work has been carried out or needs to be carried out

- Complex: Tasks that require a high level of understanding of civil and structural engineering, including identifying causes of defects such as corrosion, fracture, etc.

- Competency requirements or skillsets refer to the required experience and knowledge of the maintenance Operative, Inspector, Engineer, etc. Skillset levels associated with building fabric maintenance are described as:

    - Unskilled: Operatives that have acquired on-the-job training, have no formal qualifications, and have limited ability in understanding, analyzing and reporting

    - Semi-skilled: Operatives that have up to five years of good quality work experience, specifically in building fabric inspection, maintenance, and repair and have been assigned increasing levels of responsibility

    - Skilled: Operatives such as degree qualified engineers with several years of relevant experience who can demonstrate continual progression in breadth and depth of knowledge and competence through increased responsibilities

### 6.7.2 Training Requirements

In conjunction with their specialist FM contractor, the Entity shall oversee and agree upon the development of a Training Matrix identifying existing training needs for specialist contractors and any planned refresher dates. This will form the Training Plan.

A Training Plan may also include a schedule of themes for the year, with resources (pamphlets, posters, electronic information, and toolbox talks) to raise awareness regarding building fabric-related issues that will help to improve the condition of the facility.

Resources used to deliver training and promote awareness shall depend on factors including target audience and budget. Simple, clear messaging is essential, preferably using pictures and photos to convey information.

## 6.8 Identify Tools & Equipment

It is recommended that the reader consults the following NMA&FM documents for details regarding the identification of tools and equipment:

- National Manual of Assets and Facilities Management EOM-ZI0-PR-000008 Equipment and Tool Control Procedure
- National Manual of Assets and Facilities Management EOM-ZW0-GL-000003 Equipment Troubleshooting Guide

All tools that are required in the delivery of Building Fabric maintenance should be provided by the Building Fabric Maintenance Contractor.



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The following is an example of some of the trades associated with building fabric maintenance and examples of some of the tools that they are likely to require:

- Carpenter – Saw, chisel, plane, ladder, vice, and sander
- General Builder – Hammer, saw, chisel, screwdriver, and spirit level
- Painter – Paint Tray, brushes, roller, and sander
- Hard Landscaping – Pick, cement mixer, and spade/shovel

The safe use of hand tools is a key aspect of Building Fabric Maintenance. All tools should be carefully checked before use to ensure they are intrinsically safe and not damaged.

Damaged or defective tools shall not be used and shall be reported to a Supervisor or Manager and highlighted for disposal and replacement. At the end of a shift, tools shall be safely and properly stored to prevent damage and extend their useful life. When working at height, tools should be placed in a tool belt for increased safety and any tool in use should be secured by a lanyard or wrist strap to prevent it falling and injuring someone who may be below the work area.

## 6.9 Create Inspection & Maintenance Schedules

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 5 (Chapter2 – Facility Surveillance) and Volume 6 (Chapter 4 – Developing Maintenance Plans).

While some systems installed in a building, such as fire alarm or lifts, have prescribed maintenance frequencies, the same is not the case with Building Fabric. However, by implementing at the very least, an inspection and reporting regime, the Entity, or the occupier, can demonstrate that they are ensuring the safety of the workplace and identifying any elements that require attention.

### 6.9.1 Maintenance

#### 6.9.1.1 General

- Maintenance work shall be undertaken to ensure that assets meet their stipulated design life
- Assets that fail to meet the design life shall have restricted operations or be withdrawn from service and deemed not fit-for-purpose

#### 6.9.1.2 Maintenance Work

Maintenance Work is characterized as follows:

- Maintenance work can be preventative or remedial, and may include repairs and damage control
- Maintenance activity constitutes a key aspect of whole lifecycle asset management
- During the life of the asset, service fixings and connections are required, for which provisions may not have been made during the initial design and construction of the asset. A process shall be followed to control the cutting, grinding, drilling, repair, and support of existing structures in accordance with applicable standards and codes mentioned in Section 4.0.
- Maintenance action shall be based on:
    - Inspection Reports
    - Condition Assessment/Evaluation
    - Analytical Assessment

#### 6.9.1.3 Preventative Maintenance Strategy

Periodic inspections and maintenance work shall be carried out in order to preserve the service lives of structural and non-structural building components, and to reduce the need for emergency repairs or major renewal of components.

Figure 5 below highlights the inspection and maintenance strategies to be considered in the ongoing maintenance and periodic repairs of the structural and non-structural components of existing buildings.



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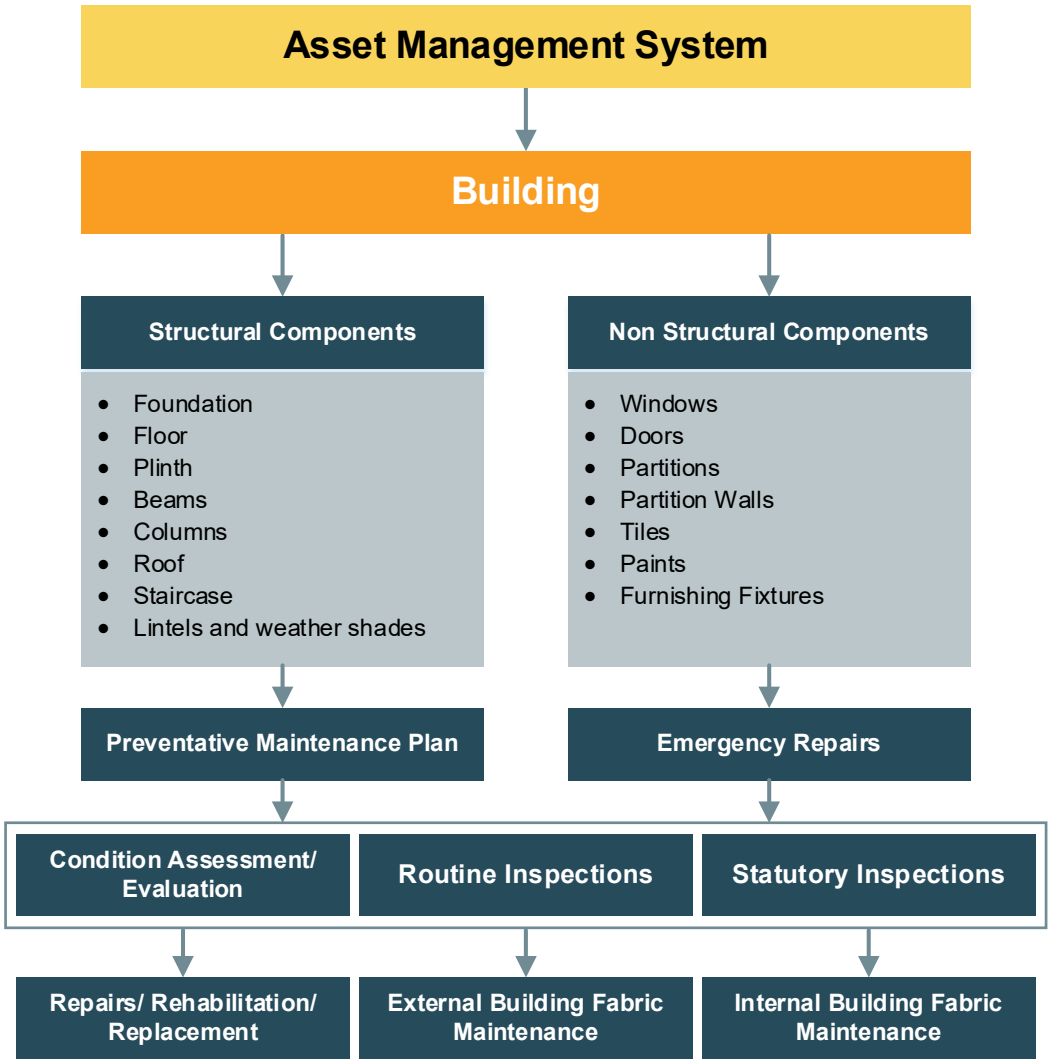


**Figure 5: Preventative Maintenance Strategy**

The Entity shall develop an effective Preventative Maintenance Plan (PMP) related to maintaining structural and non-structural components of existing buildings. The Plan shall include regular inspections, frequent maintenance and scheduled repairs of structural and non-structural building components.

A Preventative Maintenance Plan will keep the property and equipment in working condition leading to improved safety of operation and reduced incidence of emergency or breakdown repairs.

The Entity should develop its Structural Maintenance Plan to assist in the identification of maintenance requirements before they become high cost repairs. The PM Plan should help in achieving the lowest lifecycle cost of structural components of the building.

The Entity's PMP shall consider the following key aspects:

- Building a structural components inventory
- Criticality assessment of Preventative Maintenance tasks such as operate (run) to fail, condition-based, periodic-based, and calendar-based
- Periodic inspection program
- Create a robust operational framework for Preventative Maintenance programs detailing requirements that must be met and the manner in which they are to be implemented
- Use management systems tools such as a CMMS work order management system to optimize the PM program. Access to the system should be restricted to key staff responsible for the control of management or financial costs related to maintenance



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- Create a policy to clearly delineate the roles and responsibilities of maintenance staff in key positions such as Building Manager, Fabric Manager, Facade Engineer, Structural Inspectors, and Structural Engineers
- Ensure that maintenance staff are suitably qualified, trained, and competent to carry out their duties and responsibilities
- Undertake a cost-benefit analysis of various maintenance tasks

#### 6.9.1.4 External and Internal Building Fabric - Preventative Maintenance

The external fabric system of a building such as cladding, external walls and roofs is of extreme importance from both safety and public perspectives. The condition of the external fabric of a building has a major influence on the immediate perception of a building's quality and potentially the services it provides. It is important that the building is portrayed positively to maintain a reputable status by demonstrating that it is being taken care of and that maintenance works are diligently executed.

The condition of the internal fabric is of equal importance when considering the immediate perception of a building's quality. The overall state of a building's internal fabric subject to scrutiny by tenants and visitors alike. Additionally, it can also provide an indication of the condition of the building's external features which may otherwise not be visible.

Effective Planned Preventative Maintenance (PPM) of interior Building Fabric finishes such as interiors, corridors, doors, windows, toilet areas, and staircases are essential requirements to protect the area from wear and tear.

The Entity shall develop and define the scope of the PPM for the external and internal Building Fabric and provide it to the building maintenance contractor or in case of self-delivery of the service to The Entity's employees.

The PPM plan should be developed, and maintenance works must be regularly and diligently carried out, demonstrating effective maintenance of buildings.

The development of the PPM strategy should consider the following key aspects:

- A forward-looking PPM Plan in coordination with the Entity/Stakeholders to ensure proactive repair and maintenance of the external and internal fabric of the building. It should also be sensitive to the needs of the tenants and cause the least amount of disruption
- Competent and qualified personnel should be employed to oversee the maintenance of the external and internal building fabric such as building manager, fabric manager, and facade engineers.
- A periodic survey and inspection schedule of existing buildings
- The Maintenance Plan shall be considered a live document and continuously monitored. The Maintenance Plan shall consider the maintenance cycles contained within it and be periodically updated as required
- Only competent personnel shall be authorized to approve changes or deviations to agreed procedures, witness physical works at appropriate stages, and sign off activities or work elements as complete
- Records should include photographs to demonstrate the condition at the time and as a reference to indicate any degradation over the periods between inspections. CMMS systems will generally have the facility to assign these to the asset within one platform allowing efficient retrieval
- The Maintenance Plan should be structured to cover complete areas and identify the appropriate frequency of specific maintenance tasks and adequate budget to allow these tasks to be completed.
- Identify the appropriate frequency of specific maintenance tasks and support applications for suitable budgetary provisions to be made to allow necessary tasks to be completed
- Any change in frequency of maintenance should be documented and approved by the Stakeholder responsible for financial and operational management of the building
- Replacement materials should always be sourced in accordance with the building's Operations and Maintenance (O&M) manuals to match the materials that were used initially
- The materials shall be in accordance with the statutory requirements of safety (access, evacuation) and fire/smoke protection
- The materials should match the sustainability requirements detailed in the O&M Manuals and other applicable standards



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The Entity should consider detailed requirements listed in 6.4.20 – Building Fabric Maintenance Plans, to develop its external and internal Building Fabric-Planned Preventative Maintenance.

#### 6.9.1.5 Preventative Maintenance Activity Schedule

The Preventative Maintenance tasks listed in the checklist in Attachment 2 shall be carried out as part of PPM by the relevant Entity. The list shown in Attachment 2 is not exhaustive and shall be applied solely as a representation of a collection of typical activities. The relevant Entity/Contractor shall also develop a program and set of activities carried out at designated intervals to be documented in its PPM Plan and Maintenance Manual.

#### 6.9.1.6 Reactive/Emergency Maintenance

- The Entity/Contractor shall develop an Emergency Maintenance Plan, usually managed and reported through a formal service call process, to account for unscheduled and unplanned maintenance that may arise during the life of the assets
- Wherever possible, this should be recorded against the asset number to allow historical data to be collated and identify where CAPEX funds may need to be assigned
- The subsequent inspection that takes place following a service call can result in any of the following three actions:
    - If the problem is affecting the service life of the structure and is posing a threat to users, then emergency response and corrective action is required immediately.
    - If the problem is not critical, then a routine planned preventative maintenance response may be adequate
    - Undertake a review of the current maintenance regime in place and if necessary, make adjustments to mitigate, remove or control the undesirable condition
- The response can include the major repair or rehabilitation of the asset or asset component to protect life and property to moderate/major repair by qualified and skilled labor

The Entity should also refer to the requirements detailed in the National Manual of Assets and Facilities Management EOM-ZE0-PR-000001 Emergency Management Procedure for further details regarding emergency response procedures to be followed during hazardous events.

## 6.10 Inspection

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 5 (Chapter 2 – Facility Surveillance).

### 6.10.1 Purpose

The purpose of this subsection is to set the requirements for the inspection of existing building structures and facility assets for which the Entity is responsible. It is the responsibility of the Entity to detail the scope required for the relevant inspection undertaken. The necessary information to be provided to Stakeholders must be clearly identified at the outset to ensure, as far as it is reasonably practicable, that further costs are not incurred.

### 6.10.2 General

- Inspection of existing structures/assets shall be carried out for the following purposes:
    - Confirm that assets are safe for operation.
    - Provide information necessary for the managed maintenance of assets.
    - Provide the information necessary to assess the condition of the assets in a consistent and accurate manner.
    - Provide information for enabling the asset register to be maintained as an accurate record of the physical features of the assets.
    - Provide all the necessary physical information on assets to meet the requirements for the Asset Condition Reporting (ACR) process.
    - Identify defects, causes and effects of damage and deterioration and vulnerable structures.
    - Undertake root cause analysis for any failure or deficiency.



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- The asset register for each asset shall be reviewed and the records be updated as part of the reporting process.
- Inspection reports and forms shall be retained for the life of the asset. Photographic records will assist in demonstrating the condition and assist with maintenance review.
- Inspections shall not commence unless the inspector has reviewed previous inspection reports, asset registers, and asset files to establish information about the asset, its previous condition and likely hazards. This should include attributes, residual risks, etc. (e.g. hidden critical elements, falling elements, etc.), and any partial inspection information.
- As part of this planning, the inspector, must be fully aware of access arrangements so that there are no delays in the inspections. Wherever necessary, access equipment should be provided and installed. Equipment such as building maintenance units used for inspection purposes must have a current certificate, valid for the time of use, by an authorized third party inspection organization. Competent personnel with appropriate Personal Protective Equipment (PPE) must available to operate the equipment.

### 6.10.3 Types of Inspection

The Entity/Contractor shall carry out following types of inspection:

- General/visual inspection
- Principal/detailed inspection
- Special inspection
- Inspection for condition assessment/evaluation/analytical assessment
- Defect advice
- Additional measures inspection

### 6.10.4 General/Visual Inspection

- General inspections shall be carried out to obtain and record a visual check on those parts of the assets which are readily accessible without the aid of access equipment
- General inspections shall reveal any deterioration in condition or visible development of defects
- General inspections shall be able to detect and report any visual changes since the last inspection, or evidence of circumstances which may impact the condition of the asset before the next scheduled inspection

The general inspection report shall:

- Confirm that the inspection has been completed
- List significant defects which have occurred, existing defects which have worsened, or changes which have occurred since the last inspection
- Identify if there is a need for further investigations or action
- General inspections shall be reported on a form approved by the Entity

### 6.10.5 Principal/Detailed Inspection

- A close inspection of all and/or critical elements of the asset is conducted to give a visual confirmation of the maintenance requirements for managing the asset
- Principal inspections shall identify any signs of deterioration or visible development of defects and appraise their impact on the asset

The principal inspection report shall:

- Confirm that all critical elements of the asset have been examined
- Record the extent and severity of any defects found
- Identify the extent and severity of any changes in condition since the last inspection
- Draw attention to any observation which may affect the safety of the asset
- Identify the areas to be assessed by further investigations
- For assets supporting transient loading, identify whether the asset was observed under such loads and if there was any evidence of unsatisfactory performance



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- Recommend maintenance, strengthening, and renewal works as and when required

Principal inspections shall be reported, consisting of but not limited to:

- Principal inspection cover sheet signed by inspectors and checkers.
- Contents sheet
- Asset specific form
- Any additional information required

### 6.10.6 Special Inspections

- Special inspections shall be undertaken to provide additional or more frequent information on assets necessary for asset management
- Special inspections shall be conducted to address specific areas of concern
- Special inspections shall be carried out in circumstances where inspections detailed in 6.10.4 and 6.10.5 do not provide enough information
- Special inspections shall be reported with all the findings approved by the Entity

### 6.10.7 Inspection for Condition Assessment/Evaluation/Analytical Assessment

Inspections for analytical assessments shall:

- Provide the physical information about an asset necessary for the assessment of the asset to be undertaken
- Be carried out such that all inspectable and/or critical elements within close vicinity to the asset enable the person conducting the inspection to determine the actual section sizes and the extent of any deterioration, or other features having an influence on the ability of the asset to perform its required duty
- Address the condition of the structure, noting any signs of distress and their cause
- Be undertaken by the person carrying out the analytical assessment
- Provide information on the load applied to the assets and factors relevant to the structural resistance of the assets
- Provide information under the following general headings:
    - Confirmation of information in drawings and documents
    - Accurate estimates of dead and superimposed loads, including surcharge loadings
    - Structural dimensions and load dispositions
    - Details of finishes and fixings
    - Service ducts and services
    - Clearance dimensions enough to determine the imposed loading and structural clearances
    - Structural condition and evidence of physical deformation
    - Evidence of foundation deterioration
    - Performance of bearings and expansion joints

### 6.10.8 Defect Advice Inspection

Defect Advice Inspections shall be carried out following defect advice notification or a report of an incident that causes damage to an asset or has the potential to adversely affect the ability of the asset to perform its required duty.

Enough information shall be collected to identify the immediate and root causes of an incident and enable the safety of the asset.

### 6.10.9 Inspection Frequency

The frequency of Entity/Contractor inspections should be risk-based, wherein risk is defined as the likelihood of a structure developing a fault, grave enough to interrupt user service either by partial or complete building closure.



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Inspections of assets shall be undertaken at a frequency defined in Attachment 2: EOM-ZM0-TP-000133 – Checklist – Preventative Maintenance Schedule.

The Entity may request assistance in creating/conducting a structural inspection regime for their asset. Where appropriate, inspection frequencies should be carried out according to Attachment 2: EOM-ZM0-TP-000133 – Preventative Maintenance Schedule or as agreed with the Entity.

### 6.10.10 Specific Requirements

- Inspections shall be carried out by competent persons
- Inspections shall be reported on the forms approved by the Entity
- The inspector(s) has some degree of freedom when classifying defects in accordance with the system mentioned below. However, it is important that inspectors classify defects with reasonable care and that more specialized opinions are sought in case of doubt. Defects noted during inspection shall be matched to the standard severity/condition rating and priority rating mentioned in Figure 6 and Figure 7 of this document or similar categorization approved by the Entity in order to deduce the severity score that is to be entered in the inspection report
- The inspectors shall review all the information collected during the inspection and summarize the extent and severity of the defects recorded on the specific report forms approved by the Entity, give a condition rating, recommend appropriate actions, and suggest the level of priority for that action

| Condition Rating | | Condition Index | Condition Description |
|---|---|---|---|
| A | 0-19 | New | **New or almost new condition:** no reported problems or expected failures |
| B | 20-39 | Excellent | **Excellent condition:** performance is as desired, with no problems or concerns reported |
| C | 40-59 | Very Good | **Very good condition considering the age of facility:** asset is not new, but there is no problems or concerns reported |
| D | 60-74 | Good | **Good condition considering the age of facility:** asset is not new, and there are some problems that does not affect its performance |
| E | 75-89 | Poor | **Asset is worn out due to frequent use and is approaching the end of its lifetime:** asses does not work as intended |
| F | 90-100 | Critical | **Critically worn out or damaged:** asset has expired and is about to cause a near risk of failure |

**Figure 6 Condition Rating Classification**

| Priority | Deferred Maintenance | Regular Maintenance |
|---|---|---|



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| | | |
|---|---|---|
| **Priority 1** | Urgent<br>(Requires urgent action). | Closure of premises and/or address an immediate high risk to the health and safety of occupants and/or remedy a serious breach of legislation. |
| **Priority 2** | Essential<br>(Requires basic actions within two years). | Causes average impact on regular maintenance or poses moderate risk to health and safety. |
| **Priority 3** | Desirable<br>(Requires action within three to five years). | Causes low impact on regular maintenance or poses low risk to health and safety. |
| **Priority 4** | Long-Term work<br>(Outside five-year planning). | No impact on regular maintenance. |

**Figure 7 Priority Rating Classification**

## 6.11 Condition Assessment/Evaluation of Existing Buildings

Detailed additional guidance on this topic may be found in National Manual of Assets & Facilities Management Volume 3.

This subsection provides the methods and guides for structural condition assessment of existing buildings constructed of different materials such as concrete, steel, masonry, and wood. This section will focus on the following key components of condition assessment of existing buildings:

- Planning
- Assessment procedure
- Investigation
- Testing methodology
- Reporting

### 6.11.1 Purpose

Condition assessments are conducted for:

- Developing building performance reports
- Establishing building use
- Ensuring serviceability, durability and safety
- Ensuring compliance with codes and standards
- Special purposes based on the specific building and its current or proposed occupancy or function

**IMPORTANT NOTE:**

The Engineer should consider the possibility of the presence of hazardous materials such as asbestos when assessing an existing building, advise the client as necessary, and take or recommend appropriate precautions.

### 6.11.2 General Requirements

All personnel involved in the assessment shall possess the technical qualifications, including practical experience, education, and professional judgment required to perform the individual, technical tasks assigned. Interpretation of results and conclusions shall be performed by a registered Professional Engineer qualified in the appropriate discipline.



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Equipment shall be obtained as appropriate to accomplish or perform the various tests and inspection methods specified in the standard document. All equipment needs to be in good working order. For equipment that can be calibrated, reports of calibration shall be available. Guidance given in Volume 8, Chapter 4 (Equipment and Tool Control) of the O&M Manual should be followed for accessing and using equipment.

### 6.11.3 Procedure

The procedure to carry out the condition assessment of buildings is illustrated in Figure 8 below:

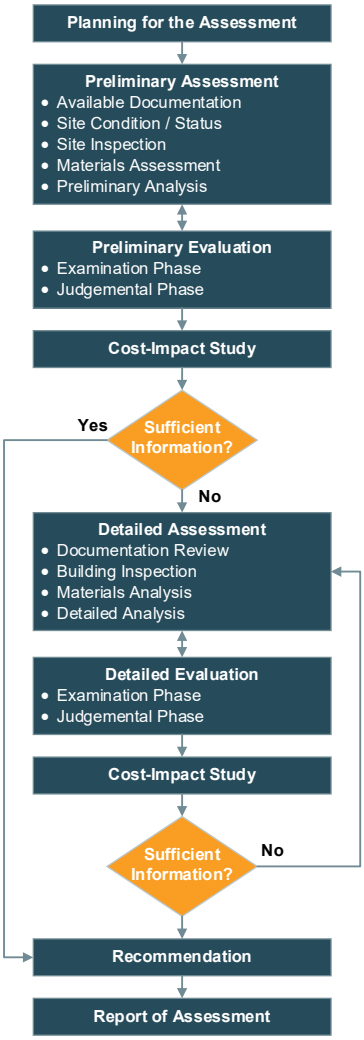


**Figure 8: General Structural Assessment and Evaluation Procedure for Existing Buildings**

### 6.11.4 Preliminary Assessment

The Preliminary Assessment shall provide the data necessary to determine and estimate the structural integrity of an existing building. This preliminary assessment provides the initial analytical data for estimating the structural adequacy of an existing building and for establishing the need and priority for a more detailed analysis.

The primary steps of a Preliminary Assessment include:

- Reviewing as-built information, available data, and documents prior to inspection such as design drawings, design criteria, soil investigations, and calculations

- Performing a Site Inspection which entails evaluating:
    - Design information



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  - Structural modifications if any
  - Material conditions
  - Structural and nonstructural members and connection conditions
  - Deterioration and damage to the structural building components
  - Suitably qualified and competent structural engineers to be part of the site inspection

- Preliminary analysis, which shall entail:

  - Structural analysis, structural adequacy, and relevant code compliance
  - Assessment of damage to property
  - Identification of structural deficiencies in the building with special reference to applicable minimum life and public safety standards and codes
  - Assessment of environmental effects on the building structure

- Preliminary findings
- Recommendations

### 6.11.5 Detailed Assessment

A detailed assessment shall be performed on the building being analyzed as a result of the findings of the preliminary assessment or as directed by mandatory actions or by the Entity.

The purpose of the detailed assessment is:

- Determine if the building satisfies the required performance criteria or if it requires rehabilitation
- Identify its deficiencies and recommend alternatives for rehabilitation

The detailed assessment process is similar to the preliminary assessment, except that it is done in greater detail and with more accuracy in order to increase the reliability of the resulting recommendations.

The Entity shall consider the following primary steps in the detailed assessment:

- Original design (as built), repair, rehabilitation and a review of the following additional information:

  - Calculations, drawings, specifications, testing, geotechnical and foundation information
  - Historical data and information
  - Preliminary assessment information and data
  - Applicable standards and local codes during construction/modification
  - Building features and structural configuration: Engineers involved in the detailed assessment should carefully identify irregularities in the structural components and other features/non-structural components which can have a major impact on the behavior of the building underloads
  - Operations and maintenance data

- Detailed inspection

Once the document review is completed, a detailed inspection of both structural connections and non-structural components shall be carried out. If required, special inspections and tests should be performed to support the existing information. The aim of these inspections should be to identify any discrepancies in the building structural system/non-structural components against the requirements and specifications outlined in design documents. Any hazardous problems should be noted and highlighted during inspection.

Structural analysis should encompass detailed information pertaining to the structural systems and their interactions as a total structural system, and should capture following information:

- Loading and performance criteria
- Critical system/members
- Capacities of existing systems/members
- Required capacities of systems/members
- Non-structural components and their behavior
- Structural evaluation (actual vs required capacity comparison)



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- Detailed findings and recommendations

The findings from the above key steps shall provide details about the conformance of existing buildings to required performance criteria. Any deviation or deficiency in performance should be highlighted, and recommended remedial procedures and actions such as monitoring, repair, or rehabilitation should be reported and documented accordingly.

- Report: The Entity/Contractor shall develop a detailed Condition Assessment Report consisting of the following sections:
    - Executive Summary
    - Introduction and Purpose
    - Structure Description
    - Site Visit Details and Findings
    - Structural Analysis, Calculations and Findings.
    - Test Results and Findings
    - Summary
    - Conclusions
    - Recommendations

- Cost-benefit analysis: The cost benefit analysis shall be carried out prior to and after the condition assessment. The cost benefit analysis should consider the following key aspects, while keeping safety a priority in the final decision-making process:
    - Condition assessment cost
    - Rehabilitation cost and benefits
    - Repair cost and benefits
    - Strengthening cost and benefits
    - Monitoring cost and benefits
    - Disruption costs of and temporarily vacating the building

- Recommendations

## 6.12 Repairs/Rehabilitation to Existing Buildings

Indications of potential distress within the structural components or system appear in the form of deflection, cracks, spalling/delamination, dry rot, etc. These types of defects may indicate minor or major problems. Although peeling of paint and cracks in the coating are not signs of distress, these defects should nevertheless be appropriately assessed.

Structural defects should always be assessed and repaired by competent and qualified structural engineers. It is not within the scope of this chapter to detail new construction works. It is recommended that the reader consults NMA&FM EOM-ZM0-PL-000067 Facility Structure Maintenance Plan.

### 6.12.1 General

This sub-section details the requirements to carry out required repairs to existing buildings.

### 6.12.2 Compliance

The repair work conducted on a building shall ensure that the building's post work level of compliance exceeds that of its pre-work state. The repair work shall be undertaken in a manner that ensures that building conditions are not rendered:

- Unsafe
- Hazardous
- Unsanitary
- Overloaded

The repair work shall ensure that the following conditions are adhered to:



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- Mechanical and plumbing systems shall not become unsafe
- Building elements and materials such as windows (including the sash and glazed portion or safety glazing) shall comply with the safety glazing requirements of applicable codes. In case of replacement of windows, they shall comply with energy requirements
- Fire protection levels shall be maintained in accordance with the applicable fire safety codes such as smoke detectors
- Emergency escape, egress and rescue openings are properly maintained

### 6.12.3 Permit

The repair and rehabilitation work shall not be carried out in the existing building without prior approval of the relevant authority and Entity.

### 6.12.4 Approvals

The Entity reviews and approves all drawings and specifications related to repair/rehabilitation and alteration of existing building structures and structural systems. This is shared with the building owner, if it is other than the Entity.

### 6.12.5 Structural Repairs/Rehabilitations

A competent, registered and qualified professional shall carry out the evaluation and condition assessment of the damaged building and shall submit a report to the Entity. The contractors shall obtain approval from the Entity for the designated work area. The work area shall be clearly highlighted and identified within the construction documents.

### 6.12.6 Repairs to Existing Buildings with Less than Significant Structural Damage

If the condition assessment and evaluation (Refer to Section 6.11) concludes that the damage to the building is minor, the damaged elements shall be restored to their pre-damage condition and to a level that complies with applicable codes and standards.

### 6.12.7 Repairs to Existing Buildings with Significant Structural Damage

Buildings with substantial damage shall be assessed and evaluated by a competent, registered, and qualified professional before carrying out any structural repair. This damage can generally be caused by natural events such as flooding, storms, earthquake, inappropriate initial structural design, soil movement, and differential settlement.

- If the vertical building elements such as those that resist the lateral forces are substantially damaged, then these elements or structural components shall be repaired and/or retrofitted in accordance with the applicable standards
- If the gravity load carrying elements that resist vertical loads have been substantially damaged, then these should be replaced/rehabilitated in accordance with the applicable codes and standards and should comply with the provisions of dead and live loads carried by these elements/structural components. The adjacent structural elements that bear the same load as the repaired elements should also be considered for repair or rehabilitation to match the newly repaired elements in terms of compliance with applicable codes and standards, even if they are not substantially damaged
- In flood and earthquake prone areas, buildings that have sustained substantial damage shall be brought into compliance with applicable codes

### 6.12.8 Concrete Repairs

Concrete repairs to the existing building should be carried out in accordance with the detailed requirements highlighted in the following ACI documents:

- 546R-14: Guide to Concrete Repair



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- 562-19: Code Requirements for Assessment, Repair, and Rehabilitation of Existing Concrete Structures and Commentary

The requirements detailed in the above documents encompass the following key aspects in the repair and rehabilitation of the existing concrete building structures:

- General requirements for concrete repair
- Evaluation/condition assessment requirements for concrete repair
- Structural analysis for concrete repair
- Design, implementation, execution, durability, and quality assurance requirements for repairing concrete

### 6.12.9 Steel Repairs

Steel repairs to the existing building should be carried out in accordance with the detailed requirements highlighted in the following documents, steel manufacture requirements, and specifications:

- SBC 306 Steel Structures Chapter 14 Existing Buildings
- ANSI/AISC 360-16 Specification for Structural Steel Buildings Appendix 5 Evaluation of Existing Structures
- ANSI/AISC 303-16 Code of Standard Practice for Steel Buildings and Bridges

The requirements detailed in the above documents encompass the following key aspects in the repair and rehabilitation of the existing steel building structures:

- General provisions for evaluation of existing steel buildings and repair
- Material properties and tests for evaluation of existing steel buildings and repair
- Evaluation by structural analysis of existing steel buildings
- Evaluation by load testing of existing steel buildings
- Evaluation report
- Design, implementation, execution, durability, and quality assurance requirements for steel repair

### 6.12.10 Masonry Repairs

Masonry used as building material is limited in Saudi Arabia. The masonry is repaired in case of deterioration to restore the load bearing capacity, while the strengthening techniques are used to increase the load bearing capacity of the masonry elements.

Generally, the following techniques are used to repair the masonry elements of an existing building:

- Replacement of masonry elements with a similar type of material
- Repointing the masonry by reinforcing mortar joints due to extreme weather such as cycle of freeze and thaw, roof/gutter leakage, dampness of walls, differential settlement causing cracks along the joints, mortar cracking, missing bricks, and masonry units. Repointing is carried out by removing the damaged joints and filling new mortar after proper cleaning. This type of repair improves the masonry's shear and compressive strength, its aesthetic condition, and any deformations.
- Covering and injecting the cracks with appropriate repair material
- Pinning-repairing cracks using steel pins
- Shotcreting by spray concrete
- External steel plate reinforcement

The repair should be carried by specialized contractors and competent and skilled labor. The materials used for the repair, rehabilitation and strengthening of masonry should be in accordance with material specifications and requirements highlighted in:

- SBC 305 Masonry Structures Requirements
- TMS 402/602 Building Code Requirements and Specification for Masonry Structures, 2016
- ASCE 5/ACI 530 Building Code Requirements for Masonry Structures
- Any additional applicable standards for masonry structures.



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### 6.12.11 Strengthening, Renewal & Alterations to Existing Buildings

- Strengthening, renewal, and alteration work shall be controlled to ensure that assets are durable
- Strengthening, renewal, and alteration work shall be performed as corrective actions to address expired assets or elements in accordance with the supplier's program for lifecycle management or a change in use, function, or duty of the asset or element
- Strengthening, renewal and alteration work shall be justified by the principles of whole lifecycle asset management
- Strengthening, renewal, and alteration work shall be based on inspection reports, condition assessments and analytical assessments
- Strengthening, renewal, and alteration work to the existing building can be classified as carrying out the following works to the building:
    - Change of any space
    - Addition
    - Removal
    - Reconfiguration
    - Extension
- The alteration to the buildings is classified in the following categories:
    - Level 1 Alteration: Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose. Level 1 alterations shall comply with the provisions of the IEBC (2018 Chapter 7) and other applicable standards
    - Level 2 Alteration: Level 2 alterations include the reconfiguration of space, the addition or elimination of any door or window, the reconfiguration or extension of any system, or the installation of any additional equipment. Level 2 alterations shall comply with the provisions of IEBC (2018 - Chapter 7 and 8) and other applicable standards
    - Level 3 Alteration: Level 3 alterations apply where the work area exceeds 50% of the building area. Level 3 alterations shall comply with the provisions of IEBC (2018 – Chapter 7, 8 and 9) and other applicable standards
- The work carried by the Entity/Contractors for the purpose of strengthening, renewal, and alteration work to the existing building shall comply with the provisions mentioned in the relevant sections and relevant provisions detailed in SBC, SBC 901 (Existing Building), IEBC (2018 - Chapters 6 through 12), IRC (2018 – Appendix J) and any other Entity-specific regulations
- The strengthening, renewal, and alteration work shall be carried out in a manner that ensures, at a minimum, that design loads resemble the loads when the building was constructed. If any of the structural components are exposed during the alteration and if the condition assessment of the components suggest that these structural elements are unsound or dangerous, then they shall be made to comply with applicable clauses of SBC, IEBC (2018 – Chapters 6 through 12), IRC (2018 – Appendix J) and any other relevant Entity-specific regulations
- The contractors shall provide and get approval from the Entity for the designated work area and access. The work area shall be clearly highlighted and identified within the construction documents.
- The Entity reviews and approves all drawings and specifications related to the repair/rehabilitation and alteration of existing building structures and structural systems. This is then shared with the building owner, if it is other than the Entity

## 6.13 Establish Audit Frequency & Content

The Entity should undertake regular reviews and audits of the Building Fabric Maintenance Contractor's work to evaluate its effectiveness.

These reviews should include but not be limited to:

- Weekly Reviews – Evaluate the general condition of the site paying particular attention to the completion of daily/weekly activities such as inspections and reporting. Visual inspection by the Entity and feedback on the adequacy of the Contractor's performance is the quickest means of identifying, communicating, and addressing any deficiencies in performance. Good quality work should be recognized and praised
- Monthly Reviews – Review reported performance and close out of work activities for timeliness and thorough completion. A formal monthly Review Meeting is considered best practice for recording



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performance, noting actions, identifying benchmarks that need to be achieved and measuring ongoing improvement strategies
- Annual Reviews – Review the performance for the entire year and set the strategy for the coming twelve months

The use of the Plan, Do, Check, Act model is a key to delivering continuous improvement. It is a model based on ISO9001:2015 which drives the Entity and its providers towards an operational model that learns from experience by having an intended outcome and verifying it against experience. If there is a disparity between actual experience and that which was originally anticipated, the Entity should review the process to ascertain the cause for such discrepancy and identify changes that need to be made.

In the field of Building Fabric Maintenance, this could entail a simple review of maintenance inspection frequency if the building condition's rate of deterioration between inspections is greater than anticipated.

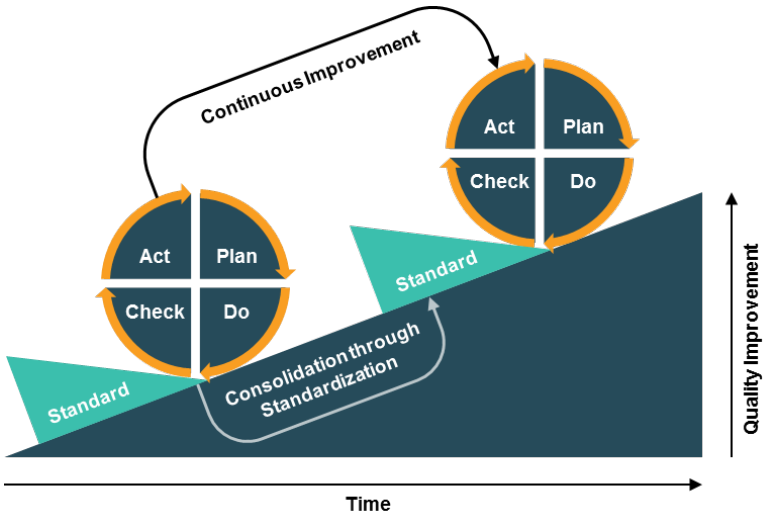


**Figure 9: Plan, Do, Check, Act Process of Continuous Improvement and Audit**

## 7.0 ATTACHMENTS

1. Building Engineering Services Association (BESA)/Service and Facilities Group - SFG 20 (doc. 20)
2. EOM-ZM0-TP-000133 – Preventative Maintenance Schedule Checklist



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## Attachment 1 – Building Engineering Services Association (BESA)/Service and Facilities Group - SFG 20 (doc. 20)

| SFG Work Activity Reference Number | Building Fabric Element |
|---|---|
| 23-17 | Fire Doors |
| 72-07 | Turnstile - Tripod Type |
| 88-01 | Ancillary Buildings and Other Structures |
| 88-02 | Controlled Entry Gates and Barriers |
| 88-03 | Boundary Vegetation and Landscaping * |
| 88-04 | Building Inspections |
| 88-05 | Building Security ** |
| 88-06 | Car Parks |
| 88-08 | Damp Proofing Inspections |
| 88-09 | Doors General/Automatic/Steel |
| 88-10 | ETFE (Ethylene Tetrafluoroethylene) Roof System |
| 88-11 | External Ground Surfaces |
| 88-12 | External Walls and Cladding |
| 88-13 | Fences, Railings and Boundary Walls |
| 88-14 | Floors and Floor Finishes |
| 88-15 | Glazed Roof/Glazed Roof Sections/Glass Canopies |
| 88-16 | Goods Yards |
| 88-17 | Grease Traps |
| 88-18 | Internal Painting and Decoration |
| 88-19 | Internal Walls and Ceilings |
| 88-20 | Load Bearing Walls - Internal |
| 88-21 | Motorized Blinds |
| 88-22 | Non-Automated Gates |
| 88-23 | Pitched and Barrel Roofs |
| 88-24 | Public Area Waiting Shelters |
| 88-25 | Rainwater Drainage |
| 88-26 | Ramp Decks and Ramp Supports |
| 88-27 : Not generally applicable in KSA | Road Salting - Stock Check |
| 88-28 | Roof and Canopy Fall Protection Systems |
| 88-29 | Roof Coverings and Flashings |
| 88-30 | Roof Features and Chimneys |
| 88-31 | Roof Skylights and Openings |
| 88-32 | Service Drainage |
| 88-33 | Steps, Stairs, Ramps, Balustrades and Handrails |
| 88-34 | Timber Maintenance Platform |
| 88-35 | Toilet and Shower Areas |
| 88-36 | Transportable Office and Storage Buildings |
| 88-37 | Vehicle Access and Boundary Control |
| 88-38 | Windows Internal and External |
| 88-39 | Access Panels and Hatches |
| 88-40 | Bird and Vermin Control *** |
| 88-41 | External Decorations |
| 88-42 | Fire Escape External Staircases |
| 88-43 | Fire Stopping Checks |
| 88-44 | Fittings, Furnishings and Equipment |
| 88-45 | Flagpoles |
| 88-46 | Green Roofs and Gardens |
| 88-47 | Ground Gas Venting Systems |
| 88-48 | Internal Planting |
| 88-49 | Laundry and Refuse Chutes |
| 88-50 | Movable Wall Dividers |



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| | |
|---|---|
| 88-51 | Planted Green Walls |
| 88-52 | Siphonic Roof Drainage |
| 88-53 | Suspended Ceilings |
| 88-54 | Accessing Ceiling Voids |
| 88-55 | Cleaning of Roof Walkways |
| 88-56 | Vehicle Washing Plant |
| 88-57 (Not generally applicable in KSA) | Mechanical Heritage Clocks |
| 88-58 | Barriers and Safety/Handrails (where fitted) |

* Please also refer to EOM-ZO0-PR-000083 - EOM-ZO0-PR-000088

** Please also refer to EOM-ZO0-PR-000040 - EOM-ZO0-PR-000045 and EOM-ZO0-PR-000100

*** Please also refer to EOM-ZO0-PR-000071 - EOM-ZO0-PR-000076



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## Attachment 2 – EOM-ZM0-TP-000133 - Preventative Maintenance Schedule Checklist

| Building name: | | Reference No. | | REV-000 | | |
|---|---|---|---|---|---|---|
| **No.** | **Inspection Item** | **Task** | **Frequency** | **CHECKED SATISFACTORY** | | |
| | | | | **N/A** | **YES** | **NO** |
| **1.0** | **Roof** | | | ☐ | ☐ | ☐ |
| 1.1 | Roof Coverings | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 1.2 | Roof Boarding | Visual inspection | Annually | ☐ | ☐ | ☐ |
| 1.3 | Any Other Substrates | Visual inspection | Annually | ☐ | ☐ | ☐ |
| 1.4 | Glazing | Visual inspection* | Annually* | ☐ | ☐ | ☐ |
| 1.5 | Roof frame (beams, columns and masonry walls providing support) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| 1.6 | Corrosion Protection | Test | 12 months | ☐ | ☐ | ☐ |
| 1.7 | Pipework | Visual (confirm structural integrity and function) | 12 months | ☐ | ☐ | ☐ |
| 1.8 | Insulation | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 1.9 | Louvres | Visual (confirm structural integrity and function) | 12 months | ☐ | ☐ | ☐ |
| 1.10 | Vents | Visual (confirm structural integrity and function) | 12 months | ☐ | ☐ | ☐ |
| 1.11 | Cladding | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 1.12 | Eaves | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 1.13 | Soffit | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| **2.0** | **Façade** | | | ☐ | ☐ | ☐ |
| 2.1 | Façade | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.1 | Canopies (fixed, glazed, dependent) | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.2 | Doors – Fire (including door furniture) | Visual inspection*** | Monthly*** | ☐ | ☐ | ☐ |

SAMPLE



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| Building name: | Reference No. | REV-000 |
|---|---|---|

| No. | Inspection Item | Task | Frequency | CHECKED SATISFACTORY | | |
|---|---|---|---|---|---|---|
| | | | | N/A | YES | NO |
| 2.3 | Curtain Walling (glazing pressure plate, glazing pressure plate caps, movement joints, panels, connector, steel boom trusses, secondary structural support) | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.4 | Doors – Sensor Operated | Inspection** | Subject to local risk assessment** | ☐ | ☐ | ☐ |
| 2.5 | Doors – Manual (including door furniture) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 2.6 | Louvres | Visual (confirm structural integrity and function) | Annually | ☐ | ☐ | ☐ |
| 2.7 | Photovoltaic Coverings | Visual inspection & Test | Annually | ☐ | ☐ | ☐ |
| 2.8 | Screens | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.9 | Soft Finish | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.10 | Vents (manual/powered) | Visual (confirm structural integrity and function) | Annually | ☐ | ☐ | ☐ |
| 2.11 | Windows (glass, standard, security) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 2.12 | Cladding (hard – tiles, panels) | Visual inspection* | Not less than annually* | ☐ | ☐ | ☐ |
| 2.13 | Non-Supporting Structural Walls (non-load bearing walls of masonry, steel, glass, timber or concrete) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| **3.0** | **Internal Walls** | | | ☐ | ☐ | ☐ |
| 3.1 | Walls | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 3.2 | Doors – Manual (including door furniture) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 3.3 | Hard Finish (including hard tiles) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |

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| Building name: | Reference No. | REV-000 |
|---|---|---|

| No. | Inspection Item | Task | Frequency | CHECKED SATISFACTORY | | |
|---|---|---|---|---|---|---|
| | | | | N/A | YES | NO |
| 3.4 | Soft Finish | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 3.5 | Windows (Glass, Standard, Security) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 3.6 | Cladding Panels | Inspection | Routinely/continuously by Building Users* | ☐ | ☐ | ☐ |
| 3.7 | Non-Supporting Structural Walls (non-load bearing walls of masonry, steel, glass, timber or concrete) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| 3.8 | Supporting Structural Walls (load bearing walls of masonry, steel, glass, timber or concrete) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| **4.0** | **Floors Finishes** | | | ☐ | ☐ | ☐ |
| 4.1 | Floors Finishes | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 4.2 | Carpets | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 4.3 | Hard Finish (including hard tiles) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 4.4 | Soft Finish | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| 4.4 | Coatings | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| **5.0** | **Ceilings** | | | ☐ | ☐ | ☐ |
| 5.1 | Ceilings | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |

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|---|---|---|

| No. | Inspection Item | Task | Frequency | CHECKED SATISFACTORY | | |
|---|---|---|---|---|---|---|
| | | | | N/A | YES | NO |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 5.2 | Hard Finish (cornices/coves, acoustical ceiling treatment) | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| 5.3 | Suspended ceilings (hard – tiles, access hatch, cornices/coves, grid – main) | Visual inspection**** | - | ☐ | ☐ | ☐ |
| **6.0** | **Building Structures – Permanent Elements** | | | ☐ | ☐ | ☐ |
| 6.1 | Structural Elements | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.2 | Slab (steel, concrete, masonry, timber) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.3 | Beams (steel, concrete, masonry, timber) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.4 | Columns (steel, concrete, masonry, timber) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.5 | Roof (slabs, beams, trusses) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.6 | Foundation (ground beams/slabs, special foundations/piles) | + | + | ☐ | ☐ | ☐ |
| 6.7 | Frames (formed of reinforced concrete, structural steel or timber) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.8 | Lining (decorative or fire protection linings) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| 6.9 | Barriers – Fixed (pedestrian and vehicular barriers for public or vehicle protection) | Visual inspection | Annually | ☐ | ☐ | ☐ |
| | | Detailed inspection | 5-yearly | ☐ | ☐ | ☐ |
| **7.0** | **Stairs and Ramps** | | | ☐ | ☐ | ☐ |
| 7.1 | Stairs, Handrails and Ramps | Routinely/continuously by Building Users* | Ongoing* | ☐ | ☐ | ☐ |
| | | General inspection* | Annually* | ☐ | ☐ | ☐ |
| | | Detailed inspection* | 5-yearly* | ☐ | ☐ | ☐ |
| **8.0** | **Cathodic Protection (CP) – Structural** | | | ☐ | ☐ | ☐ |
| 8.1 | All CP elements such as battery, monitoring devices, supply, software, rods (electrodes) | Test | Annually | ☐ | ☐ | ☐ |

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| No. | Inspection Item | Task | Frequency | CHECKED SATISFACTORY | | |
|---|---|---|---|---|---|---|
| | | | | N/A | YES | NO |
| **9.0** | **Built in Furniture/Fittings** | | | ☐ | ☐ | ☐ |
| 9.1 | Mirrors | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.2 | Cupboards | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.3 | Shelving | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.4 | Counter Tops | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.5 | Cubicles | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.6 | Floor Mats | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.7 | Blinds | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.8 | Lockers | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.9 | Benches | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.10 | Post Boxes | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.11 | Screens | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.12 | Toilet Fittings | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.13 | Whiteboards | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.14 | Fencing | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.15 | Barriers | * Visual inspection | * | ☐ | ☐ | ☐ |
| 9.16 | Safety Access | * Visual inspection | * | ☐ | ☐ | ☐ |
| **10.0** | **Specific Room Types** | | | ☐ | ☐ | ☐ |
| 10.1 | Kitchens | Routinely/continuously by Building Users*<br><br>General inspection* (Yearly)<br><br>Detailed inspection* (5 yearly) | * | ☐ | ☐ | ☐ |
| 10.2 | Toilets | | | ☐ | ☐ | ☐ |
| 10.3 | Common area including waiting areas | | | ☐ | ☐ | ☐ |
| 10.4 | Meeting Rooms | | | ☐ | ☐ | ☐ |
| 10.5 | Equipment Rooms | | | ☐ | ☐ | ☐ |
| 10.6 | Any Other Rooms | | | ☐ | ☐ | ☐ |
| **11.0** | **Hard Landscaping** | * Inspection | * | ☐ | ☐ | ☐ |
| **12.0** | **Drainage** | * Inspection | * | ☐ | ☐ | ☐ |
| **13.0** | **Specific Planned Preventative Maintenance (PPM) Notes** | | | ☐ | ☐ | ☐ |

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| No. | Inspection Item | Task | Frequency | CHECKED SATISFACTORY | | |
|---|---|---|---|---|---|---|
| | | | | N/A | YES | NO |
| | | | | | | |

* Task nature and frequency to be determined by site-specific risk assessment - depends inter alia upon materials, exposure and location.

** Statutory Requirement - Visual inspection ensuring that there is no damage to the door, intumescent strips, cold smoke seals and furniture. A working check to ensure that the self-closing device operates correctly.

***Statutory (Health, Safety & Welfare) Regulations usually includes doors and gates. Dependent on location and use may be considered work equipment and subject to Provision and Use of Work Equipment Regulations if applicable.

**** Visual inspection to ensure that the compartmentation has not been breached. On completion of modification works by specialist contractors by permit to work system.

+ Part of foundation systems (underground). The accesses to foundations are not available in most buildings, however, any associated problems in visible components may trigger condition assessment and destructive/nondestructive inspections (Refer section 11.0).

SAMPLE

| No. | Reviewer's Comments | | | Resolution |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Originator's Name/Signature and Date: | | | | Checker's Name/Signature and Date: |



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