



INDIAN RAILWAY
STATIONS DEVELOPMENT
CORPORATION LIMITED



06b

Guidebook for Conservation of Railway Heritage Assets

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Preface

The Development Control plays an important role in guiding and facilitating the physical Development. Since the commercial development along with station redevelopment in the railway land is to be done under Section 11 of the Railways Act 1989, there was a need to have set of Manuals/Guidelines to guide the entire development. In fact the Union cabinet has approved (in terms of communication received from Ministry of Railways, GOI vide letter No. 2011/LMB.WCS/22/07/25 Pt.1 dated 17.10.2018) that 'Railways/RLDA/IRSDC shall consult urban local bodies/other statutory authorities while approving its plans in terms of powers conferred to it under Section 11 of the Railways Act 1989 so that the development in Railway Land is harmonious with surrounding development, generally following National Transit Oriented Development (TOD) Policy. No change in Land Use is required pan India by Railways for developing railway land for commercial use.' It is further approved that IRSDC shall be the Nodal Agency and the main Project Development Agency for redevelopment/development of all stations. MoHUA has also conveyed the approval of Union Cabinet to Chief Secretaries of All States/UTs to incorporate suitable provisions in the local byelaws/ development control norms in congruence with the National TOD Policy as well as relevant provisions of the Railways Act to facilitate Railways/RLDA/IRSDC to proceed with their development plans in consultation with local bodies/other statutory authorities, at the earliest.

Accordingly as the Nodal Agency for station redevelopment, IRSDC took upon the responsibility, on behalf of Railways/RLDA besides for guiding its own work for station redevelopment along with commercial development, to produce a series of Manuals/Guidelines to guide the Architects/Developers/Concessionaires as well as the Authority on the Procedures, Dos & Don'ts in preparing development plans and submitting the applications for approval of Layout Plans and Building Plans of the commercial development to IRSDC.

IRSDC aims to transform the railway stations and the adjoining land into a "RAILOPOLIS" - a Mini Smart 24/7 City Centre where one can live, work, play and ride while putting the land resources to optimal use following the National Transit Oriented Development Policy norms. The aim is to facilitate developments by streamlining policies and making the Manuals/Guidelines as transparent as possible to promote ease of doing business. The Manual on Form Based Codes explains various developments such as buildings set back, ground coverage, FAR, heights etc. while Manual on building plan approval and commercial assets covers the process for the approval of building plans. The Manuals are mandatory while the Guidelines are Recommendatory and the Development Agreement/Concession Agreement or any other legal agreement between IRSDC (Authority) and Developments/Concessionaires shall prevail over and above the guidelines.

The advantage of the Manual on Form Based Codes is that it facilitates flexibility in development of mix use (horizontal and vertical mixing) to make the development sustainable, user friendly and market responsive while most of the local building byelaws restrict mixing which is essential for development of TOD. The guidelines propose good practices related to Construction Standards that promote and protect health, safety and general welfare of the occupant and environment across its life cycle while permitting dynamic building use.

These "Manuals for Station (Re)development including Commercial Development" is a comprehensive set of documents which provide standards and guidelines in the following order of decreasing priority-

1. Safety Standards, (like fire safety, earthquake related controls, etc.)
2. Passenger and user comfort and convenience.
3. Environmental Conservation (Natural and Man-made)
4. Heritage Conservation
5. Design and aesthetic in harmony

These Manuals and Guidelines have been prepared over a period, after research, site visits, case studies, best practices, study of other similar national, international designs, National TOD Policy and Form Based Codes (as advised by MoHUA), National Building Codes, UBBL-2016 and Environment Management Guidelines issued by MoEF&CC. Some of these have also been applied and tested on the on-going projects of IRSDC.

PUBLIC CONSULTATIONS: The (draft) Manuals and Guidelines were posted on IRSDC's website. These documents are available for reference at- www.irsdc.in. The stakeholder consultation was held via six (6) national webinars during April 2021- July 2021. The attendees were provided with a brief overview of salient features of the Manual, Guidelines, etc. Over 1300 participants, which included about 25 Government Agencies, Educational Institutions, Professional Bodies, Centres of Excellence, and senior professionals, attended, and shared their valuable feedback during the Webinars and over emails.

These Manuals and Guidelines have now been adopted for Station Redevelopment Works after incorporating relevant feedback and other suggestions by all the stakeholders. Further, final draft Manuals and Guidelines were discussed in the Plan Sanctioning and Monitoring Committee (PSMC) where subject experts were also invited as

special invitees in July 2021. IRSDC's Board of Directors (BOD) has also deliberated on this subject in August 2021 for adoption and application to the program of (re)development of Railway Stations along with Commercial Development. These Manuals and Guidelines are expected to transform the railway area around stations into model development as envisaged also by MoHUA and spur similar development in surrounding area.

STRUCTURE OF THIS GUIDEBOOK FOR CONSERVATION OF RAILWAY HERITAGE ASSETS

Sl. No.	Chapter	Content
1	Heritage Assessment Report (HAR)	HAR – Form 01, Heritage Building Condition Report (HBCR), Instructions for Inventorying, Measured drawings, Condition Mapping and Assessment
2	Heritage Conservation and Reuse Plan (HCRP)	Typical Structure and Content of the HCRP, Guidelines for Conservation works, Guidelines for Heritage Regulation Card, Guidelines for removal of vegetation from RHA, Guidelines for addition of Universal accessibility features, Guidelines for Green Building upgradations, Typical Instructions for construction/ Repair works, Guidelines for Advertisements and signage Infrastructure
3	Heritage Management & Maintenance Plan (HMMP)	Typical Structure and Content of HMMP, Guidelines for Protection from vibrations, construction dust, moisture and other polluting/ invasive agents, Guidelines for Heritage building maintenance team, Guidelines for Maintaining temperature and relative humidity levels, Guidelines for Selection and application of substitute materials/ features, Standard Instructions for Regular Inspection, Maintenance, Monitoring and Repair Works

The manuals and guidelines are intended to be comprehensive for promoting balance and orderly development of railway stations and surrounding city area. Manuals and Guidelines inter-alia provide the framework, necessary technique, norms and standards, and development promotion techniques. Conditions may vary from place to place and accordingly these manuals and guidelines may be applied to all situations and places by adopting to local conditions. These manuals and guidelines fulfil the need for a planning process which facilitate efficient and dynamic station development in overall urban framework.

The manuals and guidelines are also intended to be a possible reference for various aspects of urban planning and design by State Governments, Development Authorities, Private Sector and Planning Organizations.

(Sanjeev Kumar Lohia)

Managing Director and Chief Executive Officer
Indian Railway Stations Development Corporation Ltd.

Section 0.1: About this Guidebook

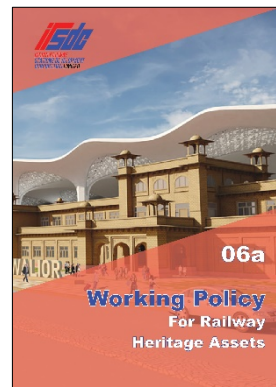
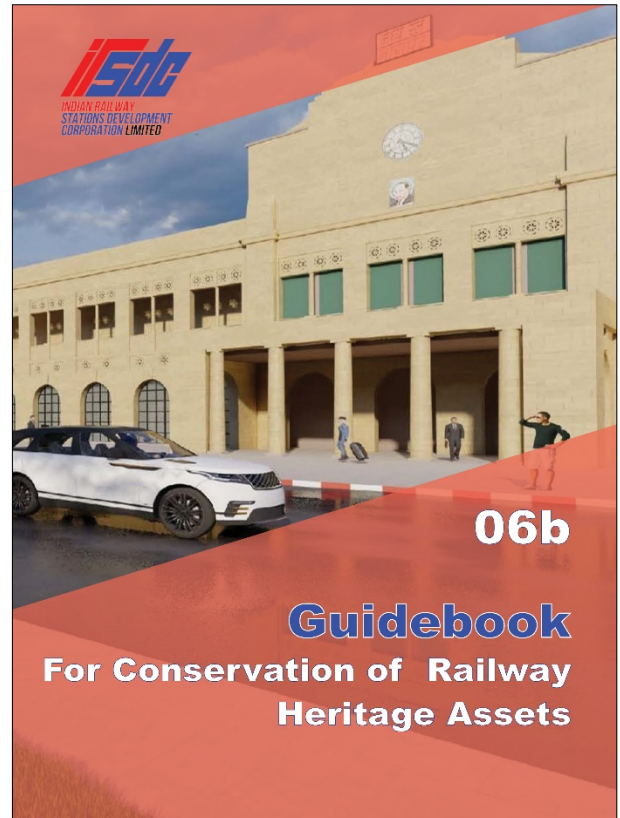
Indian Railways envisions that their Station Redevelopment works and Commercial Assets shall ensure Conservation of Heritage.

In the above context, Working Policy and Guidebook have been developed for the Indian Railways, so that the Railway Station Redevelopment responds to Railway Heritage Assets (RHA). Accordingly, these documents lay down Policy and Guidelines for Conservation, Management and Maintenance of the Railway Heritage Assets.

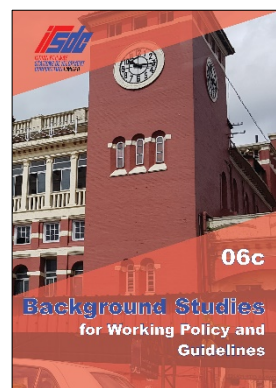
Departing from the conventional Monument-Centric approach, the focus of these Policy and Guidelines shall be to conserve the RHA while ensuring their continued use, necessary expansion, and suitable preservation.

This Guidebook is a compilation of all guidelines for all kind of works to be performed either at the Railway Heritage Assets or around it. These range from planning tools, construction monitoring tools, site management tools, site maintenance and repair tools.

This Guidebook derives its basis from the 'Working Policy for Railway Heritage Assets'.

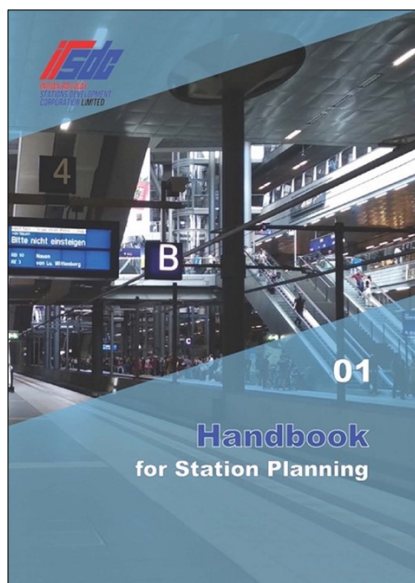


Working Policy for Railway heritage Assets contains Working Policy defining the desired response to conservation of Railway Heritage Assets.

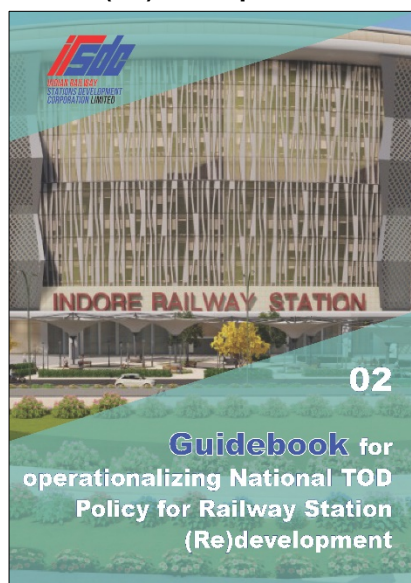


Background Studies for Working Policy and Guidelines is a compilation of relevant studies for reference purpose only.

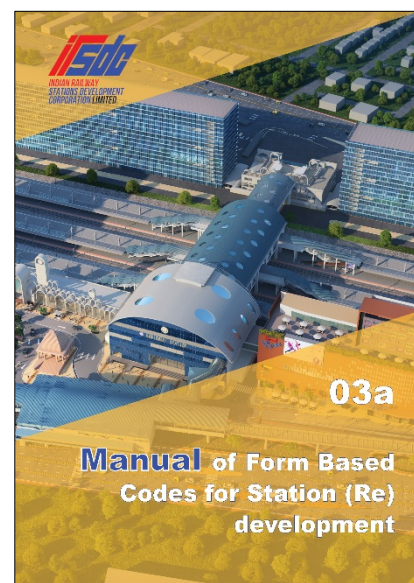
Table 1: Schedule of remaining parts of the Manuals for Station Redevelopment including Commercial Development

**Handbook for Station Planning
(for internal use only)**

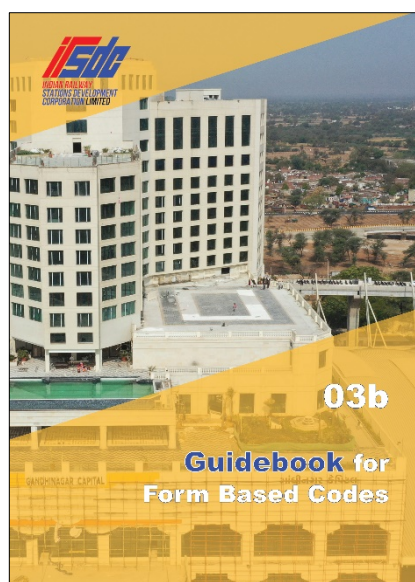
This document contains Norms, Standards and Tools for Design of Station Operational Areas.

**Guidebook for operationalizing
National TOD Policy for Railway
Station (Re)development**

This document contains Tools and Processes for Layout Planning within the Railway Land, with the intent of 'Land Value Capture' for optimum monetization.

**Manual of Form Based Codes
for Station (Re)development**

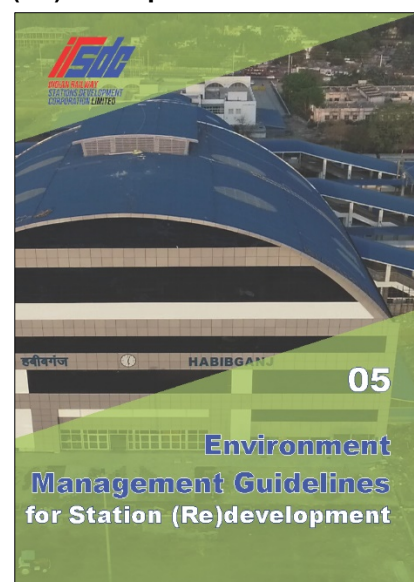
This document contains (a) Development Control Norms (b) Format for preparation of Layout Regulating Plans and (c) Parameters of Property Development Card.

**Guidebook for Form Based
Codes**

This document assists in preparation of Layout Regulating Plans and Property Development Card.

**Manual for Building Plan
Approval of Commercial Assets**

This document contains the procedures and parameters for the approval of Building Plan of Commercial Assets.

**Environment Management
Guidelines for Railway Station
(Re)development**

This document contains guidelines for integrating provisions of Environment Management during Layout Planning and is based on the recommendations issued by MoEF&CC, NGT and other statutory bodies.

Section 0.2: Inventory of Abbreviations and Definitions

0.2.1. Abbreviations

1.	BOD	:	Board of Directors
2.	DPR	:	Detailed Project Report
3.	GOI	:	Government of India
4.	HA	:	Heritage Asset
5.	HAR	:	Heritage Assessment Report
6.	HBCR	:	Heritage Building Condition Report
7.	HCRP	:	Heritage Conservation and Reuse Plan
8.	HMMP	:	Heritage Management and Maintenance Plan
9.	HVAC	:	Heating, Ventilation, and Air Conditioning
10.	IR	:	Indian Railways
11.	IRSDC	:	Indian Railway Stations Development Corporation
12.	MCA	:	Model Concession Agreement
13.	MoEF&CC	:	Ministry of Environment, Forest and Climate Change
14.	MoHUA	:	Ministry of Housing and Urban Affairs
15.	MoR	:	Ministry of Railways
16.	NTOD	:	National Transit Oriented Development
17.	OoS	:	Object of Significance
18.	PSMC	:	Plan Sanctioning and Monitoring Committee
19.	RHA	:	Railway Heritage Asset
20.	RLDA	:	Rail Land Development Authority
21.	UBBL	:	Unified Building Bye-Laws

Chapter 1: Heritage Assessment Report

“Heritage Assessment Report (HAR)” shall provide the documentation of the state of the RHA based on inspection, monitoring, mapping, evaluations, tests etc. It shall comprise of details of the RHA, its inherent properties and values and a Heritage Building Condition Report (HBCR).

It shall contain-

1. HAR- Form 01- Preliminary Documentation based on Reconnaissance Surveys (Refer Section 1.1)
2. HAR- HBCR- Detailed Documentation of Physical Assets (Refer Section 1.2)
 - a. Inventorying (Refer Appendix I)
 - b. Measure drawings (Refer Appendix II)
 - c. Condition Mapping and Assessment (Refer Appendix III)

Section 1.1: HAR – Form - 01

Explanation- This form is to be filled by the consultant/ expert based on Preliminary Site Visits, Secondary Data collection, interviews of Station Manager, Station Director etc. **This form and its Appendices will be a part of the Inception Report of Consultancy Assignments.**

1. Write **Statement of Significance** (within 500 words)
2. Provide **copies of existing drawings and images** of RHA, Objects of Significance and its Character Defining Features
3. Provide **applicable** Legal documents including Regulations, Guidelines, Circulars, Plans, Policies and Schemes (formed by MoR or other agencies), Guidebooks, Fictions, Diaries, Personal notes, archival material et al
4. Provide a **Preliminary State of Conservation** Report for RHA and Objects of Significance conducted through Site visits and visual surveys with special focus on identification of Risks and Vulnerabilities.
5. Provide **existing Inspection, Monitoring, Maintenance and Repair protocols** for RHA and Objects of Significance as collected from concerned Station officer.
6. Write statement on **Degree of Adaptability** for RHA (within 250 words).

Section 1.2: HAR – Heritage Building Condition Report (HBCR)

Explanation- Heritage Building Condition Report (HBCR) to be prepared by the consultant/ expert based on Surveys, Primary data collection, documentation, etc. **This document and its Appendices will be a part of the stage that requires Surveys, Primary data collection, documentation, etc of Consultancy Assignments.**

1.2.1. Instructions for Inventorying (Refer Appendix I for sample format)

- a) Provide chronology of evolution of RHA since its inception.
- b) Map all movable and immovable RHA along with geocoordinates within Railway Land and atleast 500m from the Railway Land or as specified by the competent authority.

1.2.2. Instructions for Measured drawings (Refer Appendix II for sample format)

- a) Provide Survey Drawings including documentation of changes across lifetime.
 - i. Satellite Imagery demarcating boundaries and buffers
 - ii. Contour plan drawn at an interval of 0.5m.
 - iii. Revenue boundaries.
 - iv. Boundaries depicting limits of protective designations.
 - v. Building Roof footprint and landscape features.
 - vi. Existing site and landscape features.
 - vii. Infrastructure layout.
 - viii. Existing routes and access.
 - ix. Contiguous RHA, Contributing and Non-contributing features.
- b) Provide Survey of Station Building:
 - i. Original Railway property boundary, site boundary, plot boundary, built features/components.
 - ii. Original Urban design and Public space system.
 - iii. Layout and chronological addition of components and features overlayed on original scheme, Notified areas, Ward plans, or any other boundaries necessary for decision-making.
 - iv. Contours at interval of 0.5m, especially for sites that are subject to flooding.

- v. Spatial planning, Circulation, and Multi-modal interchanges.
- vi. Movement of Goods, Passengers and Services.
- vii. Land use and Building use, and Surface utilization.
- viii. Road layout, Landscape features - existing and historic.
- ix. Drainage features with slope analysis.
- x. Infrastructure distribution and Buildings of use/disuse.
- xi. MEP services.
- xii. Roof plan, and Finished levels.
- c) Provide Original and altered Building Plan, Elevations, Sections and Details
 - i. General layout of different levels and Reflected ceiling plans.
 - ii. Additions, alterations, extensions and past conservation or repair work undertaken to original layout and feature.
 - iii. Moveable and Immoveable features, equipment and objects.
 - iv. Interior design scheme including soft furnishing and Building infrastructure.
 - v. Colour scheme, Building craft details, Texture and Material distribution.
 - vi. Drainage and Sanitation Plan.
 - vii. Vertical and Horizontal movement plans.
 - viii. Structural system and joinery details.
 - ix. Layout of equipment and services of water supply, Fire safety and Energy performance installations.
 - x. Room-by-room uses and its supporting infrastructure.
 - xi. Advertisement and public outreach system.
- d) Provide State of Conservation of RHA
- e) Provide Impact Assessment of changes in use of whole/or parts of RHA (**Refer Appendix VI for sample format**)

1.2.3. Instructions for Condition Mapping and Assessment (Refer Appendix III for sample format)

- a) Assessment of Structural Deterioration and Safety
 - i. Expected increase in live and dead loads due to station redevelopment works
 - ii. Seismic action.
 - iii. Landslide.
 - iv. Flooding.
 - v. Water logging
 - vi. Erosion.
 - vii. *Differential Settlement.*
- b) Identification of threats to structural safety within the context
- c) Assessment of Integrity
 - i. Historic Structural Integrity
 - ii. Social Functional Integrity
 - iii. Visual-Aesthetic Integrity
 - iv. Statement of Integrity
- d) Condition Mapping Assessment of Site Plan marking issues that have direct/indirect impact on the Railway Yard area:
 - i. Drainage, water logging and other water-related issues.
 - ii. Levelling, change in original site contours.
 - iii. Issues related to location of infrastructure, amenities and facilities.
 - iv. Issues affecting Traffic including physical and visual access to RHA.
 - v. Usage of areas/abandoned areas within the Yard, and that contiguous to it affecting the RHA.
 - vi. Changed Historic landscape.
 - vii. Risk and Vulnerability Mapping.
- e) Condition Mapping Assessment of Building Level:
 - i. Recording of active and passive issues affecting State of Conservation.
 - ii. Plan depicting Impact Zone, and Origin of sources of risks and vulnerabilities.
 - iii. Plan depicting Changes proposed in contiguous and adjacent properties (whether detached or attached to the RHA).

Chapter 2: Heritage Conservation and Reuse Plan (HCRP)

“**Heritage Conservation and Reuse Plan (HCRP)**” shall refer to the dynamic document that shall form the basis of continued restoration/ use/ reuse of the RHA, while preserving or enhancing its intrinsic heritage value. The Plan shall be periodically updated and include (i) summary of HAR, (ii) adaptive reuse strategy with defined scope and limitations, and (iii) actions proposed in short, medium and long term for conservation and reuse of the RHA.

Section 2.1: Typical Structure and Content of the HCRP

The Heritage Conservation and Reuse Plan shall comprise of following four parts-

- RHA Information Plan
- RHA Assessment, Repair and Maintenance Plan
- RHA Protection Plan
- RHA Management Plan

(Refer Appendix IV for sample format)

Following sections of this chapter provide guidelines for addressing various aspects of HCRP.

Section 2.2: Guidelines for Conservation works

This section contains guidelines for Conservation and enhancement of the original design intent and relation between the Historic Station, Station Area, surrounding landscape and other historic assets;

2.2.1. The offset of any construction activity from a RHA shall be defined in the HCRP, demarcated in the Layout Plan and concerned Sub-Plot Property Development Card. (Refer Chapter 4: Property Development Card, in 03(a) Manual of Form Based Codes for Station (Re)development and 03(b) Guidebook for Form Based Codes). Also refer Section 2.3.

2.2.2. All proposal for new development (attached or detached from) whether identified in the above-mentioned Documents or during the life-cycle of the Historic Assets shall:

-
- f) Be compatible with properties of the RHA.
 - g) Maximize the longevity of RHA.
 - h) Ensure compatible Continued (re)use.
 - i) Be a genuine requirement and a value addition.

2.2.3. Any new construction contiguous to the Historic Building shall maintain an offset from the Building Line of the latter to ensure that:

-
- a) New building does not obscure the Historic Public Face.
 - b) Historic Building or historic feature is the foreground and focus,
 - c) The addition articulates itself as an attaché and a background.
 - d) It does not cast a shadow, prevent natural ventilation and sunlight, nor alter the microclimate adversely.
 - e) Exceptions in offset may be considered in case of providing Universal Access (Refer Section 2.5).

2.2.4. Compatible Design of extension/addition/infill shall:

-
- a) Follow parameters identified in the Heritage Regulation Card to ascertain the architectural form
 - b) Preserve Character Defining features viz historic, spatial, architectural, structural, and ornamental components and Character Defining Feature (not limited to, doors, windows, cornices, dados, skirtings, concealers, furnishing, fabric, balustrades, railings, lightening conductors et al).
 - c) Be clearly discernible and not replicate or recreate a false heritage Façade, Feature, Buildings or Complexes.

2.2.5. At a Layout Planning/ Site Level, following additions/interventions shall be deemed incompatible and non-sympathetic (interventions) to Railway Heritage Asset and Objects of Significance:

-
- a) Obstruct visual access.
 - b) Obstruct direct sunlight.
 - c) Obstruct natural cross-ventilation / air flow.
 - d) Cause water logging/ sewage collection.

2.2.6. Use of air rights by means of vertical extension shall be the least preferred option above or in the vicinity of RHA. Should the same be considered, following may be required for decision making:

-
- a) A mock-up model of an indicative volume to be installed at site with dismantlable material to demonstrate actual visual impact of the overbuild.

- b) Structural impact of ascertained volume shall be the basis of arriving at a volume thereafter
- c) Detailing of such form of development shall only be followed post engagement of an expert and a wider public dissemination.

Section 2.3: Guidelines for Heritage Regulation Card

2.3.1. Guidelines for Safety offsets from the heritage buildings

- a) The Safety offsets in the form of View Corridor, Vision Cone, Architectural Response Zone, Construction Control Zone, Height Control Zone, et al shall be reflected in the Heritage Regulation Cards prepared as per Manual 03a and Guidebook 03b.
- b) Parameters to determine safety offsets from RHA for ground and above-ground constructions:
 - i. History and signs of differential settlement
 - ii. Compaction and Properties of soil
 - iii. New construction shall not:
 - Cast shadows throughout the daylight hours
 - Prevent direct sunlight and cross-ventilation
 - Shall not alter microclimate of the historic building
 - Disconnect views and vistas
- c) Where under-ground constructions are required, below-identified infrastructure would be necessary for the entire project implementation period or till the structure is stabilised, whichever is later:
 - i. Hoist foundation with hydraulic jacks to support super-structure
 - ii. Scaffold and shore any dislodge-able part of the building
- d) For purposes of landscaping, root spread of trees/ plantation shall also determine:
 - i. Offset distance
 - ii. Possibility of poor soil compaction due to root action
- e) Post construction monitoring requirement shall be as follows:
 - i. Appearance of cracks.
 - ii. Discolouration of building surfaces.
 - iii. Increase in micro and macro vegetal growth.
 - iv. Increase in requirement of artificial ventilation and illumination.
 - v. Cause discomfort (suffocation, unnatural heat, musty odour etc) when walking through the passage.
- f) Introduction of Subsurface components like a sunken court, subways (completely subsurface or partly daylit), may be considered in the forecourt or public space in and around the RHA, or area contiguous to it.
- g) Subsurface components shall be planned in-keeping with and not be limited to the following:
 - i. Shall not jeopardise nor increase rate of differential settlement of the historic structure.
 - ii. Not damage potential or existing subsurface Archaeological or Natural features.
 - iii. Where expanded volume enhances access to heritage or provides additional space or increase holding capacity of the heritage building public activities except be used for parking, warehousing, storage, or that which may cause fire, heat, vibration, pollution, et al.

2.3.2. Principles for Continued, Compatible Adaptive Reuse

- a) General principles pertaining to use/ reuse at a layout-level:
 - i. Require minimal changes and preserves historic structural and architectural integrity.
 - ii. Reduces the Degree of Adaptability and/or Life Cycle of the Asset.
 - iii. Conveys historic design intent and associations truthfully.
 - iv. Follow principles of circular economy and have positive socio-economic footprint
 - v. Host uses that are non-polluting, do not risk conflagration, are (physically and fiscally) inclusive and encourage repeated visitation.
 - vi. Be unsympathetic or a nuisance to life and habitation within its immediate zone.
 - vii. Not hinder Risk and Disaster management.
- b) Design Principles applicable at building-level:
 - i. Changing quality and configurations of space by means of (i) Subdividing by partitioning and/or lowering ceilings, (ii) Damaging or obscuring or removing Character Defining Features, (iii) Require demolition and dismantling, (iv) Prevents access, (v) Prevents maintenance, (vi) Uses inflammable services and object.
 - ii. Space use shall not require Building Services and Infrastructure that is exclusive to one use and applicable to other classes of use.
 - iii. Introducing new and contrasting features or finishes in terms of its size, proportion, scale, material, colour, finish and period of history.
 - iv. Creating an inaccurate appearance by installing features without evidence.
 - v. Installing a feature that is inconsistent with the period of construction.
 - vi. Converting spaces into wet cores that were not designed for the purpose.

- c) A sample format for assessing the Continued, Compatible Adaptive Reuse is provided as **Appendix V**.

Section 2.4: Guidelines for removal of vegetation from RHA

2.4.1. Instructions for removal of vegetation (from historic building)

- a) Removal of all roots/plants shall be inspected by a trained Horticulturist to categorise whether it befits Type 01 or Type 02.
 - i. **Type 01** - Sapling or whose ingrowth is superficial, of depth less than one (1) masonry unit and
 - ii. **Type 02** - For matured trees protected under respective State's Tree Preservation Act
- b) Regular inspection is recommended, to prevent/ control plant growth into buildings

2.4.2. Guidelines for removal of vegetation

- c) Only those herbicides that are inert to building material and do not discolour surfaces shall be used.
- a) **For Type 01** - the following procedure shall be followed:
 - i. Photographic and architectural documentation explaining existing conditions, process of removal of plant, and proposed repair work to be submitted as the Work Plan.
 - ii. It shall be mandatory to submit a video recording of all stages of removal of plant and repair of surface.
 - iii. Stems to be cut closest to the masonry surface. No part of the plant shall be removed by pulling.
 - iv. Remaining root to be treated with herbicide that is inert to the masonry
 - v. Loosened or dislodged masonry or cavity (if any) to be repaired with compatible material following identical construction process
 - vi. It is recommended that persons appointed for the task be trained and be monitored by a trained Horticulturist when plants are removed and when chemicals are used.
- b) **For Type 02** - the following procedure shall be followed:
 - i. A trained Horticulturist and a Forest Officer shall ascertain.
 - ii. Whether tree is a threat to life and property.
 - iii. Removal of Tree is as per the relevant Tree Preservation Act.
 - iv. A Structural Engineer shall assess requirements for structural supports during removal of tree and restoration of historic building components.
 - v. Reconstruction of dismantled parts shall be allowed post removal of trees/vegetation to ensure structural integrity.
 - vi. A stone-by-stone documentation and a Work Plan detailing (i) dismantling and (ii) Reassembly and Repair shall be mandatory.
 - vii. It shall be mandatory to video record and submit the entire processes of (ii) extraction and transplantation of the tree, and (iii) reconstruction of the structure, to the Authority.

Section 2.5: Guidelines for addition of Universal accessibility features

2.5.1. Universal accessibility features are necessary for user safety and shall be provided in and around RHA as per provisions of "Harmonised Guidelines and space standards for barrier free built environment for Persons with Disability and Elderly Persons, 2016".

2.5.2. An accessibility audit shall be conducted with the following order of decreasing priority.

- a) Universal Access and User Safety
- b) Historic Structural and Material Safety
- c) Aesthetics

2.5.3. Guidelines for Installation of lifts-

- a) **Most Preferred**- New Lifts required to ensure Universal Accessibility should be accommodated within the planned expansion and suitably connected with the above-ground floors in the RHA
- b) **Second Preference**- New Lift required to ensure Universal Accessibility should be planned as a detached structure outside the RHA, ensuring the following-
 - i. It should not obstruct the public face and character defining elements of the RHA.
 - ii. It should be suitably connected with the above-ground floors in the RHA without obstructing the public face of the RHA.
- c) **Least Preferred**- New Lifts required to ensure Universal Accessibility may be planned within the RHA, subject to obtaining Structural Safety Certificate/Report from Third Party/Institutes of National Repute, which shows that such installation would not affect structural safety of the RHA.

2.5.4. Installation of accessibility ramps, including for thresholds and spot level changes-

Accessibility ramps to be provided as a detachable unit shall be made out of materials which do not lead to damage/ deterioration to the historic fabric. Alternatively, Hydraulic lifts may be used, ensuring it does not lead to structural/ material damage to the RHA.

2.5.5. Guideline for ensuring minimum widths for wheelchair access-

For RHA, where the minimum widths of corridors, doorways, etc. are not as per the “Harmonised Guidelines and space standards for barrier free built environment for Persons with Disability and Elderly Persons, 2016”, provisions for alternate access shall be made.

2.5.6. Guidelines for installing tactile paving-

Within RHA, the colour of the paving should be harmonious with the flooring (material, texture, pattern).

Section 2.6: Guidelines for Green Building upgradations

2.6.1. Green Building upgradation of RHA through Conservation of RHA is recommended, as embodied carbon value for reuse of RHA is nil and that for restoration is negligible as compared to a new construction.

2.6.2. The following acts would account for pro-green building actions:

- a) Technically correct conservation and maintenance.
- b) Rehabilitation and Compatible Adaptive Reuse that do not require renovation and alteration.
- c) Enhanced lifecycle of the historic building.
- d) Use of natural light for illumination and minimal dependency on artificial sources.
- e) Use of ventilation and passive energy management to ensure user comfort.
- f) Reuse of salvaged material shall be a priority, followed by upcycled and material. Use of new material shall be kept a minimal as possible.

2.6.3. Material and fixtures to be used as per approved Environment Management Plan, and installed while following the relevant guidelines in this document.

Section 2.7: Typical Instructions for construction/ Repair works

2.7.1. Following aspects shall be monitored during Construction contiguous to historic building

- a) Also see section 2.3.1. ‘Safety offsets from the Heritage Buildings’ for signs of building stress
- b) All moveable component parts shall be inspected before commencement of and after demolition or heavy, vibration inducing machinery
- c) All surfaces shall be checked for signs of deposition of dust, abrasion, discoloration, or any form of surface distortion
- d) Replantation of trees to be arranged before commencement of construction
- e) Rupture and dislodgement of Building Services
- f) Disruption of earthing or exposure of live-wire to be checked
- g) Adhoc water and sewage logging to be checked
- h) Obstruction to physical access to historic building to be checked
- i) Sub-surface remains (Archaeological or Geological) should not be damaged

2.7.2. Following aspects shall be monitored during Construction/ Repair within historic building

- a) Also see section 2.3. HRC Guidelines
- b) That work shall not be commissioned under lack of material and trained personals.
- c) Suitable provisions to be made for cost and time over-runs.
- d) That no moveable and immovable building part is disassembled, dismantled or dislodged during work unless the HCRP recommends to do so.
- e) That interventions do not cause increase in the rate of degeneration and decay
- f) That spare parts and components for replacement are available and used while repairs are undertaken in a single phase of work
- g) That safety measures and precautions are maintained for:
 - i. All those working at site,
 - ii. All components parts of the historic building and Character Defining Features.
- h) That works and observations are recorded by-
 - i. Updating the Maintenance Manual
 - ii. Updating the Drawings
 - iii. Process is recorded both photographically and video-graphically for future reference
- i) That no original details (bonding patterns, coatings, color, texture to the minutest details) including original designed visual features and craftsmanship shall be altered.
- j) A trial path shall be commissioned if proposed material or technology is experimental.
- k) That working area shall not hinder emergency evacuation and have access to the same.

Section 2.8: Guidelines for Advertisements and signage Infrastructure

2.8.1. Also see Framework for HRAP in Appendix VII

2.8.2. Providing interpretation is binding and shall include the following:

- a) System and scheme for interpretation shall be as per HCRP and shall have valid information on the historicity of the Station and its significance.
- b) Intent and proposals of conservation work shall be made public to raise participation. This may be done through printing and installation of images at site, publication in newspaper, and via social media handles, in order or preference.
- c) Texts, graphics, samples or replicas of historic objects at strategic points that do not hinder overall circulation to be put up.
- d) Information package provided shall be validated, be true and the schema for its presentation shall follow the overall format adopted by the IRSDC/ MoR.

2.8.3. Historic walls shall not be perforated for mounting new material for publicity, interpretation, public engagement, advertisement boards, notice boards et al

2.8.4. Historic display systems, lettering style and font types, mounting and hanging, displaying information shall be preserved in continued use and their designs suitably adopted for new works at Historic Stations.

Chapter 3: Heritage Management & Maintenance Plan (HMMP)

“Heritage Management & Maintenance Plan (HMMP)” shall refer to the comprehensive plan prepared to guide the regular maintenance, upkeep and (re)use of the RHA. HMMP shall be a dynamic document including regularly updated RHA documentation, building condition survey reports, Work Plans, emergency/ disaster management plans, regular Inspection reports, Maintenance & upkeep protocols, etc. and shall be updated at least twice a year.

Section 3.1: Typical Structure and Content of HMMP

For Railway Heritage Assets, HMMP shall comprise case specific recommendations for implementing immediate, mid and long term maintenance works. It shall atleast provide recommendations for following works-

1. Protection from vibrations, construction dust, moisture and other polluting/ invasive agents
2. Selection and application of substitute materials/ features
3. Standard Instructions for Regular Inspection, Maintenance, Monitoring & Repair Works
4. Specifications of recommended maintenance works related to RHA
5. Implementation schedule for-
 - a. Urgent and Immediate plans,
 - b. Medium and Long Term plans (including repair, material specification and quantification, interpretation and Outreach and Training requirements)
6. Additional case specific recommendations may also be added.

Following sections provide guidelines for various aspects of preparation of HMMP.

Section 3.2: Guidelines for Protection from vibrations, construction dust, moisture and other polluting/ invasive agents

3.2.1. Guidelines for protection against vibrations

- a) For each station, independent studies to assess impacts of existing/ during construction/ post construction Noise and Vibrations on the RHA to be conducted.
- b) Provisionally, other suitable guidelines from Indian Railways/ Metro Railways, may be referred for the purpose.
- c) General Precautions to be taken prior to construction includes:
 - i. Estimating building's inherent designed resilience to vibration
 - ii. Simulate extent of vibration to be induced during (i) construction, and (ii) operation /proposed use.
 - iii. Assess (i) strength of structural members, (ii) retrofits and scaffolding required for temporary buffering during construction, and (iii) scaffolding / shoring/ any other supports required during construction to hold in place overhangs, projections, moveable or parts that is subjected to dislodgement (like water tanks, lift boxes, electrical sub meters et al).

- iv. Before commencement of construction work, the RHA and its subcomponents, including ornamental details, plasters, finishes, fixtures et al, shall be inspected, consolidated where required and regularly monitored for any change of state.
- v. Telltales¹ shall be installed to monitor cracks across project life cycle.
- vi. For safety of users and RHA, use that induces increased vibration shall not be permitted in and around the RHA unless, (i) that the structural retrofits strengthen the structural system and elongates useable life of the RHA, and (ii) retrofits do not decrease the Degree of Adaptability of RHA.

3.2.2. Guidelines for protection against construction dust

- a) Follow 05:Environment Management Guidelines for Station (Re)development for curtailing and containing construction dust within Site.
- b) RHA with delicate stone and ornamentation shall be continually monitored for signs of sudden increase of abrasion, erosion or any other form of surface deformation during the construction period. Should such signs of distress be visible, the amends shall be made to the curtaining system used to prevent dispersion of construction dust.

3.2.3. Guidelines for protection against moisture

- a) Refer to 3.2.1. and 3.2.7, for periodicity and location of Check against moisture.
- b) General Principles applicable to protect against moisture:
 - i. All sources of leaking equipment, wet uses, services or infrastructure susceptible to moisture retention, condensation or spillage shall be (i) identified, (ii) removed, and (iii) repaired, on an urgent basis.
 - ii. Construction sites shall be regularly inspected for (i) direction where water is stored and discharged, (ii) water stagnation, (iii) constant wetting of ground adjacent to RHA, (iv) tear in plinth protection, (v) breakage and stagnation of drains, STPs, submersible tanks et al, and (vi)
 - iii. RHA and its surrounding shall be kept free from untended accumulation of garbage.

3.2.4. Protection against Pollutants/Invasive agents

- a) Preventing and minimising source of pollution remains the mandatory treatment and a priority in protecting RHA and occupants against pollutants/ Invasive Agents.
- b) Where eradicating the source is not possible or execution needs to be done in phases, temporary buffers, such as trees, or green screens or other ornamental features (not advertisement boards) may be used. Placement of the same shall be in accordance with the EMP and not obstruct natural ventilation, sunlight, unhindered access to the RHA.

3.2.5. Protection of foundations of the heritage building:

- a) Refer to 3.2.2. & 3.2.3., for protection of foundation against vibration and moisture
- b) All underground service lines, especially those carrying liquid, shall be checked for any rupture, breakage and be kept free from any leaks or spillage and be repaired immediately
- c) Ground around RHA shall be inspected for rodents and any other animal habitation. While animals shall be rehabilitated as per existing norms, the burrow or hole or nest created shall be (i) cleaned for traces of food, excreta or habitation remains, and (ii) filled and secured.
- d) Site and surrounds shall be checked regularly for unnatural stagnation of water, sewer or any other toxic or non-toxic material that may percolate causing (i) differential settlement, (ii) undesigned movement, (iii) reaction with materials used in foundation.
- e) Addition and alteration in an around RHA shall be carefully examined undesigned changes in the form of addition of floors, staircases, lifts, building blocks or any post which, cracks have appeared.

Section 3.3: Guidelines for Heritage building maintenance team

- a) Only trained persons shall be involved in conservation and repair works.
- b) Where trained staff is absent or where special repairs are to be taken, provisions shall be made to hire an expert for training the staff on the job.
- c) Contingency funds shall be allocated for skill upgradation and on-the-job, peer-to-peer learning for persons involved in all levels of conservation work.

Section 3.4: Guidelines for Maintaining temperature and relative humidity levels

3.4.1. Indoor temperature and relative humidity shall be

- a) Compatible with the hygroscopic properties of building materials of the given space in the location. The value shall be customised based on the number of occupants and Climatic Zone.

¹ A tell-tale, sometimes called an idiot light or warning light, is an indicator of malfunction or operation of a system, indicated by a binary (on/off) illuminated light, symbol or text legend.

- b) In maintaining the ambient indoor climate, passive energy management shall be given a priority. In doing so, plantation, use of shading devices and others shall be as per local climatic requirements.

Note: For the above to be effective, regular and technically sound Building Maintenance shall be indispensable. Necessary procedures to be applied before removal of any plants/ trees or features obstructing natural airflow.

Section 3.5: Guidelines for Selection and application of substitute materials/features

3.5.1. Guidelines for selection of substitute materials:

- a) A substitute material shall be considered compatible by the virtue of being collected from same source.
- b) Original material shall be substituted with a newer counterpart when original material used has inherent flaws for example impurities in material, incorrect manufacturing et al.
- c) Where material from identical source is not available and a new material is being sourced, it shall have
 - i. identical physical and chemical properties, specifically permeability to moisture and thermal expansion and contraction rates;
 - ii. allow evaporation or passage of trapped moisture;
 - iii. be comparatively less dense than the original material;
 - iv. identical texture and colour;
 - v. be sacrificial in nature, where it may be replaced, without damaging original core material;
- d) Substitute material shall be first tested, weathered and monitored for impact and then approved.

Note: It may be judicious to customise and manufacture those substitute material that are likely to be used in large number of RHA.

3.5.2. Guidelines for Painting and Finishing works

- a) Historic paint shall not be dismantled/ removed.
- b) Where part of the original paint remains, the same shall be stabilised, edged and the part with missing paint shall be finished with paint of matching properties.
- c) The Hue, Saturation and Colour of Paint shall match original paint.
- d) Should several layers of paint, especially of different shade, is evident, that which is representative of the thematic period shall be retained. Evidence of other layers shall be kept preserved for future reference, if a change in colour is desired.
- e) Change in colour shall be evidence based (as mentioned above). Evidence in this case implies both, (i) layers of paint available at site, and (ii) archival photographic records
- f) Paint over historic (natural) building material shall allow Moisture evaporation (and not trapping moisture).
- g) Painted surfaces shall be continually monitored for blistering or Swelling of paint
- h) Surfaces that may be painted (besides walls) are as follows:
 - i. Woodwork on doors, windows, balustrades that were originally painted (including varnishes) (also see Section on Wood)
 - ii. Metal pipes with anti-corrosive paint
- i) Surfaces that shall not be painted are as follows:
 - i. Exposed Masonry i.e. where by design, no finishes were applied over building material,
 - ii. Natural building stone,
 - iii. Part components of Building Services (wires, metal clips, mounting material, pipes, et al.)

3.5.3. Guidelines for Stoneworks

- a) Stone as dados, flooring, skirting or any other surface susceptible to heavy duty use shall be checked for:
 - i. Deformation like warping, blistering, crazing,
 - ii. Chipping, cracking, flaking, segregation of layers along minerals
 - iii. Dislodgement
 - iv. Discolouration, depigmentation
 - v. Erroneous repairs like replacement either wholly or partly, with incompatible material
 - vi. Covering with painting, wall paper, poster, notices et al
- b) Principles for treatment of stone are as follows:
 - i. No historic stone surface, unless painted as in the original scheme, shall be provided with a coat of paint. This shall be considered defacing.
 - ii. Where natural stone of dados and skirtings has been replaced with impermeable tiles, the latter should be replaced with natural stone as per original scheme to prevent further deterioration of brickwork. Natural stones being breathable, shall allow evaporation of the rising damp and prevent degeneration of brick, wood or other building core material.
 - iii. Fixing and masonry details shall be as per original design (layout/ pattern)
 - iv. Cleaning of surfaces shall not use acid based material

- v. To replace, broken or missing pieces, new members shall (i) match design, grain, texture, colour, and any other design specification as per case at hand, and (ii) be seamless.

3.5.4. Guidelines for Masonry works

- a) Issues being addressed through pointing should first be identified, treated before repointing
- b) Exposed masonry shall be maintained by re-pointing.
- c) Repair of Masonry following dismantling, upgradation, retrofitting et al, shall maintain the original layout pattern in terms of material, size, style, bonding pattern, et al.
- d) Overcleaning of masonry i.e. removal of patina shall be avoided to prevent damage to building material.
- e) New mortar shall:
 - i. Be tested prior to application for compatibility and impact
 - ii. Match historic mortar in colour, texture and tooling
 - iii. Have greater vapor permeability and be softer (measured in compressive strength) than the masonry units.
- f) Pressure washing and Chemical Cleaning shall only be undertaken if:
 - i. proposed by a qualified professional
 - ii. be supervised by the proposer

3.5.5. Guidelines for Woodworks

- a) All woodwork shall be regularly checked for:
 - i. Termite colony and growth,
 - ii. Dead wood,
 - iii. Cracks and split along fibres,
 - iv. Staining and discolouration,
 - v. Injury like scratches or where parts of the member is scooped out,
 - vi. Dry rot.
- b) Original woodwork shall be retained and reused as much as practicable.
- c) Unused/ Discarded wood or that intended for reused for a purpose other than original, shall all be salvaged, repaired and reused preferably in situ.
- d) Storing wood for reuse shall be subjected to the following:
 - i. Removal of metal pieces like screws, pins, hinges etc,
 - ii. Store room to be dry and free of dust, moisture, insects, birds and other lifeform that may initiate or increase rate of decay,
 - iii. Wood to be stacked above ground
 - iv. Shall be repaired, shall be provided with a coat of anti-insecticide paint and dried before stacking.
 - v. Stacking shall be mindful of the direction of fibres and cracks.
- e) Repair of woodwork shall include:
 - i. Injection with organic insecticide to kill termites and insect colony.
 - ii. Such paint shall not stain or render wood brittle.
 - iii. Non-structural member and components not under rigorous use may be repaired by removing dead wood and replacing with firm, new wood of compatible properties. For such purposes, salvaged wood may be used.
 - iv. For structural members and components under rigorous use, effective strength of repaired woodwork shall determine the (re)use of repaired member or a new member.
 - v. Infill or substitute wood shall have compatible property (in terms of density, fibre strength, degeneration pattern etc).

3.5.6. Guidelines for Metal works

- a) All metal members shall be regularly checked for:
 - i. Rust, Salt action,
 - ii. Breakage,
 - iii. Dislodgement,
 - iv. Formation of non-sympathetic patina (say dirt, grime et al),
 - v. Staining and discolouration,
 - vi. Injury like scratches or where parts of the member is scooped out
- b) If an ornamental metal members are found brittle, flaking and has lost its integrity, these shall:
 - i. Not be used in places where its failure may cause loss of life and property
 - ii. Be replaced by an identical member customised for the purpose
 - iii. Match in aesthetics and be indiscernible
- c) Treatment of Metal surfaces shall include and not be limited to
 - i. Removal of addition layers of paint or that which is flaking prior to treatment.
 - ii. At no point of time shall non-painted metal members be coated with paint.

- iii. Treated with anti-corrosive paint where rust is evident and where material can be in continued state of use
- iv. Oiling to ensure smooth movement of joints
- d) Disposed but workable metal components shall be salvaged, treated for rust or any other damage, oiled, and stored in a clean and dry space for reuse.

3.5.7. Guidelines for Glassworks

- a) All glazing shall be regularly checked for:
 - i. Cracks, Breakage,
 - ii. Missing members
 - iii. Loss or disintegration
 - iv. of putty and beading
- b) All broken non-ornamental glazing shall be replaced with units having identical visual property and weight.
- c) The following treatment shall be undertaken for loosened, but not broken or cracked glazing:
 - i. Beading and dead putty be removed and fresh layer be applied
 - ii. Fasteners like nail may be used to fix glazing onto panel depending on thickness
- d) The following treatment shall be undertaken for ornamental glazing:
 - i. No part shall be disposed
 - ii. Glass shards to be removed only by trained conservators for documentation and repair.
- e) Where storms are frequent, storm windows can be provided to protect glazing

Section 3.6: Standard Instructions for Regular Inspection, Maintenance, Monitoring & Repair Works

Sample format for conducting periodic Inspection, Maintenance, Monitoring & Repair Works is provided as Appendix XI.

3.6.1. Landscape features (soft and hardscape), viz - Walkways, paths, pavements, retaining and other walls, gates and garden structures adjacent to the Historic Building

- a) Check materials for cracks, loose elements, and loose mortar joints, moist or bulging areas. Repair, as necessary.
- b) Inspect gates for soundness and damage. Test gates for operation.
- c) Inspect for damaged, decayed, loose or missing pickets, posts, and rails. Check fence alignment.
- d) Inspect for damaged or missing bollards and chains. Test bollards for stability.
- e) Identify trees and shrubs requiring pruning.
- f) Check taps, sprinklers, and watering systems to prevent wastage and waterlogging once a month.
- g) Check for presence and location of warning signs (such as those marking electric fence).
- h) Inspect for uneven ground that may lead to water stagnation, trips and falls.
- i) Inspect for open drains, manholes etc. that are a safety hazard.
- j) Inspect the premises for unpleasant/unusual odors.

3.6.2. Site Drainage (Slope of the land and constructed elements like Pipes, Gutters, Swales, Drains)

- a) Check for blockage, clogging, corrosion, and leaks in pipes, gutters, swales, catch basins.
- b) Ensure all outlets from the gutters have downspouts to direct the water to extensions or splash backs.
- c) Check downspouts for water flow and leaks.
- d) Ensure the slope of the ground around the downspout runs away from the foundation.
- e) Grading may require building up the ground around the foundation, making sure not to get within 150 mm of siding or other exterior cladding to prevent rot due to splash back.
- f) Ensure that the ground water/any water source is not polluted.

3.6.3. Exterior Illumination (Lamps, Light fixtures, Electrical parts like wires, conduits etc.)

- a) Check for functionality.
- b) Check for deteriorated paint, rust, corrosion, moisture damage, and wear.

3.6.4. Roof (Terraces, Roof tiles, Rafters, Beams, Gutters)

- a) Check the covering over the ridge or hip of a roof to make sure it is tight, without gaps.
- b) Where ventilation is introduced to a roof system, ensure that the sealing details (screens, flashing, and caulking) are visually inspected.
- c) Check for loose or missing shingles. Look for moss growth, overhanging branches, level of roof.
- d) Check the roof at changes in pitch or direction for failing materials or gaps.
- e) Search roofing materials for deterioration -- cracks, blisters or curling, and for any loose or missing parts.
- f) Inspect soffits and fascia for deterioration (sagging) or openings, where animals/insects could find access or where they could nest.

- g) Inspect the joints, where roof and siding meet, for cracks.
- h) Inspect for evidence of decay in the rafter ends and for water damage cornices.
- i) Inspect for signs of clogging, inadequate slopes, or defects in the gutters and downspouts.
- j) Inspect the pitch of the gutters.
- k) Inspect water tightness of the roof.
- l) Check eaves for bird/animal nests.

3.6.5. Chimney (Hearth, Damper, Flue, Lining)

- a) Inspect if the chimneys leaning above the roof line.
- b) Inspect if the bricks near the top of the chimney are deteriorated.
- c) Inspect if the chimneys are free of obstructions and soot build-up.
- d) Inspect if the mortar is crumbling, or if there are loose or missing bricks.
- e) Inspect if the flashing is rusted or pulling away from the roof and chimney.

3.6.6. Foundation

- a) Inspect for Movement: Check for signs of recent building settlement.
- b) Are any serious cracks visible?
- c) Are there any signs of movement -- patched cracks re-opening, cracks in walls, bulging siding, windows, or doors out of square?
- d) Is the roofline straight and horizontal?
- e) Are beams, columns, posts and joists sound? Are posts vertical and stable?
- f) Are the foundation walls plumb?
- g) Inspect for Moisture percolation.
- h) Are there any signs of leaking?
- i) Are there any signs of excessive moisture -- musty smell, corrosion?
- j) Is there any efflorescence or peeling paint on the walls or floor?
- k) Is there any condensation forming?
- l) Are there water stains or rotted wood near the floor?
- m) Are the wood posts, beams or floor joists damp or soft?
- n) Inspect the exterior of the foundation.
- o) Is the parging in good condition? Are there any new cracks or flaking?
- p) Is the ground properly sloped away from the building?
- q) Are there any trees or saplings growing near the foundation?

3.6.7. Masonry (Stone, Brick exterior or interior walls, Arches, Vaults and Domes)

- a) Check exposed exterior and interior surfaces of walls and foundations, with particular attention to areas of stairway, floor and wall openings, and changes in wall masonry material.
- b) Check for cracks, collapsing, leaning, or bulging areas or other signs of uneven settlement, movement or structural deterioration.
- c) Check interior wall surfaces at upper levels, with particular attention to joints between side and front and rear walls, joints between floors and end walls, and joints between partitions and ceilings.
- d) Check for cracks, crumbled plaster, gaps, or other signs of movement. If significant cracks, surface spalling, or material deterioration is found, review the condition of masonry with a registered architect, materials conservator, or restoration contractor experienced in evaluating masonry.
- e) Check for moist areas, cracks, crumbling material, loose pieces, missing mortar, or efflorescence (white discoloration).
- f) Check for points of moisture ingress such as leaks in roofing, cornice, flashing, downspouts, and joints between masonry and other materials.
- g) Check for vegetation, algal, mold growth on the masonry.
- h) Check overgrowth of vegetation in close vicinity of the masonry.

3.6.8. Staircases (Balustrades, Steps, Stairwells)

- a) Check for moisture ingress, cracks.
- b) Check for corrosion in case of metal staircases.
- c) Check for loose balusters/railings.

3.6.9. Openings/Fenestrations (Doors, Windows, Ventilators, Screens)

- a) Check for debris, clogged drainage.
- b) Check for loose joints, deteriorated paint, corrosion, holes, moisture damage, and wear.
- c) Check for cracked or broken panes of glass.
- d) Check for moisture damage, warping, splitting, and unsound joints. Check window putty for cracks or missing sections.

- e) If wood is decayed, determine source of moisture, for leaks, and replace decayed wood to match original material. Repair unsound or loosened joints. Replace missing wooden elements to match original in dimensions, species, workmanship, and finish.
- f) Check putty for cracks or missing pieces.
- g) Check for loose attachments of hardware. Reattach as necessary.
- h) Check for vandalism or break and enter damage to windows and doors.
- i) Check for tight, broken or defective locks and latches.
- j) Check nets/screens for tears.

3.6.10. External and Internal Finishes (Plastered surfaces, Painted surfaces, Flooring finishes)

- a) Check for loose spots, sagging, large cracks, and significant holes in plaster.
- b) Check for efflorescence (visible salts) on plaster.
- c) Check for signs of dampness and moisture intrusion.
- d) Check for peeling, blistering painted surfaces.
- e) Check for mold/algal growth in plastered or painted surfaces.
- f) Check for excessive wear and tear in flooring surfaces.
- g) Check for missing grouts in case of tiles.
- h) Check for missing/broken tiles.
- i) Check for animal droppings and its impact on the finish.
- j) Check for termite/termite/another pest action.
- k) Check for graffiti or signs of vandalism.

3.6.11. Water Conduction system (Downspouts, gutters)

- a) Test for leaks or blocked sections of water conduction systems.
- b) Check for any loose or missing gutters, downspouts, or other system components.
- c) Check joinery between gutters/downspouts for leaks.
- d) Check for obstructions in downspouts.

3.6.12. Plumbing system (Water Heater, Plumbing Fixtures, Water Supply)

- a) Check water, waste and vent piping and fittings. Visually inspect for leaks, corrosion, damage and ease of operation. Check kitchen sinks, flush toilets, and garbage disposal equipment.
- b) Check for leaks in the water heater, drain to reduce sediment build-up. Check temperature setting, and safety mechanisms.
- c) Check metal ductwork for holes, loose connections. Keep air handlers clear of debris/exhaust.
- d) Check spigots on the exterior of buildings.
- e) Identify polluting sources.

3.6.13. Electrical Work (Lighting, Wiring, Vents, Security Monitoring)

- a) Identify electrical wiring and components that may have degraded over time.
- b) Reveal if any electrical circuits are overloaded.
- c) Reveal if any lack of earthing.
- d) Identify any defective wiring.
- e) Spot oversized fuses or breakers that may cause an electrical fire hazard.
- f) Find any potential electric shock risks.
- g) Check interior incandescent and fluorescent bulbs.
- h) Check fittings and wall connections. Check electrical outlets for damage, secure plate connections.
- i) Check smoke detectors. Check wiring, sockets and fixtures. Visually inspect for sparks, frayed ends, loose connections, corrosion and other damage.
- j) Check and clean vents hood in kitchens.
- k) Check security monitoring, test annually, ensure regular inspection by licensed professionals.

3.6.14. Fire Extinguisher

- a) Check all fire extinguishers, test annually, ensure regular inspection by a licensed professional. Ensure that extinguishers are not blocked by equipment, coats or other objects that could interfere with access in an emergency.
- b) Ensure extinguisher pressure is at the recommended level. For extinguishers equipped with a gauge, the needle should be in the green zone - not too high and not too low.
Note: if the nozzle or other parts are damaged in any way, and if the pin and tamper seal are intact.
- c) Check to see that there are no dents, leaks, rust, chemical deposits and/or other signs of abuse/wear. Wipe off any corrosive chemicals, oil, debris, etc. that may have deposited on the extinguisher.

3.6.15. Mechanical building systems (HVAC)

- a) Change and clean filters, vents, and condensation pans to control fungus, molds, and other organisms as often as needed.
- b) Inspect for adequate ventilation, ensure that area is free of musty smell.
- c) Check for visible signs of moisture damage from HVAC system (staining, wet patches, bubbling).
- d) Ensure that a semi-annual inspection is performed by qualified HVAC professionals prior to the start of heating and air conditioning seasons.

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