ABRIDGED MANUAL

GRIHA INFRASTRUCTURE RATING

FOR HIGHWAYS

A GRIHA COUNCIL PUBLICATION

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FOR HIGHWAYS

VERSION 1

A GRIHA Council Publication

DEVELOPED BY:

GRIHA Council
Core 1B, 3rd Floor
India Habitat Centre
Lodhi Road
New Delhi - 110003

Tel. - (+91 11) 46444500/24339606-08
Email id: info@grihaindia.org
Website: www.grihaindia.org

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MESSAGE FROM THE VICE PRESIDENT

I am excited to announce the launch of GRIHA Infrastructure Rating for Highways, a significant step forward in promoting sustainable road development in India. Our country boasts the second-largest road network in the world, covering approximately 6.7 million kilometres of road network, making it imperative that we prioritize sustainability in our road infrastructure. **The introduction to this rating system for highways addresses four key needs: enhancing sustainability by going beyond current standards, providing consistency in evaluating roadway projects, simplifying the complex science behind sustainability for better decision-making, and normalizing metrics to offer a holistic view of roadway performance.** The anticipated benefits of green highways include reduction of virgin materials, lower energy consumption, mitigated environmental impacts with minimizing GHG emissions, and improved human health and safety.

This rating will transform traditional highways into green highways, beginning from the design phase and continuing through construction and maintenance. I commend our dedicated team at GRIHA Council for their hard work in bringing this initiative to fruition and look forward to making our contribution for enhancing our infrastructure sustainably.

"Let us work together to build a future where our highways not only connect people and places but also contribute to a healthier, more sustainable planet for generations to come"

SANJAY SETH

Vice President & CEO
GRIHA Council

TECHNICAL ADVISORS

GRIHA Council

Mr. Sanjay Seth, CEO & Vice President
Ms. Shabnam Bassi, Dy. CEO & Secretary
Mr. Akash Deep, Deputy General Manager & Treasurer

TERI

Mr. Sharif Qamar, Associate Director

DEVELOPMENT TEAM

GRIHA Council

Mr. Ankit Bhalla, Manager
Ms. Shaily Mahera, Manager
Ms. Aakriti Sachdeva, Deputy Manager
Mr. Mohak Jain, Deputy Manager
Ms. Moumita Ghosh, Project Officer
Ms. Jay Prabha Rani, Project Officer
Mr. Yash Nayyar, Assistant Project Officer
Mr. Avinash Dutta, Assistant Project Officer
Ms. Nayan Thara A, Assistant Project Officer

TERI

Mr. Faiz Jamal, Associate Fellow
Mr. Piyush Saxena, Research Associate

TABLE OF CONTENTS

ABBREVIATIONS

ASI	Accident Severity Index
AQI	Air Quality Index
CCEA	Cabinet Committee on Economic Affairs
CO	Carbon Monoxide
CO2	Carbon dioxide
CSR	Corporate Social Responsibility
C&R	Construction and Demolition
GRIHA	Green Rating for Integrated Habitat Assessment
HVAC	Heating, Ventilation, and Air-Conditioning
IRC	Indian Roads Congress
MoEFCC	Ministry of Environment, Forest and Climate Change
MoRTH	Ministry of Road Transport and Highways
PM	Particulate Matter
RA	Recycled Aggregate
RCA	Recycled Concrete Aggregates
RE	Renewable Energy
SUDS	Sustainable Urban Drainage Systems
SOS	Save our Soul
T&P	Tools, Plants, and Equipment
WCs	Water Closet
WHO	World Health Organization

OVERVIEW

Highways form the backbone of a nation's infrastructure, playing a crucial role in economic growth, regional connectivity, and social development. However, the extensive construction and maintenance of highways have significant environmental implications, often resulting in habitat disruption, increased greenhouse gas emissions, and higher resource consumption. Additionally, these networks have a profound influence on surrounding communities and ecosystems, making it essential to consider sustainability principles in their planning, construction, and maintenance.

The need for a specialized highway rating system that evaluates construction projects on sustainability parameters has never been more pressing. Infrastructure development, including highways, is a significant contributor to carbon emissions and natural resource depletion. Traditional highway construction often prioritizes immediate economic and functional outcomes over environmental or social considerations, leading to deforestation, loss of biodiversity, soil erosion, air pollution, and other adverse impacts. Additionally, highways play a crucial role in connecting remote regions and supporting economic growth, making it imperative to construct them in a manner that balances environmental responsibility with developmental goals.

To address such challenges and promote responsible infrastructure development, GRIHA Council has introduced the GRIHA Infrastructure Rating for Highways. This rating system aims to provide a structured framework that evaluates the sustainability aspects of highway projects, encouraging environmentally responsible practices, resource efficiency, and long-term resilience. GRIHA Infrastructure Rating for Highways has been designed to address these critical needs by promoting sustainable practices throughout the project lifecycle—from planning and design to construction, operation, and maintenance.

OVERVIEW

The introduction of GRIHA's highway rating system aligns with India's target of becoming a 'Net Zero' nation by 2070 and achieving the vision of becoming Viksit Bharat @2047.

This rating system provides a holistic approach to assess the environmental, social, and economic impacts of highway projects. GRIHA's framework focuses on parameters such as energy efficiency, water management, waste reduction, ecological preservation, and minimizing the carbon footprint associated with highway development.

By assessing these factors, GRIHA's highway rating encourages project developers, contractors, and stakeholders to adopt sustainable construction techniques, reduce resource consumption, and implement environmental safeguards. In doing so, the rating system helps mitigate the long-term ecological and social impacts of highway projects while enhancing their resilience against climate-related challenges.

The GRIHA Infrastructure Rating for Highways is thus a significant step towards a more sustainable approach to infrastructure development. By setting measurable criteria for sustainability, it fosters a culture of environmental stewardship and social responsibility within the construction industry.

This rating system not only aids in mitigating the negative impacts of highway construction but also serves as a guide for integrating sustainable practices across other infrastructure sectors, contributing to the broader vision of a sustainable and resilient built environment.

RATING STRUCTURE

Introduction

The GRIHA Infrastructure Rating for Highways is designed to promote sustainable practices in the design, construction, and maintenance of highway projects. This certification process outlines the necessary steps to achieve high sustainability standards, ensuring that all highway projects comply with established sustainability criteria as defined by GRIHA, while positively contributing to the environment, economy, and local communities.

Applicability

The GRIHA Infrastructure Rating for Highways is applicable to new, proposed, and expanded National and State highways. It encompasses 12 key criteria, each accompanied by specific assessments aimed at evaluating the environmental performance of highway projects effectively.

Criteria for Evaluation

The following twelve criteria are integral to the GRIHA Infrastructure Rating for Highways:

- **Governance:** Establishes the framework for decision-making and accountability in project management.
- **Sustainable Planning and Design:** Focuses on integrating sustainability principles into the planning and design phases.
- **Green Infrastructure:** Encourages the use of natural systems to enhance the environmental performance of highways.
- **Road Safety:** Ensures that safety measures are prioritized in highway design and operation.
- **Climate Action:** Addresses the impacts of climate change and promotes resilience in highway projects.

RATING STRUCTURE

- **Carbon Assessment:** Evaluates the carbon footprint of the highway throughout its life cycle.
- **Road Construction Materials and Technology:** Emphasizes the use of sustainable materials and innovative technologies in construction.
- **Social Impact:** Considers the social implications of highway projects on local communities.
- **Construction Management:** Focuses on effective management practices during both construction and operational phases.
- **Waste Management:** Addresses waste reduction, recycling, and responsible disposal practices.
- **Water Management:** Ensures efficient use and management of water resources throughout the project.
- **Energy Management:** Promotes energy efficiency and the use of renewable energy sources in highway operations.

Rating thresholds

Percentile	Star Rating
25 - 40	★
41 - 55	★★
56 - 70	★★★
71 - 85	★★★★
86 and more	★★★★★

RATING STRUCTURE

Criterion Number	Criterion Name	Points
1	Governance	1
2	Sustainable Planning and Design	6
3	Green Infrastructure	12
4	Road Safety	10
5	Climate Action	20
6	Carbon Assessment	5
7	Road Construction Materials and Technology	12
8	Social	5
9	Construction Management	10
10	Waste Management	5
11	Water Management	9
12	Energy Management	5
	Total	**100**