

ICS 17.160
CCS J 04



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 33521.1-2017

**Mechanical vibration -- Ground-borne noise and vibration
arising from rail systems -- Part 1: General guidance**

Issued on: February 28, 2017

Implemented on: September 1, 2017

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of the People's Republic of China, Standardization
Administration of the People's Republic of China**

Table of Contents

Foreword

Introduction

1 method depends on

2 evaluation criteria

3 affect the parameters

4 measurements

5 Forecast

6 assessment

7 mitigation measures

8 solution

1 Scope

2 normative reference documents

3 terms and definitions

Foreword

This part is part 1 of GB/T 33521 "Ground induced structural noise and ground vibration generated by mechanical vibration track systems".

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This part uses the translation method equivalent to the ISO 14837-1..2005 "mechanical vibration orbital system to produce ground induced structural noise and

Part 1. General Regulations "(English version).

In this part of the normative reference to the international documents have a consistent correspondence between the following documents.

GB/T 2298-2010 Mechanical vibration, shock and condition monitoring vocabulary (ISO 2041..2009, IDT)

This part of the National Mechanical Vibration, Impact and Condition Monitoring Standardization Technical Committee (SAC/TC53) proposed and centralized.

This part of the drafting unit. China Railway Research Institute of energy conservation and environmental protection labor Institute, China Railway Research Institute of standard measurement research

Beijing Institute of Labor Protection Science, Southwest Jiaotong University, Tsinghua University.

This part of the main drafters. Sun Chenglong, Li Yanliang, Cao Yu, Fan Ronghua, Shao Bin, Lin Jianhui, Wang Zonggang, Wu Xiangyang, Lv Dongmei, Ma Yun.

Introduction

Not all ground traffic systems can cause ground-induced vibration and/or ground-induced structural noise. The rail traffic system vibration is by

It is the most common and most important vibration source in the operation of the steel wheel on the rail.

All types of rail transit systems produce geostrophic and/or ground induced structural noise (especially in urban areas)

The environment has a negative impact. It is therefore necessary to evaluate the geostrophic vibration and building response at different distances from the vibration source. When there is the following demand,

This section can be used to guide the relevant planning.

Build or rebuild the railway, build or rebuild the building;

The dynamic performance of the track changes or the dynamic characteristics of the train change;

Train operating conditions change (such as the total length of the train, train speed or operating mode changes);

Evaluation of vibration mitigation measures.

The correct prediction of ground-induced vibration and/or ground-induced structural noise is an important part of the assessment, including the identification of new or converted rail systems

The impact of vibration on existing buildings, or the impact assessment of new buildings adjacent to existing rail transit systems. building

The standard [and/or limit] of the ground-induced vibration and/or ground-induced structural noise is the second part of the assessment. But the standard and limit

Generally by the national standards and other international standards.

The prediction of ground-induced vibration and/or ground-induced structural noise caused by rail transit systems is a complex and evolving technical field. this

Some of the basic ideas of the forecasting model are defined to ensure their applicability to the objectives and the consistency of their methods.

The guide is used to correct and confirm the model and verify its feasibility, which is an important step in quantifying and improving the accuracy of the model.

Table 1 shows the framework for each stage for the construction or reconstruction of the rail transit system, or the rail transit system along the alteration of the building. Headquarters

We give general referral and guide. A more detailed section will be given in the subsequent criteria, whose title names are listed in the preface.

Table 1 The framework of each stage and the corresponding standard

1 method depends on

New, renovated (refurbished) or proximity development (Part 1)

Design phase (conceptual design, preliminary design, detailed design) (Part 1)

2 evaluation criteria

Using national standards and/or part 4

Provide for the assessment of places and measures

3 affect the parameters

Identify the relevant impact parameters (checklist for Part 1)

Collect parameter data

4 measurements

Use field-defined metrics to obtain site-specific information (Part 3 and Part 4)

Evaluation of model parameters

Create and/or confirm the forecast model

Assess the effect of mitigation

Table 1 (continued)

5 Forecast

Using standard-defined measures (Part 4)

Appropriate models are used in the design phase (Part 1 and Part 2)

To ensure effective and well-defined (Part 1)

6 assessment

The predicted value is compared with the standard value

Find out more than the standard

7 mitigation measures

Confirmation of mitigation measures (sections 1, 5 and 6)

Evaluate whether the selected measures are feasible

Conduct cost/benefit analysis

8 solution

Detailed design development

Solve the implementation

Asset Management

By initiating a status monitoring and maintenance program to see if the criteria are met

Mechanical vibration of the orbital system caused by ground induction

Structural noise and ground vibration Part 1. General

1 Scope

This part of GB/T 33521 specifies the ground vibration generated by the operation of the orbital system and the resulting ground induced structure in the building

General requirements for noise.

This section lists the factors and parameters that need to be considered and gives guidelines for forecasting methods applicable to different environmental conditions (eg,

In addition to the assessment of the impact of indoor personnel and sensitive equipment in buildings, can also be used for risk assessment of structural damage to buildings).

This section requires attention to the following.

--- vibration source characteristics. launch (such as trains, wheels, rails, rails, rail support structure);

- propagation path. propagation (such as earth conditions, distance);

--- vibration by the building. incoming (such as basic, architectural form).

This section covers all wheel and rail systems from light rail trains to high-speed trains and