

Guidelines for Periodic Road Structure Inspections

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(Key words) Road structure, Principal inspections, Maintenance

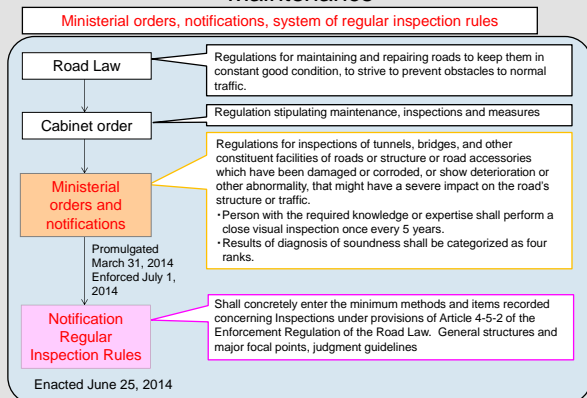
1. Introduction

With the increasing recognition of the need for appropriate management of road structures and given the aging of existing structures or the possibility of hazardous situations, the Road Law was amended in 2013. Article 42 paragraph 2 of the Road Law stipulates that a Government Ordinance shall be set out to describe the technical norms for maintenance and repair, including periodic inspections. Accordingly, MLIT had an obligation to establish the technical norms for periodic inspections for road structures.

2. Technical Standards for Principal Inspections

The Ministerial Orders for periodic inspections for road bridges and tunnels were promulgated on March 31, 2014 and came into force on July 1, 2014. There are approximately 700,000 bridges and 10,000 tunnels in Japan and the Ministerial Orders stipulate that close visual inspections of all components be conducted at five-year intervals. Technical Guidelines for the legally-binded periodic inspections were notified announced on June 25, 2014, setting out minimum requirements for inspection methods, recordings, and references for typical structural components, inspection focal points, and remedial action urgency ratings.

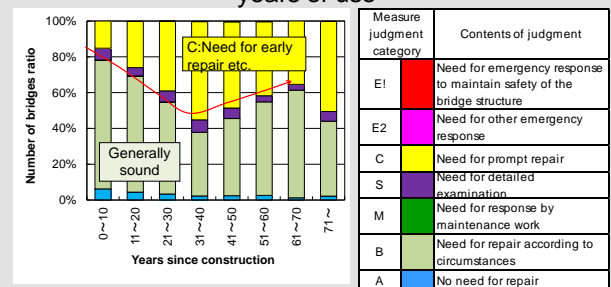
Figure 1 Legal System of Technical Standards for Maintenance



3. Background study in NILIM

The NILIM has conducted studies for road administrative agencies to improve management of inspections, planning and actions, and analysis of inspection data and modeling deterioration behavior for bridges, tunnels, and other road structures that are owned by MLIT, the largest road owner in Japan operating designated sections of the national highway system. One of the highlighted results is shown in Fig. 2¹⁾, where the ratios of remedial work urgency ratings are classified at different age groups for road bridges. The ratio of C-rating, in which repair is required, increases with age up to the age group of 31-40, while this increasing tendency is reversed for the ages groups of 41-50 or older. This may be attributed to the fact that older bridges are supposed to be maintained or repaired and indicates that earlier preventive maintenance would reverse the worsening tendency with age at an earlier time. Segmental condition records, were analyzed and the results were considered when establishing the technical guidance for periodic inspections. In addition, NILIM also prepared the official textbook for bridge inspector training courses that are provided by Regional Bureau of MLIT.

Figure 2 Changing remedial work urgency ratings for government managed road bridges based on years of use



4. Remarks

The periodic inspection described herein is now implemented nationwide. The enactment of the technical

guidance for inspections will lead to a better management system. NILIM continues to analyze inspection data records to establish more reasonable and reliable inspection protocols and seek a better management methodology to extend their service lifetimes.

[Sources]

- 1) TECHNICAL NOTE of NILIM NO. 748
- 2) TECHNICAL NOTE of NILIM NO. 294
- 3) TECHNICAL NOTE of NILIM NO. 381
- 4) TECHNICAL NOTE of NILIM NO. 471
- 5) TECHNICAL NOTE of NILIM NO. 685
- 6) TECHNICAL NOTE of NILIM NO. 748

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<http://www.nilim.go.jp/lab/ubg/index.htm>