

Publication of Evaluation Guidelines for New Road Bridge Technologies (Draft)

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1. Introduction

In recent years, examples of the contract method with technical proposal have been increasingly introduced, and on the other hand, examples of the adoption of ‘new technologies’ applying to materials, structures, and design methods not specified in the Technical Standards for Bridges and Highway Bridges (below called, “Specifications for Highway Bridges”) have also increased.

Specifications for Highway Bridges regulate “standard methods” assuming that performances such as the required safety allowances are surely obtained, based on the required performance and past research and experiences. However, they do not indicate a verification method or concrete evaluation standards to verify that the performances of the new technologies equivalent to or greater than cases based on “standard methods” are obtained.. Therefore, verification methods and the contents are set separately with reference to each condition in practice levels, and the verifications matching with standards are conducted through a process of trial and error, (below called, “performance verification”).

In response to these background circumstances, the NILIM has published guidelines as universal and practical references focused on main items and points to remember when conducting individual performance verifications. (Technical Note of the National Institute for Land and Infrastructure Management No. 609, Guideline to Research Concerning Road Bridge Technology Evaluation Methods and New Technology Evaluations (Draft), September 2010).

2. Framework and Outline of Evaluation Guideline for New Technologies

[1] Part I, Common

In Part I, items necessary to verify performance individually by experiments or analyses and the basic concepts of the new technology evaluations are indicated from No.4 to No.8 of Part I as shown in Table 1.

Table 1 Framework of evaluation guideline for new techniques, Part I

Part I Common
1. Basics of new technology evaluation
2. Selection evaluation methods

3. Perspective of technology evaluation
4. <u>Deviation from the range of standard specification</u> (Examples) Deck slab span length, abbreviation of members
5. <u>Materials and structures with characteristics different from standard regulations</u> (Examples) Application of high strength reinforcing bars to concrete members Welding steel unstandardized as welding structures
6. <u>Design principles and mechanisms different from standard regulations</u> (Examples) Welding joints unstandardized in ‘Fatigue design guidelines for steel road bridges’ Structures abbreviating cross frames or lateral bracing Shear connector mechanisms other than stud shear connectors
7. <u>Construction conditions different from standard regulations</u> (Example) Effects of concrete placement of steel-concrete composite slabs
8. <u>Conditions for maintenance different from standard regulations</u> (Example) Steel-concrete composite slabs and weather resistant steel materials

[2] Part II, Case Examples of New Technology Evaluation

Part II indicates examples of road bridge verification items and performance verification methods using new technologies studied in recent years in order to design and construct road bridges based on ‘Specifications for Highway Bridges’. Even new technologies not included in these examples are considered to lead to more complete performance verifications by referring to common parts such as focus points and points to remember.

[3] Part III. Examples of preparation of evaluation manuals

Part III indicates examples of setting specific verification items and performance verification methods referring to examples of PC box girder bridges with corrugated steel web and steel-concrete composite slabs. It can be used as a reference for methods of establishing plans to evaluate new construction methods.

3. Summary

We hope that the guideline will help provide society with infrastructure with high reliability as further appropriate technology evaluations referring to the basic concepts and examples of new technology evaluation in the guideline are established. .