

Design Guidelines for Cable System of Long Span Bridges

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Summary

Based on the active construction market of cable supported bridges, many experiences accumulated in design and construction technologies as well as the development of high strength materials have led the Korean engineer to think about new design scheme and concepts for long span cable supported bridges. Under this background, Super long span bridge R&D center in Korea have developed the reliability based design guideline for super long span bridges which allows 200 years design life and is capable of using high strength cable and high performance steel as well as high performance concrete.

Keywords: long span; cable supported bridge; high strength cable; high performance steel; reliability based design; limit state; safety of cable; suspension bridge; cable stayed bridge; LRFD.

1. Introduction

Usually long span bridge is unique in its scale, boundary condition and public needs. And it also requires longer life cycle while the maintenance work should be minimized due to the difficulties of access and repair. For the past decades, many cable supported bridges are designed and constructed in accordance mainly with the domestic bridge design specification which concept is limited to medium size bridge. Consequently several foreign specifications and recommendations were introduced case by case to fill up the lack of specific design manual for each long span bridge project.

In order to improve this absurdity, 'A Design Guideline on Cable Supported Steel Bridges'(KSCE, 2006), 'A Guideline on using of Cable Materials in Long-Span Bridge'(KSCE, 2008) and 'A Design Guideline on Concrete Cable Stayed Bridge'(KICT, 2009) have been published successively. Even though these efforts have contributed to resolve the thirsty for consistency and rationality in design, these were a kind of agreement among domestic engineers based on some design examples of advanced foreign countries and own experiences and knowledge without any research or detail investigation.

In order to develop internationally competitive technologies, Super long span bridge R&D center has been launched from May, 2009 as a government propelling program. Under the strategy of this program, a reliability based design code (hereafter "Cable Bridge Code") has been developed as one of its key outcomes as well as high strength cable and high performance materials. And Cable Bridge Code will cover these new developed materials. This code will allows the 200 year design life for the primary structures with the corresponding reliability index of 4.0.