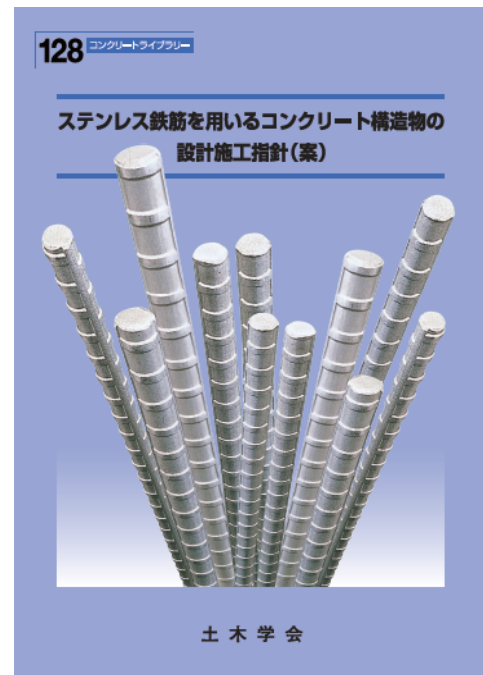


Outline of “Recommendations for Design and Construction of Concrete Structures Using Stainless Steel Bars”

Stainless steel reinforcement is highly resistant to corrosion and can significantly enhance the durability of concrete structures in service under highly corrosive environments. Consequently, the maintenance costs of infrastructures with long service life can be substantially reduced and minimize the life cycle cost (LCC). With the aim of applying stainless steel reinforcement extensively to concrete structures, the Guidelines for Design and Construction of Concrete Structures (draft) have been published as the Japan Society of Civil Engineers Library 130 in August 2008.

The guidelines consist of seven chapters, from Chapter 1 – General Rules to Chapter 7 – Construction Records. Chapter 1 – General Rules defines the scope of application and the meaning of terms. Chapter 2 – Stainless Steel Reinforcement provides the design values of quality and material for stainless steel reinforcement. The guidelines cover the following three types of stainless steel bars prescribed by JIS G4322 "Stainless steel bars for concrete reinforcement," or SUS304-SD, SUS316-SD, and SUS410-SD. The yield strength of stainless steel reinforcement that does not exhibit clear yield point is defined as the stress at a residual strain of 0.2%. Chapter 3 – Verification of Structural Performance of Structures contains the following sections: general, study of cracking, verification of stainless steel reinforcement for corrosion, verification of stainless steel reinforcement for corrosion due to the ingress of chloride ions, and verification of stainless steel reinforcement for corrosion due to chemical erosion. Because stainless steel reinforcement is highly resistant to corrosion, the limit value of crack width is set at 0.5 mm for SUS304-SD and SUS316-SD and 0.005c mm for SUS410-SD. The recommended value of critical chloride ion concentration for the initiation of corrosion is set at 15 kg/m³ for SUS304-SD, 24 kg/m³ for SUS316-SD, and 9 kg/m³ for SUS410-SD. Chapter 4 – General Structural Details contains the following sections: concrete cover and joint, Chapter 5 – Construction contains general and steel reinforcement work, Chapter 6 – Inspection contains general, on-site acceptance inspection of stainless steel reinforcement and steel reinforcement work, and Chapter 7 – Construction Records contains general rules.

It is hoped that the guidelines will contribute to minimizing the LCC of concrete structures even in severely corrosive environments where chloride ions are present in large



quantities and aid in constructing a secure and safe society by designing and constructing concrete structures in accordance with the guidelines.