KCS 11 30 05 : 2019

General Provisions of Soft Ground Improvement Works

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국토교통부

Foreword

· This standard was organized and integrated as the code by comparing and reviewing duplicate or contradictory content within the existing construction standards (design standards, standard specifications) due to the transition of the construction standards code system.

· This standard is established by integrating and organizing the parts that are related to soft ground improvement work in the Standard Specifications for General Civil Works, Standard Specifications for Construction Works, and Standard Specification of Sewer Pipe Construction based on existing Road Construction Standard Specifications and Harbor and Fishing Ports Construction Standard Specifications. The histories of the standards are as follows:

Construction standards	Main contents	Establishment or revision (Month Year)
Road Construction Standard Specification	· Established by the Korean Society of Civil Engineers commissioned by the Ministry of Construction	Establishment (Dec. 1967)
Road Construction Standard Specifications	· The specifications were improved and revised to become general specifications of overall road work by reviewing the related existing specifications and guidelines that were used and being developed.	Revision (Dec. 1985)
Road Construction Standard Specifications	· The specifications were improved and revised to be better specifications by advancing and complying with the currently used specifications and guidelines, along with the introduction of new theories.	Revision (May 1990)
Road Construction Standard Specifications	· The specifications were revised to enhance the international competitiveness and to promote quality improvements of road works by reorganizing the system to cope with the openness of the construction market as a result of the launch of the World Trade Organization (WTO).	Revision (July 1996)

Construction standards	Main contents	Establishment or revision (Month Year)
Road Construction Standard Specifications	· The specifications were re-organized to establish a system of national standards and to reflect the revision of contents and other standards, such as the Korean Industrial Standard (KS) and the Standard Specification of Concrete according to the Construction Standard Organization Guideline, and to improved and revise standards to address the problems.	Revision (Nov. 2003)
Road Construction Standard Specifications	· The specifications were revised to improve the problems produced during the road construction and to induce reliable constructions through consistency with other standards such as the KS, Standard Specification of Concretes , and Standard Specifications of Tunnels, ensuring the prevention of shoddy and faulty construction thorough quality control.	Revision (Mar. 2009)
Road Construction Standard Specifications	· The specifications were revised to reflect the recommendations from the Central Construction Technology Deliberation Committee and changed the standard specifications, specialized specifications, and design drawings.	Revision (Sep. 2015)
Road Construction Standard Specifications	· Partial revision, including overview, forest and tree protection materials, and general construction works.	Revision (May 2016)
Standards Specifications of Harbor Construction	· Establishment of the Standards Specifications for Harbor Construction	Establishment (Dec. 1976)
Standards Specifications of Harbor Construction	· Revision of the Standards Specifications for Harbor Construction	Revision (Dec. 1977)
Standards Specifications of Harbor Construction	· The specifications added various design conditions for harbor construction, and included general policies and standards of designs in relation to harbor facilities, counter facilities, and other facilities for harbor construction.	Revision (Dec. 1986)
Standards Specifications of Harbor Construction	· The standards were significantly revised to provide a basis to apply the re-estimation of deep-sea waves, the estimation of wind speeds, and load coefficient to improve the safety of harbor facility and equipment, including coastal maintenance facilities.	Revision (Dec. 1996)
Standard Specifications of Harbor and Fishing Port Construction	· The standards were completely revised to include preemptive countermeasure against climate changes and to reflect the changing port construction conditions.	Revision (Nov. 2005)

Construction standards	Main contents	Establishment or revision (Month Year)
Standard Specifications of Harbor and Fishing Port Construction	· The specifications were significantly revised to reflect the modified contents in the upper technical standards and other fields standards, improving related specifications, such as mass concrete and cap concrete and other related specifications such as filter mats, ships, quay walls, and other attached facilities, and added specifications concerning marina facilities.	Revision (Dec. 2012)
KCS 11 30 05 : 2016	· Integrated and organized the code system due to the transition to the code system of construction standards.	Establishment (Jun. 2016)
KCS 11 30 05 : 2016	· Modified to satisfy the Korean Industrial Standards and Construction Standards.	Modification (Jul. 2018)

Table of contents

1. General

1.1 Scope of application

(1) This standard is applied to soft ground improvement work that is generalized and universally used.

(2) The soft ground improvement work aims for the increase of the ground strength, the facilitation of ground consolidation, and the reduction in ground compressibility by improving the engineering characteristics of the ground which is expected to have insuff

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(1) Normal soft cohesive soils are improved by dehydrating the water contained in the ground, and if the ground remains too soft and the scope of the improvement is not too large, mechanical replacement shall be used

1.4.2 Sandy soil ground treatment work

(1) Loose sandy soil ground shall be improved by installing structural members, such as piles on the ground, or applying physical force or vibration to the surface for deep compaction to reduce the voids, or injecting other materials to fill the voids therefore

increasing the strength and relative density.

1.4.3 Temporary ground treatment work

(1) When ground is needed to be improved temporarily, ground's improvement effects shall be obtained only at the time of the temporary ground treatment.

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in the construction specifications.

(3) Since the specification and quality inspections of materials cannot be checked after construction, they shall be tested prior to construction, and only the test-approved products shall be used.

2.3 Material inspection

(1) If the construction supervisor deems it necessary, they may dispatch inspectors, at any time, to the required production facility to test the products or inspect the production

process.

(2) The inspection of the ground improvement results shall be conducted by dividing tests into initial inspection, mid-inspection, and final inspection phases.

(3) The criteria of pass or fail shall follow the criteria proposed in the construction specifications.

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verification results shall be submitted to the construction supervisor, and the verification methods of the improvement results must follow the rules specified in the construction specifications.

3.2 Establishment and proposal of construction plan

(1) The contractor shall establish the construction plan related to the soft ground improvement work prior to the start of construction and submit the construction plan to the construction supervisor.

(2) The following items shall be included in the construction plan document.

① Earthwork delivery plan at the borrow pit, considering the ground improvement period (retention period)

② Earthwork move plan in the project district considering the ground improvement period (retention period)

③ Supply plan of materials

④ Delivered equipment type and quantity

⑤ Test construction plan, if needed

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(4) If the results of the test construction lead to plan changes that are deemed necessary, consult with the construction supervisor and the engineer in charge.

3.5 Geotechnical investigation for verification

(1) The contractor shall conduct a geotechnical investigation for the verification of whether the ground was improved sufficiently in addition to instrumentation management after completing the ground improvement works.

(2) A geotechnical investigation for verification is conducted in every embankment phase,

so that only when the target criteria such as ground strength, deformation, and consolidation are satisfied, along with the analysis of the instrumentation results, the next phase of construction can proceed. In addition, the construction plan of next phase may be modified, depending on the investigation results.

(3) For the geotechnical investigation for verification, indoor soil tests are conducted after collecting undisturbed samples, or in-situ soil tests at the site are conducted. The standard penetration test results cannot be used alone in cohesive soil grounds.

(4) The detailed geotechnical investigation items and methods are determined by consultat

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3.7 Archiving

(1) The contract party in relation to the soft ground treatment work in the project district shall record construction videos during each major phase, and the recorded videos shall be submitted to the construction supervisor upon the completion of the work.