

SPECIFICATION SECTION 01800

CONTRACTOR'S QUALITY CONTROL

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SPECIFICATION SECTION 01800

CONTRACTOR'S QUALITY CONTROL

1. DESCRIPTION

This Specification Section prescribes the requirements and procedures to establish, implement, and maintain the Quality Control program by the Contractor.

Quality Control procedures and acceptance test procedures fulfill different purposes. Quality Control procedures shall be adopted by the Contractor to ensure the Works are constructed in accordance with the Contract. Acceptance tests shall be conducted to record the acceptance of the Work. The data from the Quality Control procedures will be used also as the data for the acceptance of the Works.

The following definitions shall be referred to for proper interpretation of this Specification Section:

Quality Control Plan :	The Contractors' plan for Quality Control that shall be prepared and submitted by the Contractor to the Engineer in compliance with the Contract. It shall consist of a complete plan for implementation and monitoring of the necessary measures and procedures to be carried out by the Contractor to ensure that the Works comply with the Contract.
Program:	As defined in Specification Section 01300 Program of Work
Laboratory:	As defined in Specification Section 01750 Laboratory
Certificate of Satisfactory Quality Control:	The certificate that the Engineer shall issue for the purpose of processing the Interim Payment Certificate to certify that the relevant activities for Quality Control have been performed by the Contractor in compliance with the requirements of this Specification

	Section for Quality Control
Certificate of Satisfactory Laboratory Operation:	As defined in Specification Section 01750 Laboratory
Certificate of Satisfactory Control of Materials:	As defined in Specification Section 01900 Control of Materials

2. REQUIREMENTS

2.1 Reference Standards

The latest edition of the following Standards shall supplement the current Vietnamese regulations for Quality Control.

AASHTO and ASTM Standards for Quality Control and Quality Assurance for Construction of Civil Works;

Japan Highway Public Corporation (Nihon Doro Kodan): Manual for Supervision of Civil Works;

Japan Road Association: Manual for Asphalt and Concrete Pavements;

Japan Civil Engineering Association: Standard Specifications for Concrete; and

U.S. Department of Transportation, Federal Highways Administration; Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects: FP-2003 (Metric Units)

2.2 General

- a) The regulations stipulated by the Vietnamese Law, Decree No. 15/2013/ND-CP promulgated on 06th February 2013 by the Government of Vietnam for Quality Control on construction of civil works shall govern the basic procedure for establishing and monitoring the Quality Control plan for the Works.

In the event of any discrepancy or ambiguity between the above referred regulations and this Specification Section the Contractor shall request clarification from the pertinent regulating Local Authorities before requesting the Engineer for instructions.

- b) Decree No. 15/2013/ND-CP dated 6 February 2013 sets out the obligations of project owners in respect of quality management of construction facilities and provides for, inter alia, regulations on quality management of construction facilities in the fields of survey, design, construction execution and warranty. The Contractor shall ensure that the format and implementation of his Quality Control plan takes due cognizance of the Employer's obligations under the Decree and provides the platform for the Employer to comply with this Decree;

while still complying with the obligations of the Contractor in the Specification and the Conditions of Contract.

- c) The Contractor shall be solely and fully responsible; for the application of measures, methods and procedures for testing and handling the testing results, for correction of defects in the Works and for any work performed to assure the quality of the Works. However, the respective analysis and application of the results for quality Control will be performed by the Engineer.
- d) The Quality Control plan shall be considered as one of the key plans comprising the Program described in Specification Section 01300 Program of Work.
- e) The requirements established in this Specification Section are intended to read in conjunction with and mutually explanatory with the requirements and provisions stated in the following clause and subclauses of the Conditions of Contract:

Subclause 4.9, Quality Assurance,

Subclause 7.2, Samples,

Subclause 7.3, Inspection,

Subclause 7.4, Testing,

Subclause 7.5, Rejection,

Subclause 7.6, Remedial Work,

Subclause 9.2, Delayed Tests,

Subclause 9.3, Retesting,

Subclause 9.4, Failure to Pass Tests on Completion,

Subclause 10.1, Taking Over of the Works and Sections,

Subclause 10.2, Taking Over of Parts of the Works,

Subclause 10.3, Interference with Tests on Completion,

Subclause 11.1, Completion of Outstanding Work and Remedying Defects ,

Subclause 11.2, Cost of Remedying Defects,

Subclause 11.3, Extension of Defects Notification Period,

Subclause 11.4, Failure to Remedy Defects,

Subclause 11.5, Removal of Defective Work,

Subclause 11.6, Further Tests,

Clause 13, Variations and Adjustments.

- f) The requirements established in this Specification Section are intended to read in conjunction with and mutually explanatory with the requirements and provisions stated in the following sections of the General Specifications:

Section 01200 Contractor Drawings;

Section 01750 Laboratory;

Section 01900 Control of Materials.

and related Specifications dealing with Quality Control in the Contract.

- g) Failure to comply with the requirements of this Specification Section shall be considered as a serious default of the Contractor in meeting his contractual obligations. In this case the Engineer will take note, record the default and instruct the Contractor to apply pertinent measures to secure compliance with the requirements for Quality Control.
- h) In the event that the Contractor's failure to meet these requirements persists, the Engineer shall be entitled to proceed with the following:
- (i) Any delay to the Works arising from the Contractor's failure to comply with this Specification Section will be the subject of the Engineer's consideration at the issue of Taking-Over Certificate; should the Employer chose to exercise his rights under subclause 8.7, Delay Damages of the Conditions of Contract. In this situation the Contractor will be required to demonstrate that the aforementioned delay did not impact the critical path of the Works.
 - (ii) In the event the Contractor's failure to comply with the requirements of this Specification Section persist the Engineer, at the request of the Employer, will carry out such works as he deems necessary and charge the Contractor with the full cost thereof plus respective incidental and administrative costs in accordance with the provisions of subclauses 2.5 and 3.5 of the Conditions of Contract. The Contractor shall remain fully responsible for the works performed on his behalf and shall have no right of action against the Engineer or the Employer for any reason.

2.3 Contractor's Plan for Quality Control (QCP)

- a) The Contractor shall prepare and submit to the Engineer for review and comments the Quality Control plan that shall be implemented and monitored on a daily basis during the execution of the Works. Thereafter, the Contractor shall revise his Quality Control plan by introducing the Engineer's comments and review it as necessary and shall resubmit it to the Engineer for its use on the Works. The Quality Control plan shall be one of the key parts of the Program described in Specification Section 01300 Program of Work

- b) The Quality Control plan shall include, but not be limited to, the following:
- (i) **Quality Control Organizational Structure:** The organization classified into subdivisions that can be technically and effectively managed, and described in a Quality Control organizational chart identifying the subdivisions, responsibilities and tasks of the personnel and supporting staff, all of them engaged solely and specifically for quality control issues (including the Contractor's quality control manager who will be responsible for all Quality Control issues in the Site). Moreover, the criteria for appointment of principal staff shall also be described.
 - (ii) **Lines of Communication:** The organizational structure shall show direct lines of communication and reporting between the quality control manager, Contractor's project manager and the Contractor's director responsible for the Contract execution.
 - (iii) **Interaction and Communication Procedures:** The procedures defining the communication system between the Contractor's construction personnel working where Quality Control is required and the quality control staff, including a regular communication and reporting system. Moreover, the frequency, coverage and intent of Site meetings for coordination shall also be specified.
 - (iv) **Subcontractors' Quality Control Plan:** The means by which the Quality Control plan will be communicated to Subcontractors (if any), including also the procedure for reviewing the plan for Quality Control proposed by Subcontractors and the method to incorporate the Subcontractors' quality control plans into the Contractor's Quality Control plan.
 - (v) **Methods, Equipment and Supporting Staff for Quality Control:**
 - A detailed and consistent description of the methodology, techniques to be applied and equipment (including Laboratory) and supporting staff to be provided for Quality Control, including details for each stage considered during the construction of the Works.
 - A consistent cross-reference between the methods applied in the Quality Control plan, this Specification and all applicable requirements of the Vietnamese Standards or the like regarding Quality Control.
 - (vi) **Testing List:** A list of tests to be performed throughout the Contract period. The list shall give the test name, frequency, Specification Section and paragraph containing the test requirements, the personnel and Laboratory responsible for each type of test and an estimate of the number of tests required.
 - (vii) **On Site and Off Site Testing:** A list and brief description of all on Site and off Site testing to be performed by the Laboratory. Moreover, a list

of other testing that the Contractor proposes to be accomplished by other laboratories.

- (viii) Quality Control Schedules: Bar schedules prepared for each case of Quality Control necessity identified in the above mentioned inventory, including a description of all the main activities for Quality Control, dates for commencement and completion of each activity, critical items of the schedule, certification, management submittals, etc..
- (ix) Quality Control Inspections: The procedure and schedule for:
 - Quality control inspections,;
 - Verification of due compliance of the methods and materials and
 - Supervision of the performance of the supporting staff.

A complete set of the forms to be used for the inspections shall also be included.

- (x) Forms for Testing, Reporting and other Submittals: All the forms to be used for testing, testing summary reports, Quality Control monthly report, and other submittals.
 - (xi) Tracking of Defects: The procedure for tracking construction deficiencies from its identification through acceptable corrective actions. This shall also include the method to verify that the identified deficiencies have been properly corrected.
 - (xii) Supervision and Auditing: The means by which the established Quality Control procedures are supervised, monitored and audited by the quality control manager to ensure due compliance with the principles and objectives of the Quality Control plan. This shall also include the procedure for updating the Quality Control plan.
 - (xiii) Records: To be prepared and maintained by the quality control manager and the staff for Quality Control and the communication procedures to be adopted by the quality control manager such that the Engineer and others associated with the Works, are kept fully informed throughout the period of the Contract on matters relating to traffic regulations.
- c) Before the start of construction and prior to the approval by the Engineer of the Quality Control plan, the Contractor shall make a full and detailed presentation of the Quality Control plan and his proposed Quality Control procedures prescribed therein. Minutes of the meeting shall be prepared by the Contractor and shall be signed by the Contractor and the Engineer. The minutes shall become a part of the contract procedures.
 - d) Modifications to the revised Quality Control plan shall not be allowed without prior consultation with the Engineer, unless otherwise requested by the

Engineer based on the actual necessities for improving the Quality Control in the Works or in the event of the introduction of new items due to the application of some variation orders in accordance with clause 13, Variations and Adjustments of the Conditions of Contract.

2.4 Quality Control Manager (the QC Manager)

- a) The Contractor shall appoint a quality control manager (herein referred to as QC manager), whose duties throughout the period of the Contract shall be solely and entirely connected with the Quality Control activities on the Site.
- b) The QC manager shall be bilingual (Vietnamese/English) and shall be a suitably qualified and experienced person who shall prepare, supervise and monitor the Quality Control plan, and shall, in particular but without limitation, carry out auditing of the operation of the Quality Control plan in accordance with a rolling program to be submitted, from time to time, to the Engineer for his consent.
- c) The appointment and designation of the QC manager shall be subject to the Engineer's approval.
- d) Unless specifically agreed in writing by the Engineer, the Contractor shall not undertake any work on the Site, which may require Quality Control for his work acceptance, until the QC Manager has commenced duties on Site and the revised Quality Control plan has been approved by the Engineer.
- e) The Contractor shall not remove the QC Manager from the Site without the express written permission of the Engineer. Within fourteen (14) days of any such removal, or notice of intent of removal, the Contractor shall nominate a replacement QC Manager for the Engineer's approval.
- f) The Contractor shall provide the QC manager with enough authority on all aspects relating to Quality Control within the Contractor's main organization.
- g) The Contractor shall provide the QC manager with at least one (1) deputy quality control manager whose appointment shall be subject to the Engineer's approval. The deputy quality control manager shall be capable of assuming the duties and functions of the QC manager as contained in the Quality Control plan whenever necessary.
- h) The Contractor shall provide the QC manager with enough supporting staff in accordance with the staffing levels set out in the Quality Control plan. The supporting staff shall be fully qualified in terms of experience and technical training to perform their responsibilities for Quality Control and shall have excellent understanding regarding the contents and objectives of the Quality Control plan.

- i) The Contractor shall ensure that the QC Manager maintains a daily Site diary, comprehensively recording all relevant matters concerning Site safety inspections and audits, related incidents, and the like. The Site diary shall be available at all times for inspection by the Engineer.

2.5 Special Requirements for Quality Control

2.5.1 Laboratory, Testing Inspection, Sampling and Testing Procedures

(1) Laboratory

- a) General: The Contractor shall procure and provide the services of the Laboratory in accordance with the requirements and provisions of Specification Section 01750 Laboratory.
- b) Administration: The Laboratory shall work independently but under the jurisdiction of the QC manager.
- c) Laboratory Check by the Engineer: The rights and power of the Engineer to check the Laboratory are as described in Specification Section 01750 Laboratory.

(2) Inspections and Testing

- a) Categories: Testing inspections to be performed regularly by the Contractor, in the presence of the Engineer, are divided into the following two categories:
 - (i) Job Site Testing Inspection: The inspection of all on Site testing, including its respective procedures, facilities and results to confirm complete and due compliance with the Contract.
 - (ii) Off Site Testing Inspection: Off site or factory inspection consisting of:
 - Inspection at the point of manufacture or production of the various products or materials to be shipped to the Site and
 - Inspection of the equipment and materials identified in the Specifications.
- b) Notice to the Engineer: The Contractor shall give appropriate written notice to the Engineer not less than 28 days before off Site inspection services are required and shall provide for the producer, manufacturer, or fabricator to furnish safe access and proper facilities and to cooperate with the inspecting personnel in the performance of their duties.
 - (i) If the Engineer does not attend on the date agreed, the Contractor may, unless otherwise instructed by the Engineer, proceed with the tests. The absence of the Engineer at the tests does not relieve the Contractor from his obligations.

- c) Expenses: The Contractor shall pay all the expenses required for the inspection, testing and the attendance of the Engineer.
- d) Off Site Testing and Inspections By Specialized Laboratory:
 - (i) In the case of foreign equipment and materials, an independent specialized laboratory approved by the Engineer shall certify the off Site testing and inspections. The related expense shall be borne by the Contractor.
 - (ii) All off Site testing and inspections shall be completed to the satisfaction of the Engineer prior to the shipment of the products concerned from the factory to the Site.
- e) Final Inspection:
 - (i) Prior to the commencement of the procedure for taking-over of the Works in accordance with the requirements of Clause 10 of the Conditions of Contract Taking Over of the Works and Sections the QC manager shall; conduct an inspection of the Works and prepare a list of items which do not conform to the plans and specifications.
 - (ii) The list of deficiencies shall be included as a part of the Quality Control documentation and shall include the estimated date by which the deficiencies will be corrected.
 - (iii) Further, the QC manager shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Engineer.
 - (iv) After completion of deficiency correction as identified by the Quality Control inspection, the Contractor may proceed with his application for the issue of the Taking-Over Certificate.
- (3) Sampling
 - a) Standards: Where required by the Specifications (General and Technical), for any work item, sampling shall be made in due accordance with the Vietnamese current standards for sampling, supplemented by the like of AASHTO, ASTM, JIS or other standards recommended by the Engineer as applicable.
 - b) Samples: Any material that appears defective or inconsistent with similar material being produced shall be sampled, unless such material is voluntarily removed and replaced or corrected by the Contractor at his own expense.
 - c) Procedure: The procedure for sampling shall be defined and scheduled in the Quality Control plan, by using random number methods and defining sets, lots or sections for monitoring the tests procedure until the issuance of the respective acceptance of the Works. Splits of samples shall be

performed when required and they shall be delivered to the Engineer in an acceptable container.

- d) Witness by the Engineer: The sampling procedure shall provide the Engineer with the opportunity to witness all sampling. The Contractor shall submit to the Engineer the Employer's portion of the sample or split in an acceptable container suitable for shipment.
- e) Labeling of Samples: Labels of samples shall contain the following information:
 - (i) Project number;
 - (ii) Source of material;
 - (iii) Pay item number;
 - (iv) Sample number;
 - (v) Date sampled;
 - (vi) Time sampled;
 - (vii) Location where sample taken;
 - (viii) Name of person sampling;
 - (ix) Name of person witnessing sampling; and
 - (x) Type of test required on sample.

(4) Testing Procedures

- a) Scope of Tests: The Contractor shall perform the tests specified or required to verify that control measures are adequate to provide a product that conforms to the requirements of the Contract and/or Specification. Testing includes operation and/or acceptance tests when specified or required.
- b) Required Data: The QC manager shall perform the following activities, and shall provide the following data for approval by the Engineer:
 - (i) Verify that the testing procedures comply with the standards referred to in this Specification Section.
 - (ii) Verify that the facilities and testing equipment are available and comply with testing standards.
 - (iii) Check the test instrument calibration data against certified standards.
 - (iv) Verify that the recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- c) Results Report:
 - (i) Results of all tests taken, both passing and failing tests, shall be recorded on the Quality Control report for the date taken. Specification Section paragraph reference, location where tests were taken and the sequential control number identifying the test shall be

given. Actual test reports may be submitted later, if allowed by the Engineer, with a reference to the test number and date taken.

- (ii) The Contractor shall provide directly to the Engineer an information copy of tests performed by an off Site or commercial test facility.
- (iii) Failure to submit timely test reports, as stated and/or disapproval of the test facility, may result in non payment for the related work performed.

2.5.2 Certified Laboratory Tests and Manufacturer's Certification

a) Certified Laboratory Tests:

- (i) Laboratory tests may consist also of certified tests made by an authorized agency for testing of materials and equipment that will be incorporated into the Works under the Contract.
- (ii) Certified tests on materials to be incorporated into the structures will be accepted provided that the tests are performed by the manufacturer or by authorized agencies or laboratories and show that the materials conform to the Specifications.

b) Manufacturer's Certification:

- (i) Manufacturer's certification may be furnished by the Contractor on items of materials and equipment to be provided only when this method will assure, to the satisfaction of the Engineer, their full compliance with the provisions of the Contract. Preprinted certifications will not be accepted.
- (ii) All certifications shall be submitted to the Engineer. All certifications by manufacturers or independent laboratories shall name the appropriate item of equipment and material, specifications, standards or other document specified as controlling the quality of that item, and shall be accompanied by certified copies of test reports upon which the certifications are based.

2.5.3 Quality Control's Records and Reports

(1) Quality Control Records

- a) Current records of all Quality Control operations, activities, and tests performed, including those performed by Subcontractors and/or suppliers shall be maintained in the way and format prescribed in the Quality Control plan.
- b) The above mentioned records shall be made on a daily report form reviewed by the Engineer, and shall include actual evidences that specified Quality Control activities and/or tests have been properly performed in accordance with the standards referred in the Specification.

- c) The records shall include, but not be limited, to the following:
 - (i) Work performed, giving location, description, and the names of technical staff in charge of the control.
 - (ii) Type and number of control activities and tests involved.
 - (iii) Results of control activities or tests.
 - (iv) Deficiencies noted, including in a first instance, the proposed remedial or corrective action.
 - (v) Quality control activities performed with results and references to specifications and/or drawings requirements.

(2) Quality Control Reports

- a) Written reports of tests and engineering data furnished by the Contractor for the Engineer's review of materials and equipment proposed to be used in the Works shall be submitted as specified and detailed in the Revised Quality Control plan.
- b) The Laboratory shall furnish three copies of a written report on each test performed by the Contractor's QC staff or by the Engineer when necessary. (Two copies shall be distributed to the Engineer and one copy to the Contractor).
- c) The submittal shall be done within three (3) days after a test is completed.
- d) Laboratory submittal procedures and requirements shall be detailed in the Revised Quality Control plan.

(3) Monthly Summary

- a) In compliance with the requirements of Specification Section 01400 Monthly Progress Report the QC Manager shall summarize; all the main activities, all relevant tests and results obtained in the activities performed during the month.
- b) Moreover, all the problems occurred in the course of execution of the activities for Quality Control and outstanding deficiencies, shall also be included in the summary. Tabulated and graphic form should preferably be applied.

2.6 Acceptance and Notification of Noncompliance

2.6.1 Acceptance

- a) If the Engineer determines that the testing and Quality Control, implemented by the Contractor in executing the Works, is ineffective or contains defects the Contractor shall make immediate improvements to correct these inadequacies.

2.6.2 Notification of Non Compliance.

- a) The Contractor shall, immediately after receipt of a notice regarding any non compliance with the foregoing requirements, detected by the Engineer or by his staff, take prompt corrective actions.
- b) Such notice, when delivered to the Contractor at the Site, shall be deemed sufficient for the purpose of notification.
- c) If the Contractor fails or refuses to comply promptly with this requirement, the Engineer will be entitled to issue an order for stopping all or part of the Works until satisfactory corrective actions are taken. No part of the time lost due to such stop orders will be accepted as the subject of a claim by the Contractor for extension to the Time for Completion or for additional costs or damages. However, instead of that, the procedure established in subsection 2.2 (f) and (g) of this Specification Section shall be applied.

2.6.3 Certificate of Satisfactory Quality Control

This certificate will be issued by the Engineer, on a monthly basis, upon the Contractor's due compliance with the following conditions:

- a) No failures in the compliance with the requirements of this Specification Section have been observed by the Engineer and the Quality Control plan has been properly implemented to the Engineer's satisfaction in accordance with the approved Quality Control schedules;
- b) The certificate of satisfactory laboratory operation required in Specification Section 01750 Laboratory has been issued by the Engineer;
- c) The certificate of satisfactory control of materials required in Specification Section 01900 Control of Materials has been issued by the Engineer and
- d) The Quality Control records and reports, including the monthly summary have been submitted to the Engineer promptly.

3. MEASUREMENT AND PAYMENT

The establishment, implementation and maintenance of the Quality Control program in accordance with the provisions and requirements of this Specification Section shall be deemed to be Inherently Paid Work, which is included in or distributed among all rates and prices entered in the unit prices of the Bill of Quantities. No separate payment will be made for these items.

Any Contractor's Quality Control Works not specifically identified in this Specification Section but which are necessary for the performance of the Works shall be deemed to be Inherently Paid Work, which shall neither be measured nor paid

separately and shall be deemed included in or distributed among all the pay items listed in the Bill of Quantities.