



Republic of Türkiye
MINISTRY OF ENAGRICULTURE AND FORESTRY
Directorate General of State Hydraulic Works
Technical Research and Quality Control Department



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CIRCULAR
2020/9

In order to carry out quality control activities in DSİ projects effectively and efficiently and to ensure unity in practice throughout our organization, the following issues must be complied with.

Quality control activities in DSİ projects must be carried out in accordance with the issues specified in the Quality Control Technical Specification and Quality Control Guide, taking into account the contract and its annexes.

The duties of the Quality Control and Laboratory Branch Directorate are defined in the DSİ Organization Guide as **"to inspect and monitor all quality control and laboratory activities in the region, to analyze the work of the units affiliated to it, to determine criteria to assess efficiency, to prepare and implement the necessary instructions regarding its unit, to evaluate the results of the work, to make corrections and to take/have taken all necessary measures in this regard, and to provide enlightening technical information requested by the acceptance committees in temporary and final acceptances, based on national and international standards, technical specifications, and test results"**.

Accordingly, within the scope of quality control activities; quality control personnel with appropriate qualifications (technical personnel, lab technician, lab assistant, etc.) shall be assigned by the Regional Director with the recommendation of the Quality Control and Laboratory Branch Director, after examining the contract and its annexes of the work.

The laboratory personnel assigned to the construction site are technically subordinate to the Quality Control and Laboratory Branch Director.

The test forms to be organized regarding the tests performed on the construction site shall be signed by the quality control personnel, the contractor's representative and the construction supervision officer. A copy of the signed test forms shall be sent with an official letter by the unit to which the construction supervision officer is affiliated, at least 5 business days before the progress payment is started, so that the material/manufacturing conformity assessment can be made, in such a way that it will be at the Quality Control and Laboratory Branch Directorate.

Material/manufacturing conformity assessments that cannot be completed within 5 business days in case there is not the number of test results specified in the contract and its annexes, shall be made after the data based on the assessment is obtained.

For the material/manufacturing conformity assessment, the sample taken shall be recorded (on a form, report, etc.) by the administration's quality control personnel under the supervision of the authorized representative of the contractor and the construction supervision officer.

The samples shall be delivered to the DSI Laboratory under the responsibility of the administration with an official letter, also specifying the requested tests to be performed.

The tests on the samples, including cross-controls, shall be performed by the Regional Quality Control and Laboratory Branch Directorate with a report for quality control purposes, with the knowledge of the Authority. The test results shall be officially sent to all relevant parties.

Tests that are not within the scope of DSI laboratories and cannot be performed shall be carried out in accredited laboratories determined jointly by the Quality Control and Laboratory Branch Director and the construction supervision officer. Tests that cannot be performed in an accredited laboratory for technical reasons can be carried out in a laboratory authorized/approved by the relevant Ministry, with the reason specified by the construction supervision officer.

The Quality Control and Laboratory Branch Directorate shall be able to perform the material/manufacturing conformity assessment based on the test reports prepared by the tests performed on the construction site or by DSI Laboratories outside the construction site.

The Quality Control and Laboratory Branch Directorate shall organize a "Tested Material/Manufacturing Conformity Form" within five business days after receiving the test results that are the basis for the material/manufacturing conformity assessment, taking into account the contract and its annexes of the work, and send it to the relevant unit with its annexes.

The conformity assessment of materials that are not tested in DSI laboratories shall be performed by the construction supervision officer. In this case, the construction supervision officer shall prepare the "Tested Material/Manufacturing Conformity Form" to be included in the progress payment.

In the event that the Quality Control and Laboratory Branch Directorate detects non-conforming material/manufacturing as a result of the material/manufacturing conformity assessment, it shall inform the relevant units and the Regional Director in order to correct the nonconformity and prevent its recurrence.

The materials subject to progress payment (concrete, cement, bentonite, rock, aggregate, steel bar, waterstop seal, concrete chemicals, geosynthetics, clays, etc.) shall not be used in the manufacturing without a conformity report.

No payment shall be made for defective or faulty materials/manufacturing costs determined to belong to the contractor without reporting the test results of quality control activities or as required by the contract and its annexes. Even if included in interim payments, such costs shall be deducted from the contractor's subsequent payments or final payment.

This circular shall enter into force as of the date of its publication. With this circular, circular numbered 2014/02 is abolished.

I kindly request that the issues specified in the circular be diligently implemented in order to carry out quality control activities effectively and efficiently, to ensure that the materials and manufacturing used in the projects meet the desired quality criteria, and to prevent resource waste.

e-signed

Kaya YILDIZ
Deputy General Director

Annex:

- 1 - Quality Control Technical Specification (18 pages)
- 2 - Quality Control Guide (1 page)
- 3 - Quality Control Plan (6 pages)

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Republic of Türkiye
MINISTRY OF AGRICULTURE AND FORESTRY
DIRECTORATE GENERAL OF STATE HYDRAULIC WORKS



TECHNICAL RESEARCH AND QUALITY CONTROL DEPARTMENT

QUALITY CONTROL TECHNICAL SPECIFICATION



September 2020

ANKARA





Contents

1.	INTRODUCTION.....	2
2.	CONTRACTOR'S RESPONSIBILITIES	3
3.	QUALITY CONTROL PLAN	4
4.	QUALITY CONTROL PERSONNEL.....	4
5.	LABORATORIES.....	6
6.	SAMPLES.....	11
7.	TESTS.....	12
8.	DEVICE MANAGEMENT.....	12
9.	COMMUNICATION/COOPERATION/PENAL PROCEDURES	14
10.	CROSS CONTROLS	14
11.	FEES.....	15
12.	DOCUMENTATION.....	15
13.	CONFORMITY CRITERIA.....	16
14.	PROPERTY RIGHTS.....	16
15.	ENVIRONMENTAL RESPONSIBILITY.....	16
16.	OCCUPATIONAL HEALTH AND SAFETY.....	17
17.	CONSULTANT SERVICE PROCUREMENT STATUS	17
18.	ANNEXES.....	17



DSİ DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

1. INTRODUCTION

1.1. Objective

This specification aims to ensure that the experimental quality control activities for the works carried out by the General Directorate of DSİ can be performed in an effective, efficient, controllable, and systematic manner, in accordance with the contract and its annexes, the Circular on Quality Control Activities, and the Quality Control Guide.

1.2. Scope

The specification covers the principles and procedures of how the experimental quality control activities of the works carried out by DSİ through contractors at the planning, project, construction, and operation stages will be performed.

1.3. Responsibility

The DSİ units defined in the Quality Control Guide, as well as the contractors and subcontractors, are responsible for the implementation of the specification.

1.4. Definitions

In this specification;

Administration: The Department Heads and/or Regional Directorates affiliated with the General Directorate of DSİ, which is the legal entity that tenders the work, concludes the contract, and is the owner of the work,

TAKK: DSİ Technical Research and Quality Control Department of the General Directorate of DSİ,

Quality Control and Laboratory Branch Directorate: The Quality Control and Laboratory Branch Directorates of the DSİ Regional Directorates,

Contractor: The bidder who is responsible for the construction of the work as a result of the tender and signs the contract with the administration,

Contractor's Representative: A real person who represents the contractor regarding the work subject to the contract, has been given full power of attorney by the contractor with a notarized power of attorney for that work, and has been accepted by the administration,

Subcontractor: A real or legal person who carries out a part of the work subject to the contract based on a contract he/she has made with the contractor,

Specification: Documents showing the general, special, technical, and administrative principles and procedures of the construction work,

Building Audit Officer: A civil servant or a committee to be assigned by the administration for the supervision of the works and/or a real or legal person or persons assigned from outside the administration to perform these works,

Consultant: A real or legal person or persons who perform Quality Control activities on behalf of the administration and have no organic ties with the contractors of the work,

Quality Control: Works that include all kinds of measurements, records, and laboratory tests that need to be done in a timely and sufficient manner to ensure that the project and construction of all kinds of engineering structures under the responsibility of the General Directorate of DSİ are made in accordance with technical rules and with the quality described in the specifications and standards, and the analysis of the obtained results and, if necessary, the execution of corrective, preventive, and improving activities,

Quality Control Personnel: A person appointed by the Administration and/or the Contractor to carry out or supervise quality control activities

Test: Analyses made to determine whether any material or manufacturing is in compliance with pre-determined criteria in terms of quality control activities,

Sample: Small parts taken for tests that represent the whole or a part of the material or manufacturing,

Witness Sample: A sample that is taken at the same time and under exactly the same conditions as the test sample, is of the same quality, and shows exactly the same properties as the sample, to be used in the resolution of possible objections to the analysis results. The remaining amount after the completion of the requested tests should be sufficient to repeat all of the initially requested tests.

Seal: An apparatus that is used to prevent unauthorized persons from tampering with the sample,

Cross-Control Sample: Additional samples that the Administration will take from the material or manufacturing for verification purposes at any time,

Quality Control Plan: A document defined by the form number F 0 16 00 89, which is submitted to the Administration by the contractor, specifying how, where, when, how often, and by whom the quality control activities will be performed during the work,

DSİ Laboratories: Locations where test procedures are performed, which are established in the General Directorate, Regional Directorates, Branch Directorates or construction sites of DSİ and whose management belongs to the Administration,

Site Laboratory: Locations where test procedures are performed, which are established and operated by the contractor for the experimental quality control activities of the project and construction works, and whose control belongs to the Administration,

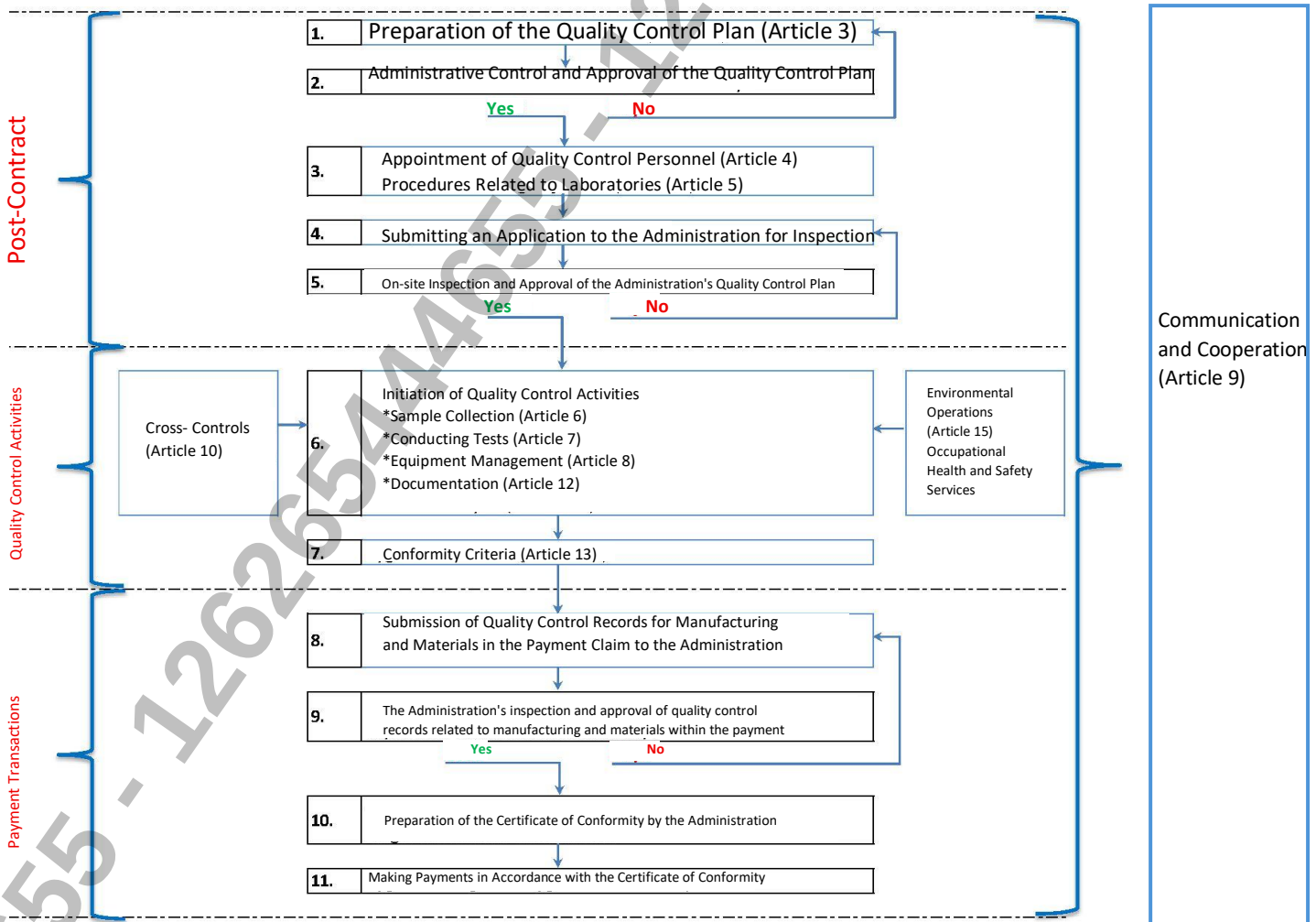
Factory Laboratory: Locations where test procedures are performed, which are established for the inspection of the product to be procured and its raw materials at the place where they are produced, and whose operation belongs to the manufacturer,

Accredited Laboratory: Test and/or calibration laboratories that are accredited by TÜRKAK (Turkish Accreditation Agency) in our country and by authorized accreditation bodies abroad according to the TS EN ISO/IEC 17025 standard,

Construction Material: All materials that are produced, placed on the market, and meet the desired performance requirements in accordance with the legal regulations, criteria, and arrangements published by the Ministry of Environment and Urbanization, to be used permanently in all kinds of construction works or in any part of these works.

2. CONTRACTOR'S RESPONSIBILITIES

The procedures to be followed by the contractor after the signing of the contract are specified in the flowchart below. The contractor is responsible for every stage of the work.





DSI DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

3. QUALITY CONTROL PLAN

The Quality Control Plan is prepared by the Contractor before the start of the project, in accordance with the work schedule and the F O 16 00 89 Quality Control Plan form, and is submitted to the Administration for approval. In case the work schedule is revised, the quality control plan is also reviewed and the parts affected by this change, if any, are updated and submitted to the Administration for approval. The contract conditions are taken as the basis for the preparation of the Quality Control Plan. In case there are issues not specified in the contract conditions or that contradict each other in practice, action is taken according to the priority order in the tender documents.

The Quality Control Plan is examined by the Administration in accordance with the contract and its annexes, and if found appropriate, it is approved and sent to the contractor and the relevant units. It is implemented by the Contractor in accordance with the work schedule. If necessary after the start of the work, changes can be made to the plan upon the request of both the Administration and the contractor. In case of a change in the work schedule, the plan is revised by the contractor in accordance with the changed work schedule. Any change on the approved plan is subject to the approval of the Administration.

a. Implementation of the Plan:

The following points shall be complied with in the implementation of the quality control plan, in the order specified.

- The appointment of quality control personnel,
- The establishment of laboratory buildings and subsidiary buildings,
- The procurement of laboratory devices, equipment, and consumables,
- The calibration of devices subject to calibration,
- Applying to the Administration for the control and approval of the personnel appointed, the laboratory established, and the devices and materials procured in accordance with the quality control plan,
- The research of building materials that meet the contract conditions and are subject to the Progress Payment Manufacturing Conformity assessment,
- Having the conformity tests of both natural building materials and other building materials, which require pre-qualification tests, performed according to the criteria requested in the contract and its annexes, performing the procurement if it is found appropriate by the administration, and not transporting the non-conforming material to the construction site, or removing it from the construction site even if it has been transported,
- The implementation of quality control activities in accordance with the quality control plan,
 - ✓ Taking samples,
 - ✓ Performing tests,
 - ✓ Device management,
 - ✓ Documentation,
- Submitting the test results obtained for the performance of quality control and conformity assessment activities to the Administration in the format requested by the Administration,
- Taking the necessary measures related to environmental, occupational health and safety at the workplace and construction site throughout the entire process, and ensuring cooperation and coordination with the Administration.

4. QUALITY CONTROL PERSONNEL

Before starting the work, the contractor shall form a quality control team with the titles, criteria, and numbers specified below, and shall fully perform the duties defined below. The competency documents of the quality control team shall be submitted to the Administration, and the team shall be responsible to the Administration and the contractor.

The number and qualifications of the personnel to be assigned to the 3 different types of laboratories in the site laboratories section are shown in the following chart.



DSİ DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

Laboratory Type	Quality Control Engineer		Laboratory technician (At least technical high school graduate)		Lab Assistant (At least high school or technical high school graduate)	
	Quantity	Experience (Year)	Quantity	Experience (Year)	Quantity	Experience (Year)
Type 1	1	2	2	2	2	2
Type 2	1	1	1	2	1	1
Type 3	1	1	1	1	1	-

a. Quality Control Engineer:

The technical personnel appointed by the Contractor and responsible for the execution of the quality control activities of the construction work. The number of Quality Control Engineers specified in the chart above can be increased by the Administration according to the content of the work.

The Quality Control engineer shall be appointed by the Contractor within 10 workdays following the approval of the quality control plan by the Administration.

The duties, authorities, and responsibilities of the quality control engineer are as follows:

- To establish and operate the site laboratory foreseen in the Quality Control Plan,
- To implement the Quality Control Plan approved by the Administration, and to notify the Administration of any deviations from the plan,
- To ensure cooperation and coordination with the Administration and the Contractor,
- To inform the Administration and the Contractor,
- Taking samples/having samples taken,
- Performing tests/having tests performed,
- To keep, organize, compile, submit to the Administration, and archive records,
- To sign the raw test data of the tests performed in the Site Laboratory,
- To determine, procure, and execute supply and stock control procedures by determining critical stock levels to ensure the continuity of the works, such as the tools, equipment, devices, instruments, and accessories used in the laboratory, as well as consumables or manufacturing type laboratory equipment requiring special setups, test standards, publications, technical documents, etc., and to inform the Administration and the contractor in a timely manner,
- To perform/have performed the procurement, installation, maintenance, repair, and calibration services of the quality control devices used in the Site Laboratory,
- To follow and guide the work of the personnel, and to meet their training needs,
- To follow the legislation and principles related to his/her duty, and to inform the personnel under his/her command about these issues,
- To monitor the possible environmental effects of quality control activities, to take/have taken the necessary measures in accordance with the relevant legislation, and to eliminate their environmental effects,
- To take, have taken, and implement measures related to occupational health and safety during quality control activities,
- To perform other duties to be given by the Administration related to his/her area of duty.

b. Laboratory technician:

The personnel who will perform the tasks given by the quality control engineer within the scope of quality control activities during the execution of the project.

The number of lab technicians specified in the chart above can be increased by the Administration according to the content of the work. If a lab technician is not assigned by the contractor, the Administration may assign one. Regarding the lab technician expenses, action will be taken according to the regulations specified in Article 11.

The duties, authorities, and responsibilities of the lab technician are as follows:



DSi DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

- To carry out experimental activities and lab technician works in accordance with the test standards, instructions, and the DSi Quality Control Guide, under the supervision of the personnel (lab technician) assigned by the Administration, in such a way that they meet the conditions of the contract, technical specifications, and the project,
 - To use the existing tools and materials in accordance with the instructions for use,
 - To prepare the devices and equipment to be used in the test; to perform the test according to its instruction, and to ensure the cleanliness of the environment, device, and equipment used at the end of the test,
 - To perform other duties to be given by the Administration related to his/her area of duty.
- c. **Lab Assistant:**
The personnel employed to assist the lab technician. The number of lab assistants specified in the chart above can be increased by the Administration according to the content of the work.

5. LABORATORIES

a. **Site Laboratory:**

In large and small hydraulic works that require on-site experimental quality control activities, laboratory/laboratories (concrete, soil, material, etc.) that are appropriate for the scope of the work and approved with the quality control plan, shall be established within the site facilities. However, in projects that can be completed in less than 1 year, if the establishment of a laboratory is not requested by the Contractor, it shall be stated in the Quality Control Plan with its justification. For these projects, a decision will be made on whether to establish a laboratory or to establish it partially, as a result of the evaluation to be made by the Administration according to the nature and justification of the work.

The laboratories shall continue their activities in compliance with the conditions specified below.

- The laboratories shall be able to perform the tests included in the contract and its annexes, and shall have the competence approved in the quality control plan. The tests of the materials included in the scope of Building Materials (metallic materials, geosynthetics, pipes, waterstop seals, etc.) shall not be performed in the site laboratory.
- The laboratories shall not be used for purposes other than their intended use.
- The necessary security conditions of the laboratories shall be ensured, and they shall be open only to the authorized personnel.
- The laboratories shall not be used for other works that are not related to DSi.
- In case a laboratory established for a DSi work is desired to be used in another DSi work, the approval of the Administration and the mutual agreement of the contractors are required.
- Whether the laboratories established on the site are suitable for the scope of the work shall be inspected by the Administration after the approval of the Quality Control Plan and the application of the Contractor, and if found appropriate, the testing activities shall be allowed to start.
- No testing activities shall not be performed in laboratories that are not found to be appropriate.
- There shall be no element or issue that may prevent the samples delivered to the laboratory from getting mixed up or the tests from being performed as required.
- The laboratory environment shall be suitable for the proper placement of the test devices and for the comfortable work of the personnel in terms of infrastructure and physical conditions.
- The laboratories shall have electrical and water installations, heating and cooling systems, telephone and Internet connection, and, if necessary, a ventilation unit and an appropriate lighting system.
- In cases where more than one laboratory needs to be established, laboratory materials, devices, or equipment with the same features can be used in other laboratories with the approval of the Administration.
- The laboratory cannot be taken out of service before the provisional acceptance of the work is made. The written approval of the Administration shall be obtained for the closing of the laboratory before the final acceptance.



DSİ DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

Laboratory Characteristics:

The laboratories to be established in the site facilities are defined as follows.

The criteria for Small Ponds, Ponds, and Dams are determined based on the height from the thalweg and the total reservoir volume, as described in the General Directorate's Circular No. 2020/3. The irrigation constructions, transmission canals, supply constructions, and tunnels belonging to the work specified in the Planning/Working Criteria section shall also be evaluated within the same work and the laboratory type shall be determined.

Thalweg Height (H)	Total Reservoir Volume ($V_{\text{dead}}+V_{\text{active}}$)	Name	Planning/Working Criteria	Laboratory Type
$H \leq 15 \text{ m}$	$V \leq 0,5 \text{ hm}^3$	Small Pond	Small Pond	Type 3
	$0,5 \text{ hm}^3 < V \leq 3 \text{ hm}^3$	Pond	Pond	Type 3
	$V > 3 \text{ hm}^3$	Pond	Dam	Type 2
$15 \text{ m} < H \leq 25 \text{ m}$	$V \leq 3 \text{ hm}^3$	Pond	Pond	Type 2
	$V > 3 \text{ hm}^3$	Pond	Dam	Type 2
$25 \text{ m} < H$	$V \leq 3 \text{ hm}^3$	Pond	Dam	Type 1
	$V > 3 \text{ hm}^3$	Dam	Dam	Type 1

In projects where the water source is a regulator, the Irrigation Area (A) (gross-ha) shall be evaluated. If $A \leq 1000$, a Type 2 laboratory shall be established; if $A > 1000$, a Type 3 laboratory shall be established.

For large flood protection works, treatment plants, and their supply works, a Type 2 laboratory shall be established.

For flood protection works, water tanks, and their supply works, a Type 3 laboratory shall be established.

In tendered works not specified above, the laboratory type shall be determined by the Administration according to the content of the work.

The laboratory to be established according to the scope of the work shall comply with the "Regulation on Health and Safety Measures to be Taken in Workplace Buildings and Subsidiary Buildings" and shall provide the following minimum area conditions.

Laboratory/Subsidiary Building	Quantity	Type 1	Type 2	Type 3
Concrete Laboratory	1	25 m ²	15 m ²	10 m ²
Soil Laboratory	1	25 m ²	15 m ²	10 m ²
Curing Room (This quantity can be increased by the	1	10 m ²	10 m ²	6 m ²
Cement Laboratory (*)	1	25 m ²	15 m ²	
Chemistry Laboratory (*)	1	25 m ²	15 m ²	
Material Laboratory (*)	1	25 m ²	15 m ²	
Office Area	1	20 m ²	15 m ²	10 m ²
Restroom/WC/Shower/Dressing room (with a wardrobe)	1	10 m ²	10 m ²	7 m ²
Storage	1	10 m ²	10 m ²	7 m ²
Dormitory (For when a resident Administration lab technician is needed, with its furnishings and wet areas)	1	25 m ²	15 m ²	10 m ²
(*) To be established if requested in the Special Technical Specification.				



DSi DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

Devices, Equipment, Consumables: The laboratories to be established according to the scope of the work shall have at least the devices marked below, and these devices shall meet the requirements of TS EN 932-5 or its related standard:

For Concrete Laboratory	Characteristic	Quantity	Type 1	Type 2	Type 3
Concrete compression press	At least 2000 kN capacity, conforming to TS EN 12390-4	1	X	X	X
Drying oven	At least 250 liters, 110 ± 5 °C	1	X	X	X
Large and small sieve shaker machines and sieves	Sieve Shakers conforming to ASTM C 136, sieves conforming to TS EN 933-1	1	X		
Sieve set for coarse and fine aggregate	Conforming to TS EN 933-1	1	X	X	X
Archimedes Balance	15 kg, with 0.1-gram sensitivity	1	X	X	
Balance	50 kg, with 1 gram sensitivity	1	X	X	
Weighbridge	150 kg, with 5-gram sensitivity	1	X	X	
Methylene Blue test set	Conforming to TS EN 933-9	1	X	X	
Slump Set	Conforming to TS EN 12350-2	1	X	X	X
Cube and/or cylinder sample	Sufficient quantity, conforming to TS EN 12390-1	Sufficient quantity	X	X	X
Thermometers	Preferably with data logger control	Sufficient quantity	X	X	X
Moisture meter (relative humidity meter)	Preferably with data logger control	1	X		
Digital caliper	300 mm, with 0.01 mm sensitivity	1	X	X	X
Straightedge and Square	Conforming to TS EN 12390-3	1	X	X	X
Curing Tank (with Data Logger control if requested by the Administration)	Conforming to TS EN 12390-2	1	X	X	X
Air meter	Conforming to TS EN 12350- 7, ASTM C 231	1	X	X	X
Containers for unit volume mass and void ratio	Conforming to ASTM C29	Sufficient quantity	X		
Compressor	For removing concrete samples from the mold	1	X		
Graduated glass measuring cylinders	For water weighing or solution preparation	Sufficient quantity	X		
Heater with fan	For bringing samples to SSD (Saturated-surface-dry)	1	X		
Abraham cone and tamping	For determining SSD condition	1	X	X	
Sample taking apparatuses	Conforming to TS EN 12350-1 and TS EN 12390-2	Sufficient quantity	X	X	X
Feeler gauge	Conforming to TS EN 12390-1	1	X	X	X
Sample trays in various sizes	For drying samples in the oven and for sample weighing	Sufficient quantity	X	X	
Sample Splitter	For taking representative test samples	1	X		
Chronometer	Digital	1	X		
Concrete mixer (If a concrete plant is established, trials are done at the plant)	At least 500 dm3 capacity for making trial mixes	1	X		
Pressure Press (*)	Maximum 500 kN, conforming to TS EN ISO 7500-1	1	X	X	X
Special apparatus for Splitting Tensile Strength	Conforming to TS EN 12390-6	1	X	X	X
Ve-Be consistometer (*)	Conforming to ASTM C1170	1	X	X	X
Kango hammer (*)	Conforming to ASTM C1435	1	X	X	X
Nuclear density and moisture meter (*)	Conforming to TS 13653, with GPS control, detector and dosimeter	1	X	X	X
Core drilling machine (**) (For taking core from conventional concrete)	Suitable for taking samples with diameters of 50mm, 75 mm, 100 mm, 150 mm	1	X	X	X



DSi DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

For the Concrete Laboratory	Characteristic	Quantity	Type 1	Type 2	Type 3
Cylinder sample molds	Conforming to TS EN 12390-1	Sufficient quantity	X	X	X
Capping apparatuses for cylinder samples (*)	Conforming to ASTM C617 or TS EN 12390-3	Sufficient quantity	X	X	X
(*) Shall be available in the laboratory if the project includes RCC manufacturing. (**) If the project includes RCC manufacturing, a long core with a diameter of at least 150 mm shall be taken using a drilling machine. The ones marked with X are the mandatory devices, tools, and equipment for the concrete laboratory.					

For the Soil Laboratory	Characteristic	Quantity	Type 1	Type 2	Type 3
Small sieve shaker	Conforming to TS 1900-1	1	X		
Sieve Set	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	1	X	X	X
Washing sieve	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	5	X	X	X
Drying oven	At least 250 liters, 105- 110 °C		X	X	X
Balance	6 kg, with 0.01-gram sensitivity	1	X	X	X
Balance	50 kg, with 1 gram sensitivity	1	X	X	X
Proctor apparatus (standard and modified) and set (related molds, tamping rod, etc.)	Manual or automatic (conforming to TS 1900-1)	1	X	X	X
Thermometers	Conforming to TS 1900-1 and/or TS EN ISO 17892-1	Sufficient quantity	X	X	
Shovel, pickaxe, etc.		Sufficient quantity	X	X	X
Sand cone set	Conforming to TS 1900-1 and/or ASTM	1	X	X	X
In-place density and moisture control device	Nuclear density and moisture meter (ASTM D6938) or Electrical density meter (ASTM D7830 / D7830M) or Falling Weight Deflectometer (ASTM D4694)	1	X	X	
Microwave oven	Conforming to TS 1900-1	1	X	X	
Weighbridge	(in rockfill dams) 150 kg, with 0.5-gram sensitivity	1	X	X	X
Sample taking containers	In different sizes	Sufficient quantity	X	X	X
Spatula, brush, steel ruler	Conforming to TS 1900-1	1	X	X	X
Caliper	Conforming to TS 1900-1 and/or TS EN ISO 17892-2	1	X	X	X
Templates for water replacement test	(in rockfill dams) USBR 7221, ASTM 5030	1 Set	X	X	X
Flowmeter for water replacement test	(in rockfill dams) USBR 7221, ASTM 5030	1	X	X	X
Samplers (cylindrical)	Conforming to TS 1900-1	Sufficient quantity	X	X	X
Liquid limit device and set	Casagrande or cone penetration liquid limit device and set (conforming to TS 1900-1 and/or TS EN ISO 17892-12)	1	X	X	
Plastic limit set	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	1	X	X	
Pycnometer	Conforming to TS 1900-1 and/or TS EN ISO 17892-3	2	X	X	
Vacuum pump	Conforming to TS 1900-1 and/or TS EN ISO 17892-3	1	X	X	
Splitter		4	X		
Desiccator	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	1	X	X	



DSi DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

For the Soil Laboratory	Characteristic	Quantity	Type 1	Type 2	Type 3
Porcelain crucible	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	1	X	X	
Glass rod	Conforming to TS 1900-1 and/or TS EN ISO 17892-12	1	X	X	
Water bath	Conforming to TS 1900-1 and/or TS EN ISO 17892-3	1	X	X	
Mixer	Conforming to TS 1900-1 and/or TS EN ISO 17892-4	1	X	X	
Chronometer	Conforming to TS 1900-1 and/or TS EN ISO 17892-4	2	X	X	
Measuring Cylinder	Conforming to TS 1900-1 and/or TS EN ISO 17892-4	5	X	X	X
Vibrating table and set	Conforming to ASTM D 4253 and ASTM D 4254	1	X		
Marsh Funnel and Beaker (*)	(ISO 2431) For measuring viscosity (Mouth opening 4.7 mm, Sieve mesh size 2 mm, Weight 1 kg)	1	X	X	
Mud (density) balance (*)	(ASTM D 2419; AASHTO T 176) With a metal graduated body, Dimensions 550x110x100mm, Weight (Approx) 1 kg, Approximately 5 kg with Carrying Case.	1	X	X	
Glass Measuring Cylinder (*)	1000 ml	Sufficient quantity	X	X	
(*) Shall be available in the laboratory if the project includes injection manufacturing. The ones marked with X are the mandatory devices, tools, and equipment for the concrete laboratory.					

Material Laboratory, Chemistry Laboratory and Cement Laboratory (Equipment content is determined by the special technical specification.)

Ancillary Devices, Equipment, and Furnishings: The following minimum devices, equipment, and furnishings shall be provided for the use of the quality control personnel to be assigned by both the contractor and the Administration.

Name	Quantity	Characteristic
Computer	1	Of a quality acceptable by the Administration
Printer	1	Of a quality acceptable by the Administration
GPS	1	Of a quality acceptable by the Administration
Table, chair and cabinets	Sufficient quantity	Of a quality acceptable by the Administration

The devices, equipment, and materials specified for the laboratories shall be submitted to the Administration for inspection after they have arrived at the construction site and their calibrations have been performed, and if they are found appropriate, their use in experimental activities will be allowed. No additional payment shall be made to the Contractor for the devices, equipment, and materials to be supplied, and unless otherwise specified, their ownership shall belong to the Contractor at the end of the work. The laboratories and devices shall be open to the use and inspection of the quality control personnel assigned by the Administration.

In addition to the devices included in the lists above, the Contractor shall provide the necessary devices, materials, equipment, and consumables required by the contract and its annexes.

If similar devices for the same purpose as the ones specified above are found in other tender documents, the Administration shall decide which one to select.



DSi DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

b. **DSi Laboratories:**

Tests that cannot be performed in site laboratories or that are requested by the building audit officer are carried out in DSi Laboratories. The costs of these tests are covered by the contractor unless there is a provision to the contrary in the contract. In test requests, care is taken not to disrupt the work program of the DSi Laboratories.

c. **Non-DSi Laboratories:**

If it is desired to have the tests performed in non-DSi laboratories, the provisions of the current quality control activities circular are valid.

6. **SAMPLES**

The following points shall be complied with for samples to be taken for both quality control and cross-control purposes.

a. **General Provisions**

- The sample taking methods specified in the contract or standards that will represent the manufacturing or the material are used for taking samples.
- Unless otherwise specified, samples are taken in the amount specified in the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples and at the frequency specified in the Quality Control Guide.
- Samples are taken from the materials procured to the construction site, under the supervision of the authorized representative of the contractor company and the Building Audit Officer, by the quality control personnel of the Administration, using the F 0 16 00 56 Site Sample Taking Report.
- Samples are taken in an amount sufficient for witness tests as well, if deemed necessary and possible by the Administration.
- Samples are stored under the responsibility of the Contractor, in accordance with the necessary protection and safety conditions.
- The samples taken are recorded in the F 0 16 00 57 Site Sample Logbook form.
- A sample taking report may not be prepared for samples to be tested in the site laboratory. In this case, the relevant quantity, such as the place and amount that the sample represents, is recorded on the test forms.
- If necessary, the same process is followed for tests to be performed on witness samples.
- The same procedures apply to samples to be taken based on the inspections conducted by all kinds of boards, commissions, and officials formed by the Administration.
- The samples whose tests have been completed are destroyed as specified in the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples, with the knowledge and approval of the Administration.
- All damage caused by sample taking is repaired by the Contractor. No additional payment is made to the Contractor for these procedures.

b. **Samples to be Transferred to Laboratories Other Than Site Laboratories**

- Samples taken to be tested in laboratories other than the site laboratory are sealed after they are taken, under the supervision of the Administration and together with the contractor's authorized representative. The samples taken by the quality control personnel of the Administration are recorded in the F 0 16 00 57 Site Sample Taking Form. The seal number, sample information, and the amount that the samples represent are recorded on the form.
- The samples are transported to the laboratories by the Contractor, under the responsibility of the Contractor, in compliance with the transportation, protection, and safety conditions in accordance with the standards, and under the supervision of the authorized DSi personnel if deemed necessary by the Administration.
- The transportation of samples to the laboratories can also be done by the Administration if necessary.
- In case there is a situation that prevents the tests from being performed on the samples during their transfer to the laboratories, this shall be put under a report by the Contractor and the Administration officials.
- The tests to be performed on the samples to be taken are requested in a formal letter from the Regional Quality Control and Laboratory Branch Directorate by the Building Audit Officer using the F 0 16 00 55 DSi Laboratories Test Request Form.



DSİ DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

- The Regional Quality Control and Laboratory Branch Directorate notifies the relevant laboratories of the test requests in writing.
- The samples are accepted by the relevant laboratory with a report.

7. TESTS

The following points shall be complied with in the tests performed for quality control purposes:

- The tests are performed according to national or international standards, technical specifications, or accepted methods.
- The test standards to be used should be the current version in force. However, in long-term contracts, in case the standard is revised, the standard in force on the date of signing the contract is valid.
- In case different test methods are specified for the same test in the contract and its annexes, the priority of the standards is as follows.
 1. TS EN (European Union Norms accepted as Turkish Standards)
 2. TS (Turkish Standards)
 3. ASTM (American Society for Testing and Materials)
 4. ISO (International Standard Organisation)
 5. EN (European Union Norms)
 6. DIN (Deutsches Institut für Normung, German Standards Institute)
 7. Other Standards
 8. Methods Developed in the Laboratory or Non-Standard Methods
- The tests are performed by the Contractor's quality control personnel, under the supervision of the quality control personnel of the Administration.
- In case of any deviation from the standard method in the test environment, the tests are stopped, and the tests are continued after the standard requirement is fulfilled.
- The provisions of Article 12 shall be complied with for the documents to be used in the tests.
- The Administration and the Contractor/Contractor's representative are informed of the test results.
- If requested by the Administration, the quality control activities are recorded with photographs and/or videos.
- The names, numbers, representative locations/amounts, and results of the tests performed in accordance with the work progress plan are compiled daily, monthly, and annually. If requested by the Administration, a report is submitted to the Administration in a format determined by the Administration or in a format approved by the Administration, and at the frequency requested by the Administration. The approval of the Administration is obtained for the report format.
- In addition to the progress reports, a final report is prepared by the Contractor at the end of the work and submitted to the Administration for approval.
- If requested or deemed necessary by the Administration, the tests are repeated, and all results obtained from the repetitions are also recorded along with the originals.

8. DEVICE MANAGEMENT

The test devices, ancillary equipment, or devices used in the site laboratories operated by the Contractor or in non-DSİ laboratories where services are procured must meet the conditions specified below.

- No devices other than those submitted to the Administration and approved with the quality control plan can be kept or operated in the site laboratories.
- Devices without a manufacturer, serial number, etc., or without labels cannot be used.
- Devices that are not included in the quality control plan are submitted to the Administration with a revised quality control plan by the contractor and can be used after the approval of the Administration.



DSİ DIRECTORATE GENERAL
QUALITY CONTROL TECHNICAL SPECIFICATIONS

- The devices included in the quality control plan cannot be transported, rented out, or sold to any location without the knowledge of the Administration.
- The devices shall only be used by authorized personnel.
- The devices in the laboratories shall be kept in a continuously working condition.
- In case the devices become temporarily or permanently non-functional for any reason that would prevent the tests from being performed, the Administration shall be notified immediately. The necessary measures are taken by the Contractor, and their maintenance/repairs, renewals, or replacements are performed.
- Devices subject to calibration cannot be used without their calibrations being performed and their suitability for the test being confirmed according to the calibration certificate.
- The calibration intervals should cover the device's usage range in the test.
- The devices are verified at certain intervals. The Administration can also perform checks as necessary.
- Devices found to be non-conforming as a result of verification cannot be used until their conformity is proven.
- Device calibrations are performed by calibration laboratories accredited in the relevant device calibration field. In case an accredited calibration laboratory in the relevant device calibration field cannot be found, action is taken according to the Turkish Accreditation Agency's (TÜRKAK) R10.12 Metrological Traceability Guide.
- The periodic durations specified below are complied with in calibrations. The Administration can also request additional calibration at any time.
- In case devices requiring on-site calibration are moved, their calibrations are renewed regardless of their period.
- Device calibrations should be performed by laboratories accredited according to the TS EN ISO/IEC 17025 standard in the relevant device field.

Device Group	Calibration Period (year)	On-site Calibration
Balances	2 (according to TS EN 932-5)	X
Force machines (Concrete test presses, tensile-compression test presses, etc.)	1	X
Climatic cabinets (Ovens, incubators, water baths, ash furnaces, etc.)	Calibration before first use, then verification once a year with a temperature meter with a calibration certificate (according to TS EN 932-5)	
Sieves [mesh size: 0.63 mm-1.00 mm (inclusive)]	1	
Sieves [mesh size: 1.00 mm-10.00 mm (inclusive)]	2	
Sieves [mesh size: greater than 10.00 mm]	3	
Molds (cube, cylinder, scale container)	5	
Dimension measuring instruments (comparator gauge, caliper, micrometer)	1	
Temperature and humidity meters	1	
Verification devices (mass set, load cell, etc.)	2	

- Laboratory devices are subjected to maintenance and repair at various levels according to the condition of the device, manufacturer's recommendations, and calibration results.
- The maintenance and repairs of devices that require periodic maintenance/repair by authorized services are performed within the period and in a way that does not prevent the tests from being conducted.
- The daily cleaning procedures of the devices are not neglected.



DSI DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

- The same procedures are applied for the weighing and measuring devices in the ready-mix concrete plants established within the construction site facilities.

9. COMMUNICATION/COOPERATION/PENAL PROCEDURES

Each stage of this specification shall be open to the inspection of the Administration, and the contractor shall work in cooperation and coordination with the Administration. Written application is essential in communication with the Administration.

In cases where the procedures for which the Contractor is responsible are not carried out during the implementation of the specification, manufacturing requiring quality control activity shall not be started.

The findings regarding the site visits to be made by the Administration are written on the F 0 16 00 77 Finding/Notification Form. In case it is determined that the principles specified in the specification are not fulfilled, the penal provisions specified in the General Conditions of Construction Works and/or the contract, etc., of the work shall be applied.

10. CROSS CONTROLS

The following points shall be complied with in performing/having performed cross-controls.

- Cross-controls cover all quality control activities performed/had performed both on-site and in off-site laboratories.
- Cross-controls are primarily performed on witness samples, if available. If the Administration and the contractor agree, or at the request of the Administration, a cross-control can also be performed on a new sample.
- The sample to be taken and the test method to be applied in the cross-control must be the same as the sample taken and the test method applied in the first quality control, if applicable. In case a different sample and test method are to be used, this situation is recorded in the sample taking report.
- If the value obtained from the cross-control performed/had performed is not consistent with the values obtained during the first quality control activity, the analysis is repeated on a third sample if possible. The Administration decides whether the material or manufacturing in question is suitable, taking into account the results obtained.
- In cases where it is not possible to perform a test on a third sample, the Administration decides whether the material or manufacturing in question is suitable, taking into account the previously obtained results.
- Situations where the required criterion is not met in both routine quality control and cross-control are recorded and sent to the relevant units for evaluation. According to the instruction to be given by the Administration, the manufacturing affected by the quality control activity is stopped and the Contractor is asked to make the necessary corrections.
- The correction made is re-checked by the Administration, and if found appropriate, the contractor is allowed to restart the manufacturing affected by the quality control activity.
- The number of cross-controls that can be requested by the contractor on a material or manufacturing cannot be more than one. The Administration can perform cross-controls in any number and frequency it desires.
- All procedures required for the taking of the cross-control sample (sample taking, labor, engineering/lab technician services, transportation/road expenses, transfer to the laboratory, etc.) are carried out by the contractor, regardless of who made the request. No additional payment is made to the Contractor for all these works.

In the following situations, cross-controls can be performed or made to be carried out by the Administration or the Contractor:

- ✓ When it is desired to confirm the accuracy of the application of the test standard/method or technical document (e.g., concrete mix recipe) used,
- ✓ When it is desired to confirm the results of the tests performed on manufacturing or materials,
- ✓ When it is desired to check whether the devices used in the tests are working correctly,
- ✓ When it is desired to check whether the experimental software used in the tests is working correctly,
- ✓ When it is desired to check whether the samples are taken in a way that represents the materials or manufacturing.



DSİ DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

11. FEES

Unless there is a provision to the contrary in the contract and its annexes, all expenses to be incurred within the scope of this specification shall be covered by the Contractor, and no additional payment shall be made to the contractor by the Administration.

The current "DSİ Laboratories Test Unit Price List" is used for the pricing of the quality control services to be provided by DSİ.

12. DOCUMENTATION

The following principles shall be complied with in the preparation, filling, archiving, and disposal of the documents, records, reports, etc., to be used by the Contractor:

- It should be preferred that the documents used are managed using a quality system. In quality control activities, the forms defined in the DSİ system shall be used primarily. The current versions of the instructions, forms, etc., documents specified in the Technical Specification shall be obtained and used from the website of the TAKK Department Presidency at <http://takk.dsi.gov.tr/kalite-kontrol-faaliyetleri>
- If a form defined by DSİ is not available, the relevant form shall be evaluated by the Administration upon the written proposal of the Contractor, and if found appropriate, its use shall be started. The prepared documents shall have the DSİ and contractor logos, the name of the project, its region, the title of the Contractor, contact information, date, and a section for relevant signatures.
- Manual records related to sample and test activities shall be prepared clearly, legibly, without scribbling, using a non-erasable pen of blue color.
- In case of using computer software, printouts of the relevant forms are taken.
- The forms used, reports prepared, and reports shall have the wet signatures of the Contractor/Contractor's representative and the Administration's quality control personnel, the Contractor's quality control engineer, and the Building Audit Officer. It is mandatory for the signatures to include the name, surname, title, and date.
- In changes on a signed document, the original part is underlined with a non-erasable pen so that it can be read, the date of correction is written, and the initials of the signatories are put.
- All documents related to quality control activities shall be stored in a secure archive environment where they can be accessed immediately when requested, and which will prevent their deterioration, wear, burning, and which will not allow unauthorized persons to interfere, and the archive shall be provided by the contractor.
- The documents related to quality control activities to be archived are specified below.
 - ✓ Raw Test Forms
 - ✓ Documents related to test processes
 - ✓ Analysis Reports (Obtained from All Laboratories)
 - ✓ Other Reports, Presentations, Plans
 - ✓ Delivery notes
 - ✓ Procurement documents
 - ✓ Sample Taking, Delivery/Receipt Documents
 - ✓ Reports
 - ✓ Notifications, Correspondence, and Annexes Made by the Administration
 - ✓ Device Installation, Maintenance, Repair, and Service Records
 - ✓ Calibration Certificates
 - ✓ Site Sample Logbook
 - ✓ Digital Records
 - ✓ Quality control personnel records
 - ✓ Pictures, videos



DSi DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

- The background formula/code parts of the software used shall be open to the inspection of the Administration.
- The Contractor shall use the software/documents deemed appropriate by the Administration for quality control activities and shall enter data at the frequency specified by the Administration in programs/documents that require periodic data entry.
- The documents used in quality control activities shall not be destroyed.
- If the measurement results in the Test Reports are outside the value range given in the specification, standard, etc., documents to be compared with (if any/if given), the relevant measurement shall be shown in the Test Report with a different font/color/shape.

13. CONFORMITY

In the conformity evaluations to be made for payments for materials and manufacturing that fall within the scope of the progress payment and require an experimental quality control stage, the following principles shall be followed:

- The provisions of the current ["Quality Control Activities Circular"](#) published by the Administration shall be complied with.
- The conformity evaluation process begins with the contractor submitting the documents obtained as a result of quality control or cross-control activities for the materials or manufacturing that have been inspected by the Building Audit Officer to the Administration before the preparation of the progress payment. It is completed by the Administration evaluating the documents within the period given in accordance with the provisions of the current "Quality Control Activities Circular" and sending the prepared conformity documents to the relevant payment unit by adding them to the progress payment file.
- Conformity assessment shall be carried out by the Administration, taking into account the criteria specified in the contract and its annexes, standards, technical specifications, or instructions, and shall be documented using the [F 0 16 00 52 Test Structures Material/Manufacturing Conformity Form](#).
- The conformity evaluation shall be made by the Administration by preparing the F 0 16 00 52 Material / Manufacturing Conformity Form, taking into account the criteria required in the contract and its annexes, standards, technical specifications, or instructions. The expression "Conforming" or "Non-conforming" shall not be used for materials or manufacturing for which a document cannot be shown.
- Materials that do not have a conformity document or are non-conforming according to the prepared conformity document shall not be used in manufacturing.
- Conformity evaluations shall be made over the quantities (weight, length, number, volume, etc.) represented by the relevant quality control activity, in accordance with the principles specified in the Quality Control Activities Circular and [the Quality Control Guide](#).
- The quantities shall be determined based on the forms, reports, delivery notes, or determinations prepared by the mutual agreement of the contractor and Administration representatives, and a quantity used in one conformity evaluation document shall not be used in another conformity evaluation document. In all conformity evaluations, it should be clearly stated how much material or manufacturing the relevant test/tests represent.
- In cases where cross-controls are performed, the provisions of Article 10 shall be valid for the conformity evaluation criteria to be made.

14. PROPERTY RIGHTS

In the giving or sharing of the documents prepared or provided by both the Contractor and the Administration during quality control activities to third parties, in the recording of the activities related to quality control with sound, photograph, or video, in the presentation of the places related to quality control activities to the visits of third parties, and in the use of vehicles, equipment, and devices for quality control purposes, the knowledge and permission of the Administration shall be sought. It is mandatory for the permission to be given by the Administration to be in writing.

15. ENVIRONMENTAL RESPONSIBILITY



DSi DIRECTORATE GENERAL QUALITY CONTROL TECHNICAL SPECIFICATIONS

During quality control activities, the protection and non-pollution of the environment are essential. The fulfillment of all environmental obligations is the responsibility of the contractor. The Contractor shall comply with the provisions of the current legislation regarding the protection and non-pollution of the environment and shall fulfill the requirements of the notifications made to him/her within the given period. The contractor shall act in accordance with the knowledge and approval of the Administration in his/her environmental protection activities (removal or reduction of waste, residues, solid waste, excavation, dust, noise, wastewater, and emissions, prevention of water, soil, and air pollution, etc.).

16. OCCUPATIONAL HEALTH AND SAFETY

- The Contractor shall comply with all legislative provisions related to Occupational Health and Safety for its employees and shall submit the documents related to the procedures to the Administration.
- The Contractor is obliged to establish the laboratories in a way that fulfills the conditions specified in the "Regulation on Health and Safety Measures to be Taken in Workplace Buildings and Annexes."
- The Contractor is obliged to have and ensure the use of adequate Personal Protective Equipment in the laboratory to be established, in accordance with the "Regulation on the Use of Personal Protective Equipment in Workplaces."
- The deficiencies determined during the inspections to be made by the Administration in terms of Occupational Health and Safety shall be fulfilled immediately by the Contractor, and the works performed shall be submitted to the Administration.
- The Contractor is responsible for making the notifications of work accidents and occupational diseases that may occur to the Social Security Institution within the legal periods, and for submitting the necessary documents to the Administration showing that these notifications have been made, and the damage caused by the notifications not being made or being incomplete shall be collected from the contractor.

17. CONSULTANT SERVICE PROCUREMENT STATUS

It is essential to comply with the points specified in this specification and its annexes in the implementation of quality control activities. In works where project inspections will be carried out with the help of a consultant, all duties and responsibilities given to the building audit organization within the scope of this specification shall be carried out by the consultant company. The Administration has the right to inspect and intervene in all areas where both the Contractor and the consultant are responsible at any time. The definition of Administration under this heading refers to the Regional Directorates.

18. ANNEXES

- a. [Quality Control Activities Circular](#)
- b. [Quality Control Guide](#)
- c. [DSi Laboratories Test Unit Price List \(for the relevant year\)](#) (for the relevant year)
- d. [T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples](#)
- e. [F 0 16 00 52 Tested Material / Manufacturing Conformity Form](#)
- f. [F 0 16 00 55 DSi Laboratories Test Request Form](#)
- g. [F 0 16 00 56 Site Sample Taking Report](#)
- h. [F 0 16 00 57 Site Sample Logbook](#)
- i. [F 0 16 00 77 Finding/Notification Form \(for Administration/Consultant\)](#)
- j. [F 0 16 00 89 Quality Control Plan](#)



REPUBLIC OF TÜRKİYE
MINISTRY OF ENAGRICULTURE AND FORESTRY
DIRECTORATE GENERAL OF STATE HYDRAULIC WORKS

TECHNICAL RESEARCH AND QUALITY CONTROL DEPARTMENT

QUALITY CONTROL GUIDE



September 2020

ANKARA

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QUALITY CONTROL GUIDE

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Contents

DEFINITIONS.....	5
ABBREVIATIONS.....	5
1. INTRODUCTION.....	6
2. BUILDING MATERIALS REGULATIONS, CE AND G MARKING.....	7
3. QUALITY CONTROL UNITS.....	7
4. IMPLEMENTATION OF THE QUALITY CONTROL GUIDE	8
a) Study and Planning Stage.....	9
b) Project Stage.....	9
c) Procurement Stage.....	9
d) Construction Stage.....	9
e) Operation Stage.....	10
5. SENDING SAMPLES and PROCEDURES TO BE APPLIED	10
6. MATERIALS.....	11
Cements.....	11
All Cement types specified in TS EN 197-1 standard.....	11
Pozzolanic Binders/Mineral Admixtures.....	11
Fly Ash (FA).....	11
Silica Fume (SF)	11
Granulated Blast Furnace Slag	12
Natural Pozzolan (Trass).....	12
Bentonite.....	12
Concrete.....	12
Concrete Mix Design.....	12
Checking the Mix Calculation of Ready-Mix Concrete.....	13
Self-Compacting Concrete Design	13
Chemical Admixtures	13
Fresh Concrete.....	13
Hardened Concrete.....	14
Concrete Mixing Water.....	14
Concrete Contact Water	14
Concrete Curing Materials.....	14
Concrete Aggregate Tests	14
Filter Material.....	15
Rock.....	15
Concrete Paving Slabs (Concrete Tiles)	15
Concrete Curbs and Paving Stones.....	15
Bricks.....	16
Joint Filling Materials (Cold application).....	16
Metallic Materials.....	16
Concrete Steel Bars (Ribbed Reinforcement).....	16
Steel Profiles.....	17
Steel Meshes.....	17
Galvanized Wires.....	17
Steel Wires.....	18
Flat Steels.....	18

Copper Seal.....	18
Steel Strands (Anchorage).....	18
Steel Materials (Spectral Analysis).....	19
Geomembranes.....	19
HDPE and LLDPE Geomembrane.....	19
EPDM Geomembrane.....	20
PVC Geomembrane	20
Geotextiles.....	21
Geosynthetic Clay Liner.....	21
Polymer Modified Bitumen Sheets.....	21
Waterstop Seals.....	22
Rubber Seal.....	22
PVC Seal.....	22
Elastomer Seal.....	22
Thermoplastic Seal.....	23
Pipes.....	23
Polyethylene Pipes (HDPE Pipes).....	23
Glass Reinforced Plastic (GRP) Pipes	24
Drainage Pipes - Rigid PVC.....	24
Neoprene Bearings.....	24
Laminated Plates.....	25
Drinking and Utility Water Analyses.....	25
Soil Analyses.....	25
Chemical Analysis of Soil Samples.....	25
Foundation Soil investigation.....	26
Natural Construction Materials investigation.....	26
Material control during the soil manufacturing process.....	27
Compaction Control.....	27
Permeability and Settlement in Fill.....	30
Water Machines (Pump, Valve).....	30
Calibration Service.....	30
Hydraulic Model.....	30

DEFINITIONS

Unit Requesting Quality Control: The unit that will request the quality control and laboratory activities that need to be carried out according to the Quality Control Guide.

Unit Performing Quality Control: The unit that will request the quality control and laboratory activities that need to be carried out according to the Quality Control Guide.

ABBREVIATIONS

Abbreviation	Unit
BB	: Regional Dams Branch Directorate
BHİT	: Regional Basin Management, Monitoring and Allotments Branch Directorate
BET	: Regional Electromechanical Equipment Branch Directorate
BİB	: Regional Operation and Maintenance Branch Directorate
BİA	: Regional Drinking Water and Wastewater Branch Directorate
BJHY	: Regional Geotechnical Services and Soilwater Branch Directorate
BSM	: Regional Drilling Branch Directorate
BKK	: Regional Quality Control and Laboratory Branch Directorate
BMI	: Regional Machinery Manufacturing and Equipment Branch Directorate
BP	: Regional Planning Branch Directorate
BPI	: Regional Project and Construction Branch Directorate
SB	: Procurement Unit
EPD	: Department of Studies, Planning, and Allocations
ASD	: Department of Wastewater
İBD	: Department of Operation and Maintenance
İBM	: Relevant Regional Directorates
İDB	: Relevant Department
İSD	: Department of Drinking Water
JHY	: Department of Geotechnical Services and Soilwater
KT	: Control Organization
MİD	: Department of Machinery Manufacturing and Equipment
PİD	: Department of Project and Construction
ŞKK	: Site Quality Control Laboratory
TAKK	: Technical Research and Quality Control Department
PBL	: Pilot Regional Laboratory

1. INTRODUCTION

The Quality Control Guide has been prepared to guide the technical staff who will take part in the study, planning, project, and operation stages of DSI projects, as well as those who carry out the control services during the construction stage (building audit officers) or those who will make the necessary procurements related to the work, who are responsible for carrying out the necessary quality control studies in accordance with the definition below and on time, to fulfill their responsibilities.

In the Quality Control Guide, it is very clearly stated what, where, when, and by what methods the persons concerned will do the work under their responsibility to achieve the desired quality. In addition, since the Quality Control Laboratories established in DSI regional, site, and branch offices, the Pilot Regional Laboratories (PBL), and the Laboratories of the Technical Research and Quality Control Department (TAKK) are obliged to carry out or have carried out the studies specified in the prepared quality control guide, it will greatly facilitate the work of those working in control services, in particular.

It is important to obtain the desired quality that the authorized and relevant persons of the study, planning, project, operation, procurement, and construction units, and those who carry out the construction control services, and the authorized persons of the regional, site, and branch quality control units, carefully examine the quality control guide and plan and program their services in accordance with this guide and closely monitor the results.

The term "quality control" that is the subject of the guide refers to a series of studies that include all kinds of measurements and recording works, as well as timely and sufficient number of field and laboratory tests, to ensure and control that all kinds of engineering structures and their construction are carried out in accordance with technical rules and with the qualities described in the specifications (DSI internal or external) and standards, and if necessary, to carry out corrective, preventive, and improvement activities by analyzing the results obtained.

To be able to perform and/or have performed quality control, the following must be defined:

- a) What the quality control studies are,
- b) Which units will be the unit to request quality control and the unit to perform quality control,
- c) Where the laboratory services related to quality control can be obtained from,
- d) How often control should be performed at each stage, especially at the procurement, construction, and manufacturing stages,
- e) What the resources to be referred to in the execution of quality control activities (quality control methods, tests, relevant standards, and DSI internal and external technical specifications) are.

The Quality Control Guide was first prepared in 1982 to clarify the issues listed above and to ensure the unity of application by acting within the framework of the same procedures and principles in quality control studies at DSI. Care has been taken to ensure that the prepared guide covers the application methods envisaged in DSI projects and the materials used in the construction of the projects, in particular. In this framework, the quality control activities specified below are explained in the said guide:

- Concrete and concrete products, cement, mineral admixtures, natural stones, aggregate, chemical admixtures, and other similar materials,

- Metallic materials, geosynthetics, pipes, water-tight seals, and other building materials,
- Water analyses,
- Natural construction materials and fill manufacturing (compaction, water content, etc.),
- Water machine tests,
- Examination of hydraulic structure projects from the perspective of water engineering,
- Isotope hydrology.

The majority of the laboratory services required during quality control activities are provided by DSİ Laboratories.

DSİ laboratories (central and regional laboratories) are accredited by the Turkish Accreditation Agency (TÜRKAK) and serve as "accredited laboratories" according to the TS EN ISO/IEC 17025 Standard.

Information about the current accreditation status and accreditation scope of DSİ laboratories can be accessed from the official website of TÜRKAK (www.turkak.org.tr)

The Quality Control Guide is updated, taking into account the changes made in the standards that form the basis for quality control and the developments in quality control methods, in the period since its preparation in 1982.

2. BUILDING MATERIALS REGULATIONS, CE AND G MARKING

The building materials used in DSİ manufacturing must comply with the legal legislation, criteria, and regulations related to building materials published by the Ministry of Environment and Urbanization.

3. QUALITY CONTROL UNITS

In the subjects that fall under the duties, authorities, and responsibilities of the DSİ General Directorate, the necessary technical research and quality control activities and laboratory services are carried out by the units specified below, in accordance with the rules of science, technique, and economy:

1) In the urban areas, the Branch Directorates within the Technical Research and Quality Control Department (TAKK):

- 1) Hydraulic Model Laboratory Branch Directorate,
- 2) Technical Services Branch Directorate
- 3) Isotope Laboratory Branch Directorate
- 4) Concrete Laboratory Branch Directorate
- 5) Chemistry Laboratory Branch Directorate
- 6) Soil Mechanics Laboratory Branch Directorate,
- 7) Calibration Laboratory Branch Directorate
- 8) Strategy Development Branch Directorate
- 9) Building Materials Laboratory Branch Directorate
- 10) Water Soil Laboratory Branch Directorate

2) In the rural areas,

- 1) This is carried out by the Quality Control and Laboratory Branch Directorates within the Regional Directorates, as well as by branch and site laboratories.

Pilot Regional Laboratories (PBL) are regional laboratories established under the coordination of the TAKK Department to effectively submit test requests, taking into account their geographical locations.

4. IMPLEMENTATION OF THE QUALITY CONTROL GUIDE

To help the units that will request and perform quality control services carry out these services completely and correctly, the scope of the quality control activities of the TAKK Department and the Regional Quality Control and Laboratory Branch Directorates are given in Schedule 1.

The issues regarding the taking of samples of the materials used in DSI manufacturing and to be subjected to quality control, their quantity, transportation, preservation, preparation for testing, measures to be taken during the test process, storage, and disposal of samples are specified in the [Quality Control Circular, P7.3 Sample Taking Procedure, P7.4 Handling of Test or Calibration Items](#) and [T 0 16 00 01 "Instruction for Control, Acceptance, Preservation, and Disposal of Samples."](#) These documents are an integral part of the Quality Control Guide. The current versions of these documents can be accessed from the TAKK Department's website at <http://takk.dsi.gov.tr/kalite-kontrol-faaliyetleri>

Unless a contrary situation is specified in the contract and its annexes, the priority order of the laboratories where the quality control activities specified in the guide will be carried out is as follows:

1. Site Quality Control Laboratories (ŞKK) under the control of the Administration,
2. Regional Quality Control Laboratories (BKK),
3. Pilot Regional Laboratory (PBL)
4. Technical Research and Quality Control Department (TAKK),
5. Laboratories deemed appropriate by the Administration for tests that cannot be performed in Site and DSI Laboratories (preferably accredited laboratories),
6. Tender provisions in the works within the scope of the tender.

In the "Frequency of Quality Control" column that regulates the frequency of the quality control process in the guide, the procedures to be performed are carried out in accordance with the contract and its annexes. If there is no provision regarding the control frequency in the contract and its annexes, the control frequency instructions specified in this column are complied with in accordance with the technical requirements of the work.

In the guide, the control points are defined in Schedule 1. If any additional control point and frequency are defined in addition to the control points defined in the contract and its annexes of the said work, the quality control works are also applied as specified in the contract and its annexes.

In case the work is done by tender, the tests related to the quality control activities that fall within this scope are carried out by the Contractor in accordance with the provisions in Table 1, unless otherwise specified in the contract.

Activities that are outside the scope of services of DSI Laboratories or for technical reasons (the time taken to transfer the sample to the DSI Laboratory does not meet the standard requirements related to the preservation of the sample, the existence of an accredited laboratory closer in distance to the location where the work is carried out and the sample is taken for economic reasons etc.) are performed/had performed in an off-DSI accredited laboratory or, if an accredited laboratory is not available, in a traceable and/or authorized/approved laboratory by the relevant Ministry. Before these situations, the Administration makes the necessary evaluation and decision after the Contractor makes an application to the Administration and submits the records regarding the competence of the non-DSI laboratory from which he/she will receive service. The contractor acts in accordance

with the decision of the Administration.

To help with the use of the guide, an example application is given below.

EXAMPLE:

The studies related to quality control in the construction of a concrete-lined irrigation canal planned to be built within an irrigation project should be as follows.

a) Study and Planning Stage

At this stage, the Regional Basin Management, Monitoring and Allotments Branch Directorate (BHİT) and the Planning Branch Directorate are the "units to request quality control" responsible for the study and planning of the project.

The duties of the other units that will perform the quality control activities requested by these units are defined below.

- i) Soil investigations: It will be notified to the Regional Geotechnical Services and Soilwater Branch Directorate (BJHY), and BJHY will perform or have performed the tests on-site/in the laboratory.
- ii) Concrete manufacturing: BJHY will determine the planned aggregate material quarries and will have the necessary tests performed by the Regional Quality Control and Laboratory Branch Directorate (BKK) and/or TAKK in coordination.
- iii) Concrete mix and/or contact water: It will be notified to BJHY, and BJHY will have the necessary tests performed in BKK and/or TAKK in coordination.

b) Project Stage

At this stage, the follow-up of the project is carried out by the Regional Project and Construction Branch (BPI) according to the data specified in the reports prepared/had prepared by the Regional Basin Management, Monitoring and Allotments Branch Directorate (BHİT) and/or the Regional Planning Branch Directorate (BP).

c) Procurement Stage

At this stage, since only material procurement is in question, the unit to request quality control shall be;

- i) If the material is to be purchased in bulk for regional needs; the Regional Machinery Manufacturing and Equipment Branch Directorate (BİMİ),
- ii) If it is to be purchased for site needs, the Control Organization (KT).

The said responsible units will perform the quality control of the purchased material or will have it checked whether the material is in accordance with the specifications and relevant standards through the Regional Quality Control and Laboratory Branch Directorate (BKK).

d) Construction Stage

At this stage, the unit to request quality control is the Control Organization (KT). KT shall;

- i) Continuously have the cement, mineral admixture, aggregate, rock, chemical admixture, and mix and contact water controlled through the Site Quality Control Laboratory (ŞKK) or the Regional Quality Control and Laboratory Branch Directorate (BKK).
- ii) Have the concrete mix designs prepared in ŞKK, BKK, or TAKK, taking into account the environmental effect class.

- iii) Have the fresh concrete and hardened concrete tests performed during concrete pouring through ŞKK or BKK.
- iv) Have the tests related to the materials included in the scope of Building Materials (metallic materials, geosynthetics, pipes, water-tight seals, etc.) performed in BKK, Pilot Regional Laboratory (PBL), or TAKK in order of priority.

e) Operation Stage

At this stage, the unit to request quality control is the Regional Operation and Maintenance Branch Directorate (BİB). BİB shall;

- i) Continuously have the cement, aggregate, and mix and contact water controlled through the Site Quality Control Laboratory (ŞKK) or the Regional Quality Control and Laboratory Branch Directorate (BKK).
- ii) Have the concrete mix calculations performed in the Regional Quality Control and Laboratory Branch Directorate (BKK) or TAKK, according to the available facilities.
- iii) Have the fresh concrete and hardened concrete tests performed during concrete pouring through ŞKK or the Regional Quality Control and Laboratory Branch Directorate (BKK).
- iv) Have the tests related to the materials included in the scope of Building Materials (metallic materials, geosynthetics, pipes, water-tight seals, etc.) performed in BKK, Pilot Regional Laboratory (PBL), or TAKK in order of priority.

5. SENDING SAMPLES and PROCEDURES TO BE APPLIED

The principles regarding the taking, sending, control, acceptance, transportation, preservation, preparation for testing, measures to be taken during the test process, storage, and disposal of samples for the implementation of the activities included in the Quality Control Guide; shall be carried out within the scope of the conditions specified in the “P7.3 Sample Taking [Procedure](#) and P7.4 Handling of Test or Calibration Items Procedure” and “T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples.”

6. MATERIALS

Schedule 1 - Quality Control Schedule

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Cements												
1.1	All Cement types specified in TS EN 197-1 and Low-Heat Cement in TS EN 14216 and Boron-Activated Belite (BAB) Cement in TS 13353	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK PBL TAKK	BİB	BKK PBL TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 1 month before starting to be used, once, 3- During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	For all physical and chemical conformity tests TS EN 197-1, TS EN 197-2, TS EN 14216, TS 13353, Analyses with XRF and XRD
2	Pozzolanıic Binders/Mineral Admixtures												
2.1	Fly Ash (FA)	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 2 month before starting to be used, once, 3- During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS EN 450-1, TS EN 450-2 ASTM C 618,
2.2	Silica Fume (SF)	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 2 month before starting to be used, once, 3- During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS EN 13263-1+A1, TS EN 13263-2 ASTM C 1240

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
2.3	Granulated Blast Furnace Slag	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 2 month before starting to be used, once, 3- During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS EN 15167-1, TS EN 15167-2, ASTM C 989,
2.4	Natural Pozzolan (Trass)	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 2 month before starting to be used, once, 3- During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS 25 ASTM C 618,
3	Bentonite	BHİT BP BİA BJHY	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 1 month before, once, 3-During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS EN ISO 13500, TS EN ISO 17892-12
4	Concrete												
4.1	Concrete mix design	BB BPİ BİA BJHY	BKK TAKK	BB BPİ BİA	BKK TAKK	SB	BKK TAKK	KT	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting the construction, once, 2-Verification with one-to-one scale trial mixes under field conditions 3-In case of a change in the concrete or the properties of the mix components for any reason 4-In cases deemed necessary by KT and/or BKK	TS 802, TS EN 206, TS 13515, TS 13815, ACI 207.1R and ACI 207.5R

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.2	Checking the Mix Calculation of Ready-Mix Concrete					SB	BKK TAKK	KT BB BPI BIA	BKK TAKK	BİB	BKK TAKK	1-The controls of the mix calculation at least once per facility and per concrete class at least 1 month before starting construction 2-In case of a change in the concrete or the properties of the mix components for any reason 3-In cases deemed necessary by KT and/or BKK	TS EN 206, TS 13515, TS 802, ACI 211.1
4.3	Self-Compacting Concrete Design			BB BPI BIA	BKK TAKK	SB	BKK TAKK	KT	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting construction and quality control tests and mix calculations control for every 50 m3 during the construction process, once 2-Control of mix ratios in case of a change in the properties of the mix components for any reason 3-In cases deemed necessary by KT and/or BKK	TS EN 206, TS 13515, TS 802, ACI 237R, TS EN 12350-8, -9, -10, -11
4.4	Chemical admixtures					SB	BKK TAKK	KT BB BPI BIA BJHY	BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting construction and infrared analysis with FT-IR for conformity in each batch during the construction process, once 2-In case of a change in the properties and type of the admixture, the admixture conformity tests will be repeated 3-In cases deemed necessary by KT and/or BKK	TS EN 934-1, TS EN 934-2, TS EN 480-1, TS EN 480-6, TS EN 480-11
4.5	Fresh Concrete					SB	BKK TAKK	KT BB BPI BIA	BKK TAKK	BİB	BKK TAKK	1-Control of fresh concrete tests such as slump, unit volume weight and air content as well as concrete compressive strength, permeability and other hardened concrete tests at the frequency specified in the technical specification of the work or as specified in TS EN 206/TS 13515, and TS 13515 Annex B1 2-In cases deemed necessary by KT and/or BKK	TS EN 206, TS 13515 TS EN 12350-1, T 0 16 05 31, T 0 16 05 51 ASTM C172

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.6	Hardened concrete							KT BB BPI BIA	BKK TAKK	BIB	BKK TAKK	1-Control of at least 2 core sample compressive strength for a 30 m3 test location concrete volume for a 180 m3 test area in the same concrete class or at the frequency specified in the technical specification of the work 2-Permeability control and other tests for 100 m3 concrete volume for WR class impermeable concrete 2-In cases deemed necessary by KT and/or BKK	TS EN 13791, TS 13685, T O 16 05 52, TS 500, TS EN 206/TS 13515, TS EN 12504-1,2,3,4 ASTM C 39, ASTM C 42 TS EN 480-11 TS EN 12390 ASTM C1202
4.7	Concrete Mixing Water	BHIT BP BJHY BIA	BKK TAKK					KT	ŞKK BKK TAKK	BIB	BKK TAKK	1-At least 1 month before starting construction and once every 6 months	TS EN 1008, TS 3440
4.8	Concrete Contact Water	BHIT BP BJHY BIA	BKK TAKK					KT	ŞKK BKK TAKK	BIB	BKK TAKK	2-In case the water source changes, at least 1 month before the change and once every 6 months	
4.9	Concrete Curing Materials					SB	BKK TAKK	KT	ŞKK BKK TAKK	BIB	BKK TAKK	1-At least 2 months before starting to be used in construction, once, 2-When it is necessary to change the cement for any reason during construction, at least 1 month before, once, 3-During the construction process, in each batch or at least 4 times a year, 4- In cases deemed necessary by KT and/or BKK	TS 10966, TS 10967
4.10	Concrete Aggregate Tests	BHIT BP BIA	BKK TAKK	BB BPI BIA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BIB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-If the quarry needs to be changed for any reason, at least 2 months before the change 3-At the frequency specified in the Technical Specification for Concrete Works or the special technical specification of the work,	4-In cases deemed necessary by KT and/or BKK ASTM C33, TS 13516, TS 13517

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and Planning		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performin g quality control	Unit requesting quality control	Unit performi ng quality control	Unit requesting quality control	Unit performi ng quality control	Unit requesti ng quality control	Unit performi ng quality control	Unit requesting quality control	Unit performi ng quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	Filter Material	BHİT BP BİA	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK	SB	BKK TAKK	KT BJHY	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 3 months before starting to be used in construction, once, 2-If the quarry needs to be changed for any reason, at least 2 months before the change 3-At the frequency specified in the Technical Specification for Concrete Works or the special technical specification of the work 3-In cases deemed necessary by KT and/or BKK	TS EN 1367-1 ASTM C 117 ASTM C 88 ASTM C 136 ASTM C 131 ASTM D 422 ASTM D 2434 ISO/TS 17892-11 TS EN 12902 ASTM D 6938 USBR 7230
6	Rock	BHİT BP BİA	BKK TAKK	BB BPİ BİA BJHY	BKK TAKK			KT BJHY	ŞKK BKK PBL TAKK	BİB	BKK PBL TAKK	1-At least 3 months before starting to be used in construction or procurement, once, 2-All conformity tests once every 4 months during the construction process 3-If the quarry needs to be changed for any reason, at least 3 months before the change, once 4-At the intervals specified in the technical specification of the work 5-In cases deemed necessary by KT and/or BKK	TS 699, TS 10282, ASTM D5731, ASTM D5240 TS EN 12407
7	Concrete Paving Slabs (Concrete Tiles)					SB	BKK TAKK	KT	BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting procurement and all conformity tests once every 3 months during the construction process, once 2-At the intervals specified in the technical specification of the work 3-Once per batch 3-In cases deemed necessary by KT and/or BKK	TS 213-1 EN 13748-1 TS 213-2 EN 13748-2
8	Concrete Curbs and Paving Stones					SB	BKK TAKK	KT	BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting procurement and all conformity tests once every 3 months during the construction process, once 2-At the intervals specified in the technical specification of the work 3-Once per batch or once a year for each surface class 4-In cases deemed necessary by KT and/or BKK	TS 436 EN 1340, TS 2824 EN 1338 TS 699

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
9	Bricks					SB	BKK TAKK	KT	BKK TAKK	BiB	BKK TAKK	1-At least 2 months before starting procurement and all conformity tests once every 3 months during the construction process, once 2-At the intervals specified in the technical specification of the work 3-Once per batch or once for up to 3200 pieces 4-In cases deemed necessary by KT and/or BKK	TS EN 15037-3, TS 1260, TS 1261, TS EN 771-1+A1, TS EN 771-2+A1
10	Joint Filling Materials (Cold application)					SB	BKK TAKK	KT	BKK TAKK	BiB	BKK TAKK	1-At least 2 months before starting procurement and all conformity tests once every 3 months during the construction process, once 2-At the intervals specified in the technical specification of the work 3-Once per batch 4-In cases deemed necessary by KT and/or BKK	TS 5926 EN 14188-2
11	Metallic Materials												
11.1	Concrete Steel Bars (Ribbed Reinforcement)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 708 TS EN ISO 6892-1, TS EN ISO 15630-1

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
11.2	Steel Profiles					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BIB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 708, TS EN 10080, TS EN ISO 6892- 1
11.3	Steel Meshes					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BIB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 4559 TS EN ISO 15630- 2
11.4	Galvanized Wires					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BIB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 270, TS 5680

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
11.5	Steel Wires					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 270
11.6	Flat Steels					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 708, TS EN ISO 6892- 1
11.7	Copper Seal					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 6892-1, TS 708 TS EN 1652

11.8	Steel Strands (Anchorage)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BIB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 5680
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Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
11.9	Steel Materials (Spectral Analysis)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	-
12	Geomembranes												
12.1	HDPE and LLDPE Geomembrane					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 9863-1, TS EN 1849-2, TS EN ISO 527, TS EN 12236, TS ISO 34-1, TS EN 495-5, TS EN 12317-2, TS EN 12316-2, ASTM D5596, TS EN 1107-2, TS EN ISO 1183-1, TS ISO 6964, TS EN ISO 1133-1, TS EN ISO 11357-1 TS EN ISO 11357-6, TS EN ISO 11358-1, TS EN 12224, TS EN 14150, TS EN 14576, TS EN 13361, TS EN 13362

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
12.2	EPDM Geomembranes					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 9863-1, TS EN 1849-2, TS EN 12311-2, TS EN 12236, TS ISO 34-1, TS EN ISO 527 TS EN 495-5, TS EN 1928, TS EN 12317-2, TS EN 12316-2, TS EN 1107-2, TS EN ISO 1183-1, TS ISO 6964, TS EN ISO 11357-1, TS EN ISO 11358-1 TS EN 14150, TS EN 13361, TS EN 13362
12.3	PVC Geomembranes					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 9863-1, TS EN 1849-2, TS EN ISO 527, TS EN 12236, TS ISO 34-1, TS EN 12310-2, TS EN 495-5, TS EN 1928, TS EN 12317-2, TS EN 12316-2, TS EN 1107-2, TS EN ISO 1183-1, TS EN ISO 11357-1, TS EN ISO 11358-1, TS EN 12224, TS EN 14150, TS EN 13361, TS EN 13362

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	Geotextiles					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 9863-1, TS EN ISO 9864, TS EN ISO 10319, TS EN ISO 12236, TS EN ISO 13433, TS EN ISO 11058, TS EN 12224, TS EN 13719, TS EN ISO 10321, TS EN 13254, TS EN 13255
14	Geosynthetic Clay Liners					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 9863-1, TS EN ISO 14196, TS EN ISO 10319, TS EN ISO 12236, ASTM D6496, TS EN 13361, TS EN 13362
15	Polymer Modified Bitumen Sheets					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN 1849-1, TS EN 12311-1, TS EN 12236, TS EN 12310-1, TS EN 1109, TS EN 1928, TS 11758-1, TS 11758-1/T1, T2, TS EN 1107-1

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
16	Waterstop Seals												
16.1	CANCELLED Standards and tenders conducted according to these standards Rubber Seal (Compliant with TS 2810: 2007) PVC Seal (Compliant with TS 3078: 2007)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 2810, TS 4595 ISO 815, TS 3078
16.2	Elastomer Seal (Conforming to TS 2810-1, TS EN 2810-2)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 2810-1, TS 2810-2, TS ISO 37, TS ISO 7619-1, TS ISO 34-1

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
16.3	Thermoplastic Seal (Conforming to TS 3078-1, TS 3078-2)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 3078-1, TS 3078-2, TS EN ISO 3302-1, TS EN ISO 527-2, TS ISO 34-1
17	Pipes												
17.1	Polyethylene Pipes (HDPE Pipes)					SB	BKK PBL TAKK	KT	BKK PBL TAKK	BiB	BKK PBL TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN ISO 3126, TS EN ISO 6259-1, TS EN ISO 6259-3, TS ISO 18553, TS ISO 13953, TS EN ISO 11357-6, TS ISO 6964, TS EN ISO 1133-1, TS EN ISO 1183-1, TS EN 12099, TS EN ISO 2505, TS EN 12201-2, TS EN 1167-1, TS EN 1167-2

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
17.2	GRP Pipes					SB	BKK TAKK	KT	BKK TAKK	BiB	BKK TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS EN 1796, TS EN ISO 3126, TS ISO 8513, TS ISO 8521, TS ISO 7685, TS ISO 10466
17.3	Drainage Pipes - Rigid PVC					SB	BKK TAKK	KT	BKK TAKK	BiB	BKK TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	TS 9128
18	Neoprene Bearings					SB	BKK TAKK	KT	BKK TAKK	BiB	BKK TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples 4-In cases deemed necessary by KT and/or BKK	Highway Technical Specification TS ISO 813, TS ISO 37, TS ISO 48, TS EN ISO 6892-1, TS ISO 6446

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
19	Laminated Plates					SB	BKK TAKK	KT	BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting to be used in construction or procurement, 2-At the intervals specified in the technical specification of the work 3-In each batch shipment, in the numbers and quantities specified in Section 4.3 of the T 0 16 00 01 Instruction for Control, Acceptance, Preservation, and Disposal of Samples	TS 10764, TS EN ISO 527
20	Drinking and Utility Water Analyses	BHİT BP BİA BJHY	BKK TAKK	BHİT BB BPİ BİA BJHY	BKK TAKK			KT BJHY BİA	ŞKK BKK TAKK	BİB	BKK TAKK	1-At least 2 months before starting to be used in construction and procurement 2-At the intervals specified in the technical specification of the work	TS EN ISO 10523, TS 9748 EN 27888, TS EN ISO 7887, TS EN ISO 7027-1, TS EN ISO 7027-2 TS 4164 ISO 9297,TS 5095, TS 5095, TS 4474 ISO 6059,TS 8195 EN 1484, TS 4530, TS ISO 7890-3,TS 7526 EN 26777, STMD 2005 , TS EN ISO 10304-1, TS EN ISO 14911, EPA 200,8, TS 266, EPA 900, IAEA
21	Soil Analyses												
21.1	Chemical Analysis of Soil Samples	BHİT BP BİA BJHY	BKK TAKK	BHİT BB BPİ BİA BJHY	BKK TAKK			KT	ŞKK BKK TAKK	BİB	BKK TAKK	1-At the intervals specified in the technical specification of the work 2-In cases deemed necessary by KT and/or BKK	TS 3440, TS 6166, TS 6169, TS 8334, TS 8335, TS 8336, TS ISO 11048, TS 2517 TS 8332, TS ISO 10390, TS 6170

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
21.2	Foundation Soil investigation	BHIT BP BIA BJHY	BKK TAKK BJHY BSM	BB BPI BIA BJHY	BKK TAKK BJHY BSM			KT BB BPI BIA BJHY	BKK TAKK BJHY BSM			1-At the intervals specified in the technical specification of the work	TS EN 14688-1 TS EN 14688-2 TS 1900-1 TS EN ISO 17892-1 TS EN ISO 17892-2 TS EN ISO 17892-3 TS EN ISO 17892-4 TS EN ISO 17892-5 TS EN ISO 17892-6 TS EN ISO 17892-7 TS EN ISO 17892-8 TS EN ISO 17892-9 TS EN ISO 17892-10 TS EN ISO 17892-11 TS EN ISO 17892-12 TS 13745 TS 13851 TS 13878
21.3	Natural Construction Materials investigation	BHIT BP BIA BJHY	BKK TAKK BJHY BSM	BB BPI BIA BJHY	BKK TAKK BJHY BSM			KT BB BPI BIA BJHY	BKK TAKK BJHY BSM			1-If the quarry needs to be changed for any reason, at least 2 months before the change 2-At the intervals specified in the technical specification of the work 3-In cases deemed necessary by KT and/or BKK	TS 1900-1 TS EN 14688-1 TS EN 14688-2 TS EN ISO 22475-1 TS EN ISO 17892-1 TS EN ISO 17892-2 TS EN ISO 17892-3 TS EN ISO 17892-4 TS EN ISO 17892-5 TS EN ISO 17892-6 TS EN ISO 17892-7 TS EN ISO 17892-8 TS EN ISO 17892-9 TS EN ISO 17892-10 TS EN ISO 17892-11 TS EN ISO 17892-12 ASTM D2487 ASTM D698, ASTM D2216 ASTM D4318, ASTM D2166 ASTM D4254 ASTM D4253 ASTM D2434 TS 13745, TS 13851, TS 13878

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
21.4	Material control during the soil manufacturing process							KT BB BPi BiA BJHY	ŞKK BKK TAKK	BiB KT	ŞKK BKK TAKK	1-Gradation control of permeable and semi-permeable material at least once every 2,000 cubic meters. 2-Gradation control of filter material at least once every 1,000 cubic meters 3-Consistency limits control in impermeable material at least once every 10,000 cubic meters. 4-In cases deemed necessary by KT and/or BKK	TS 1900-1 TS EN ISO 17892-1 TS EN ISO 17892-2 TS EN ISO 17892-3 TS EN ISO 17892-4 TS EN ISO 17892-12 TS EN 14688-1 TS EN 14688-2 TS 13745 TS 13851 TS 13878
21.5	Compaction Control												
21.6	In embankment fills (Dam, pond, levee, weir, check dam, cofferdam, etc.)							KT	ŞKK BKK TAKK	BiB KT	ŞKK BKK TAKK	1-At the intervals specified in the contract and its annexes, 2-In compacted layers of impermeable, permeable and semi-permeable fills (in each zone) at least once or at least once every 1,000 cubic meters of each layer, 3-In rock fills smaller than 50,000 cubic meters, at least once during the manufacturing process. In rock fills larger than 50,000 cubic meters, at least once every 100,000 cubic meters in each zone 4-In rockfill dams with concrete facing, at least once every 50,000 cubic meters, 5-If the filter fill is less than 250 meters, at least once in each layer placement. If the filter fill is more than 250 meters, at least once every 250 meters. 6-In cases deemed necessary by KT and/or BKK	TS 1900-1 TS EN ISO 17892-1 TS 5744 TS 13759 TS 13872 TS 13785 TS 13873 TS 13874 TS 13875 TS 13745 TS 13851 TS 13878 ASTM D1556 / D1556M ASTM D2167 ASTM D2937 ASTM D4914 / D4914M ASTM D5030 / D5030M ASTM D5080 ASTM D6938 ASTM D7830/D7830M ASTM D5195 ASTM D4253 ASTM D4254 USBR 7221 USBR 7230 USBR 7240 USBR 7250

21.7	In Roller-Compacted Concrete (RCC) fills							KT	ŞKK BKK TAKK	BİB KT	ŞKK BKK TAKK	1) In dams with 100,000 m3 and larger RCC fills: -Fine and coarse aggregate particle size distribution control for every 2,000 m3 concrete. -Very fine material content control for every 1,000 m3 concrete -Aggregate moisture content every shift depending on climatic conditions -Fresh concrete mix consistency and density in the laboratory once every shift or when necessary, -In-situ density, unit weight, and moisture content once from each layer and/or for every 1000 m2 concrete placement from 4 different locations or according to the DSI-RCC specification -For compressive strength and split tensile strength, at least one set (12 cylinders) of standard cylinder samples will be taken for every 2,000 m3 of RCC poured in the first few days of RCC production. After analyzing the seven-day test results, the test intervals will be decided with Administration approval to take one set of standard cylinder samples for every shift or every 6,000 m3 of RCC poured. -For modulus of elasticity and permeability tests, once a month for 28, 90 and if necessary, 180 days. 2) In dams with 100,000 m3 and smaller RCC fills: -Fine and coarse aggregate particle size distribution control for every 1000 m3 concrete. -Very fine material content control for every 1,000 m3 concrete -Aggregate moisture content every shift depending on climatic conditions -Fresh concrete mix consistency and density in the laboratory once every shift or when necessary, -In-situ density, unit weight, and moisture content once for every 500 m2 concrete placement from 4 different locations or according to the DSI-RCC specification	TS 13653, ASTM C1040, ASTM C1170 or ASTM D 6938 as an alternative USBR 7230 ASTM C 39 ASTM C 496 ASTM C 469 TS 3455
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Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
												-Fresh concrete mix consistency and density in the laboratory twice a day or when necessary, -For compressive strength and split tensile strength, 7, 28 and 90-day cylinder samples, one set per 500 m3 of fill. -For modulus of elasticity and permeability tests, twice a month for 28, 90 and if necessary, 180 days.	
21.8	In Piped System Fills							KT	ŞKK BKK TAKK	BİB KT	ŞKK BKK TAKK	1-At the intervals specified in the contract and its annexes, 2-Daily production depending on the condition of the natural ground, separately in each stage of the bedding, right, left, bottom and top jacket fills: For GRP pipes: If it is less than 250 meters, at least once, if it is more than 250 meters, at least once for every 250 meters of production, For HDPE pipes: If it is less than 250 meters, at least once, if it is more than 250 meters, at least once for every 250 meters of production, 3-Gradation control specified in the technical specification of the work at least once every 1,000 meters 4-In cases deemed necessary by KT and/or BKK	TS 1900-1 ASTM D1556 / D1556M ASTM D2167 ASTM D2937 ASTM D4914 / D4914M ASTM D5030 / D5030M ASTM D5080 ASTM D6938 ASTM D7830/D7830M USBR 7221 USBR 7230 USBR 7240 USBR 7250 USBR 7205 TS 13745 TS 13851 TS 13878

Order no.	Name	Stages										Frequency of Quality Control	Product Standard or Resources to be Referred
		Study and		Project		Procurement		Construction		Operation			
		Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control	Unit requesting quality control	Unit performing quality control		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
21.9	Permeability and Settlement in Fill							KT	BKK TAKK			1-At the intervals specified in the contract and its annexes, 2-Permeability in fill, in permeable and semi-permeable material, at least once every 50,000 cubic meters 3-Settlement, in impermeable and semi-permeable material, at least once during the manufacturing process	ASTM D5126 TS 5744 EM 1110-2-2301 “Standpipe” Matsuo Akai
22	Water Machines (Pump, Valve)					BSM SB	BKK TAKK	KT BPi BB BiA BJHY	BKK TAKK	BiB BJHY	BKK TAKK	1-At the intervals specified in the contract and its annexes, 2-In cases deemed necessary by KT and/or BKK	TS EN ISO 9906 TS EN 14267 TS 11146 Article 5.3.5 TS 11146 Article 5.3.6 and TS EN 60034-1 Article 9.2 TS 11146 Article 5.3.3 TS EN 14268 TS EN 1074-4
23	Calibration Service					SB	BKK TAKK	KT	BKK TAKK	All Units	BKK TAKK SB	1-According to the Device List and Calibration Plan, 2-When the device undergoes repair that will affect the measurement values 3-When there is a deviation in the measurement values of the device	TS ISO 3455 TS EN ISO 7500-1, TS EN 12390-4, TS ISO 3310-1, 2, 3 TS EN 932-5 TS EN 933-3 DIN 862 VDI/VDE/ DGQ-2618 Blatt 11.1 VDI/VDE/ DGQ-2618 Blatt 9.1 DIN 878 Euramet /cg-17/v.02 Euramet /cg-18/v.04 Euramet /cg-20/v.03
24	Hydraulic Model			iDB BB BPi BiA	TAKK			iDB BB BPi BiA	TAKK	iDB BB BPi BiA	TAKK	1-When deemed necessary,	Laws of hydraulic similarity and models

DATE	
REVISION NO	

QUALITY CONTROL PLAN

SECTION 1

General Information

Information of the Institution

Institution Name	
Branch Name	

Information on the Work

Work Name	
Address	
Phone	
Fax	

Information of the Contractors

Name	
Address	
Tax Office	
Tax ID	
Phone	
Contractor Representative	
Contractor Representative Phone	
Fax No	
E-Mail	

DATE	
REVISION NO	

QUALITY CONTROL PLAN

SECTION 2

Quality Control Personnel

Construction Manager

Name & Surname	
Phone	
E-Mail	

Quality Control Engineer

Name & Surname	
Occupation	
Years of Service	
Phone	
E-Mail	

Quality Control Personnel

Laboratory technician 1		Laboratory technician 2	
Name & Surname		Name & Surname	
Training		Training	
Years of Service		Years of Service	
Phone		Phone	
E-Mail		E-Mail	
Lab Assistant 1		Lab Assistant 2	
Name & Surname		Name & Surname	
Training		Training	
Years of Service		Years of Service	
Phone		Phone	
E-Mail		E-Mail	

DATE	
REVISION NO	

QUALITY CONTROL PLAN

Section 3

Quality Control Infrastructure

1-Will a Site Laboratory be established?

If Yes;

Information about the Laboratory Building

Laboratory/ Subsidiary Building	Area (m ²)	Phone	Internet	Heating/C ooling	Air Conditioning	Description
Concrete Laboratory						
Soil Laboratory						
Curing Room						
Cement Laboratory						
Chemistry Laboratory						
Materials Laboratory						
Office Area						
Restroom/WC/Show- er, Locker Room and Wardrobe						
Dormitory (For when a resident Administration lab technician is needed, with its furnishings and wet areas)						
Storage						

If No;

Reason:

QUALITY CONTROL PLAN

DATE	
REVISION NO	

3- Material, Manufacturing, or Technical Report Information Requiring Quality Control Activities

Material, manufacturing or technical report requiring Quality Control Activity	Place of Use/ Manufacturing	Dimension (Diameter, Section etc.)	Quantity	Type	Conformity Assessment Reference (Specification, Standard, Contract, Project, etc.)	Sample taking frequency according to Contract, Specification or QCR	Test Location (\$KK, BKK,TAKK, Factory, other)	Place of supply for materials	Planned Total Number of Samples (Pieces)	Sample Time and Number			
										1. Three mont hs	2. Three mont hs	3. Three mont hs	4. Three mont hs
Cement	Spillway	-	30 tons	Cem I 42,5	TS EN 197-1	Once every three months	BKK	Factory/Dealer	4	1	1	1	1
Iron	Spillway Derivation	12 mm	20 tons	S420	TS 708 TS 3078	30 ton	BKK	TDG/Iskenderun	1	-	1	-	-
Seal Concrete Compressive	Tunnel	25/8	500 m	A		100 m	TAKK	Abed Ready-mixed concrete	5	3	-	2	-
Strength	Derivation	15*15*15	600 m3	C20/25 1	TS 12390-4	1 piece per 50 m3	\$KK	(Quilted Parts)	72	-	18	30	24
Compaction	Body No. 1	15 cm	300 cm	Quick Method	Project (Sheet no. BM-5	3 pieces for every 15 cm	\$KK	A-site	600	-	300	200	100
GRP Pipe	S1 Main Canal	Φ800 mm	1200 m	8 atu	DSI-GRP Technical Specification Project and GRP	1 piece per 50 pipes	Factory	Water-Boron	20	20	-	-	-
Compaction (GRP)	S1 Main Canal	30 cm	1200 m	Water exchange	Technical Specification	1 per 200 m	\$KK	Crushed Stone Stock Site	48	-	16	16	16

QUALITY CONTROL PLAN

ON BEHALF OF THE CONTRACTOR		ON BEHALF OF THE ADMINISTRATION	
Prepared by Contractor Representative ../.../...	Quality Control Engineer ../.../...	Approved by Quality Control and Laboratory Branch Manager ../.../...	Approved by Construction Supervision Officer ../.../...
Approved Regional Manager			