



NATIONAL QUALIFICATION

12UY0049-3

CONCRETOR

LEVEL 3

REVISION NO: 00

VOCATIONAL QUALIFICATION AUTHORITY

Ankara, 2012

PREFACE

This reference guide, namely National Qualification of Concretor (Level 3) was prepared in accordance with the provisions of the “Regulation on Vocational Qualifications, Testing and Certification” issued pursuant to the Vocational Qualifications Authority (VQA) Law no 5544.

Draft Qualification was prepared by Construction Employer’s Union (INTES) based upon cooperation protocol signed on December 8th, 2009. Opinions of relevant institutions and organizations on draft qualification were taken and assessed to make required arrangements and revisions on the qualification. The final draft was evaluated by the VQA’s **Construction Sector Committee**, which deemed it suitable. It was approved by the Board of Directors of the VQA through its decision no **2012/43** of **30 May 2012** and decided to be placed within the National Qualification Framework (NQF).

We would like to extend our gratitude to all people, organizations and institutions that have expressed their opinions and contributed to the preparation, examination and verification processes of the qualification. We would like to offer it to the service of all likely beneficiaries.

Vocational Qualification Authority

INTRODUCTION

The key criteria referred to in the national qualification preparation process, the relevant sector committees' review and the VQA's Board of Directors' approval processes are set in the Regulation on Vocational Qualification, Testing and Certification.

National qualification is defined by,

- a) Name and level of the qualification,
- b) Aim and rationale of the qualification,
- c) Vocational standard, Vocational standard units or qualification units which for the basis for the qualification,
- d) Training and experience criteria (form, content, duration etc) necessary for the qualification,
- e) Learning outcomes necessary to acquire the qualification,
- f) Assessment procedures and principles to be applicable to in the acquisition of the qualification, minimum testing materials and assessor criteria necessary for assessment,
- g) Validity of the qualification certificate, renewal conditions, supervision of the certificate holder if deemed necessary,
- h) Institution developing the qualification and Sector Committee verifying the Qualification.

National qualifications are built according to the relevant national Vocational standard if there is one or to the relevant international Vocational standard if there is none at the national level.

National qualifications are set in cooperation with the below bodies

- Formal and non-formal education and training institutions,
- Authorized Certification Bodies,
- Institutions having pre-applied for certification to the authority,
- Institutions having drawn up national Vocational standard,
- Vocational organizations.

12UY0049-3 CONCRETE WORKER NATIONAL QUALIFICATION		
1	NAME OF QUALIFICATION	Concrete Worker
2	REFERENCE CODE	12UY0049–3
3	LEVEL	3
4	INTERNATIONAL CLASSIFICATION CODE	ISCO 08: 7114
5	TYPE	-
6	CREDIT VALUE	-
7	A) DATE OF PUBLICATION	30/05/2012
	B) REVISION NO	
	C) REVISION DATE	-
8	AIM	<p>This National Vocational Standard is prepared for determination and certification of the qualifications of the concrete worker.</p> <p>The said National Vocational Standard is prepared for defining the knowledge, skills and actions the concrete work must have for taking the required measures according to the pre-casting preparations, weather conditions; carrying out the placing, compacting and surface leveling processes of fresh concrete in accordance with their technique; protecting and curing the concrete</p>
9 VOCATIONAL STANDARD(S) FORMING THE BASIS FOR THE QUALIFICATION		
		Concrete Worker (Level 3) National Vocational Standard - 12UMS0186 -3
10 REQUIREMENTS TO TAKE QUALIFICATION TEST		
		-
11 STRUCTURE OF QUALIFICATION		
11-a) Compulsory Units		
		12UY0049–3/A1 Occupational Health and Safety 12UY0049–3/A2 General Concrete Worker Operations
11-b) Elective Units		
		-
11-c) Alternatives for Grouping of Units and Additional Learning Outcomes		
		-
12 ASSESSMENT		
		The assessment and evaluation for the certification in accordance with the Concrete Worker (Level 3) National Vocational Standard shall be carried out in the testing and certification centers or workplaces where the required working conditions are fulfilled as theoretical and practice tests. The person may take the qualification units separately and it's also possible that all units are given at once upon request. Theoretical test consists of 4-alternative multiple-choice questions, true-false questions and "fill in the blanks" questions. However, the total number of true-false and "fill in the blanks" questions shall not exceed ¼ of the total number of questions.

13	VALIDITY OF CERTIFICATE	The validity period of the qualification certificate is 5 years beginning from the date of issue.
14	FREQUENCY OF SURVEILLANCE	Minimum one performance monitoring report is prepared within the validity period for determining that the certified person's qualification is continued.
15	ASSESSMENT METHODS TO BE FOLLOWED IN RENEWAL OF EXPIRED CERTIFICATES	The term of document is extended for 5 years when a case to cancel the document doesn't occur and there are no complaints regarding the said person during document validity date made to the related certification board; and the plaster board applier certifies that he has worked for a total of 18 months. The persons failing to certify that they work are subjected to the practice test and the certificates of succeeded candidates are extended for a period of 5 years. Theoretical and practical tests are performed after the expiry of extension time (10 years after the first test is performed).
16	QUALIFICATION DEVELOPMENT INSTITUTION(S)	INTES
17	SECTOR COMMITTEE TO VERIFY QUALIFICATION	Construction Sector Committee
18	DATE AND NUMBER OF APPROVAL BY VQA BOARD OF DIRECTORS	30/05/2012 – 2012/43

12UY0049-3/A1 OCCUPATIONAL HEALTH AND SAFETY QUALIFICATION ITEM

1	NAME OF QUALIFICATION UNIT	Occupational Health and Safety
2	REFERENCE CODE	12UY0049–3/A1
3	LEVEL	3
4	CREDIT VALUE	-
	A) DATE OF PUBLICATION	30/05/2012
5	B) REVISION NO	
	C) REVISION DATE	-
6	VOCATIONAL STANDARD(S) FORMING THE BASIS FOR THE QUALIFICATION	
	Concrete Worker (Level 3) National Vocational Standard - 12UMS0186 -3	
7	LEARNING OUTCOMES	
	<p>Learning Outcome 1: Takes the measures required for the Occupational Health and safety in accordance with the instructions given.</p> <p>Performance Criteria</p> <ul style="list-style-type: none"> 1.1: Lists the risk factors at the working site. 1.2: Uses necessary PPEs for Occupational Health and safety 1.3: Explains the actions to cause accidents and defects to cause problems. 1.4: Lists the tools, equipment and means of communication to be used in case of emergency. 1.5: Explains whether the working site is appropriate in terms of Occupational Health and safety or not. <p>Context:</p> <ul style="list-style-type: none"> 1.5: Gives information on how the work area must be in accordance with the instructions of the Employer or Vocational Safety Specialist and assesses the conformity of the provided environment. <p>Learning Outcome 2: Explains the environmental risks.</p> <p>Performance Criteria</p> <ul style="list-style-type: none"> 2.1: Explains the classification and segregation operations for recovery of recyclable materials. 2.2: Explains how to separate the hazardous and harmful wastes from the other materials in accordance with the instructions given. 2.3: Explains the storage conditions of the hazardous and harmful wastes in accordance with the instructions given. 	
8	ASSESSMENT	
	8 a) Theoretical Examination	
	<p>(T1) Written Test: A written test including multiple-choice test of minimum 5 questions, true-false questions and “fill in the blanks” questions shall be performed within the unit and the candidate shall succeed minimum % 60 of the test. Average period of time per question shall be estimated as 1.5 to 2 minutes. The test questions shall be designed to measure all learning outcomes and performance criteria stipulated to be measured within the scope of the whole theoretical test.</p>	

8 b) Performance based Examination

(P1) Performance Test: Time of performance based examination should be determined as 20-30 minutes, depending on the nature of application. Candidates should score at least 80% at the examination. All the performance criteria stipulated to be measured by the Practice Test (P1) should be measured for each candidate by the said test.

8 c) Other Assessment related conditions

To be succeeded in both the theoretical and practice tests is required.

A person who fails in any part of the test may take the part of the test he has failed, again within a year. In case he fails to exercise his right within a year, he must take the two tests again. Candidate who fails twice in any part of the test must be trained related to the parts/subjects s/he has failed.

9	QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANIZATIONS(S)	INTES
10	SECTOR COMMITTEE TO VERIFY QUALIFICATION UNIT	Construction Sector Committee
11	DATE AND NUMBER OF APPROVAL BY VQA BOARD OF DIRECTORS	30/05/2012 – 2012/43

ANNEXES**EK 12UY0049–3/A1–1: Information on Recommended Training to Earn a Qualification Unit**

It's recommended that a training program of minimum 24 hours and with the content of training defined below should be completed for earning this unit.

Content of Training:

- Necessary Occupational Health and safety information regarding with the occupation
- Importance of environmental considerations and potential environmental risks
- Storage and evaluation of wastes

12UY0049-3/A2 GENERAL CONCRETE WORKER OPERATIONS QUALIFICATION ITEM

1	NAME OF QUALIFICATION UNIT	General Concrete Worker Operations
2	REFERENCE CODE	12UY0049-3/A2
3	LEVEL	3
4	CREDIT VALUE	-
5	A) DATE OF PUBLICATION	30/05/2012
	B) REVISION NO	00
	C) REVISION DATE	-
6	VOCATIONAL STANDARD(S) FORMING THE BASIS FOR THE QUALIFICATION	
Concrete Worker (Level 3) National Vocational Standard - 12UMS0186 -3		
7	LEARNING OUTCOMES	

Learning Outcome 1: Makes the work organization.**Performance Criteria**

- 1.1: Prepares the work flow and work distribution related to the work he shall perform.
- 1.2: Determines the work's start up and end times.
- 1.3: Explains how to fulfill the quality requirements during the operations.

Learning Outcome 2: Controls the equipment.**Performance Criteria**

- 2.1: Controls the conformity of the concreting equipment to the work.
- 2.2: Controls the number, capacity and type of the vibrator he shall use.
- 2.3: Controls the quantity and conformity of surface leveling equipment to the work.
- 2.4: Gets the materials to be used in the curing and protection operations ready according to the weather conditions.
- 2.5: Carries out the cleaning and maintenance of the hand tools he shall use to be ready for use.
- 2.6: Determines the equipment to be used for concreting.

Learning Outcome 3: Carries out site control.**Performance Criteria**

- 3.1: Controls the location and specifications of the place to be concreted before concreting.
- 3.2: Organizes the team he shall work with.
- 3.3: Carries out the visual inspection of the moulds and reinforcements.
- 3.4: Ensures that the deficiencies observed during the control of mould and reinforcement are corrected.
- 3.5: Cleans the concreting site.
- 3.6: Waters the mould before concreting.
- 3.7: Takes the required measures for concreting according to the weather conditions.

Learning Outcome 4: Controls the dispatch list.**Performance Criteria**

- 4.1: Controls the conformity of the class and consistency (slump) of concrete ordered to the dispatch list.

Learning Outcome 5: Carries out the visual inspection of fresh concrete

Performance Criteria

- 5.1: Controls if concrete segregation is present.
- 5.2: Visually inspects the conformity of the concrete consistency class to the dispatch list.
- 5.3: Controls whether substances or materials non-conforming to the concrete are present in the concrete.

Learning Outcome 6: Moulds the fresh concrete.

Performance Criteria

- 6.1: Ensures that the concrete is cast to the appropriate locations.
- 6.2: Controls whether the concrete is mould without disturbing its uniformity in accordance with its standard.
- 6.3: Ensures that no inclined layers are formed during placing of concrete.
- 6.4: Ensures that the concrete is mould from a height to prevent grain-segregation of concrete.
- 6.5: Controls that concrete placing and compacting speeds are in conformity with each other.
- 6.6: Places the concrete so that no cold joints are present in the concrete.
- 6.7: Ensures that the concrete is cast as not to open the mould and shift the reinforcement.
- 6.8: Ensures that concrete is cast bottom-top by using additional pipe or hose in case of high elements.

Context:

6.2: Concrete standard stated in the related learning outcome: TS EN 206-1 Concrete- Section 1: Specification, Performance, Production and Conformity

Learning Outcome 7: Carries out molding of fresh concrete.

Performance Criteria

- 7.1: Uses the vibrator adequate for the structural component to be concreted.
- 7.2: Holds the vibrator vertical to the surface, not to contact with the reinforcement and mould for an adequate period of time.
- 7.3: Ensures that the concrete is not shifted horizontally by the vibrator's end.
- 7.4: Controls the sequence of thickness and layers for cast- in-situ fresh concrete.
- 7.5: Ensures that the vibrator transits minimum 10 cm between the layers to prevent formation of layers.
- 7.6: Takes care that the impact area of vibration points intersect.
- 7.7: Places the concrete by starting from the rock bottom in the inclined surfaces.
- 7.8: Takes care of not impairing the concrete's quality.

Learning Outcome 8: Carries out surface leveling.

Performance Criteria

- 8.1: Carries out finishing by using an appropriate template after concrete placing is finished.
- 8.2: Maintains the structural component's thickness in the project in the finishing process.
- 8.3: Completes the second finishing before the concrete is set.
- 8.4: Carries out surface finishing by using an appropriate finishing tool.

Learning Outcome 9: Cures the concrete during the process of hardening.**Performance Criteria**

- 9.1: Starts the curing operation by using the appropriate materials and taking the weather conditions into account after the final finishing.
- 9.2: Uses the curing procedure suitable for the structural component.
- 9.3: Explains the measures to be taken for completing the concrete's setting time under abnormal weather conditions.
- 9.4: Takes care of not disturbing the surface during the course of curing.

Context:

- 9.3: It's referred to the abnormal weather conditions and weather conditions in which the temperature is outside the range of + 5 and +35 degrees.

Learning Outcome 10: Cures the hardened concrete**Performance Criteria**

- 10.1: Cures the hardened concrete within a reasonable period of time by taking the type of concrete and weather conditions into account.
- 10.2: Explains whether the cure period shall be changed or not according to the weather conditions.

8	ASSESSMENT	
8 a) Theoretical Examination		
(T2) Written Test: A written test including multiple-choice test of minimum 20 questions, true-false questions and "fill in the blanks" questions shall be performed within the unit and the candidate shall succeed minimum % 60 of the test. Average period of time per question shall be estimated as 1.5 to 2 minutes. The test questions shall be designed to measure all learning outcomes and performance criteria stipulated to be measured within the scope of the whole theoretical test.		
8 b) Performance based Examination		
(P2) Performance Test: Time of performance based examination should be determined as 210-240 minutes, depending on the nature of application. Candidates should score at least 80% at the examination. In this unit, all the success criteria to be measured with the practice exam will be measured by this examination (P2).		
8 c) Other Assessment related conditions		
To be succeeded in both the theoretical and practice tests is required. A person who fails in any part of the test may take the part of the test he has failed, again within a year. In case he fails to exercise his right within a year, he must take the two tests again. Candidate who fails twice in any part of the test must be trained related to the parts/subjects s/he has failed.		
9	QUALIFICATION DEVELOPMENT INSTITUTION(S)/ORGANIZATIONS(S)	INTES
10	SECTOR COMMITTEE TO VERIFY QUALIFICATION UNIT	Construction Sector Committee
11	DATE AND NUMBER OF APPROVAL BY VQA BOARD OF DIRECTORS	30/05/2012 – 2012/43

ANNEXES

ANNEX 12UY0049-3/A2-1: Information on Recommended Training to Earn a Qualification Unit

It's recommended that a training program of minimum 112 hours and with the content of training defined below should be completed for earning this unit.

Content of Training:

- Introduction to concrete and concrete production
- General information on concrete mixture components
- Concrete's place and importance in the construction sector
- Concrete and types of concrete
- Concrete additives
- Determination of tools and equipment required for preparation before concreting
- Giving information on creating the work organization chart required by his occupation
- Controlling equipment and tools to be used in concreting
- Information required to be included in the dispatch list attached to trans-mixer of fresh concrete
- Visual inspection of fresh concrete
- Points to take into account in moulding of fresh concrete
- Moulding of fresh concrete and requirements
- Placing, compacting and finishing of fresh concrete
- Normal and abnormal weather conditions in concreting
- Maintenance of mould concrete according to the weather conditions
- Selection of curing by types of concrete
- Protection of concrete and measures to be taken during the hardening process according to the weather conditions
- Types of protection and maintenance of hardened concrete

ANNEXES

ANNEX 1: Qualification Items

12UY0049-3/A1 Occupational Health and Safety
12UY0049-3/A2 General Concrete Worker Operations

ANNEX 2: Terms, Symbols and Abbreviations

TERMS, SYMBOLS AND ABBREVIATIONS

SEGREGATION: Segregation of coarse grains constituting the concrete from fine grains,
CONCRETE COMPRESSIVE STRENGTH CLASS: Class of hardened concrete by compressive strength of 28 days,
CONCRETE CONSISTENCY CLASS: Class of fresh concrete's fluidity,
CONCRETE SETTING TIME: The period of concrete starting to be hardened,
REINFORCEMENT: Reinforced concrete steel prepared and placed according to the project,
FLOORING: Structural component comprising layer surfaces and transferring loads in the structures,
FREQUENCY: Number of vibrations of vibrator wave per unit of time,
HOMOGENEOUS: Distribution of materials forming the concrete having the same or close values/specifications,
ISCO: International Standard Classification of Occupations,
DISPATCH LIST: Document stating the list and quantity of material sent to the consumer by the seller,
ISG (WHS): Occupational Health & Safety,
CONSISTENCY: Appropriate fluidity for concrete processing under any circumstances, concreting the reinforcement and flowing without concrete adhesion,
BEAM: Structural component transferring the loads to vertical load bearers,
PERSONAL PROTECTIVE EQUIPMENT (PPE): All kinds of tools, instruments, appliances and devices which are worn, put on or hold by the worker and which protect the worker from one or more hazards arising from the work and effect the health and safety of the worker, and which are designed to suit such purpose,
COLUMN: Vertical load-bearing reinforced concrete component,
CURE: Fulfillment of time and humidity conditions for the concrete setting to ensure adequate concrete strength,
FINISHING: Finishing surface of fresh concrete,
SHEAR WALL: Reinforced concrete vertical load-bearing wall,
COLD JOINT: Joint or discontinuity occurring between two layers due to delay in application during concrete casting,
BOTTLE DIAMETER: Diameter of end part where vibration is actualized in the vibrator,
FOUNDATION: Load-bearing structural component safely transferring the loads from the components such as wall, shear and column to floor,
FRESH CONCRETE: Shapeable status of newly mixed concrete before hardening,
VIBRATOR: Electrical machine used for compacting cast-in-situ fresh concrete and less porous concrete with high resistance.

ANNEX 3: Ways of Horizontal and Vertical Progress At Occupation

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ANNEX 4(*): Assessor Criteria

Assessor should meet at least one of following criteria:

- Being academic in relevant field,
- Having worked at least 5 years as engineer or technician in the works involving relevant occupation,
- Having worked at least five years as technical teacher in the works involving relevant occupation or relevant vocational high schools,
- Having graduated from vocational high school and worked at least 10 years in the works involving relevant occupation.