



NATIONAL OCCUPATIONAL STANDARD

**CONCRETE WORKER
LEVEL 3**

REFERENCE CODE /12UMS0186-3

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Occupation:	CONCRETE WORKER
Level:	3¹
Reference Code:	12UMS0186-3
Prepared by:	The Turkish Employers Association of Construction Industries (INTES)
Verified by:	VQA Construction Sector Committee
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¹Occupational Qualification Level is determined as Level Three (3) in the octal (8) level matrix.

TERMS, SYMBOLS AND ABBREVIATIONS

SEGREGATION: Segregation of the coarse grains forming the concrete from the fine grains,

CONCRETE COMPRESSIVE STRENGTH CLASS: The class of hardened concrete as per 28 days of compressive strength,

CONCRETE CONSISTENCY CLASS: The class of consistency of fresh concrete,

INITIAL SETTING TIME OF CONCRETE: The time for the concrete starting to harden,

REINFORCEMENT: Reinforcement steel prepared and furnished according to the design,

FLOOR: The construction element forming the floor surfaces and transferring load in the buildings,

FREQUENCY: Number of vibrations of vibrator wave per unit of time,

HOMOGENEOUS: The distribution of materials constituting the concrete is the same or featuring equal values/characteristics at each point,

ISCO: International Standard Classification of Occupations,

BILL OF LADING: The document stating the list and quantity of materials sent to the consumer by the seller,

OHS: Occupational Health and Safety,

CONSISTENCY: The proper consistency to enable processing of concrete in any case, concrete coating around the reinforcement and concrete flowing without adherence,

BEAM: The construction element transferring the loads to the 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 element,

CURE: Providing for concrete maturing, satisfying time and humidity conditions after the concrete is casted for ensuring adequate strength of concrete,

SURFACE FINISH: Finishing fresh concrete surface,

SHEAR WALL: Reinforced concrete vertical load-bearing wall,

COLD JOINT: The joint or discontinuity formed between two layers due to delay in application during concrete casting,

BOTTLE DIAMETER: The diameter of connector section where vibration is actualized in the vibrator,

FRESH CONCRETE: Not hardened (not set) concrete,

FOUNDATION: Load-bearing construction element safely transferring the loads from the elements like wall, shear, column to the floor,

VIBRATOR: Electrical machine used for obtaining a concrete with less hollows and more strength by compacting the cast-in-place concrete.

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1. INTRODUCTION

National occupational standard titled Concrete Worker (Level 3) was issued by Turkish Construction Industry Employers Union (INTES) assigned as per the provisions of Vocational Qualifications Authority (VQA) Law No.5544 and "Bylaw on Drawing up National Occupational Standards" and "Regulation on the Establishment, Duties and Operation Procedures and Principles of the Sector Committees of Vocational Qualification Authority" introduced pursuant to the aforementioned Law.

National occupational standard titled Concrete Worker (Level 3) was assessed upon receiving the opinions of the related institutions and organizations in the sector, and approved by VQA Board of Directors upon examination of VQA Construction Sector Committee.

2. INTRODUCTION OF THE OCCUPATION

2.1. Definition of the Occupation

The Concrete Worker (Level 3), who takes measures regarding occupational health and safety and environment, carries out work organization relating his occupation, performs preparation works prior to concrete works, places fresh concrete, ensures smoothness of concrete surface, carries concrete curing, pouring, and compacting works in accordance with weather conditions, performs maintenance of tools and equipments used in the works, and takes part in necessary activities for the occupational development.

2.2. Place of the Occupation in International Classification System

ISCO 08: 7114 (Those working in concrete pouring, glazing, and related works)

2.3. Regulations on Health, Safety and Environment

Labor Law No. 4857

Social Security and General Health Insurance Law No.5510

By Law on Heavy and Dangerous Works; By Law on the Safety and Health Markings

By Law on the Health and Safety Conditions when using Business Equipment

Occupational Safety and Health Regulation

By Law on the Usage of Personal Protective Equipment in the Business Places

Furthermore, it is essential to comply with applicable laws, bylaws, and other legislation regarding occupational health, security, and environment and to carry out relevant risk analysis.

2.4. Regulation on Control of Solid Wastes

There is no other legislation on the occupation.

2.5. Trade Unions Law No. 2821

Working environment of Concrete Worker (Level 3) may be indoor, outdoor, humid, and dusty spaces. S/he may have to work at high and stand on for long time. S/he works in communication with her/his colleagues and relevant officials during process of work, depending on requirements of the work. There are risks of accident and getting injured during performance of works and these require being taken of measures regarding occupational health and security.

2.6. Other Requirements Regarding the Occupation

The Concrete Worker (Level 3) should work in accordance with specifications regarding scaffold and falsework, should not have acrophobia and should have the report of "employment and periodical inspection for those who will work in heavy and dangerous works"

3. OCCUPATIONAL PROFILE

3.1. Duties, Tasks and Performance Criteria

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
A	Performing work organization (to be continued)	A.1	To take measures towards occupational health and safety	A.1.1	Has knowledge about risk factors in the work environment
				A.1.2	Uses necessary PPEs for occupational health and safety
				A.1.3	Informs the authorized person regarding the troubles, which could constitute problems
				A.1.4	Avoids behaviors, which could cause accident, pays attention to and complies with measures
				A.1.5	Warns unauthorized people within and around working area, reports them to officials, and ensures them being warned off working area.
				A.1.6	Keeps ready first aid kit and fire extinguisher.
				A.1.7	Takes with the communication devices (wireless, telephone etc.)
				A.1.8	Does the necessary safety equipment control at the workplace according to the instructions of the work safety expert.
				A.1.9	Ensures keeping the work areas clean and tidy.
				A.1.10	Ensures that there is no one under the boom while handling end hose of the pump.
		A.2	To make work organization	A.2.1	Determines the program regarding the work.
				A.2.2	Makes task distribution to her / his co-workers.
				A.2.3	Determines the times to start and finish the work.

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
A	Performing work organization	A.3	To contribute decreasing of environmental risks	A.3.1	Does the necessary separation and classification for recycling of recyclable materials
				A.3.2	Separates dangerous and hazardous materials from other materials according to the instructions and ensures storages by taking necessary precautions.
		A.4	To apply technical procedures to ensure quality	A.4.1	Applies technical procedures to ensure quality according to the type of work
				A.4.2	Provides fulfillment of quality conditions during procedures.

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
B	Making preparation before concrete casting	B.1	To control conformity of and clean instruments and equipment	B.1.1	Controls and makes the casting equipment (hopper, dispenser and etc.) ready for use.
				B.1.2	Controls number, type and conformity of vibrators with the work.
				B.1.3	Controls number, type and conformity of finishing equipment with the work.
				B.1.4	Makes the material he shall use in the curing process according to the weather conditions ready for use.
				B.1.5	Cleans and maintains the hand tools he shall use, if required.
				B.1.6	Ensures that the equipment and materials to be used are supplied in the application environment.
		B.2	To make site control	B.2.1	Makes the general control of the site by considering the building's type and location before casting. Informs the situation to the authorized person in case of defect.
				B.2.2	Controls the number of team he shall work with and informs such number to the authority.
				Code	Inspects the type and location of reinforcements.
				B.2.4	Controls the shape, cleanliness, conformity and strength of moulds.
				B.2.5	Takes care that the concrete he shall use shall not be effected by bad weather conditions.

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
C	Placing the fresh concrete (To be continued)	C.1	To control bill of lading	C.1.1	Controls the concrete compressive strength class from the bill of lading delivered to the site.
				C.1.2	Controls the concrete consistency class from the bill of lading delivered to the site.
				C.1.3	Informs the non-conforming cases related to the bill of lading to the authority.
		C.2	To inspect fresh concrete	C.2.1	Controls whether there's segregation in the concrete or not.
				C.2.2	Controls the conformity of concrete consistency.
				C.2.3	Takes care that there are no inclusions (wood, mud, cobbles and etc.) in the concrete.
		C.3	To mould fresh concrete	C.3.1	Casts or ensures casting of concrete to the specified place or as close as possible.
				C.3.2	Moulds the concrete in layers and homogeneously in accordance with the standards.
				C.3.3	Takes care of not forming large piles and inclined layers during placement of concrete.
				C.3.4	Casts or ensures casting of the concrete into the mould at an appropriate height to prevent concrete segregation.
				C.3.5	Ensures that the rates of placement and compacting of concrete are compatible.
C.3.6	Ensures that concrete is placed without delay and stopping to prevent cold joint occurrence.				
C.3.7	Casts the concrete without disturbing the mould and reinforcement.				
C.3.8	Casts the concrete at high columns and shears by using additional pipe or hose as upwards.				

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
C	Placing the fresh concrete	C.4	To mould fresh concrete	C.4.1	Uses the bottle diameter as per the construction element to be casted concrete and vibrator with suitable frequency.
				C.4.2	Holds the vibrator perpendicular to the surface and follows up that the vibrator is hold in the concrete for an appropriate period of time.
				C.4.3	Take cares of not to contact the vibrator bottle with the reinforcement and mould during vibration.
				C.4.4	Ensures that the concrete is not carried horizontally by using the vibrator end.
				C.4.5	Casts the fresh concrete in its place in horizontal layers of suitable thicknesses.
				C.4.6	Prevents occurrence of cold joints by inserting the vibrator minimum 10 cm into the sublayer while the upper layer is vibrated.
				C.4.7	Takes care that the impact areas of points to be vibrated do not intersect.
				C.4.8	Places the concrete by starting from the lowest level on the inclined surfaces.
		C.5	To carry out surface finishing	C.5.1	Carries out the first surface finishing after the concrete placement is finished.
				C.5.2	Ensures that the slab thickness specified in the design is maintained while surface finishing.
C.5.3	Carries out the second surface finishing when the concrete consistency becomes suitable after the first surface finishing.				

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
D	Curing the concrete	D.1	To cure the hardened concrete	D.1.1	Starts curing by considering the type of concrete of which surface finishing is carried out and weather conditions.
				D.1.2	Uses the appropriate cure method (watering, coat, chemical, fog, steam and etc.) as per the type of construction element.
				D.1.3	Ensures that the concrete is continuously kept wet until the setting time of concrete at high temperatures is completed.
				D.1.4	Takes care of not deforming the surface while curing.
		D.2	To cure the hardened concrete	D.2.1	Cures the hardened concrete as soon as possible by considering the type of concrete and weather conditions.
				D.2.2	Takes required measures for continuity of curing as per the weather conditions.

Duties		Tasks		Performance Criteria	
Code	Name	Code	Name	Code	Description
E	Taking part in the occupational development activities	E.1	Performing studies on personal occupational development.	E.1.1	Participates in the trainings related to his occupation and keeps the certificates he obtains.
				E.1.2	Follows up the emerging technologies and developments related to his occupation.
				E.1.3	Shares his knowledge and experiences with his co-workers.

3.2. Tools, Appliances and Equipment Used

1. Frost protection materials
2. Trolley
3. Brush
4. Security Line Tape
5. Water level
6. Wet sack
7. Communication tools (radio set, telephone etc.)
8. First aid bag
9. Rope
10. Personal Protective Equipment (Working cloth, working shoes, gloves, helmet, gas mask, dust mask, protective google, safety belt, rope, etc.)
11. Curing equipment (stove, tube, heaters, etc.)
12. Shovel
13. Trowels
14. Floating rules
15. Measuring tape
16. Nylon
17. Water Hose
18. Water bucket
19. Bubble level
20. Rake
21. Vibrator
22. Crane basket
23. Insulating materials

3.3. Knowledge & Skills

1. Knowledge on emergency case
2. Knowledge on tools, apparatus and equipment
3. Basic first-aid knowledge
4. Knowledge on Concrete Consistency
5. Concrete control knowledge and skills
6. Knowledge and skill of placing the concrete into formwork
7. Knowledge on environmental protection methods
8. Ability of working in a team or an organization
9. Knowledge and skill of using hand tools
10. Manual skill
11. Hand-eye coordination skills
12. Communication skills
13. Dispatch list control skills
14. Knowledge on occupational health & safety
15. Knowledge on railway signs
16. Knowledge on the work site operation procedures

17. Curing knowledge and skills
18. Knowledge on materials
19. Distance and weight estimating skills
20. Knowledge on legal regulations regarding the occupation
21. Knowledge of vocational terms
22. Skill of learning and being able to share what s/he learned
23. Knowledge on measuring and control
24. Knowledge on standard materials
25. Knowledge on basic labour legislation
26. Basic formwork knowledge
27. Knowledge on basic mathematics
28. Knowledge on fire fighting techniques and use of fire-extinguisher
29. Knowledge and skills of surface preparing techniques
30. Skill of using the time well.

3.4. Attitudes and Behaviours

1. To be cold blooded and calm under emergency and stressful conditions
2. To inform superiors properly and in time
3. To establish coordination and synchronization with co-workers according to requirements of work performed
4. To use her/his time effectively and efficiently in accordance with work orders
5. To be sensitive to protection of environment
6. To adopt environmental, quality and OHS rules
7. To be open to change and to adapt to changing conditions
8. To be in harmony with the team
9. To follow-up and apply new developments and techniques regarding with her/his task
10. To take care of human relations
11. To have working discipline
12. To obey the working principles and procedures of the workplace
13. To pay attention to the usage of tools, appliances and equipments belonging to workplace
14. To be willingful to improve himself/herself
15. To ensure his/her own safety and safety of other people
16. To have professional ethics
17. To be planned and organized
18. To be sensitive to issues of risk and hazard factors
19. To take care of his/her own health
20. To know his/her responsibilities and to fulfill the same
21. To learn instructions and guides and to comply them meticulously
22. To be cautious
23. To give fast and right reaction in dangerous situation in his/her own movement area
24. Taking care of cleanness, tidiness, and order of workplace
25. To share information clearly, effectively at shift change
26. To inform concerned people about the defects which are not under his/her authority

4. TESTING, ASSESSMENT AND CERTIFICATION

Testing and assessment for certification with respect to national qualifications based on Concrete Worker (Level 3) Occupational Standard shall be held in written and/or oral forms, theoretically and practically, in testing and assessment centers where required conditions are met.

Testing and assessment method and practice principles shall be detailed with national qualifications to be drawn up pursuant to this occupational standard. Activities regarding testing, assessment and certification shall be conducted within the framework of Vocational Qualification Authority, Testing and Certification Regulation.

ANNEX: Institutions participated in the Occupational Standard Preparation Process

1. Professional Standards Team of Institution Preparing Professional Standard

H.Necati ERSOY,	İNTES - General Secretary
Dr. Aytekin AKAGÜN,	İNTES -Senior Civil Engineer
Aslı KARATEKİN,	İNTES-Statistician
Gülesen BAL,	İNTES-Operation
Sevil Buket ATAR,	İNTES-Civil Technician

2. Technical Work Group Members:

Ender Derin,	Akçansa Cement Industry and Trade Inc. – Civil Engineer
Mehmet Mutlu,	Nuh Beton -Senior Civil Engineer
Mert Akşit,	Turkish Union of Ready-Mixed Concrete (THBB) - Civil Engineer
Necati Akbaş,	İNTES MYM - Building Trainer

3. People, Institutions, and Organizations Asked for Opinion:

Ankara Chamber of Industry (ASO)
Ankara Chamber of Trade (ATO)
Bosphorus University school of Engineering, Department of Civil Engineering
Directorate General of State Hydraulic Works, Department of Project and Civil Works
Dokuz Eylül University, School of Engineering, Department of Civil Engineering
Gazi University school of Engineering, Department of Civil Engineering
Gazi University, School of Technical Education, Department of Building Education
HAK Trade Unions Confederation
Chamber of Civil Engineers, Ankara Branch
İNTES Members
Istanbul Technical University, School of Engineering, Department of Civil Engineering
Karadeniz (Blacksea) Technical University, School of Engineering, Department of Civil Engineering
Presidency of Small and Medium Scale Enterprises Developing and Supporting Administration
Foundation of Supporting Occupational Training and Small-Scale Industry
Middle East Technical University, School of Engineering, Department of Civil Engineering
Republic of Turkey Presidency of Housing Development Administration of Turkey
Republic of Turkey Ministry of Labour and Social Security, State Personnel Administration
Republic of Turkey Ministry of Environment and Urban Planning, Directorate General for Construction Affairs
Republic of Turkey Ministry of Labour and Social Security, Labor and Social Security Research and Training Center
Republic of Turkey Ministry of Labour and Social Security, General Directorate of Occupational Health and Safety
Republic of Turkey Ministry of Labour and Social Security, Social Security Institute, Department of Civil Works
Republic of Turkey Ministry of Labour and Social Security, Turkish Labor Institute, Labor Compliance Administration
Republic of Turkey Ministry of Education, Directorate General of Occupational and Technical Education
Republic of Turkey Ministry of Education Directorate General of Life-Long Learning
Republic of Turkey Ministry of Education, Directorate General of Innovation and Educational Technologies
Turkish Accreditation Agency

Union of Chambers of Turkish Engineers and Architects (TMMOB)
Confederation of Revolutionary Trade Unions of Turkey (DISK)
Confederation of Turkish Tradesmen and Craftsmen (TESK)
Turkish Employers Association of Construction Industries (INTES)
Construction and Installation Workers Training Foundation of Turkey
Confederation of Turkish Trade Unions (TURK-IS)
Turkish Confederation of Employer Associations- The Turkish Contractors Association
Turkish Union of Chambers and Exchange Commodities (TOBB)
Turkish Public Sector
Turkish Employers Association of Construction Industries (INTES)
Turkish Union of Highway, Construction, and Civil Workers
Yıldız Technical University, School of Engineering, Department of Civil Engineering
Board of Higher Education

4. Sector Committee Members and Experts

Mustafa DEMİR,	President	Turkish Confederation of Employer Associations
Ekrem DİRİER,	Vice President	Ministry of National Education
Ahmet Emin YİĞİT,	Member	Ministry of Environment and Urban Planning
Kemal AYDOĞAN,	Member	Ministry of Labor and Social Security
Abdülkadir YILMAZ,	Member	Ministry of Communication
Not determined, yet,	Member	Board of Higher Education (YOK)
H.Necati ERSOY,	Member	Turkish Union of Chambers and Exchange Commodities (TOBB)
Mustafa ARSLAN,	Member	Confederation of Turkish Tradesmen and Craftsmen (TESK)
Hacı ÜSTÜNDAL,	Member	HAK Trade Unions Confederation
Aylin RAMANLI,	Member	Occupational Qualification Authority
Firuzan SİLAHŞÖR,	Department Head	Occupational Qualification Authority
Sinan GERGİN,	Sector Committee	Prime Ministry Department of the Administration of the Disabled and Elder Services

5. Executive Board

Bayram AKBAŞ,	President	Representative of Ministry of Labour and Social Security
Prof. Dr. Oğuz BORAT,	Vice President	Representative of Ministry of National Education
Assoc. Pr.Dr. Ömer AÇIKGÖZ,	Member	Representative Board of Higher Education
Prof. Dr. Yücel ALTUNBAŞAK,	Member	Representative of Professional Organizations
Dr. Osman YILDIZ,	Member	Representative of Confederation of Turkish Trade Unions
Celal KOLOĞLU,	Member	Representative of Turkish Confederation of Employer Associations