



NATIONAL OCCUPATIONAL STANDARD

**RAILROAD CONSTRUCTION MAINTENANCE AND REPAIR
MACHINE OPERATOR
LEVEL 3**

REFERENCE CODE /12UMS0278-3

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Occupation:	RAILROAD CONSTRUCTION MAINTENANCE AND REPAIR UNIT OPERATOR
Level:	3¹
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¹ Occupational Qualification Level is determined as Level Three (3) in the octal (8) level matrix.

TERMS, SYMBOLS AND ABBREVIATIONS

WAVY WOODEN WEDGE: Wood dowel to be used for fixing of sleeper-screw into the concrete sleeper

ANTI-CREEP WEDGE: The material connected to the rail to prevent longitudinal movement of rails

COUPLING MATERIAL: materials which secure a highly stabilized frame by coupling rail bars with each other and sleepers; facilitate power transmission between rails and sleepers; prevent rail deformation and displacement; damp the impacts on superstructure via elastic transformations,

BALLAST PROFILE: shape of ballast on railroad section, with predefined dimensions,

BALLAST: sharp-edged and sharp-angled hard and rough stones crushed to approximately 20-63 mm size which spread out and transmit all impacts delivered from sleepers to platform by means of friction between fines without causing any permanent collapses,

BOLT: Bolt to connect railway superstructure elements

HUMAN-POWERED RAIL CAR: Mechanical vehicle that can be moved on rails by power of workers, by using motor power to remove and install bolts

TAMPERING: Pressing the ballast which already exists on the track, beneath the sleepers in order to provide its functionality to be a suitable bearing for sleepers,

SCREW: grooved, sharp steel tool to open hole on the wooden sleeper,

FISHPLATE: Plate to connect the rail ends together,

GASKET: Joint to connect two rails together,

FRAME (PANEL): one-rail bar long section of the superstructure where rail sleeper and coupling materials are already installed,

REMOVAL SCREW: Grooved, sharp steel tool, used to remove the wavy wedge.

DEBUSHING: The gap under the bridge

RAILWAY: A pair of rails and whole facilities composing the rails on which series of tractive and hauled vehicles move,

RESISTANCE SHEET: metal plate mounted into the sleepers to increase the lateral resistance of the railway,

BACKFILL (EMBANKMENT): Building infrastructure which is obtained by filling and pressing places where black level is lower than red level, in order to create a platform on railway route,

RAIL CLEARANCE: horizontal gap between inner sides of rail head between two laid rail bars of a rail line

DRILL: angular irregularity between sleeper's axis and railroad axis,

FB WAGON: Wagon designed to carry ballast,

EXPANSION SEAL: Special application in order to absorb expansion and contraction of bridge and rails caused by temperature difference,

SPIRAL DOWEL: Spiral-shaped aluminum dowel used to fill the gap created by the sleeper screw on which wooden sleepers is connected,

LEVEL CROSSING: the section where railroad and highway cross each other at the same level,

ISCO: International Standard Classification of Occupations,

EXPANSION: expansion gap left between the two rails,

ISG (WHS): Occupational Health & Safety,

WORK CAR: Derrick car moving on the rail acting for transferring workers and materials,

SIGNAL: All audio and visual signals of which meanings are predetermined and which are used for safe and sound regulation of traffic,

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,

LEVEL: height according to a fixed base point,

BRIDGE: Structures built to pass rivers, road, railway or similar barriers,

SWITCH: Railway facility providing railway cars to pass from one rail to another,

CULVERT: hydraulic engineering structures which allow small streams either flowing continuously or after precipitations, pass from one side of track to the other,

RAIL HOOK: Slice bar used to carry or to lift the rail,

TRACK: specially profiled track superstructure component which provides an uninterrupted and smooth surface for vehicle wheels to roll and transmits load coming from wheels to culvert units,

RISK: Possibility of loss, injury or other unfavorable consequences that may occur due to dangers,

BASEPLATE: the plate on which rail connecting elements are fixed in order to provide connection between the rail and sleepers or concrete floor.

SUBBALLAST (SUB- BALLAST / BALLAST CUSHION / BASE): crushed stone material to lay under the ballast layer in breadth of platform to meet different demands of superstructure.

SLOPE: Inclined surfaces formed on the sides of the infrastructure, made after filling and cutting work on the land to pass railroad,

CREEPING: Uncontrolled creeping of rails on sleepers,

DANGER: Potential of damage or injury likely to affect the worker or work place and likely to exist in the workplace or to be caused externally,

PRECIPITATION: All kinds of impurities such as sand, gravel, sillage accumulated with flood on railway facilities,

SLEEPERS-SCREW: Rail and sleeper connection element,

TIREFONNEUSE: Mechanical vehicle, that can be moved on rails by power of workers, by using motor power to remove and install sleeper screws,

SLEEPERS HOLE: To open new hole with wooden sleeper screw

SLEEPERS: cross beams laid as embedded into the ballast layer on vertical direction to track axis with certain clearances which function as culverts for rails,

THIRD RAIL: The power rail transmitting the electric power used in the railroad cars to the vehicle over current collector,

RAILWAY CAR (HAULED VEHICLE): Kendi tahrik gücü bulunmayan, bir cer aracı tarafından çekilerek veya itilerek hareket ettirilen, üzerinde yük veya yolcu taşımaya elverişli raylı sistem aracını,

VAGONETA: Simple railway vehicle, that can be moved on rails by power of workers, designed to carry material,

FORK: Tool to separate impurities from the ballast mixed into the ballast such as soil on the railway,

CLEAVAGE: building infrastructure obtained by opening higher places through cleaving to create a platform on railway route,

RAILROAD UNITS: units which are integrated parts of engineering structures such as bridge, culvert; and railroad such as rail switch, level crossing and water channel

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1. INTRODUCTION

National occupational standards on railroad construction, maintenance and repair machine operator (level 3) was issued by Foundation of Turkish Railways Development and Cooperation & Solidarity with Turkish Railways Personnel assigned by Vocational Qualifications Agency in accordance with provisions of “Directive on Drawing National Occupational Standards” and “Directive on Procedures and Fundamentals of establishment, assignment and works of Committees under Vocational Qualifications Agency” published pursuant to 5544 numbered Law on Vocational Qualifications Agency and mentioned law.

Railway Construction, Maintenance and Repair Machine Operator (level 3) National Vocational Standard 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 the VQA Transportation, Logistics and Communication Sector Committee.

2. INTRODUCTION OF THE OCCUPATION

2.1. Definition of the Occupation

The Rail Road Construction, Maintainer and Repairer (Level 3), is a person who does repair, maintenance and conservation work within the framework of the rules of OHS, environmental protection, quality rules and methods in the construction of railway, renewal of old railways, facilities of railways within a certain time alone or with a team.

The Rail Road Construction, Maintainer and Repairer (Level 3), is responsible for the correctness, timing and quality of works of control, maintenance, repair he does under supervision. In the performance of works, s/he works in accordance with the work instructions and informs the failures and defects outside his area of responsibility to the relevant persons in charge. Ensure his own safety and contribute to the safety of other people who work together in the Rail Road Construction, are under responsibilities of The Rail Road Construction, Maintainer and Repairer (Level 3).

2.2. Place of the Occupation in International Classification System

ISCO 08: 7119 (Başka yerde sınıflandırılmamış kaba inşaat ve ilgili işlerde çalışan sanatkarlar)

2.3. Regulations on Health, Safety and Environment

Labor Law No. 4857

Social Security and General Health Insurance Law No.5510

Law No. 6331 on Occupational Health and Security

Bylaw on Control of Packaging Wastes

Bylaw on the Control of Waste Oils

Bylaw on the General Principles of Waste Management

By Law on the Principles and Procedures of Occupational Health and Safety Trainings of Employees

By Law on the Authorities, Tasks, and Responsibilities of Scientists Relating to Electricity

Bylaw on Heavy Current Electrical Installations

Bylaw on the Works of Carrying by Hand

By Law on the Environmental Noise

By Law on the Safety and Health Markings

By Law on Preparation, Completion and Cleaning Works

By Law on the Health and Safety Conditions when Working with Business Equipment

By Law on the Health and Safety Measures to be Taken in Business Place Buildings and Extensions

Bylaw on the Control of Solid Wastes

By Law on the Safety and Health Measures in the Works with Chemical Substances

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

Bylaw on Safety of Machinery (2006/42/EC)

By Law on the Protection of Employees from Dangers Caused by Explosive Environments

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. Other Legislation Related to the Occupation

Decree Law Concerning Regulation of State Economic Enterprises Personnel System Law No. 399 and Repealing Some Articles of Decree Law No. 233
Government Labor Unions and Collective Bargaining Law No. 4688
Law numbered 6356 on Trade Unions and Collective Bargaining Agreements
Public servants Law No. 657
Bylaw on Traffic Signs

Furthermore, it is essential to obey other legislation regarding the occupation.

2.5. Working Environment and Conditions

Demiryolu Yol Yapım, Bakım ve Onarımcısının (Seviye 3), çalışma ortamından ve koşullarından kaynaklanan meslek hastalıkları riski bulunmaktadır. Since almost all of his duties are performed under outdoor field conditions, it is likely to be exposed to cold or hot weather conditions. It is a profession that requires high concentration so a high sensitivity and care must be given to observance of OHS rules without any exception. Since the operations are related with train traffic, it can be said that he might work any hour of the day and even on holidays and working hours might exceed his routine working hours.

2.6. Other Requirements Regarding the Occupation

Railroad construction, maintenance and repair unit operator (level 3) must have health report and psycho technical report indicating that his physical competence is fully meeting requirements of his assignment.

3. OCCUPATIONAL PROFILE

3.1. Duties, Tasks and Performance Criteria

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
A	Applying occupational health and safety, fire and emergency rules	A.1	To apply legal and workplace rules regarding occupational health and safety.	A.1.1	Gets information from OHS official regarding regulations and directives on OHS.
				A.1.2	Informs authorities about deficiencies in workplace regarding first aid and emergency response materials and equipment.
				A.1.3	Wears appropriate working clothes provided by employer and uses personal protective equipment.
				A.1.4	Places warning signs and boards regarding the operation done, in accordance with the instructions and thus contributes to ensuring safety of work place and other workers during the operations.
		A.2	To mitigate risk factors	A.2.1	Contributes to the activities related to determination of risks.
				A.2.2	Reports the available or potential risk factors he faces during the performance of work to the authorities.
				A.2.3	Participates in the activities for decreasing risk factors.
		A.3	To apply emergency procedures in case of emergency.	A.3.1	Contributes to works of taking measures for the purpose of determining and immediately eliminating dangerous situations.
				A.3.2	Informs relevant people about dangerous situations which are not possible to eliminate immediately.
				A.3.4	Carries out the works described in the emergency procedure.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
B	Applying environmental protection legislation	B.1	To determine environmental hazards	B.1.1	Contributes to evaluation of environmental impacts and potential dangers in connection with operations done
				B.1.2	Attends in periodical trainings regarding environmental protection requirements and applications.
				B.1.3	Contributes to studies on elimination of given environmental danger sources and risk factors
		B.2	To apply environmental protection measures	B.2.1	Takes measures against the environmental impacts to occur during the performance of work processes according to the directives.
				B.2.2	Takes measures related to safe and healthy operation of device, equipment and tools used against negative environmental impacts to occur.
				B.2.3	Uses operating assets like available energy, consumables, time in the work processes economically and productively.
C	Working in accordance with the quality management system regulations.	C.1	To control quality of works performed.	C.1.1	Carries out the corporation's quality assurance rules and procedures according to the instructions included in the transaction forms.
				C.1.2	Checks conformity of operations done with standards.
				C.1.3	Fills in the quality management system forms related to the work.
		C.2	To participate in the activities related to prevention of failures and defects detected during the processes.	C.2.1	Inform the failures and defects detected during the works to the superior/related authorized person.
				C.2.2	Participates to inspections and assessments regarding detection of reasons caused fault and failures within the scope of his assigned duties.
				C.2.3	Submits her/his and her/his team's observations, ideas and suggestions for improvement of work processes and elimination of faults to the relevant authority in accordance with the corporation's rules and procedures.
				C.2.4	Applies company's rules and procedures related to the failure and defect repairs.
				C.2.5	Inform the failures and defects outside his authority or he fails to repair to the related authorized person.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
D	Making preparations prior to work	D.1	To make personal preparations	D.1.1	Makes his self-care and cleaning
				D.1.2	Is present in the workplace at the time stated in the work legislation before the work starts.
				D.1.3	Makes required process for check documents regarding his status of attendance
				D.1.4	Wears overalls appropriate to the working rules of workplace and puts identification symbol and marks on his overalls and wears PPEs.
		D.2	To accept work	D.2.1	Takes work schedule
				D.2.2	Gets information from the person who delivers him an ongoing operation if it is an ongoing operation
		D.3	To investigate the work area	D.3.1	Inspects conformity of workplace to the task.
				D.3.2	Contributes to the improvement of the negative aspects of the work area.
		D.4	To prepare the equipment and material he shall use for work	D.4.1	Chooses the equipment and material in accordance with instructions given.
				D.4.2	Makes the equipment and material available for work.
				D.4.3	Repairs faults and defects of the defective equipment and material under his/her authority.
				D.4.4	Informs relevant persons for replacement and repair of defective equipment and tools.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
E	Making new railway superstructures (to be continued)	E.1	To ballast	E.1.1	Cleans foreign materials such as stone, root, etc. on the platform and prepares the platform for first layer of ballasting.
				E.1.2	Opens wagon covers as specified in the instructions and ensures being unloaded of ballast onto platform in ballasting operation made by means of ballast car.
				E.1.3	Throws the ballasts slipping out of ballasting profile and falling out of platform into ballasting profile by using tools such as shovel during ballasting onto platform.
		E.2	To floor traverses	E.2.1	Marks the places where traverse will be laid onto ballast in accordance with instructions given.
				E.2.2	Levels the irregularities on the surface of ballast according to determined elevation in order to ensure the smoothness of the contact surface of sleepers.
				E.2.3	Controls sleepers by visual inspection for cracks, deflection
				E.2.4	Places the sleepers to the marked points by using appropriate tools together with other workers in team.
				E.2.5	Levels the sleepers perpendicular to the axis of the road and parallel to each other by using a lever.
				E.2.6	Controls the intervals of the sleepers to the criteria specified in the instructions, levels the intervals, which are not in their measure by using a lever.
		E.3	To place rails	E.3.1	Controls the baseplate and shoulders, to be put on sleepers of rails, inspects cracks, foreign objects visually.
				E.3.2	Controls visually of the baseplate on layer of baseplate and the robustness.
				E.3.3	Removes impurities on the baseplate, hindering the smoothness of the contact surface of rail baseplate.
				E.3.4	Puts the rails together with other workers in the team to sit correctly to the baseplates by using appropriate tools according to the work methods.
				E.3.5	Aligns the end of parallel rails together with other workers in the team by using appropriate tools according to the work methods.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
E	Making new railway superstructure	E.4	To make track-traverse / support connection (to create frames)	E.4.1	Selects appropriate connection materials according to types of materials in order to connect the rail to the sleepers/bracket.
				E.4.2	Selects appropriate tools such as power wrench/bolt motor or power wrench/ bolt wrench to make the connection.
				E.4.3	Mounts according to the work order together with other workers in the team by using appropriate tools according to work methods
				E.4.4	Tightens the connection material with the power wrench/bolt motor or power wrench/ bolt wrench adjusted to the determined power.
				E.4.5	Controls visually the tightness of the connections.
				E.4.6	Enerjinin üçüncü raydan temin edildiği hatlarda, üçüncü ray ve ilgili birleştirme ekipmanlarının montajını yapar.
		E.5	To bind frames to each other	E.5.1	Moves the rail frame laterally and horizontally and brings the ends of rail on the same row of both frame together with other workers in the team by using appropriate tools.
				E.5.2	Leaves gaps between two rails in the same line according to the measures given in the instructions.
				E.5.3	Drills the rails in the marked places according to the instructions by using rail drilling motor.
				E.5.4	Selects fishplate, fishplate bolts and bolts and rondelas according to the catalogue of rail types.
				E.5.5	Connects the fishplates by putting into and outside the rails as to put the holes corresponding to each other.
				E.5.6	Controls the tightness of the connection visually.
		E.6	To make line affixed on concrete	E.5.7	Mounts the expansion element in place of connection of two rails, on which project an expansion joint (dilatation work) is stated.
				E.6.1	Places the superstructure frame, prepared previously according to the geometry of the road.
				E.6.2	Makes the connection of the superstructure frame, which is put to its place with other frames.
E.6.3	Tightens the loose connection materials on the frame using the motor power adjusted for this material.				
E.6.4	Adjust the upper level of the rail according to the instructions, appropriate to the project.				
E.6.5	Mounts the supporting or damping plastic or rubber type material under and/or next to the rail.				

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
F	Making railway maintenance & repair (To be continued)	F.1	To repair vertical geometric faults of track	F.1.1	Opens the ballast under the lower sleepers as to let sufficient gap to set up the jack.
				F.1.2	Sets up the jack according to the instructions in the user guide and instructions.
				F.1.3	Lifts the road with the jack according to the measure given in the instructions.
				F.1.4	Compresses the ballast under the lifted sleepers, according to the row as stated in the instructions with tools such as shovel, tamping digger, tamping machine etc., as not to leave gap between the lower surface of the sleepers and ballast.
				F.1.5	After compressing, fills the missing ballast parts around the frame of sleepers according to the profile of ballast.
		F.2	To repair horizontal geometric faults of track	F.2.1	Takes the ballast around the sleepers with a shovel, as not to hinder to shift the road to the direction, which will be placed and hives in the nearest place as not to hinder the works.
				F.2.2	Dismantles the resistance plates connected to the sleepers, as the sleepers will be moved in horizontal direction.
				F.2.3	Moves the road in the measure as given in instructions in order to bring to the axis with the jack in horizontal direction.
				F.2.4	Mounts the missing and dismantled resistance plates to move the road as to the plan according to the type of connection in the catalogue.
				F.2.5	After bringing the road to it axis, fills the ballast gap on ends and around the sleepers according to the ballast profile.
				F.2.6	Compresses the refilled ballast according to the row as stated in the instructions with tools such as shovel, tamping digger, tamping machine etc., as not to leave gap between the lower surface of the sleepers and ballast.
		F.3	To replace rail (to be continued)	F.3.1	Cuts the new and old rail according to the instructions at marked places, by using rail cutting machine.
				F.3.2	Takes out the old rail from the line by using appropriate tools together with other workers in the team.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
F	Making railway maintenance & repair (To be continued)	F.3	To replace rail	F.3.3	Places the new rail, which is prepared by cutting, using appropriate tools together with other workers in the team.
				F.3.4	Make the adjustment of expansion on the gaskets at each end of the new rail using appropriate tools together with other workers in the team.
				F.3.5	Drills the rails in the marked places according to the instructions by using rail drilling motor in order to connect to the fishplate.
				F.3.6	Mounts the connection materials, connecting the rail to the sleepers and rail to rail according to the work order by using appropriate tools to the type of material.
		F.4	To replace traverse	F.4.1	Opens the ballast by using appropriate tools around the sleepers, which is decided to change and marked.
				F.4.2	Dismantles the rail sleepers connection of the old sleepers by using appropriate tools to the type of material.
				F.4.3	Takes out the old sleepers together with other workers in the team by using appropriate tools to the method.
				F.4.4	Levels the upper surface of the ballast layer in order to provide smooth sleepers contact surface, taking the level of the adjacent sleepers into consideration.
				F.4.5	Places the new sleepers out of the line onto the leveled ballast surface together with other workers in the team by using appropriate tools to the method.
				F.4.6	Levels the sleepers right to the road axis and in desired gap by using a lever.
		F.5	To make maintenance of connection material (To be continued)	F.4.7	Mounts the connection materials, connecting the rail to the sleepers according to the work order by using appropriate tools to the material type.
				F.5.1	Greases the connection materials to be maintained before dismantling, with a grease for designed for the work.
				F.5.2	Dismantles the connection materials according to the work order by using appropriate tools to the material type.
				F.5.3	Controls dismantled connection materials for their reuse.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
F	Making railway maintenance & repair (To be continued)	F.5	To make maintenance of connection material	F.5.4	Separates the connection materials which can not be reused from other materials.
				F.5.5	Cleans the connection materials, which can be reused from dirt, rust and other impurities.
				F.5.6	Changes the connection materials, which can not be reused with new materials.
				F.5.7	Greases the connection materials, which can be reused.
				F.5.8	Mounts the cleaned and greased connection materials according to the work order by using appropriate tools to the material type.
				F.5.9	Tightens with the power wrench/bolt motor or power wrench/ bolt wrench adjusted to the determined power.
		F.6	To repair gauge bar	F.6.1	Dismantles the connection materials according to the work order by using appropriate tools to the material type.
				F.6.2	Slides the steel baseplate onto the sleepers in connections with steel baseplates.
				F.6.3	If the failure of rail distance occurred as a result of deformation of the wavy wooden wedge on the sleepers screw bed, breaks up the faulty wavy wooden wedge with the removal screw with or without motor.
				F.6.4	The parts of broken wavy wooden wedge in the bed of dowel and if exist other impurities will be removed with a clamp or wedge.
				F.6.5	Places a two parted plastic dowel into the dowel bed instead of the wavy wooden wedge.
				F.6.6	If the failure of rail distance occurred in the road with wooden sleepers, opens new sleeper-screw holes in the marked place by using a screw with or without motor according to the given instructions.
				F.6.7	If the failure of rail distance occurred as a result of weakening of the cross section in the sleeper-screw, replaces the sleeper-screw with new one.
				F.6.8	Mounts the connection materials dismantled in order to repair different distance failures according to the work order by using appropriate tools to the material type.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
F	Making railway maintenance & repair	F.7	To repair anti-creep device	F.7.1	Tightens the connection materials if the distance failures arises from materials having lose connection.
				F.7.2	Corrects the elements hindering appropriate working of anti-creep wedges.
				F.7.3	Mounts the missing anti-creeping wedges through appropriate connection method.
		F.8	To make maintenance of switch	F.8.1	Cleans all types of impurities hindering the movement of switch blades and other components and removes the material appropriately.
				F.8.2	Greases the beds of switch sliding blades using appropriate tools.
				F.8.3	Changes the defective rods of maneuver, tie rod and locking devices of the switches working manually with new ones.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
G	Mounting and dismantling the switch	G.1	To prepare the switch to dismantle	G.1.1	Takes the ballast around the sleeper switches with appropriate tools together with other workers in the team and hives in place as not to hinder the works.
				G.1.2	Makes signing and numbering of the piece of switches with a brush with oil paint according to the instructions.
				G.1.3	Greases the connection parts of the switches, used to separate the parts to carry easily.
		G.2	To prepare the switch to mount	G.2.1	Selects tools and devices to be used in the mounting of the switches.
				G.2.2	Selects connection materials appropriate to the type and features of the switches
				G.2.3	Carries the new switches as parts opposite to the old switches together with other workers in the team according to work methods.
				G.2.4	Controls whether there are missing parts by classifying the parts of switches according to work and mounting order.
				G.2.5	Cleans the parts of switches from dirt, rust and other impurities.
		G.3	To dismantle the switch	G.3.1	Dismantles the connections according to work order.
				G.3.2	Separates the parts of switches in measures to be carried.
				G.3.3	Carries the old switches as parts out of line together with other workers in the team according to work methods.
		G.4	To prepare the place where switch will be mounted	G.4.1	Carries the impurities in mounting place of the new switches out of the line and cleans.
				G.4.2	Carries the excessive ballast to the place of hived ballast in order to make appropriate the ground to the desired level, on which the switches will be mounted.
				G.4.3	Levels the irregularities with a shovel in order to provide surface contact smoothness of the ballast and sleepers.
		G.5	To mount the switch	G.5.1	Positions the parts of new switch in accordance with work and mounting order together with other workers in the team according to work methods.
				G.5.2	Makes horizontal and vertical alignment taking the instructions and measurement intervals into consideration in order to connect the parts of switches together.
G.5.3	Makes the connection of the parts of switches according to work and mounting order of the parts of switches together with other workers in the team according to work methods.				
G.5.4	Selects the ballast hived previously with shovel and fork fills the new switches according to ballast profile.				

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
H	To use auxiliary rolling stocks (To be continued)	H.1	To carry auxiliary rolling stock	H.1.1	Takes one or more of rail cutting, rail drilling, tamping digger, tamping machine, rail profile grinding machines and rail sliding/carrying and rail adjusting apparatus according to the work to be done from the storage room.
				H.1.2	Loads the auxiliary road machines to the transport vehicle.
				H.1.3	Carries the auxiliary road machines between transport vehicle, work place and storage room
				H.1.4	Carries the spare fuel and consumable materials and auxiliary road machines belonging to the road machines to be taken from the storage room with road machines.
				H.1.5	Carries apparatus and other completing parts together with auxiliary road machines according to the work to be done and catalogue belonging to the auxiliary road machines.
		H.2	To supply fuel and consumables of auxiliary track machine	H.2.1	Makes provision of auxiliary work machines such as fuel, grease etc., decreased fuel and water according to work condition.
				H.2.2	Changes parts affected because of work such as sparking plug, V belt and filter belonging to the auxiliary road machines.
				H.2.3	Cleans contaminated/oiled parts after a certain working time belonging to the auxiliary road machines such as spark plug, carburetor and filters.
		H.3	To mount / dismantle apparatus of auxiliary rolling stock	H.3.1	Attaches/ removes the cutting stone appropriate to the rail cutting machine.
				H.3.2	Attaches/removes drilling bit with the wrench appropriate to the rail drilling machine.
				H.3.3	Attach/removes sleeper-screw attaching/removing head appropriate to the power wrench machine.
				H.3.4	Attaches/removes bolt attaching/removing head appropriate to machine with appropriate wrenches.
				H.3.5	Attaches/removes grinding stone appropriate to the rail profile grinding machine with appropriate wrenches.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
H	Using auxiliary rolling stocks	H.4	To mount / dismantle auxiliary rolling stock onto / from track	H.4.1	Mounts/dismantles the auxiliary road machine with the apparatus together with other workers in the team according to work methods.
				H.4.2	Mounts the rail cutting machine from the rail cork to the base in a position to cut perpendicular.
				H.4.3	Mounts the rail drilling machine in a position to drill perpendicular to the body of rail.
				H.4.4	Places the rail screw/bolt power wrench on the road contacting stably on both rails.
		H.5	To work with auxiliary rolling stocks	H.5.1	Examines the user guide of the tools to be used.
				H.5.2	Uses the user guide of rail cutting machine appropriately and cuts the rail from the marked point according to instruction.
				H.5.3	Uses the rail drilling machine according to instructions and drills the rail in the marked point.
				H.5.4	Uses the rail screw power wrench according to instructions and removes/attaches the rail screws in the adjusted power according to instructions.
				H.5.5	Uses the bolt power wrench according to instructions and removes/attaches the sleepers bolts in the adjusted power according to instructions.
				H.5.6	Uses the tamping machine according to instructions and makes tamping of the sleepers in the row appropriate to the work method.
				H.5.7	Uses the rail profile grinding machine appropriately and makes grinding of rails according to instructions in the marked point.
				H.5.8	Carries/slides the rails with the rail carrying machine together with other workers in the team according to the work method.
				H.5.9	Straightens the rails with the rail straightening machine together with other workers in the team according to the work method.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
I	Constructing / maintaining level crossing	I.1	To construct level crossing	I.1.1	Arranges the level of grade crossing for accord of the rail level and grade crossing coating level in the place to be built a grade crossing.
				I.1.2	Digs a channel in order to remove the surface water from the region of grade crossing.
				I.1.3	Places appropriate passing materials on both ends of the coating material of grade crossing.
				I.1.4	Makes the coating of the part to pass by road vehicles with different coating materials.
		I.2	To maintain level crossing	I.2.1	Cleans all impurities of the flange gap in order to leave the flange gap of the grade crossing free.
				I.2.2	Makes the cleaning of drainage channels of the grade crossing.
				I.2.3	Repairs the deformations on the coating of grade crossing with the material appropriate to the type.
				I.2.4	Dismantles and mounts the coatings of grade crossings according to the needs.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
J	Cleaning the track (to be continued)	J.1	To clean snow and ice	J.1.1	Cleans snows from the roads and facilities together with other workers according to the method of work.
				J.1.2	Cleans ice from the roads and facilities together with other workers according to the method of work.
				J.1.3	Makes cleaning of snow and ice, hindering the function of switches using appropriate tools together with other workers according to the method of work.
				J.1.4	Makes the cleaning of snow and ice as not to hinder the traffic security.
		J.2	To clean trenches and other facilities	J.2.1	Cleans stones, soil etc. affecting the leveled surface of the cleavage slope together with other workers according to the method of work.
				J.2.2	Carries the stones and rocks, which may fall onto the road in a controlled manner together with other workers according to the method of work.
				J.2.3	Cleans impurities from ditches and water channels using appropriate tools together with other workers according to the method of work.
				J.2.4	Cleans impurities in the cleaning of channels and debushing in which the machine can not reach by using appropriate tools together with other workers according to the method of work.
				J.2.5	Cleans garbage accumulated on roads and facilities by using appropriate tools together with other workers according to the method of work.
		J.3	To clean weeds	J.3.1	Weeds grasses springing up on the platform
				J.3.2	Mows grasses springing up within the platform with scythe or motor scythe.
				J.3.3	Cuts bushes springing up within or around the platform with axe or digger.
				J.3.4	Gathers all type of plants or other wastes on an appropriate place out of the line.
				J.3.5	Applies spraying with hand pumps in places where the spraying of special wagons can not reach according to the instructions.

J	Cleaning the track	J.4	To combat against natural disasters and track-blocking	J.4.1	Makes cleaning of the road, which is closed after flooding together with other workers in the team.
				J.4.2	Carries soil and rocks out of the line, which is closed after landslide together with other workers according to the method of work.
				J.4.3	Carries soil and rocks out of the line, which is closed after falling of avalanche together with other workers according to the method of work.
				J.4.4	Carries foreign substances out of the line, in order to clean the road which is closed after falling of rock/tree together with other workers according to the method of work.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
C	Stacking / storing track material	K.1	To load superstructure materials	K.1.1	Helps to load the parts rail, sleepers, switches and the frame to load onto the transport vehicle together with other workers in the team.
				K.1.2	Puts appropriate wedge between the parts rail, sleepers, switches.
				K.1.3	Loads the connection materials onto the transport vehicle using appropriate tools together with other workers in the team.
				K.1.4	Loads consumable material materials onto the transport vehicle using appropriate tools together with other workers in the team.
		K.2	To unload superstructure materials	K.2.1	Unloads the parts rail, sleepers, switches and the frame to load onto the transport vehicle together with other workers in the team.
				K.2.2	Unloads connection materials onto the transport vehicle using appropriate tools together with other workers in the team.
				K.2.3	Unloads consumable material materials onto the transport vehicle using appropriate tools together with other workers in the team.
		K.3	To carry superstructure material	K.3.1	Carries the parts rail, sleepers, switches in a short distance using appropriate tools together with other workers in the team.
				K.3.2	Carries connection materials between storage- transport vehicle- work place using appropriate tools together with other workers in the team.
				K.3.3	Carries consumable materials between storage- transport vehicle- work place using appropriate tools together with other workers in the team.
		K.4	To stack / store track material	K.4.1	Hives parts rail, sleepers, switches on the material fields according to type of hive of each material using appropriate tools together with other workers in the team.
				K.4.2	Stores connection parts in storages steady using appropriate tools together with other workers in the team.
				K.4.3	Stores consumable materials in storages steady using appropriate tools together with other workers in the team.

Tasks		Actions		Performance Criteria	
Code	Name	Code	Name	Code	Description
L	Carrying out end-of-work delivery procedures	L.1	To perform end-of-work controls	L.1.1	Controls if there is any incomplete work according to work order.
				L.1.2	Completes if there is incomplete work
		L.2	To carry out the cleaning of equipment and work area at the end of work.	L.2.1	Leaves his workplace in a tidy and clean condition.
				L.2.2	Keep maintained the tools and equipment used in the work.
				L.2.3	Puts materials, tools and instruments used into their places.
				L.2.4	Exercises due care during usage of the materials that may damage occupational safety and stores them in designated areas properly.
		L.3	To report about the works done.	L.3.1	Reports to his closest superior about works he did.
				L.3.2	Gives information about the work to personnel to whom he will deliver the work in case of ongoing works.
		M	Carrying out professional development activities	M.1	To do works on individual professional development
M.1.2	Follows up new technologies.				
M.1.3	Yol yapım, bakım ve onarım işlemleriyle ilgili eğitimlere katılır.				
M.2	To share professional knowledge and experiences			M.2.1	Transfers his/her knowledge to his/her colleagues.
				M.2.2	Shares the document related to his occupation with his colleagues.

3.2. Tools, Appliances and Equipment Used

1. Ballast fork
2. Hammer
3. Bolt wrench
4. Bolt power wrench
5. Tamping digger
6. Fishplate wrench
7. Brace and bit
8. Hand tamping machine
9. Hand screw
10. Adze
11. Generator
12. Personal protective equipment
13. Leverage
14. Rail drilling machine
15. Rail straightening machine
16. Rail hook
17. Rail cutting machine
18. Rail carrying-sliding apparatus
19. T Saw
20. Railscrew wrench
21. Rail screw power wrench
22. Digging tool
23. Shovel
24. Sleepers hook
25. Auxiliary road machines catalogues

3.3. Knowledge & Skills

1. Knowledge on emergency case
2. Knowledge on tools, apparatus and equipment
3. Basic first-aid knowledge
4. Ability of working in a team or an organization
5. Manual skill
6. Knowledge on general occupational health & safety
7. Visual skill
8. Workplace working procedures information
9. Knowledge on legal regulations regarding the occupation
10. Knowledge on occupational and technological advancements
11. Knowledge of vocational terms
12. Skill of learning and being able to share what he learned
13. Problem solving skills
14. Oral and written communication skills

15. Knowledge on basic labor legislation
16. Knowledge on basic facilities
17. Knowledge on track material
18. Knowledge on railway construction, maintenance, and repair

3.4. Attitudes and Behaviors

1. Being cold blooded and calm under emergency and stressful situations
2. Informing superiors properly and in time
3. Making decisions within knowledge and experience
4. Using her/his time effectively and efficiently in accordance with work orders
5. Adopting regulations set forth in environmental, quality, and OHS legislation
6. Sharing experience with associates
7. To be sensitive about the changes to occur during procedures
8. Being sensitive on use and recovery of resources
9. Behaving in accordance with hierarchical structure of workplace
10. Ensuring his/her own safety and safety of other people
11. Being enthusiastic about research for occupational development
12. To be planned and organized
13. To be sensitive to issues of risk and hazard factors
14. Knowing his/her responsibilities and fulfilling the same
15. To comply with instructions and guidelines
16. To inform relevant people of dangerous situations
17. Taking care of cleanness, tidiness, and order of workplace
18. To share information at shift changes in efficient, open, and correct manner
19. Informing concerned people about the malfunctions which are not under his/her authority

4. TESTING, ASSESSMENT AND CERTIFICATION

Testing and assessment for certification with respect to national qualifications based on Railway Construction Maintenance and Repair Machine Operator (Level 3) Vocational 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

İsa APAYDIN	Deputy General Manager, TCDD
Murat PENEKEN	Education and Training Department Head, TCDD
Yavuz KIRAN	General Manager of TCDD Foundation
Fatma Ülker YETGİN	Project Coordinator
Pınar DEMİREKLER	Quality Process Manager
Mehmet EKTAŞ	Branch Manager (Education and Training Department, TCDD), moderator
Feyzi SIVACI	Branch Manager (Education and Training Department, TCDD), moderator
Ekrem ARSLAN	Office Chief (Education and Training Department, TCDD)
Tulgay GEÇGEL	Moderator (MoE Gazi Technical and Industrial Vocational High school)

2. Technical Work Group Members

Mustafa KORUCU	Occupation Group Coordinator (Deputy Manager of Railway Dept., TCDD)
Ali ÖZTÜRK	Occupation Group Coordinator (Deputy Manager of Railway Dept., TCDD)
Mehmet ÇELİKTEN	Railway Maintenance & Repair Chief, TCDD
Mehmet AYDEMİR	Railway Maintenance & Repair Worker, TCDD
Davut KOÇOĞLU	Railway Maintenance & Repair Worker, TCDD
Fuat DEMİRKOL	Railway Maintenance & Repair Worker, TCDD
Mehmet Akif VURGUN	Railroad Surveyor, TCDD

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

Ministry of Labor and Social Security
MoE Occupational and Technical Education Directorate General
MoE Life-Time Learning Directorate General
MoE Innovation and Education Technologies Directorate General
Ministry of Science Industry and Technology
Ministry of Transportation maritime and Communication
Turkish Labor Institution (ISKUR)

Turkish Statistical Institute (TUIK)
Board of Higher Education (YOK)
State Personnel Administration
Small and Medium Industry Development Organization (KOSGEB)
Confederation of Revolutionary Trade Unions of Turkey (DISK)
HAK-IS Trade Union Confederation
Confederation of Turkish Tradesmen and Craftsmen (TESK)
Confederation of Turkish Trade Unions (TURK-IS)
Turkish Confederation of Employer Associations (TİSK)
Turkish Union of Chambers and Exchange Commodities (TOBB)
Turkish Exporters Assembly (TIM)
Ankara Chamber of Industry (ASO)
Ankara Chamber of Trade (ATO)
Istanbul Chamber of Commerce (ITO)
Aegean Region Chamber of Industry (EBSO)
İstanbul Transportation Inc.
Bursa Rail Operation Center (BURULAS)
Eskisehir Light Rail System Enterprise (ESTRAM)
Ankara Subway
İzmir subway Inc.
Antalya Metropolitan Municipality
Konya Metropolitan Municipality
The Turkish Employers Association of Construction Industries (INTES)
Yapıray
Rhombert
Kalebozan Demiryolu İnş. San. ve Tic. A. Ş.
Alarko Group of Companies
Yuksel Project Corporation

Olmuksa
Petkim
Tüpraş
Eti Mining Enterprise
Iskenderun Steel & Iron Plant Enterprise (ISDEMİR)
Eregli Steel & Iron Plant Enterprise (ERDEMİR)
MKE – Machinery and Chemistry Institution
Sumer Holding (Iron&Steel)
Yıldız Entegre (Tügsaş)
Demiryolu Lojistik Müh.San.Tic.Ltd.Şti.
Kayseray
Turkish Transportation Sector Public Workers Trade Union (TUS-Turk-Ulasim Sen)
United Transportation Workers Trade Union (BTS)
Transportation Active Public Servants Trade Union Faal-Sen (UFS)
Independent Transportation Services Public Workers Trade Union (BUS)
Transportation Workers Right Trade Union (Ulasim-Hak-Sen)
Transportation Workers Trade Union (Ulasim-Bir-Sen)
Transportation and Railway Workers Right Trade Union (Udem-Hak-Sen)
Association of Railway Vocational School Graduates
Association of Railway Machinists and Revisors
Association of Railroad Construction and Operation Personnel Solidarity and Assistance
Associatio ofn Railway Clerks
Association of Railway Train Professionals
Association of Railway Transportation
Association of Rail Transportation Systems
Turkish State Railways (TCDD) Railway Department
Turkish State Railways (TCDD) Traction Division

Turkish State Railways (TCDD) Premises Department
Turkish State Railways (TCDD) Personnel and Administrative Affairs Department
Turkish State Railways (TCDD) Traffic Department
Turkish State Railways (TCDD) Ankara Training Center
Turkish State Railways (TCDD) Eskisehir Training Center
Turkish State Railways (TCDD) Sivas Training Center
Turkish Locomotive and Motor Industry Corporation
Turkey Railway Machinery Industry Corporation
Turkish Railway Car Industry Corporation
Central Technical and Industrial Vocational High School
Anatolian Technical and Industrial Vocational High School
Ataturk Anatolian Industrial Vocational High School
Haydarpasa Anatolian Technical Vocational High School
Fatih Anatolian Vocational High School
Gazi Anatolian Vocational High School
Sht. Kemal Ozalper Anatolian Vocational High School
Anatolian University Porsuk Vocational School
Erzincan University Refahiye Vocational High School Rail Systems Programme

4. Sector Committee Members and Experts

Prof. Dr. Mustafa KARAŞAHİN,	President (Board of Higher Education)
Şeyhamit Ünal SARIBAŞ,	Vice President (Ministry of Education)
Aykut KARAKAVAK,	Member (Ministry of Labor and Social Security)
Edip TÜRKAY,	Member (Ministry of Energy and Natural Resources)
Damla Ebru ESEN,	Member (Ministry of Industry and Trade)
Burak ERDEM,	Member (Turkish Confederation of Employer Associations)
Mehmet KARABÜBER,	Member (HAK Trade Unions Confederation)
Hakan BEZGİNLİ,	Member (Turkish Union of Chambers and Exchange Commodities -TOBB)
Nizamettin ATEŞ,	Member (Confederation of Turkish Tradesmen and Craftsmen - TESK)
Dilek TORUN,	Member (Occupational Qualification Authority)
Firuzan SİLAHŞÖR,	Department Head (Vocational Qualification Authority)
Fatma GÖKMEN,	Sector Committee Repr., (Administration of Disabled and Elderly Services)

5. Executive Board

Bayram AKBAŞ,	President (Repr. Of Ministry of Labor and social Security)
Doç. Dr. Ömer AÇIKGÖZ	Vice President (Ministry of Education)
Prof. Dr. Mahmut ÖZER	Representative of Council of Higher Education
Bendevi PALANDÖKEN	Member (Professional Associations)
Mustafa DEMİR	Member (Employer Unions Confederations)
Dr. Osman YILDIZ	Member (Trade Unions Confederations)