Model Curriculum

QP Name: Pavement Layer Helper

QP Code: CON/Q1001

QP Version: 2.0

NSQF Level: 2

Model Curriculum Version: 1.0

Construction Skill Development Council of India|| Construction Skill Development Council of India (CSDCCI), CPB – 103 & 104, Block-4B, DLF corporate Park, Phase – III, MG Road Gurugram – 122002
Near Guru Dronacharya Metro Station

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Training Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Roads & Runway Construction
Country	India
NSQF Level	2
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7112.05.9900
Minimum Educational Qualification and Experience	5th Class with 1-2 Years of experience (a non-trained worker should have minimum 1 year experience at construction site)
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	31/03/2022
Next Review Date	31/03/2025
NSQC Approval Date	31/03/2022
QP Version	2.0
Model Curriculum Creation Date	21/11/2020
Model Curriculum Valid Up to Date	31/03/2025
Model Curriculum Version	2.0
Minimum Duration of the Course	270 hrs
Maximum Duration of the Course	270 hrs

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Perform handling and storing of hand tools and equipment used in road construction.
- Perform shifting and stacking of construction material used in road construction.
- Explain process of tagging, storing and stacking of hazardous material.
- Demonstrate excavation and backfilling of earth manually.
- Demonstrate disposal of excess earth and loose material from earth surface.
- Demonstrate levelling and compaction of earth surface to obtain desired levels.
- Explain method of shifting of hot asphalt.
- Demonstrate operation of wheel barrow for shifting of hot asphalt.
- Demonstrate placing and spreading of hot asphalt.
- Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams
- Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task.
- Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality
- Identify various hazards at construction site.
- Use PPE's relevant to pavement laying works.
- Perform safe waste disposal at construction site.
- Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
Bridge Module	**08:00**	**00:00**	**--**	**--**	**08:00**
CON/N1001-Handle and store tools and construction materials for road construction works **NOS Version No. 2.0** **NSQF Level 2**	**07:00**	**15:00**	--	--	**22:00**
Handle tools and materials used in road construction works	07:00	15:00	--	--	22:00
CON/N100- Prepare base course for road by surface cleaning and carrying out earthwork manually	**15:00**	**75:00**	**--**	**--**	**90:00**

NOS Version No. 2.0 NSQF Level 2					
Perform manual earthwork for the base course of road.	15:00	75:00	--	--	90:00
CON/N1003-Shift and place hot asphalt mix by suitable/ specified means at specified locations NOS Version No.2.0 NSQF Level 2	**15:00**	**75:00**	**--**	**--**	**90:00**
Demonstrate shifting and placing of hot asphalt by suitable means to specified location	15:00	75:00	--	--	90:00
CON/N8001-Work effectively in a team to deliver results at a construction site NOS Version No.5.0 NSQF Level 3	**07:30**	**22:30**	**--**	**--**	**30:00**
Communicate effectively at workplace	07:30	22:30	--	--	30:00
CON/N9001-Work according to personal health, safety and environment protocol at construction site NOS Version No.7.0 NSQF Level 2	**07:30**	**22:30**	**--**	**--**	**30:00**
Follow safety norms as defined by organization, adopt healthy and safe work practices	07:30	22:30	--	--	30:00
Total Duration	**60:00**	**210:00**	**--**		**270:00**

Module Details

Module 1: Introduction to Assistant pavement layer job role

Bridge Module

Terminal Outcomes:

- Explain the role and responsibilities of assistant pavement layer.
- Identify the career progression for the assistant pavement layer.

Duration: *08:00*	**Duration**: *00:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Discuss the roles and responsibilities of assistant pavement layer • Define the personal attributes required in roads and runway occupation • Explain the future possible progression and career development options of an assistant pavement layer	
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Register, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
NA	

Module 2: Handle and store tools and materials for road construction works

Mapped to NOS/N1001, v 2.0

Terminal Outcomes:

- Perform handling and storing of hand tools and equipment used in road construction.
- Perform shifting, stacking and tagging of materials used in road construction.
- Explain process of tagging, storing and stacking of hazardous material used in road construction.

Duration: *07:00*	**Duration**: *15:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the various construction and hazardous materials used in road construction works • List tools and tackles used for surface grading/ cleaning, earthwork, bitumen spreading etc.in manual pavement construction work. • List materials used for erecting temporary scaffolding and barricading. • Discuss procedure of loading, unloading and shifting of construction materials, tools and equipment used for road works • Explain procedure to storing, stacking & tagging of materials, tools and equipment used in road works. • Explain standard procedure of storing and shifting of sewer and drainage pipes. • Discuss standard practice of handling of hot bitumen as per safety guidelines.	• Select construction and hazardous materials such as aggregates, sand, bitumen, murrum, stone crusher dust, hot bitumen/ asphalt, diesel, chemicals etc., used for pavement construction work. • Select different components of service lines/drainage works for road construction. • Demonstrate safe shifting and stacking of construction material, pipe segments and hazardous materials as per standard practices, following ergonomic principles. • Demonstrate erection of barricade and safety signage for pavement construction work. • Demonstrate safe shifting and stacking of tools and equipment used in road construction works, following ergonomic principles.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers ,Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Spade, Shovel, Pick axe, Hand rammer, Hand roller, Asphalt rake, Measurement tape, Water level, Chalk line/mason , Line, Plumb bob, Wood peg, Chalk, Rope, Chain shackles, Safety Helmet , Safety goggles ,Safety shoes , Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Barricade tape, Safety tags	

Module 3: Prepare base course for roads by carrying out surface cleaning and manual earthwork

Mapped to NOS/N1002, v2.0

Terminal Outcomes:

- Demonstrate excavation and backfilling of earth manually.
- Demonstrate disposal of excess earth and loose material from earth surface.
- Demonstrate levelling and compaction of earth surface to obtain desired levels.

Duration: *15:00*	**Duration**: *75:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the manual earth cutting and marking tools used in road construction work • List manual earth compacting tools such as plate compactor, hand roller, earth ramming tools etc. • Explain the process of surface cleaning, excavation and backfilling including the sequence of activities involved in base course preparation. • Explain ways to maintain desired slope during excavation. • Discuss the precautions to be taken while working in a pit/trench. • Explain advantages of digging earth to remove vegetation, stumps, etc. • Define appropriate thickness of various layers of earth during compaction. • Explain advantages of spreading water uniformly over surface of base course layers during compaction process. • Describe method of shifting and uniform spreading of earth, murrum, stone on the specified surface for maintaining specified thickness of layers.	• Demonstrate surface cleaning works prior to excavation. • Demonstrate marking of the area for excavation using marking tools and materials. • Demonstrate manual excavation and surface dressing of excavated area, maintaining required level. • Demonstrate manual shifting and placing of earth, stone and murrum for backfilling using appropriate tools, while maintaining required thickness • Demonstrate levelling and compaction of earth surface by rammer or hand /plate compactor for base course preparation. • Demonstrate filling of pits and trenches for assisting the manual road operator. • Demonstrate backfilling of earth after sorting of gravels, for base course of road.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers ,Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Spade, Pick axe, Shovel, Wheel barrow, Hand rollers, Hand rammer, Hammer, Chisel, Steel scale, Water level, Chalk line, Measurement tape, Plate compactor, Wooden pegs, Lime, Ropes, PVC Hose pipe, Safety Helmet , Safety goggles , Safety shoes, Safety belt, Cotton gloves, Ear plugs ,Reflective jackets, Dust mask, Barricade tape	

Module 4: Shift and place hot asphalt mix by suitable/ specified means at specified locations

Mapped to NOS/N1003, v2.0

Terminal Outcome:

- Explain method of shifting of hot asphalt.
- Demonstrate operation of wheel barrow for shifting of hot asphalt.
- Demonstrate placing and spreading of hot asphalt.

Duration: *15:00*	**Duration**: *75:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain standard and safe procedure of handling hot bitumen/ asphalt mix. • Explain method of safe loading, unloading and shifting bitumen/ asphalt mix using manual transporting vehicle. • Describe components and physical properties of bitumen/ asphalt mix. • Explain hazards involved in handling of bitumen/ hot asphalt. • Explain mixing procedure of bitumen, aggregates, sands and polymers (if applicable) to form asphalt mix. • Explain sequence of application of asphalt.	• Demonstrate safe loading, unloading and shifting of hot asphalt using manual transportation vehicle/ wheel barrow. • Demonstrate spreading of hot asphalt on the road surface as per instructions/requirement.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer, Registers ,Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Broom, Wheel barrow, Shovel, Spade, Asphalt rake, Measurement tape, Wooden planks, Lifting appliance (Sling, Shackle, Belts),Safety Helmet , Safety goggles , Safety shoes , Cotton gloves, Ear plugs, Reflective jackets, Dust mask, Fire protection kit, Barricade Tape	

Module 5: Communicate effectively at workplace

Mapped to CON/N8001, v 5.0

Terminal Outcome:

- Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams
- Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task.
- Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality.

Duration: *07:30*	**Duration**: *22:30*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the effects and benefits of timely actions relevant to the task at hand with examples. • Explain the importance of teamwork and its effects relevant to the task at hand with examples. • Explain the importance of proper and effective communication and its adverse effects in case of failure of proper communication. • Discuss about gender and its related concept: gender equality, gender equity (group work) • Discuss different types of disabilities (physical, mental, intellectual or sensory impairment). • Discuss the activities sensitive to the cultural diversity, disabilities and gender neutrality at the workplace. • Discuss the basic rules and regulations related to gender sensitivity, disabilities, and cultural diversity, with their impact on operations of a workplace. • Discuss how to take initiative in resolving issues among co-workers in a given situation. • Discuss reporting procedure followed at the workplace.	• Apply effective communication skills while interacting with co-workers, trade seniors and others during the assigned task. • Use appropriate writing skills and verbal communication reporting as per commonly acceptable organisational norms. • Demonstrate teamwork skills during assigned task. • Demonstrate acceptable interpersonal transactions with individuals having disabilities (physical, mental, intellectual or sensory impairment) or cultural diversity. • Demonstrate the process modifications required to make the workplace free from gender biases.
Classroom Aids:	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
Tools, Equipment and Other Requirements	
NA	

Module 6: Follow safety norms as defined by organization, adopt healthy and safe work practices

Mapped to CON/N9001, v.7.0

Terminal Outcome:

- Identify various hazards at construction site.
- Use PPE's relevant to pavement laying works.
- Perform safe waste disposal at construction site.
- Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines.

Duration: *07:30*	**Duration**: *22:30*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the types of hazards at the construction sites and identify the hazards specific to the domain related works. • Recall the safety control measures and actions to be taken under emergency situation. • Explain the classes of fire and types of fire extinguishers. • Explain the importance of participation of workers in safety drills. • Explain the reporting procedure to the concerned authority in case of emergency situations. • Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories. • Explain different types of waste at construction sites and their disposal method. • Explain the purpose and importance of vertigo test at construction site. • List out basic medical tests required for working at construction site. • Explain the types and benefits of basic ergonomic principles, which should be adopted while carrying out specific task at the construction sites. • Explain the importance of housekeeping works. • List different types of infectious disease that can spread/ originate at a construction site. • Discuss the ways of transmission of the various infectious disease. • Explain the methods to check the spread of the infectious disease.	• Demonstrate the operating procedure of the fire extinguishers. • Demonstrate use of PPEs as per work requirements. • Demonstrate vertigo test. • Demonstrate safety techniques to be adopted in case of accidents. • Demonstrate safe waste disposal practices followed at construction site. • Demonstrate safe housekeeping practices. • Demonstrate the practices to maintain personal hygiene, workplace hygiene and site/ workplace sanitization. • Demonstrate the methods to clean and disinfect all materials, tools and supplies before and after use. • Demonstrate the procedure to report to the concerned authority regarding the outbreak/ hazard of any infectious disease/ pandemic.

• Describe the symptoms and cure of the various infectious disease.	
Classroom Aids:	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
Tools, Equipment and Other Requirements	
Safety Helmet , Safety goggles , Safety shoes , Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire extinguishers, Sand buckets Flashback arrestors, Fire prevention kit, First Aid box, Safety tags, Safety Notice board	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post-Graduation/ Graduation in Engineering	M. Tech in Civil/B. Tech in civil	6 months	Civil Engineering	0	Civil Engineering	As a pre-requisite for new entrant, no prior experience in training /assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience.
Diploma	Diploma in Civil	One	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12th pass	Two	Working as pavement layer/roads and runway domain/supervisory work of roads and runway domain	0	Working as pavement layer/roads and runway domain/supervisory work of roads and runway domain	

Trainer Certification	
Domain Certification	**Platform Certification**
70 % in each NOS of Qualification Pack "Assistant pavement layer CON/Q1001 v2.0" & 80% overall.	80% in each NOS of Qualification Pack "Trainer MEP/Q2601, v1.0"and 80% overall.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training/Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post-Graduation/ Graduation in Engineering	M. Tech in Civil/B. Tech in civil	One	Civil Engineering	0	Civil Engineering	As a pre-requisite for new entrant, no prior experience in training /assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience.
Diploma	Diploma in Civil	Two	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12th pass	Three	Working as pavement layer/roads and runway domain/supervisory work of roads and runway domain	0	Working as pavement layer/roads and runway domain/supervisory work of roads and runway domain	

Assessor Certification	
Domain Certification	**Platform Certification**
70% in each NOS of Qualification Pack "Assistant pavement layer CON/Q1001 v2.0" & 80% overall	80% in each NOS of Qualification Pack "Assessor MEP/Q2701, v1.0"and overall 80%.

Assessment strategy

Assessment system Overview

Assessment is done through CSDCI affiliated Assessment Agencies. Assessors are trained & certified by CSDCI after training of assessors' program. Assessments is conducted to gauge and assess the trainee's skill and knowledge competency in the specified areas. The assessment will have both theory and practical component 20:80 ratios for assistant pavement layer job role.

During the practical task, trainees are assessed on their workmanship, quality of finished product and time management. They will be graded for all their assessments based on the approved assessment strategy which is signed off by CSDCI. The Assessor submits an assessment plan to CSDCI prior to assessments.

The assessment plan contains the following information:

- What will be assessed, i.e. the competency based on each NOS based on theory and practical questions
- How assessment will occur i.e. methods of assessment
- When the assessment will occur
- duration of assessment
- Where the assessment will take place i.e. context of the assessment (workplace/simulation)
- The criteria for decision making i.e. those aspects that will guide judgments and
- Where appropriate, any supplementary criteria used to make a judgment on the level of performance.

Testing Environment

Training partner shares the batch start date and end date, number of trainees and the job role.

Assessment will be fixed for a day after the end date of training. It could be next day or later. Assessment will be conducted at the training venue/test center.

The knowledge/theory assessments are conducted with proper seating arrangements with enough space between the candidates to prevent copying.

Question set for theory and practical will be distributed to each candidate by the Assessor. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on his theoretical knowledge of the subject. The skill /practical assessments will be conducted in the approved test centers. The training provider will ensure adequate tools and materials are available to conduct the practical test.

If number of candidates are more than 30, more assessors will be organized on same day to complete the assessment.

The assessment has to comprise of two components, namely:
1. Knowledge assessment (theory/viva assessment)
2. Skill assessment (practical/hands-on skill assessment)

Mode of assessment

1. Demonstration/Practical for Performance /Skill Assessment
2. Synoptic multiple choice question test } For Knowledge Assessment
3. Viva

Performance/skill assessment: The performance/skill assessment will be conducted through demonstration/practical

For the practical test trainees are assessed through a given task, which they have to complete correctly for them to be marked as passed.

The assessment is conducted in a simulated working environment. Due to this fact, the assessors must note that the naturally occurring evidence of competence is unavailable or infrequent. Simulation must be undertaken in a Realistic Working Environment which provides an environment that replicates the key characteristics of the workplace in which the skill to be assessed is normally employed**.**

Knowledge Assessment: The knowledge assessments are conducted through written test/ viva.

Synoptic test is used for this. It is an MCQ (Multiple Choice Question) test which are prepared externally and externally marked, meaning by agency having no link with training partners. The test may be conducted by the assessor in the oral mode, if required, considering the lack of reading and comprehending acumen (skills) of trainees. In such cases, the assessor will mention it on top of the MCQ submitted to CSDCI.

The assessment strategy, weightage and duration of assessment for assistant pavement layer is summarized below:

Assessment Type	**Formative or Summative**	**Strategies**	**Weightage**	**Duration (hours)**
Knowledge	Summative	MCQ/Viva	20	1.0
skill	Summative	Structured practical task	80	5.0

Assessment Quality Assurance framework

CSDCI has developed assessment criteria framework for each Qualification pack as per National Occupational Standards. The criteria framework includes weightages/marks for each criteria under knowledge and skill. This criteria ensures quality assurance as it ensures valid, consistent and fair assessments at all locations. Issued to the affiliated Assessment body. The Assessment body develop questions based on CSDCI issued assessment criteria.

Evidences in the form of answer sheets in case of knowledge assessments are collected. For skill assessments videos and photographs are prepared as evidence. These are submitted by the assessor

to the assessment agency. CSDCI does random checks of the same with the participant/ trainee's ID and ascertains authenticity and validity of assessments.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue. Random spot checks/audit is conducted by CSDCI to monitor assessment.

Methods of Validation

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, ID verification is carried out. Aadhar card number is part of registering the candidate for training. This forms the basis of further verification during the assessment.

Assessor conducts the assessment through theory and practical questions developed in accordance with the assessment criteria and guidelines issued by CSDCI. This too is verified by random audits carried out by CSDCI.

Evidences for assessments are to be collected and submitted to CSDCI for verification as per demand.

Assessment agency is responsible to put details in SIP. CSDCI will also validate the data and result received from the assessment agency.

Method of assessment documentation and access

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by CSDCI assessment team. After upload, only CSDCI can access this data.

CSDCI approves the results within five days after which results are uploaded on SIP by Assessment Agency.