



Model Curriculum

QP Name: Shuttering Carpenter (System / Conventional)

QP Code: CON/Q3001

QP Version: 2.0

NSQF Level: 4

Model Curriculum Version: 2.0

Construction Skill Development Council of India | | Construction Skill Development Council of India
(CSDCCI), CPB – 103 and 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 Skill Development Council of India
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Shuttering carpentry
Country	India
NSQF Level	4
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7115.0300
Minimum Educational Qualification and Experience	11th grade pass or Completed 1st year of 3-year diploma (after 10th) and pursuing regular diploma or 10th grade pass plus 1-year NTC/ NAC or 8th grade pass plus 2-year NTC plus 1 Year NAC/ relevant experience or 10th Grade Pass with 2 years relevant experience or 10th grade pass and pursuing continuous schooling or Previous relevant Qualification of NSQF Level 3.0 with minimum education as 5th Grade pass or Previous relevant Qualification of NSQF Level 3.5
Pre-Requisite License or Training	NA
Minimum Job Entry Age	18 Years
Last Reviewed On	17/11/2022
Next Review Date	31/03/2025
NSQC Approval Date	31/03/2022
QP Version	Version number 2.0
Model Curriculum Creation Date	17/11/2022
Model Curriculum Valid Up to Date	31/03/2025
Model Curriculum Version	Version number 2.0
Minimum Duration of the Course	450 hrs
Maximum Duration of the Course	630 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.

- Prepare cutting plan for the plywood or timber as per required shape and size.
- Demonstrate the procedure to make wooden shutters using suitable joints.
- Perform checks on the erected formwork to ensure its correctness with respect to survey layout, rigidity of joints, dimensions within tolerance limit, water tightness, line, level, alignment and stability.
- 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.
- Demonstrate prioritizing of work activities to achieve the desired productivity.
- Demonstrate organizing of resources as per work plan prior to commencement of work.
- Identify various hazards at construction site.
- Use PPE's relevant to shuttering carpentry task.
- Perform safe waste disposal at construction site.
- Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines.
- Describe different types of system formwork.
- Interpret sketches/ schematic working drawings relevant to conventional formwork.
- Demonstrate how to assemble conventional formwork.
- Interpret sketches/ schematic working drawings relevant to conventional formwork.
- Demonstrate how to assemble conventional formwork.
- Demonstrate how to dismantle conventional formwork.
- Demonstrate how to dismantle conventional formwork.



Compulsory Modules

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

NOS and Module Details	Theory Duration (Hrs)	Practical Duration (Hrs)	On-the-Job Training Duration (Mandatory) (Hrs)	On-the-Job Training Duration (Recommended) (Hrs)	Total Duration (Hrs)
CON/N0302 - Make wooden shutters used in shuttering carpentry NOS Version No.3.0 NSQF Level 4	21:00	39:00	00:00	00:00	60:00
Introduction to the job role of shuttering carpenter (system/ conventional)	08:00	00:00	00:00	00:00	8:00
Make wooden shutters used in shuttering carpentry	13:00	39:00	00:00	00:00	52:00
CON/N0304 - Carry out quality checks for shuttering works NOS Version No.3.0 NSQF Level 4	18:00	42:00	00:00	00:00	60:00
Perform quality checks for shuttering works	18:00	42:00	00:00	00:00	60:00
CON/N8001 - Work effectively in a team to deliver desired results at the workplace NOS Version No.10.0 NSQF Level 4	09:00	21:00	00:00	00:00	30:00
Communicate effectively at workplace	09:00	21:00	00:00	00:00	30:00
CON/N8002 - Plan and organize work to meet expected outcomes NOS Version No.7.0 NSQF Level 4	09:00	21:00	00:00	00:00	30:00
Prioritise activities and organise resources	09:00	21:00	00:00	00:00	30:00
CON/N9001 - Work according to personal health, safety and environment protocol at construction site NOS Version No.8.0 NSQF Level 4	09:00	21:00	00:00	00:00	30:00
Follow safety norms as defined by organization,	09:00	21:00	00:00	00:00	30:00



adopt healthy and safe work practices					
DGT/VSQ/N0102: Employability Skills NOS Version No.1.0 NSQF Level 4	60:00	00:00	--	--	60:00
Employability Skills	60:00	00:00	--	--	60:00
Total Duration	126:00	144:00	00:00	00:00	270:00

Elective Modules

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

Elective 1: System

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
CON/N0303 - Assemble and dismantle system formwork for RCC structures NOS Version No. 3.0 NSQF Level 4	54:00	126:00	00:00	00:00	180:00
Assemble and dismantle system formwork for RCC structures	54:00	126:00	00:00	00:00	180:00
Total Duration	54:00	126:00	00:00	00:00	180:00

Elective 2: Conventional

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
CON/N0315 - Assemble and dismantle conventional shuttering / formwork for RCC structures NOS Version No. 3.0 NSQF Level 4	54:00	126:00	00:00	00:00	180:00
Assemble and dismantle conventional shuttering / formwork for RCC structures	54:00	126:00	00:00	00:00	180:00
Total Duration	54:00	126:00	00:00	00:00	180:00



Module Details

Module 1: Introduction to the job role of shuttering carpenter (system/ conventional)

Mapped to CON/N0302 v3.0

Terminal Outcomes:

- Explain the role and responsibilities of shuttering carpenter (system/ conventional).
- Discuss the career progression for the shuttering carpenter (system/ conventional).

Duration: 08:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none">• Describe the role and responsibilities of shuttering carpenter (system/conventional).• Define the personal attributes required in shuttering carpentry occupation.• Explain the future possible progression and career development options of a shuttering carpenter (system/ conventional).	
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer system, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
N/A	



Module 2: Make wooden shutters used in shuttering carpentry

Mapped to CON/N0302 v3.0

Terminal Outcomes:

- Prepare cutting plan for the plywood or timber as per required shape and size.
- Demonstrate the procedure to make wooden shutters using suitable joints.

Duration: 13:00	Duration: 39:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Interpret sketches and working drawings used for shuttering work. • Explain the use of different tools used for carpentry work. • Explain the handling and maintenance procedure of hand and power tools. • Explain the various features of different types of timber used in shuttering works. • Discuss about the seasoning of timber and common defects in timber. • Explain the methods to select quality materials and tools as per requirement in carpentry work. • Describe the sequence and standard practice of marking, laying out and cutting of form sheathing and stiffeners as per requirement for carpentry works. • Describe different types of visual checks to be performed for checking the quality of plywood and timber. • Explain the importance of using different types of joints such as dovetail joint, Tenon and mortise and lap joints. • Discuss the steps for the preparation of different types of joints used in wooden shutters. • List the safety precautions followed while using power tools for the preparation of shutters/ frames. 	<ul style="list-style-type: none"> • Perform visual checks to determine the quality of timber, plywood and other materials used for preparation of shutters. • Prepare cutting plan for the plywood/ timber as per the shape and size of the shuttering components. • Ensure all the materials, consumable and other required fixtures are available at shutter making location. • Measure and mark plywood and timber using measuring and marking tools. • Measure and mark sheathing and stiffeners at sketched location. • Demonstrate the cutting of sheathing material within the tolerance limit using various hand and power tools as per instructions /specifications. • Make the wooden shutter panels using different types of joints such as dovetail, tenon and mortise, and lap joints as per specifications. • Perform repair works for defects on the prepared shutters as per instructions.
Classroom Aids:	
Black/White board, Projector/LED Monitor, Computer system, Trade specific charts and other teaching aids	
Tools, Equipment and Other Requirements	
Claw Hammer, Handsaw, Tenon saw, Iron Jack Planner , Wooden Marking Gauge , Wooden Mortise Gauge, Spirit Level , Tri-Square, Auger , Steel Measuring Tape, Farmer Chisel , Farmer Chisel , Mortise Chisel , Cutting Player, Screw Driver 10", Marking Knife / Scribe , Wooden Mallet, Oil Stone (Rough / Smooth), Center Punch , Bench Vice, Hacksaw Frame with blade, Triangle file - 6mm (Medium) , Half Round File and Rasp cut file, Drill Bit, Plumb Bob, Ring Spanner , Double End Spanner, Screw Spanner 12" LM, Carpenter Working Table, Nail Bar, Measuring tape, Spirit level, Water level tube, Plumb-bob, Mason’s line, Lifting appliance (Sling, Shackle, Belts), Safety Helmet, Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit.	



Module 3: Carry out quality checks for shuttering works

Mapped to CON/N0304 v3.0

Terminal Outcome:

- Perform checks on the erected formwork to ensure its correctness with respect to survey layout, rigidity of joints, dimensions within tolerance limit, water tightness, line, level, alignment and stability.

Duration: 18:00	Duration: 42:00
<p>Theory – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Interpret of the rough sketches / schematic working drawings/ cutting plans used in shuttering carpentry work. • Explain different types of system formwork/ conventional formwork. • Describe the different types of material and components used in system formwork/ conventional formwork with specification • Explain the various checks for plumb, level and alignment of the formwork. • Describe the importance of Indian Standard / International codes and maximum tolerance limits for key quality checks of shuttering works. • State the sequence followed for quality checks in shuttering works. • State the do's and don'ts required during rectification of shuttering works. • Explain the basics and fundamentals of reinforcement work, shuttering work and concreting works. • Discuss the application of release agent on shuttering panels. • Explain the process of obtaining approval for the assembled formwork. 	<p>Practical – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Provide the scope for covers to the reinforcement steel in shuttering works as per the given sketches. • Perform checks for the location, dimensions, rigidity of joints of plywood and timber. • Perform checks for verticality, position and spacing of props as per the load bearing capacity and support. • Ensure that the dimension of diagonal to be as per accuracy. • Demonstrate the corrective measure to be taken if twist is observed in alignment of the formwork. • Demonstrate the rectification measures of formwork boards / plates after their removal. • Perform activities to ensure the water tightness of the assembled formwork. • Perform checks to ensure the line, level and alignment of the shuttering works with in tolerance limit and according to sketches / instructions. • Demonstrate the use of different type of support for formwork to ensure its stability. • Demonstrate procedure of obtaining approval for the assembled formwork.
<p>Classroom Aids:</p> <p>Black/White board, Projector/LED Monitor, Computer system, Trade specific charts and other teaching aids</p>	
<p>Tools, Equipment and Other Requirements</p> <p>Claw Hammer, Handsaw, Tenon saw, Iron Jack Planner , Wooden Marking Gauge , Wooden Mortise Gauge, Spirit Level , Tri-Square, Auger , Steel Measuring Tape, Farmer Chisel , Farmer Chisel , Mortise Chisel , Cutting Player, Screw Driver 10", Marking Knife / Scribe , Wooden Mallet, Oil Stone (Rough / Smooth), Center Punch , Bench Vice, Hacksaw Frame with blade, Triangle file - 6mm (Medium) , Half Round File and Rasp cut file, Drill Bit, Plumb Bob, Ring Spanner , Double End Spanner, Screw Spanner 12" LM, Carpenter Working Table, Nail Bar, Measuring tape, Spirit level, Water level tube, Plumb-bob, Mason's line, Lifting appliance (Sling, Shackle, Belts), Safety Helmet, Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit</p>	



Module 4: Communicate effectively at workplace

Mapped to CON/N8001, v10.0

Terminal Outcomes:

- 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: 09:00	Duration: 21:00
<p>Theory – Key Learning Outcomes</p> <ul style="list-style-type: none"> • 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. 	<p>Practical – Key Learning Outcomes</p> <ul style="list-style-type: none"> • 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 applicable 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.
<p>Classroom Aids:</p> <p>Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids</p>	
<p>Tools, Equipment and Other Requirements</p> <p>N/A</p>	



Module 5: Prioritise activities and organise resources

Mapped to CON/N8002, v7.0

Terminal Outcomes:

- Demonstrate prioritizing of work activities to achieve the desired productivity.
- Demonstrate organizing of resources as per work plan prior to commencement of work.

Duration: 09:00	Duration: 21:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain methods to upkeep, store and stack tools, materials used for domain specific works. • Explain the process of planning of the given tasks and activities relevant to the trade/job role within defined scope and duration. • Explain the procedure adopted for prioritizing an activity and sequencing of activities. • Explain the work plan and flow of activities in sequence for the assigned work. • Explain basic concept of labour productivity and work productivity. • Explain requisition of resources, reporting for requirement of resources orally and in written to concerned authority. • Explain how to minimise wastage of resources. • Explain the plan for waste collection and disposal after task. 	<ul style="list-style-type: none"> • Identify the work target and plan activities to achieve the desired productivity. • Demonstrate requisition of resource citing an example. • Demonstrate the planning for various activities relevant to task as per the scope and schedule. • Demonstrate how to organise the required tool, manpower and material resources for the assigned task. • Select required quantity of materials, tools or devices for defined work activities. • Demonstrate how to prioritize all works/ activities to maximise output. • Demonstrate optimum use of resources while performing domain specific work activities. • Demonstrate waste collection and disposal as per organisational norms. • Demonstrate completion of work within stipulated time and plan.
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	
N/A	



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

Mapped to CON/N9001, v8.0

Terminal Outcome:

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

Duration: 09:00	Duration: 21:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • 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

Leather Hand Gloves, Jump suit, Wire brush, Hand and Leg guard leather, Safety goggles, Nose mask, Ear protection, Fire extinguishers, Sand buckets Flashback arrestors, Welding helmet, Welding glass, Fire Extinguisher, Fire prevention kit, First Aid box, Safety tags, Safety Notice board



Module 7: Employability Skills (60 Hours)

Mapped to DGT/VSQ/N0102- v1.0

Duration: 60:00

Key Learning Outcomes

Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss the importance of relevant 21st-century skills.
6. Exhibit 21st-century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e-mail using basic English

Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.
13. Explain the importance of active listening for effective communication
14. Discuss the significance of working collaboratively with others in a team

Diversity & Inclusion Duration: 2.5 Hours

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD
16. Discuss the significance of escalating sexual harassment issues as per POSH act.

Financial and Legal Literacy Duration: 5 Hours

17. Outline the importance of selecting the right financial institution, product, and service
18. Demonstrate how to carry out offline and online financial transactions, safely and securely
19. List the common components of salary and compute income, expenditure, taxes, investments etc.
20. Discuss the legal rights, laws, and aids



Essential Digital Skills Duration: 10 Hours

21. Describe the role of digital technology in today's life
22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
24. Create sample word documents, excel sheets and presentations using basic features
25. utilize virtual collaboration tools to work effectively

Entrepreneurship Duration: 7 Hours

26. Explain the types of entrepreneurship and enterprises
27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
29. Create a sample business plan, for the selected business opportunity

Customer Service Duration: 5 Hours

30. Describe the significance of analyzing different types and needs of customers
31. Explain the significance of identifying customer needs and responding to them in a professional manner.
32. Discuss the significance of maintaining hygiene and dressing appropriately

Getting Ready for apprenticeship & Jobs Duration: 8 Hours

33. Create a professional Curriculum Vitae (CV)
34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
35. Discuss the significance of maintaining hygiene and confidence during an interview
36. Perform a mock interview
37. List the steps for searching and registering for apprenticeship opportunities



Elective 1

Module 8: Assemble and dismantle system formwork for RCC structures

Mapped to CON/N0303 v3.0

Terminal Outcome:

- Describe different types of system formworks.
- Interpret sketches/ schematic working drawings relevant to conventional formwork.
- Demonstrate how to assemble conventional formwork.
- Demonstrate how to dismantle conventional formwork.

Duration: 54:00	Duration: 126:00
<p>Theory – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Interpret the sketches/ schematic working drawing relevant to system formwork. • Discuss about system formwork and its types. • Describe the difference between conventional and system formwork. • List the various types of shuttering material with their specifications. • Discuss about consumables used in shuttering work. • Explain different types of releasing agents (shuttering oil, cream emulsions, chemical release agents). • Discuss the standard procedure for assembling and dismantling of system formwork for R.C.C footing, column, wall, beam, slab. • State general tolerance limit for shuttering works. • Discuss the standard procedure for dismantling of system formwork for R.C.C footing, column, wall, slab, beam etc. • Explain the importance of stripping time for removing shuttering of various R.C.C structural elements. • Describe the procedure for repairing the formwork. • Discuss the use of lifting gears for shifting and fixing of formwork components. • Explain the standard procedure for stacking and storing of formwork components. 	<p>Practical – Key Learning Outcomes</p> <ul style="list-style-type: none"> • Demonstrate reading of schematic working drawing for shuttering works. • Perform checks to ensure cleanliness of shutters, suitability of supporting base, availability of tools, availability of fixtures prior to erection/use of system formwork. • Determine shuttering materials required for work. • Demonstrate assembling of system formwork for R.C.C footing, column, wall, beam and slab. • Demonstrate methods to check the erected formwork for line, level, alignment and plumb within tolerance limit. • Demonstrate dismantling of system formwork for R.C.C footing, column, wall, beam and slab. • Check the quality of formwork materials for reusability after dismantling. • Demonstrate stacking of formwork components.
Classroom Aids:	



Black/White board, Projector/LED Monitor, Computer system, Trade specific charts and other teaching aids

Tools, Equipment and Other Requirements

Claw Hammer, Handsaw, Tenon saw, Iron Jack Planner , Wooden Marking Gauge , Wooden Mortise Gauge, Spirit Level , Tri-Square, Auger , Steel Measuring Tape, Farmer Chisel , Farmer Chisel , Mortise Chisel , Cutting Player, Screw Driver 10", Marking Knife / Scribe , Wooden Mallet, Oil Stone (Rough / Smooth), Center Punch , Bench Vice, Hacksaw Frame with blade, Triangle file - 6mm (Medium) , Half Round File and Rasp cut file, Drill Bit, Plumb Bob, Ring Spanner , Double End Spanner, Screw Spanner 12" LM, Carpenter Working Table, Nail Bar, Measuring tape, Spirit level, Water level tube, Plumb-bob, Mason's line, Lifting appliance (Sling, Shackle, Belts), Safety Helmet, Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit, System formwork components and fixtures (for Footing, column, wall, beam, slab)Cup-lock scaffolding components (set)/Frame scaffold components, Staircase tower components with fixtures, Castor wheels , 40 NB pipes, Swivel coupler, Fixed clamp, Steel walkways, Aluminum/ GI ladder, Safety net



Elective 2

Module 9: Assemble and dismantle conventional shuttering / formwork for RCC structures

Mapped to CON/N0315 v3.0

Terminal Outcome:

- Interpret sketches/ schematic working drawings relevant to conventional formwork.
- Demonstrate how to assemble conventional formwork.
- Demonstrate how to dismantle conventional formwork.

Duration: 54:00	Duration: 126:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Interpret sketches / schematic working drawing/ cutting plan relevant to shuttering work. • Discuss about conventional formworks. • Discuss the importance of handling of hand and power tools and their basic maintenance. • Discuss the defects in bamboo, ballies, timber and plywood etc. • Explain the application of different types of timber and non-timber materials used in different shuttering works. • Discuss the standard shape and size of carpentry tools. • Discuss the use different types of material used in conventional shuttering works. • Explain the importance of tying knots and different type of knots used for connection of bamboos and ballies. • Discuss the various components of the conventional formwork such as pipes, coupler, tying thread and other fixtures. • Discuss the sequential steps for erection and bracing of formwork, as per standard procedure. • Explain the method statement used for the erection of conventional staging using bamboo, ballies, pipe and coupler. • List the do's and don'ts applicable for erection of conventional staging either using bracings or bamboo and ballies or pipe and coupler. • Explain the importance of checks with respect to plumb, level and alignment for the formwork. 	<ul style="list-style-type: none"> • Perform check to ensure cleanliness of shutters, suitability of supporting base, availability of tools, availability of components, availability of fixtures prior to erection/use of conventional formwork. • Demonstrate the application of releasing agent to sheathing materials as per the specification. • Demonstrate how to position and strike box-outs and bolt boxes, grout checks, level controls, angle fillets and features • Use the supports such as runner pieces, timber, props, tie systems appropriately for positioning and providing support. • Provide the braces for formwork support as per the specification and requirement. • Use form sheet or other appropriate packing material for ensuring the water tightness of form. • Demonstrate how to fix tie rods, supports, bracings after erection of formwork shutters. • Perform checks for line, level and alignment of the erected formwork as per permissible tolerance limits. • Perform checks for dimensional accuracy and right angle, and take necessary corrective action if required. • Demonstrate the standard procedure for dismantling of formwork shutters manually or by mechanical means as per the requirements • Check the quality of formwork materials for reusability after dismantling. • Demonstrate proper storing, stacking and cleaning of formwork materials after dismantling



- Discuss the different type of shuttering required for various structures with its applicable limits of tolerances.
- Describe the procedure for positioning or attaching tie systems, soldiers and walling.
- Explain the properties and method of application of release agents.
- Explain the sequential step for dismantling of conventional formwork shutters.

Classroom Aids:

Black/White board, Projector/LED Monitor, Computer system, Trade specific charts and other teaching aids

Tools, Equipment and Other Requirements

Claw Hammer, Handsaw, Tenon saw, Iron Jack Planner , Wooden Marking Gauge , Wooden Mortise Gauge, Spirit Level , Tri-Square, Auger , Steel Measuring Tape, Farmer Chisel , Farmer Chisel , Mortise Chisel , Cutting Player, Screw Driver 10", Marking Knife / Scribe , Wooden Mallet, Oil Stone (Rough / Smooth), Center Punch , Bench Vice, Hacksaw Frame with blade, Triangle file - 6mm (Medium) , Half Round File and Rasp cut file, Drill Bit, Plumb Bob, Ring Spanner , Double End Spanner, Screw Spanner 12" LM, Carpenter Working Table, Nail Bar, Measuring tape, Spirit level, Water level tube, Plumb-bob, Mason's line, Lifting appliance (Sling, Shackle, Belts), Safety Helmet, Safety goggles, Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit, 36. Conventional formwork for Footing, column, wall, beam, slab, Conventional scaffolding components (set)/bamboo, bellies, pipe and coupler scaffold components , 40 NB pipes, Swivel coupler, Fixed clamp, Steel walkways, Aluminum/ GI ladder, Safety net, Tying thread



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	Two	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	Three	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12 th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12 th pass	Six	Working experience as Shuttering Carpenter/ supervisory work experience in shuttering carpentry work	0	Working experience as Shuttering Carpenter/ supervisory work experience in shuttering carpentry work	

Trainer Certification	
Domain Certification	Platform Certification
Trainer- 70 % in each NOS of Qualification Pack “Shuttering carpenter (System/Conventional) CON/Q3001, v2.0” and 80% overall	Trainers - 80% in each NOS of Qualification Pack “Trainer (VET and Skills) MEP/Q2601, v2.0” 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	Two	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	Five	Civil Engineering	0	Civil Engineering	
Graduation/ Ex. Army /ITI /12 th pass	General B.A./B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade/12 th pass	Seven	Working experience as Shuttering Carpenter/ supervisory work experience in shuttering carpentry work	0	Working experience as Shuttering Carpenter/ supervisory work experience in shuttering carpentry works	

Assessor Certification	
Domain Certification	Platform Certification
Assessor- 70% in each NOS of Qualification Pack “Shuttering carpenter (System/Conventional) CON/Q3001, v2.0” and 80% overall	Assessors- 80% in each NOS of Qualification Pack “Assessor (VET and Skills) MEP/Q2701, v2.0” and overall 80%.



Assessment strategy

Assessment system Overview

Assessment is done through CSDCI affiliated Assessment Body. Assessors are trained and certified by CSDCI after training of assessor's 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 components in 30:70 ratios for shuttering carpenter V1.0 (Elective: System/Conventional) 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 Assessment agency/ Assessor will ensure adequate tools and materials are available to conduct the practical test.

The theory and practical assessments will be carried out on same day. If number of candidates are more than 20, 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

1. Synoptic multiple-choice question test
 2. Viva
- } for Knowledge Assessment



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 shuttering carpenter V1.0 (Elective: system/ conventional) is summarized below:

Assessment				
Assessment Type	Formative or Summative	Strategies	Weightage	Duration (hours)
Knowledge	Summative	MCQ/ Viva	30	1.5
Skill	Summative	Structured practical tasks	70	5.5

Assessment Quality Assurance framework

CSDCI has developed assessment criteria framework for each Qualification pack as per National Occupational Standards (NOS). The criteria framework includes weightages/marks for each criterion under knowledge and skill. The criteria ensure 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.

Video of the practical session is prepared 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 a week and uploads it on SIP.



References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training .
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module . A set of terminal outcomes help to achieve the training outcome.



Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
CSDCI	Construction Skill development Council of India
MCQ	Multiple Choice Question
EHS	Environment Health and Safety