Model Curriculum

QP Name: Foreman Fabrication

QP Code: CON/Q1208

QP Version: 3.0

NSQF Level: 4.5

Model Curriculum Version: 3.0

Construction Skill Development Council of India ||(CSDCI), CPB – 201 and 202, Block-4B, DLF corporate Park, Near Guru Dronacharya Metro Station, Phase – III, MG Road, Gurugram, Haryana – 122002

Table of Contents

Training Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure Construction
Occupation	Fabrication
Country	India
NSQF Level	5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/3122.4300
Minimum Educational Qualification and Experience	Completed 1st year of 3-years / 4-years of UG in Civil / Mechanical Engineering OR Completed 3-year Diploma in Civil / Mechanical Engineering after 10th OR Completed 2nd year of 2-years Diploma in Civil / Mechanical Engineering after 12th OR Pursuing 2nd year of 2-years Diploma in Civil / Mechanical Engineering after 12th OR 12th grade pass with 1-year of relevant industry experience OR 10th grade pass with 3-years of relevant industry experience OR Previous relevant Qualification of NSQF Level 3.5 with 3 years of relevant industry experience OR Previous relevant Qualification of NSQF Level 4 with 1.5 years of relevant industry experience
Pre-Requisite License or Training	N.A.
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	3.0
Model Curriculum Creation Date	31-03-2022
Model Curriculum Valid Up to Date	31-03-2025
Model Curriculum Version	3.0
Minimum Duration of the Course	570 hours
Maximum Duration of the Course	570 hours
Rationalization Date	18-04-2024

Program Overview

Training Outcomes

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

- Explain ways to supervise the joint preparation and related activities
- Describe the method of coordinating the joint connection and related activities
- Provide signals to equipment operator by hand or using electronic device
- Explain the heavy lifting activities.
- Describe the planning for erection works.
- Explain processes for execution of erection works.
- Explain the planning of various work activities as per the given target, timelines and resources.
- Discuss about the optimum utilization of the manpower and other resources.
- 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.
- Discuss about maintaining healthy and safe working environment at the construction site.
- Identify risks and other emergency situations at the workplace and respond accordingly to minimize risk.
- Explain methods of sanitization and infection control measures followed at the construction site.

Compulsory Modules

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

NOS and Module Details	Theory Duration (In Hours)	Practical Duration (In Hours)	On-the-Job Training Duration (Mandatory) (In Hours)	Total Duration (In Hours)
CON/N1213: Ensure completion of joint preparation activities for fabrication NOS Version No.: 3.0 NSQF Level: 4.5	**10:00**	**30:00**	**20:00**	**60:00**
Module 1: Bridge Module	05:00	00:00	00:00	08:00
Module 2: Ensure completion of joint preparation activities for fabrication activity	05:00	30:00	20:00	55:00
CON/N1214: Ensure completion of joint connection activities NOS Version No.: 2.0 NSQF Level: 4.5	**20:00**	**50:00**	**20:00**	**90:00**

Module 3: Ensure completion of joint connection activities	20:00	50:00	20:00	90:00
CON/N0726: Supervise heavy lifting of structural assemblies at construction sites NOS Version No.: 3.0 NSQF Level: 4.5	**40:00**	**55:00**	**25:00**	**120:00**
Module 4: Supervise heavy lifting of structural assemblies at construction sites	40:00	55:00	25:00	120:00
CON/N0727: Execute erection works as per drawing/ specification NOS Version No.: 2.0 NSQF Level: 4.5	**50:00**	**75:00**	**25:00**	**150:00**
Module 5: Execute erection works as per drawing / specification	50:00	75:00	25:00	150:00
CON/N7001: Plan, arrange and manage resources for execution of relevant work NOS Version No.: 4.0 NSQF Level: 5	**10:00**	**20:00**	**00:00**	**30:00**
Module 6: Plan, arrange an manage resources for execution of relevant work	10:00	20:00	00:00	30:00
CON/N8001: Work effectively in a team to deliver desired results at the workplace NOS Version No.: 12.0 NSQF Level: 4	**10:00**	**20:00**	**00:00**	**30:00**
Module 7: Communicate effectively at workplace	10:00	20:00	00:00	30:00
CON/N9002: Manage workplace for safe and healthy work environment NOS Version No.: 4.0 NSQF Level: 5	**10:00**	**20:00**	**00:00**	**30:00**
Module 8: Manage safety and healthy at workplace	10:00	20:00	00:00	30:00
DGT/VSQ/N0102: Employability Skills (60 Hours) NOS Version No.: 1.0 NSQF Level: 3	**60:00**	**00:00**	00:00	**60:00**
Module 9: Employability Skills	60:00	00:00	00:00	60:00
Total Duration	**210:00**	**270:00**	**90:00**	**570:00**

Module Details

Module 1: Bridge Module

Mapped to CON/N1213, v 3.0

Terminal Outcomes:

- Explain the role and responsibilities of the Foreman Fabrication.
- Discuss the career progression for the Foreman Fabrication.

Duration: *05:00*	**Duration: *00:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Describe the role and responsibilities of a Foreman Fabrication. • Define the personal attributes required in fabrication work. • Explain the future possible progression and career development options of a Foreman Fabrication	
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 2: Ensure completion of joint preparation activities for fabrication activity

Mapped to CON/N1213, v 3.0

Terminal Outcomes:

- Explain ways to supervise the joint preparation and related activities

Duration: *05:00*	**Duration:** *30:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Interpret drawings and weld symbol. • Interpret method statement and work instruction • Describe the process to implement safety requirements for the workman and the fabrication location. • Describe the welding procedure specification and welder qualification. • Explain the different welding process. • Explain the selection of welding consumable as per welding procedure specification. • List the different size and grades of fasteners. • Explain the selection of the different bolt tightening methods for assembly as per method statement. • Describe the quality certification marks, identification of their originality and their importance. • Explain the various deformities found in sections and their causes. • Describe the method of use of different measuring devices, their least count and area of application. • List the equipment used for gas cutting, its settings and adjustments and their results, working principles, range of operation. • Explain the ssafety considerations and parameters while working with gas cutting and beveling equipment. • List the various equipment used for grinding, their settings and adjustments and their results, working principles, range of operation, different accessories and consumables. • Explain the safety considerations and parameters while working with grinding equipment.	• estimate the quantities of resources (men, materials and machines) used in a fabrication workshop. • carry out dimensional check of components consumables • identify sections and other materials required for fabrication work • Demonstrate the checks performed for the compliance of identified materials with work requirement and specification such as grade, shape and size • Demonstrate the checks performed for the compliance of the type of consumables, selection of process parameters, thermal treatment etc. as per welding procedure specification • Demonstrate the checks performed for the quality certification marks on consumables and other tools and materials • Demonstrate the checks to ensure the plates and sections are free from damage and visible defects Demonstrate the checks to surface cleaning is done prior to cutting of section • Demonstrate the checks to the approved drawing number and revisions. • Demonstrate the checks to that markings and measurements are carried out using appropriate instruments and devices as per instructions and drawings • Demonstrate the checks to ensure that the shrinkage allowance, cutting and grinding allowances are considered in marking of sections and plate • Demonstrate the checks for the dimensions of the cut sections and identify the requirements of scalloping and edge preparation from shop drawings

• List the various equipment used for load lifting, working principles, range of operation, different accessories. • Explain the safety considerations and parameters while working with load lifting equipment. List the various equipment used for anchoring and clamping, their settings and adjustments and there results, working principles, range of operation, different accessories and consumables. • Describe the safety considerations and parameters while working with anchoring and clamping equipment. • Describe the need and importance of tack weld.	• Demonstrate the checks to ensure that prepared edge and scallop is as per design requirements shown in drawings • Demonstrate the checks for the lifting accessories, tools and gears for proper working conditions • oversee preparatory works for platforms undertaken by subordinates and provide instructions and guidance as per requirement, • Estimate and cross-check the requirements of materials, tools or other resources as provided by subordinates and report the same to superiors. • Demonstrate the checks to oversee the pre –heating/inter-pass temperature and post weld heat treatment if required and continuously monitor the heating parameters to ensure the quality and optimal utilization of resources • Demonstrate the checks to the weld equipment calibration and ensure proper connections of electrode holder and earth connections • Demonstrate the checks for climate condition and wind speed before beginning of work • Demonstrate the checks for the availability of quivers for storing of electrode • Demonstrate the checks for clamping arrangements before beginning the fit-up • Identify locations for erection of temporary anchorages and instruct any change required in same. • Demonstrate the checks for joint configuration (groove angle, root gap and root face) wherever applicable and inform the quality inspector for fit-up inspection if required • Demonstrate the checks that grooves and adjacent surfaces are free from moisture, oil, grease, rust etc. • Demonstrate the checks tor ensure the tack weld is free from defects and is of required length • Demonstrate the checks for oversee that the weld is deposited as per the approved welding procedure and monitor the welding process parameters

	• oversee the de-clamping of component to ensure safe working • ensure the de-slagging of weld joint after the completion of welding • Demonstrate the checks for for-fitted components and sections to ensure that the dimensions of the components are complying with the drawings • Instruct subordinates for repair or removal of any divergences found by quality inspectors as per requirement • Demonstrate the checks for the traceability of the fabricated component by using proper marking tool
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	
Different types of cleaners and accessories, clamps and vices, spark lighter, welding transformer with all accessories, welding transformer (or) Inverter based welding machine with all accessories, D.C Arc welding rectifiers set with all accessories, AC/DC SMAW and GTAW welding machine with water- or air-cooled torch and standard accessories, argon regulator, gas hose, water circulating system (if required), trolley for cylinder, clamps, tapes, electrode holders, gas regulators, flashback arrestors, welding helmet, welding glass, chipping hammer, chisel, leather hand gloves, Jump suit, wire brush, hand and leg guards' leather, safety goggles, nose mask, ear protection, fire extinguishers, sand buckets	

Module 3: Ensure completion of Joint Connection activities

Mapped to CON/N1214, v 3.0

Terminal Outcomes:

- Describe the method of coordinating the joint connection and related activities

Duration: *20:00*	**Duration: *50:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the welding terminologies like arc, flux, slag etc. • List the different materials used in fabrication. • Describe the different welding parameters. • Explain the correct calibration of welding kit and various adjustments in the same. • Explain the importance of proper joint finishing • Interpret fabrication shop drawings. • Interpret various welding specifications from charts and tables. • Describe the appropriate procedure for storage of electrodes. • Explain the basics of SMAW, GMAW, GTAW, SAW and FCAW processes. • Explain the effect of polarity on welding. • Explain the correct handling and storage of gas cylinders for welding purposes. • Explain the power ratings of welding equipment. • Explain the relationship between wire feed, speed control and voltage. • Explain the gas regulation, rate of flow of shielding gas and its effects. • Explain the components of welding gun, equipment and their functions. • Explain the effects of welding fumes. • Explain the consumable, their specification, types, usage, storage and handling. • List the different types of shielding gases and their uses in different conditions. • Explain the appropriate positions of welding, specific to requirements. • Explain the patterns and position of welding and their application. • List the grinding and gas cutting equipment specification and application.	• Demonstrate checks on the joints prepared for accurate dimensions and smoothness. • Demonstrate checks on the edge preparation nomenclature of the members. • Demonstrate checks on the surface preparation of base metal before beginning of weld • Extract weld specifications from drawings and other technical documents. • Identify the cause of improper welding. • Measure the weld bead profile by weld gauge. • Identify other defects in welds such as undercut, lack of fusion, cracks, craters, spatters etc. and suggest corrective measures for avoiding these defects in future • Conduct dimensional checks of the connected assemblies or components • Demonstrate checks on bolt holes for their size, position, shape and grouping • Demonstrate checks to ensure that required number of nuts, bolts and washers are available and have cleared quality inspection before commencing the work • Extract the bolting requirements from drawings, standards or specifications • Demonstrate monitoring and observation of safe working practices as per organizational norms within workplace • Demonstrate effective communication skills by instructing subordinates for repair or removal of any divergences found by quality inspectors as per requirement
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	

Different types of cleaners and accessories, clamps and vices, spark lighter, welding transformer with all accessories, welding transformer (or) Inverter based welding machine with all accessories, D.C Arc welding rectifiers set with all accessories, AC/DC SMAW and GTAW welding machine with water or air cooled torch and standard accessories, argon regulator, gas hose, water circulating system (if required), trolley for cylinder, clamps, tapes, electrode holders, gas regulators, flashback arrestors, welding helmet, welding glass, chipping hammer, chisel, leather hand gloves, Jump suit, wire brush, hand and leg guards leather, safety goggles, nose mask, ear protection, fire extinguishers, sand buckets, grinding and gas cutting equipment

Module 4: Supervise heavy lifting of structural assemblies at construction sites

Mapped to CON/N0726. V2.0

Terminal Outcomes:

- Provide signals to equipment operator by hand or using electronic device
- Explain the heavy lifting activities.

Duration: *40:00*	**Duration:** *55:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Interpret lifting and erection plan and schedule • Interpret drawings, specifications relevant to task. • Describe the working mechanism of heavy lifting equipment like cranes, jacks, winches, derricks. • List the load lifting capacity of lifting equipment under use. • List the statutory requirements of lifting equipment and its operators for safe working at construction sites. • Describe the preparatory works to be completed for using heavy lift equipment like area grading, base • compaction, periodical maintenance • Explain the code of practices relevant to lifting operations. • Describe the common hazards involved in heavy lifting and erection work. • Explain the reporting procedures as per standard and organizational norms • List the factors influencing lifting and erection work like wind speed, visibility, shape and weight of object being lifted, presence of obstruction, counter weight etc. • Explain about load lifting capacity of the equipment under operation according to boom length and angle • of boom • Describe the standard hand signals applicable to heavy load lifting operations by cranes • Discuss about load chart applicable to lifting equipment • Discuss about communication devices • Describe the ways to provide direction to lifting equipment operator using communication device	• Demonstrate the briefing of subordinates about heavy lifting plan and safety control measures prior to lifting. • Demonstrate the allocation of activities to specified subordinates as per their level of expertise. Demonstrate the analyze of hazards related with lifting operations and report to concerned authority for any required action • Conducting checks/trail runs on the equipment to ensure safe and desired functioning of lifting equipment • Demonstrate physical checks on components, assemblies and its locations where sling is to be • attached for lifting • Demonstrate the checks slinging tools and lifting tools for their usability and specifications according to load • Demonstrate the checks to ensure tightening of shackles, hooks, anchoring slings or belts during lifting of load • Demonstrate the checks to ensure exact locking of sling at hook of crane • Demonstrate the checks to ensure the use of tag line of adequate length to control motion of the suspended load • Demonstrate the checks to ensure free motion of crane boom load movement path is free from any static or mobile obstruction and is adequately illuminated • Demonstrate the checks to ensure erection of barricades surrounding heavy lifting location • Provide signals to equipment operator by hand or using electronic devices • Demonstrate the maintenance of clear line of vision with the operator and suspended load while providing signal

	• provide appropriate verbal directions to equipment operator using communication devices • Show adherence to standard hand signal methods while providing signals • Provide signals to guide suspended loads to appropriate location under critical conditions
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	
Spud Wrenches, Open-End Wrenches, Crescent Wrenches, Hammer, Nibbler, pliers, Impact Wrench, Drilling machine with bits, Electric screw gun, Electric hexa saw, Measuring tape, Plumb Bob, Spirit level, Chalks line, Try square, Water level, Tower crane, Mobile crane, Forklift, Scissor lift, Hydraulic jacks, Electric Wire Rope Hoist, Civil / Mechanical winch, Civil / Mechanical chain hoist, Belts, Slings, Wire ropes, Shackles, Spreader board, Chain, Link, Eye hook, Eye bolts, Bull dog grips, Clamp, Socket, Safety instruments, Safety Helmet, Safety goggles , Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit, Barricade tape, Safety Tags	

Module 5: Execute erection works as per drawing/ specification

Mapped to CON/N0727, v 3.0

Terminal Outcomes:

- Describe the planning for erection works.
- Explain processes for execution of erection works.

Duration: *50:00*	**Duration:** *75:00*
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• List the statutory compliance requirement related to workmen engagement. • Discuss the specified level, orientation of the structure to be erected. • Discuss the technical details (related to erection) applicable to the component, assembly. • List the different standard sections of structural steel. • Describe the dimensional checks to be performed as per requirement. • Explain the different types of welding according to welding material, method and criticality in position. • Explain the different types of bolts as per diameter and their functions. • Explain the welded joints, bolt joints and rivet joints and their use. • Explain the gas cutting and grinding works. • Explain the working mechanism of heavy lifting equipment like cranes, jacks, winches, derricks. • Explain the load lifting capacity of lifting equipment under use. • List the common hazards involved in heavy lifting and erection work. • List the factors having influence in lifting and erection work like wind speed, visibility, shape and weight of object being lifted, presence of obstruction, counter weight etc. • Explain the load lifting capacity of equipment according to angle of boom • Explain about the maximum boom length of the equipment. • Explain about the methods of linear, areal and volumetric measurement. • Discuss the standard hand signals applicable to heavy load lifting operations by cranes. • Describe the load chart applicable to lifting equipment .	• Interpret structural drawings to determine structural locations, orientations, critical erection points and resource required for executing the work. • Show adherence to specified time line for completion of activities. • Demonstrate the sequencing of key activities related to lifting and erection of components or assemblies. • Demonstrate the management of required resources in coordination with superiors and other respective authorities • Demonstrate the checks for completion of preparatory activities. • Transfer the technical drawing to hand sketches. • Demonstrate the overseeing of lowering, placing and positioning of components or assemblies by providing instructions to the subordinates to achieve desired outcome. • Demonstrate the overseeing of erection activity and ensure the orientation of structural components and assemblies is within tolerance limit, as per relevant drawings or instructions. • Demonstrate the checks for verticality, level, location, centre to centre distance, diagonal, orientation of transvers truss, column, flatness of end plate, splice plate (close mating of plate) etc of the erected truss/ member/ assembly. • Demonstrate the checks for the terminals, edges, holes and joints for compliance as per quality control checklists or guidelines. • Demonstrate the checks for the bolt tightening of the assembly as per requirement (snug- tightening, torqueing and DTI) • Demonstrate the checks for stick-out of the bolt as per specification. • Demonstrate the checks for the matching of holes and inform the supervisor of any

	deviation • Demonstrate the grouting works as per specifications. • Demonstrate the checks on bolts and bolts assembly to confirm their compliance. • Demonstrate the checks on threaded inserts. • Demonstrate the checks stability of erected components. • Demonstrate the completion of work as per set standards and offer for quality control checks by superior and other concerned authorities
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	
Spud Wrenches, Open-End Wrenches, Crescent Wrenches, Hammer, Nibbler, pliers, Impact Wrench, Drilling machine with bits, Electric screw gun, Electric hexa saw, Measuring tape, Plumb Bob, Spirit level, Chalks line, Try square, Water level, Tower crane, Mobile crane, Forklift, Scissor lift, Hydraulic jacks, Electric Wire Rope Hoist, Civil / Mechanical winch, Civil / Mechanical chain hoist, Belts, Slings, Wire ropes, Shackles, Spreader board, Chain, Link, Eye hook, Eye bolts, Bull dog grips, Clamp, Socket, Safety instruments, Safety Helmet, Safety goggles , Safety shoes, Safety belt, Cotton gloves, Ear plugs , Reflective jackets, Dust mask, Fire Prevention kit, Barricade tape, Safety Tags	

Module 6: Plan, arrange and manage resources for execution of relevant work

Mapped to CON/N7001, v4.0

Terminal Outcomes:

- Explain the planning of various work activities as per the given target, timelines and resources.
- Discuss about the optimum utilization of the manpower and other resources.

Duration: *10:00*	**Duration: *20:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• 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 basic concept of labour productivity and work productivity. • Interpret the Construction drawing for the technical details. • Discuss the methods to calculate the quantum of the given work. • Estimate the quantities of tools, accessories, materials and manpower required as per the given work. • State the standard working practices for the given work. • Discuss the methods and techniques for briefing team members on the matter of the given work. • Describe the methods to evaluate the progress and quality of the ongoing works. • Explain the importance of daily productivity report and attendance register. • Discuss on the optimized use of the available resources. • Explain the process to produce 2D drawings using auto-cad software.	• Identify the work target, timeline and plan activities to achieve the desired productivity. • Demonstrate the planning for various activities relevant to task as per the scope and schedule. • Calculate the requirement of manpower as per the quantum and nature of the given work. • Demonstrate to allocate the work among the various teammates as per the schedule and work plan. • Demonstrate the ability to coordinate with the teammates and superiors for the timely execution of the given work. • Ensure the optimum utilization of the manpower and other resources. • Prepare the daily Labour attendance record and their productivity report. • Demonstrate the methods to allocate various materials, equipment and tools to workmen as per the requirements. • Demonstrate optimum use of resources while performing domain specific work activities. • Ensure the completion of the given work/ task as per the allocated resources and specified timeline • Demonstrate to exhibit proper housekeeping after the completion of the work.
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 7: Communicate effectively at workplace

Mapped to CON/N8001, v 12.0

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: *10:00*	**Duration:** *20:00*
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 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.
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 8: Manage safety and health at workplace

Mapped to CON/N9002, v 4.0

Terminal Outcome:

- Discuss about maintaining healthy and safe working environment at the construction site.
- Identify risks and other emergency situations at the workplace and respond accordingly to minimize risk.
- Explain methods of sanitization and infection control measures followed at the construction site.

Duration: *10:00*	**Duration: *20:00***
Theory – Key Learning Outcomes	**Practical – Key Learning Outcomes**
• Explain the various types of hazards at construction site and procedures to respond in case of any emergency or accidents. • Discuss about the various personal protective equipment (PPE) used during various construction works. • Describe the safe work practices to be followed while performing task. • Discuss the methods to ensure the workplace safety and good health of workers. • Explain the safe ways for using tools, tackles, equipment and materials as specified by Environment, Health and Safety (EHS) department. • Discuss the policies, guidelines and other requirements related to workplace safety as per EHS department/ government norms. • Describe the various types of infectious disease, their symptoms and control, at the construction site. • Discuss the medical guidelines, national legislation, local policies and protocols regarding spread of infectious disease.	• Ensure that all the safety and protection installation at construction site are adequate and correctly placed. • Demonstrate effective implementation of the health and safety plan for all the subordinates at the construction site. • Perform checks to ensure the safe handling, stacking and storing of tools, tackles, equipment and materials at the work place. • Demonstrate effective use of proper PPE by the subordinates. • Demonstrate provision for proper entrance and exit from confined spaces, excavated pits and other locations of workplace, as per safety recommendations. • Demonstrate the use of fire protection equipment for different type of fire hazard. • Demonstrate ways to create awareness about organisational policies and procedures associated with health, safety and welfare of construction workers. • Demonstrate the procedures for identifying, recording and reporting of hazards/accidents/ hazard of any infectious disease/ pandemic as per organizational and statuary requirements. • Ensure effective adherence to response to emergency procedures / protocols. • Demonstrate effective implementation of control measures to reduce risks. • Demonstrate vertigo test. • Demonstrate the practices to maintain personal hygiene, workplace hygiene and site/ workplace sanitization. • Ensure proper housekeeping at the workplace.

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 & 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, personal protective equipment (PPE), organizational and statuary documents for EHS

Module 9: 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

After completing this programme, participants will be able to:

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

After completing this programme, participants will be able to:

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

After completing this programme, participants will be able to:

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

After completing this programme, participants will be able to:

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

Communication Skills Duration: 5 Hours

After completing this programme, participants will be able to:

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

After completing this programme, participants will be able to:

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

After completing this programme, participants will be able to:

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.

Essential Digital Skills Duration: 10 Hours

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

Entrepreneurship Duration: 7 Hours

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

Customer Service Duration: 5 Hours

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

Getting Ready for apprenticeship & Jobs Duration: 8 Hours

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

On-the-Job Training

Mapped to Foreman - Fabrication, v 3.0

CON/N1213 v. 3.0, Mandatory Duration: 20:00
Location: On Site
• estimate the quantities of resources (men, materials and machines) used in a fabrication workshop. • carry out dimensional check of components consumables • identify sections and other materials required for fabrication work • Demonstrate the checks performed for the compliance of identified materials with work requirement and specification such as grade, shape and size • Demonstrate the checks performed for the compliance of the type of consumables, selection of process parameters, thermal treatment etc. as per welding procedure specification • Demonstrate the checks performed for the quality certification marks on consumables and other tools and materials • Demonstrate the checks to ensure the plates and sections are free from damage and visible defects Demonstrate the checks to surface cleaning is done prior to cutting of section • Demonstrate the checks to the approved drawing number and revisions. • Demonstrate the checks to that markings and measurements are carried out using appropriate instruments and devices as per instructions and drawings • Demonstrate the checks to ensure that the shrinkage allowance, cutting and grinding allowances are considered in marking of sections and plate • Demonstrate the checks for the dimensions of the cut sections and identify the requirements of scalloping and edge preparation from shop drawings • Demonstrate the checks to ensure that prepared edge and scallop is as per design requirements shown in drawings • Demonstrate the checks for the lifting accessories, tools and gears for proper working conditions • oversee preparatory works for platforms undertaken by subordinates and provide instructions and guidance as per requirement, • Estimate and cross-check the requirements of materials, tools or other resources as provided by subordinates and report the same to superiors. • Demonstrate the checks to oversee the pre –heating/inter-pass temperature and post weld heat treatment if required and continuously monitor the heating parameters to ensure the quality and optimal utilization of resources • Demonstrate the checks to the weld equipment calibration and ensure proper connections of electrode holder and earth connections • Demonstrate the checks for climate condition and wind speed before beginning of work • Demonstrate the checks for the availability of quivers for storing of electrode • Demonstrate the checks for clamping arrangements before beginning the fit-up • Identify locations for erection of temporary anchorages and instruct any change required in same. • Demonstrate the checks for joint configuration (groove angle, root gap and root face) wherever applicable and inform the quality inspector for fit-up inspection if required • Demonstrate the checks that grooves and adjacent surfaces are free from moisture, oil, grease, rust etc. • Demonstrate the checks tor ensure the tack weld is free from defects and is of required length • Demonstrate the checks for oversee that the weld is deposited as per the approved welding procedure and monitor the welding process parameters

- oversee the de-clamping of component to ensure safe working
- ensure the de-slagging of weld joint after the completion of welding
- Demonstrate the checks for for-fitted components and sections to ensure that the dimensions of the components are complying with the drawings
- Instruct subordinates for repair or removal of any divergences found by quality inspectors as per requirement
- Demonstrate the checks for the traceability of the fabricated component by using proper marking tool

CON/N1214, v 3.0, Mandatory Duration: 20:00

Location: On Site

- Demonstrate checks on the joints prepared for accurate dimensions and smoothness.
- Demonstrate checks on the edge preparation nomenclature of the members.
- Demonstrate checks on the surface preparation of base metal before beginning of weld
- Extract weld specifications from drawings and other technical documents.
- Identify the cause of improper welding.
- Measure the weld bead profile by weld gauge.
- Identify other defects in welds such as undercut, lack of fusion, cracks, craters, spatters etc. and suggest corrective measures for avoiding these defects in future
- Conduct dimensional checks of the connected assemblies or components
- Demonstrate checks on bolt holes for their size, position, shape and grouping
- Demonstrate checks to ensure that required amount of nuts, bolts and washers are available and have cleared quality inspection before commencing the work
- Extract the bolting requirements from drawings, standards or specifications
- Demonstrate monitoring and observation of safe working practices as per organizational norms within workplace
- Demonstrate effective communication skills by instructing subordinates for repair or removal of any divergences found by quality inspectors as per requirement

CON/N0726, v 3.0, Mandatory Duration: 25:00

Location: On Site

- Demonstrate the briefing of subordinates about heavy lifting plan and safety control measures prior to lifting.
- Demonstrate the allocation of activities to specified subordinates as per their level of expertise. Demonstrate the analyze of hazards related with lifting operations and report to concerned authority for any required action
- Conducting checks/trail runs on the equipment to ensure safe and desired functioning of lifting equipment
- Demonstrate physical checks on components, assemblies and its locations where sling is to be
- attached for lifting
- Demonstrate the checks slinging tools and lifting tools for their usability and specifications according to load
- Demonstrate the checks to ensure tightening of shackles, hooks, anchoring slings or belts during lifting of load
- Demonstrate the checks to ensure exact locking of sling at hook of crane
- Demonstrate the checks to ensure the use of tag line of adequate length to control motion of the suspended load
- Demonstrate the checks to ensure free motion of crane boom load movement path is free from any static or mobile obstruction and is adequately illuminated
- Demonstrate the checks to ensure erection of barricades surrounding heavy lifting location
- Provide signals to equipment operator by hand or using electronic devices

• Demonstrate the maintenance of clear line of vision with the operator and suspended load while providing signal • provide appropriate verbal directions to equipment operator using communication devices • Show adherence to standard hand signal methods while providing signals • Provide signals to guide suspended loads to appropriate location under critical conditions
CON/N0727, v 3.0, Mandatory Duration: 25:00
Location: On Site
• Interpret structural drawings to determine structural locations, orientations, critical erection points and resource required for executing the work. • Show adherence to specified time line for completion of activities. • Demonstrate the sequencing of key activities related to lifting and erection of components or assemblies. • Demonstrate the management of required resources in coordination with superiors and other respective authorities • Demonstrate the checks for completion of preparatory activities. • Transfer the technical drawing to hand sketches. • Demonstrate the overseeing of lowering, placing and positioning of components or assemblies by providing instructions to the subordinates to achieve desired outcome. • Demonstrate the overseeing of erection activity and ensure the orientation of structural components and assemblies is within tolerance limit, as per relevant drawings or instructions. • Demonstrate the checks for verticality, level, location, centre to centre distance, diagonal, orientation of transvers truss, column, flatness of end plate, splice plate (close mating of plate) etc of the erected truss/ member/ assembly. • Demonstrate the checks for the terminals, edges, holes and joints for compliance as per quality control checklists or guidelines. • Demonstrate the checks for the bolt tightening of the assembly as per requirement (snug-tightening, torqueing and DTI) • Demonstrate the checks for stick-out of the bolt as per specification. • Demonstrate the checks for the matching of holes and inform the supervisor of any deviation • Demonstrate the grouting works as per specifications. • Demonstrate the checks on bolts and bolts assembly to confirm their compliance. • Demonstrate the checks on threaded inserts. • Demonstrate the checks stability of erected components. • Demonstrate the completion of work as per set standards and offer for quality control checks by superior and other concerned authorities

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Training Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post- Graduation	Civil / Mechanical Engineering	3	Fabrication Works	1	Fabrication Works	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.
Graduation	Civil / Mechanical Engineering	4	Fabrication Works	1	Fabrication Works	
Diploma	Civil / Mechanical Engineering	5	Fabrication Works	1	Fabrication Works	
Graduation/ Ex. Army/ ITI Coarse/ Others	B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade	7	Fabrication Works	1	Fabrication Works	

Trainer Certification	
Domain Certification	**Platform Certification**
Recommended that the Trainer is certified for the Job Role: "Foreman-Fabrication", mapped to the Qualification Pack: "CON/Q01208, v3.0". The minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: "Trainer (VET and skills)", mapped to the Qualification Pack: "MEP/Q2601, v3.0". The minimum accepted score is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	**Specialization**	**Relevant Industry Experience**		**Assessment Experience**		**Remarks**
		Years	***Specialization***	***Years***	***Specialization***	
Post- Graduation	Civil / Mechanical Engineering	4	Fabrication Works	1	Fabrication Works	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.
Graduation	Civil / Mechanical Engineering	5	Fabrication Works	1	Fabrication Works	
Diploma	Civil / Mechanical Engineering	6	Fabrication Works	1	Fabrication Works	
Graduation/ Ex. Army/ ITI Coarse/ Others	B.Sc./ Graduation certificate from Army/ITI certificate in relevant trade	8	Fabrication Works	1	Fabrication Works	

Assessor Certification	
Domain Certification	**Platform Certification**
Recommended that the Assessor is certified for the Job Role: "Foreman-Fabrication", mapped to the Qualification Pack: "CON/Q01208, v3.0". The minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: "Assessor (VET and skills)", mapped to the Qualification Pack: "MEP/Q2701, v3.0". The minimum accepted score is 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 components in 30:70 ratio for false ceiling and Dry wall installer 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 is 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:
- Knowledge assessment (theory/viva assessment)
- Skill assessment (practical/hands-on skill assessment)

Mode of assessment:

- Demonstration/Practical for Performance /Skill Assessment
- Synoptic multiple-choice question test } for Knowledge Assessment
- 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 false ceiling and dry wall installer is summarized below

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

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 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.
- 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.

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
PPEs	Personal Protective Equipment