Qualification Pack



Construction Fabricator

Concreting

QP Code: ICE/CON/Q0501 Instantiated QP Code: ICE/CON/Q0501-SI004

Version: 1.0

NSQF Level: 4

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Qualification Pack

ICE/CON/Q0501-SI004: Construction Fabricator

Brief Job Description

A Construction Fabricator assembles, shapes, and installs materials like metal, wood, masonry, and concrete to create structural elements for buildings and infrastructure. The individual interprets construction drawings, identifies materials, and follows the applicable safety and quality standards. The specializations available in the job include masonry, woodworking, metalworking, and concreting.

Personal Attributes

The individual should be physically fit and mentally alert. The person should have problem-solving, coordination and appropriate verbal and written communication skills.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. ICE/CON/N0501: Identify Construction Building Materials and Components
2. ICE/CON/N0502: Follow Environment, Health and Safety (EHS) Guidelines at Construction Sites
3. DGT/VSQ/N0102: Employability Skills (60 Hours)

Electives*(mandatory to select at least one):*

Elective : Concreting

1. ICE/CON/N0518: Prepare, Pour and Cure Concrete Structures
2. ICE/CON/N0519: Perform Concreting for Structural Elements
3. ICE/CON/N0520: Carry Out Reinforced Concrete Works
4. ICE/CON/N0521: Repair and Restore Concrete Surfaces
5. ICE/CON/N0522: Construct and Install Precast Concrete Structures

Qualification Pack (QP) Parameters

Sector	Construction

Qualification Pack

Sub-Sector	Infrastructure Construction
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
Country	India
NSQF Level	4
Credits	13
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7122.0601, NCO-2015/7112.0200, NCO-2015/7115.0201, NCO-2015/7213.0200, NCO-2015/7114.9900
Minimum Educational Qualification & Experience	12th grade Pass OR 10th grade pass with 2 Years of experience Relevant Industry OR 8th grade pass with 4 Years of experience Relevant Industry
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	18 Years
Last Reviewed On	NA
Next Review Date	07/10/2028
NSQC Approval Date	07/10/2025
Version	1.0
Reference code on NQR	NCVET-QG-04-CO-046442025-V1-ICES
NQR Version	1.0

Remarks:

The Min. Job Entry Age for this Job Role will be as per Government Norms

Qualification Pack

ICE/CON/N0501: Identify Construction Building Materials and Components

Description

This unit covers identifying, selecting and inspecting various building materials and components required for fabrication tasks. This includes understanding material specifications, properties, and applications to ensure proper use in construction projects.

Scope

The scope covers the following :

- Identify building materials
- Inspect and verify the quality of materials
- Organize and prepare materials

Elements and Performance Criteria

Identify building materials

To be competent, the user/individual on the job must be able to:

PC1. identify different types of metals, such as steel, aluminium and alloys, used in construction

PC2. explain distinguish between non-metallic materials like concrete, glass, wood and plastics based on their properties and uses

PC3. interpret technical specifications of materials from product catalogues, datasheets and drawings

PC4. identify common building components such as beams, columns, trusses and panels based on drawings and specifications

Inspect and verify the quality materials

To be competent, the user/individual on the job must be able to:

PC5. check the dimensions, weight and appearance of materials against specifications

PC6. assess the physical condition of materials for defects such as cracks, rust or warping

PC7. confirm material certifications and test reports to ensure compliance with the applicable quality standards

PC8. report any discrepancies or substandard materials to the supervisor

Organize and prepare materials

To be competent, the user/individual on the job must be able to:

PC9. sort and label materials as per their type, size and intended use

PC10. store materials safely to prevent damage or contamination

PC11. check for the availability of appropriate tools and equipment for material handling during fabrication

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for material identification and handling
KU2. roles involved in ensuring material quality and compliance
KU3. common construction material defects and reporting lines for escalating material-related issues
KU4. types and classifications of construction materials (e.g., ferrous and non-ferrous metals, composites, polymers)
KU5. properties of materials such as strength, durability, and resistance to environmental conditions
KU6. use of material handling equipment, e.g.forklifts, pallet jacks, and trolleys
KU7. relevant material storage techniques
KU8. quality standards and certifications for construction materials (e.g., BIS, ASTM)
KU9. interpret specifications and drawings to identify material requirements
KU10. verify material quality through physical inspection and documentation review
KU11. benefits of sorting and storing materials systematically, e.g. accessibility and safety
KU12. use of measuring tools such as rulers, micrometers, calipers and weighing scales
KU13. material datasheets, product catalogues and technical specifications
KU14. use of relevant Personal Protective Equipment (PPE) for safe construction material handling

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. comprehend technical documents, instructions and specifications accurately
GS2. use basic math skills for measurements, calculations,and verification tasks
GS3. convey information, report issues and coordinate with team members and supervisors with clarity
GS4. identify challenges and inconsistencies in tasks and resolve them effectively or escalate as needed
GS5. plan and prioritize work to ensure efficient task completion
GS6. collaborate effectively with others to meet project requirements and deadlines
GS7. adjust to changing priorities, updates or unexpected challenges in the work environment
GS8. follow safety protocols and guidelines consistently to maintain a secure workplace
GS9. acquire new skills and knowledge to improve work efficiency and adaptability

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify building materials	**10**	**20**	**-**	**4**
PC1. identify different types of metals, such as steel, aluminium and alloys, used in construction	-	-	-	-
PC2. explain distinguish between non-metallic materials like concrete, glass, wood and plastics based on their properties and uses	-	-	-	-
PC3. interpret technical specifications of materials from product catalogues, datasheets and drawings	-	-	-	-
PC4. identify common building components such as beams, columns, trusses and panels based on drawings and specifications	-	-	-	-
Inspect and verify the quality materials	**10**	**20**	**-**	**4**
PC5. check the dimensions, weight and appearance of materials against specifications	-	-	-	-
PC6. assess the physical condition of materials for defects such as cracks, rust or warping	-	-	-	-
PC7. confirm material certifications and test reports to ensure compliance with the applicable quality standards	-	-	-	-
PC8. report any discrepancies or substandard materials to the supervisor	-	-	-	-
Organize and prepare materials	**10**	**20**	**-**	**2**
PC9. sort and label materials as per their type, size and intended use	-	-	-	-
PC10. store materials safely to prevent damage or contamination	-	-	-	-
PC11. check for the availability of appropriate tools and equipment for material handling during fabrication	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0501
NOS Name	Identify Construction Building Materials and Components
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	4
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

ICE/CON/N0502: Follow Environment, Health and Safety (EHS) Guidelines at Construction Sites

Description

This unit focuses on implementing Environment, Health and Safety (EHS) guidelines to minimize risks and ensure compliance with legal and organizational standards.

Scope

The scope covers the following :

- Identify hazards and risks
- Comply with safety standards
- Follow health and hygiene guidelines
- Follow environmental protection measures
- Handle emergencies

Elements and Performance Criteria

Identify hazards and risks

To be competent, the user/individual on the job must be able to:

PC1. identify common construction site hazards, including falling objects, slippery surfaces and electrical risks

PC2. evaluate the potential risks

PC3. report the identified hazards to the supervisor or safety officer

Comply with safety standards

To be competent, the user/individual on the job must be able to:

PC4. use and maintain personal protective equipment (PPE) such as helmets, gloves, safety boots and harnesses

PC5. follow signage and barricading instructions to avoid restricted or hazardous areas

PC6. adhere to safe lifting techniques and tools to minimize strain and injuries

Follow health and hygiene guidelines

To be competent, the user/individual on the job must be able to:

PC7. maintain personal hygiene by using clean drinking water and designated rest areas

PC8. report health symptoms (e.g., respiratory issues, heatstroke) promptly to the designated authority

PC9. ensure proper handling and disposal of materials that may pose health risks such as asbestos or chemicals

Follow environmental protection measures

To be competent, the user/individual on the job must be able to:

PC10. follow appropriate measures to prevent the spillage of construction materials and chemicals that may harm the environment

PC11. carry out waste segregation activities into biodegradable and non-biodegradable for recycling and disposal

PC12. follow protocols for conserving water and energy at the construction site

Handle emergencies

To be competent, the user/individual on the job must be able to:

PC13. identify emergency alarms and evacuation routes

PC14. use firefighting equipment (fire extinguishers, sand buckets) proper, when necessary

PC15. assist in first-aid or CPR procedures, if required

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. importance of EHS guidelines and company policies

KU2. reporting structure for safety incidents or concerns

KU3. roles of key personnel such as the safety officer and site engineer

KU4. types of construction hazards (e.g. chemical, physical, ergonomic)

KU5. correct use and maintenance of PPE

KU6. first aid and basic firefighting techniques

KU7. environmental regulations related to construction, e.g. dust control, waste disposal etc.

KU8. safe operation of construction tools and equipment

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. effectively report hazards or safety violations

GS2. read safety signage and instructions

GS3. carry out appropriate documentation concerning workplace safety

GS4. apply basic problem-solving skills to manage minor risks or incidents

GS5. collaborate with the team during emergencies or environmental protection activities

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Identify hazards and risks	**6**	**12**	**-**	**2**
PC1. identify common construction site hazards, including falling objects, slippery surfaces and electrical risks	-	-	-	-
PC2. evaluate the potential risks	-	-	-	-
PC3. report the identified hazards to the supervisor or safety officer	-	-	-	-
Comply with safety standards	**6**	**12**	**-**	**2**
PC4. use and maintain personal protective equipment (PPE) such as helmets, gloves, safety boots and harnesses	-	-	-	-
PC5. follow signage and barricading instructions to avoid restricted or hazardous areas	-	-	-	-
PC6. adhere to safe lifting techniques and tools to minimize strain and injuries	-	-	-	-
Follow health and hygiene guidelines	**6**	**12**	**-**	**2**
PC7. maintain personal hygiene by using clean drinking water and designated rest areas	-	-	-	-
PC8. report health symptoms (e.g., respiratory issues, heatstroke) promptly to the designated authority	-	-	-	-
PC9. ensure proper handling and disposal of materials that may pose health risks such as asbestos or chemicals	-	-	-	-
Follow environmental protection measures	**6**	**12**	**-**	**2**
PC10. follow appropriate measures to prevent the spillage of construction materials and chemicals that may harm the environment	-	-	-	-
PC11. carry out waste segregation activities into biodegradable and non-biodegradable for recycling and disposal	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. follow protocols for conserving water and energy at the construction site	-	-	-	-
Handle emergencies	**6**	**12**	**-**	**2**
PC13. identify emergency alarms and evacuation routes	-	-	-	-
PC14. use firefighting equipment (fire extinguishers, sand buckets) proper, when necessary	-	-	-	-
PC15. assist in first-aid or CPR procedures, if required	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0502
NOS Name	Follow Environment, Health and Safety (EHS) Guidelines at Construction Sites
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication, MEP Supervison - Maintenance
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

Qualification Pack

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. identify employability skills required for jobs in various industries

PC2. identify and explore learning and employability portals

Constitutional values – Citizenship

To be competent, the user/individual on the job must be able to:

PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.

PC4. follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC5. recognize the significance of 21st Century Skills for employment

PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC7. use basic English for everyday conversation in different contexts, in person and over the telephone

PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English

PC9. write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

PC10. understand the difference between job and career

PC11. prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

To be competent, the user/individual on the job must be able to:

PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings

PC13. work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC14. communicate and behave appropriately with all genders and PwD

PC15. escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC16. select financial institutions, products and services as per requirement

PC17. carry out offline and online financial transactions, safely and securely

PC18. identify common components of salary and compute income, expenses, taxes, investments etc

PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC20. operate digital devices and carry out basic internet operations securely and safely

PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively

PC22. use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research

PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion

PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

PC26. identify different types of customers

PC27. identify and respond to customer requests and needs in a professional manner.

PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings

GS3. behave politely and appropriately with all
GS4. how to work in a virtual mode
GS5. perform calculations efficiently
GS6. solve problems effectively
GS7. pay attention to details
GS8. manage time efficiently
GS9. maintain hygiene and sanitization to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**2**	**4**	**-**	**-**
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
Career Development & Goal Setting	**1**	**2**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
Communication Skills	**2**	**2**	**-**	**-**
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**2**	**-**	**-**
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
Financial and Legal Literacy	**2**	**3**	**-**	**-**
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
Essential Digital Skills	**3**	**4**	**-**	**-**
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Entrepreneurship	**2**	**3**	**-**	**-**
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
Customer Service	**1**	**2**	**-**	**-**
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**2**	**3**	**-**	**-**
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	22/09/2026
Next Review Date	22/09/2031
NSQC Clearance Date	22/09/2026

ICE/CON/N0518: Prepare, Pour and Cure Concrete Structures

Description

This unit covers the process of preparing, pouring, and curing concrete structures using both traditional and advanced concreting techniques.

Scope

The scope covers the following :

- Read and interpret construction drawings
- Prepare materials and mix concrete
- Pour and place concrete
- Compact concrete
- Cure concrete

Elements and Performance Criteria

Read and Interpret Construction Drawings

To be competent, the user/individual on the job must be able to:

PC1. analyze structural blueprints to determine concrete specifications and reinforcement details.

PC2. identify load-bearing sections and reinforcement placements as per project requirements.

PC3. calculate the quantity of concrete required based on mix proportions and structural dimensions.

PC4. mark layout points for formwork placement using leveling tools and total stations.

Prepare Materials and Mix Concrete

To be competent, the user/individual on the job must be able to:

PC5. select appropriate cement, aggregates, and admixtures based on strength and workability requirements.

PC6. measure and batch materials using weigh batching and volumetric batching methods.

PC7. mix concrete manually, mechanically, or using ready-mix concrete (RMC) plants for uniform consistency.

PC8. adjust water-cement ratios and incorporate plasticizers or retarders to improve workability.

PC9. test slump, workability, and consistency of concrete before pouring.

Pour and Place Concrete

To be competent, the user/individual on the job must be able to:

PC10. transport concrete using wheelbarrows, pumps, or conveyors for efficient placement.

PC11. pour concrete in layers to avoid segregation and cold joints.

PC12. use self-compacting concrete (SCC) technology to eliminate the need for vibration.

PC13. apply slip-form and jump-form techniques for continuous concreting in high-rise structures.

PC14. embed reinforcement bars, anchor bolts, and conduits while placing concrete.

Compact Concrete

To be competent, the user/individual on the job must be able to:

PC15. use mechanical vibrators such as needle, surface, and form vibrators to remove air voids.
PC16. ensure uniform compaction to prevent honeycombing and weak zones.
PC17. apply pressure grouting techniques for filling voids in hardened concrete.

Cure Concrete

To be competent, the user/individual on the job must be able to:

PC18. apply traditional curing methods such as ponding, wet covering, and water spraying.
PC19. use curing compounds and self-curing concrete additives for moisture retention.
PC20. cover concrete with plastic sheets or wet burlap to prevent rapid moisture loss.
PC21. implement steam curing and accelerated curing methods for precast concrete elements.
PC22. monitor curing temperatures and maintain optimal moisture levels for hydration.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. properties and classification of different types of concrete, including normal, high-strength, and self-compacting concrete.
KU2. components of concrete mixtures and their roles, including cement, aggregates, water, and admixtures.
KU3. principles of mix design, including water-cement ratio, workability, and slump testing.
KU4. traditional and modern methods of concrete placement, including pumping and slip-form techniques.
KU5. importance of proper compaction in eliminating air pockets and increasing strength.
KU6. different curing techniques and their impact on concrete strength and durability.
KU7. impact of weather conditions on concrete setting and how to mitigate issues like shrinkage and cracking.
KU8. technological advancements in concrete construction, including high-performance concrete (HPC) and geopolymer concrete.
KU9. use of non-destructive testing methods such as ultrasonic pulse velocity (UPV) and rebound hammer for assessing concrete quality.
KU10. environmental considerations in concrete production, including the use of recycled aggregates and carbon capture technologies.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively with team members, supervisors, and stakeholders
GS2. listen actively to understand instructions and feedback
GS3. perform basic arithmetic calculations and take measurements accurately
GS4. analyze project specifications to identify potential risks or challenges
GS5. plan tasks to optimize time and resources
GS6. organize tools, equipment, and materials efficiently

GS7. operate modern tools and equipment with basic proficiency
GS8. adapt to new construction technologies and methods
GS9. follow health and safety guidelines to minimize workplace risks
GS10. identify and mitigate workplace hazards promptly
GS11. ensure compliance with environmental sustainability practices
GS12. assess work challenges and make informed decisions
GS13. evaluate feedback to implement process improvements
GS14. maintain a professional attitude and ethical behaviour

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Read and Interpret Construction Drawings	**6**	**12**	**-**	**2**
PC1. analyze structural blueprints to determine concrete specifications and reinforcement details.	-	-	-	-
PC2. identify load-bearing sections and reinforcement placements as per project requirements.	-	-	-	-
PC3. calculate the quantity of concrete required based on mix proportions and structural dimensions.	-	-	-	-
PC4. mark layout points for formwork placement using leveling tools and total stations.	-	-	-	-
Prepare Materials and Mix Concrete	**6**	**12**	**-**	**2**
PC5. select appropriate cement, aggregates, and admixtures based on strength and workability requirements.	-	-	-	-
PC6. measure and batch materials using weigh batching and volumetric batching methods.	-	-	-	-
PC7. mix concrete manually, mechanically, or using ready-mix concrete (RMC) plants for uniform consistency.	-	-	-	-
PC8. adjust water-cement ratios and incorporate plasticizers or retarders to improve workability.	-	-	-	-
PC9. test slump, workability, and consistency of concrete before pouring.	-	-	-	-
Pour and Place Concrete	**6**	**12**	**-**	**2**
PC10. transport concrete using wheelbarrows, pumps, or conveyors for efficient placement.	-	-	-	-
PC11. pour concrete in layers to avoid segregation and cold joints.	-	-	-	-
PC12. use self-compacting concrete (SCC) technology to eliminate the need for vibration.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. apply slip-form and jump-form techniques for continuous concreting in high-rise structures.	-	-	-	-
PC14. embed reinforcement bars, anchor bolts, and conduits while placing concrete.	-	-	-	-
Compact Concrete	**6**	**12**	**-**	**2**
PC15. use mechanical vibrators such as needle, surface, and form vibrators to remove air voids.	-	-	-	-
PC16. ensure uniform compaction to prevent honeycombing and weak zones.	-	-	-	-
PC17. apply pressure grouting techniques for filling voids in hardened concrete.	-	-	-	-
Cure Concrete	**6**	**12**	**-**	**2**
PC18. apply traditional curing methods such as ponding, wet covering, and water spraying.	-	-	-	-
PC19. use curing compounds and self-curing concrete additives for moisture retention.	-	-	-	-
PC20. cover concrete with plastic sheets or wet burlap to prevent rapid moisture loss.	-	-	-	-
PC21. implement steam curing and accelerated curing methods for precast concrete elements.	-	-	-	-
PC22. monitor curing temperatures and maintain optimal moisture levels for hydration.	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0518
NOS Name	Prepare, Pour and Cure Concrete Structures
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

ICE/CON/N0519: Perform Concreting for Structural Elements

Description

This unit covers the process of constructing reinforced concrete structural elements, including floors, walls, and other load-bearing components.

Scope

The scope covers the following :

- Construct reinforced concrete floors
- Use insulated concrete formwork (ICF)
- Construct beams and columns
- Apply high-performance concrete (HPC

Elements and Performance Criteria

Construct Reinforced Concrete Floors

To be competent, the user/individual on the job must be able to:

PC1. prepare formwork and reinforcement layout as per structural design.

PC2. place reinforcement bars, mesh, or fiber reinforcement for strength and crack resistance.

PC3. mix and pour concrete using appropriate workability and slump control.

PC4. compact concrete using mechanical vibrators to eliminate air pockets.

PC5. level and finish the surface using trowels, screeds, or power floaters

Use Insulated Concrete Formwork (ICF)

To be competent, the user/individual on the job must be able to:

PC6. assemble insulated concrete formwork (ICF) for wall construction.

PC7. place reinforcement bars within ICF systems for structural integrity.

PC8. pour concrete into the ICF framework, ensuring uniform flow and consolidation.

PC9. remove excess air using vibration techniques to prevent voids and segregation.

PC10. allow concrete to cure within the insulated formwork for enhanced thermal efficiency.

Construct Beams and Columns

To be competent, the user/individual on the job must be able to:

PC11. install temporary supports and scaffolding for load-bearing elements.

PC12. fix reinforcement cages inside beam and column formworks.

PC13. pour concrete in layers while ensuring even distribution around reinforcements.

PC14. monitor alignment and positioning using plumb bobs and laser levels.

PC15. cure concrete beams and columns using wet hessian cloth or membrane curing

Apply High-Performance Concrete (HPC)

To be competent, the user/individual on the job must be able to:

PC16. mix high-performance concrete with silica fume, fly ash, or polymer additives.

PC17. use self-compacting concrete (SCC) to enhance workability and reduce segregation.

PC18. implement post-tensioning techniques for structural stability.

PC19. conduct non-destructive testing (NDT) to assess concrete strength and uniformity.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. structural behavior and load-bearing capacity of reinforced concrete elements.

KU2. properties of concrete and reinforcement materials used in floors, beams, columns, and walls.

KU3. techniques for installing insulated concrete formwork (ICF) and its advantages in thermal efficiency.

KU4. formwork types and best practices for constructing walls, floors, beams, and columns.

KU5. role of reinforcement in preventing tensile failures and improving durability.

KU6. principles of concrete pouring, leveling, and finishing for smooth and strong surfaces.

KU7. compaction techniques to eliminate voids and enhance strength.

KU8. curing methods and their impact on long-term performance of structural elements.

KU9. advanced concreting techniques, including self-compacting concrete (SCC) and high-performance concrete (HPC).

KU10. use of non-destructive testing (NDT) such as ultrasonic testing and core sampling to verify concrete quality

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively with team members, supervisors, and stakeholders

GS2. listen actively to understand instructions and feedback

GS3. perform basic arithmetic calculations and take measurements accurately

GS4. analyze project specifications to identify potential risks or challenges

GS5. plan tasks to optimize time and resources

GS6. organize tools, equipment, and materials efficiently

GS7. operate modern tools and equipment with basic proficiency

GS8. adapt to new construction technologies and methods

GS9. follow health and safety guidelines to minimize workplace risks

GS10. identify and mitigate workplace hazards promptly

GS11. ensure compliance with environmental sustainability practices

GS12. assess work challenges and make informed decisions

GS13. evaluate feedback to implement process improvements

GS14. maintain a professional attitude and ethical behaviour

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Construct Reinforced Concrete Floors	**6**	**12**	**-**	**2**
PC1. prepare formwork and reinforcement layout as per structural design.	-	-	-	-
PC2. place reinforcement bars, mesh, or fiber reinforcement for strength and crack resistance.	-	-	-	-
PC3. mix and pour concrete using appropriate workability and slump control.	-	-	-	-
PC4. compact concrete using mechanical vibrators to eliminate air pockets.	-	-	-	-
PC5. level and finish the surface using trowels, screeds, or power floaters	-	-	-	-
Use Insulated Concrete Formwork (ICF)	**6**	**12**	**-**	**2**
PC6. assemble insulated concrete formwork (ICF) for wall construction.	-	-	-	-
PC7. place reinforcement bars within ICF systems for structural integrity.	-	-	-	-
PC8. pour concrete into the ICF framework, ensuring uniform flow and consolidation.	-	-	-	-
PC9. remove excess air using vibration techniques to prevent voids and segregation.	-	-	-	-
PC10. allow concrete to cure within the insulated formwork for enhanced thermal efficiency.	-	-	-	-
Construct Beams and Columns	**10**	**20**	**-**	**3**
PC11. install temporary supports and scaffolding for load-bearing elements.	-	-	-	-
PC12. fix reinforcement cages inside beam and column formworks.	-	-	-	-
PC13. pour concrete in layers while ensuring even distribution around reinforcements.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. monitor alignment and positioning using plumb bobs and laser levels.	-	-	-	-
PC15. cure concrete beams and columns using wet hessian cloth or membrane curing	-	-	-	-
Apply High-Performance Concrete (HPC)	**8**	**16**	**-**	**3**
PC16. mix high-performance concrete with silica fume, fly ash, or polymer additives.	-	-	-	-
PC17. use self-compacting concrete (SCC) to enhance workability and reduce segregation.	-	-	-	-
PC18. implement post-tensioning techniques for structural stability.	-	-	-	-
PC19. conduct non-destructive testing (NDT) to assess concrete strength and uniformity.	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0519
NOS Name	Perform Concreting for Structural Elements
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

ICE/CON/N0520: Carry Out Reinforced Concrete Works

Description

This unit covers the process of executing reinforced concrete works to construct structural components such as beams, columns, slabs, and foundations.

Scope

The scope covers the following :

- Prepare for reinforced concrete works
- Install and secure reinforcement materials
- Use fiber-reinforced concrete (FRC)
- Implement reinforcement techniques

Elements and Performance Criteria

Prepare for Reinforced Concrete Works

To be competent, the user/individual on the job must be able to:

PC1. select appropriate reinforcement materials, including steel bars, mesh, and fiber reinforcements.

PC2. measure and cut reinforcement bars and mesh to required lengths using cutting tools.

PC3. install shuttering and temporary supports for reinforced concrete components.

Install and Secure Reinforcement Materials

To be competent, the user/individual on the job must be able to:

PC4. position reinforcement bars as per structural design and spacing requirements.

PC5. tie reinforcement bars using binding wire to maintain structural layout.

PC6. fix stirrups, spacers, and chairs to maintain proper concrete cover and alignment.

PC7. install reinforcement mesh or cages for slabs, beams, and columns.

PC8. apply mechanical couplers and lapping techniques for extended reinforcement bars.

Use Fiber-Reinforced Concrete (FRC)

To be competent, the user/individual on the job must be able to:

PC9. select appropriate fiber types such as steel, glass, synthetic, or natural fibers.

PC10. mix fibers into concrete at specified proportions using manual or mechanical methods.

PC11. pour and place fiber-reinforced concrete in slabs, beams, and foundations.

PC12. compact fiber-reinforced concrete using vibrators to eliminate air voids.

PC13. monitor fiber distribution and ensure uniform dispersion during pouring.

Implement Reinforcement Techniques

To be competent, the user/individual on the job must be able to:

PC14. apply post-tensioning systems for added strength in large structural elements.

PC15. use welded wire mesh for enhanced crack resistance in slabs and walls.

PC16. reinforce joints and corners with additional rebar or mesh layers.

PC17. integrate shear reinforcement for beams and columns to prevent failure.
PC18. inspect reinforcement layout before concreting to ensure compliance with design.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. properties of reinforcement materials such as steel bars, wire mesh, and fibers.
KU2. different types of fibers used in concrete, including steel, glass, polypropylene, and natural fibers.
KU3. principles of reinforcement placement to improve tensile strength and crack resistance.
KU4. methods of cutting, bending, and tying reinforcement bars.
KU5. importance of concrete cover and bar spacing for corrosion protection and structural stability.
KU6. techniques for mixing, placing, and compacting fiber-reinforced concrete (FRC).
KU7. applications of post-tensioning systems in structural concrete works.
KU8. quality control procedures for reinforcement installation and concrete pouring.
KU9. common defects in reinforced concrete works and corrective measures.
KU10. safety considerations in handling and installing reinforcement materials.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively with team members, supervisors, and stakeholders
GS2. listen actively to understand instructions and feedback
GS3. perform basic arithmetic calculations and take measurements accurately
GS4. analyze project specifications to identify potential risks or challenges
GS5. plan tasks to optimize time and resources
GS6. organize tools, equipment, and materials efficiently
GS7. operate modern tools and equipment with basic proficiency
GS8. adapt to new construction technologies and methods
GS9. follow health and safety guidelines to minimize workplace risks
GS10. identify and mitigate workplace hazards promptly
GS11. ensure compliance with environmental sustainability practices
GS12. assess work challenges and make informed decisions
GS13. evaluate feedback to implement process improvements
GS14. maintain a professional attitude and ethical behaviour

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare for Reinforced Concrete Works	**6**	**12**	**-**	**2**
PC1. select appropriate reinforcement materials, including steel bars, mesh, and fiber reinforcements.	-	-	-	-
PC2. measure and cut reinforcement bars and mesh to required lengths using cutting tools.	-	-	-	-
PC3. install shuttering and temporary supports for reinforced concrete components.	-	-	-	-
Install and Secure Reinforcement Materials	**6**	**12**	**-**	**2**
PC4. position reinforcement bars as per structural design and spacing requirements.	-	-	-	-
PC5. tie reinforcement bars using binding wire to maintain structural layout.	-	-	-	-
PC6. fix stirrups, spacers, and chairs to maintain proper concrete cover and alignment.	-	-	-	-
PC7. install reinforcement mesh or cages for slabs, beams, and columns.	-	-	-	-
PC8. apply mechanical couplers and lapping techniques for extended reinforcement bars.	-	-	-	-
Use Fiber-Reinforced Concrete (FRC)	**10**	**20**	**-**	**3**
PC9. select appropriate fiber types such as steel, glass, synthetic, or natural fibers.	-	-	-	-
PC10. mix fibers into concrete at specified proportions using manual or mechanical methods.	-	-	-	-
PC11. pour and place fiber-reinforced concrete in slabs, beams, and foundations.	-	-	-	-
PC12. compact fiber-reinforced concrete using vibrators to eliminate air voids.	-	-	-	-
PC13. monitor fiber distribution and ensure uniform dispersion during pouring.	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Implement Reinforcement Techniques	**8**	**16**	**-**	**3**
PC14. apply post-tensioning systems for added strength in large structural elements.	-	-	-	-
PC15. use welded wire mesh for enhanced crack resistance in slabs and walls.	-	-	-	-
PC16. reinforce joints and corners with additional rebar or mesh layers.	-	-	-	-
PC17. integrate shear reinforcement for beams and columns to prevent failure.	-	-	-	-
PC18. inspect reinforcement layout before concreting to ensure compliance with design.	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0520
NOS Name	Carry Out Reinforced Concrete Works
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

ICE/CON/N0521: Repair and Restore Concrete Surfaces

Description

This unit covers the techniques and processes involved in repairing and restoring concrete surfaces to maintain their structural integrity and aesthetics.

Scope

The scope covers the following :

- Prepare concrete surfaces for repair
- Repair concrete surfaces using traditional methods
- Apply nano-concrete technology for surface repairs
- Perform crack sealing and surface refinishing

Elements and Performance Criteria

Prepare Concrete Surfaces for Repair

To be competent, the user/individual on the job must be able to:

PC1. inspect concrete surfaces for cracks, spalling, erosion and other defects.

PC2. identify causes of concrete deterioration such as water ingress, chemical exposure or structural stress.

PC3. clean damaged areas using mechanical or chemical methods to remove loose material.

PC4. mark and outline repair zones according to structural repair plans.

Repair Concrete Surfaces Using Traditional Methods

To be competent, the user/individual on the job must be able to:

PC5. mix and apply cementitious repair mortar for minor surface damages.

PC6. perform patch repairs using rapid-setting concrete for small cracks and voids.

PC7. apply bonding agents and primers to enhance adhesion before repairs.

PC8. use formwork and shuttering techniques for deep repairs and re-casting damaged sections.

Apply Nano-Concrete Technology for Surface Repairs

To be competent, the user/individual on the job must be able to:

PC9. mix and apply nano-concrete materials for enhanced durability and crack resistance.

PC10. use self-healing concrete mixtures infused with nano-particles for micro-crack sealing.

PC11. reinforce repaired areas with nano-coatings to improve water resistance and longevity.

PC12. apply advanced polymer-modified concrete for enhanced surface performance

Perform Crack Sealing and Surface Refinishing

To be competent, the user/individual on the job must be able to:

PC13. inject epoxy or polyurethane sealants into deep cracks for structural reinforcement.

PC14. apply flexible sealants for expansion joints and surface movement cracks.

PC15. grind and smooth repaired areas to match surrounding surfaces.

PC16. use high-performance coatings and resurfacing compounds for final finishing.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. types and causes of concrete damage, including cracking, spalling, and surface wear.
KU2. properties of cementitious and polymer-based repair materials.
KU3. techniques for assessing structural damage in concrete.
KU4. methods of crack repair, including epoxy injection, routing, and sealing.
KU5. principles of nano-concrete technology and its applications in concrete restoration.
KU6. advantages of self-healing concrete and nano-modified repair materials.
KU7. importance of surface preparation for effective adhesion of repair materials.
KU8. different types of concrete coatings and finishing techniques for durability and aesthetics.
KU9. tools and equipment used for repairing and refinishing concrete surfaces.
KU10. factors affecting the longevity of repaired concrete surfaces and methods to enhance durability.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively with team members, supervisors, and stakeholders
GS2. listen actively to understand instructions and feedback
GS3. perform basic arithmetic calculations and take measurements accurately
GS4. analyze project specifications to identify potential risks or challenges
GS5. plan tasks to optimize time and resources
GS6. organize tools, equipment, and materials efficiently
GS7. operate modern tools and equipment with basic proficiency
GS8. adapt to new construction technologies and methods
GS9. follow health and safety guidelines to minimize workplace risks
GS10. identify and mitigate workplace hazards promptly
GS11. ensure compliance with environmental sustainability practices
GS12. assess work challenges and make informed decisions
GS13. evaluate feedback to implement process improvements
GS14. maintain a professional attitude and ethical behaviour

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Prepare Concrete Surfaces for Repair	**6**	**12**	**-**	**2**
PC1. inspect concrete surfaces for cracks, spalling, erosion and other defects.	-	-	-	-
PC2. identify causes of concrete deterioration such as water ingress, chemical exposure or structural stress.	-	-	-	-
PC3. clean damaged areas using mechanical or chemical methods to remove loose material.	-	-	-	-
PC4. mark and outline repair zones according to structural repair plans.	-	-	-	-
Repair Concrete Surfaces Using Traditional Methods	**6**	**12**	**-**	**2**
PC5. mix and apply cementitious repair mortar for minor surface damages.	-	-	-	-
PC6. perform patch repairs using rapid-setting concrete for small cracks and voids.	-	-	-	-
PC7. apply bonding agents and primers to enhance adhesion before repairs.	-	-	-	-
PC8. use formwork and shuttering techniques for deep repairs and re-casting damaged sections.	-	-	-	-
Apply Nano-Concrete Technology for Surface Repairs	**10**	**20**	**-**	**3**
PC9. mix and apply nano-concrete materials for enhanced durability and crack resistance.	-	-	-	-
PC10. use self-healing concrete mixtures infused with nano-particles for micro-crack sealing.	-	-	-	-
PC11. reinforce repaired areas with nano-coatings to improve water resistance and longevity.	-	-	-	-
PC12. apply advanced polymer-modified concrete for enhanced surface performance	-	-	-	-
Perform Crack Sealing and Surface Refinishing	**8**	**16**	**-**	**3**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. inject epoxy or polyurethane sealants into deep cracks for structural reinforcement.	-	-	-	-
PC14. apply flexible sealants for expansion joints and surface movement cracks.	-	-	-	-
PC15. grind and smooth repaired areas to match surrounding surfaces.	-	-	-	-
PC16. use high-performance coatings and resurfacing compounds for final finishing.	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0521
NOS Name	Repair and Restore Concrete Surfaces
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

ICE/CON/N0522: Construct and Install Precast Concrete Structures

Description

This unit focuses on the processes involved in manufacturing, transporting, and installing precast concrete structures.

Scope

The scope covers the following :

- Construct precast concrete elements
- Transport and handle precast elements
- Install precast concrete structures
- Ensure quality control in precast installation

Elements and Performance Criteria

Construct Precast Concrete Elements

To be competent, the user/individual on the job must be able to:

PC1. prepare and assemble formwork for casting precast concrete components.

PC2. mix and pour concrete into molds, ensuring proper vibration to remove air pockets.

PC3. use high-performance concrete mixes for strength and durability.

PC4. apply curing techniques such as steam curing to enhance early strength.

PC5. demold precast components safely without causing surface damage.

Transport and Handle Precast Elements

To be competent, the user/individual on the job must be able to:

PC6. lift and move precast components using cranes, slings, and lifting anchors.

PC7. ensure proper stacking and securing of precast elements during transportation.

PC8. use protective coverings and supports to prevent damage during handling.

PC9. follow weight distribution guidelines to maintain load balance during transit.

Install Precast Concrete Structures

To be competent, the user/individual on the job must be able to:

PC10. position precast elements using laser alignment and precision measurement tools.

PC11. secure precast components using dowels, grout, or mechanical connections.

PC12. apply post-installation finishing, including joint sealing and surface treatments.

PC13. ensure structural alignment and level adjustments before final fixing.

Ensure Quality Control in Precast Installation

To be competent, the user/individual on the job must be able to:

PC14. inspect precast components for cracks, voids, or dimensional deviations.

PC15. verify reinforcement placement and curing compliance before installation.

PC16. test load-bearing capacity of installed precast structures.

PC17. document installation procedures and maintain records for compliance.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. types of precast concrete elements, including panels, beams, slabs, and columns.
KU2. properties of precast concrete and advantages over in-situ concrete.
KU3. formwork design and casting techniques for precast manufacturing.
KU4. methods of reinforcement placement and curing in precast production.
KU5. handling and lifting procedures for heavy precast elements.
KU6. principles of alignment, leveling, and joining in precast installation.
KU7. different types of precast connection systems, including grouted and mechanical joints.
KU8. quality control measures to assess strength, durability, and finish of precast elements.
KU9. tools and machinery used for installing and securing precast components.
KU10. safety procedures related to lifting, transportation, and installation of precast structures.

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. communicate effectively with team members, supervisors, and stakeholders
GS2. listen actively to understand instructions and feedback
GS3. perform basic arithmetic calculations and take measurements accurately
GS4. analyze project specifications to identify potential risks or challenges
GS5. plan tasks to optimize time and resources
GS6. organize tools, equipment, and materials efficiently
GS7. operate modern tools and equipment with basic proficiency
GS8. adapt to new construction technologies and methods
GS9. follow health and safety guidelines to minimize workplace risks
GS10. identify and mitigate workplace hazards promptly
GS11. ensure compliance with environmental sustainability practices
GS12. assess work challenges and make informed decisions
GS13. evaluate feedback to implement process improvements
GS14. maintain a professional attitude and ethical behaviour

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Construct Precast Concrete Elements	**6**	**12**	**-**	**2**
PC1. prepare and assemble formwork for casting precast concrete components.	-	-	-	-
PC2. mix and pour concrete into molds, ensuring proper vibration to remove air pockets.	-	-	-	-
PC3. use high-performance concrete mixes for strength and durability.	-	-	-	-
PC4. apply curing techniques such as steam curing to enhance early strength.	-	-	-	-
PC5. demold precast components safely without causing surface damage.	-	-	-	-
Transport and Handle Precast Elements	**6**	**12**	**-**	**2**
PC6. lift and move precast components using cranes, slings, and lifting anchors.	-	-	-	-
PC7. ensure proper stacking and securing of precast elements during transportation.	-	-	-	-
PC8. use protective coverings and supports to prevent damage during handling.	-	-	-	-
PC9. follow weight distribution guidelines to maintain load balance during transit.	-	-	-	-
Install Precast Concrete Structures	**10**	**20**	**-**	**3**
PC10. position precast elements using laser alignment and precision measurement tools.	-	-	-	-
PC11. secure precast components using dowels, grout, or mechanical connections.	-	-	-	-
PC12. apply post-installation finishing, including joint sealing and surface treatments.	-	-	-	-
PC13. ensure structural alignment and level adjustments before final fixing.	-	-	-	-
Ensure Quality Control in Precast Installation	**8**	**16**	**-**	**3**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. inspect precast components for cracks, voids, or dimensional deviations.	-	-	-	-
PC15. verify reinforcement placement and curing compliance before installation.	-	-	-	-
PC16. test load-bearing capacity of installed precast structures.	-	-	-	-
PC17. document installation procedures and maintain records for compliance.	-	-	-	-
NOS Total	**30**	**60**	**-**	**10**

National Occupational Standards (NOS) Parameters

NOS Code	ICE/CON/N0522
NOS Name	Construct and Install Precast Concrete Structures
Sector	Construction
Sub-Sector	
Occupation	Masonry/Shuttering Carpentry/Bar Bending/Fabrication
NSQF Level	4
Credits	1
Version	1.0
Last Reviewed Date	07/10/2025
Next Review Date	07/10/2028
NSQC Clearance Date	07/10/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Awarding Body. Each Performance Criteria (PC)/ Element will be assigned marks proportional to its importance in NOS. AB will also lay down proportion of marks for Theory and Practical Skills for each PC/ Element.

2. The assessment of the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by AB.

3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below.

4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.

5. To pass the Qualification Pack, every trainee must score 70% on overall QP.

6. The Assessor shall check the outcome of the practices while evaluating the steps performed to achieve the outcome.

7. The trainee shall be provided with a chance to repeat the test to correct his procedures in case of

improper performance, with a deduction of marks for each iteration.

8. After the certain number of iterations as decided by AB the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.

9. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified time frame set by AB.

10. Minimum duration of Assessment of each QP shall be 8hrs/batch (max. 30 candidates).

Minimum Aggregate Passing % at QP Level : 70

(**Please note**: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ICE/CON/N0501.Identify Construction Building Materials and Components	30	60	-	10	100	15
ICE/CON/N0502.Follow Environment, Health and Safety (EHS) Guidelines at Construction Sites	30	60	-	10	100	10
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	5
Total	**80**	**150**	**-**	**20**	**250**	**30**

Elective: 1 Concreting

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ICE/CON/N0518.Prepare, Pour and Cure Concrete Structures	30	60	-	10	100	10
ICE/CON/N0519.Perform Concreting for Structural Elements	30	60	-	10	100	15

Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ICE/CON/N0520.Carry Out Reinforced Concrete Works	30	60	-	10	100	15
ICE/CON/N0521.Repair and Restore Concrete Surfaces	30	60	-	10	100	15
ICE/CON/N0522.Construct and Install Precast Concrete Structures	30	60	-	10	100	15
Total	**150**	**300**	**-**	**50**	**500**	**70**