Qualification Pack

Construction Welder

Metal Inert Gas (MIG) Welding/ Tungsten Inert Gas (TIG) Welding/ Shielded Metal Arc Welding (SMAW)

QP Code: CON/Q1252

Version: 2.0

NSQF Level: 4

Construction Skill Development Council of India || CPB 103 & 104 (1st Floor), Block 4B, DLF Corporate Park, Phase III, MG Road
Gurgaon-122002 || email:jancy@csdcindia.org

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CON/Q1252: Construction Welder

Brief Job Description

A Construction Welder is responsible for joining, cutting, and repairing metal components at construction sites using various welding techniques. They work with steel structures, pipelines, and other metal frameworks, ensuring high-quality welds that meet industry standards and project specifications.

Personal Attributes

The Construction Welder is expected to be physically fit to work across various locations with varied environmental conditions. Moreover, they should preferably not be suffering from any respiratory disorder, vision defects and skin allergies due to exposure to light and heat. The person should be organized, diligent, methodical, safety-conscious, and a prompt decision-maker. In addition to being a team player, the individual should have good communication skills.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CON/N1206: Carry out grinding activities on structural steel elements
2. CON/N9001: Work according to personal health, safety and environment protocols at construction site
3. CON/N8001: Work effectively in a team to deliver desired results at the workplace
4. DGT/VSQ/N0101: Employability Skills (30 Hours)

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

Elective 1: Metal Inert Gas (MIG) Welding

1. CON/N1253: Carry out preparatory works for Metal Inert Gas (MIG) Welding operations
2. CON/N1254: Carry out Metal Inert Gas (MIG) Welding as per requirement in fabrication workshop or construction site

Elective 2: Tungsten Inert Gas (TIG) Welding

1. CON/N1255: Carry out preparatory works for Tungsten Inert Gas (TIG) Welding operations
2. CON/N1256: Carry out Tungsten Inert Gas (TIG) Welding as per requirement in fabrication workshop or construction site

Elective 3: Shielded Metal Arc Welding (SMAW)

1. CON/N1257: Carry out preparatory work for Shielded Metal Arc Welding (SMAW) operations

2. CON/N1258: Carry out Shielded Metal Arc Welding (SMAW) as per requirement in fabrication workshop or construction site

Qualification Pack (QP) Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
Country	India
NSQF Level	4
Credits	36
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7212.0303
Minimum Educational Qualification & Experience	12th Class OR 10th Class + I.T.I (Welder) OR 11th grade pass with 1 Year of experience Relevant Industry OR 10th grade pass with 2 Years of experience Relevant Industry OR 8th grade pass with 4 Years of experience Relevant Industry OR Previous relevant Qualification of NSQF Level (3.5 as Construction Fitter) with 1.5 years of experience Relevant Industry OR Previous relevant Qualification of NSQF Level (3 as Assistant Construction Fitter) with 3 Years of experience Relevant Industry
Minimum Level of Education for Training in School	Not Applicable

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Pre-Requisite License or Training	Not Applicable
Minimum Job Entry Age	18 Years
Last Reviewed On	18/08/2021
Next Review Date	30/04/2028
NSQC Approval Date	08/05/2025
Version	2.0
Reference code on NQR	QG-04-CO-04206-2025-V1-CSDCI
NQR Version	2.0

CON/N1206: Carry out grinding activities on structural steel elements

Description

This unit is about carrying out grinding activities on structural steel elements

Scope

The scope covers the following :

- Carry out preparatory works for grinding structural steel sections, plates, tubes and pipes
- Grind the structural steel sections, plates, tubes and pipes to required dimensions as per instructions

Elements and Performance Criteria

Carry out preparatory works for grinding structural steel sections, plates, tubes and pipes

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

PC1. ensure that the grinder is in proper working condition

PC2. check that guard is installed on the machine and is secure and effective

PC3. check and notify any inadequacy like incorrect type of grinder, incorrect consumable issued etc. in the grinding tool to appropriate authority

PC4. check the accessibility (in between joints, large distance from power source etc.) of the grinder for the work

PC5. identify the location of surface to be grinded

PC6. clean the metal surface to remove any foreign matter like dust, rust, paint, oil etc

PC7. clamp and fix the metal before grinding

PC8. select appropriate consumables as per work requirement

PC9. select and use appropriate grinding wheel as per work requirement

Grind the structural steel sections, plates, tubes and pipes to required dimensions as per instructions

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

PC10. gather and identify information from superiors regarding the dimensions of grinding, angle of grinding etc

PC11. select proper body position so that hand movements are comfortable and smooth

PC12. move the grinding tool in desired patterns as per work requirements

PC13. provide proper pressure at correct angle as per work requirement to minimize the waste age of consumables

PC14. grind off defective weld joints to required depth joints

PC15. grind off excessive root reinforcements in welded joint if required

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the standard practices of construction fabrication

KU2. • safety rules and regulations for identifying structural steel material for measurement and
• marking of fit-up positions

KU3. personal protection including use of safety gears and equipment

KU4. safe working methods and movements while performing relevant tasks

KU5. request procedure for tools & materials

KU6. housekeeping & other administrative rules

KU7. different types of grinding machines, their application and specifications

KU8. safety norms while using grinding equipment

KU9. different types of consumables and their specifications

KU10. importance and need of housekeeping

KU11. need for cleaning the surface prior to use

KU12. various operations of the grinding machine

KU13. specification of grinding wheels

KU14. how to optimism the use of consumable

KU15. importance of comfortable body position in grinding

KU16. various patterns of grinding

KU17. importance of angle of grinding

KU18. pressure implied during grinding and its relation to minimizing wastage

KU19. how to finish welded connections

KU20. different parts of the grinding machine

KU21. different hand and power tools available in market for fabrication activity

KU22. application of commonly used hand and power tools used in fabrication shop

KU23. selection and correct use of different tools and tackles as per the work requirement

KU24. how to carry out basic maintenance of different hand and power tools

KU25. know the tolerance limits and range of operation for all common hand and power tools

KU26. ergonomic principles to carry loads

KU27. tools and tackles to be used in basic rigging work

KU28. standard practices regarding heavy material lifting and shifting

Generic Skills (GS)

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

GS1. write in at least one language, preferably in the local language of the site

GS2. read one or more language, preferably in the local language of the site

GS3. • read instructions, guidelines, sign boards, safety rules & safety tags instruction related to
• exit routes during emergency at the workplace

GS4. speak in one or more language, preferably in one of the local language of the site

GS5. • listen and follow instructions / communication shared by superiors/ coworkers regarding
• team requirements or interfaces during work processes

GS6. • orally communicate with co-workers regarding support required to completethe respective
• work

GS7. decide the type of grinder to be used and the specifications of the consumables

GS8. decide the pattern of grinding

GS9. check the availability of grinder and plan work accordingly

GS10. perform work as per agreed time schedule and quality

GS11. • report to seniors or appropriate authority in case of any discrepancies in the issued
• equipment or grinders

GS12. check the adequacy of the clamps before grinding

GS13. confirm the depth and length of grinding

GS14. identify the weld areas with over reinforcement correctly

GS15. correctly identify the defect areas for grinding

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory works for grinding structural steel sections, plates, tubes and pipes	**15**	**35**	**-**	**-**
PC1. ensure that the grinder is in proper working condition	-	-	-	-
PC2. check that guard is installed on the machine and is secure and effective	-	-	-	-
PC3. check and notify any inadequacy like incorrect type of grinder, incorrect consumable issued etc. in the grinding tool to appropriate authority	-	-	-	-
PC4. check the accessibility (in between joints, large distance from power source etc.) of the grinder for the work	-	-	-	-
PC5. identify the location of surface to be grinded	-	-	-	-
PC6. clean the metal surface to remove any foreign matter like dust, rust, paint, oil etc	-	-	-	-
PC7. clamp and fix the metal before grinding	-	-	-	-
PC8. select appropriate consumables as per work requirement	-	-	-	-
PC9. select and use appropriate grinding wheel as per work requirement	-	-	-	-
Grind the structural steel sections, plates, tubes and pipes to required dimensions as per instructions	**15**	**35**	**-**	**-**
PC10. gather and identify information from superiors regarding the dimensions of grinding, angle of grinding etc	-	-	-	-
PC11. select proper body position so that hand movements are comfortable and smooth	-	-	-	-
PC12. move the grinding tool in desired patterns as per work requirements	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. provide proper pressure at correct angle as per work requirement to minimize the waste age of consumables	-	-	-	-
PC14. grind off defective weld joints to required depth joints	-	-	-	-
PC15. grind off excessive root reinforcements in welded joint if required	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1206
NOS Name	Carry out grinding activities on structural steel elements
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	3
Credits	3
Version	4.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N9001: Work according to personal health, safety and environment protocols at construction site

Description

This NOS covers the skill and knowledge required for an individual to work according to personal health, safety and environmental protocols at construction site

Scope

The scope covers the following :

- Follow safety norms as defined by organization
- Adopt healthy & safe work practices
- Implement good housekeeping and environment protection process and activities
- Follow infection control guidelines as per applicability

Elements and Performance Criteria

Follow safety norms as defined by the organization

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

PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority

PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities

PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable

PC4. follow all the protocols and safety techniques conveyed during safety awareness programs like Tool Box Talks, safety demonstrations and mock drills conducted at the site

PC5. select and operate different types of fire extinguishers corresponding to various types of fires as per EHS guideline

PC6. identify near miss, unsafe condition and unsafe act

Adopt healthy & safe work practices

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

PC7. use appropriate Personal Protective Equipment (PPE) as per work requirements for : Head Protection, Ear protection, Fall Protection ,Foot Protection, Face and Eye Protection, Hand and Body Protection , and Respiratory Protection (if required)

PC8. handle all required tools, tackles, materials and equipment safely

PC9. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines

PC10. check and install all safety equipment as per standard guidelines

PC11. follow safety protocols and practices as laid down by site EHS department

PC12. obtain "height pass" clearance for working at heights

Implement good housekeeping practices

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

PC13. collect, segregate and deposit construction waste into appropriate containers based on their toxicity or hazardous nature

PC14. apply ergonomic principles wherever required

Follow infection control guidelines as per applicability

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

PC15. follow recommended personal hygiene, workplace hygiene and sanitization practices

PC16. clean and disinfect all materials, tools and supplies before and after use

PC17. report immediately to concerned authorities regarding signs and symptoms of illness of self and others

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. reporting procedures in cases of breaches or hazards for site safety, accidents, and emergency situations as per guidelines

KU2. types of safety hazards at construction sites

KU3. basic ergonomic principles as per applicability

KU4. the procedure for responding to accidents and other emergencies at site

KU5. use of appropriate personal protective equipment based on various working conditions

KU6. importance of handling tools, equipment, and materials as per applicable norms

KU7. effect of construction material on health and environments as per applicability

KU8. various environmental protection methods as per applicability

KU9. storage of waste including non-combustible scrap material and debris, combustible scrap material and debris, general construction waste and trash (non-toxic, non-hazardous), any other hazardous wastes and any other flammable wastes at the appropriate location

KU10. how to keep the workplace neat and tidy so as to be safe

KU11. how to use hazardous material in a safe and appropriate manner as per applicability

KU12. types of fire

KU13. procedure of operating different types of fire extinguishers

KU14. safety relevant to tools, tackles, and equipment as per applicability

KU15. housekeeping activities relevant to task

KU16. ways of transmission of infection

KU17. ways to manage infectious risks at the workplace

KU18. different methods of cleaning, disinfection, sterilization, and sanitization

KU19. symptoms of infection like fever, cough, redness, swelling, and inflammation

Generic Skills (GS)

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

GS1. write in at least one language, preferably in the local language of the site

GS2. fill safety formats for near miss, unsafe conditions and safety suggestions

GS3. read in one or more language, preferably in the local language of the site

GS4. speak in one or more language, preferably in one of the local language of the site

GS5. listen to instructions/communication shared by site EHS and superiors regarding site safety, and conducting the toolbox talk

GS6. identify potential safety risks and report to the appropriate authority

GS7. assess and analyze areas which may affect health, safety and environment protocol on the site

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Follow safety norms as defined by the organization	**5**	**15**	**-**	**-**
PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authority	-	-	-	-
PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities	-	-	-	-
PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable	-	-	-	-
PC4. follow all the protocols and safety techniques conveyed during safety awareness programs like Tool Box Talks, safety demonstrations and mock drills conducted at the site	-	-	-	-
PC5. select and operate different types of fire extinguishers corresponding to various types of fires as per EHS guideline	-	-	-	-
PC6. identify near miss, unsafe condition and unsafe act	-	-	-	-
Adopt healthy & safe work practices	**15**	**35**	**-**	**-**
PC7. use appropriate Personal Protective Equipment (PPE) as per work requirements for : Head Protection, Ear protection, Fall Protection ,Foot Protection, Face and Eye Protection, Hand and Body Protection , and Respiratory Protection (if required)	-	-	-	-
PC8. handle all required tools, tackles, materials and equipment safely	-	-	-	-
PC9. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines	-	-	-	-
PC10. check and install all safety equipment as per standard guidelines	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. follow safety protocols and practices as laid down by site EHS department	-	-	-	-
PC12. obtain "height pass" clearance for working at heights	-	-	-	-
Implement good housekeeping practices	**5**	**15**	**-**	**-**
PC13. collect, segregate and deposit construction waste into appropriate containers based on their toxicity or hazardous nature	-	-	-	-
PC14. apply ergonomic principles wherever required	-	-	-	-
Follow infection control guidelines as per applicability	**5**	**5**	**-**	**-**
PC15. follow recommended personal hygiene, workplace hygiene and sanitization practices	-	-	-	-
PC16. clean and disinfect all materials, tools and supplies before and after use	-	-	-	-
PC17. report immediately to concerned authorities regarding signs and symptoms of illness of self and others	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

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National Occupational Standards (NOS) Parameters

NOS Code	CON/N9001
NOS Name	Work according to personal health, safety and environment protocols at construction site
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Generic Safety
NSQF Level	4
Credits	1
Version	3.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N8001: Work effectively in a team to deliver desired results at the workplace

Description

This unit describes the skills and knowledge required to work effectively within a team to achieve the desired results

Scope

The scope covers the following :

- Interact and communicate in an effective manner
- Support co-workers to execute the project requirements
- Practice inclusion

Elements and Performance Criteria

Interact and communicate in an effective manner

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

PC1. pass on work related information/ requirement clearly to the team members

PC2. inform co-workers and superiors about any kind of deviations from work

PC3. report any unresolved problem to the supervisor immediately

PC4. obtain instructions from superiors and respond on the same

PC5. communicate to team members/subordinates for appropriate work technique and method

PC6. seek clarification and advice as per the requirement

Support co-workers to execute the project requirements

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

PC7. hand over the required material, tools, tackles, equipment and work fronts timely to interfacing teams

PC8. work together with co-workers in a synchronized manner

Practice inclusion

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

PC9. maintain cultural inclusivity at work place

PC10. maintain disability friendly work practices

PC11. follow gender neutral practices at workplace

PC12. address discriminatory and offensive behaviour in a professional manner as per organizational policy

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. own roles and responsibilities

KU2. importance of effective communication

KU3. the consequence of poor teamwork on project outcomes, timelines, safety at the construction site, etc.

KU4. different modes of communication used at workplace

KU5. importance of creating healthy and cooperative work environment among the gangs of workers

KU6. different activities within the work area where interaction with other workers is required

KU7. applicable techniques of work, properties of materials used, tools and tackles used, safety standards that co-workers might need as per the requirement

KU8. importance of proper and effective communication and the expected adverse effects in case of failure relating to quality, timeliness, safety, risks at the construction project site

KU9. importance and need of supporting co-workers facing problems for the smooth functioning of work

KU10. the fundamental concept of gender equality

KU11. how to recognise and be sensitive to issues of disability, culture and gender

KU12. legislation, policies, and procedures relating to gender sensitivity and cultural diversity including their impact on the area of operation

Generic Skills (GS)

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

GS1. write in at least one language, preferably in the local language of the site

GS2. read the communication regarding work completion, materials used, tools and tackles used, the resource required, etc,

GS3. speak in one or more languages, preferably in one of the local language of the site

GS4. listen and follow instructions / communication shared by superiors/ co-workers regarding team requirements or interfaces during work processes

GS5. communicate orally and effectively with co-workers considering their educational and social background

GS6. decide on what information is to be shared with co-workers within the team or to the interfacing gang of workers

GS7. plan work and organize the required resources in coordination with team members

GS8. complete all assigned task in coordination with team members

GS9. take initiative in resolving issues among co-workers or report the same to superiors

GS10. ensure best ways of coordination among team members

GS11. evaluate the complexity of task and determine if any guidance is required from superiors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Interact and communicate in an effective manner	**20**	**40**	**-**	**-**
PC1. pass on work related information/ requirement clearly to the team members	-	-	-	-
PC2. inform co-workers and superiors about any kind of deviations from work	-	-	-	-
PC3. report any unresolved problem to the supervisor immediately	-	-	-	-
PC4. obtain instructions from superiors and respond on the same	-	-	-	-
PC5. communicate to team members/subordinates for appropriate work technique and method	-	-	-	-
PC6. seek clarification and advice as per the requirement	-	-	-	-
Support co-workers to execute the project requirements	**5**	**15**	**-**	**-**
PC7. hand over the required material, tools, tackles, equipment and work fronts timely to interfacing teams	-	-	-	-
PC8. work together with co-workers in a synchronized manner	-	-	-	-
Practice inclusion	**5**	**15**	**-**	**-**
PC9. maintain cultural inclusivity at work place	-	-	-	-
PC10. maintain disability friendly work practices	-	-	-	-
PC11. follow gender neutral practices at workplace	-	-	-	-
PC12. address discriminatory and offensive behaviour in a professional manner as per organizational policy	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N8001
NOS Name	Work effectively in a team to deliver desired results at the workplace
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Generic 2
NSQF Level	4
Credits	1
Version	3.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

DGT/VSQ/N0101: Employability Skills (30 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
- 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. understand the significance of employability skills in meeting the job requirements

Constitutional values – Citizenship

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

PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices

Becoming a Professional in the 21st Century

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

PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.

Basic English Skills

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

PC4. speak with others using some basic English phrases or sentences

Communication Skills

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

PC5. follow good manners while communicating with others

PC6. work with others in a team

Diversity & Inclusion

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

PC7. communicate and behave appropriately with all genders and PwD

PC8. report any issues related to sexual harassment

Financial and Legal Literacy

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

PC9. use various financial products and services safely and securely

PC10. calculate income, expenses, savings etc.

PC11. approach the concerned authorities for any exploitation as per legal rights and laws

Essential Digital Skills

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

PC12. operate digital devices and use its features and applications securely and safely

PC13. use internet and social media platforms securely and safely

Entrepreneurship

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

PC14. identify and assess opportunities for potential business

PC15. identify sources for arranging money and associated financial and legal challenges

Customer Service

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

PC16. identify different types of customers

PC17. identify customer needs and address them appropriately

PC18. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

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

PC19. create a basic biodata

PC20. search for suitable jobs and apply

PC21. identify and register apprenticeship opportunities as per requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills

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 basic spoken English language

KU6. Do and dont of effective communication

KU7. inclusivity and its importance

KU8. different types of disabilities and appropriate communication and behaviour towards PwD

KU9. different types of financial products and services

KU10. how to compute income and expenses
KU11. importance of maintaining safety and security in financial transactions
KU12. different legal rights and laws
KU13. how to operate digital devices and applications safely and securely
KU14. ways to identify business opportunities
KU15. types of customers and their needs
KU16. how to apply for a job and prepare for an interview
KU17. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

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

GS1. communicate effectively using appropriate language
GS2. behave politely and appropriately with all
GS3. perform basic calculations
GS4. solve problems effectively
GS5. be careful and attentive at work
GS6. use time effectively
GS7. maintain hygiene and sanitisation to avoid infection

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Introduction to Employability Skills	**1**	**1**	**-**	**-**
PC1. understand the significance of employability skills in meeting the job requirements	-	-	-	-
Constitutional values – Citizenship	**1**	**1**	**-**	**-**
PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
Becoming a Professional in the 21st Century	**1**	**3**	**-**	**-**
PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.	-	-	-	-
Basic English Skills	**2**	**3**	**-**	**-**
PC4. speak with others using some basic English phrases or sentences	-	-	-	-
Communication Skills	**1**	**1**	**-**	**-**
PC5. follow good manners while communicating with others	-	-	-	-
PC6. work with others in a team	-	-	-	-
Diversity & Inclusion	**1**	**1**	**-**	**-**
PC7. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC8. report any issues related to sexual harassment	-	-	-	-
Financial and Legal Literacy	**3**	**4**	**-**	**-**
PC9. use various financial products and services safely and securely	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. calculate income, expenses, savings etc.	-	-	-	-
PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
Essential Digital Skills	**4**	**6**	**-**	**-**
PC12. operate digital devices and use its features and applications securely and safely	-	-	-	-
PC13. use internet and social media platforms securely and safely	-	-	-	-
Entrepreneurship	**3**	**5**	**-**	**-**
PC14. identify and assess opportunities for potential business	-	-	-	-
PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-
Customer Service	**2**	**2**	**-**	**-**
PC16. identify different types of customers	-	-	-	-
PC17. identify customer needs and address them appropriately	-	-	-	-
PC18. follow appropriate hygiene and grooming standards	-	-	-	-
Getting ready for apprenticeship & Jobs	**1**	**3**	**-**	**-**
PC19. create a basic biodata	-	-	-	-
PC20. search for suitable jobs and apply	-	-	-	-
PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
NOS Total	**20**	**30**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0101
NOS Name	Employability Skills (30 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	2
Credits	1
Version	1.0
Last Reviewed Date	30/04/2025
Next Review Date	30/04/2028
NSQC Clearance Date	30/04/2025

CON/N1253: Carry out preparatory works for Metal Inert Gas (MIG) Welding operations

Description

This unit describes the skills and knowledge required to carry out preparatory works prior to MIG welding operations

Scope

The scope covers the following :

- Preparatory works for MIG welding operations
- Prepare base metal of thickness 1 mm and above

Elements and Performance Criteria

Preparatory works for MIG welding operations

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

PC1. use appropriate PPEs catering to welding works

PC2. inspect and clear the work area of any flammable objects like boxes, plastic etc.

PC3. inspect electric connections for adequate tightness and secure them prior to commencing the work

PC4. ensure that work clamps are adequately secured and are in correct polarity (negative on welding bed and positive on electrode)

PC5. ensure that contact tip, tip holder, diffuser, and nozzle are in order

PC6. make initial adjustments of electrode consumption rate and voltage as per requirement

PC7. ensure that proper lighting and ventilation arrangement is available at workplace

PC8. ensure that the gas cylinders are in upright positions

PC9. inspect and adjust the gas valves ensuring there is no leakage

PC10. ensure that electrodes are compatible with base metal and weld requirements

Prepare base metal of thickness 1 mm and above

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

PC11. clean the surface to be welded and ensure it is free from irregularities, oxides, dust/foreign particles, paints, etc. and is not galvanized

PC12. check that adequate root gap is available

PC13. check the bevel angle visually

PC14. ensure that the element is properly anchored to restrict distortion

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for MIG welding

KU2. safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
KU3. importance of personal protection including the use of related safety gears & equipment in accordance with organizational norms
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipment as per organizational norms
KU6. statutory compliance requirements related to working at height
KU7. how to read and interpret fabrication drawings and symbols
KU8. correct handling and storage of gas cylinders for welding purposes
KU9. selection of welding mask, welding filter shade glass and their use as PPEs
KU10. the effects of polarity of setup
KU11. power ratings of welding equipment
KU12. relationship between wire feed, speed control, and voltage
KU13. the gas regulation, rate of flow of shielding gas and its effects
KU14. components of welding gun, equipment, and their functions
KU15. effects of welding fumes
KU16. consumable (electrodes, gas, wires etc.) used in welding works, their specification, types and uses
KU17. properties of different types of shield gases and their application,
KU18. effects of unclean surface on welds
KU19. importance of proper lighting and ventilation for proper welding space
KU20. how to detect gas leakage
KU21. process of preparing a weld joint

Generic Skills (GS)

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

GS1. write in at least two language, preferably in the local language of the site and basic English
GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site
GS3. speak in one or more language, preferably one of the local language at the site
GS4. communicate orally and effectively with team members
GS5. analyze the safety aspect of the workplace
GS6. plan work and organize required resource effectively
GS7. complete work as per agreed time schedule and quality parameters
GS8. resolve any conflict within the teammates
GS9. evaluate the complexity of the tasks
GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Preparatory works for MIG welding operations	**15**	**35**	**-**	**-**
PC1. use appropriate PPEs catering to welding works	-	-	-	-
PC2. inspect and clear the work area of any flammable objects like boxes, plastic etc.	-	-	-	-
PC3. inspect electric connections for adequate tightness and secure them prior to commencing the work	-	-	-	-
PC4. ensure that work clamps are adequately secured and are in correct polarity (negative on welding bed and positive on electrode)	-	-	-	-
PC5. ensure that contact tip, tip holder, diffuser, and nozzle are in order	-	-	-	-
PC6. make initial adjustments of electrode consumption rate and voltage as per requirement	-	-	-	-
PC7. ensure that proper lighting and ventilation arrangement is available at workplace	-	-	-	-
PC8. ensure that the gas cylinders are in upright positions	-	-	-	-
PC9. inspect and adjust the gas valves ensuring there is no leakage	-	-	-	-
PC10. ensure that electrodes are compatible with base metal and weld requirements	-	-	-	-
Prepare base metal of thickness 1 mm and above	**15**	**35**	**-**	**-**
PC11. clean the surface to be welded and ensure it is free from irregularities, oxides, dust/foreign particles, paints, etc. and is not galvanized	-	-	-	-
PC12. check that adequate root gap is available	-	-	-	-
PC13. check the bevel angle visually	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure that the element is properly anchored to restrict distortion	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1253
NOS Name	Carry out preparatory works for Metal Inert Gas (MIG) Welding operations
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	3
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N1254: Carry out Metal Inert Gas (MIG) Welding as per requirement in fabrication workshop or construction site

Description

This unit describes the skills and knowledge required to carry out MIG welding on structural elements (rolled section, tubular section, plate section and other casting) of materials (carbon steel, stainless steel ,alloy teel,alumunium and other metals) of thickness ranging from (3.15mm to 100mm) as per requirement in fabrication workshop or construction site for structures of height up to 100 meters and also in confined spaces

Scope

The scope covers the following :

- Carry out welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1 mm and above
- Carry out visual inspection during and post welding

Elements and Performance Criteria

Carry out welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1 mm and above

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

PC1. interpret weld requirements like position of weld, type of joint, number of passes required, etc., from fabrication drawings/specification

PC2. estimate the number or length of filler material required to complete the weld

PC3. pre heat the base material before welding if required

PC4. maintain correct body posture as per requirement of weld

PC5. adjust the wire stick out and regulate the gas flow rate accordingly

PC6. use appropriate patterns of welding as per position and type of joints

PC7. hold the welding gun at proper angle as per requirement

PC8. make required number of steady passes of weld to ensure proper heat generation and penetration

PC9. make adjustments in welding machine if required

PC10. disconnect the equipment correctly and store the same as per manufacture guidelines and site safety parameters

PC11. clean the welded joint

Carry out visual inspection during and post welding

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

PC12. ensure proper penetration of weld

PC13. ensure that the weld is properly shielded by shielding gas

PC14. ensure proper heat input through arc

PC15. ensure the spatter spray is reduced during the welding

PC16. check the root pass for cracks
PC17. check visually for spatters, craters, undercuts
PC18. check the welded joint visually for cracks

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for MIG welding
KU2. safety rules and regulations for handling and storing relevant tools and equipment and materials required for MIG welding works
KU3. importance of personal protection including the use of related safety gears & equipment in accordance with organizational norms
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipmentst
KU6. statutory compliance requirements related to working at height
KU7. how to read and interpret fabrication drawings and symbols
KU8. the gas regulation, rate of flow of shielding gas and its effects
KU9. components of welding gun, equipment and their functions
KU10. effects of welding fumes
KU11. various consumables, their specification, types and uses
KU12. different types of shielding gases and their uses in different conditions
KU13. effects of unclean surface on welds
KU14. types of welded joints
KU15. positions of welding
KU16. patterns of welding and their application
KU17. defects in welding
KU18. preparation of weld joints

Generic Skills (GS)

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

GS1. write in at least two language, preferably in the local language of the site and basic English
GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site
GS3. speak in one or more language, preferably one of the local language at the site
GS4. communicate orally and effectively with team members
GS5. analyze the safety aspect of the workplace
GS6. plan work and organize required resource effectively
GS7. complete work as per agreed time schedule and quality parameters

GS8. resolve any conflict within the teammates

GS9. evaluate the complexity of the tasks

GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1 mm and above	**15**	**35**	**-**	**-**
PC1. interpret weld requirements like position of weld, type of joint, number of passes required, etc., from fabrication drawings/specification	-	-	-	-
PC2. estimate the number or length of filler material required to complete the weld	-	-	-	-
PC3. pre heat the base material before welding if required	-	-	-	-
PC4. maintain correct body posture as per requirement of weld	-	-	-	-
PC5. adjust the wire stick out and regulate the gas flow rate accordingly	-	-	-	-
PC6. use appropriate patterns of welding as per position and type of joints	-	-	-	-
PC7. hold the welding gun at proper angle as per requirement	-	-	-	-
PC8. make required number of steady passes of weld to ensure proper heat generation and penetration	-	-	-	-
PC9. make adjustments in welding machine if required	-	-	-	-
PC10. disconnect the equipment correctly and store the same as per manufacture guidelines and site safety parameters	-	-	-	-
PC11. clean the welded joint	-	-	-	-
Carry out visual inspection during and post welding	**15**	**35**	**-**	**-**
PC12. ensure proper penetration of weld	-	-	-	-
PC13. ensure that the weld is properly shielded by shielding gas	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure proper heat input through arc	-	-	-	-
PC15. ensure the spatter spray is reduced during the welding	-	-	-	-
PC16. check the root pass for cracks	-	-	-	-
PC17. check visually for spatters, craters, undercuts	-	-	-	-
PC18. check the welded joint visually for cracks	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1254
NOS Name	Carry out Metal Inert Gas (MIG) Welding as per requirement in fabrication workshop or construction site
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	7
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N1255: Carry out preparatory works for Tungsten Inert Gas (TIG) Welding operations

Description

This unit describes the skills and knowledge required to carry out preparatory works prior to TIG welding operations

Scope

The scope covers the following :

- Carry out preparatory works for TIG welding
- Prepare base metal of thickness 1 mm and above

Elements and Performance Criteria

Carry out preparatory works for TIG welding

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

PC1. identify the joints to be welded, their location and position of welding

PC2. interpret the weld specifications like the type of joint, throat for fillet, number of passes required, specifications of filler rod, required heat input, preheat temperature etc. form relevant charts and drawings

PC3. use appropriate PPEs catering to welding works

PC4. inspect and clear the work area of any flammable objects like boxes, plastic, etc.

PC5. ensure that proper lighting and ventilation arrangement is available at the workplace

PC6. keep the shielding gas cylinders in an upright position only

PC7. inspect and adjust the gas valves ensuring there is no leakage

PC8. ensure that shielding gas is purely inert e. g Argon

PC9. check the pipes, valves/ regulator, and flow meter is securely connected

PC10. taper the tungsten rod and sharpen the point of the electrode for better arc stability

PC11. adjust the tungsten stick out as per requirement based upon type of joint, base metal properties etc

PC12. estimate the number or length of filler material/electrodes required and stack them per instructions

PC13. clean the filler rod to remove any foreign particles in order to avoid weld contamination

PC14. ensure that filler material is compatible with base metal and as per weld specifications

PC15. ensure that work clamps are adequately secured and in correct polarity (positive on welding bed and negative on electrode)

PC16. ensure that electrical connections are tight, secure, and compatible with the equipment

Prepare base metal of thickness 1 mm and above

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

PC17. clean the surface to be welded and ensure it is free from irregularities, oxides, dust/foreign particles, paints etc. and is not galvanized

PC18. check that adequate root gap is available
PC19. check the bevel angle visually
PC20. ensure that the joint is properly secured against any movement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for TIG welding
KU2. safety rules and regulations for handling and storing relevant tools and equipment and materials for TIG welding works
KU3. importance of personal protection including the use of the related safety gears and equipment
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipmentst
KU6. statutory compliance requirements related to working at height
KU7. how to read and interpret fabrication drawings and symbols
KU8. correct handling and storage of gas cylinders for welding purposes
KU9. the effects of polarity of setup
KU10. power ratings of welding equipment
KU11. relationship between wire feed, speed control and voltage
KU12. the gas regulation, rate of flow of shielding gas and its effects
KU13. components of welding gun, equipment and their functions
KU14. effects of welding fumes
KU15. fire protection and prevention methods, equipment and their use
KU16. use of welding mask
KU17. various consumables, their specification, types and uses
KU18. selection of consumables for different purposes
KU19. different types of shielding gases and their uses in different conditions
KU20. effects of unclean surface on welds
KU21. preparation of weld joints
KU22. positions of welding
KU23. pattern of welding and their application
KU24. different types of personnel protective equipment and their application
KU25. importance of proper lighting and ventilation
KU26. how to check the electrical connections
KU27. how to detect gas leakage

Generic Skills (GS)

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

GS1. write in at least two language, preferably in the local language of the site and basic English

GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site

GS3. speak in one or more language, preferably one of the local language at the site

GS4. communicate orally and effectively with team members

GS5. analyze the safety aspect of the workplace

GS6. plan work and organize required resource effectively

GS7. complete work as per agreed time schedule and quality parameters

GS8. resolve any conflict within the teammates

GS9. evaluate the complexity of the tasks

GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out preparatory works for TIG welding	**15**	**35**	**-**	**-**
PC1. identify the joints to be welded, their location and position of welding	-	-	-	-
PC2. interpret the weld specifications like the type of joint, throat for fillet, number of passes required, specifications of filler rod, required heat input, preheat temperature etc. form relevant charts and drawings	-	-	-	-
PC3. use appropriate PPEs catering to welding works	-	-	-	-
PC4. inspect and clear the work area of any flammable objects like boxes, plastic, etc.	-	-	-	-
PC5. ensure that proper lighting and ventilation arrangement is available at the workplace	-	-	-	-
PC6. keep the shielding gas cylinders in an upright position only	-	-	-	-
PC7. inspect and adjust the gas valves ensuring there is no leakage	-	-	-	-
PC8. ensure that shielding gas is purely inert e. g Argon	-	-	-	-
PC9. check the pipes, valves/ regulator, and flow meter is securely connected	-	-	-	-
PC10. taper the tungsten rod and sharpen the point of the electrode for better arc stability	-	-	-	-
PC11. adjust the tungsten stick out as per requirement based upon type of joint, base metal properties etc	-	-	-	-
PC12. estimate the number or length of filler material/electrodes required and stack them per instructions	-	-	-	-
PC13. clean the filler rod to remove any foreign particles in order to avoid weld contamination	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. ensure that filler material is compatible with base metal and as per weld specifications	-	-	-	-
PC15. ensure that work clamps are adequately secured and in correct polarity (positive on welding bed and negative on electrode)	-	-	-	-
PC16. ensure that electrical connections are tight, secure, and compatible with the equipment	-	-	-	-
Prepare base metal of thickness 1 mm and above	**15**	**35**	**-**	**-**
PC17. clean the surface to be welded and ensure it is free from irregularities, oxides, dust/foreign particles, paints etc. and is not galvanized	-	-	-	-
PC18. check that adequate root gap is available	-	-	-	-
PC19. check the bevel angle visually	-	-	-	-
PC20. ensure that the joint is properly secured against any movement	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1255
NOS Name	Carry out preparatory works for Tungsten Inert Gas (TIG) Welding operations
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	3
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N1256: Carry out Tungsten Inert Gas (TIG) Welding as per requirement in fabrication workshop or construction site

Description

This unit describes the skills and knowledge required to carry out tungsten Inert gas welding on structural elements (rolled section, tubular section, plate section and other casting) on ferrous materials (Mild steel, stainless steel, alloy steel) of thickness 1 mm and above as per requirement in fabrication workshop or construction site for structures of height up to 100 meter and above and also in confined spaces

Scope

The scope covers the following :

- Carry out welding operation in 1G, 1F, 2G, 2F, 3G,3F positions for structural elements of thickness 1 mm and above
- Carry out visual inspection during and post welding

Elements and Performance Criteria

Carry out welding operation in 1G, 1F, 2G, 2F, 3G,3F positions for structural elements of thickness 1 mm and above

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

PC1. ignite the arc by superimposing the high frequency over high voltage

PC2. ensure that the tungsten rod doesn't touch the base metal

PC3. ensure that the filler rod is always inside the sheilding gas cover to avoid contamination during welding operation

PC4. follow ergonomic principles for smooth welding works

PC5. position head such that weld is clearly visible

PC6. ensure that weld location is properly illuminated and ventilated

PC7. use appropriate patterns of welding as per position and type of joints

PC8. hold the welding gun at proper angle as per requirement(70-80 from base plate)

PC9. ensure that the arc length is not too large and is as per heat requirement

PC10. adjust the travel speed of weld to ensure proper penetration

PC11. make required number of steady passes of weld to ensure proper heat generation and penetration

PC12. make required adjustments in welding machine

PC13. disconnect the equipment correctly and store the same as per manufacture guidelines and site safety parameters

PC14. clean the welded joint

Carry out visual inspection during and post welding

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

PC15. ensure proper penetration of weld

PC16. ensure that the weld is properly shielded by shielding gas

PC17. ensure proper heat input through arc
PC18. ensure that the spatter spray is reduced during the welding
PC19. check the root pass for cracks
PC20. check visually for spatters, craters, undercuts
PC21. check the welded joint visually for cracks

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for TIG welding
KU2. safety rules and regulations for handling and storing relevant tools and equipment and materials for welding works
KU3. importance of personal protection including the use of the related safety gears and equipment
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipmentst
KU6. statutory compliance requirements related to working at height
KU7. how to read and interpret fabrication drawings
KU8. how to read and interpret fabrication symbols
KU9. the gas regulation, rate of flow of shielding gas and its effects
KU10. components of welding gun, equipment and their functions
KU11. effects of welding fumes
KU12. fire protection and prevention methods, equipment and their use
KU13. hazards of welding
KU14. use of welding mask
KU15. consumable specification, types and use
KU16. different types of shielding gases and their uses in different conditions
KU17. effects of unclean surface on welds
KU18. types of welded joints
KU19. positions of welding
KU20. patterns of welding and their application
KU21. defects in welding
KU22. preparation of weld joints
KU23. process of welding
KU24. physical and chemical changes occurring during welding
KU25. behavior of metal upon heating, plasticity curve etc.
KU26. NDT and other tests relevant to welding

Generic Skills (GS)

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

GS1. write in at least two language, preferably in the local language of the site and basic English

GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site

GS3. speak in one or more language, preferably one of the local language at the site

GS4. communicate orally and effectively with team members

GS5. analyze the safety aspect of the workplace

GS6. plan work and organize required resource effectively

GS7. complete work as per agreed time schedule and quality parameters

GS8. resolve any conflict within the teammates

GS9. evaluate the complexity of the tasks

GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out welding operation in 1G, 1F, 2G, 2F, 3G,3F positions for structural elements of thickness 1 mm and above	**15**	**35**	**-**	**-**
PC1. ignite the arc by superimposing the high frequency over high voltage	-	-	-	-
PC2. ensure that the tungsten rod doesn't touch the base metal	-	-	-	-
PC3. ensure that the filler rod is always inside the sheilding gas cover to avoid contamination during welding operation	-	-	-	-
PC4. follow ergonomic principles for smooth welding works	-	-	-	-
PC5. position head such that weld is clearly visible	-	-	-	-
PC6. ensure that weld location is properly illuminated and ventilated	-	-	-	-
PC7. use appropriate patterns of welding as per position and type of joints	-	-	-	-
PC8. hold the welding gun at proper angle as per requirement(70-80 from base plate)	-	-	-	-
PC9. ensure that the arc length is not too large and is as per heat requirement	-	-	-	-
PC10. adjust the travel speed of weld to ensure proper penetration	-	-	-	-
PC11. make required number of steady passes of weld to ensure proper heat generation and penetration	-	-	-	-
PC12. make required adjustments in welding machine	-	-	-	-
PC13. disconnect the equipment correctly and store the same as per manufacture guidelines and site safety parameters	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. clean the welded joint	-	-	-	-
Carry out visual inspection during and post welding	**15**	**35**	**-**	**-**
PC15. ensure proper penetration of weld	-	-	-	-
PC16. ensure that the weld is properly shielded by shielding gas	-	-	-	-
PC17. ensure proper heat input through arc	-	-	-	-
PC18. ensure that the spatter spray is reduced during the welding	-	-	-	-
PC19. check the root pass for cracks	-	-	-	-
PC20. check visually for spatters, craters, undercuts	-	-	-	-
PC21. check the welded joint visually for cracks	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1256
NOS Name	Carry out Tungsten Inert Gas (TIG) Welding as per requirement in fabrication workshop or construction site
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	7
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N1257: Carry out preparatory work for Shielded Metal Arc Welding (SMAW) operations

Description

This unit describes the skills and knowledge required to carry out preparatory work for performing shielded metal arc welding operations

Scope

The scope covers the following :

- Conduct preparatory works for setting up the welding kit and prepare the base metal of thickness 1mm and above

Elements and Performance Criteria

Conduct preparatory works for setting up the welding kit and prepare the base metal of thickness 1 mm and above

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

PC1. use appropriate PPEs catering to welding works

PC2. inspect and clear the work area of any flammable objects like boxes, plastic, etc.

PC3. ensure that proper lighting and ventilation arrangement is available at the workplace

PC4. inspect electric connections to be adequately tight and secure prior to commencing the work

PC5. ensure that electrodes are compatible with base metal and weld requirements

PC6. ensure that work clamps are adequately secured and are in correct polarity (negative on welding bed and positive on electrode)

PC7. clean the surface to be welded(base metal) and ensure it is free from irregularities, oxides, dust/foreign particles, paints etc. and is not galvanized

PC8. check that adequate root gap is available

PC9. check the bevel angle visually

PC10. attach the work clamps to the base metal

PC11. extract the weld specifications like type of joint, throat for fillet, number of passes required, specifications of filler rod, required heat input, preheat temperature, type of welding process, type of weld , required consumables, required welding process parameters, base metal, joint design, type of edge preparation welding position, backing, preheat temp, post weld heat treatment, welding techniques etc. form relevant charts and drawings

PC12. estimate the quantity of filler material required to complete the weld

PC13. identify the joints to be welded, their location and position of welding

PC14. ensure that the joint is properly secured against any movement

PC15. ensure that the temperature at joint is as per specifications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for welding works
KU2. safety rules and regulations for handling and storing relevant tools ,equipment and materials for welding works
KU3. personal protection including the use of the related safety gears and equipment
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipment
KU6. statutory compliance requirements related to working at height
KU7. welding terminologies like arc, flux, slag, etc.
KU8. different types of sections, plates, etc.
KU9. different materials used in fabrication
KU10. different welding parameters
KU11. correct calibration of welding kit and various adjustments in the same
KU12. importance of cleaning the surface of the material prior to welding
KU13. importance of proper joint finishing
KU14. fabrication shop drawings, welding symbol, weld nomenclature, weld joint, and welding position
KU15. welding procedure specification (WPS)
KU16. various welding specifications from charts and tables
KU17. selection and handling of electrodes
KU18. basics of SMAW process
KU19. effect of polarity on welding

Generic Skills (GS)

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

GS1. write in one or more languages, preferably in the local language of the site and basic English
GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site
GS3. speak in one or more language, preferably one of the local language at the site
GS4. communicate orally and effectively with team members
GS5. analyze the safety aspect of the workplace
GS6. plan work and organize required resource effectively
GS7. complete work as per agreed time schedule and quality parameters
GS8. resolve any conflict within the teammates
GS9. evaluate the complexity of the tasks
GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Conduct preparatory works for setting up the welding kit and prepare the base metal of thickness 1 mm and above	**30**	**70**	**-**	**-**
PC1. use appropriate PPEs catering to welding works	-	-	-	-
PC2. inspect and clear the work area of any flammable objects like boxes, plastic, etc.	-	-	-	-
PC3. ensure that proper lighting and ventilation arrangement is available at the workplace	-	-	-	-
PC4. inspect electric connections to be adequately tight and secure prior to commencing the work	-	-	-	-
PC5. ensure that electrodes are compatible with base metal and weld requirements	-	-	-	-
PC6. ensure that work clamps are adequately secured and are in correct polarity (negative on welding bed and positive on electrode)	-	-	-	-
PC7. clean the surface to be welded(base metal) and ensure it is free from irregularities, oxides, dust/foreign particles, paints etc. and is not galvanized	-	-	-	-
PC8. check that adequate root gap is available	-	-	-	-
PC9. check the bevel angle visually	-	-	-	-
PC10. attach the work clamps to the base metal	-	-	-	-
PC11. extract the weld specifications like type of joint, throat for fillet, number of passes required, specifications of filler rod, required heat input, preheat temperature, type of welding process, type of weld , required consumables, required welding process parameters, base metal, joint design, type of edge preparation welding position, backing, preheat temp, post weld heat treatment, welding techniques etc. form relevant charts and drawings	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. estimate the quantity of filler material required to complete the weld	-	-	-	-
PC13. identify the joints to be welded, their location and position of welding	-	-	-	-
PC14. ensure that the joint is properly secured against any movement	-	-	-	-
PC15. ensure that the temperature at joint is as per specifications	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1257
NOS Name	Carry out preparatory work for Shielded Metal Arc Welding (SMAW) operations
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	3
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

CON/N1258: Carry out Shielded Metal Arc Welding (SMAW) as per requirement in fabrication workshop or construction site

Description

This unit describes the skills and knowledge required to carry out shielded metal arc welding on structural elements (rolled section, tubular section, plate section and other casting) on ferrous materials (Mild Steel, stainless steel, alloy steel) of thickness ranging from 1 mm upwards as per requirement in fabrication workshop or construction site for structures of height up to 100 meters and above and also in confined spaces

Scope

The scope covers the following :

- Carry out shielded metal arc welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1 mm and above
- Carry out visual inspection during and post welding

Elements and Performance Criteria

Carry out shielded metal arc welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1mm and above

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

PC1. ignite the arc by striking the electrode on the base metal like a match

PC2. maintain correct body posture as per requirement of weld

PC3. position head such that weld is clearly visible

PC4. ensure that weld location is properly illuminated and ventilated

PC5. use appropriate patterns of welding as per position and type of joints

PC6. push or drag the arc as per requirement

PC7. ensure that the arc length is not too large and is as per heat requirement

PC8. adjust the travel speed of weld to ensure proper penetration

PC9. make required number of steady passes of weld to ensure proper heat generation and penetration

PC10. clean the weld after each pass to scrap out the slag formed on the surface of weld

PC11. make required adjustments in welding machine

PC12. disconnect the equipment correctly and store the same as per manufacturer's guidelines and site safety parameters

PC13. dispose of the stubs of electrode left after completing the welding appropriately

PC14. clean the welded joint by removing slag formed during the welding process

Carry out visual inspection during and post welding

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

PC15. ensure proper penetration of weld

PC16. ensure that the weld is properly shielded throughout the operation

PC17. ensure proper heat input through arc
PC18. ensure that the spatter spray is reduced during the welding
PC19. check the root pass for cracks, porosity, slag inclusion, incomplete penetration, root concavity, incomplete fusion, undercut etc.
PC20. check visually for spatters, craters, undercuts
PC21. check the welded joint visually for cracks

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard procedures for welding works
KU2. safety rules and regulations for handling and storing relevant tools and equipment and materials for welding works
KU3. personal protection including the use of the related safety gears and equipment
KU4. precautions required in the lifting and movement of heavy components and materials
KU5. service request procedures for tools, materials and equipment
KU6. statutory compliance requirements related to working at height
KU7. how to read and interpret fabrication shop drawings
KU8. how to read and interpret various welding specifications from charts and tables
KU9. different welding parameters
KU10. correct calibration of welding kit and various adjustments in the same
KU11. importance of cleaning the surface of the material prior to welding
KU12. importance of proper joint finishing
KU13. basics of SMAW process to be carried out
KU14. effect of polarity on welding
KU15. importance of preheating and post heating
KU16. selection of electrodes as per requirements
KU17. importance of light, ventilation and proper body posture
KU18. different patterns of welding
KU19. the process of assembling and disconnecting the welding kit
KU20. how and why the slag should be removed
KU21. parameters for checking the correctness of weld
KU22. welding terminologies like arc, flux, slag, etc.
KU23. relation of arc length with heat transfer
KU24. effect of atmospheric agents on welding
KU25. NDT and other tests relevant to welding

Generic Skills (GS)

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

GS1. write in one or more languages, preferably in the local language of the site and basic English

GS2. read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site

GS3. speak in one or more language, preferably one of the local language at the site

GS4. communicate orally and effectively with team members

GS5. analyze the safety aspect of the workplace

GS6. plan work and organize required resource effectively

GS7. complete work as per agreed time schedule and quality parameters

GS8. resolve any conflict within the teammates

GS9. evaluate the complexity of the tasks

GS10. identify any violation of safety norms during the work

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out shielded metal arc welding operation in 1G, 1F, 2G, 2F, 3G, 3F positions for structural elements of thickness 1mm and above	**15**	**35**	**-**	**-**
PC1. ignite the arc by striking the electrode on the base metal like a match	-	-	-	-
PC2. maintain correct body posture as per requirement of weld	-	-	-	-
PC3. position head such that weld is clearly visible	-	-	-	-
PC4. ensure that weld location is properly illuminated and ventilated	-	-	-	-
PC5. use appropriate patterns of welding as per position and type of joints	-	-	-	-
PC6. push or drag the arc as per requirement	-	-	-	-
PC7. ensure that the arc length is not too large and is as per heat requirement	-	-	-	-
PC8. adjust the travel speed of weld to ensure proper penetration	-	-	-	-
PC9. make required number of steady passes of weld to ensure proper heat generation and penetration	-	-	-	-
PC10. clean the weld after each pass to scrap out the slag formed on the surface of weld	-	-	-	-
PC11. make required adjustments in welding machine	-	-	-	-
PC12. disconnect the equipment correctly and store the same as per manufacturer's guidelines and site safety parameters	-	-	-	-
PC13. dispose of the stubs of electrode left after completing the welding appropriately	-	-	-	-
PC14. clean the welded joint by removing slag formed during the welding process	-	-	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out visual inspection during and post welding	**15**	**35**	**-**	**-**
PC15. ensure proper penetration of weld	-	-	-	-
PC16. ensure that the weld is properly shielded throughout the operation	-	-	-	-
PC17. ensure proper heat input through arc	-	-	-	-
PC18. ensure that the spatter spray is reduced during the welding	-	-	-	-
PC19. check the root pass for cracks, porosity, slag inclusion, incomplete penetration, root concavity, incomplete fusion, undercut etc.	-	-	-	-
PC20. check visually for spatters, craters, undercuts	-	-	-	-
PC21. check the welded joint visually for cracks	-	-	-	-
NOS Total	**30**	**70**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1258
NOS Name	Carry out Shielded Metal Arc Welding (SMAW) as per requirement in fabrication workshop or construction site
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	4
Credits	7
Version	2.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by CSDCI. Each Performance Criteria (PC)/ Elements will be assigned marks proportional to its importance in NOS.

2. CSDCI will also lay down proportion of marks for Theory and Skills Practical for each PC/ Elements. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by CSDCI.

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

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

b) The passing percentage for the QP will be 70%. To pass the Qualification Pack.

c) The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome

d) 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.

e) After the certain number of iteration as decided by SSC the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.

f) 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 CSDCI.

g) The candidates shall undergo On job training (OJT), and will learn at actual workplace for a fixed period of time and a certain weightage of assessment is allocated out of total skill weightage of Qualification Pack for undergoing OJT as stipulated by CSDCI. This OJT score and assessors' end point score are combined to arrive at final Marking/grading of trainees' skill test. The OJT score is determined by Supervisor of company under which candidates undergo on job training.

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
CON/N1206.Carry out grinding activities on structural steel elements	30	70	-	-	100	10
CON/N9001.Work according to personal health, safety and environment protocols at construction site	30	70	-	-	100	5
CON/N8001.Work effectively in a team to deliver desired results at the workplace	30	70	-	-	100	5
DGT/VSQ/N0101.Employability Skills (30 Hours)	20	30	-	-	50	5
Total	**110**	**240**	**-**	**-**	**350**	**25**

Elective: 1 Metal Inert Gas (MIG) Welding

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N1253.Carry out preparatory works for Metal Inert Gas (MIG) Welding operations	30	70	-	-	100	25
CON/N1254.Carry out Metal Inert Gas (MIG) Welding as per requirement in fabrication workshop or construction site	30	70	-	-	100	50
Total	**60**	**140**	**-**	**-**	**200**	**75**

Elective: 2 Tungsten Inert Gas (TIG) Welding

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N1255.Carry out preparatory works for Tungsten Inert Gas (TIG) Welding operations	30	70	-	-	100	25
CON/N1256.Carry out Tungsten Inert Gas (TIG) Welding as per requirement in fabrication workshop or construction site	30	70	-	-	100	50
Total	**60**	**140**	**-**	**-**	**200**	**75**

Elective: 3 Shielded Metal Arc Welding (SMAW)

Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N1257.Carry out preparatory work for Shielded Metal Arc Welding (SMAW) operations	30	70	-	-	100	25
CON/N1258.Carry out Shielded Metal Arc Welding (SMAW) as per requirement in fabrication workshop or construction site	30	70	-	-	100	50
Total	**60**	**140**	**-**	**-**	**200**	**75**

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.