Supervisor Fabrication

QP Code: CON/Q1209

Version: 1.0

NSQF Level: 6

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CON/Q1209: Supervisor Fabrication

Brief Job Description

This job role is responsible for planning and sequencing the activities while optimizing the use of resources. They are responsible to supervise, monitor and troubleshoot fabrication activities like cutting, bending, fit-up, welding, bolting, repairing etc. The individual should possess sound technical knowledge, should be able to monitor and maintain safe and quality working practices

Personal Attributes

This job role requires the individual to be physically and mentally strong to oversee the fabrication work at a construction site. The individual should be having strong organizational, interpersonal and communication skills, along with comprehensive technical knowledge of fabrication operations and ability to supervise construction crew

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CON/N1215: Plan and organize resources for completion of construction Fabrication works
2. CON/N1216: Read and interpret specifications and fabrication drawings and assist in documentation of reports
3. CON/N1217: Supervise cutting , drilling & edge preparation activity of structural steel elements
4. CON/N1218: Supervise joint preparation activity of structural steel elements to meet desiredquality standards
5. CON/N1219: Supervise bolting and welding of structural steel elements according to standard procedures and to meet desired standards
6. CON/N9002: Manage workplace for safe and healthy work environment

Qualification Pack (QP) Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
Country	India

NSQF Level	6
Credits	NA
Aligned to NCO/ISCO/ISIC Code	NCO-2004/7218.20
Minimum Educational Qualification & Experience	Diploma (Civil/Mechanical) with 3-5 Years of experience as a certified Foreman Fabrication, CNC Cutter, Senior Construction Welder â€“ TIG, Senior Construction Welder â€“ MIG and Senior Construction Welder â€“ SMAW OR Diploma (Civil/Mechanical) with 10-15 Years of experience in case of a Non trained worker, in same occupation
Minimum Level of Education for Training in School	
Pre-Requisite License or Training	Recommended training period of 20-24 weeks as per QP of Supervisor Fabrication
Minimum Job Entry Age	18 Years
Last Reviewed On	23/08/2015
Next Review Date	31/03/2022
Deactivation Date	31/03/2022
NSQC Approval Date	19/12/2018
Version	1.0
Reference code on NQR	2019/CON/CSDCI/03121
NQR Version	1.0

CON/N1215: Plan and organize resources for completion of construction Fabrication works

Description

This unit describes the skills and knowledge required to plan and organize resources for completion of construction fabrication works

Scope

The scope covers the following:

- Plan and sequence the activities for completion of assigned work
- Ensure optimum utilization of material, equipment and manpower resources involved in fabrication works

Elements and Performance Criteria

Plan and sequence the activities for completion of assigned work

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

PC1. plan activities as per schedule and sequence

PC2. determine requirement of manpower to complete works for each fabrication activity like welding, cutting, grinding etc

PC3. ascertain type and range of equipment to be used for different operations such as welding, cutting, grinding etc

PC4. provide inputs regarding requirements for manpower, tools, and materials as per work requirements to superiors

PC5. determine resources to be used in accordance with safety practices to be observed during various operations

Ensure optimum utilization of material, equipment and manpower resources involved in fabrication works

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

PC6. check the working of different equipment and consumables to identify any defects and mark the same for replacement or repair as applicable

PC7. ensure that the tools and consumables are used for appropriate purpose only as specified by manufacturers and with complete safety

PC8. ensure that materials and consumables are appropriately used and wastage of such is avoided

PC9. employ tools, tackles and equipment with care to avoid damage to the same

PC10. ensure that all scrap is disposed as per organisational norms

PC11. allocate manpower to respective activities on the basis of work requirement

PC12. ensure productivity of manpower by providing instruction, checking completed works as per drawing and reporting to senior authorities

PC13. report efficiently to the concerned authorities for discrepancies found in the jobs

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for fabrication works
KU2. safety rules and regulations for handling and storing required fabrication tools, equipment and materials
KU3. personal protection including the use of related safety gears & equipments
KU4. service request procedures for tools, materials and equipments
KU5. statutory compliance requirement related to working at height
KU6. statutory compliance requirement related to workmen engagement
KU7. processes involved in fabrication and standard working procedures
KU8. identification of correct sequence as per work requirement
KU9. types of materials, different processes applicable on the materials, their limitations, etc.
KU10. essential requirements for completing any fabrication activity including, equipment required, quantity and quality of consumables required, skill set required
KU11. how to estimate the time duration for completion of activity considering available resources
KU12. different safety concerns and protocols established at site for various activities
KU13. working and operational requirements of different tools and equipments, correct usage and storage of the same
KU14. different consumables, their specifications and applications
KU15. classifying materials as scrap and places and methods to reduce scrap
KU16. approved code of practice related fabrication operations
KU17. scope of work and timelines to be met according to agreed fabrication plan
KU18. to communicate efficiently to achieve desired outcome from the team
KU19. reporting procedure as per organizational norms
KU20. job requirement and level of competencies required from a worker to execute specific works

Generic Skills (GS)

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

GS1. write in one or more language, preferably in the local language of the site and basic English
GS2. provide clear and simple instructions, details & sketches to sub-ordinate
GS3. record and documents daily productivity report, daily labour attendance &details regarding work
GS4. prepare basic status updates for the superiors in the prescribed format
GS5. read one or more language, preferably in the local language of the site
GS6. read drawing, specification and standards related to relevant work
GS7. read key documents including quality standards and standard workingmethods
GS8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace
GS9. speak in one or more language, preferably in one of the local languages of the site
GS10. listen and follow instructions clearly given by the superior

GS11. provide clear instructions to subordinates for completion of task as per work plan, time schedule and quality

GS12. estimate required material and resources for work

GS13. decide alternate course of action in case of hindrance to work

GS14. determine whether tools and equipment are being deployed as per manufacturers instructions and for appropriate use

GS15. plan work & organize required resource in coordination with team members and superior

GS16. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time

GS17. plan work activities related to fabrication works and their sequence

GS18. ensure completion of work as per agreed time schedule and quality

GS19. resolve and solve any conflict within the team

GS20. report to concerned authority in case of any discrepancies in the quantity of materials and resources

GS21. assess the functioning of equipment and determine need for repair or replacement

GS22. ensure safe and appropriate disposal of scrap from the site

GS23. assess quantity of materials for day work

GS24. optimize resources

GS25. minimize wastages

GS26. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS27. identify and assess how violation of any safety norms may lead to accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Plan and sequence the activities for completion of assigned work	**18.5**	**18.5**	**-**	**-**
PC1. plan activities as per schedule and sequence	3.5	3.5	-	-
PC2. determine requirement of manpower to complete works for each fabrication activity like welding, cutting, grinding etc	3.5	3.5	-	-
PC3. ascertain type and range of equipment to be used for different operations such as welding, cutting, grinding etc	4	4	-	-
PC4. provide inputs regarding requirements for manpower, tools, and materials as per work requirements to superiors	4	4	-	-
PC5. determine resources to be used in accordance with safety practices to be observed during various operations	3.5	3.5	-	-
Ensure optimum utilization of material, equipment and manpower resources involved in fabrication works	**31.5**	**31.5**	**-**	**-**
PC6. check the working of different equipment and consumables to identify any defects and mark the same for replacement or repair as applicable	4	4	-	-
PC7. ensure that the tools and consumables are used for appropriate purpose only as specified by manufacturers and with complete safety	4	4	-	-
PC8. ensure that materials and consumables are appropriately used and wastage of such is avoided	3.5	3.5	-	-
PC9. employ tools, tackles and equipment with care to avoid damage to the same	4	4	-	-
PC10. ensure that all scrap is disposed as per organisational norms	4	4	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. allocate manpower to respective activities on the basis of work requirement	4	4	-	-
PC12. ensure productivity of manpower by providing instruction, checking completed works as per drawing and reporting to senior authorities	4	4	-	-
PC13. report efficiently to the concerned authorities for discrepancies found in the jobs	4	4	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1215
NOS Name	Plan and organize resources for completion of construction Fabrication works
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/12/2018

CON/N1216: Read and interpret specifications and fabrication drawings and assist in documentation of reports

Description

This unit describes the skills and knowledge required to read and interpretspecifications and fabrication drawings and assist in documentation of reports

Scope

The scope covers the following:

- Read and interpret drawings and specification
- Assist in documentation of required reports

Elements and Performance Criteria

Element Performance Criteria Read and interpret drawings and specification

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

PC1. read and interpret working drawings, schematics etc

PC2. interpret symbols, terms and other labels used in the drawings for respective works

PC3. read and interpret the code of practices, specifications, charts and tables and other documents regarding the use and application of various tools and materials employed in the fabrication yard

PC4. employ correct drawings for confirming the orientations, joint and surface preparations etc

PC5. carry out necessary calculations and computations from the drawings

PC6. read and understand the equipment specifications related to operations, storage and capacity

Assist in documentation of required reports

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

PC7. fill up checklists, permits and relevant formats as applicable to allotted work

PC8. provide necessary inputs for preparation of reports such as o Details, specification and progress of jointso Details , specification and progress of welds o Parameters such as preheat temp, root gap, repair points etc.o Details of cutting patterns and progresso Details of drilling, output and progress

PC9. assist in completion of dimensional checking and make relevant entries

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for fabrication works

KU2. safety rules and regulations for handling and storing required fabrication tools, equipment and materials

KU3. personal protection including the use of related safety gears & equipments

KU4. service request procedures for tools, materials and equipments

KU5. statutory compliance requirement related to workmen engagement
KU6. the symbols used in fabrication drawings
KU7. code of practices for fabrication works
KU8. how to derive conclusions from specification tables and other guidelines
KU9. technical terms and their common language synonyms if any
KU10. different specifications and parameters of fabrication activities
KU11. tolerances as applicable on site
KU12. mensuration, arithmetic and geometry
KU13. measurements and different instruments used in the same
KU14. working procedures to be employed in different activities included in fabrication

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. provide clear and simple instructions, details & sketches to sub-ordinate
GS3. record and documents daily productivity report, daily labour attendance &details regarding work
GS4. prepare basic status updates for the superiors in the prescribed format
GS5. read one or more language, preferably in the local language of the site
GS6. read drawing, specification and standards related to relevant work
GS7. read key documents including quality standards and standard workingmethods
GS8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace
GS9. speak in one or more language, preferably in one of the local languages of the site
GS10. listen and follow instructions clearly given by the superior
GS11. provide clear instructions to subordinates for completion of task as per workplan, time schedule and quality
GS12. estimate required material and resources for work
GS13. decide alternate course of action in case of hindrance to work
GS14. determine whether drawings employed, for confirming orientations, joint and surface preparations, etc., are correct
GS15. plan work & organize required resource in coordination with team membersand superior
GS16. plan work targets, allocate time schedule to sub-ordinates and organizecompletion of task within allocated time
GS17. ensure completion of work as per agreed time schedule and quality
GS18. resolve and solve any conflict within the team
GS19. assess and report on repair points relating to fabrication works
GS20. assess quantity of materials for day work
GS21. optimize resources
GS22. minimize wastages

GS23. analyze drawings for making necessary calculations and computations

GS24. analyze and document parameters such as pre heat temperature, root gap, etc.

GS25. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS26. identify and assess how violation of any safety norms may lead to accidents

GS27. evaluate necessary reports relating to progress of joints, welds, cutting and drilling

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Element Performance Criteria Read and interpret drawings and specification	**33**	**33**	**-**	**-**
PC1. read and interpret working drawings, schematics etc	5.5	5.5	-	-
PC2. interpret symbols, terms and other labels used in the drawings for respective works	5.5	5.5	-	-
PC3. read and interpret the code of practices, specifications, charts and tables and other documents regarding the use and application of various tools and materials employed in the fabrication yard	5.5	5.5	-	-
PC4. employ correct drawings for confirming the orientations, joint and surface preparations etc	5.5	5.5	-	-
PC5. carry out necessary calculations and computations from the drawings	5.5	5.5	-	-
PC6. read and understand the equipment specifications related to operations, storage and capacity	5.5	5.5	-	-
Assist in documentation of required reports	**17**	**17**	**-**	**-**
PC7. fill up checklists, permits and relevant formats as applicable to allotted work	5.5	5.5	-	-
PC8. provide necessary inputs for preparation of reports such as o Details, specification and progress of jointso Details , specification and progress of welds o Parameters such as preheat temp, root gap, repair points etc.o Details of cutting patterns and progresso Details of drilling, output and progress	6	6	-	-
PC9. assist in completion of dimensional checking and make relevant entries	5.5	5.5	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1216
NOS Name	Read and interpret specifications and fabrication drawings and assist in documentation of reports
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/12/2018

CON/N1217: Supervise cutting , drilling & edge preparation activity of structural steel elements

Description

This unit describes the skills and knowledge required to supervise cutting , drilling & edge preparation activity of structural steel elements

Scope

The scope covers the following:

- Supervise joint connection works

Elements and Performance Criteria

Supervise joint connection works

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

PC1. instruct the subordinates for shifting required materials

PC2. oversee the lifting and shifting of structural steel elements/components and provide support to the riggers as and when necessary for the same

PC3. check the physical conditions of the structural steel elements

PC4. oversee the marking and measuring activity and guide the gang for correctly measuring the elements, using the tool and instruments according to standard procedures

PC5. determine the shrinkage allowance by estimating the heat input and relative shrinkage

PC6. inspect the markings and confirm it is matching with the drawings while incorporating thereof and shrinkage factor in appropriate locations

PC7. check the section post cutting to confirm their dimension and shape and instruct to put appropriate markings on the same as per organizational procedures

PC8. check the edges prepared for dimensional accuracy and compliance with drawing, provide repair solutions in case of non-compliance

PC9. check the markings for positions of holes for bolts and rivets and ensure that they are within tolerance limit shown in the applicable standards

PC10. provide support in cutting, drilling, beveling, scalloping etc

PC11. check the compliances of the holes drilled in the sections/ components are within the tolerance limits specified by the approved standard and comply with respective drawings

PC12. confirm the restriction of movement of sections of cutting platform to avoid incorrect cutting of sections

PC13. check the positions of cutting torch with reference to the cutting diagram in case of CNC cutting

PC14. check and confirm the orientation of sections with cutting drawings

PC15. ensure proper ventilation in the cutting yard to expel the toxic fumes emitted during cutting operation

PC16. report any HSE non-compliance to appropriate authorities

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for fabrication works
KU2. safety rules and regulations for handling and storing required fabrication tools, equipment and materials
KU3. personal protection including the use of related safety gears & equipments
KU4. service request procedures for tools, materials and equipments
KU5. statutory compliance requirement related to working at height
KU6. statutory compliance requirement related to workmen engagement
KU7. thorough knowledge of lifting gears (areas of application and methods of use), lifting and lowering procedures, signaling etc
KU8. different types of steel and ferrous alloys used in construction industry
KU9. defects and distortions in structural steel sections, plates, pipes, tubes and ducts etc. their identification, causes and remedial procedures
KU10. different tools and instruments used in measuring and marking of structural steel sections their limitations, applications, correct procedure of use and least count
KU11. identification of cut elements, and their correct nomenclature as perdrawings, importance of correct naming and segregation of material
KU12. methods of checking the shape and dimensions, effect of heat input on shape and dimension, methods to avoid the same
KU13. kerf and shrinkage allowance, their calculations, and provisions for applying the same
KU14. importance and requirement of correct edge and surface preparations, remedial measures to be employed in case of incorrect work
KU15. international codes of practices related to fabrication works and different tolerance limits specified in the these standards
KU16. different hazards at workplace especially those related to fire, electricity and working in closed space
KU17. different occupational diseases associated with fabrication works, their symptoms, preventive measures and general medication
KU18. different first aid procedures related to burns, shocks, unconsciousness andother common disorders

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. provide clear and simple instructions, details & sketches to sub-ordinate
GS3. record and documents daily productivity report, daily labour attendance &details regarding work
GS4. prepare basic status updates for the superiors in the prescribed format
GS5. read one or more language, preferably in the local language of the site

GS6. read drawing, specification and standards related to relevant work

GS7. read key documents including quality standards and standard workingmethods

GS8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace

GS9. speak in one or more language, preferably in one of the local languages of the site

GS10. listen and follow instructions clearly given by the superior

GS11. provide clear instructions to subordinates for completion of task as per work plan, time schedule and quality

GS12. estimate required material and resources for work

GS13. decide alternate course of action in case of hindrance to work

GS14. determine whether physical condition of structural steel elements are as per requirements

GS15. determine whether markings are in line with drawings, after incorporating necessary allowances

GS16. determine suitability of dimensions of sections post cutting

GS17. determine whether positions of holes for bolts and rivets are as per tolerance limit

GS18. plan work & organize required resource in coordination with team members and superior

GS19. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time

GS20. ensure completion of work as per agreed time schedule and quality

GS21. resolve and solve any conflict within the team

GS22. assess dimensions of edges and provide repair solutions in case noncompliance or inaccuracy

GS23. check for HSE non-compliance and report to authorities

GS24. assess quantity of materials for day work

GS25. optimize resources

GS26. minimize wastages

GS27. analyze heat input and relative shrinkage to estimate shrinkage allowance

GS28. analyze the orientation of sections and confirm alignment with cutting drawings

GS29. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS30. identify and assess how violation of any safety norms may lead to accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Supervise joint connection works	**50**	**50**	**-**	**-**
PC1. instruct the subordinates for shifting required materials	3	3	-	-
PC2. oversee the lifting and shifting of structural steel elements/components and provide support to the riggers as and when necessary for the same	3	3	-	-
PC3. check the physical conditions of the structural steel elements	3	3	-	-
PC4. oversee the marking and measuring activity and guide the gang for correctly measuring the elements, using the tool and instruments according to standard procedures	3	3	-	-
PC5. determine the shrinkage allowance by estimating the heat input and relative shrinkage	3	3	-	-
PC6. inspect the markings and confirm it is matching with the drawings while incorporating thereof and shrinkage factor in appropriate locations	3.5	3.5	-	-
PC7. check the section post cutting to confirm their dimension and shape and instruct to put appropriate markings on the same as per organizational procedures	3	3	-	-
PC8. check the edges prepared for dimensional accuracy and compliance with drawing, provide repair solutions in case of non-compliance	3	3	-	-
PC9. check the markings for positions of holes for bolts and rivets and ensure that they are within tolerance limit shown in the applicable standards	3.5	3.5	-	-
PC10. provide support in cutting, drilling, beveling, scalloping etc	3	3	-	-
PC11. check the compliances of the holes drilled in the sections/ components are within the tolerance limits specified by the approved standard and comply with respective drawings	3.5	3.5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. confirm the restriction of movement of sections of cutting platform to avoid incorrect cutting of sections	3.5	3.5	-	-
PC13. check the positions of cutting torch with reference to the cutting diagram in case of CNC cutting	3	3	-	-
PC14. check and confirm the orientation of sections with cutting drawings	3	3	-	-
PC15. ensure proper ventilation in the cutting yard to expel the toxic fumes emitted during cutting operation	3	3	-	-
PC16. report any HSE non-compliance to appropriate authorities	3	3	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1217
NOS Name	Supervise cutting , drilling & edge preparation activity of structural steel elements
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/12/2018

CON/N1218: Supervise joint preparation activity of structural steel elements to meet desiredquality standards

Description

This unit describes the skills and knowledge required to supervise joint preparation activity of structural steel elements to meet desired quality standards

Scope

The scope covers the following:

- Supervise joint preparation works

Elements and Performance Criteria

Supervise joint preparation works

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

PC1. oversee the measuring and marking of prepared sections and confirm their locations and positions as per drawings

PC2. supervise the preparation of fitup platform as per requirement

PC3. oversee the lifting and shifting of components to ensure all safety parameters are followed

PC4. provide technical support in operations of tools and equipments like vices, jigs and fixtures, clamps and supports etc

PC5. check on the working conditions of various equipments and tools required for fit-up operation

PC6. consult drawings and specifications to ensure correct location, orientation and other specs of the joints

PC7. check the materials for any for any distortion or damage that may have occurred post cutting, drilling or other activities

PC8. supervise positioning and placing of the sections as per required sequence mentioned in the method statement

PC9. observe and confirm that the activity of clamping and anchoring of the elements as per standard practice and by complying with relevant safety norms prevalent on site

PC10. check the positioning of the section by conducting required measurements and confirm that the sections are aligned as per markings

PC11. identify the requirements of jacking, striking etc

PC12. monitor the procedures implemented for adjusting fixed elements to confirm their sequence is as per method statements

PC13. check and confirm if there is a requirement for heat input for tack welding the components

PC14. check the root gap for the joint for their depth both before and after tack welding

PC15. supervise the activities involved in removing anchorages and clamping equipments and confirm that the procedure is conducted safely, without damaging the sections

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for fabrication works

KU2. safety rules and regulations for handling and storing required fabrication tools, equipment and materials

KU3. personal protection including the use of related safety gears & equipments

KU4. service request procedures for tools, materials and equipments

KU5. statutory compliance requirement related to working at height

KU6. statutory compliance requirement related to workmen engagement

KU7. different tools and instruments used in measuring and marking of structural steel sections their limitations, applications, correct

KU8. how to read and interpret drawings, check the position, location and orientation of components

KU9. need and importance of platform preparation, various activities involved in the same and correct procedures for executing them

KU10. through knowledge of lifting gears (areas of application and methods of use), lifting and lowering procedures, signaling etc

KU11. different types of movement restraining devices and equipment, their operations and ideal working conditions, their range and areas of applications, procedures for placing and removing the

KU12. methods of checking the shape and dimensions, effect of heat input on shape and dimension, methods to avoid the same

KU13. through knowledge of measurements in different measurement systems,using and directing the use of different measuring instruments

KU14. how to identify the need for adjustment in fit-up, suitable procedure for sameand location for applying these methods the effects of applying these methods on different materials and recommendations provided in code of practices for them

KU15. need and importance of preheating, purpose and location of preheat, method to be adopted for pre heating and their correct procedures as described in the code of practices or method statement

KU16. requirement of root gap, checking the gap as required in 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 siteand basic English

GS2. provide clear and simple instructions, details & sketches to sub-ordinate

GS3. record and documents daily productivity report, daily labour attendance &details regarding work

GS4. prepare basic status updates for the superiors in the prescribed format

GS5. read one or more language, preferably in the local language of the site

GS6. read drawing, specification and standards related to relevant work

GS7. read key documents including quality standards and standard workingmethods

GS8. read various, sign boards, safety rules and safety tags , instructions relatedto exit routes during emergency at the workplace

GS9. speak in one or more language, preferably in one of the local languages of the site

GS10. listen and follow instructions clearly given by the superior

GS11. provide clear instructions to subordinates for completion of task as per workplan, time schedule and quality

GS12. estimate required material and resources for work

GS13. decide alternate course of action in case of hindrance to work

GS14. determine locations and position of prepared sections as per drawings

GS15. determine suitability of various equipment and tools for fit-up operation

GS16. determine suitable location, orientation and specifications of joints

GS17. determine whether clamping and anchoring of elements, and subsequentremoval complies with standard practice and safety norms

GS18. plan work & organize required resource in coordination with team members and superior

GS19. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time

GS20. ensure completion of work as per agreed time schedule and quality

GS21. resolve and solve any conflict within the team

GS22. check for damaged or distorted materials and make necessary rectifications

GS23. assess quantity of materials for day work

GS24. optimize resources

GS25. minimize wastages

GS26. analyze and determine appropriate sequencing for joint preparation

GS27. analyze requirement for heat input as part of the tack welding process

GS28. assess the depth of root gap of the joint before and after tack welding

GS29. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS30. identify and assess how violation of any safety norms may lead to accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Supervise joint preparation works	**50**	**50**	**-**	**-**
PC1. oversee the measuring and marking of prepared sections and confirm their locations and positions as per drawings	3.5	3.5	-	-
PC2. supervise the preparation of fitup platform as per requirement	3.5	3.5	-	-
PC3. oversee the lifting and shifting of components to ensure all safety parameters are followed	3.5	3.5	-	-
PC4. provide technical support in operations of tools and equipments like vices, jigs and fixtures, clamps and supports etc	3	3	-	-
PC5. check on the working conditions of various equipments and tools required for fit-up operation	3	3	-	-
PC6. consult drawings and specifications to ensure correct location, orientation and other specs of the joints	3	3	-	-
PC7. check the materials for any for any distortion or damage that may have occurred post cutting, drilling or other activities	3	3	-	-
PC8. supervise positioning and placing of the sections as per required sequence mentioned in the method statement	3.5	3.5	-	-
PC9. observe and confirm that the activity of clamping and anchoring of the elements as per standard practice and by complying with relevant safety norms prevalent on site	3.5	3.5	-	-
PC10. check the positioning of the section by conducting required measurements and confirm that the sections are aligned as per markings	3.5	3.5	-	-
PC11. identify the requirements of jacking, striking etc	3	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. monitor the procedures implemented for adjusting fixed elements to confirm their sequence is as per method statements	3.5	3.5	-	-
PC13. check and confirm if there is a requirement for heat input for tack welding the components	3.5	3.5	-	-
PC14. check the root gap for the joint for their depth both before and after tack welding	3.5	3.5	-	-
PC15. supervise the activities involved in removing anchorages and clamping equipments and confirm that the procedure is conducted safely, without damaging the sections	3.5	3.5	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1218
NOS Name	Supervise joint preparation activity of structural steel elements to meet desiredquality standards
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/12/2018

CON/N1219: Supervise bolting and welding of structural steel elements according to standard procedures and to meet desired standards

Description

This unit describes the skills and knowledge required to supervise bolting and welding of structural steel elements according to standard procedures and to meet desired standards.

Scope

The scope covers the following:

- Supervise joint connection works

Elements and Performance Criteria

Supervise joint connection works

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

PC1. confirm that consumables required like shielding gas, electrodes, filler rods, equipment consumables etc. are of required specifications are available

PC2. monitor the welding works and confirm its compliance to the applicable standards

PC3. ensure that the elements/ sections are properly clamped during welding to avoid distortion

PC4. confirm the availability of required power source for conducting welding operations

PC5. trouble shoot problems related to:Heat inputTravel speed and feed rateCurrent/amperage settingsFlow of shielding gasDamage to the welding tip and methods to avoid the sameEquipment adjustments, tools and consumables etc.and provide guidance to the welders to avoid such errors in future works

PC6. carry out primitive quality checks for welded joints as per requirements and standard procedures

PC7. identify defects such as spatters, undercut, over- reinforcement, porosity etc

PC8. confirm the completion of job from foreman/ welder and process the job for quality inspections as per the standard practices observed at site

PC9. check the dimensions of the completed section to ensure all dimension are within tolerances as specified in the applicable standards

PC10. identify the defects as indicated by the quality department and instruct subordinates to carry out recommended repair activities

PC11. ensure that the work is completed within the specified time and safety

PC12. notify the superiors of any errors encountered during supervision, discuss possible corrective actions and implement the instructions as applicable

PC13. check and expel bolts, nuts and washers which are damaged or not in useable condition

PC14. check the bolt holes and groups to identify any deviations from drawings or specifications

PC15. check the requirements of the bolt assemblies from the drawings and specification documents

PC16. ensure that all bolts are properly secured in respective places

PC17. check the torque of HSFG bolts and ensure that it is as per specifications

PC18. prepare bolting report describing the necessary parameters

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for fabrication works

KU2. safety rules and regulations for handling and storing required fabrication tools, equipment and materials

KU3. personal protection including the use of related safety gears & equipments

KU4. service request procedures for tools, materials and equipments

KU5. statutory compliance requirement related to working at height

KU6. statutory compliance requirement related to workmen engagement

KU7. different welding process (GMAW, GTAW,SMAW, SAW etc.), their standard methodologies, code of practices

KU8. different tools and equipments used in the welding process, bolting and riveting works, their range and capacity of operation, procedures for proper handling and storage

KU9. different consumables required in welding and related works, their specifications, criteria for selections, handling and storing

KU10. defects and distortions in structural steel sections, plates, pipes, tubes and ducts etc. their identification, causes and remedial procedures

KU11. location and placing of power outlet, their limitations and capacity

KU12. in depth relationship of various parameters such as travel speed and feed rate and flow of shielding gas etc. , their implications while working, problems arising from mismatch of parameters and their remedial and repair procedures

KU13. use of different gauges, scales or instruments to check the profile of welding, dimensions of the finished component, torque for HSFG bolts etc.

KU14. different defects in welding like cracks, undercut, porosity etc., their causes, effects and remedies

KU15. usability of bolts as per required specifications and work

KU16. different code of practice, and international standards related to bolting and riveting

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. provide clear and simple instructions, details & sketches to sub-ordinate

GS3. record and documents daily productivity report, daily labour attendance & details regarding work

GS4. prepare basic status updates for the superiors in the prescribed format

GS5. read one or more language, preferably in the local language of the site

GS6. read drawing, specification and standards related to relevant work

GS7. read key documents including quality standards and standard workingmethods

GS8. read various, sign boards, safety rules and safety tags , instructions related to exit routes during emergency at the workplace

GS9. speak in one or more language, preferably in one of the local languages of the site

GS10. listen and follow instructions clearly given by the superior

GS11. provide clear instructions to subordinates for completion of task as per work plan, time schedule and quality

GS12. estimate required material and resources for work

GS13. decide alternate course of action in case of hindrance to work

GS14. determine whether consumables to be used are as per requirements

GS15. confirm compliance of welding works with applicable standards

GS16. determine whether a suitable power source is available for welding works

GS17. determine whether bolts are properly secured

GS18. plan work & organize required resource in coordination with team members and superior

GS19. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time

GS20. ensure completion of work as per agreed time schedule and quality

GS21. resolve and solve any conflict within the team

GS22. check for appropriate clamping of elements / sections to avoid distortion

GS23. check for issues related to heat input, travel speed and feed rate, flow of shielding gas, etc., troubleshoot the problem and provide guidance to workers to avoid a repeat of the concern faced

GS24. carry out visual inspections to identify defects such as spatters, undercuts, etc.

GS25. instruct subordinates to carry out repairs of all defects identified by the quality team

GS26. check for bolts, nuts and washers that are not in suitable condition and remove the same

GS27. assess quantity of materials for day work

GS28. optimize resources

GS29. minimize wastages

GS30. assess the dimensions of the completed sections and analyze whether they are within the required tolerance levels

GS31. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS32. identify and assess how violation of any safety norms may lead to accidents

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Supervise joint connection works	**50**	**50**	**-**	**-**
PC1. confirm that consumables required like shielding gas, electrodes, filler rods, equipment consumables etc. are of required specifications are available	2.5	2.5	-	-
PC2. monitor the welding works and confirm its compliance to the applicable standards	3	3	-	-
PC3. ensure that the elements/ sections are properly clamped during welding to avoid distortion	2.5	2.5	-	-
PC4. confirm the availability of required power source for conducting welding operations	2.5	2.5	-	-
PC5. trouble shoot problems related to:Heat inputTravel speed and feed rateCurrent/amperage settingsFlow of shielding gasDamage to the welding tip and methods to avoid the sameEquipment adjustments, tools and consumables etc.and provide guidance to the welders to avoid such errors in future works	3	3	-	-
PC6. carry out primitive quality checks for welded joints as per requirements and standard procedures	2.5	2.5	-	-
PC7. identify defects such as spatters, undercut, over- reinforcement, porosity etc	2.5	2.5	-	-
PC8. confirm the completion of job from foreman/ welder and process the job for quality inspections as per the standard practices observed at site	3	3	-	-
PC9. check the dimensions of the completed section to ensure all dimension are within tolerances as specified in the applicable standards	3	3	-	-
PC10. identify the defects as indicated by the quality department and instruct subordinates to carry out recommended repair activities	2.5	2.5	-	-
PC11. ensure that the work is completed within the specified time and safety	3	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. notify the superiors of any errors encountered during supervision, discuss possible corrective actions and implement the instructions as applicable	3	3	-	-
PC13. check and expel bolts, nuts and washers which are damaged or not in useable condition	2.5	2.5	-	-
PC14. check the bolt holes and groups to identify any deviations from drawings or specifications	2.5	2.5	-	-
PC15. check the requirements of the bolt assemblies from the drawings and specification documents	3	3	-	-
PC16. ensure that all bolts are properly secured in respective places	3	3	-	-
PC17. check the torque of HSFG bolts and ensure that it is as per specifications	3	3	-	-
PC18. prepare bolting report describing the necessary parameters	3	3	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N1219
NOS Name	Supervise bolting and welding of structural steel elements according to standard procedures and to meet desired standards
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Fabrication
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/12/2018

CON/N9002: Manage workplace for safe and healthy work environment

Description

This unit describes the skill and knowledge required to maintain a healthy & safe working environment for the group of people working under an individual

Scope

This unit/task covers the following:

- Ensure healthy and safe working environment for subordinates.
- Ensure effective implementation of health, safety and environment policies and procedures
- Identify and respond to risks / fire and emergencies associated with the work practices, workplace and ensure related organizational & statuary requirement as followed

Elements and Performance Criteria

Ensure healthy and safe working environment for subordinates

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

PC1. ensure proper housekeeping at workplace

PC2. implement safe handling , stacking methods at workplace / store

PC3. ensure that health and safety plan is followed by all subordinates

PC4. Identify any hazard in workplace and notify them to appropriate authority

PC5. ensure that all safety and protection installation are correctly placed & adequate

PC6. ensure safe access is available at work place for movement of workers & materials

PC7. ensure safe use of tools and tackles by the workmen as per applicability

PC8. ensure appropriate use of following Personal Protective Equipment (PPE) as per applicability: Head Protection (Helmets Ear Protection Fall Protection Foot Protection Face and Eye Protection, Hand &Body Protection Respiratory Protection

PC9. maintain entrances & exit from confined spaces , excavated pits and other location in concurrence with safety parameters or instruction form safety personals

Identify and respond to risks / fire and emergencies associated with the work practices, workplace and ensure related organizational & statuary requirement as followed

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

PC10. ensure organizational policies and procedures are followed for health , safety and welfare, in relation to: methods of receiving or sourcing information dealing with accidents and emergencies associated with the work and environment reporting stooping work evacuation fire risks and safe exit procedures

PC11. follow procedures for accident recording and reporting as per organizational and statuary requirements

PC12. ensure effective adherence to response to emergency procedures /protocols

PC13. report any case of emergency / risks to the concern people at the construction site

PC14. report any perceived risk hazards to the superiors / concerned EHS

PC15. demonstrate the use of fire protection equipments for different type of fire hazard

PC16. implement control measures to reduce risk & meet legal requirement as per organizational policies

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. the policies, procedures and protocol set up by the EHS Department With respect to Health , Safety and Environment at the respective construction site

KU2. reporting procedures in cases of breaches or hazards in site safety, accidents or emergency situations

KU3. safe working practices for tools, tackles and equipment

KU4. workplace policies and health and safety requirements for dealing with potential risks as defined by the EHS department

KU5. how to respond to accidents & emergencies

KU6. the appropriate personal protective equipment to be used based on various working conditions

KU7. how to use necessary material ,tools, tackles and equipment in a safe and appropriate manner as specified by site EHS for each level and respective workman gang

KU8. monitoring working in workplace keeping safety & health in mind

Generic Skills (GS)

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

GS1. write in one or more language

GS2. read in one or more language

GS3. read instructions, rules, guidelines, sign boards related to safety as per the requirements

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

GS5. listen and follow instructions shared by site EHS and superiors regarding site safety

GS6. communicate reporting of site conditions, hazards, accidents, etc.

GS7. decide upon the appropriate application & installation of safety equipments like barricades and nets

GS8. decide upon the tools box talks contents

GS9. identify any hazards in workplace organize safety equipments prior to commencing work

GS10. work to ensure safe and healthy environmental conditions at workplace

GS11. identify analysis & report hazards, accidents, health and safety risks, etc. or seek help from the appropriate authorities to address the same as per the guidelines laid down by site EHS

GS12. analyze areas of work which are potential safety hazards and could result in damage to life or property for the respective gang at the construction site

GS13. respond to critical health risks or accidents on an urgent basis through appropriate actions

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Ensure healthy and safe working environment for subordinates	**25**	**25**	**-**	**-**
PC1. ensure proper housekeeping at workplace	2.5	2.5	-	-
PC2. implement safe handling , stacking methods at workplace / store	2.5	2.5	-	-
PC3. ensure that health and safety plan is followed by all subordinates	2.5	2.5	-	-
PC4. Identify any hazard in workplace and notify them to appropriate authority	2.5	2.5	-	-
PC5. ensure that all safety and protection installation are correctly placed & adequate	2.5	2.5	-	-
PC6. ensure safe access is available at work place for movement of workers & materials	2.5	2.5	-	-
PC7. ensure safe use of tools and tackles by the workmen as per applicability	2.5	2.5	-	-
PC8. ensure appropriate use of following Personal Protective Equipment (PPE) as per applicability: Head Protection (Helmets Ear Protection Fall Protection Foot Protection Face and Eye Protection, Hand &Body Protection Respiratory Protection	5	5	-	-
PC9. maintain entrances & exit from confined spaces , excavated pits and other location in concurrence with safety parameters or instruction form safety personals	2.5	2.5	-	-
Identify and respond to risks / fire and emergencies associated with the work practices, workplace and ensure related organizational & statuary requirement as followed	**25**	**25**	**-**	**-**

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. ensure organizational policies and procedures are followed for health , safety and welfare, in relation to: methods of receiving or sourcing information dealing with accidents and emergencies associated with the work and environment reporting stooping work evacuation fire risks and safe exit procedures	5	5	-	-
PC11. follow procedures for accident recording and reporting as per organizational and statuary requirements	2.5	2.5	-	-
PC12. ensure effective adherence to response to emergency procedures /protocols	3.75	3.75	-	-
PC13. report any case of emergency / risks to the concern people at the construction site	3.75	3.75	-	-
PC14. report any perceived risk hazards to the superiors / concerned EHS	3.75	3.75	-	-
PC15. demonstrate the use of fire protection equipments for different type of fire hazard	3.75	3.75	-	-
PC16. implement control measures to reduce risk & meet legal requirement as per organizational policies	2.5	2.5	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N9002
NOS Name	Manage workplace for safe and healthy work environment
Sector	Construction
Sub-Sector	Generic
Occupation	Generic
NSQF Level	6
Credits	TBD
Version	1.1
Last Reviewed Date	23/03/2015
Next Review Date	31/03/2022
NSQC Clearance Date	19/05/2015

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1.Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.

2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.

3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).

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

5. In case of successfully passing only certain number of NOSs, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

6. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack

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/N1215.Plan and organize resources for completion of construction Fabrication works	50	50	-	-	100	12
CON/N1216.Read and interpret specifications and fabrication drawings and assist in documentation of reports	50	50	-	-	100	12
CON/N1217.Supervise cutting , drilling & edge preparation activity of structural steel elements	50	50	-	-	100	22
CON/N1218.Supervise joint preparation activity of structural steel elements to meet desiredquality standards	50	50	-	-	100	22
CON/N1219.Supervise bolting and welding of structural steel elements according to standard procedures and to meet desired standards	50	50	-	-	100	22
CON/N9002.Manage workplace for safe and healthy work environment	50	50	-	-	100	10
Total	**300**	**300**	**-**	**-**	**600**	**100**

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.