Qualification Pack

Senior Technician - Prestress

QP Code: CON/Q0803

Version: 1.0

NSQF Level: 6

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CON/Q0803: Senior Technician - Prestress

Brief Job Description

This job role is responsible for ensuring that materials and components required for pre-stressing works are stored, handled and used as per applicable quality norms, preparatory works are completed as per agreed/ specified work methodology and carry out stressing of tendons using appropriate equipments at construction sites.

Personal Attributes

This job role requires the individual to be physically and mentally fit enough to oversee the Prestressing work at construction sites. The individual should be having strong organizational, interpersonal and communication skills, along with comprehensive technical knowledge of Prestressing works and ability to supervise construction crew. Individual should be analytical and having good numerical skills and trade safety awareness as the job requires controlled tensioning of steel tensions by applying heavy load

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. CON/N0807: Ensure installation of embedded components is as per drawing
2. CON/N0808: Monitor storage and laying of tendons
3. CON/N0809: Carry out stressing of tendons using jacks
4. CON/N8003: Supervise, monitor and evaluate performance of subordinates at workplace
5. CON/N9002: Manage workplace for safe and healthy work environment

Qualification Pack (QP) Parameters

Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Prestressing
Country	India
NSQF Level	6
Credits	NA

Aligned to NCO/ISCO/ISIC Code	NCO-2004/NIL
Minimum Educational Qualification & Experience	12th Class with 3-5 Years of experience as a certified Technician Prestress OR 12th Class 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 Senior Technician - Prestress
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	09/10/2017
Version	1.0
Reference code on NQR	2017/CON/CSDCI/02012
NQR Version	1.0

CON/N0807: Ensure installation of embedded components is as per drawing

Description

This unit describes the skills and knowledge required to ensure installation of embedded components is as per drawing

Scope

The scope covers the following:

- Check reinforcement steel works, sheathing ducts and supports as per drawing
- Check location and fixing of embedded anchorage guides as per drawing

Elements and Performance Criteria

Check reinforcement steel works, sheathing ducts and supports as per drawing

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

PC1. check reinforcement bars in anchorage zone with respect to drawing in the following aspects diameter of the bar shape of bending of the bar dimension of bends and hooks number and spacing of the bars clear cover to the anchorage tying of bar

PC2. check reinforcement bars, duct supports and sheathing ducts throughout the span of laying with respect to drawing in following aspects clear cover of the bars from the sheathing duct duct supports are provided at specified interval as per applicable planning/ schematics duct supports used conforms to approved specification and of appropriate dimension diameter of ducts are as per drawing physical condition of the sheathing ducts free from cracks, tampering, moisture, corrosion x-y orientation (elevation and position) of the ducts are maintained as per drawing/ schematics joints of ducts provided with suitable sealants, free from water/ slurry leakage, sealed properly against ingress of contaminants locking of ducts with duct supports are adequate

PC3. check the location of sleeves for gout vents and ensure that the sleeves are closed against dust/ moisture by using suitable material

PC4. ensure that the supports are not placed directly underneath the duct joints or sleeves for grout vents

Check location and fixing of embedded anchorage guides as per drawing

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

PC5. read and interpret applicable drawing, specification to determine details of works and applicable limit of tolerance

PC6. ensure proper survey points, level markings are provided at specified locations

PC7. carry out necessary measurements to ascertain location of embedded components

PC8. inspect and cross check locations of markings with respect to the established survey points/ levels

PC9. check dimensions of templates and ensure their fixing as per drawing

PC10. check alignment and elevation of the anchorage guide cones are as per drawing

PC11. check and ensure anchorages of right specification are fixed at appropriate locations as per marking/ instruction
PC12. ensure required number of anchorage guides are fixed at respective locations as per drawing
PC13. check spacing of anchorage cones and ensure it is as per drawing
PC14. check and ensure that proper clearance is kept from concrete edge as per drawing
PC15. ensure locking of guides cones are rigid and water tight
PC16. ensure connection of ducts to the guide cones is as per drawing/ schematics
PC17. ensure proper sealant is applied to the joint of anchorage guide cones and ducts
PC18. ensure appropriate reinforcement bars are provided to the joint of anchorage cone and ducts

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for Prestressing works
KU2. safety rules and regulation for handling and storing Prestressing tools, equipment and materials
KU3. personal protection including the use of the related safety gears & safety equipment
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. concept of RCC drawings and pre-stressing details/ specifications as provided by the designer
KU8. concept of reinforcement works in RCC structures and checks to be carried out to inspect the same
KU9. standard laying method of sheathing ducts as per drawing/ specification
KU10. dos and donts applicable to laying sheathing ducts and duct supports as agreed work method statement
KU11. positioning and alignment of ducts as per drawing and specification/ details of ducts provided
KU12. applicable limit of tolerance for fabrication and positioning of ducts and duct supports
KU13. method of inserting grout vents to the sheathing ducts as their locking as per specified quality norms
KU14. requirement of survey points and their uses for marking location of embedded components
KU15. method of linear, areal and volumetric measurements and conversion of units
KU16. dimension and location of templates for anchorage as per drawing
KU17. specification of anchorage and its components
KU18. details of fixing anchorages as per drawing
KU19. various checks to be conducted to sheathing ducts and its connections to determine its accordance with drawing
KU20. use of sealants and their applications to pre-stressing ducts

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 document 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 working methods
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, time 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. select suitable material for closing sleeves in order to protect against dust, moisture, etc.
GS16. determine whether suitable survey points and levels have been provided
GS17. determine whether templates and anchorages have been fixed as per drawings
GS18. select suitable sealants for application to the joints
GS19. plan work & organize required resource in coordination with team members and superior
GS20. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time
GS21. ensure completion of work as per agreed time schedule and quality
GS22. resolve and solve any conflict within the team
GS23. report to concerned authority in case of any discrepancies in the quantity of materials and resources
GS24. assess quantity of materials for day work
GS25. optimize resources
GS26. minimize wastages
GS27. assess and check for rigidity and water tightness of guide cones
GS28. evaluate requirement for appropriate reinforcement bars to be provided to the joints
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
GS31. assess and evaluate whether reinforcement bars, duct supports and sheathing ducts comply with the drawings

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Check reinforcement steel works, sheathing ducts and supports as per drawing	**12.5**	**12.5**	**-**	**-**
PC1. check reinforcement bars in anchorage zone with respect to drawing in the following aspects diameter of the bar shape of bending of the bar dimension of bends and hooks number and spacing of the bars clear cover to the anchorage tying of bar	3.5	3.5	-	-
PC2. check reinforcement bars, duct supports and sheathing ducts throughout the span of laying with respect to drawing in following aspects clear cover of the bars from the sheathing duct duct supports are provided at specified interval as per applicable planning/ schematics duct supports used conforms to approved specification and of appropriate dimension diameter of ducts are as per drawing physical condition of the sheathing ducts free from cracks, tampering, moisture, corrosion x-y orientation (elevation and position) of the ducts are maintained as per drawing/ schematics joints of ducts provided with suitable sealants, free from water/ slurry leakage, sealed properly against ingress of contaminants locking of ducts with duct supports are adequate	3.5	3.5	-	-
PC3. check the location of sleeves for gout vents and ensure that the sleeves are closed against dust/ moisture by using suitable material	2.5	2.5	-	-
PC4. ensure that the supports are not placed directly underneath the duct joints or sleeves for grout vents	3	3	-	-
Check location and fixing of embedded anchorage guides as per drawing	**37.5**	**37.5**	**-**	**-**
PC5. read and interpret applicable drawing, specification to determine details of works and applicable limit of tolerance	3	3	-	-
PC6. ensure proper survey points, level markings are provided at specified locations	3	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC7. carry out necessary measurements to ascertain location of embedded components	3	3	-	-
PC8. inspect and cross check locations of markings with respect to the established survey points/ levels	3.5	3.5	-	-
PC9. check dimensions of templates and ensure their fixing as per drawing	2.5	2.5	-	-
PC10. check alignment and elevation of the anchorage guide cones are as per drawing	2.5	2.5	-	-
PC11. check and ensure anchorages of right specification are fixed at appropriate locations as per marking/ instruction	2.5	2.5	-	-
PC12. ensure required number of anchorage guides are fixed at respective locations as per drawing	2.5	2.5	-	-
PC13. check spacing of anchorage cones and ensure it is as per drawing	2.5	2.5	-	-
PC14. check and ensure that proper clearance is kept from concrete edge as per drawing	2.5	2.5	-	-
PC15. ensure locking of guides cones are rigid and water tight	2.5	2.5	-	-
PC16. ensure connection of ducts to the guide cones is as per drawing/ schematics	2.5	2.5	-	-
PC17. ensure proper sealant is applied to the joint of anchorage guide cones and ducts	2.5	2.5	-	-
PC18. ensure appropriate reinforcement bars are provided to the joint of anchorage cone and ducts	2.5	2.5	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N0807
NOS Name	Ensure installation of embedded components is as per drawing
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Prestressing
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	09/10/2017

CON/N0808: Monitor storage and laying of tendons

Description

This unit describes the skills and knowledge required to monitor storage and laying of tendons

Scope

The scope covers the following:

- Check and ensure the tendon storage area is constructed as per specified storage norms
- Monitor laying of tendons as per drawing/specification

Elements and Performance Criteria

Check and ensure the tendon storage area is constructed as per specified storage norms

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

PC1. check and ensure that pre-stressing tendons are stored on an elevated platform having adequate ground clearance

PC2. check and ensure that proper cover and protective arrangement is provided to the tendon storage area

PC3. ensure that tendons are not exposed to water, heat or any abrasive acts

PC4. ensure that the storage area has adequate ventilation to prevent condensation

PC5. check and ensure that manufacturers supplied test certificates and identification labels/ tags are fixed with every tendon coil

PC6. ensure tendons are being handled as per applicable handling norms during storing, uncoiling, cutting and laying

Monitor laying of tendons as perdrawing/specification

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

PC7. check and inspect tendons visually for corrosion, breakages or any visible deviation which would restrict its usability

PC8. read and interpret drawing and specification to determine cutting length of tendons and prepare suitable chart/ table for cutting

PC9. ensure tendons are cut using appropriate cutting tools and having smooth cut edges

PC10. check and ensure cutting length of the tendons are as per drawing

PC11. ensure tendons of appropriate specifications are passed through designated ducts and anchorages

PC12. monitor bulb preparation of tendons and check bulb dimensions using appropriate measuring tools

PC13. check tendons at blind ends for specified anchorage

PC14. check and ensure the sheathing ducts are not damaged or dislocated while passing tendons through the same

PC15. check threading and extension of tendons through the ducts

PC16. check proper fixing of grips, bearing plates to anchorage cones and pre-stressing tendons

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for Prestressing works
KU2. safety rules and regulation for handling and storing Prestressing tools, equipment and materials
KU3. personal protection including the use of the related safety gears & safety equipment
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. type of tendons used in pre-stressing works
KU8. specification/ grade of tendons and their use
KU9. properties of tendons, their elongation and yield point
KU10. causes those can harm tendons
KU11. standard storing norms applicable to tendons
KU12. identification of tendons by labels, tags etc. provided by manufacturer
KU13. interpretation of material testing certificate
KU14. standard procedure of handling, uncoiling and cutting tendons
KU15. location of respective tendons as per drawing and their laying schedule
KU16. how to calculate cutting length of tendons from drawing/ schedule
KU17. visual checks to be carried out to the tendons to determine their usability
KU18. standard cutting method of pre-stressing tendons
KU19. cutting tools to be used for cutting tendons
KU20. standard procedure of laying tendons through sheathing ducts
KU21. how to form bulb in tendon cables using hand/ power tolls
KU22. checks to be performed to ensure sheathing ducts are not damaged, cracked or sheathing joints are intact while placing tendons through the same
KU23. use of grips, bearing plates and anchorage cones and standard procedure of fixing them to pre-stressing systems

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 document 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 working methods

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, time and resources for work

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

GS14. determine suitability of tendon storage area by assessing ground clearance, cover, protective arrangement, etc

GS15. determine whether manufacturers test certificates and associated tags are fixed with each tendon coil

GS16. determine whether tendons are passed through appropriate ducts and anchorages

GS17. plan work & organize required resource in coordination with team members and superior

GS18. plan work targets, allocate time schedule to sub-ordinates and organize completion of task within allocated time

GS19. ensure completion of work as per agreed time schedule and quality

GS20. resolve and solve any conflict within the team

GS21. check tendons for damage, deviation, corrosion, etc. and take necessary action

GS22. check for damage / dislocation of sheathing ducts and take necessary action

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

GS28. analyze appropriate cutting lengths of tendons

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Check and ensure the tendon storage area is constructed as per specified storage norms	**18**	**18**	**-**	**-**
PC1. check and ensure that pre-stressing tendons are stored on an elevated platform having adequate ground clearance	3	3	-	-
PC2. check and ensure that proper cover and protective arrangement is provided to the tendon storage area	3	3	-	-
PC3. ensure that tendons are not exposed to water, heat or any abrasive acts	3	3	-	-
PC4. ensure that the storage area has adequate ventilation to prevent condensation	3	3	-	-
PC5. check and ensure that manufacturers supplied test certificates and identification labels/ tags are fixed with every tendon coil	3	3	-	-
PC6. ensure tendons are being handled as per applicable handling norms during storing, uncoiling, cutting and laying	3	3	-	-
Monitor laying of tendons as perdrawing/specification	**32**	**32**	**-**	**-**
PC7. check and inspect tendons visually for corrosion, breakages or any visible deviation which would restrict its usability	3.5	3.5	-	-
PC8. read and interpret drawing and specification to determine cutting length of tendons and prepare suitable chart/ table for cutting	3.5	3.5	-	-
PC9. ensure tendons are cut using appropriate cutting tools and having smooth cut edges	3.5	3.5	-	-
PC10. check and ensure cutting length of the tendons are as per drawing	3	3	-	-
PC11. ensure tendons of appropriate specifications are passed through designated ducts and anchorages	3	3	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. monitor bulb preparation of tendons and check bulb dimensions using appropriate measuring tools	3.5	3.5	-	-
PC13. check tendons at blind ends for specified anchorage	3	3	-	-
PC14. check and ensure the sheathing ducts are not damaged or dislocated while passing tendons through the same	3	3	-	-
PC15. check threading and extension of tendons through the ducts	3	3	-	-
PC16. check proper fixing of grips, bearing plates to anchorage cones and pre-stressing tendons	3	3	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N0808
NOS Name	Monitor storage and laying of tendons
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Prestressing
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	09/10/2017

CON/N0809: Carry out stressing of tendons using jacks

Description

This unit describes the skills and knowledge required tocarry out stressing of tendons using jacks

Scope

The scope covers the following:

- Carry out stressing operation using hydraulic jacks

Elements and Performance Criteria

Carry out stressing operation using hydraulic jacks

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

PC1. check stressing jacks visually for any visible damages such as, dislocation of accessories, breakage/ cracks etc

PC2. check and ensure the pressure gauges which are fixed with the jacks are properly calibrated

PC3. check the hose pipes and its end fittings are intact and are connected correctly with the pump & jack

PC4. check and ensure hydraulic systems and oil connections are in good working conditions

PC5. check grips are in good working condition and tendons are secured against slipping while in tension

PC6. read and interpret stressing drawing, stressing schedule, load application schedules

PC7. carry out marking of tendons using paint or suitable markings to tress out elongation during stressing

PC8. check and ensure stressing jacks and power packs are working within the tolerance limit

PC9. apply initial stressing to the tendons to remove slackness of tendons and jacks (as per applicability of work method)

PC10. carry out stressing of tendons as per approved work method and stressing schedule

PC11. control application of loads as per stressing schedule

PC12. ensure increment of tensile load is graduated as per schedule and thus evenly distributed to the tendons

PC13. monitor gauge pressure and elongation of tendons under stressing

PC14. follow correct sequence of tendons to be stressed as per stressing schedule

PC15. carry out necessary measurements to tress out elongation of tendons as per standard practice

PC16. ensure that desired elongation has been achieved to each tendons as per stressing schedule

PC17. communicate/ provide signals with co-workers/ superiors to maintain synchronization while multiple stressing equipments are in action

PC18. ensure sheathing/ tendon ducts are closed in all aspect after completion of stressing, against ingress of dust, moisture or foreign contaminants

PC19. ensure all faults, deviations and alterations to the stressing system are brought to the notice of concerned authority as per applicable reporting procedure

PC20. ensure all faults, deviations and alterations are duly addressed and prescribed action/ approval has been taken for further progress of work

PC21. ensure stressing platform/ gantry is safely erected and stable during stressing/ jack operating activities

PC22. check and ensure that appropriate barricading, signage has been erected surrounding the stressing point and the location is safely restricted against movement of unauthorized person, vehicle or unwanted materials

PC23. ensure appropriate PPEs are used by self and subordinates while carrying out stressing work

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. standard practices for Prestressing works

KU2. safety rules and regulation for handling and storing Prestressing tools, equipment and materials

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

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. checks to be performed to the stressing jacks to determine their usability

KU8. statutory maintenance to be done to the stressing jacks and their accessories

KU9. concept of efficiency of jacks and permissible tolerance limit to the same

KU10. standard method of marking of tendons using suitable marking tools

KU11. check to be carried out to ensure pre-stressing hydraulic system is free from air or any leakage

KU12. procedure of making hydraulic stressing system free from air bubble

KU13. method of operating pre-stressing jacks as per approved work method statement

KU14. sequential steps involved in pre-stressing operations

KU15. necessary safety precautions to be taken while operating jacks and tendons are in elongation

KU16. specified limit of tolerance applicable to applied stressing load and elongation of tendons

KU17. how to measure elongation of tendons by using measuring instruments

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 document 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 working methods

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, time and resources for work

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

GS14. determine whether hydraulic systems, grips, hosepipes, stressing jacks and power packs are in appropriate working condition

GS15. determine whether pressure gauges have been appropriately calibrated

GS16. identify appropriate work method for stressing of tendons

GS17. determine whether appropriate elongation has been achieved to each tendon

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 any damage to the stressing jacks and take necessary action

GS23. identify and escalate all faults to the stressing system for necessary action

GS24. assess quantity of materials for day work

GS25. optimize resources

GS26. minimize wastages

GS27. analyze incremental tensile load to ensure even distribution to the tendons

GS28. assess complexity of the tasks and provide guidance for carrying out corrective action as per requirement

GS29. identify and assess how violation of any safety norms may lead to accidents

GS30. assess and analyze stressing drawings, stressing schedules and load application schedules

GS31. determine appropriate sequence for stressing of tendons

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Carry out stressing operation using hydraulic jacks	**50**	**50**	**-**	**-**
PC1. check stressing jacks visually for any visible damages such as, dislocation of accessories, breakage/ cracks etc	2.5	2.5	-	-
PC2. check and ensure the pressure gauges which are fixed with the jacks are properly calibrated	2.5	2.5	-	-
PC3. check the hose pipes and its end fittings are intact and are connected correctly with the pump & jack	2	2	-	-
PC4. check and ensure hydraulic systems and oil connections are in good working conditions	2.5	2.5	-	-
PC5. check grips are in good working condition and tendons are secured against slipping while in tension	2.5	2.5	-	-
PC6. read and interpret stressing drawing, stressing schedule, load application schedules	2	2	-	-
PC7. carry out marking of tendons using paint or suitable markings to tress out elongation during stressing	2	2	-	-
PC8. check and ensure stressing jacks and power packs are working within the tolerance limit	2	2	-	-
PC9. apply initial stressing to the tendons to remove slackness of tendons and jacks (as per applicability of work method)	2.5	2.5	-	-
PC10. carry out stressing of tendons as per approved work method and stressing schedule	2.5	2.5	-	-
PC11. control application of loads as per stressing schedule	2	2	-	-
PC12. ensure increment of tensile load is graduated as per schedule and thus evenly distributed to the tendons	2.5	2.5	-	-
PC13. monitor gauge pressure and elongation of tendons under stressing	2.5	2.5	-	-

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. follow correct sequence of tendons to be stressed as per stressing schedule	2	2	-	-
PC15. carry out necessary measurements to tress out elongation of tendons as per standard practice	2	2	-	-
PC16. ensure that desired elongation has been achieved to each tendons as per stressing schedule	2	2	-	-
PC17. communicate/ provide signals with co-workers/ superiors to maintain synchronization while multiple stressing equipments are in action	2	2	-	-
PC18. ensure sheathing/ tendon ducts are closed in all aspect after completion of stressing, against ingress of dust, moisture or foreign contaminants	2	2	-	-
PC19. ensure all faults, deviations and alterations to the stressing system are brought to the notice of concerned authority as per applicable reporting procedure	2	2	-	-
PC20. ensure all faults, deviations and alterations are duly addressed and prescribed action/ approval has been taken for further progress of work	2	2	-	-
PC21. ensure stressing platform/ gantry is safely erected and stable during stressing/ jack operating activities	2	2	-	-
PC22. check and ensure that appropriate barricading, signage has been erected surrounding the stressing point and the location is safely restricted against movement of unauthorized person, vehicle or unwanted materials	2	2	-	-
PC23. ensure appropriate PPEs are used by self and subordinates while carrying out stressing work	2	2	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N0809
NOS Name	Carry out stressing of tendons using jacks
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Prestressing
NSQF Level	6
Credits	TBD
Version	1.0
Last Reviewed Date	23/08/2015
Next Review Date	31/03/2022
NSQC Clearance Date	09/10/2017

CON/N8003: Supervise, monitor and evaluate performance of subordinates at workplace

Description

This OS covers the skills and knowledge required by an individual to supervise,monitor and evaluate performance of subordinates at work place

Scope

The scope covers the following:

- Monitor all construction work activities performed by subordinates and evaluate their performance and ensure strict adherence to quality instructions & timelines as per organizational policies and procedures

Elements and Performance Criteria

Supervise, monitor and evaluate performance of all subordinates and ensure adherence to organizational policies and procedures

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

PC1. fix expected targets for the respective gang as per site requirements and allocate work to subordinates

PC2. establish expected performance standards and expectations for the respective gang of workers to meet the desired outcomes

PC3. inspect assigned work to the respected gang of workers through progressive checking

PC4. observe and verify the work activities performed by the subordinates at the construction site

PC5. monitor overall performance of subordinates on the designed measures to ensure quality requirements set by the concerned authority

PC6. ensure adherence to the organizational policies and procedures for all relevant construction activities by the workmen subordinations

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. policies, procedures and work targets for performance evaluation and appraisals

KU2. organizational policies, procedures and protocol for smooth completion of work at the respective workplace

KU3. complete work/task accurately by following standard specifications and procedures by optimized and correct used of materials , tools, tackles and equipment

Generic Skills (GS)

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

GS1. write in at one or more language, preferably the local language

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

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

GS4. effectively communicate with team members at workplace

GS5. rectify errors, select workman according to the performance and carry out appropriate allocation of task

GS6. motivate the subordinate for better quality work

GS7. plan work as per right sequence and organize required resources in coordination with the team members

GS8. complete work as per the requirement

GS9. solve any anomalies in work processes, critical problems & cause for delays at workplace

GS10. sort workers activities in order of sequence and importance workers

GS11. identify root cause and effects of workers conflicts at workplace

GS12. evaluate and find solutions to minimize errors and suggest improvements for optimizing resource utilization

GS13. assess which situations would require intervention of superiors

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
Supervise, monitor and evaluate performance of all subordinates and ensure adherence to organizational policies and procedures	**50**	**50**	**-**	**-**
PC1. fix expected targets for the respective gang as per site requirements and allocate work to subordinates	7.5	7.5	-	-
PC2. establish expected performance standards and expectations for the respective gang of workers to meet the desired outcomes	7.5	7.5	-	-
PC3. inspect assigned work to the respected gang of workers through progressive checking	10	10	-	-
PC4. observe and verify the work activities performed by the subordinates at the construction site	10	10	-	-
PC5. monitor overall performance of subordinates on the designed measures to ensure quality requirements set by the concerned authority	7.5	7.5	-	-
PC6. ensure adherence to the organizational policies and procedures for all relevant construction activities by the workmen subordinations	7.5	7.5	-	-
NOS Total	**50**	**50**	**-**	**-**

National Occupational Standards (NOS) Parameters

NOS Code	CON/N8003
NOS Name	Supervise, monitor and evaluate performance of subordinates at workplace
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

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/N0807.Ensure installation of embedded components is as per drawing	50	50	-	-	100	20
CON/N0808.Monitor storage and laying of tendons	50	50	-	-	100	25
CON/N0809.Carry out stressing of tendons using jacks	50	50	-	-	100	35
CON/N8003.Supervise, monitor and evaluate performance of subordinates at workplace	50	50	-	-	100	10
CON/N9002.Manage workplace for safe and healthy work environment	50	50	-	-	100	10
Total	**250**	**250**	**-**	**-**	**500**	**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.