



Qualification Pack



Surveyor

QP Code: CON/Q0902

Version: 2.0

NSQF Level: 6

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CON/Q0902: Surveyor

Brief Job Description

This job role is responsible for carrying out land surveying using modern and conventional systems and instruments at a construction site

Personal Attributes

The surveying is expected to be physically fit to work across various locations with varied environmental conditions. The person should be organized, diligent, methodical, safety-conscious, and a prompt decision-maker. In addition to being a team player, the individual should have good communication skills

Applicable National Occupational Standards (NOS)

Compulsory NOS:

- [CON/N0903: Carry out temporary adjustment of survey instruments as per standard methods](#)
- [CON/N0904: Conduct linear measurements using survey instruments and tools](#)
- [CON/N0905: Carry out leveling and cross sectioning survey](#)
- [CON/N0906: Carry out setting out operations for buildings/ other structures](#)
- [CON/N0907: Carry out topographic survey](#)
- [CON/N7001: Plan, arrange and manage resources for execution of relevant work](#)
- [CON/N9002: Manage workplace for safe and healthy work environment](#)

Qualification Pack (QP) Parameters

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



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Aligned to NCO/ISCO/ISIC Code	NCO-2015/2165.0200
Minimum Educational Qualification & Experience	Diploma (3 years after 12 class) with 3 Years of experience in relevant field OR Graduate (in relevant field) with 1 Year of experience OR Certificate-NSQF (level 5) with 3 Years of experience in same occupation
Minimum Level of Education for Training in School	Not Applicable
Pre-Requisite License or Training	NIL
Minimum Job Entry Age	18 Years
Last Reviewed On	31/03/2022
Next Review Date	31/03/2025
NSQC Approval Date	31/03/2022
Version	2.0
Reference code on NQR	2022/CON/CSDCI/05619
NQR Version	1.0



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CON/N0903: Carry out temporary adjustment of survey instruments as per standard methods

Description

This unit describes the skills and knowledge required to carry out temporary adjustments of the survey instruments as per standard methods.

Scope

The scope covers the following :

- Carry out initial set up, centering and levelling of survey equipment (levels, theodolite, total station etc.)

Elements and Performance Criteria

Carry out initial set up, centering and levelling of survey equipment (levels, theodolite, total station etc.)

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

- PC1.** locate the station mark on the ground surface
- PC2.** place the tripod over the station mark
- PC3.** fix the instrument on the tripod head
- PC4.** level the instrument by adjusting the legs of tripod
- PC5.** ensure that the legs of tripod are sufficient distance apart and are pressed firmly on the ground to provide stability to the instrument
- PC6.** ensure that the height of instrument is such that it is convenient to take readings
- PC7.** perform the centering of the instrument over the station mark by using plumb bob, optical plummet or laser pointer as per applicability
- PC8.** adjust the levels of horizontal and vertical axis of the instruments using standard references/indicators such as bubble tubes, spirit level and adjustable screws as per standard practices.
- PC9.** focus the telescope on the concerned object or point for clear visibility, by adjusting the eye-piece/ knobs/screw and cross-hair

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** standard practices for surveying works
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment



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- KU6.** statutory compliance requirement related to workmen engagement
- KU7.** different survey instruments and their temporary adjustments
- KU8.** basic concepts of temporary and permanent adjustments, its purpose and importance
- KU9.** procedures for carrying out temporary adjustments
- KU10.** procedure for centering and levelling in survey instruments
- KU11.** various types of permanent adjustments
- KU12.** types of errors in surveying instruments

Generic Skills (GS)

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

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



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out initial set up, centering and levelling of survey equipment (levels, theodolite, total station etc.)</i>	50	50	-	-
PC1. locate the station mark on the ground surface	-	-	-	-
PC2. place the tripod over the station mark	-	-	-	-
PC3. fix the instrument on the tripod head	-	-	-	-
PC4. level the instrument by adjusting the legs of tripod	-	-	-	-
PC5. ensure that the legs of tripod are sufficient distance apart and are pressed firmly on the ground to provide stability to the instrument	-	-	-	-
PC6. ensure that the height of instrument is such that it is convenient to take readings	-	-	-	-
PC7. perform the centering of the instrument over the station mark by using plumb bob, optical plummet or laser pointer as per applicability	-	-	-	-
PC8. adjust the levels of horizontal and vertical axis of the instruments using standard references/indicators such as bubble tubes, spirit level and adjustable screws as per standard practices.	-	-	-	-
PC9. focus the telescope on the concerned object or point for clear visibility, by adjusting the eye-piece/ knobs/screw and cross-hair	-	-	-	-
NOS Total	50	50	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	CON/N0903
NOS Name	Carry out temporary adjustment of survey instruments as per standard methods
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Surveying
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



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CON/N0904: Conduct linear measurements using survey instruments and tools

Description

This unit describes the skills and knowledge required to conduct linear measurements using survey instruments and tools

Scope

The scope covers the following :

- Conduct linear measurements using chain and measuring tape for measurement in plans and slopes
- Conduct linear measurement using total stations

Elements and Performance Criteria

Conduct linear measurements using chain and measuring tape for measurement in plans and slopes

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

- PC1.** interpret site drawings, layout plans, and boundary maps etc
- PC2.** estimate the optimal length of chain required for measuring the required distance
- PC3.** select suitable tools, instruments and marking materials for conducting required work
- PC4.** identify the start point/ benchmark for measurement as per work requirement
- PC5.** monitor subordinates to ensure that the unfolding of the chain or tape is as per standard practice
- PC6.** check that the subordinates have collected appropriate tools such as arrows, pegs etc. in required number
- PC7.** check that the ranging rods are vertical and of appropriate length to avoid any errors in ranging
- PC8.** ensure that the chain or tape is stretched appropriately to avoid any errors due to sagging of the same
- PC9.** coordinate between leader and follower to maintain straight line of measurement and proper placement of flags or pegs
- PC10.** ensure that the peg is fixed at all station points of the survey
- PC11.** record the chainages or measured distance for respective points using proper symbols in the field book, as per standard practice
- PC12.** instruct subordinates to use appropriate tools for transferring points on ground/ slopes

Conduct linear measurement using total stations

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

- PC13.** identify the location of master and secondary control points to set up the instrument
- PC14.** identify the suitable benchmark as a reference to obtain a back-sight at station point
- PC15.** locate the exact position of the instrument with respect to the back-sight and foresight points
- PC16.** set up the instrument exactly over the station point
- PC17.** carry out temporary adjustments of the instrument



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- PC18.** input various data/parameters as per job details, locations and technical specifications
- PC19.** identify the location of staff point for measuring the horizontal distance as per the drawings or co-ordinates
- PC20.** instruct the subordinate to hold the staff exactly at the staff point
- PC21.** operate the total station instrument to compute and record the required data
- PC22.** remove the data card from the instrument and transfer the same into compatible computer

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** standard practices for surveying works
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment
- KU6.** different types of chains and tapes based upon their length and material
- KU7.** how to read and understand site drawings, layout plans, boundary maps etc
- KU8.** procedure for calculations of dimensions and angles
- KU9.** concept of latitudes and longitudes, their computations and use
- KU10.** use of various tools and materials in surveying and their application
- KU11.** how to check the serviceability of various tools and tackles
- KU12.** different causes of errors in the linier measurements, their impact on project measurement and how to avoid such errors
- KU13.** various difficulties that may be faced during survey and procedure to overcome the same
- KU14.** procedure for conducting linier measurements on site
- KU15.** standard hand signals, their interpretations and applications
- KU16.** how to maintain and store the various tools and tackles
- KU17.** how to document readings in field book for different types of surveys
- KU18.** ideal conditions for selecting a station point
- KU19.** concept of bench mark, types, its importance in surveying, ideal conditions for selecting a bench mark
- KU20.** survey concrete pillars
- KU21.** principal of operation of total station
- KU22.** various applications of total station
- KU23.** how to feed and retrieve data from the total station
- KU24.** how to transfer data from instrument to computer
- KU25.** how to operate computer
- KU26.** standard procedure for operating total stations
- KU27.** type of reflective staff/prism used in survey



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- KU28.** standard procedure for conducting liner measurements with total station
- KU29.** how to download Field Data through various sources like; Data Cable, Data Card, CD, Pen Drive etc.
- KU30.** procedure of conducting as built measurements
- KU31.** recording and plotting of as built measurements

Generic Skills (GS)

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

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



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Conduct linear measurements using chain and measuring tape for measurement in plans and slopes</i>	25	25	-	-
PC1. interpret site drawings, layout plans, and boundary maps etc	-	-	-	-
PC2. estimate the optimal length of chain required for measuring the required distance	-	-	-	-
PC3. select suitable tools, instruments and marking materials for conducting required work	-	-	-	-
PC4. identify the start point/ benchmark for measurement as per work requirement	-	-	-	-
PC5. monitor subordinates to ensure that the unfolding of the chain or tape is as per standard practice	-	-	-	-
PC6. check that the subordinates have collected appropriate tools such as arrows, pegs etc. in required number	-	-	-	-
PC7. check that the ranging rods are vertical and of appropriate length to avoid any errors in ranging	-	-	-	-
PC8. ensure that the chain or tape is stretched appropriately to avoid any errors due to sagging of the same	-	-	-	-
PC9. coordinate between leader and follower to maintain straight line of measurement and proper placement of flags or pegs	-	-	-	-
PC10. ensure that the peg is fixed at all station points of the survey	-	-	-	-
PC11. record the chainages or measured distance for respective points using proper symbols in the field book, as per standard practice	-	-	-	-
PC12. instruct subordinates to use appropriate tools for transferring points on ground/ slopes	-	-	-	-
<i>Conduct linear measurement using total stations</i>	25	25	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. identify the location of master and secondary control points to set up the instrument	-	-	-	-
PC14. identify the suitable benchmark as a reference to obtain a back-sight at station point	-	-	-	-
PC15. locate the exact position of the instrument with respect to the back-sight and foresight points	-	-	-	-
PC16. set up the instrument exactly over the station point	-	-	-	-
PC17. carry out temporary adjustments of the instrument	-	-	-	-
PC18. input various data/parameters as per job details, locations and technical specifications	-	-	-	-
PC19. identify the location of staff point for measuring the horizontal distance as per the drawings or co-ordinates	-	-	-	-
PC20. instruct the subordinate to hold the staff exactly at the staff point	-	-	-	-
PC21. operate the total station instrument to compute and record the required data	-	-	-	-
PC22. remove the data card from the instrument and transfer the same into compatible computer	-	-	-	-
NOS Total	50	50	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	CON/N0904
NOS Name	Conduct linear measurements using survey instruments and tools
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Surveying
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



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CON/N0905: Carry out leveling and cross sectioning survey

Description

This unit describes the skills and knowledge required to carry out leveling and cross sectioning survey

Scope

The scope covers the following :

- Carry out leveling and cross section survey using total station

Elements and Performance Criteria

Carry out leveling and cross section survey using total station

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

- PC1.** interpret the scope of survey and data to be collected
- PC2.** identify and locate the first station point to set up the instrument
- PC3.** identify and locate the benchmark on the field as instructed by the surveyor
- PC4.** setup the instrument exactly over the station point
- PC5.** carry out temporary adjustments of the instrument
- PC6.** input data regarding temperature and pressure bars into the total station
- PC7.** input the data regarding survey job, station point, type of measurement, RL of benchmark etc. as required by the instrument
- PC8.** instruct the subordinate to hold the reflective staff exactly over the benchmark of known elevation
- PC9.** bisect the reflective prism mounted on the staff with the help of tangent screw and fine tune screw
- PC10.** bisect the prism using the input panel on the total station to compute the reduced level at the station point from the RL earlier fed in the instrument using the telescope
- PC11.** identify the direction and position of the terminal point/ station and place the staff
- PC12.** obtain the RL(reduced level) of the staff point by bisecting the reflective prism and instructing the instrument to calculate the RL
- PC13.** follow the standard procedure to obtain readings at multiple staff points at fixed interval
- PC14.** transfer the instrument to the next point as per requirement and take a back sight reading at the previous intermediate point or staff point
- PC15.** take staff readings at fixed interval on multiple points normal to the center line on both sides
- PC16.** check the display of the instrument to confirm that data displayed is as per requirement
- PC17.** remove the data card from the instrument and transfer the same into compatible computer

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:



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- KU1.** standard practices for surveying works
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment
- KU6.** statutory compliance requirement related to workmen engagement
- KU7.** how to read and understand the layout plan, alignment diagram, and other drawings
- KU8.** concept and principles of leveling, different types of leveling, their application
- KU9.** standard procedure for conducting leveling works
- KU10.** importance of leveling in various sub sectors
- KU11.** different instruments used for leveling
- KU12.** different parts and components of the total station
- KU13.** interpretation of site drawings, layout plans, boundary maps etc.
- KU14.** calculations for computations of dimensions and angles
- KU15.** concept of latitudes and longitudes, their computations and use
- KU16.** various tools, materials and their use and applications in surveying
- KU17.** how to check the serviceability of various tools and tackles
- KU18.** different causes of errors in the leveling works, their impact on the project
- KU19.** different terminologies used in the leveling operations
- KU20.** procedures for making entries in the field book and making necessary calculations
- KU21.** ideal conditions for selecting a bench mark
- KU22.** procedure for laying slopes and gradients for roads, bridges, pipelines, canals etc
- KU23.** errors in slope alignment and their implications
- KU24.** calculation of RL using rise and fall method and height of collimation method, and performing necessary checks
- KU25.** how to feed and retrieve data from the total station
- KU26.** how to transfer data from instrument to computer
- KU27.** computer literacy
- KU28.** standard procedure for operating total stations
- KU29.** type of reflective staff used in survey
- KU30.** placing of measurement/ reflective staff at appropriate location

Generic Skills (GS)

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

- GS1.** write in at least one language, preferably in the local language of the site
- GS2.** read sketches, instructions provided for the work, and various signboards, safety rules, safety tags, exit route information in one or more languages, preferably in the local language of the site



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- GS3.** speak in one or more language, preferably one of the local language at the site
- GS4.** communicate orally and effectively with team members
- GS5.** analyze the safety aspect of the workplace
- GS6.** plan work and organize required resource effectively
- GS7.** complete work as per agreed time schedule and quality parameters
- GS8.** resolve any conflict within the teammates
- GS9.** evaluate the complexity of the tasks
- GS10.** identify any violation of safety norms during the work



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out leveling and cross section survey using total station</i>	50	50	-	-
PC1. interpret the scope of survey and data to be collected	-	-	-	-
PC2. identify and locate the first station point to set up the instrument	-	-	-	-
PC3. identify and locate the benchmark on the field as instructed by the surveyor	-	-	-	-
PC4. setup the instrument exactly over the station point	-	-	-	-
PC5. carry out temporary adjustments of the instrument	-	-	-	-
PC6. input data regarding temperature and pressure bars into the total station	-	-	-	-
PC7. input the data regarding survey job, station point, type of measurement, RL of benchmark etc. as required by the instrument	-	-	-	-
PC8. instruct the subordinate to hold the reflective staff exactly over the benchmark of known elevation	-	-	-	-
PC9. bisect the reflective prism mounted on the staff with the help of tangent screw and fine tune screw	-	-	-	-
PC10. bisect the prism using the input panel on the total station to compute the reduced level at the station point from the RL earlier fed in the instrument using the telescope	-	-	-	-
PC11. identify the direction and position of the terminal point/ station and place the staff	-	-	-	-
PC12. obtain the RL(reduced level) of the staff point by bisecting the reflective prism and instructing the instrument to calculate the RL	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. follow the standard procedure to obtain readings at multiple staff points at fixed interval	-	-	-	-
PC14. transfer the instrument to the next point as per requirement and take a back sight reading at the previous intermediate point or staff point	-	-	-	-
PC15. take staff readings at fixed interval on multiple points normal to the center line on both sides	-	-	-	-
PC16. check the display of the instrument to confirm that data displayed is as per requirement	-	-	-	-
PC17. remove the data card from the instrument and transfer the same into compatible computer	-	-	-	-
NOS Total	50	50	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	CON/N0905
NOS Name	Carry out leveling and cross sectioning survey
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Surveying
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



Qualification Pack

CON/N0906: Carry out setting out operations for buildings/ other structures

Description

This unit describes the skills and knowledge required to carry out setting out for buildings/ other structures

Scope

The scope covers the following :

- Perform preparatory activities prior to setting out
- Carry out setting out operations

Elements and Performance Criteria

Perform preparatory activities prior to setting out

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

- PC1.** obtain work instructions, plans, specifications, quality requirements and operational details
- PC2.** plan the sequence to be adopted for setting out works
- PC3.** check the serviceability of the required tools and instruments and report any errors/ faults to the seniors
- PC4.** estimate the required materials and ensure that they comply with work requirements

Carry out setting out operations

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

- PC5.** locate and identify the survey pegs or control point and mark the boundary lines
- PC6.** calculate the distance and direction of building line from the boundary or base line as per plans/drawings
- PC7.** carry out liner and angular measurements to locate the building line on field from the boundary or baseline
- PC8.** identify all the grid lines /numbers provided on the plans/drawings and establish them on the ground using string (line dori) and pegs
- PC9.** conduct the erection/construction of profile/hurdles/platform at the both ends of grid lines and mark them as per their grid numbers
- PC10.** determine the corner of building on set building line to true measurement from adjacent boundary and mark the same as per drawings and specifications
- PC11.** set out right angle to the building line from the identified corner point using TS, theodolite or triangulation principals
- PC12.** recheck all the measurements accurately using TS or triangulation methods and confirm the same with drawings

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:



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- KU1.** standard practices for surveying works
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment
- KU6.** statutory compliance requirement related to workmen engagement
- KU7.** application and requirements for line, level and plumb in construction projects
- KU8.** basic mathematical techniques associated with setting out
- KU9.** setting out techniques
- KU10.** method and sequence of setting out of the building profile on the ground
- KU11.** site isolation and traffic control responsibilities and authorities
- KU12.** types, characteristics, technical capabilities and limitations of setting out devices
- KU13.** how to read and understand the layout plan, alignment diagram, and other drawings
- KU14.** concept and principles of leveling, different types of leveling, their application
- KU15.** standard procedure for conducting leveling works
- KU16.** importance of leveling in various sub sectors
- KU17.** different instruments used for leveling
- KU18.** different parts and components of the instruments
- KU19.** interpreting site drawings, layout plans, boundary maps etc.
- KU20.** calculations for computations of dimensions and angle

Generic Skills (GS)

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

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



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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Perform preparatory activities prior to setting out</i>	12	12	-	-
PC1. obtain work instructions, plans, specifications, quality requirements and operational details	-	-	-	-
PC2. plan the sequence to be adopted for setting out works	-	-	-	-
PC3. check the serviceability of the required tools and instruments and report any errors/ faults to the seniors	-	-	-	-
PC4. estimate the required materials and ensure that they comply with work requirements	-	-	-	-
<i>Carry out setting out operations</i>	38	38	-	-
PC5. locate and identify the survey pegs or control point and mark the boundary lines	-	-	-	-
PC6. calculate the distance and direction of building line from the boundary or base line as per plans/drawings	-	-	-	-
PC7. carry out liner and angular measurements to locate the building line on field from the boundary or baseline	-	-	-	-
PC8. identify all the grid lines /numbers provided on the plans/drawings and establish them on the ground using string (line dori) and pegs	-	-	-	-
PC9. conduct the erection/construction of profile/hurdles/platform at the both ends of grid lines and mark them as per their grid numbers	-	-	-	-
PC10. determine the corner of building on set building line to true measurement from adjacent boundary and mark the same as per drawings and specifications	-	-	-	-
PC11. set out right angle to the building line from the identified corner point using TS, theodolite or triangulation principals	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC12. recheck all the measurements accurately using TS or triangulation methods and confirm the same with drawings	-	-	-	-
NOS Total	50	50	-	-



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National Occupational Standards (NOS) Parameters

NOS Code	CON/N0906
NOS Name	Carry out setting out operations for buildings/ other structures
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Surveying
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



Qualification Pack

CON/N0907: Carry out topographic survey

Description

This unit describes the skills and knowledge required to carry out topographic survey

Scope

The scope covers the following :

- Carry out topographic survey
- Prepare contour and topographic map

Elements and Performance Criteria

Carry out topographic survey

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

- PC1.** identify the boundaries of the area to be surveyed
- PC2.** establish control points/bench marks to initiate the survey
- PC3.** identify a suitable location for setting up a total station such that maximum points or features are visible from this point
- PC4.** set up the instrument at identified point and perform necessary adjustments
- PC5.** take the back sight from instrument point to BM and set the readings as zero for this point
- PC6.** instruct the subordinate to place the staff at all relevant feature points like corners of buildings, trees, pillars etc
- PC7.** operate the survey instrument to focus on the staff and record the required readings for the fore sights/intermediate sight as per the requirement
- PC8.** coordinate with team members to change the instrument placing and repeat the same procedure for taking further reading
- PC9.** transfer/upload the recorded data on the computer system using appropriate CAD software

Prepare contour and topographic map

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

- PC10.** obtain approval from seniors regarding correctness of the collected data
- PC11.** segregate the required information in desired formats using available software
- PC12.** decide the scale for plotting the survey data
- PC13.** plot the recorded points using the CAD software to get the required contour/ topographic map as per the measured distance, location, levels and angles
- PC14.** confirm that the coordinates of all the plotted points are as per the survey data
- PC15.** obtain approval from senior for confirming the correctness of the map
- PC16.** store and save the map as per organizational norms

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:



Qualification Pack

- KU1.** standard practices for surveying works
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment
- KU6.** statutory compliance requirement related to workmen engagement
- KU7.** introduction to topographic survey and its types
- KU8.** different methods of conducting topographic survey
- KU9.** different instruments and their operation in conducting topographic surveying
- KU10.** how to plot the collected data to represent topography of the area in required scale
- KU11.** various software used in surveying and plotting
- KU12.** temporary and permanent adjustments of various equipment
- KU13.** application of different types of topographic survey in various sectors
- KU14.** different methods of computing levels, angles, bearing and distances using modern instruments
- KU15.** different methods of computing levels, angles, bearing and distances using conventional instruments
- KU16.** calculation and properties of contour lines and plotting the same with required scale
- KU17.** interpretation of contour lines
- KU18.** importance of contour lines

Generic Skills (GS)

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

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



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out topographic survey</i>	30	30	-	-
PC1. identify the boundaries of the area to be surveyed	-	-	-	-
PC2. establish control points/bench marks to initiate the survey	-	-	-	-
PC3. identify a suitable location for setting up a total station such that maximum points or features are visible from this point	-	-	-	-
PC4. set up the instrument at identified point and perform necessary adjustments	-	-	-	-
PC5. take the back sight from instrument point to BM and set the readings as zero for this point	-	-	-	-
PC6. instruct the subordinate to place the staff at all relevant feature points like corners of buildings, trees, pillars etc	-	-	-	-
PC7. operate the survey instrument to focus on the staff and record the required readings for the fore sights/intermediate sight as per the requirement	-	-	-	-
PC8. coordinate with team members to change the instrument placing and repeat the same procedure for taking further reading	-	-	-	-
PC9. transfer/upload the recorded data on the computer system using appropriate CAD software	-	-	-	-
<i>Prepare contour and topographic map</i>	20	20	-	-
PC10. obtain approval from seniors regarding correctness of the collected data	-	-	-	-
PC11. segregate the required information in desired formats using available software	-	-	-	-
PC12. decide the scale for plotting the survey data	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. plot the recorded points using the CAD software to get the required contour/ topographic map as per the measured distance, location, levels and angles	-	-	-	-
PC14. confirm that the coordinates of all the plotted points are as per the survey data	-	-	-	-
PC15. obtain approval from senior for confirming the correctness of the map	-	-	-	-
PC16. store and save the map as per organizational norms	-	-	-	-
NOS Total	50	50	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	CON/N0907
NOS Name	Carry out topographic survey
Sector	Construction
Sub-Sector	Real Estate and Infrastructure construction
Occupation	Surveying
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



Qualification Pack

CON/N7001: Plan, arrange and manage resources for execution of relevant work

Description

This unit describes the knowledge and the skills required for an individual to plan and organize work in order to meet expected outcome.

Scope

The scope covers the following :

- Plan and prepare for work
- Arrange and manage manpower
- Arrange allocate and manage tools, material and equipment for completion of work, as per the plan

Elements and Performance Criteria

Plan and prepare for work

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

- PC1.** identify the targets and timelines for the work set by superiors
- PC2.** determine the work requirements corresponding to task(drawings/schedules/instructions/methodology), safety, tools and equipment prior to commencement of task
- PC3.** plan the work by analyzing the required outcomes, work procedures, allotted time, resource availability and known priorities
- PC4.** prepare the work areas in coordination with team members
- PC5.** plan for waste collection and disposal prior to and after completion of work

Arrange and manage manpower

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

- PC6.** determine quantum and nature of work under assigned activity
- PC7.** calculate requirement of manpower for assigned activities
- PC8.** submit manpower requirement to superiors
- PC9.** allocate and extract work as per plan
- PC10.** provide clear instructions to workmen for execution of work
- PC11.** ensure optimum utilization of manpower resources
- PC12.** record the daily labor attendance and their daily productivity

Arrange allocate and manage tools, material and equipment for completion of work, as per the plan

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

- PC13.** estimate requirement for material, components, fixtures, equipment, tools and accessories
- PC14.** submit material, equipment and tool requirement to superiors
- PC15.** allocate material, equipment and tools to workmen and extract the work as per plan
- PC16.** provide clear instructions for optimum use of resources



Qualification Pack

PC17. ensure the work processes adopted are in line with the specified standards and instructions

PC18. complete the work with the allocated resources within specified time

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** standard practices for execution of relevant work
- KU2.** safety rules and regulations for handling and storing relevant tools, equipment, and materials required for relevant works in accordance with organizational norms
- KU3.** importance of personal protection including the use of related safety gears and equipment in accordance with organizational norms
- KU4.** service request procedures for tools, materials and equipment as per organizational norms
- KU5.** procedure for maintenance of tools and equipment
- KU6.** how to identify work activities that need to be planned and organized
- KU7.** how to undertake all aspect of planning and organizing the task, including interpretation of task, reading drawing/schedules, arranging resources, reporting problems etc.
- KU8.** manpower requirement on the basis of quantum of work and productivity
- KU9.** sequence and priority of activities
- KU10.** how to identify priority and critical activity of relevant task
- KU11.** method and technique on briefing team members about relevant work
- KU12.** different checks to evaluate progress and quality of relevant works
- KU13.** importance of daily productivity report
- KU14.** importance of daily attendance register
- KU15.** how to calculate quantum of relevant work
- KU16.** calculation of tools and material requirement
- KU17.** optimum use of available resources
- KU18.** computer basics

Generic Skills (GS)

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

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



Qualification Pack

GS9. evaluate the complexity of the tasks

GS10. identify any violation of safety norms during the work



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Plan and prepare for work</i>	12	18	-	-
PC1. identify the targets and timelines for the work set by superiors	-	-	-	-
PC2. determine the work requirements corresponding to task(drawings/schedules/instructions/methodology), safety, tools and equipment prior to commencement of task	-	-	-	-
PC3. plan the work by analyzing the required outcomes, work procedures, allotted time, resource availability and known priorities	-	-	-	-
PC4. prepare the work areas in coordination with team members	-	-	-	-
PC5. plan for waste collection and disposal prior to and after completion of work	-	-	-	-
<i>Arrange and manage manpower</i>	12	18	-	-
PC6. determine quantum and nature of work under assigned activity	-	-	-	-
PC7. calculate requirement of manpower for assigned activities	-	-	-	-
PC8. submit manpower requirement to superiors	-	-	-	-
PC9. allocate and extract work as per plan	-	-	-	-
PC10. provide clear instructions to workmen for execution of work	-	-	-	-
PC11. ensure optimum utilization of manpower resources	-	-	-	-
PC12. record the daily labor attendance and their daily productivity	-	-	-	-
<i>Arrange allocate and manage tools, material and equipment for completion of work, as per the plan</i>	16	24	-	-
PC13. estimate requirement for material, components, fixtures, equipment, tools and accessories	-	-	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. submit material, equipment and tool requirement to superiors	-	-	-	-
PC15. allocate material, equipment and tools to workmen and extract the work as per plan	-	-	-	-
PC16. provide clear instructions for optimum use of resources	-	-	-	-
PC17. ensure the work processes adopted are in line with the specified standards and instructions	-	-	-	-
PC18. complete the work with the allocated resources within specified time	-	-	-	-
NOS Total	40	60	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	CON/N7001
NOS Name	Plan, arrange and manage resources for execution of relevant work
Sector	Construction
Sub-Sector	Generic, Real Estate and Infrastructure construction
Occupation	Generic
NSQF Level	5
Credits	TBD
Version	3.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022



Qualification Pack

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

The scope covers the following :

- Ensure effective implementation of health, safety and environment policies and procedures
- Identify and respond to risks / fire and emergencies associated with the work practices and workplace
- Ensure sanitization and infection control guidelines are followed at construction site

Elements and Performance Criteria

Ensure effective implementation of health, safety and environment policies and procedures

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

- PC1.** implement safe handling and stacking methods at workplace /store
- PC2.** ensure the adequate availability and placing of safety and protection installations at site
- PC3.** ensure that safe access ways are available at work place for movement of workers and materials
- PC4.** ensure the safe use of tools and tackles by teammates as per work requirements
- PC5.** ensure ergonomic principles are adopted by the teammates while lifting and shifting of construction materials, tools and equipment
- PC6.** ensure appropriate use of following Personal Protective Equipment (PPE) as per work requirement of head protection, ear protection, fall protection, foot protection, face and eye protection, hand and body protection, respiratory protection
- PC7.** maintain entry and exit pathways from confined spaces, excavated pits and other location as per safety parameters/instructions
- PC8.** ensure proper housekeeping at workplace
- PC9.** ensure that subordinates adhere to health and safety plans

Identify and respond to risks / fire and emergencies associated with the work practices and workplace

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

- PC10.** identify any hazard at workplace and report/notify the same to appropriate authorities.
- PC11.** follow procedures for accident recording and reporting as per organizational and statutory requirements
- PC12.** ensure effective adherence to emergency response procedures / protocols
- PC13.** select and operate different types of fire extinguishers corresponding to types of fires as per EHS guideline
- PC14.** obtain 'height pass' clearance as per EHS guideline



Qualification Pack

PC15. implement control measures to reduce risks ,meeting legislative requirements within the scope of own role and expertise, as per organizational policies

Ensure sanitization and infection control guidelines are followed at construction site

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

PC16. promote awareness about latest hygiene and sanitation regulations

PC17. ensure disinfection procedure related to material, tools and supplies are followed properly

PC18. respond to infection prevention and control and its non-compliance , within scope of own role or report to required personnel

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 and 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. ways of transmission of infection

KU9. ways to manage infectious risks at the workplace

KU10. different methods of cleaning, disinfection, sterilization and sanitization

KU11. symptoms of infection like fever, cough, redness, swelling and inflammation

KU12. actions be taken during a medical emergency

KU13. current guidelines, national legislation, local policies and protocols regarding spread of infectious disease.

Generic Skills (GS)

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

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

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

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

GS4. listen and follow instructions shared by site EHS and superiors regarding site safety

GS5. communicate reporting of site conditions, hazards, accidents, etc.

GS6. analyze the safety aspect of the workplace



Qualification Pack

GS7. identify any violation of safety norms during the work



Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Ensure effective implementation of health, safety and environment policies and procedures</i>	20	30	-	-
PC1. implement safe handling and stacking methods at workplace /store	-	-	-	-
PC2. ensure the adequate availability and placing of safety and protection installations at site	-	-	-	-
PC3. ensure that safe access ways are available at work place for movement of workers and materials	-	-	-	-
PC4. ensure the safe use of tools and tackles by teammates as per work requirements	-	-	-	-
PC5. ensure ergonomic principles are adopted by the teammates while lifting and shifting of construction materials, tools and equipment	-	-	-	-
PC6. ensure appropriate use of following Personal Protective Equipment (PPE) as per work requirement of head protection, ear protection, fall protection, foot protection, face and eye protection, hand and body protection, respiratory protection	-	-	-	-
PC7. maintain entry and exit pathways from confined spaces, excavated pits and other location as per safety parameters/instructions	-	-	-	-
PC8. ensure proper housekeeping at workplace	-	-	-	-
PC9. ensure that subordinates adhere to health and safety plans	-	-	-	-
<i>Identify and respond to risks / fire and emergencies associated with the work practices and workplace</i>	12	18	-	-
PC10. identify any hazard at workplace and report/notify the same to appropriate authorities.	-	-	-	-
PC11. follow procedures for accident recording and reporting as per organizational and statutory requirements	-	-	-	-
PC12. ensure effective adherence to emergency response procedures / protocols	-	-	-	-



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. select and operate different types of fire extinguishers corresponding to types of fires as per EHS guideline	-	-	-	-
PC14. obtain 'height pass' clearance as per EHS guideline	-	-	-	-
PC15. implement control measures to reduce risks ,meeting legislative requirements within the scope of own role and expertise, as per organizational policies	-	-	-	-
<i>Ensure sanitization and infection control guidelines are followed at construction site</i>	8	12	-	-
PC16. promote awareness about latest hygiene and sanitation regulations	-	-	-	-
PC17. ensure disinfection procedure related to material, tools and supplies are followed properly	-	-	-	-
PC18. respond to infection prevention and control and its non-compliance , within scope of own role or report to required personnel	-	-	-	-
NOS Total	40	60	-	-



Qualification Pack

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	5
Credits	TBD
Version	3.0
Last Reviewed Date	31/03/2022
Next Review Date	31/03/2025
NSQC Clearance Date	31/03/2022

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)/ element 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/ element.
2. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by SSC
3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.
5. The passing percentage for each QP will be 70%. To pass the Qualification Pack, every trainee should score a minimum of 70% individually in each NOS.
6. The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome.



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- The trainee shall be provided with a chance to repeat the test to correct his procedures in case of improper performance, with a deduction of marks for each iteration.
- After the certain number of iteration as decided by SSC the trainee is marked as fail, scoring zero marks for the procedure for the practical activity.
- In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified timeframe set by SSC.
- Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

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/N0903.Carry out temporary adjustment of survey instruments as per standard methods	50	50	-	-	100	10
CON/N0904.Conduct linear measurements using survey instruments and tools	50	50	-	-	100	15
CON/N0905.Carry out leveling and cross sectioning survey	50	50	-	-	100	20
CON/N0906.Carry out setting out operations for buildings/ other structures	50	50	-	-	100	15
CON/N0907.Carry out topographic survey	50	50	-	-	100	20
CON/N7001.Plan, arrange and manage resources for execution of relevant work	40	60	-	-	100	10



Qualification Pack

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N9002.Manage workplace for safe and healthy work environment	40	60	-	-	100	10
Total	330	370	-	-	700	100



Qualification Pack

Acronyms

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



Qualification Pack

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.



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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.
BM	Bench Mark