



# Model Curriculum

**QP Name: Surveyor**

**QP Code: CON/Q0902**

**QP Version: 2.0**

**NSQF Level: 6**

**Model Curriculum Version: 1.0**

Construction Skill Development Council of India | Construction Skill Development Council of India (CSDCCI), CPB – 201 and 202, Block-4B, DLF corporate Park, Phase – III, MG Road Gurugram – 122002  
Near Guru Dronacharya Metro Station



# Table of Contents

Training Parameters.....	3
Program Overview .....	<b>Error! Bookmark not defined.</b>
Training Outcomes.....	4
Compulsory Modules.....	4
Optional Modules .....	<b>Error! Bookmark not defined.</b>
Module Details.....	6
Bridge Module.....	8
Read and interpret drawings, formwork specification and standards	<b>Error! Bookmark not defined.</b>
Monitor shutter making and assembling process at formwork yard / site .....	10
Ensure erection and dismantling of formwork as per formwork drawings and specifications..	<b>Error! Bookmark not defined.</b>
Check and ensure erected formwork is as per specified standards ....	<b>Error! Bookmark not defined.</b>
Monitor installation and operation of Jump form system.....	12
Plan, arrange and manage resources for execution of relevant work	<b>Error! Bookmark not defined.</b>
Work effectively in a team to deliver desired results at the workplace.....	<b>Error! Bookmark not defined.</b>
Plan and organize work to meet expected outcomes .....	<b>Error! Bookmark not defined.</b>
Supervise, monitor and evaluate performance of subordinates at workplace ..	<b>Error! Bookmark not defined.</b>
Manage workplace for safe and healthy work environment .....	<b>Error! Bookmark not defined.</b>
Annexure.....	13
Trainer Requirements .....	18
Assessor Requirements.....	19
Assessment strategy .....	20





## Training Parameters

<b>Sector</b>	Construction
<b>Sub-Sector</b>	Real Estate and Infrastructure Construction
<b>Occupation</b>	Surveying
<b>Country</b>	India
<b>NSQF Level</b>	6
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/3112.9900
<b>Minimum Educational Qualification and Experience</b>	12th Class/ I.T.I (civil) with 5 Years of experience in masonry occupation for a trained worker OR 12th Class/ I.T.I (civil) with 9 Years of experience in masonry occupation for a non-trained worker
<b>Pre-Requisite License or Training</b>	N.A.
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	31/03/2022
<b>Next Review Date</b>	31/03/2025
<b>NSQC Approval Date</b>	31/03/2022
<b>QP Version</b>	Version number 2.0
<b>Model Curriculum Creation Date</b>	
<b>Model Curriculum Valid Up to Date</b>	31/03/2025
<b>Model Curriculum Version</b>	Version number 1.0
<b>Minimum Duration of the Course</b>	1000 hrs.
<b>Maximum Duration of the Course</b>	1000 hrs.



# Program Overview

This section summarizes the end objectives of the program along with its duration.

## Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Discuss the concepts and procedures for carrying out temporary adjustments for various survey instruments.
- Explain the different types of linear measurements and their procedures.
- Discuss the standard procedure for conducting linear measurements with total station.
- Explain the concept and principles of levelling, different types of levelling, and their application.
- Discuss the standard procedure for conducting levelling works.
- Discuss about the setting out techniques, limitations and sequences.
- Discuss the concept of topographic survey, its importance and different methods of conducting topographic survey using modern and conventional instruments.
- Explain the planning of various work activities as per the given target, timelines and resources.
- Discuss about the optimum utilization of the manpower and other resources.
- Discuss about maintaining healthy and safe working environment at the construction site.
- Identify risks and other emergency situations at the workplace and respond accordingly to minimize risk.
- Explain methods of sanitization and infection control measures followed at the construction site.

## Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration (Hrs.)	Practical Duration (Hrs.)	On-the-Job Training Duration (Mandatory) (Hrs.)	On-the-Job Training Duration (Recommended) (Hrs.)	Total Duration (Hrs.)
Bridge Module	08:00	00:00	00:00	00:00	00:00



CON/N0903 <i>Carry out temporary adjustment of survey instruments by standard methods</i> NOS Version No.2.0 NSQF Level 6	40:00	00:00	40:00	00:00	80:00
	40:00	00:00	40:00	00:00	80:00
CON/N0904 <i>Conduct linear measurements using survey instruments and tools</i> NOS Version No.2.0 NSQF Level 6	64:00	00:00	64:00	00:00	128:00
	64:00	00:00	64:00	00:00	128:00
CON/N0905 <i>Carry out leveling and cross sectioning survey</i> NOS Version No. 2.0 NSQF Level 6	96:00	00:00	96:00	00:00	192:00
	96:00	00:00	96:00	00:00	192:00
CON/N0906 <i>Carry out setting out works</i> NOS Version No. 2.0 NSQF Level 6	120:00	00:00	120:00	00:00	240:00
	120:00	00:00	120:00	00:00	240:00
CON/N0907 <i>Carry out topographic survey</i> NOS Version No. 2.0 NSQF Level 6	120:00	00:00	120:00	00:00	240:00
	120:00	00:00	120:00	00:00	240:00
CON/N7001 <i>Plan, arrange and manage resources for execution of relevant work</i> NOS Version No. 2.0 NSQF Level 6	24:00	00:00	32:00	00:00	56:00
<i>Plan, arrange and manage resources for execution of relevant work</i>	24:00	00:00	32:00	00:00	56:00
CON/N9002 <i>Manage workplace for safe and healthy work environment</i> NOS Version No. 2.0 NSQF Level 6	24:00	00:00	32:00	00:00	56:00
<i>Manage safety and healthy at workplace</i>	24:00	00:00	32:00	00:00	56:00
<b>Total Duration</b>	<b>496:00</b>	<b>00:00</b>	<b>504:00</b>	<b>00:00</b>	<b>1000:00</b>



# Module Details

## Module 1: Introduction to Surveyor

### *Bridge Module*

#### Terminal Outcomes:

- Explain the role and responsibilities of the Surveyor.
- Discuss the career progression for the Surveyor.

<b>Duration:</b> 08:00	<b>Duration:</b> 00:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>



- Describe the role and responsibilities of a Surveyor.
- Define the personal attributes required in Surveying occupation.
- Explain the future possible progression and career development options of a Surveyor

**Classroom Aids:**

Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids

**Tools, Equipment and Other Requirements**

N/A





## Module 2: Carry out temporary adjustment of survey instruments by standard methods

*Mapped to CON/N0903, v 2.0*

### Terminal Outcomes:

- Discuss the concepts and procedures for carrying out temporary adjustments for various survey instruments.

<b>Duration:</b> 40:00	<b>Duration:</b> 00:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the errors/ faults in the surveying instruments.</li> <li>• Discuss the concepts and procedures for carrying out temporary adjustments for various instruments like               <ul style="list-style-type: none"> <li>• dumpy level,</li> <li>• auto level,</li> <li>• theodolite,</li> <li>• transit level,</li> <li>• total station etc.</li> </ul> </li> <li>• Elaborate the concepts and types of permanent adjustments, its purpose and importance.</li> <li>• Discuss about the difference between temporary and permanent adjustments.</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
dumpy level, auto level, theodolite, transit level, total station	



## Module 3: Conduct linear measurements using survey instruments and tools

Mapped to CON/N0904, v 2.0

### Terminal Outcomes:

- Explain the different types of linear measurements and their procedures.
- Discuss the standard procedure for conducting linear measurements with total station.

Duration: 64:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Brief about the selection of tools and instruments based upon the work requirements.</li> <li>• Describe different types of errors in the linear measurements, their causes and impact on project measurement.</li> <li>• Elaborate the methods to avoid errors in linear measurements.</li> <li>• Discuss about the various difficulties that faced during survey work.</li> <li>• Explain the different types of linear measurements and their procedures.</li> <li>• Brief about the different hand signals, their interpretations and applications.</li> <li>• Describe the procedure for entering data into field books for various types of linear measurements including symbols and representations.</li> <li>• Elaborate about selection of station points, and ideal conditions for selection of station points.</li> <li>• Explain the standard procedure for conducting linear measurements with total station.</li> <li>• Define the concept of as-built drawings and procedure for conducting measurements, recording, and plotting as built measurements.</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
Pegs Setting out Boards, Total station, Dumpy Level, Measuring staffs, Engineers chain, Measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask	



## Module 4: Carry out levelling and cross sectioning survey

Mapped to CON/N0905, v 2.0

### Terminal Outcomes:

- Explain the concept and principles of levelling, different types of levelling, and their application.
- Discuss the standard procedure for conducting levelling works.

<b>Duration: 96:00</b>	<b>Duration: 00:00</b>
<p><b>Theory – Key Learning Outcomes</b></p> <ul style="list-style-type: none"> <li>• Define the scope of the survey and decide the station points and staff locations.</li> <li>• Explain the concept and principles of levelling, different types of levelling, and their application.</li> <li>• Elaboration of computation of Reduced levels through rise and fall method and height of collimation method.</li> <li>• Discuss the standard procedure for conducting levelling works.</li> <li>• Describe the importance of levelling in various sub sectors of the construction industry.</li> <li>• Identify errors, their source and impact, and rectifying them while performing the survey works.</li> <li>• Explain the procedure for laying slopes and gradients for roads, bridges, pipelines, canals etc.</li> <li>• Elaborate the errors in slope alignment and their implications, identification, and rectifications.</li> <li>• Brief the procedures for making entries in the field book and make necessary calculations.</li> </ul>	<p><b>Practical – Key Learning Outcomes</b></p>
<p><b>Classroom Aids:</b></p> <p>Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids</p>	
<p><b>Tools, Equipment and Other Requirements</b></p> <p>Pegs Setting out Boards, Total station, Dumpy Level, measuring staffs, Engineers chain, measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask</p>	



## Module 4: Carry out setting out works

Mapped to CON/N0906, v 2.0

### Terminal Outcomes:

- Discuss about the setting out techniques, limitations and sequences.

<b>Duration:</b> 120:00	<b>Duration:</b> 00:00
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss about the specifications, quality requirements and operational details required for setting out works.</li> <li>• Brief about the setting out techniques and Sequences.</li> <li>• Elaborate the application and requirements of line, level and plumb in construction projects.</li> <li>• Explain the basic mathematical techniques associated with setting out method.</li> <li>• Discuss about the site isolation and traffic control responsibilities and authorities.</li> <li>• State the types, characteristics, technical capabilities and limitations of setting out devices.</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
Pegs Setting out Boards, Total station, Dumpy Level, Measuring staffs, Engineers chain, Measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask	



## Module 4: Carry out topographic survey

*Mapped to CON/N0907, v 2.0*

### Terminal Outcomes:

- Discuss the concept of topographic survey, its importance and different methods of conducting topographic survey using modern and conventional instruments.

<b>Duration: 120:00</b>	<b>Duration: 00:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Discuss the concept of topographic survey, its importance and different methods of conducting topographic survey using modern and conventional instruments.</li> <li>• Describe the application of topographic survey in various sectors.</li> <li>• Discuss the concepts of contours, calculations required for plotting contours,</li> <li>• Explain the Interpretation and importance of contours.</li> <li>• Brief the knowledge of scale and key while plotting a contour map</li> <li>• Discuss to plot the collected data to represent topography of the area in required scale</li> <li>• Explain the different methods of computing levels, angles, bearing and distances using modern and conventional instruments</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
Pegs Setting out Boards, Total station, Dumpy Level, Measuring staffs, Engineers chain, Measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask	



## Module 4: Plan, arrange and manage resources for execution of relevant work

Mapped to CON/N7001, v 2.0

### Terminal Outcomes:

- Explain the planning of various work activities as per the given target, timelines and resources.
- Discuss about the optimum utilization of the manpower and other resources.

Duration: 32:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain the process of planning of the given tasks and activities relevant to the trade/job role within defined scope and duration.</li> <li>• Explain the procedure adopted for prioritizing an activity and sequencing of activities.</li> <li>• Explain basic concept of labour productivity and work productivity.</li> <li>• Interpret the Construction drawing for the technical details.</li> <li>• Discuss the methods to calculate the quantum of the given work.</li> <li>• Estimate the quantities of tools, accessories, materials and manpower required as per the given work.</li> <li>• State the standard working practices for the given work.</li> <li>• Discuss the methods and techniques for briefing team members on the matter of the given work.</li> <li>• Describe the methods to evaluate the progress and quality of the ongoing works.</li> <li>• Explain the importance of daily productivity report and attendance register.</li> <li>• Discuss on the optimized use of the available resources.</li> <li>• Explain the process to produce 2D drawings using auto-cad software.</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
N/A	



## Module 8: Manage safety and healthy workplace

*Mapped to CON/N9002, v 2.0*

### Terminal Outcome:

- Discuss about maintaining healthy and safe working environment at the construction site.
- Identify risks and other emergency situations at the workplace and respond accordingly to minimize risk.
- Explain methods of sanitization and infection control measures followed at the construction site.

<b>Duration: 24:00</b>	<b>Duration: 00:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Explain the various types of hazards at construction site and procedures to respond in case of any emergency or accidents.</li> <li>• Discuss about the various personal protective equipment (PPE) used during various construction works.</li> <li>• Describe the safe work practices to be followed while performing task.</li> <li>• Discuss the methods to ensure the workplace safety and good health of workers.</li> <li>• Explain the safe ways for using tools, tackles, equipment and materials as specified by Environment, Health and Safety (EHS) department.</li> <li>• Discuss the policies, guidelines and other requirements related to workplace safety as per EHS department/ government norms.</li> <li>• Describe the various types of infectious disease, their symptoms and control, at the construction site.</li> <li>• Discuss the medical guidelines, national legislation, local policies and protocols regarding spread of infectious disease.</li> </ul>	
<b>Classroom Aids:</b>	
Black/White board, marker, Projector/LED Monitor, Computer, Trade specific charts, Safety tags, Safety Notice board, registers and other teaching aids	
<b>Tools, Equipment and Other Requirements</b>	
Leather Hand Gloves, Jump suit, Wire brush, Hand & Leg guard leather, Safety goggles, Nose mask, Ear protection, Fire extinguishers, Sand buckets Flashback arrestors, Welding helmet, Welding glass, Fire Extinguisher, Fire prevention kit, First Aid box, Safety tags, Safety Notice board, personal protective equipment (PPE), organizational and statutory documents for EHS	



## Module 9: On-the-Job Training

### Mapped to Surveyor V2.0

<b>CON/N0903 V. 2.0, Mandatory Duration: 40:00</b>	<b>Recommended Duration:</b>
<b>Location: On Site</b>	
<ul style="list-style-type: none"> <li>Perform setting up and centring of the             <ul style="list-style-type: none"> <li>• dumpy level,</li> <li>• auto level,</li> <li>• theodolite,</li> <li>• transit level,</li> <li>• total station etc</li> </ul>             including the following operations             <ul style="list-style-type: none"> <li>• identification of station mark and bench mark</li> <li>• mounting the instrument on tripod and adjusting the height of the tripod</li> <li>• centring the instrument over station mark</li> </ul> </li> <li>Carry out levelling of the survey instrument ( for All 5 types) by conducting appropriate adjustments of the screws as per standard practice.</li> </ul>	
dumpy level, auto level, theodolite, transit level, total station	
<b>CON/N0904 V. 2.0, Mandatory Duration: 64:00</b>	
<b>Location: On Site</b>	
<p>Liner Measurements using chains and tape:</p> <ul style="list-style-type: none"> <li>• Determine and describe the scope and goal of survey.</li> <li>• Selection of suitable tools and equipments and in required quantity for the survey based upon the scope of survey</li> <li>• Instruct, Observe and correct the subordinates for proper selection of tools and materials and using them as per standard practice.</li> <li>• Check the tools and equipments for damage and serviceability.</li> <li>• Identify and instruct the starting point for survey</li> <li>• Fix the ranging rod properly at the start point</li> <li>• Guide the subordinate in the direction of second station point and align him w.r.t the ranging rod using hand signals</li> <li>• Instruct and ensure that the subordinate (leader) fixes the arrows/pegs at all station point and the follower collects each of them</li> <li>• Note the chainages and measured distances into the field book and represent objects using standard symbols</li> </ul> <p>Liner Measurements using Total Station</p> <ul style="list-style-type: none"> <li>• Identify the scope of the survey and the area in which the survey is to be done</li> <li>• Identify the materials required for conducting the survey and instruct the sub ordinate to collect the same</li> <li>• Set up the instrument at appropriate location, carry out the temporary adjustments and input primary data such as project code, file name, temperature, station point, type of measurement etc.</li> <li>• Correctly identify and locate the staff points in order to obtain readings</li> <li>• instruct the subordinate to hold the staff exactly at the staff point</li> <li>• Obtain all the reading by bisecting the reflective prism mounted on the staff accurately with the telescope</li> <li>• Remove the data card and transfer the collected readings into the computer.</li> </ul>	





Pegs Setting out Boards, Total station, Dumpy Level, measuring staffs, Engineers chain, measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask

**CON/N0905 V. 2.0, Mandatory Duration: 96:00**

**Location: On Site**

Perform leveling works using a total station by performing the following:

- understanding the scope of the survey and identifying the station points, benchmarks and staff points.
- Set up and adjust (temporary) the total station at station point
- Obtain RL of the station point
- Obtain the RL, slope and gradient at the staff points
- Transfer the reading into computer
- Perform trouble shooting in case of errors in surveying

Pegs, Setting out Boards, Total station, Dumpy Level, Measuring staffs, Engineers chain, Measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask

**CON/N0906 V. 2.0, Mandatory Duration: 120:00**

**Location: On Site**

- Performing the setting out works:
- understand the work requirements and specifications
- identify and collect the required tools, instruments and materials and stack them appropriately
- identify and locate the first station point, boundary and control point
- locate the first building line from the boundary
- determine the corner of building on set building line to true measurement from adjacent boundary and mark the same
- install hurdles/profiles at required distance
- carry out accurate measurement of the building lines and mark them on the hurdle using nails
- recheck all the measurements accurately using TS or triangulation methods

Pegs Setting out Boards, Total station, Dumpy Level, Measuring staffs, Engineers chain, Measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask

**CON/N0907 V. 2.0, Mandatory Duration: 120:00**

**Location: On Site**

- understand the scope of the survey and establish the boundary for survey
- set up the instrument at location such that maximum points of measurement are visible
- carry out all temporary adjustments
- fix the location of the instrument by measuring liner and angular distances from permanent features
- take back sight from instrument and obtain RL at instrument
- obtain readings at various locations previously identified by operating total station
- complete the survey and transfer the data into a compatible computer
- segregate the information in desired formats
- decide the scale for plotting the survey data
- plot different points such as boundary marks, staff points, station points etc. with appropriate angles, and distances converted to scale using computer aided design system



- confirm that the coordinates of all the points
- store and save the map

Pegs, setting out Boards, Total station, Dumpy Level, measuring staffs, Engineers chain, measuring tape, tripods, plumb bob, optical plume, Laser pointer, Arrows, ranging rods, Safety Helmet, Safety goggles, Safety shoes, Cotton gloves, Dust mask

#### **CON/7001 V. 3.0 Mandatory Duration: 32:00**

- Identify the work target, timeline and plan activities to achieve the desired productivity.
- Demonstrate the planning for various activities relevant to task as per the scope and schedule.
- Calculate the requirement of manpower as per the quantum and nature of the given work.
- Demonstrate to allocate the work among the various teammates as per the schedule and work plan.
- Demonstrate the ability to coordinate with the teammates and superiors for the timely execution of the given work.
- Ensure the optimum utilization of the manpower and other resources.
- Prepare the daily Labour attendance record and their productivity report.
- Demonstrate the methods to allocate various materials, equipment and tools to workmen as per the requirements.
- Demonstrate optimum use of resources while performing domain specific work activities.
- Ensure the completion of the given work/ task as per the allocated resources and specified timeline.
- Demonstrate to exhibit proper housekeeping after the completion of the work.

#### **CON/9002 V 3.0, Mandatory Duration: 32:00**

##### **Location: On Site**

- Demonstrate checks performed to ensure that all the safety and protection at construction site are adequate and correctly placed.
- Demonstrate effective implementation of the health and safety plan for all the subordinates at the construction site.
- Demonstrate checks performed to ensure the safe handling, stacking and storing of tools, tackles, equipment and materials at the work place.
- Demonstrate the effective use of proper PPE by the subordinates.
- Demonstrate checks to confirm provision for proper entrance and exit from confined spaces, excavated pits and other locations of workplace, as per safety recommendations.
- Demonstrate the use of fire protection equipment for different type of fire hazard.
- Demonstrate the ways used to create awareness about organisational policies and procedures associated with health, safety and welfare of construction workers.
- Demonstrate the procedures for identifying, recording and reporting of hazards/accidents/ hazard of any infectious disease/ pandemic as per organizational and statutory requirements.
- Demonstrate checks performed to ensure effective adherence to response to emergency procedures / protocols.
- Demonstrate the effective implementation of control measures to reduce risks.
- Demonstrate vertigo test.
- Demonstrate the procedure to maintain personal hygiene, workplace hygiene and site/ workplace sanitization.
- Demonstrate checks performed to ensure proper housekeeping at the workplace.

Leather Hand Gloves, Jump suit, Wire brush, Hand & Leg guard leather, Safety goggles, Nose mask, Ear protection, Fire extinguishers, Sand buckets Flashback arrestors, Welding helmet, Welding glass, Fire Extinguisher, Fire prevention kit, First Aid box, Safety tags, Safety Notice board, personal protective equipment (PPE), organizational and statutory documents for EHS



# Annexure

## Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
Post-Graduation/Graduation in Engineering	Civil /Mechanical Engineering	Two	Civil /Mechanical Engineering	0	Civil/Mechanical Engineering	As a pre-requisite for new entrant, no prior experience in training /assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience
Diploma	Civil /Mechanical Engineering	Five	Civil /Mechanical Engineering	0	Civil /Mechanical Engineering	
Graduation/ Ex. Army /ITI /12 <sup>th</sup> pass	Any Graduation, certificate from Army/ITI certificate in relevant trade/12 <sup>th</sup> pas.	Eight	Working Experience in Supervisory role under survey occupation	0	Working Experience in Supervisory role under survey occupation	

Trainer Certification	
Domain Certification	Platform Certification
Trainer- 80 % in each NOS of Qualification Pack “Surveyor CON/Q902 v2.0” and 80% overall.	Trainers - 80% in each NOS of Qualification Pack “Trainer MEP/Q2601, v1.0” and 80% overall.

## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
Post-Graduation/Graduation in Engineering	Civil/Mechanical Engineering	Seven	Civil/Mechanical Engineering	0	Civil/Mechanical Engineering	As a prerequisite for new entrant, no prior experience in training/assessment is mandatory. However, if someone with prior experience in requisite domain joins, experience will be measured in terms of relevant industry experience
Diploma	Civil/Mechanical Engineering	Ten	Civil/Mechanical Engineering	0	Civil/Mechanical Engineering	
Graduation/ Ex. Army /ITI /12 <sup>th</sup> pass	Any Graduation, certificate from Army/ITI certificate in relevant trade/12 <sup>th</sup> pas.	Thirteen	Working Experience in Supervisory role under survey occupation	0	Working Experience in Supervisory role under survey occupation	

Assessor Certification	
Domain Certification	Platform Certification
Assessor- 80 % in each NOS of Qualification Pack “Surveyor CON/Q902 v2.0” and 80% overall.	Assessors- 80% in each NOS of Qualification Pack “Assessor MEP/Q2701, v1.0” and overall 80%.



## Assessment strategy

### Assessment system Overview

Assessment is done through CSDCI affiliated Assessment Agencies. Assessors are trained & certified by CSDCI after training of assessor's program. Assessments is conducted to gauge and assess the trainee's skill and knowledge competency in the specified areas. The assessment will have both theory and practical components in 50:50 ratio for Surveyor job role.

During the practical task, trainees are assessed on their workmanship, quality of finished product and time management. They will be graded for all their assessments based on the approved assessment strategy which is signed off by CSDCI. The Assessor submits an assessment plan to CSDCI prior to assessments.

The assessment plan contains the following information:

- What will be assessed, i.e. the competency based on each NOS based on theory and practical questions
- How assessment will occur i.e. methods of assessment
- When the assessment will occur
- duration of assessment
- Where the assessment will take place i.e. context of the assessment (workplace/simulation)
- The criteria for decision making i.e. those aspects that will guide judgments and
- Where appropriate, any supplementary criteria used to make a judgment on the level of performance.

### Testing Environment

Training partner shares the batch start date and end date, number of trainees and the job role.

Assessment will be fixed for a day after the end date of training. It could be next day or later.

Assessment will be conducted at the training venue/test center.

The knowledge/theory assessments is conducted with proper seating arrangements with enough space between the candidates to prevent copying.

Question set for theory and practical will be distributed to each candidate by the Assessor. Theory testing will include multiple choice questions, pictorial question, etc. which will test the trainee on his theoretical knowledge of the subject. The skill /practical assessments will be conducted in the approved test centers. The training provider will ensure adequate tools and materials are available to conduct the practical test.

If number of candidates are more than 30, more assessors will be organized on same day to complete the assessment.

The assessment has to comprise of two components, namely:

1. Knowledge assessment (theory/viva assessment)
2. Skill assessment (practical/hands-on skill assessment)



**Mode of assessment**

1. Demonstration/Practical for Performance /Skill Assessment
  2. Synoptic multiple choice question test
  3. Viva
- } For Knowledge Assessment

**Performance/skill assessment:** The performance/skill assessment will be conducted through demonstration/practical

For the practical test trainees are assessed through a given task, which they have to complete correctly for them to be marked as passed.

The assessment is conducted in a simulated working environment. Due to this fact, the assessors must note that the naturally occurring evidence of competence is unavailable or infrequent. Simulation must be undertaken in a Realistic Working Environment which provides an environment that replicates the key characteristics of the workplace in which the skill to be assessed is normally employed.

**Knowledge Assessment:** The knowledge assessments are conducted through written test/ viva.

Synoptic test is used for this. It is an MCQ (Multiple Choice Question) test which are prepared externally and externally marked, meaning by agency having no link with training partners. The test may be conducted by the assessor in the oral mode, if required, considering the lack of reading and comprehending acumen (skills) of trainees. In such cases, the assessor will mention it on top of the MCQ submitted to CSDCI.

The assessment strategy, weightage and duration of assessment for surveyor is summarized below

Assessment Type	Formative or Summative	Strategies	Weightage	Duration (hours)
Knowledge	Summative	MCQ/Viva	50	2.5
Skill	Summative	Structured practical task	25	3.0
Skill	Formative	Structured practical task	25	1.5

**Assessment Quality Assurance framework**

CSDCI has developed assessment criteria framework for each Qualification pack as per National Occupational Standards. The criteria framework includes weightages/marks for each criteria under knowledge and skill. The criteria ensures quality assurance as it ensures valid, consistent and fair assessments at all locations. Issued to the affiliated Assessment body. The Assessment body develop questions based on CSDCI issued assessment criteria.



Evidences in the form of answer sheets in case of knowledge assessments are collected. For skill assessments videos and photographs are prepared as evidence. These are submitted by the assessor to the assessment agency. CSDCI does random checks of the same with the participant/ trainee's ID and ascertains authenticity and validity of assessments.

The training partner will intimate the time of arrival of the assessor and time of leaving the venue. Random spot checks/audit is conducted by CSDCI to monitor assessment.

### ***Methods of Validation***

Unless the trainee is registered, the person cannot undergo assessment. To further ensure that the person registered is the person appearing for assessment, ID verification is carried out. Aadhar card number is part of registering the candidate for training. This forms the basis of further verification during the assessment.

Assessor conducts the assessment through theory and practical questions developed in accordance with the assessment criteria and guidelines issued by CSDCI. This too is verified by random audits carried out by CSDCI.

Evidences for assessments are to be collected and submitted to CSDCI for verification as per demand.

Assessment agency is responsible to put details in SIP. CSDCI will also validate the data and result received from the assessment agency.

### **Method of assessment documentation and access**

The assessment agency will upload the result of assessment in the portal. The data will not be accessible for change by the assessment agency after the upload. The assessment data will be validated by CSDCI assessment team. After upload, only CSDCI can access this data. CSDCI approves the results within five days after which results are uploaded on SIP by Assessment Agency.



## References

## Glossary

Term	Description
<b>Declarative Knowledge</b>	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
<b>Key Learning Outcome</b>	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
<b>OJT (M)</b>	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
<b>OJT (R)</b>	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
<b>Procedural Knowledge</b>	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
<b>Training Outcome</b>	Training outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of the training</b> .
<b>Terminal Outcome</b>	Terminal outcome is a statement of what a learner will know, understand and be able to do <b>upon the completion of a module</b> . A set of terminal outcomes help to achieve the training outcome.





## Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
CSDCI	Construction Skill development Council of India
MCQ	Multiple Choice Question
PPEs	Personal Protective Equipment
RCC	Reinforced Cement Concrete