



कौशल विकास और  
उद्यमशीलता मंत्रालय  
MINISTRY OF  
SKILL DEVELOPMENT  
AND ENTREPRENEURSHIP



# Model Curriculum

**QP Name: BIM Technician– Object Creation**

**QP Code: CON/Q2109**

**Version: 1.0**

**NSQF Level: 5.0**

**Model Curriculum Version: 1.0**

Construction Skill Development Council of India || Tower 4B, DLF Corporate Park, 201&, 202 4B,  
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## Training Parameters

<b>Sector</b>	Construction
<b>Sub-Sector</b>	Real Estate and Infrastructure Construction
<b>Occupation</b>	Building Information Modelling (BIM)
<b>Country</b>	India
<b>NSQF Level</b>	5.0
<b>Aligned to NCO/ISCO/ISIC Code</b>	NCO-2015/2142.9900
<b>Minimum Educational Qualification and Experience</b>	<p>Completed 2nd year of 3-year/ 4-years UG OR Completed 2nd year of diploma (after 12th) OR Pursuing 2nd year of 2-year diploma after 12th OR Completed 3-year diploma after 10th with 1-year relevant experience OR 12th Grade pass with 2-year relevant experience OR 10th Grade pass with 4-year relevant experience OR Previous relevant Qualification of NSQF Level 4 and with minimum education as 8th Grade pass with 3-year relevant experience OR Previous relevant Qualification of NSQF Level 4.5 with 1.5-year relevant experience</p>
<b>Pre-Requisite License or Training</b>	NA
<b>Minimum Job Entry Age</b>	18 Years
<b>Last Reviewed On</b>	31/08/2023
<b>Next Review Date</b>	31/08/2026
<b>NSQC Approval Date</b>	31/08/2023



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QP Version	1.0
Model Curriculum Creation Date	31/08/2023
Model Curriculum Valid Up to Date	31/08/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	510 Hours
Maximum Duration of the Course	510 Hours



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## 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 to:

- Explain the process of planning and creating BIM objects for BIM models.
- Explain the process of defining the properties and names for BIM objects.
- Elucidate ways to set the BIM object behaviour and coordinate quality check.
- Explain the importance of managing health and safety at the workplace.

### Compulsory Modules

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

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
<b>CON/N2115: Plan and create BIM objects for BIM models</b> NOS Version- 1.0 NSQF Level- 5.0	60:00	90:00	30:00	00:00	180:00
Module 1: Introduction to the role of a BIM Technician – Object Creation	05:00	0:00	0:00	00:00	05:00
Module 2: Process of planning and creating BIM objects for BIM models	55:00	90:00	30:00	00:00	175:00
<b>CON/N2116: Define the properties and names for BIM objects</b> NOS Version- 1.0 NSQF Level- 5.0	45:00	45:00	30:00	00:00	120:00
Module 3: Define the properties and names for BIM objects	45:00	45:00	30:00	00:00	120:00
<b>CON/N2117: Set the BIM object behaviour and coordinate quality check</b> NOS Version- 1.0 NSQF Level- 5.0	30:00	60:00	30:00	00:00	120:00
Module 4: Process of setting the BIM object behaviour and coordinate quality check	30:00	60:00	30:00	00:00	120:00



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<b>CON/N9003: Manage health and safety at the workplace</b> <b>NOS Version No. 1.0</b> <b>NSQF Level -5.0</b>	<b>15:00</b>	<b>15:00</b>	<b>0:00</b>	<b>00:00</b>	<b>30:00</b>
Module 4: Managing Health and Safety at the Workplace	15:00	15:00	0:00	00:00	30:00
<b>DGT/VSQ/N0102: Employability Skills</b> <b>NOS Version- 1.0</b> <b>NSQF Level- 5.0</b>	<b>60:00</b>	<b>00:00</b>	<b>0:00</b>	<b>00:00</b>	<b>60:00</b>
Module 6: Employability Skills	60:00	00:00	0:00	00:00	60:00
<b>Total Duration</b>	<b>210:00</b>	<b>210:00</b>	<b>90:00</b>	<b>00:00</b>	<b>510:00</b>



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## Module Details

### Module 1: Introduction to the role of a BIM Technician– Object Creation

*Mapped to CON/N2115, v1.0*

#### Terminal Outcomes:

- Discuss the job role of a BIM Technician – Object Creation.

<b>Duration: 05:00</b>	<b>Duration: 0:00</b>
<b>Theory – Key Learning Outcomes</b>	<b>Practical – Key Learning Outcomes</b>
<ul style="list-style-type: none"> <li>• Describe the size and scope of the construction industry and its sub-sectors.</li> <li>• Discuss the role and responsibilities of a BIM Technician – Object Creation.</li> <li>• Identify various employment opportunities for a BIM Technician – Object Creation.</li> </ul>	
<b>Classroom Aids</b>	
Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, Video Films	
<b>Tools, Equipment and Other Requirements</b>	
NA	





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## Module 2: Process of Planning and Creating BIM Objects for BIM Models

### Mapped to CON/N2115, v1.0

#### Terminal Outcomes:

- Explain the process of planning and preparing for BIM object creation.
- Explain the process of creating BIM objects.

Duration: 55:00	Duration: 90:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>● Explain the benefits of using BIM in construction projects.</li> <li>● Explain what BIM objects or 3D representation of products are and the benefits of creating and using them.</li> <li>● List the metadata contained in BIM objects, e.g. dimensions, classifications, the kind of object and its classification, performance values, material type, expected lifetime, manufacturer, maintenance, BIM object behaviour, information regarding sustainability and energy efficiency, etc.</li> <li>● State the appropriate software to be used for BIM object creation.</li> <li>● Explain the use of BIM objects for cost estimation and analyses.</li> <li>● Explain different types of BIM objects, e.g. layered and component BIM objects.</li> <li>● Explain the importance of having structured, reliable, accessible, and up to date data in BIM objects.</li> <li>● Describe the process of combining BIM objects to create a BIM model.</li> <li>● Elucidate the 3D geometry of a BIM object that describes its physical appearance, what it is, how it is classified, its performance values, material types, expected lifetime, etc.</li> <li>● Explain the benefit of standardizing BIM objects used in BIM models.</li> <li>● State the representation of a BIM object's geometrical and non-geometrical characteristics through its</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate how to collect the appropriate information and data for BIM object creation.</li> <li>● Demonstrate the process of setting up the software for use with appropriate parameters and templates.</li> <li>● Show how to create BIM objects based on the engineering design data.</li> <li>● Show how to integrate the appropriate metadata in BIM objects, e.g. critical product data, including digital installation instructions, operational guidance, digital warranty and service data.</li> <li>● Show how to deploy the BIM objects to online configurator or export them in an appropriate format.</li> <li>● Demonstrate the use of the appropriate unit of measurement, e.g. units of millimeters and degrees, as per the applicable BIM standards and guidelines.</li> <li>● Show how to combine BIM objects to create a BIM model of the building, with all assets linked to key data required to operate and maintain it effectively.</li> </ul>





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property.

- Explain the characteristics of a high-quality BIM object, e.g. well-defined purpose and value, appropriate geometrical and non-geometrical information, capability of generating production of drawings, etc.
- Explain the importance of checking and ensuring correct information in BIM objects in all aspects, e.g. geometrical and non-geometrical components.
- Explain the use of BIM objects for direct coordination in BIM models to enable the production of drawings and schedules.
- Describe the process of detailing BIM objects to an appropriate level.
- Explain how to detect and resolve clashes in BIM objects.

#### Classroom Aids

Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop

#### Tools, Equipment and Other Requirements

Revit, AutoCAD, Navisworks, Desktop/Laptop



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## Module 3: Define the Properties and Names for BIM Objects

*Mapped to CON/N2116, v1.0*

### Terminal Outcomes:

- Define the BIM object properties
- Define the names for BIM objects

Duration: 45:00	Duration: 45:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>● Explain the functional requirements of BIM objects, including BIM object naming conventions and expected behaviour.</li> <li>● State the applicable BIM object naming conventions.</li> <li>● Explain the importance of ensuring clearly defined BIM object property, i.e. consistent BIM object selection and submission between different stages.</li> <li>● State the appropriate case to be used for BIM parameter naming.</li> <li>● Explain the importance of ensuring descriptive and concise naming for BIM objects.</li> <li>● Explain the appropriate descriptions to be used for BIM objects.</li> <li>● Explain the importance of avoiding abbreviation, truncation and symbols in BIM object properties.</li> <li>● Discuss the practice of BIM object property naming with Boolean data types.</li> <li>● Explain the benefit of setting the name and parameters of BIM objects systematically and logically.</li> <li>● Describe the applicable BIM object naming methodology in the BIM object library.</li> <li>● Explain the critical characteristics of BIM objects.</li> <li>● Explain the importance of using unique abbreviation for naming BIM objects.</li> <li>● Explain the limitations applicable on the</li> </ul>	<ul style="list-style-type: none"> <li>● Demonstrate the use of the appropriate case, e.g. camel case and title casing for parameter naming.</li> <li>● Show how to perform BIM object property naming with Boolean data types, as appropriate.</li> </ul>



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number of characters in the BIM object name.	
<b>Classroom Aids</b>	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
<b>Tools, Equipment and Other Requirements</b>	
Revit, AutoCAD, Navisworks, Desktop/Laptop	



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## Module 4: Process of Setting the BIM Object Behaviour and Coordinate Quality Check

*Mapped to CON/N2117, v1.0*

### Terminal Outcomes:

- Describe the process of setting the BIM object behaviour.
- Describe the process of carrying out documentation.
- Elucidate ways to coordinate BIM object quality check.

Duration: 30:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain the importance of ensuring BIM objects are not compromised by the performance of the project model in which they are placed.</li> <li>• Explain the importance of modeling BIM objects to the recommended LOD for their intended purpose.</li> <li>• Explain the benefit of modeling BIM object to allow them to associate and connect with other BIM objects.</li> <li>• List the appropriate symbolic items to be included in BIM objects to suit 2D and 3D purposes.</li> <li>• List the functional requirements of BIM objects, including BIM object naming conventions and expected behaviour.</li> <li>• State the applicable BIM object naming conventions.</li> <li>• Explain the importance of following industry practice and project and client requirements in the production of drawings and schedules.</li> <li>• Describe the process of preparing cover sheet for BIM objects and the appropriate information to be included in the sheet.</li> <li>• List the applicable BIM object quality check requirements to verify the BIM object functions and behaviour.</li> <li>• List the requirement of maintaining the BIM object quality assurance form for clients/ receivers and the appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to prepare a comprehensive cover sheet for BIM objects detailing they are complete and satisfy the applicable requirements and functions for drawing production.</li> <li>• Show how to maintain the BIM object quality assurance form in the recommended format for clients/ receivers.</li> <li>• Demonstrate how to model BIM objects in such a manner to allow different users control their behaviour.</li> <li>• Show the process for the submission and inclusion of BIM objects in the relevant BIM object library.</li> <li>• Demonstrate how to make BIM objects available to be scheduled in a BIM project.</li> </ul>



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<p>information to be included, e.g. file size, category, unit, space, visibility control, etc.</p> <ul style="list-style-type: none"> <li>● Explain the benefit of maintaining and using BIM object libraries.</li> <li>● Describe the process of purging BIM objects before submission.</li> </ul>	
<b>Classroom Aids</b>	
Training Kit (Trainer Guide, Presentations). Whiteboard, Marker, Projector, Laptop	
<b>Tools, Equipment and Other Requirements</b>	



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## Module 5: Managing Health and Safety at the Workplace

*Mapped to CON/N9003, v1.0*

### Terminal Outcomes:

- Explain the importance of ensuring health and safety at the workplace.
- Discuss how to manage workplace emergencies.
- Demonstrate the use of Personal Protective Equipment (PPE).

Duration: 15:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> <li>• Explain the importance of health and safety at work.</li> <li>• Discuss the regulations relevant to health and safety at work.</li> <li>• Explain the selection of appropriate PPE according to the nature of work.</li> <li>• Discuss the importance of regular cleaning and sanitization at work.</li> <li>• Explain the importance of regular workplace safety audits.</li> <li>• Discuss the common health and safety hazards at the workplace and the appropriate preventive measures.</li> <li>• Discuss the benefits of providing comprehensive training to personnel on emergency procedures.</li> <li>• Explain the importance of the availability of an updated first-aid kit and functioning emergency equipment at work.</li> <li>• Discuss the appropriate measures to be taken during different workplace emergencies.</li> <li>• Explain the documentation and reporting requirements concerning workplace emergencies.</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate how to use the appropriate PPE according to the nature of work.</li> <li>• Demonstrate the use of relevant emergency equipment, e.g. use of fire extinguishers to extinguish different types of fire.</li> <li>• Demonstrate how to provide first aid for different types of injuries or medical emergencies.</li> </ul>
<b>Classroom Aids:</b>	
Training Kit - Trainer Guide, Projector/LED Monitor, Computer/ Laptop, Presentations, Black/ Whiteboard, Marker, Projector, Video	
<b>Tools, Equipment, and Other Requirements</b>	



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Safety Gloves, Face Mask, Soap/ Hand Sanitizer, Safety goggles, Fire Extinguishers, Sand buckets,  
Fire prevention kit, First Aid box, Safety Tags, Safety Notice Board





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## Module 6: Employability Skills

*Mapped to NOS DGT/VSQ/N0102 v1.0*

**Duration: 60:00**

### Key Learning Outcomes

#### Introduction to Employability Skills Duration: 1.5 Hours

After completing this programme, participants will be able to:

1. Discuss the Employability Skills required for jobs in various industries
2. List different learning and employability related GOI and private portals and their usage

#### Constitutional values - Citizenship Duration: 1.5 Hours

3. Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen
4. Show how to practice different environmentally sustainable practices.

#### Becoming a Professional in the 21st Century Duration: 2.5 Hours

5. Discuss importance of relevant 21st century skills.
6. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life.
7. Describe the benefits of continuous learning.

#### Basic English Skills Duration: 10 Hours

8. Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone
9. Read and interpret text written in basic English
10. Write a short note/paragraph / letter/e -mail using basic English

#### Career Development & Goal Setting Duration: 2 Hours

11. Create a career development plan with well-defined short- and long-term goals

#### Communication Skills Duration: 5 Hours

12. Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette.



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13. Explain the importance of active listening for effective communication

14. Discuss the significance of working collaboratively with others in a team

#### **Diversity & Inclusion Duration: 2.5 Hours**

15. Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD

16. Discuss the significance of escalating sexual harassment issues as per POSH act.

#### **Financial and Legal Literacy Duration: 5 Hours**

17. Outline the importance of selecting the right financial institution, product, and service

18. Demonstrate how to carry out offline and online financial transactions, safely and securely

19. List the common components of salary and compute income, expenditure, taxes, investments etc.

20. Discuss the legal rights, laws, and aids

#### **Essential Digital Skills Duration: 10 Hours**

21. Describe the role of digital technology in today's life

22. Demonstrate how to operate digital devices and use the associated applications and features, safely and securely

23. Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely

24. Create sample word documents, excel sheets and presentations using basic features

25. utilize virtual collaboration tools to work effectively

#### **Entrepreneurship Duration: 7 Hours**

26. Explain the types of entrepreneurship and enterprises

27. Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan

28. Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement

29. Create a sample business plan, for the selected business opportunity

#### **Customer Service Duration: 5 Hours**

30. Describe the significance of analyzing different types and needs of customers



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31. Explain the significance of identifying customer needs and responding to them in a professional manner.

32. Discuss the significance of maintaining hygiene and dressing appropriately

**Getting Ready for apprenticeship & Jobs Duration: 8 Hours**

33. Create a professional Curriculum Vitae (CV)

34. Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively

35. Discuss the significance of maintaining hygiene and confidence during an interview

36. Perform a mock interview

**37.** List the steps for searching and registering for apprenticeship opportunities



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## Module 7: On-the-Job Training

### Mapped to BIM Technician – Object Creation

<b>Mandatory Duration: 90:00</b>	<b>Recommended Duration: 00:00</b>
<b>Location: On-Site</b>	
<b>Terminal Outcomes</b> <ul style="list-style-type: none"><li>● Explain the benefits of using BIM in construction projects.</li><li>● Describe the process of preparing cover sheet for BIM objects and the appropriate information to be included in the sheet.</li><li>● Set up the software for use with appropriate parameters and templates.</li><li>● Deploy the BIM objects to online configurator or export them in an appropriate format.</li><li>● Perform BIM object property naming with Boolean data types, as appropriate.</li><li>● Maintain the BIM object quality assurance form in the recommended format for clients/receivers.</li><li>● Operate different types of fire extinguishers corresponding to various types of fires as per EHS guideline.</li><li>● Check and install all safety equipment as per standard guidelines.</li></ul>	



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## Annexure

### Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI/12th	Any domain	7	Building information modelling (BIM)	0	-	
Diploma in Engineering	Civil Engineering/ Mechanical Engineering/ Manufacturing/ Mathematics/ Physics degree	5	Building information modelling (BIM)	0	-	
Graduate	Civil Engineering/ Mechanical Engineering	3	Building information modelling (BIM)	0	-	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role "BIM Technician – Object Creation", mapped to QP: "CON/Q2109, v1.0", Minimum accepted score is 80%	Recommended that the Trainer is certified for the Job Role: "Trainer (Vet and Skills)", mapped to the Qualification Pack: "MEP/Q2601, v2.0". The minimum accepted score as per MEPSC guidelines is 80%.



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## Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training/Assessment Experience		Remarks
		Years	Specialization	Years	Specialization	
ITI/12th	Any domain	8	Building information modelling (BIM)	0	-	
Diploma in Engineering	Civil Engineering/ Mechanical Engineering/ Manufacturing/ Mathematics/ Physics degree	6	Building information modelling (BIM)	0	-	
Graduate	Civil Engineering/ Mechanical Engineering	3	Building information modelling (BIM)	0	-	

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role “BIM Technician – Object Creation”, mapped to QP: “CON/Q2109, v1.0”, Minimum accepted score is 80%	Certified for the Job Role: “Assessor (Vet and Skills)”, mapped to the Qualification Pack: “MEP/Q2701, v2.0”, with a minimum score of 80%.



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## Assessment Strategy

This section includes the processes involved in identifying, gathering, and interpreting information to evaluate the Candidate on the required competencies of the program.

### 1. Assessment System Overview:

- Batches assigned to the assessment agencies for conducting the assessment on SIP
- The batch allocation Matrix prepared for each month based on previous months' performance of AAs, which determines the quantum of Assessment which can be allocated to each AA for a month
- Post allocation of assessment, Assessment agencies send the assessment confirmation to SSC
- Assessment agency deploys the ToA certified Assessor for executing the assessment
- SSC monitors the assessment process.

### 2. Testing Environment:

- A combination of Theory and practical/demonstration test is deployed to assess knowledge and Skill respectively of Learners.
- Assessment is conducted at Training center in in-person/offline mode
- For Skill assessment, environment is simulated to create a realistic Working Environment that should replicate the key features of the workplace. In job roles, where it is difficult to replicate the same, the OJT assessment is implemented.
- During the practical task, trainees are assessed on their workmanship, quality of finished product, time management, etc., based on the performance criteria (PC), knowledge and understanding and their professional and soft skills as specified in the qualification pack.
- Knowledge assessment is done through closed ended questions up to level 4 and from level 5 onwards, it is mixture of open ended and closed ended questions

### 3. Assessment Quality Assurance levels/Framework

- Assessment criteria is developed for each QP which acts as a guide for developing question set /banks
- Sample questions aligned with Assessment criteria for each QP are developed by SSC and validated by industry
- Taking reference of Assessment criteria and Sample Questions, AAs create the question bank which is further validated by SSC
- Questions are mapped to the specified assessment criteria
- It is mandatory that Assessor and Trainer must be ToA certified & ToT Certified respectively
- Continuous Monitoring through virtual and In-person mode are conducted to ensure the assessment is conducted as per stipulated process
- Process and Technical audit of assessment batches by quality team are conducted to avoid the errors in assessment process





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- A well-defined comprehensive framework of NON-COMPLIANCE MATRIX is defined and implemented to identify the non-compliance made by assessor and AA and punitive actions are taken correspondingly.
- The capacity building sessions are conducted regularly for assessors and assessment agencies to update them about best practices in assessment

#### 4. Types of evidence or evidence-gathering protocol:

- Post Assessment, the evidences are uploaded by Assessor to assessment agency and further assessment agency to SSC as per stipulated TAT
- Evidences are broadly the photographic and video graphic in nature
- Assessment agencies upload the evidence on SIP and detailed evidence on SSC digital platform (ZoHO)
- Evidences are; NOS wise-Geotagged photographs and videos of Theory Test & Practical Tasks, Attendance sheet, result summary sheet, group photographs.

#### 5. Method of verification or validation:

- The process and technical audit of assessment batches are done by SSC
- Attendance of each candidate is verified and it is ensured that only those candidates are assessed by assessors who are meeting the stipulated minimum percentage of attendance
- The result of each candidate is verified, it is verified that that result on SIP are matching with respect to summary sheet submitted by AAs
- Under detailed technical audit for sample of batches, the knowledge and skill assessment results for each candidate is checked in technical aspect.
- All the evidences of batches are preserved on server of SSC digital platform

#### On the Job:

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



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## 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
EHS	Environment Health and Safety