



# Participant Handbook

Sector  
**Construction**

Sub-Sector  
**Real Estate & Infrastructure  
Construction**

Occupation  
**Surveying**

ReferenceID: **CON/NO901** Version 1.0 NSQF Level 2



## Assistant Surveyor

**Developed & Published by**



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## Certificate

### COMPLIANCE TO QUALIFICATION PACK - NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

**CONSTRUCTION SKILL DEVELOPMENT COUNCIL OF INDIA**

for the

**SKILLING CONTENT: PARTICIPANT HANDBOOK**

Complying to National Occupational Standards of  
Job Role/Qualification Pack: **'Assistant Surveyor'** QP No. **'CON/Q0901 NSQF Level 2'**

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Authorized Signatory  
(Construction Skill Development Council of India)

## Acknowledgements

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NIMI, set up by the Government of India to develop instructional material for the overall improvement in the standard of training in ITIs and skill development programmes is happy to widen the scope of its outreach by developing content for NSDC.

NIMI sincerely acknowledges the co-operation rendered by the media developers and their sponsoring organisations to bring out the participant handbook under Construction Sector for Qualification Pack for Assistant Surveyor.

This book is the outcome of teamwork by Construction Skill Development Council and experts from the construction industry.

NIMI thanks the media development committee members, data entry operators, CADD personnel and all others for their dedicated and continued support.

## About this book

Construction industry is the second largest employer in India. As one of the leading avenues for employment in the country, the role played by this industry in the economic development of India is pivotal. However, despite its vast potential, the construction industry faces challenge of shortage of skilled manpower. This hampers the progress of the industry, as the quality of constructed structure is poor and most projects fail to be completed in the stipulated time.

There is a vast difference between the required skill sets and available skills amongst workers in the industry today. To reduce the skill gap, appropriate skilling of the workforce is of paramount importance. It will not only empower the worker, but also benefit the construction framework.

This participant handbook is developed to impart skill training with appropriate and relevant knowledge required to work as an Assistant Surveyor in the construction industry. It is designed based on Assistant Surveyor Qualification Pack under the National Skill Qualifications Framework. It comprises the following NOS/topics:

NOS code	Major function/Task
1. CON/N0901:	Identify, Select, Use and Store Appropriate Tools and Instruments as per Instruction
2. CON/N0902:	Provide Support for Various Surveying Works
3. CON/N9001:	Work According to Personal Health, Safety and Environment Protocol in the Construction Site

This book is designed considering the lower educational background of the construction worker. Therefore, special efforts have been taken to explain the concepts required for the job with ample visual support and illustrations.

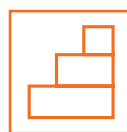
Units and symbols used in the book have been listed below:

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## Symbols Used



Key Learning  
Outcomes



Steps



Unit  
Objectives



Notes



Tips



Exercise



Practical

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## 1. Introduction

Unit 1.1 Introduction to the Training Programme

Unit 1.2 An Overview of the Construction Sector

Unit 1.3 Assistant Surveyor Job Role



## Key Learning Outcomes



**At the end of this module, you will be able to:**

1. list out the purpose of training
2. state National Occupation Standards and Qualification Pack
3. explain the benefits of the training
4. explain about the construction sector in India
5. describe urban and rural construction in India
6. outline modernization in construction
7. list out major occupations in the construction sector
8. list out the roles and responsibilities of an Assistant Surveyor
9. explain career progression for Assistant Surveyors.





## UNIT 1.1 Introduction to the Training Programme

### Unit Objectives

At the end of this unit, you will be able to:

1. identify the purpose of training
2. state National Occupation Standards and Qualification Pack
3. explain the benefits of the training.

### 1.1.1 Purpose of Training

The construction sector in India has seen tremendous growth in the last few decades. The training programme is developed to impart specific skills to individuals who wish to work as Assistant Surveyors. The training programme is based on the qualification pack for Assistant Surveyor. It is meant to help in the construction of new structures like roads, highways, canals, bridges, underground drainages for housing societies. Schools and colleges also requires property survey before construction. There are very few skilled workers for construction work in India. The purpose of Assistant Surveyor training is to skill more people in the field to work with the Surveyor in construction work/ projects. The quality of the construction is expected to improve on completion of the training.

### 1.1.2 Mode and Duration of the Training Programme

The training for the job role of Assistant Surveyor is provided through classroom and practical sessions. The total duration of the training programme as recommended in the qualification pack is 6-8 weeks.



Fig. 1.1.1 Classroom Session

**The training programme will enable an individual to:**

1. identify and handle tools and equipment used in surveying
2. define and list the importance of surveying
3. assist in linear measurement of distances
4. assist in setting out of work
5. work according to personal health and safe environment protocol in the site.
6. Assist in angular measurements and leveling

After successful completion of training and passing the assessment, the candidate will be issued a certificate. This will help in getting employment, and earn better wages than an untrained person.

**National skill qualification frame work - NSQF:**

Through the national policy on skill development 2009 India recognized the need for development of a national qualification framework. The national skill qualification framework NSQF came into being as per the Gazette Notification no 8/06/2013 dated 27th Dec. 2013. NSQF is a quality assurance framework.

It is an outcome based approach and each level in the NSQF is defined and described in terms of competency levels which needs to be achieved. The National Skill Qualification Framework is composed of 10 levels, each represents different level of competency. Level 1 represents the lowest competency and level 10 represents the highest competency level. Competence means the proven ability to use acquired knowledge, skills and personal and social abilities in discharge of responsibility of a job role. It is important to note that the NSQF levels are not directly related to years of study.

NSQF organizes qualifications according to a series of levels of knowledge, skills and aptitude. These levels are defined in terms of learning outcomes which the learner must possess regardless of whether they were acquired through formal, non-formal or informal learning.

Each level of NSQF described by a statement of learning outcomes in five domains known as level descriptors. These five domains are:

- |                           |                   |
|---------------------------|-------------------|
| 1. Process                | 4. Core skill     |
| 2. Professional knowledge | 5. Responsibility |
| 3. Professional skill     |                   |

The level mentioned below in the career progression chart corresponds to NSQF level 2.

The Assistant Surveyor is assigned level 2 based on the above five criterias.

### 1.1.3 Introduction to QP and NOS

The programme is based on Qualification Pack for Assistant Surveyor. Qualification Pack is also called QP and QP code for Assistant Surveyor is CON/Q0901.

A QP consists of a set of National Occupational Standards (NOS). It specifies the standards (NOS) which provides a detailed account of the functions to be performed in the work site.

<b>NOS code</b>	<b>Major function/Task</b>
1. CON/N0901:	Identify, Select, Use and Store Appropriate Tools and Instruments as per Instruction
2. CON/N0902:	Provide Support for Various Surveying Works
3. CON/N9001:	Work According to Personal Health, Safety and Environment Protocol in the Construction Site

### 1.1.4 Benefits of the Training Programme

1. After completion of the training programme, trainees will be assessed through theory and practical test.
2. On successful passing of the assessments, a certificate will be awarded by the Construction Skill Development Council of India (CSDCI).
3. The certificate will help the trainees to get a job with better wages in the construction sector.
4. The skills acquired along with the certificate will also help the trainees to have career progression and growth.

### Exercise

#### I. Answer the following questions.

1. What does QP consist of?

.....

2. What does NOS specify?

.....

3. Name any two NOS under Assistant Surveyor?

.....

4. Mention any two benefits of the training programme?

.....

#### II. State whether the following statements are True or False.

1. Training certificate will help you to get a job and earn better wages in the construction sector.

True

False

2. The skill acquired along with the training certificate will also help you to grow in your career.

True

False

3. The assessment after the training will have only practical examination.

True

False

4. "One should work according to personal health, safety and environment protocol in the construction site."

True

False

#### III. Write the full form of:

1. QP

.....

2. NOS

.....

3. CSDCI

.....

### Notes

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## UNIT 1.2 An Overview of the Construction Sector

### Unit Objectives

At the end of this unit, you will be able to:

1. identify aspects of the construction sector in India
2. identify urban and rural construction
3. define features of modernization in construction
4. list out major occupations in the construction sector.

### 1.2.1 Introduction

Construction refers to building of different types of structures. The sector comprises many small, medium and large industries or companies. The companies involve in different types of projects. They create a diverse, but specific requirement of workmen.

The construction sector can be broadly classified into two sub sectors: real estate and infrastructure construction, rural construction.

1. **Real estate and infrastructure construction:** This sub sector comprises all the works that are required for construction of all types of infrastructure and real estate projects. Infrastructure projects are those that directly or indirectly affect the growth of the nation. For example, roads, airports, railway bridges, dams, power plants, metros, industries, etc. Real estate projects are those which mainly focus on providing residential and commercial workplaces to all categories of people. For example, residential towers, independent houses, malls, sports complex, etc.
2. **Rural construction:** This sub sector focuses on the constructional requirements of rural areas. It includes construction of rural households, warehouses, village roads, etc.



Fig. 1.2.1 Multi-storeyed residential towers



Fig. 1.2.2 Flyovers



Fig. 1.2.3 Rural roads



Fig. 1.2.4 School in a rural area

### 1.2.2 Modernization in Construction

From the early ages to the present day, the construction sector has generated employment. It has also undergone extensive modernization, from raw material to the use of heavy equipment. The use of modern equipment and techniques has increased the speed of construction work. It has enhanced the quality of finished structures. Further, by modernization of construction, it is now possible to construct under water as well as in very high altitudes. Modernization has helped to build hi-tech buildings and atomic power generation plants.



Fig. 1.2.5 Old bridge



Fig. 1.2.6 Modern bridge



Fig. 1.2.7 Old construction equipment



Fig. 1.2.8 Modern construction equipment

### 1.2.3 Occupation and Job roles in Construction

Construction is the second largest employment generating sector in India after agriculture. There are many job roles in construction. Depending on the nature of work, some job roles cater to the employment needs of maximum number of workmen and are more prominent than others.

The following occupations are very common in most of the construction projects:

Surveying, Masonry, Barbending, Shuttering carpentry, Scaffolding, Painting.

**1. Surveying:** Surveying is the art of determining relative positions of objects on the surface of the earth. It is done by taking measurements in the horizontal and vertical planes. The measurements are drawn to a convenient size on paper. They are known as maps or plans.

In surveying, field work consists of taking measurement of details on earth. It involves recording the field notes and setting, preparing maps, plans and sections from the data collected. Volume designing of various structures is done with the collected data. Basic objectives of the job role includes:

- Working in a team before and during construction.
- Preparing the list of items required for the day's work as per the Surveyor's instructions
- Handling tools / equipment / materials related to surveying.
- Maintaining, storing and stacking tools / equipment / materials used for surveying.

**2. Masonry:** Masonry comprises of work in which bricks, stones, concrete blocks and concrete are used along with bonding mixture called mortar.

Masonry helps to construct components of buildings and other structures.

**Basic objectives of the job role include:**

Building structure by laying materials such as bricks, blocks, tiles and other construction materials and bonding them by mortar.

Constructing, altering, repairing and maintaining walls, sidewalks, street curbs, floors, sink counters, partitions, manholes and other related structures or surfaces.

Carrying out structural finishes like girt wash, cement wash, POP, plastering, stone cladding etc., on finished masonry surfaces. It helps to bring an aesthetic appeal to the finished structure.



Fig. 1.2.9 Placing concrete



Fig. 1.2.10 Brick work

### 3. Bar bending and fixing

The job of bar bending and fixing includes shifting, cutting, bending and placing the reinforcement bar. It helps to assemble cage / mesh according to the given drawing or specification.

**Few job roles under Bar bending and fixing occupation are as follows:**

1. helper bar bender and steel fixer, 2. assistant bar bender and steel fixer, 3. bar bender and steel fixer
4. reinforcement fitter, 5. foreman reinforcement.

**4. Shuttering carpentry**

A shuttering carpenter is a person who is specialized in creating shuttering, especially, using wood/timber, steel or fiber elements. They are temporary structures used for casting concrete.



Fig. 1.2.11 Reinforcement bars fixed at site



Fig. 1.2.12 Reinforcement bars during bending



Fig. 1.2.13 Conventionally formed work



Fig. 1.2.14 System formed work

**Few job roles under Shuttering carpentry are as follows:**

1. Helper Shuttering Carpenter,
2. Assistant Shuttering Carpenter,
3. Shuttering Carpenter – System
4. Shuttering Carpenter – Conventional.



Fig. 1.2.15 Scaffolding



Fig. 1.2.16 Painting work by a painter

**5. Scaffolding**

Scaffolding is a temporary support structure. The materials used are bamboo, timber or steel. This support structure helps the workmen during construction activities. Scaffolding is made for workmen to do their work safe and keep their tools and materials.

**Few job roles under Scaffolding are as follows:**

1. Assistant Scaffolder – System
2. Assistant Scaffolder – Conventional
3. Scaffolder – Conventional
4. Scaffolder – System.

**6. Construction painting:**

Painting is a key part of the overall finished work of a construction project. Application of paint adds aesthetic value to a constructed structure. This may also involve decorative painting of basic designs and patterns.

**Few job roles under Construction painting are as follows:**

5. Assistant Construction Painter and Decorator
6. Construction Painter and Decorator
7. Charge hand – Painting and Decorating.

**Exercise** 

**I. Answer the following questions.**

1. What are the sub sectors in construction?

-----

2. What does rural construction focus on?

-----

3. How has the construction sector been modernised?

-----

4. Mention 4 job roles that are common in construction projects.

-----

5. What are the main objectives of Masonry?

-----

6. What is surveying?

-----

**II State whether the following statements are True or False.**

1. Real estate projects focus on the construction of roads, airports, dams and power plants.

True                       False

2. Modern equipment has helped to construct under water and in high altitudes.

True                       False

3. Bar benders shift, cut, bend and place the reinforcement bar to create a mesh.

True                       False

4. Shuttering is done using wood/timber, steel or fiber to create temporary structures.

True                       False

5. Scaffolding is done using bricks and concrete.

True                       False

6. Repairing of concrete structure is done by Mason – Concrete.

True                       False

**Notes** 

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## UNIT 1.3 Assistant Surveyor Job Role

### Unit Objectives

At the end of this unit, you will be able to:

1. identify assistant surveyor responsibility
2. carrier programmes in surveyor occupation.

### 1.3.1 Assistant Surveyors responsibilities



Fig. 1.3.1 Theodolite Surveying

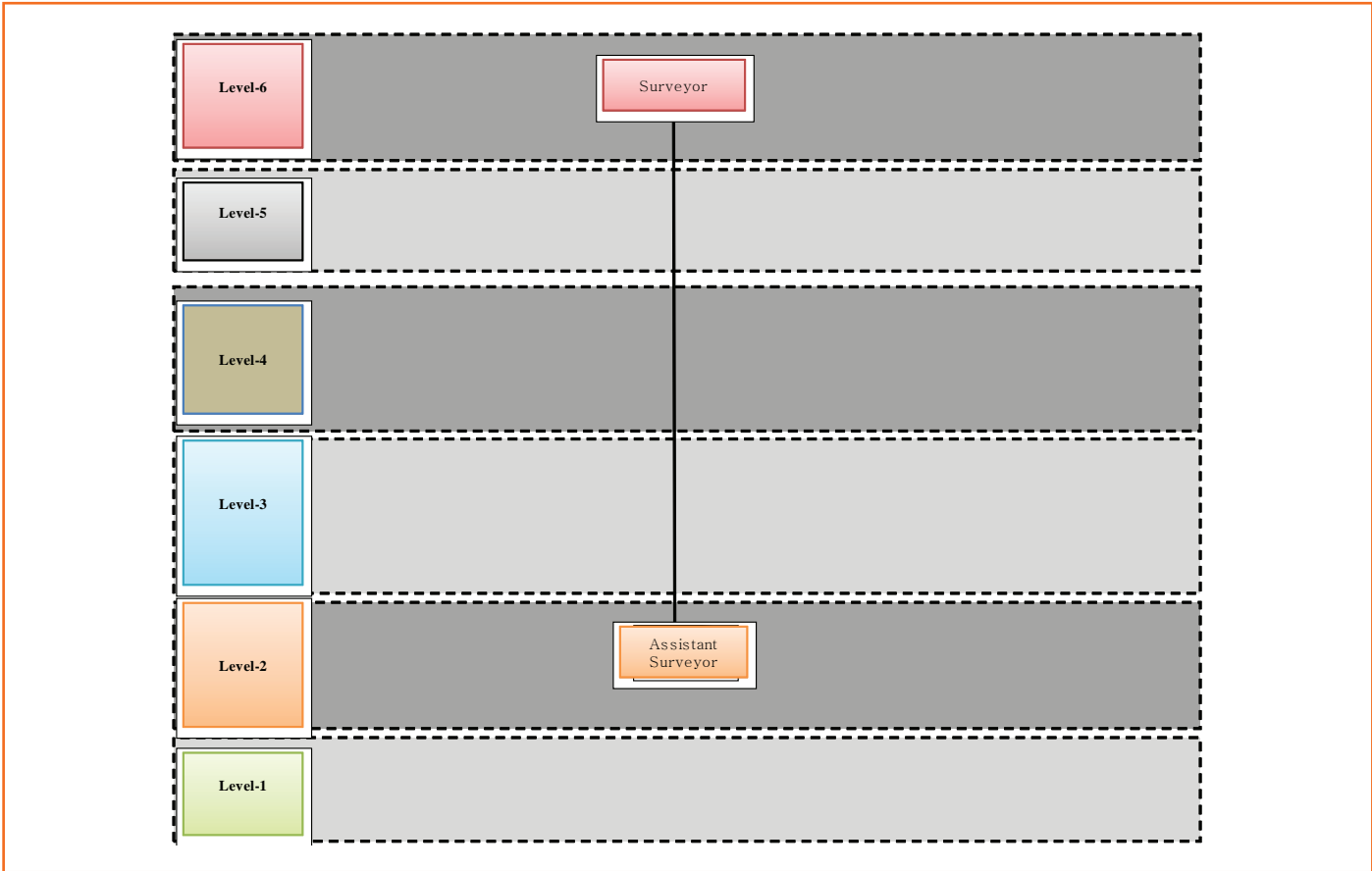


Fig. 1.3.2 Carrying Tripod

**Assistant Surveyor's responsibilities are as follows:**

1. assisting the Surveyor before and during the construction work.
2. assisting surveyor in angular measurement levelling and setting out.
3. setting the Tripod in the location as per the instruction of the Surveyor.
4. collecting the materials as instructed by the Surveyor.
5. handling survey tools / materials / equipment as per the Surveyor's instructions.
6. returning the materials to the main store on completion of the day's work.





### Exercise

**I. State whether the following statements are True or False.**

- 1. The Assistant Surveyor carries out field work individually.  
True                                       False
- 2. There is a huge requirement for skilled workforce in the surveyor sector.  
True                                       False
- 3. An Assistant Surveyor hands over the materials to the store after the day's work.  
True                                       False

### Notes

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Scan the QR Code to watch the related videos



Concept of Surveying\_Part 1



Concept of Surveying\_Part 2



Concept of Surveying\_Part 3





## 2. Identify, Select, Use and Store Appropriate Tools and Instruments as per Instructions

Unit : 2.1 Identify and Handle Survey Tools and Instruments



## Key Learning Outcomes



**At the end of this module, you will be able to:**

1. identify and handle survey chain and tape
2. identify and handle all types of levels and accessories
3. identify and handle all angular and distance measuring instruments
4. handle all tools / materials
5. store and stack all tools / instruments / materials.

