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MINISTRY OF SKILL DEVELOPMENT
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Facilitator Guide



Sector
Construction

Sub-Sector
Real Estate and Infrastructure
Construction

Occupation
Construction Electrical Works

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NSQF Level 2

Helper Electrician

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Shri Narendra Modi
Prime Minister of India

“ Skilling is building a better India.
If we have to move India towards
development then Skill Development
should be our mission. ”



Acknowledgement

We are thankful to all organizations and individuals who have helped us in the preparation of this Facilitator Guide. We also wish to extend our gratitude to all those who reviewed the content and provided valuable inputs for improving the quality, coherence, and content presentation of chapters. This Facilitator Guide will lead to successful roll out the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors etc. We are thankful to our Subject Matter Experts for the content and helping us in the preparation of this Facilitator Guide.

It is expected that this publication would meet the complete requirements of QP/NOS based training delivery. We welcome suggestions from users, industry experts, and other stakeholders for any improvement in the future.

About the Book

The objective of the guide is to provide an approach map for interacting with the trainees undergoing training on this job role. The aim of the course is to provide both theoretical and practical knowledge to the trainees, and also to guide them regarding the procedure of helping the construction electrician and performing preparatory works prior to temporary and permanent electrical installations. The guide is neither a substitute nor complete road map, but an aid to help to pass on the knowledge on all the aspects to the trainees in a systematic manner. It is expected that the trainer is fully conversant with all the contents of the guide. The guide is just to indicate how to proceed for covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension on the following aspects:

- **Knowledge and Understanding:** Satisfactory operational learning and comprehension to play out the required chore.
- **Performance Criteria:** Pick up the required aptitudes through hands-on preparation and play out the required operations inside the predetermined measures.
- **Professional Skills:** Capacity to settle on operational choices relating to the zone of work.

The job will also include judging comprehension and also help them learn more by hands-on training. But it has to be ensured that these are in accordance with the knowledge imparted and time spent on each unit. It is expected that irrespective of the region, knowledge on all aspects will be imparted to trainees.

Symbols Used



Ask



Activity



Do



Demonstrate



Elaborate



Exercise



Facilitation Notes



Field Visit



Learning Outcomes



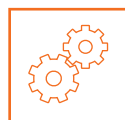
Notes



Objectives



Tips



Resources



Summarize




Say



Team Activity

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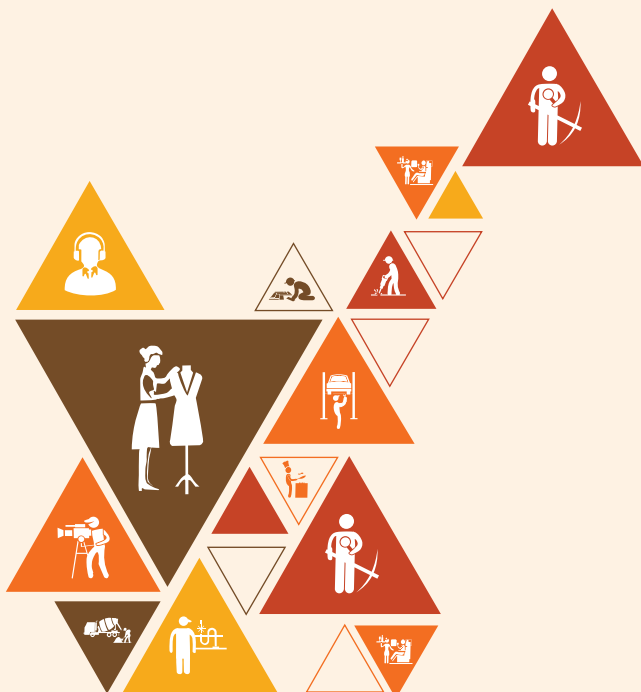


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1. Introduction to Helper Electrician Job Role

Unit 1.1 – Introduction to Construction Industry

Unit 1.2 – Role and Responsibilities of a Helper Electrician



Bridge Module

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Explain the role and responsibilities of a Helper Electrician
2. Discuss the career progression options for Helper Electrician

Unit 1.1. Introduction to Construction Industryt

Unit Objectives

By the end of this unit, participants will be able to:

1. Overview of construction industry.

Resources to be used

- Available objects such as training kit - trainer guide, presentations, whiteboard, marker, projector, laptop, video films, etc.
- PowerPoint slides, pictures/posters and videos depicting various information about the construction industry, types of construction, basic categories of construction projects, and market segments of the construction industry.

Say

- In this session, we shall learn key facts about the construction industry, types of construction, basic categories of construction projects, and market segments of the construction industry.
- Let's begin with an ice-breaking session, introduce yourself and ask participants to introduce themselves.

Activity

- **Purpose:** This activity aims to familiarise the participants in the group with one another.
- **Tentative Duration:** 15 Mins
- **Procedure:**
 1. Ask the participants to pronounce their name with an adjective beginning with the initial letter of their name.
 2. Request that they additionally provide a brief introduction of themselves.
- **Expected Outcome:** The outcome of this activity is that the participants will become familiar with each other.

Say

I hope everyone enjoyed our first activity and now let's move on to the topics that will be covered in this session.

Ask

- What do you know about the construction industry?
- Do you know how many types of construction are there?

Elaborate

With the help of audio-visual aids and the participant handbook, elaborate:

- Construction Industry
- Construction Industry in India
- Types of Construction
- Construction Project Categories
- Market Segments of the Construction Industry
- Occupation of Construction Electrical Works

Demonstrate

Show a PowerPoint presentation to the class on Construction Industry in India - <https://www.slideserve.com/frieda/construction-sector-in-india-powerpoint-ppt-presentation> and ask participants to note down the important points.

Say

Let us now perform an activity based on various market segments of the construction industry.

Activity

- **Purpose:** The objective of this activity is to introduce participants to the different market segments within the construction industry.
- **Resources Required:** Presentation materials (slides or handouts) explaining market segments in the construction industry, internet access or library resources for research, whiteboard or flip chart with markers, printed construction industry reports or data (optional but helpful), worksheets for students to complete during the activity.
- **Tentative Duration:** 60-90 minutes
- **Methods/Procedure:**
 1. **Step 1: Introduction-** Begin the activity by discussing the importance of understanding market segments in the construction industry. Explain that market segmentation helps professionals identify specialized opportunities and areas of expertise within the broader field of construction.

2. Step 2: Presentation- Deliver a presentation on the different market segments within the construction industry. Include information on residential construction, commercial construction, industrial construction, infrastructure development, and specializations like green building, renovation, and restoration. Use visual aids to make the information more engaging and accessible.
 3. Step 3: Group Research- Divide the students into small groups and assign each group a specific market segment to focus on. Provide the groups with access to the internet or library resources to conduct research on their assigned market segment. They should explore the scope, current trends, major players, challenges, and potential career opportunities within their segment.
 4. Step 4: Group Presentation- Each group presents their findings to the rest of the class. Encourage them to use visuals, statistics, and examples to support their presentation. Allow for a short Q&A session after each presentation to clarify doubts and exchange insights.
 5. Step 5: Reflection and Discussion- Lead a class discussion to debrief the activity. Encourage students to share their thoughts on which market segments they find most appealing and why. Discuss the skills and qualifications required for different market segments and how students can prepare to excel in their chosen area.
- **Expected Outcome:** By the end of this classroom activity, students are expected to:
 1. Understand the concept of market segmentation in the construction industry.
 2. Identify the various market segments within the construction field, including residential, commercial, industrial, infrastructure, and specialized sectors.
 3. Analyse the characteristics, opportunities, and challenges associated with each market segment.
 4. Gain insights into potential career paths and specialization options within the construction industry.
 5. Reflect on their interests and skills to make informed decisions about their vocational course and future career goals in construction.

Say

Did you think the activity improved your understanding? I'm hoping now you have a better idea of the various market segment of the construction industry.

Summarize

- Note down the important points related to the construction industry, types of construction, and various market segments.
- Revise these points with the participants.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Unit 1.2 Role and Responsibilities of a Helper Electrician

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain the roles and responsibilities of the job role of Helper Electrician.
2. Define the personal attributes required in the occupation of Construction electrician works.
3. Explain the possible future progression and career development options of a helper electrician.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about the roles and responsibilities of a Helper Electrician.

Say

- In the previous session, we discussed India's construction sector, types of construction and segments of construction industry. In this session, we shall learn about the roles and responsibilities of a Helper Electrician.

Ask

- Does anyone know what a Helper Electrician do?

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Demonstrate

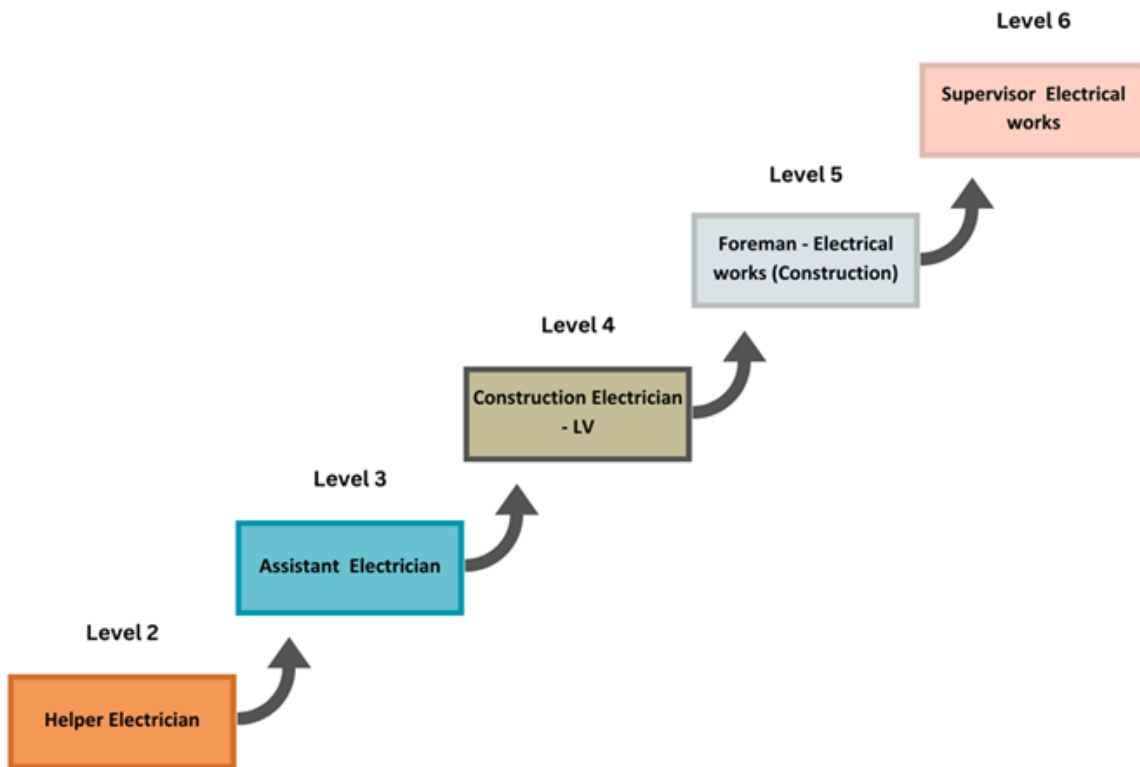


Fig. 1.2.1 Career Progression of a Helper Electrician

Present the above image to the participants using a projector and explain the career path of a Helper Electrician and ask the participants the following questions:

- Test that everyone knows about the skills and key competencies required to become a Helper Electrician.
- Write down the participants' answers on whiteboard/flipchart. Take appropriate clues from the answers and start teaching the lesson.

Activity

- In this activity, you invite an experienced Helper Electrician to give an overview of the roles, responsibilities, skill sets, and personal attributes required for the job role.
- You will conduct a group discussion session.
- If the students have any queries or they have any confusion regarding this chapter, they will raise their hands
- On availing permission, the students can ask questions.
- In addition to this, the expert will also share important pointers on areas like:
 1. Routine activities of a Helper Electrician.
 2. Companies offering jobs for this role.

- After the doubts are cleared, the expert or you may add a few points in relation to meeting the requirements.
- In addition to those, you can also include a few extra points that you may find reliable to the topic and beneficial for the students

Say

Did you find this activity interesting? Can you see how much information you had previously and how much information you have now? Let us summarise the points discussed.

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add to what they talk about.
- Ensure that all students participate in the class.

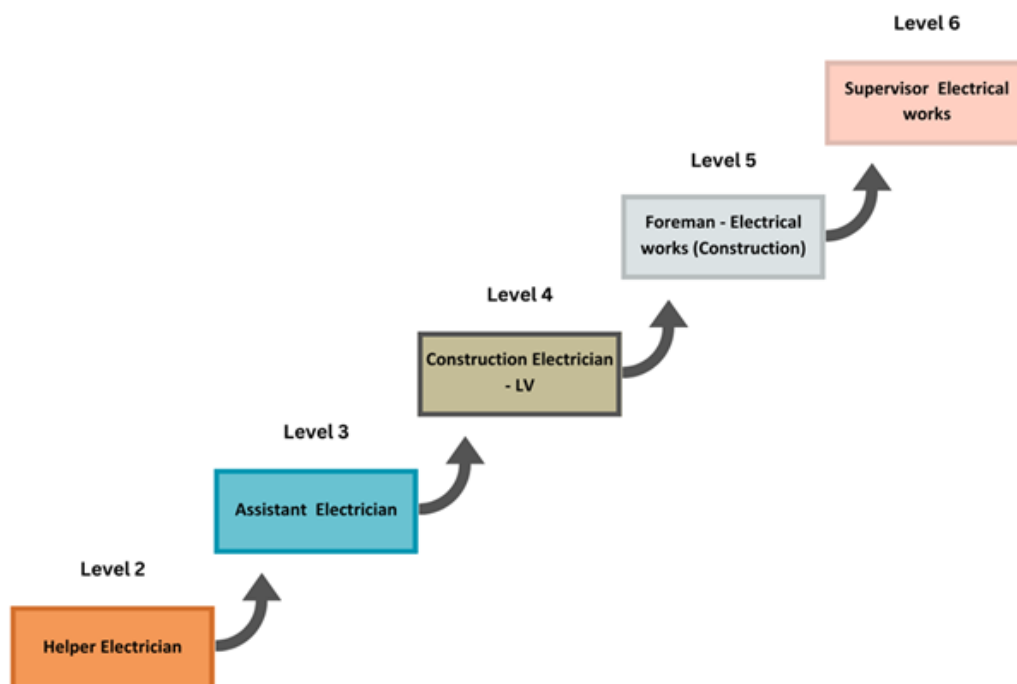
Ask

- What are the primary responsibilities of a Helper Electrician?

Exercise

Key Solutions to PHB Exercises

1.



2.

The roles and responsibilities of a helper electrician are:

- Electrical Installations Completion
- Observe and Help Electrical Worker
- Observe Safety Procedure
- Maintain Equipment and Inventory
- Prepare and Disinfect the Worksite

3.

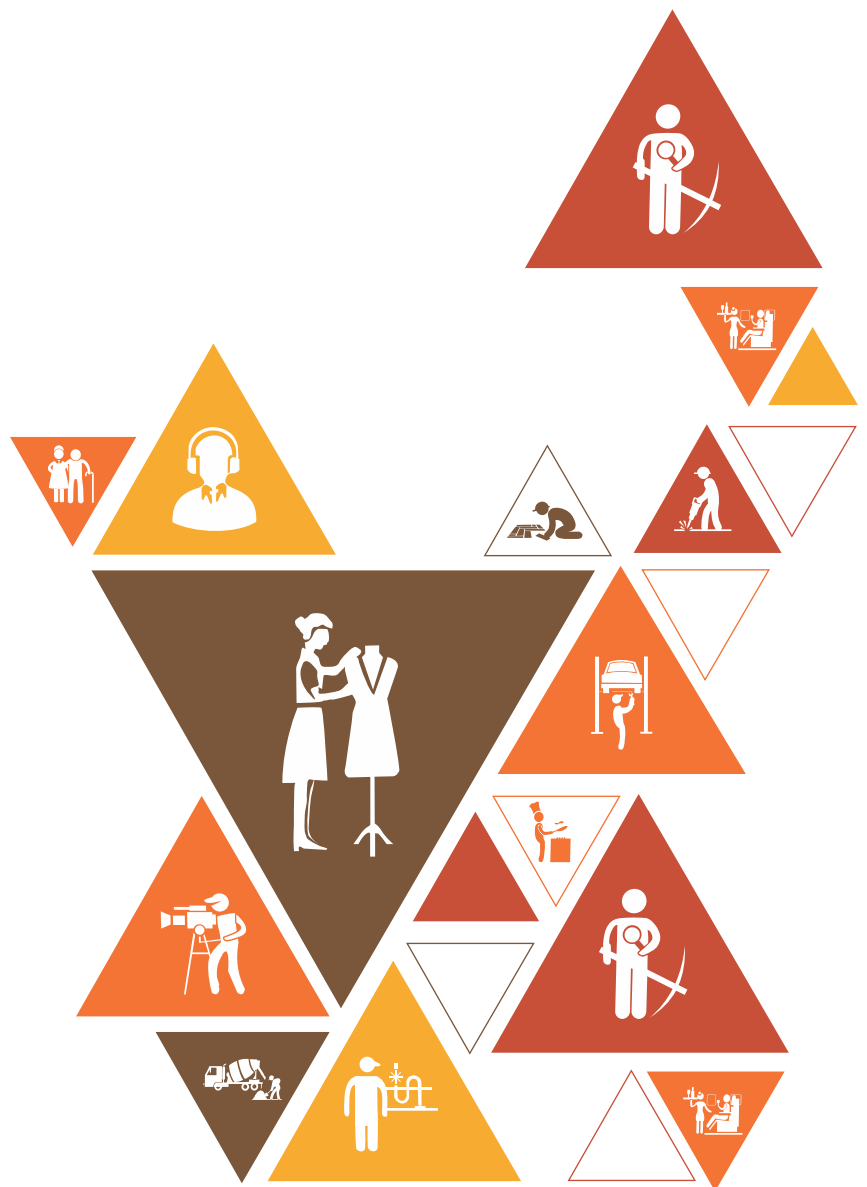
The following competencies and qualifications are typical of a helper electrician:

- Color Vision and Depth Perception
- Fine Motor Skills
- Clean Driving Record
- Physical Fitness
- Listening Skills

4.

Types of Construction:

- i. Building construction
- ii. Industrial Construction
- iii. Infrastructure Construction





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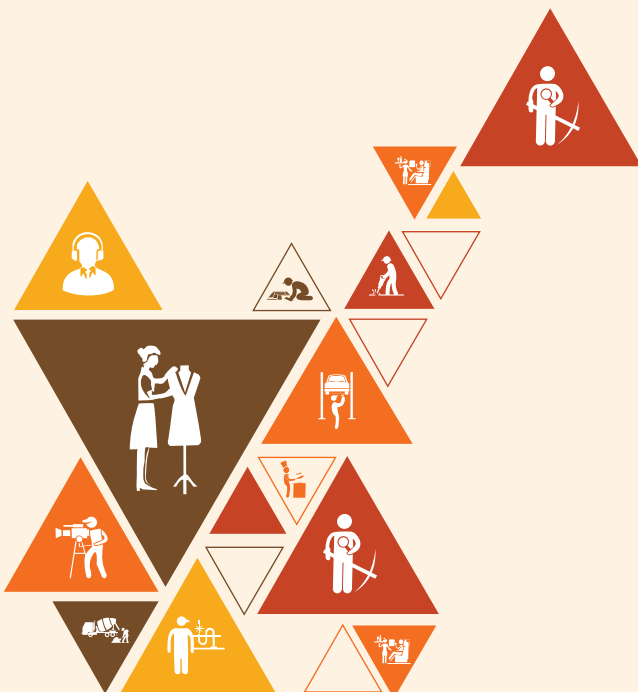


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2. LV (Low Voltage) Electrical Works Tools, Devices and Materials Handling

Unit 2.1 Understanding Electric Current

Unit 2.2 LV Electrical Works



(CON/N0606)

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Handle different tools, measuring devices and materials used for LV electrical work.
2. Shift and stack various materials and tools used for electrical work.

Unit 2.1 Understanding Electric Current

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain basic concept of electrical current flow and factors which influence electrical flow through conductor.
2. List the types of circuit breakers, starters, relays including their areas of use.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about the tools and equipment used in construction electrical works.

Say

In this session, we will learn about electrical current flow and factors which influence electrical flow and the types of circuit breakers, starters, relays including their areas of use.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Say

Now, we will discuss these topics in detail.

Elaborate

- Electric Current
- Electric Circuit and its types
- Electrical material and fixtures

Activity

- **Topic:** Exploring Electric Circuit Types
- **Purpose:** The purpose of this practical activity is to provide participants with hands-on experience in constructing and understanding different types of electric circuits. Participants will explore series circuits, parallel circuits, and combination circuits, gaining insights into their characteristics and behavior.
- **Resources:**
 - Batteries or power supply (preferably low voltage).
 - Light bulbs or LEDs.
 - Resistors (optional, for advanced participants).
 - Connecting wires.
 - Breadboards (optional, for ease of circuit building).
 - Multimeter (optional, for circuit measurements).
- **Tentative Duration:** 60-90 minutes
- **Procedure:**
 - Introduction:
 - Begin with an introduction to the topic of electric circuits and their types: series, parallel, and combination circuits.
 - Explain the significance of understanding these circuit types in various electrical applications.
 - Setting Up Workstations:
 - Arrange workstations with the required resources for each participant or group.
 - Provide participants with batteries or power supplies, light bulbs or LEDs, resistors (optional), and connecting wires.
 - Series Circuit Construction:
 - Instruct participants to build a simple series circuit using a battery, light bulb, and connecting wires.
 - Guide them on connecting the components in a series, end to end, so that the current passes through each component.
 - Parallel Circuit Construction:
 - Instruct participants to build a parallel circuit using a battery, two light bulbs, and connecting wires.

- Guide them on connecting the components in parallel, with each component having its own path for the current.
- Combination Circuit Construction:
 - For advanced participants, challenge them to build a combination circuit that includes both series and parallel components.
 - Provide resistors to add complexity to the circuit.
- Observations and Measurements:
 - Ask participants to observe the brightness of the light bulbs in series and parallel circuits.
 - Encourage them to make measurements, such as voltage drops and current readings (if using a multimeter).
- Discussion and Comparisons:
 - Gather participants for a group discussion.
 - Compare and contrast the characteristics of series and parallel circuits, including voltage, current, and brightness of components.
 - Discuss the behavior of combination circuits with both series and parallel elements.
- Real-World Applications: Discuss real-world applications where series and parallel circuits are commonly used, such as household wiring and electronics.
- Conclusion:
 - Summarize the activity by emphasizing the importance of understanding electric circuit types for practical applications.
 - Reinforce the participants' knowledge and encourage them to explore more complex circuits in their future electrical projects.
- **Expected Outcome:** By the end of this practical activity, participants should have gained hands-on experience in constructing and understanding different types of electric circuits, including series, parallel, and combination circuits. They will recognize the characteristics and behavior of each circuit type and appreciate their significance in various electrical applications. Additionally, participants will have improved their circuit-building skills and be better prepared to work with electrical systems in real-world scenarios

Say

Did you find this activity interesting? Are you aware of the basic concepts and components of an electric circuit?

Ask

- What are the key differences between a series circuit and a parallel circuit in terms of how the components are connected and the behavior of current flow?

- How does the brightness of the light bulbs in a series circuit compare to the brightness of the light bulbs in a parallel circuit? Why does this difference occur?
- During the activity, did you encounter any challenges or unexpected observations? How did you address or explain them?
- What safety precautions should be taken when working with electric circuits, especially when dealing with batteries and other electrical components?

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Unit 2.2 LV Electrical Works

Unit Objectives

By the end of this unit, participants will be able to:

1. List the different materials, fixtures, tools and equipment relevant to LV electrical work.
2. Explain the use of common electrical measuring devices required to undertake LV electrical tests/ inspections.
3. List the common construction equipment used in other construction activities such as bar bending, concreting etc.
4. Explain physical and chemical properties of good conductor, semi-conductor and bad conductor materials.
5. Explain standard practice of material handling and storing at workplace.
6. Demonstrate the use of different hand and power tools relevant to LV electrical works.
7. Demonstrate the use of measuring and marking tools relevant to LV electrical installation work.
8. Demonstrate standard procedure of shifting lights, cables, conduits, cable trays, brackets, DBs, ladders and other relevant materials.
9. Demonstrate storing and stacking of electrical materials as per standard practices.
10. Demonstrate standards practice of tagging materials, tools and tackles

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about LV Electrical works.

Say

In this session, we will learn about LV Wiring, electrical measuring devices and material handling and storing at workplace.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.

- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask

- Can anyone explain what LV (Low Voltage) wiring is and its significance in electrical systems?
- Who can name some commonly used electrical measuring devices?

Elaborate

In this unit, we will discuss the following topics:

- LV Wiring
- Electrical measuring devices
- Hand and Power Tools
- Material handling and storing at workplace
- Equipment Tagging

Activity

- **Topic:** Understanding Low Voltage (LV) Wiring Diagrams
- **Purpose:** The purpose of this classroom activity is to introduce students to Low Voltage (LV) wiring diagrams commonly used in electrical systems. Participants will learn how to interpret and create LV wiring diagrams, fostering their understanding of electrical circuits and connections.
- **Resources:**
 - Whiteboard or flip chart with markers.
 - LV wiring diagram examples (pre-prepared or accessible online).
 - Handouts with basic electrical symbols.
- **Tentative Duration: 60-90 minutes**
- **Procedure:**
 - Introduction:
 - Begin with an introduction to the topic of Low Voltage (LV) wiring diagrams and their significance in electrical systems.
 - Explain that LV wiring diagrams are schematic representations of electrical circuits at low voltage levels, typically used in residential and small commercial applications.
 - Electrical Symbols Overview:

- Provide participants with handouts that display common electrical symbols used in LV wiring diagrams.
- Go through each symbol, explaining its meaning and how it represents different electrical components (e.g., switches, lights, outlets).
- Interpretation of LV Wiring Diagrams:
 - Show participants an example of an LV wiring diagram on the whiteboard or flip chart.
 - Walk through the diagram step-by-step, explaining how to interpret the symbols and identify connections between various components.
- Group Activity - Analyzing Wiring Diagrams:
 - Divide participants into smaller groups and provide each group with a different LV wiring diagram to analyze.
 - Instruct them to discuss and interpret the diagram, identifying the components, connections, and the overall circuit configuration.
- Group Presentations:
 - Have each group present their findings and interpretations of the LV wiring diagram they analyzed.
 - Encourage other groups to ask questions and provide feedback.
- Practical Exercise - Creating LV Wiring Diagrams:
 - Challenge the participants to work in pairs or individually to create simple LV wiring diagrams for specific scenarios.
 - Provide them with scenarios such as a basic residential lighting circuit or a simple circuit with switches, outlets, and lights.
- Peer Review and Feedback:
 - Have participants exchange their wiring diagrams and review each other's work.
 - Encourage constructive feedback and corrections, as needed, to enhance their diagram creation skills.
- Real-World Applications: Discuss real-world applications where LV wiring diagrams are used, such as in electrical installations for homes, offices, or small businesses.
- Conclusion:
 - Summarize the activity by emphasizing the importance of understanding and creating LV wiring diagrams in electrical systems.
 - Reinforce the participants' comprehension of electrical symbols and their ability to interpret and draw LV wiring diagrams.
- **Expected Outcome:** By the end of this classroom activity, participants should have gained a foundational understanding of Low Voltage (LV) wiring diagrams. They will be familiar with common electrical symbols used in these diagrams and be able to interpret and create simple LV wiring diagrams for electrical circuits. Additionally, participants will appreciate the practical applications of LV wiring diagrams in electrical installations and systems.

Say 

Did you find this activity interesting? Do you have understanding of Low Voltage (LV) wiring diagrams?

Ask 

- What are Low Voltage (LV) wiring diagrams, and why are they important in electrical systems?
- Explain the purpose of using electrical symbols in LV wiring diagrams and how they help represent different components in a circuit.
- During the group activity, what were the key components and connections you identified in the LV wiring diagram you analyzed?
- In your own words, describe the process of interpreting an LV wiring diagram and understanding its circuit configuration.

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Say 

Now, we will perform another activity.

Activity 

- **Topic:** Exploring Electrical Measuring Devices for LV Electrical Tests/Inspections
- **Purpose:** The purpose of this practical activity is to familiarize participants with various electrical measuring devices used to undertake LV (Low Voltage) electrical tests and inspections. Participants will gain hands-on experience in using these devices and understand their significance in ensuring electrical safety and compliance.
- **Resources:**
 - Different types of electrical measuring devices, including but not limited to:
 - i. Digital multimeter (DMM)
 - ii. Clamp meter
 - iii. Voltage tester (non-contact or contact)
 - iv. Insulation resistance tester (Megger)

- v. Earth ground resistance tester
- vi. Phase rotation tester
- Electrical panels or simulated LV electrical systems (for testing purposes).
- Safety equipment (personal protective equipment - PPE).
- Relevant LV electrical standards and guidelines.
- **Tentative Duration:** 90-120 minutes
- **Procedure:**
 - Introduction:
 - Begin with an introduction to the topic of electrical measuring devices used for LV electrical tests and inspections.
 - Explain the importance of these devices in ensuring electrical safety and compliance with regulations.
 - Overview of Electrical Measuring Devices:
 - Introduce the various types of electrical measuring devices that will be demonstrated and used during the activity.
 - Provide a brief explanation of the purpose and functionality of each device.
 - Demonstration of Measuring Devices:
 - Conduct demonstrations of each electrical measuring device, showcasing their features and how to use them correctly.
 - Show how to make voltage, current, resistance, and ground measurements with the devices.
 - Hands-On Practice:
 - Divide participants into smaller groups.
 - Provide each group with electrical panels or simulated LV electrical systems for testing and inspection purposes.
 - Rotational Stations:
 - Set up rotational stations with different electrical measuring devices at each station.
 - Rotate groups through the stations, allowing them to practice using each device under the guidance of facilitators.
 - LV Electrical Tests and Inspections:
 - Instruct participants to perform specific LV electrical tests and inspections using the measuring devices.
 - Examples of tests could include voltage measurement, insulation resistance test, earth ground resistance test, etc.
 - Safety Considerations: Emphasize the importance of following safety protocols and wearing appropriate PPE when using electrical measuring devices.
 - Data Recording and Analysis:
 - Ask participants to record their test results and findings during the inspections.
 - Analyze the data collectively to identify any discrepancies or potential issues in the LV electrical systems.

- Conclusion:
 - Summarize the practical activity by highlighting the significance of electrical measuring devices in LV electrical tests and inspections.
 - Reinforce the participants' understanding of the devices' roles in ensuring electrical safety and compliance.
- **Expected Outcome:** By the end of this practical activity, participants should have gained hands-on experience in using various electrical measuring devices for LV electrical tests and inspections. They will be familiar with the functionality and application of devices like digital multimeters, clamp meters, insulation resistance testers, etc. Additionally, participants will appreciate the importance of electrical measurements in maintaining electrical safety and ensuring compliance with standards and guidelines.

Say

Did you find this activity interesting? Do you have a better understanding of electrical measuring devices required to undertake LV electrical tests/ inspections?

Ask

- How do the measurements obtained using the electrical measuring devices contribute to ensuring electrical safety and compliance with regulations?
- Explain the significance of using the appropriate electrical measuring device for specific LV electrical tests and inspections. How does using the right device enhance accuracy and reliability?
- Discuss the different types of electrical measurements you performed (e.g., voltage, current, resistance, ground resistance). What are the applications of each measurement type in electrical testing and inspections?

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Exercise

1.
 - a. Electric Current: Electric current is the constant flow of charged particles in a circuit. The direction of the passage of electric current is from higher to lower electric potential.
 - b. LV Wiring: Low voltage cables (LV cables) are used for electrical equipment with a voltage rating between 50 and 1000V for alternating current and between 75 and 1500V for direct current; as a result, they are not subject to excessive electric stress. They are often composed of uncoated or tinned copper, and solid or stranded aluminium, and the wire can be round, compressed, or shaped.

- c. Series Circuit: A series circuit contains only one path for the flow of electricity between two points. The amount of electricity in the circuit is uniform across all circuit components. When electricity flows across a series circuit, the flow rate (speed) is constant. In a series circuit, the overall resistance equals the sum of the individual resistances. The greater the number of resistors in a series circuit, the more challenging it is for electrons to flow.
- d. Circuit Breaker: A circuit breaker is a switch that can be activated automatically or manually for the purpose of safeguarding and managing an electrical power supply. In the modern power system, the design of the circuit breaker has altered in response to the large working currents and to prevent arcing.

2.

Basic hand tools required in construction are:

- a. Wrenches/ Spanner
- b. Chisel
- c. Pliers
- d. Wire Cutters
- e. Wire Strippers
- f. Screwdrivers
- g. Knife
- h. Hammer
- i. Hacksaw
- j. Tape Measure
- k. Nail

3.

- a. Pistol-Grip Drill
- b. Hammer Drill
- c. Circular Saw
- d. Reciprocating Saw
- e. Wall Chaser

4.

Employees should seek assistance when a weight is so large that it cannot be properly grasped or lifted, when they cannot see around or above it, or when they cannot securely handle the burden.

Handles or holders should be fitted to loads to avoid the possibility of fingers being pinched or damaged. Workers should also wear suitable protection equipment. Wear gloves or other hand and forearm protection when handling loads with sharp or rough edges. Additionally, utilise eye protection to avoid eye damage. When moving big or bulky goods, the mover should also wear steel-toed safety shoes or boots to prevent foot injuries if he or she falls or loses a load.

All stacked loads must be correctly piled and, where possible, cross-tiered. When stacking and storing materials, precautions should also be observed. Materials in storage must not pose a hazard. Storage facilities must be kept clear of collected objects that could cause tripping, fires, or explosions, or that could harbour rats and other pests.

5.

Electrical measuring instruments consist of all equipment used to measure the magnitude of an electric current for various purposes. Typical values measured with this apparatus are current, voltage, resistance, and power. Each is stated in a unique unit: amps, volts, ohms, and watts, in that order. Example: Galvanometer, Voltmeter, Ammeter, etc.





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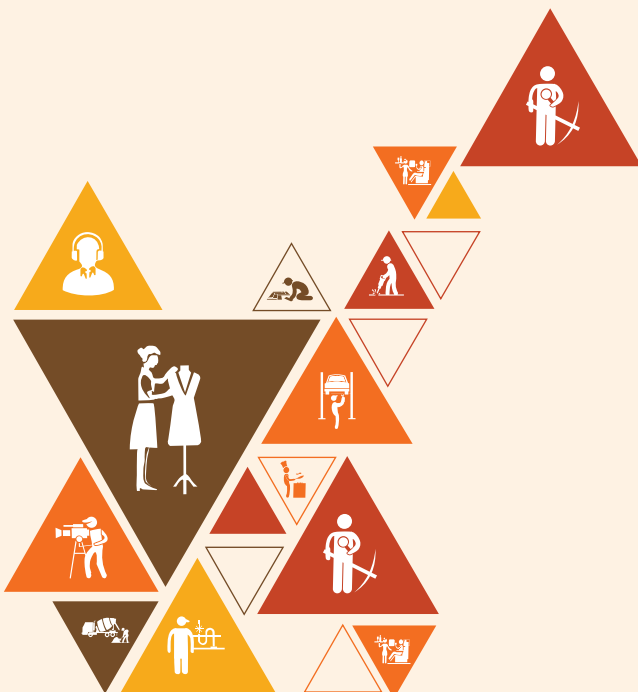
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3. Wall Chasing and External Threading on MS (mild steel) Conduit

Unit 3.1 Electrification of Buildings



(CON/N0607)

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Perform wall chasing work in concealed wiring work.
2. Perform laying of conduits in concealed wiring work.
3. Perform external threading on MS conduit.

Unit 3.1 Electrification of Buildings

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain electrical wiring methods adopted in electrification of buildings.
2. Identify electrical fixtures used in electrical wiring works.
3. Explain concealed electrical wiring and its use.
4. Discuss the use of power tools and hand tools required for wall chasing and threading of conduits.
5. Explain common accessories used for fixing of conduits
6. Explain specification of conduits and their uses.
7. Explain standard procedure of handling and storing of electrical materials required for wiring work.
8. Demonstrate marking and measurement on the wall prior to chasing.
9. Demonstrate how to chase the wall of given depth using appropriate tools.
10. Perform fixing of conduit in the chased wall using appropriate accessories.
11. Perform cutting and edge preparation of MS conduits.
12. Demonstrate threading of MS conduits using die and tap.
13. Demonstrate maintenance/ upkeep of electrical fixtures, tools and equipment.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about electrification wiring drawings and wall chasing tools and methods.

Say

In this session, we will learn about electrification of buildings, electrical wiring, wall chasing, conduits, etc.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask



- What does electrification of buildings mean?
- Name some common electrical appliances used in buildings.
- Why is it important to plan electrical systems in buildings carefully?

Elaborate



- Electrification of Buildings
- Electrical Wiring and its types
- Electrical Fixtures
- Power tools and hand tools
- Electrical Conduits
- Wall Chasing
- Safety Guidelines

Activity



- **Purpose:** The purpose of this field visit activity is to provide participants with a practical learning experience in the electrification of a building, with a focus on wall chasing, fixing conduits, and wiring installation. Participants will gain insights into the process of electrical installation in buildings and understand the importance of proper techniques and safety measures.
- **Location:** A construction site or building under electrical installation.
- **Tentative Duration:** Half-day or full-day, depending on the scope of the electrical work and complexity of the building.
- **Resources:**
 - Safety equipment (personal protective equipment - PPE) for all participants.
 - Hand tools and power tools used for wall chasing and conduit fixing (hammer drills, chasers, saws, etc.).
 - Conduits (PVC or metal), wiring, and electrical boxes.
 - Building plans or drawings of the electrical layout.
 - Safety signage and barriers to secure the work area.
- **Procedure:**
 - Introduction and Safety Briefing:
 - Begin with an introduction to the field visit and its objectives: to observe and learn about the electrification process, specifically wall chasing, conduit fixing, and wiring installation.

- Conduct a comprehensive safety briefing, emphasizing the importance of adhering to safety protocols and wearing appropriate PPE during the visit.
- Overview of Electrification Process:
 - Provide an overview of the electrical installation process in buildings, highlighting the specific tasks of wall chasing, conduit fixing, and wiring.
 - Demonstration by Experts:
 - Have experienced electricians or electrical contractors demonstrate the techniques of wall chasing and conduit fixing.
 - Explain the tools used and demonstrate safe practices for drilling and fixing conduits.
- Hands-On Practice:
 - Divide participants into smaller groups and assign each group a specific area of the building for wall chasing and conduit fixing.
 - Provide the necessary tools and materials for the participants to carry out the tasks under the guidance of experts.
- Wall Chasing and Conduit Fixing:
 - Participants will use chasers and drills to create channels (chases) in the walls for conduit placement.
 - They will fix conduits in the chases using appropriate methods and secure them firmly.
- Wiring Installation:
 - Participants will learn how to thread electrical wiring through the conduits and connect them to electrical boxes.
 - They will gain insights into proper cable management and labeling practices.
- Quality Checks and Safety Measures:
 - Participants will perform quality checks to ensure that conduits are level and properly secured.
 - They will also verify that the wiring connections are accurate and in compliance with electrical codes.
- Group Discussions:
 - Gather all participants for group discussions to share their experiences and observations during the hands-on practice.
 - Facilitate discussions on challenges faced and best practices learned.
- Q&A Session: Conduct a Q&A session where participants can ask questions and seek clarification from the experts.
- Conclusion:
 - Summarize the field visit activity by emphasizing the importance of proper wall chasing, conduit fixing, and wiring installation in electrical electrification.
 - Reinforce the significance of following safety measures and adhering to electrical codes during building electrification.

- **Expected Outcome:** By the end of this field visit activity, participants should have gained practical experience in wall chasing, fixing conduits, and wiring installation during the electrification of a building. They will understand the importance of proper techniques and safety measures in electrical installation and be better prepared to undertake similar tasks in their future electrical projects. Additionally, participants will have a clearer understanding of the electrification process and the complexities involved in ensuring a safe and efficient electrical system within a building

Say

Did you find this activity interesting? Let's have a Question-Answer Session.

Ask

- Reflecting on the field visit, what are some best practices you observed or learned regarding wall chasing, conduit fixing, and wiring installation?
- How do the techniques and skills you gained from this field visit activity apply to real-world electrical projects, such as residential or commercial building electrification?
- Describe the collaboration and teamwork that took place during the hands-on practice. How did effective teamwork contribute to the successful completion of the tasks?
- In your opinion, what are the key factors to consider when planning and executing wall chasing and conduit fixing in an electrical installation project?
- How do wall chasing, conduit fixing, and wiring installation impact the overall aesthetics and functionality of the electrical system in a building?

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Exercise

1.

- The benefits of electrification of buildings are:
- Reduced bills
- Decreased expenditures for upkeep.
- Less noisy operations.
- Enhanced capacity to regulate temperature.
- Improved operational accuracy.

2.

Workers must adhere to eight safety guidelines on the work site.

- Personal Safety
- Testing equipment
- Cord protectors
- Voltage regulators and breaker switches
- Precautions
- Equipment use
- Identifying problems
- Risk assessments

3.

The electrical wiring techniques that are frequently employed in home, business, industrial, and theatre contexts are as follows:

- Cleat wiring
- Casing and capping wiring
- Batten wiring (CTS or TRS)
- Conduit wiring (Surface or Concealed)
- Lead sheathed wiring

4.

Electric wall chase refers to the technique of cutting and chiselling channels in a wall so that electricians can run their cables through them. After the cables are installed and the job is complete, the chases can be refilled and decorated to conceal the cables within the wall.

The two primary ways used by electricians to protect buried wires in walls are conduit systems and situating the cables in safe zones as stipulated by wiring rules. There are many conduit systems that give varying levels of protection. The term conduit refers to the hollow tubing used by electricians to route cables.

5.

Chases in the wall should not be randomly cut. Simple steps are:

- The vertical chases should not be deeper than 1/3rd of the total wall thickness.
- The horizontal chases should not be deeper than 1/6th of the total wall thickness.

- The chases (either horizontal or vertical) should not be made back to back.
- Chases should be either horizontal or vertical. Diagonal chases should not be used.
- The stability of the wall will be affected if the chases are too deep.
- If the chases are found back to back, then the thickness of the wall is reduced to a greater extent and this will also affect the stability of the wall.
- A cutting tool is required for cutting the chase.
- It usually consists of two parallel blades.
- Depending on the thickness of the wall, the depth of the cut should be determined.
- Based on the depth of cut the position of the blades can be adjusted.
- Once the chase lines are cut, the middle part is removed by using a hammer and a bolster.
- Removing the middle part is easier only if the depth of cut is less.
- Once the chase is cut, the necessary wiring or piping connections are made.
- After the work is done it is again sealed by using a mixture of cement and sand in most cases.





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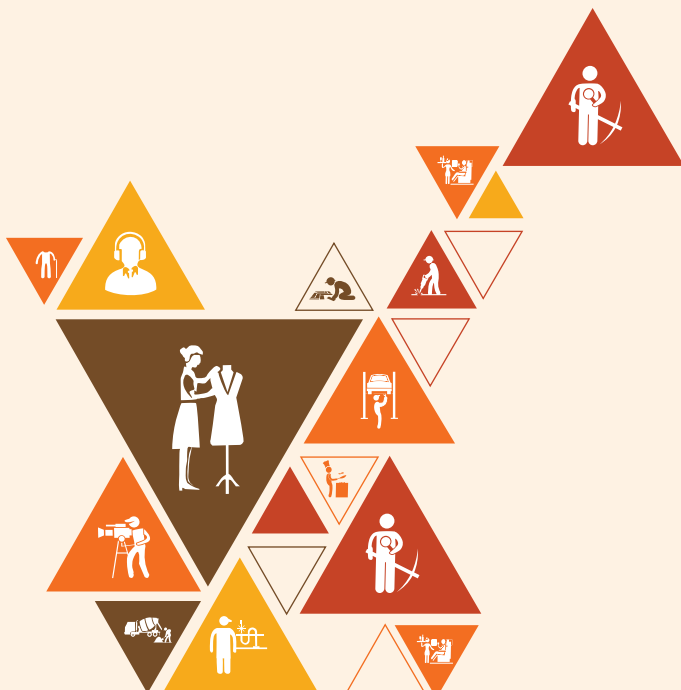
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4. Erect and Dismantle Scaffold

Unit 4.1 Erect and Dismantle Scaffold



(CON/N0101)

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Identify different components of scaffold.
2. List tools, materials components required for erection of 3.6 meter scaffold.
3. Erect and dismantle scaffold up to 3.6 metres height.
4. Stack all the components of the scaffold after dismantling.

Unit 4.1 Erect and Dismantle Scaffold

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain scaffolding and its purpose.
2. List the common materials and tools used for erection of scaffolding (pipe, cup lock (vertical and ledgers), H- frames, bamboo and ballis.
3. Discuss the functions of different hand tools like hammer, spanner, pulleys, hooks, ropes, etc., used for erection/ dismantling of scaffolds
4. Describe the visual checks to be carried out on the scaffolding components to ascertain their usability
5. Explain the functions of materials, components and accessories used in scaffolding
6. Explain the methods adopted during the erection of the scaffold to ensure its safety.
7. Explain various checks to be done on completion of erection of scaffolds, such as verticality check, stability check and so on
8. Explain the sequence and standard procedure to dismantle the scaffold and stack their components
9. Select different components used in scaffolding such as base, toe board, guard rails, platform, walkways, and ladder
10. Demonstrate preparation of scaffolding base for a scaffold up to 3.6 m height.
11. Demonstrate erection of a scaffold (up to 3.6 m height) using pipes and couplers/ cup lock system/ H frame
12. Demonstrate the process of conducting verticality check, stability check and rigidity check
13. Demonstrate the dismantling and stacking of scaffolding components.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters depicting erection and dismantling of scaffolding.

Say

In this session, we shall learn about scaffolding and its purpose, common materials and tools used for erection and dismantling of scaffolding, visual checks to be carried out on the scaffolding, erection of a scaffold (up to 3.6 m height) using pipes and couplers, etc.

Ask

- Does anyone know what is scaffolding?
- What do you know about erection and dismantling of scaffolding?

Elaborate

In this unit, we will discuss the following topics:

- Scaffolding
- Uses of Scaffold
- Scaffolding Components
- Scaffolding Materials
- Scaffolding Erection and Dismantle
- Hand Tools used in Erection/Dismantle
- Safety Checks
- Safety Check before Dismantling
- Dismantling the Scaffold

Demonstrate

Use a projector and show the following YouTube video- <https://youtu.be/VQ1e0VZmTmM> to participants on how to erect a scaffold.

Activity

- **Purpose:** The purpose of this practical activity is to demonstrate and familiarize participants with the proper procedures for erecting and dismantling a scaffold safely and efficiently.
- **Resources Required:**
 - A small-scale scaffold structure or scaffold components for demonstration.
 - Safety equipment (e.g., helmets, safety harnesses, gloves).
 - Visual aids or diagrams depicting the steps involved in scaffold erection and dismantling.
- **Tentative Duration:** 60-90 minutes
- **Procedure:**
 1. Introduction and Safety Briefing:
 - Begin by introducing the activity and its objective: to learn the correct procedures for safely erecting and dismantling a scaffold.

- Conduct a safety briefing, emphasizing the importance of using personal protective equipment (PPE) and following safety guidelines throughout the activity.
2. Presentation on Scaffold Erection and Dismantling:
 - Conduct a presentation or visual demonstration showcasing the step-by-step procedures for scaffold erection and dismantling.
 - Use visual aids or diagrams to illustrate each stage of the process.
 3. Divide Participants into Groups:
 - Divide participants into small groups of 3-5 members.
 - Assign each group specific stages of scaffold erection and dismantling to focus on during the practical demonstration.
 4. Scaffold Erection Demonstration:
 - Provide each group with the scaffold components required for their assigned stages of scaffold erection.
 - Instruct each group to demonstrate the proper procedures for erecting their portion of the scaffold.
 5. Hands-on Practice:
 - Allow participants to practice erecting and securing the scaffold components under the supervision of instructors.
 - Emphasize the importance of accuracy and stability during the erection process.
 6. Group Discussions and Comparisons:
 7. Facilitate group discussions where participants can share their experiences and insights on scaffold erection.
 8. Encourage each group to compare and discuss their approaches to ensure a comprehensive understanding of the entire process.
 9. Scaffold Dismantling Demonstration:
 10. Provide each group with the scaffold components required for their assigned stages of scaffold dismantling.
 11. Instruct each group to demonstrate the proper procedures for safely dismantling their portion of the scaffold.
 12. Hands-on Practice (Dismantling):
 13. Allow participants to practice dismantling the scaffold components while following the correct procedures and safety guidelines.
 14. Group Discussions and Feedback:
 15. Conduct a group discussion to gather feedback from participants on the challenges faced and lessons learned during scaffold erection and dismantling.
 16. Address any questions or concerns raised during the activity.
 17. Conclusion:
 - Summarize the activity by emphasizing the importance of following proper procedures and safety guidelines when erecting and dismantling scaffolds.

- Reinforce the significance of teamwork, communication, and attention to detail in scaffold erection and dismantling processes.

Expected Outcome: By the end of this activity, participants should have gained practical experience in safely erecting and dismantling a scaffold. They should be familiar with the step-by-step procedures and safety considerations involved in scaffold construction and dismantling. Additionally, participants should understand the importance of teamwork, coordination, and adherence to safety guidelines in scaffold erection and dismantling to ensure the safety and efficiency of construction projects.

Notes for Facilitation

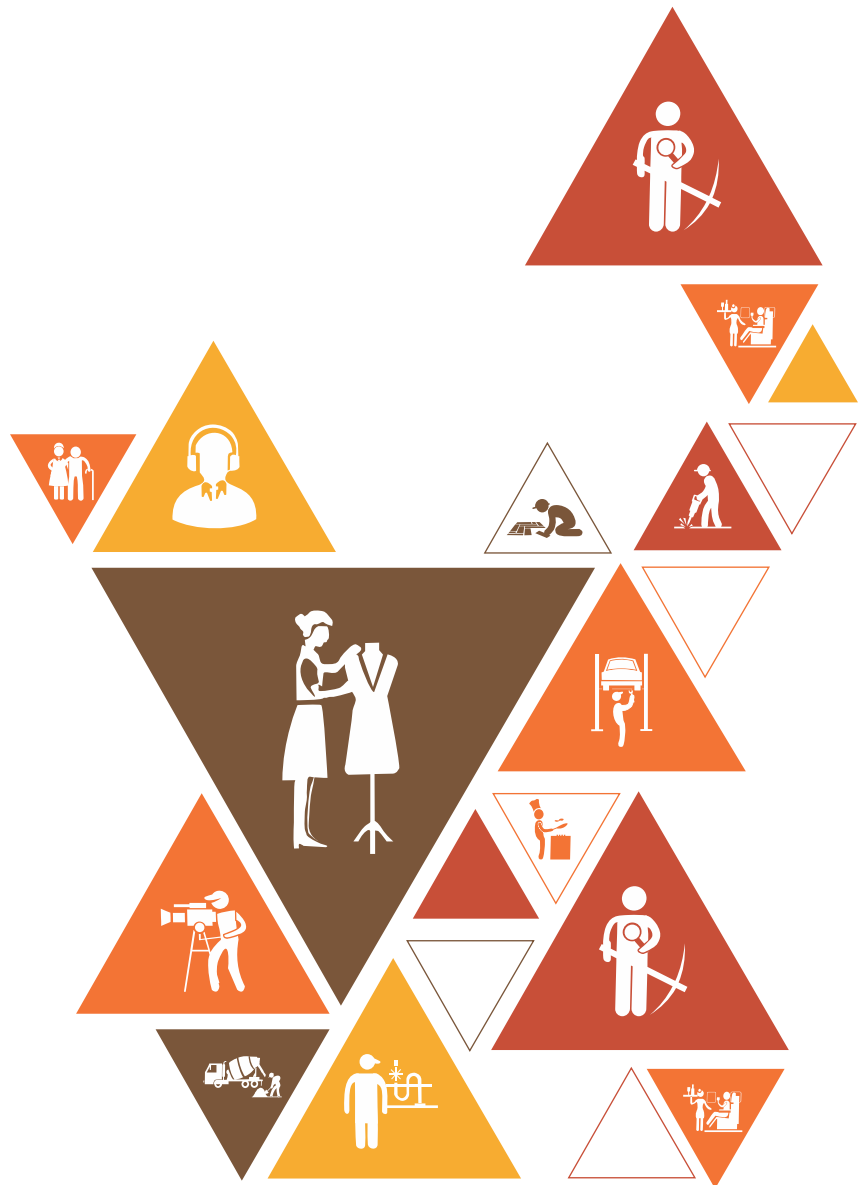
- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Exercise

Key Solutions to PHB Exercise

1. Scaffolding is a temporary structure used in construction, maintenance, or repair work to provide a platform for workers and materials. Its main purpose is to offer a safe and stable working platform at elevated heights, allowing workers to access hard-to-reach areas on buildings or structures. Scaffolding is crucial for ensuring worker safety and facilitating efficient work processes.
2. Five common scaffolding components include:
 - Standards (upright vertical posts)
 - Ledgers (horizontal members connecting the standards)
 - Transoms (horizontal members placed across ledgers)
 - Braces (diagonal members used to stabilize the scaffold)
 - Scaffold planks (platforms where workers stand or place materials)
3. Steps for dismantling the scaffold:
 - Remove all workers and materials from the scaffold.
 - Start at the highest level and remove planks, transoms, and ledgers, working downward.
 - Once each level is clear, dismantle the standards, ensuring they are released gradually and not allowed to drop
 - After dismantling, organize and store the components properly for future use or transport them safely to another location.
4. Hand tools used in the erection or dismantling of scaffolds include:
 - Scaffold wrench or spanner: For tightening or loosening scaffold fittings.
 - Hammer: For securing scaffold components and driving wedges.

- Spirit level: To ensure the scaffold is level and plumb.
- Tape measure: For accurate measurements during assembly.
- Scaffold belt: A tool belt used to carry small tools and equipment while working on the scaffold.





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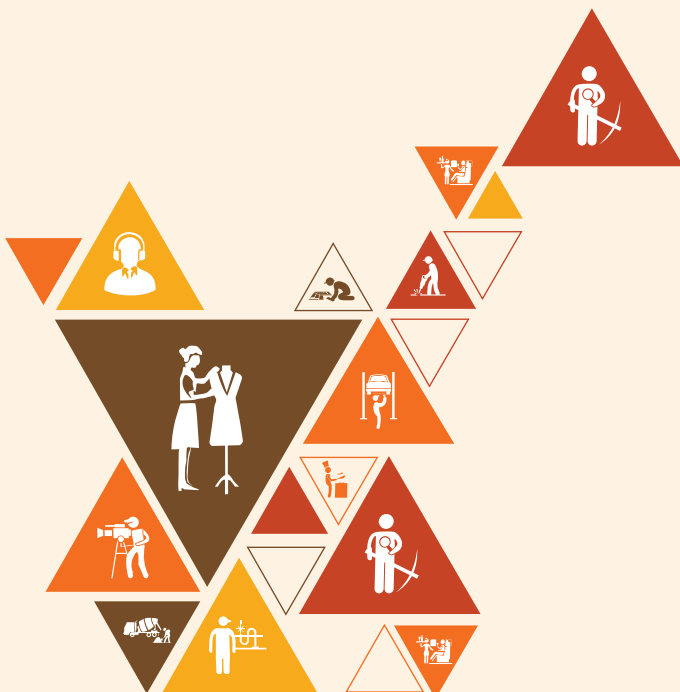
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5. Team Work and Effective Communication at Workplace

Unit 5.1 – Effective Communication and Teamwork

Unit 5.2 – Working Effectively and Maintaining Discipline at Work

Unit 5.3 – Maintaining Social Diversity at Work



(CON/N8001)

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams
2. Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task.
3. Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality.

Unit 5.1 – Effective Communication and Teamwork

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain the importance of proper and effective communication and its adverse effects in case of failure of proper communication.
2. Apply effective communication skills while interacting with co-workers, trade seniors and others during the assigned task.
3. Use appropriate writing skills and verbal communication reporting as per commonly applicable organisational norms.
4. Demonstrate teamwork skills during assigned task.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about importance of effective communication and teamwork at a construction site.

Say

In this session, we shall learn about the importance of teamwork and its effects relevant to Construction Electrical Works, proper and effective communication and its adverse effects, effective communication skills while interacting with various stakeholders, etc.

Demonstrate

Use a projector and show the following - <https://www.youtube.com/watch?v=sEzTXTRo9L4> to participants on how to build effective communication skills.

Ask

- Does anyone know the Cs of effective communication?
- Why do you think it is important for a Helper Electrician to learn about effective communication?

Elaborate

In this unit, we will discuss the following topics:

- Effective Communication
- Workplace Communication
- Effective Communication with Stakeholders
- Adverse Effects of Poor Communication
- Teamwork at Workplace
- C's of Teamwork
- Enhancing Teamwork in the Workplace

Activity

- **Purpose:** The purpose of this activity is to help students understand and practice effective communication skills.
- **Resources Required:** Whiteboard, markers, printed scenarios, timer, and notebooks.
- **Tentative Duration:** 60 minutes
- **Procedure:**

1. Introduce the importance of communication.
2. Provide communication scenarios to small 4-5 groups.

Scenario 1: Safety Briefing for New Workers You are the site supervisor on a construction project, and several new workers have joined the team. The challenge is to conduct a safety briefing for the new workers, ensuring they understand the potential hazards on the site, safety protocols, and the proper use of personal protective equipment (PPE).

Scenario 2: Communicating Changes in the Construction Plan During a construction project, unexpected challenges arise, leading to changes in the initial plan. As the project manager, you need to communicate these changes to the entire construction team effectively, addressing their concerns and ensuring everyone is on the same page to avoid delays and confusion.

3. Groups discuss and come up with solutions.
4. Groups perform role-plays of scenarios.
5. Provide feedback after each role-play.

Note: Trainer can introduce more similar scenarios

Expected outcome: By the end of this practical activity, students are expected to achieve the following:

- Improved understanding of effective communication.
- Application of knowledge in real-life scenarios.
- Ability to adapt communication style.
- Enhanced collaboration and teamwork.
- Increased confidence in communication skills.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topic.
- Arrange audio-visual aids to make them understand effective communication at the workplace-
<https://youtu.be/V1RQG1nB4Kg>
- Ask the participants if they have any questions.
- Encourage other participants to answer those questions and encourage peer learning in the class.

Unit 5.2 – Working Effectively and Maintaining Discipline at Work

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain the effects and benefits of timely actions relevant to the task at hand with examples.
2. Discuss how to take initiative in resolving issues among co-workers in a given situation.
3. Discuss reporting procedures followed at the workplace.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about the discipline management and interpersonal conflict resolution.

Say

In this session, we will learn about the importance of timely actions relevant to construction electrical works and interpersonal conflicts.

Ask

- How do you think procrastination or delayed action can affect the results of a project or task?
- Have you ever been in a situation where you had to take the initiative to resolve a conflict or issue with a co-worker? Can you describe it?

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Elaborate

- Discipline at Work
- Time Management
- Interpersonal Conflicts
- Reporting Inappropriate Behaviour in the Workplace

Activity

- **Topic:** Promoting Discipline at the Construction Site - Electrical Works
- **Purpose:** The purpose of this activity is to create awareness and promote discipline at the construction site, with a specific focus on electrical works. Participants will learn the importance of adhering to safety protocols, following regulations, and maintaining a disciplined work environment to prevent accidents and ensure efficient electrical installations.
- **Tentative Duration:** 60-90 minutes
- **Resources:**
 - Presentation materials (slides, videos, or infographics) on construction site safety and discipline.
 - Construction site or a simulated site with electrical works in progress.
 - Personal Protective Equipment (PPE) for all participants.
 - Signage and safety barriers (if conducting the activity at a construction site)
- **Procedure:**
 - Introduction:
 - Begin with an introduction to the activity and its objective: to understand the significance of maintaining discipline at the construction site, specifically in relation to electrical works.
 - Explain that disciplined practices ensure a safe and productive work environment for everyone involved.
 - Safety and Discipline Presentation:
 - Deliver a presentation on construction site safety and the importance of discipline in electrical works.
 - Address potential hazards and risks related to electrical installations and emphasize the consequences of negligence.
 - Discussion on Best Practices:
 - Facilitate an interactive discussion on best practices for maintaining discipline at the construction site.
 - Encourage participants to share their experiences and insights on promoting safety and discipline.
 - Safety Walkthrough:
 - Conduct a safety walkthrough at the construction site, focusing on electrical works areas.
 - Identify any non-compliant or unsafe practices and discuss possible solutions.

- Group Activity - Creating Safety Guidelines:
 - Divide participants into small groups and assign each group a specific aspect of maintaining discipline in electrical works.
 - Instruct each group to create a set of safety guidelines or checklists for their assigned area.
- Group Presentations:
 - Have each group present their safety guidelines to the rest of the participants.
 - Encourage feedback and suggestions from others to enhance the guidelines.
- Role-Playing Scenarios:
 - Role-play various scenarios where maintaining discipline is crucial for electrical works safety.
 - Participants can act out situations like dealing with unauthorized personnel near electrical installations or handling faulty equipment.
- Safety Commitment Pledge: Ask participants to make a safety commitment pledge, promising to follow safety protocols and maintain discipline at the construction site.
- Conclusion:
 - Summarize the activity by emphasizing the importance of discipline in electrical works to ensure a safe and productive construction site.
 - Reinforce the participants' understanding of safety guidelines and their role in promoting discipline.
- **Expected Outcome:** By the end of this activity, participants should have a deeper understanding of the importance of maintaining discipline at the construction site, particularly in electrical works areas. They will be aware of safety best practices and guidelines to follow during electrical installations. Additionally, participants will be committed to promoting discipline, adhering to safety protocols, and fostering a safe work environment for all construction site personnel.

Say

Did you find this activity interesting? Do you have a better understanding of the topics covered?

Ask

- Reflecting on the activity, how will you apply the knowledge and insights gained to promote discipline and safety at construction sites in your future work?
- What are some effective ways to communicate and reinforce safety guidelines and disciplinary practices among all construction site personnel, including workers and contractors?
- Describe the importance of personal responsibility in maintaining discipline at the construction site, especially regarding electrical works safety.
- How do you plan to actively contribute to creating a disciplined and safe work environment during electrical installations in your future projects?

- Share an example of a situation where maintaining discipline and adhering to safety protocols led to the prevention of potential accidents or hazards at a construction site.

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Unit 5.3 – Maintaining Social Diversity at Work

Unit Objectives

By the end of this unit, participants will be able to:

1. Discuss about gender and its related concept: gender equality, gender equity (group work)
2. Discuss different types of disabilities (physical, mental, intellectual or sensory impairment).
3. Discuss the activities sensitive to the cultural diversity, disabilities and gender neutrality at the workplace.
4. Discuss the basic rules and regulations related to gender sensitivity, disabilities, and cultural diversity, with their impact on operations of a workplace.
5. Demonstrate acceptable interpersonal transactions with individuals having disabilities (physical, mental, intellectual or sensory impairment) or cultural diversity.
6. Demonstrate the process modifications required to make the workplace free from gender biases.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computer, projector, flipcharts etc.
- PowerPoint slides, pictures/ posters depicting various information about diversity at workplace.

Say

In this session, we will learn about the concept of gender sensitivity and PwD sensitivity at workplace.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Demonstrate

Use a projector and show the following - <https://youtu.be/9i4bQXdFCYE> to participants about the PwD ACT 1995.

Elaborate

- Gender Sensitivity
- PwD Sensitivity
- Rights of PwD

Activity

- **Topic:** PwD (Person with Disabilities) Sensitivity
- **Purpose:** The purpose of this classroom activity is to raise awareness about disability sensitivity and promote inclusivity in the context of interacting with persons with disabilities (PwD). Participants will gain a better understanding of the challenges faced by PwD, learn respectful language and behavior, and develop empathy and support for their fellow community members.
- **Tentative Duration:** 60-90 minutes
- **Resources:**
 - Presentation materials (slides, videos, or infographics) on disability awareness and sensitivity.
 - Guest speaker (optional) with personal experiences as a PwD or a disability advocate.
 - Real-life scenarios involving PwD interactions (can be presented through role-plays or case studies).
- **Procedure:**
 - Introduction:
 - Begin with an introduction to the topic of disability sensitivity and inclusivity.
 - Explain the importance of understanding the challenges faced by PwD and treating them with respect and dignity.
 - Disability Awareness Presentation:
 - Deliver a presentation on disability awareness, including an overview of different types of disabilities and their impact on daily life.
 - Highlight common misconceptions and myths about PwD.
 - Guest Speaker (Optional):
 - If available, invite a guest speaker who is a PwD or a disability advocate to share their personal experiences and challenges.
 - Allow participants to ask questions and gain insights into the real-life experiences of PwD.
 - Language and Communication:
 - Discuss appropriate and respectful language to use when referring to PwD. Emphasize the importance of using person-first language.
 - Conduct role-playing exercises or case studies to practice using respectful language in various situations.
 - Empathy Building:
 - Engage participants in empathy-building activities to help them understand the experiences and feelings of PwD.

- Discuss the barriers and challenges faced by PWD in accessing public spaces and services.
- Inclusivity in the Classroom and Beyond:
 - Brainstorm ways to make the classroom and other environments more inclusive for PWD.
 - Discuss adjustments and accommodations that can be made to ensure equal participation and accessibility.
- Addressing Unconscious Bias:
 - Explore unconscious biases and stereotypes that may affect our interactions with PWD.
 - Encourage participants to challenge and overcome these biases.
- Group Discussions:
 - Divide participants into small groups for open discussions on disability sensitivity.
 - Encourage participants to share their perspectives, experiences, and thoughts on promoting inclusivity.
- Personal Action Plans: Have each participant create a personal action plan outlining how they will contribute to promoting disability sensitivity and inclusivity in their daily lives.
- Conclusion:
 - Summarize the classroom activity by emphasizing the importance of promoting disability sensitivity and inclusivity in all aspects of life.
 - Encourage participants to take what they have learned and apply it in their interactions with PWD, creating a more inclusive and understanding community.
- **Expected Outcome:** By the end of this classroom activity, participants should have gained awareness and sensitivity towards PWD. They will have a better understanding of the challenges faced by PWD and be more mindful of their language and behavior. Participants will be motivated to promote inclusivity and take action to create a more supportive and empathetic environment for PWD in their daily lives.

Say

Did you find this activity interesting? Do you have a better understanding of the topic covered?

Ask

- What are some of the key insights or learnings you gained from the disability awareness presentation and the personal experiences shared by the guest speaker (if applicable)?
- How can using person-first language contribute to promoting respect and dignity when referring to persons with disabilities? Can you provide examples of person-first language?
- During the empathy-building activities, what did you discover about the challenges and experiences of persons with disabilities? How did these activities influence your understanding??

Do

- Jot down the crucial points on the whiteboard as the students speak.

- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Exercise

Key Solutions to PHB Exercise

1.

Ways for Enhancing Business Writing are:

- **Take extra time:** In many instances, a person can improve their writing by taking additional time to produce and then proofread messages. Workers should view business communications as projects in their own right, not as tasks to be accomplished as soon as feasible. Essential letters and emails should be written at least a few hours before they are sent so that the writer can take a break from the article and evaluate it with fresh eyes.
- **Use a grammar checker:** Most word processing software contains a grammar checker, but independent tools provide more thorough proofreading and feedback for greater clarity.
- **Ask for feedback:** After composing an especially significant letter or email, it may be prudent for an employee to request comments from his manager or a co-worker.
- **Get tutoring or take a class:** There are numerous educational programme options for enhancing one's writing skills, including tutoring and classes. Many business writing courses offered by community colleges and adult education programmes can be taken online.

2.

PwD sensitivity: PwD sensitivity promotes empathy, etiquette and equal participation of individuals and organizations while working with individuals with a disability, e.g. sensory, physical or intellectual.

Gender sensitivity: Gender sensitivity is the act of being sensitive towards people and their thoughts regarding gender. It ensures that people know the accurate meaning of gender equality, and one's gender should not be given priority over their capabilities.

3.

The following issues are faced due to poor communication:

- i. Creating Confusion
- ii. Unnecessary Delays
- iii. Budget/Cost Overruns
- iv. Injuries and Safety Issues

4.

Some ways to resolve interpersonal conflict:

- Communication
- Active Listening
- Displaying Empathy
- Not Holding Grudges

5.

Every workplace organisation requires communication for day-to-day business, regardless of size, location, goals, etc. It forms a bridge between people to exchange ideas, inform, express their feelings, influence others, etc. Communication is required to communicate within the organisation with managers and employees, etc. and outside with suppliers, buyers, etc.

Key Learning Outcomes

By the end of this module, participants will be able to:

1. Identify various hazards at construction site.
2. Use PPE's relevant to electrical works.
3. Perform safe waste disposal at construction site.
4. Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines.

Unit 6.1 – Workplace Hazards

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain the types of hazards at the construction sites and identify the hazards specific to the domain related works.
2. Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories.
3. Demonstrate safety techniques to be adopted in case of accidents.
4. Demonstrate use of PPEs as per work requirements.
5. Demonstrate the methods to clean and disinfect all materials, tools and supplies before and after use.
6. Demonstrate the procedure to report to the concerned authority regarding the outbreak/ hazard of any infectious disease/ pandemic.
7. List different types of infectious disease that can spread/ originate at a construction site
8. Discuss the ways of transmission of the various infectious disease.
9. Recall the safety control measures and actions to be taken under emergency situation.
10. Explain the reporting procedure to the concerned authority in case of emergency situations.
11. Explain the types and benefits of basic ergonomic principles, which should be adopted while carrying out specific task at the construction sites.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters depicting the types of hazards at the construction sites, use of PPEs as per work requirements during the Construction Electrical Works job, etc.

Say

In this session, we shall learn about the importance of the types of hazards at the construction sites, workplace warning signs, cleanliness in the workplace, PPE, infectious diseases, emergency plans, etc.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.

- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask

- What is the first thing that comes to your mind when you hear the term “workplace hazards”?
- Can you name some common workplace hazards that you might encounter in various industries?
- Have you ever witnessed or experienced a workplace incident related to safety hazards? If so, what happened, and how was it handled?

Elaborate

- Workplace Safety
- Workplace Safety at Construction Site
- Workplace Hazards
- Workplace Hazard at Construction Site
- Hazard Identification and Risk Assessment (HIRA)
- Workplace Warning Signs
- Personal Protective Equipment
- Basic Ergonomic Principles
- Emergency Response Plan for Construction Site

Activity

- **Purpose:** The purpose of this practical activity is to educate students about the importance of Personal Protection Equipment (PPE) used at construction sites.
- **Resources Required:** Various PPE (e.g., hard hat, safety goggles, earplugs, dust masks, reflective vests, gloves, and safety boots), hazard posters, and safety guidelines.
- **Tentative Duration:** 60-90 minutes
- **Procedure:**
 1. Introduction: Discuss workplace safety and PPE’s significance.
 2. Hazard Awareness: Identify construction site hazards.
 3. Set up stations with examples of different types of PPE.
 4. Divide the students into groups and assign each group to a station.
 5. Instruct each group to inspect the PPE, discuss its purpose, and identify the types of hazards it protects against.
 6. Allow students to try on the PPE to experience how it fits and functions.

7. Gather the students for a recap of the key points learned during the activity.
 8. Encourage questions and facilitate a Q&A session to address any remaining doubts.
- Expected outcome: The participants will understand PPE's importance, recognize hazards, and know how to use various PPE correctly.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Notes

Lined area for notes

Unit 6.2 – Fire Safety

Unit Objectives

By the end of this unit, participants will be able to:

1. Explain the classes of fire and types of fire extinguishers.
2. Demonstrate the operating procedure of the fire extinguishers.

Say

In this session, we will learn about types of fire and fire extinguishers.

Resources to be used

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask

- What are some potential fire hazards associated with electrical works in construction sites?
- Can you name some specific construction activities that pose a higher risk of electrical-related fires?
- What are the key factors that contribute to electrical fires in construction projects?

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.

Elaborate

- Fire and its Classes
- Fire Safety
- Fire Extinguisher

Activity

- **Topic:** Fire Safety and Fire Extinguishers
- **Purpose:** The purpose of this activity is to provide participants with hands-on experience and knowledge about fire safety, the different types of fires, and the proper use of fire extinguishers. Participants will learn about fire prevention, how to respond in case of a fire emergency, and gain confidence in handling fire extinguishing equipment
- **Location:** A fire training facility or a suitable outdoor space with controlled conditions for the fire demonstration.
- **Tentative Duration:** Half-day (4-5 hours).
- **Resources:**
 - Fire safety experts or firefighters (to conduct the training).
 - Fire extinguishers (different types, such as water, foam, CO2, dry powder).
 - Fire safety equipment (fire blankets, fire hoses, fire safety signs).
 - Fire simulation setup (controlled fire demonstration area).
 - Safety equipment (personal protective equipment - PPE) for all participants.
- **Procedure:**
 - Introduction to Fire Safety:
 - Begin with an introduction to the importance of fire safety and the different types of fires (Class A, B, C, D, and K) based on the materials involved.
 - Explain the fire tetrahedron and the key elements necessary for a fire to ignite and sustain.
 - Fire Extinguishers and Their Types:
 - Provide an overview of the different types of fire extinguishers and their suitable applications for various types of fires.
 - Explain the PASS (Pull, Aim, Squeeze, Sweep) technique for using fire extinguishers effectively.
 - Fire Safety Demonstration and Fire Extinguisher Training:
 - Conduct a live fire safety demonstration using controlled fires to showcase different fire types and their behaviors.
 - Teach participants how to operate different fire extinguishers on the controlled fires (under the guidance of fire safety experts).
 - Hands-On Practice:
 - Divide participants into smaller groups.
 - Each group will have the opportunity to practice using different types of fire extinguishers to extinguish controlled fires.
 - Fire Blanket and Fire Hose Training:
 - Demonstrate the proper use of fire blankets to smother fires involving people or clothing.
 - Showcase the operation of fire hoses for controlling larger fires.
 - Fire Safety Measures and Evacuation:
 - Discuss fire safety measures, including fire escape routes, fire assembly points, and evacuation procedures.

- Conduct a fire evacuation drill, simulating a fire emergency.
- Q&A Session:
 - Gather all participants for a Q&A session with fire safety experts or firefighters.
 - Allow participants to ask questions and seek clarification on fire safety topics.
- Conclusion:
 - Summarize the practical/field visit activity by emphasizing the importance of fire safety and the proper use of fire extinguishers.
 - Reinforce the participants' understanding of fire prevention, response, and the role they can play in fire safety.
- **Expected Outcome:** By the end of this practical/field visit activity, participants should have gained practical experience in fire safety and the correct usage of fire extinguishers. They will be knowledgeable about the different types of fires, how to respond in case of a fire emergency, and how to use fire extinguishers effectively. Participants will feel more confident and capable of handling fire safety situations, contributing to a safer environment in their workplaces and communities.

Say

Did you find this activity interesting? What did you learn from the fire safety demonstration and fire extinguisher training? How did this experience enhance your understanding of fire behavior and the proper use of fire extinguishers??

Ask

- Describe your hands-on practice using fire extinguishers on the controlled fires. Which types of fires did you extinguish, and what fire extinguisher(s) did you use for each fire type?
- Did you encounter any challenges while using the fire extinguishers? How did you address these challenges, and what strategies did you find effective?
- Discuss the importance of knowing the different types of fires and using the correct fire extinguisher for each fire type. Why is it crucial to match the fire extinguisher to the specific fire??

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Notes

Lined area for notes, containing approximately 30 horizontal lines.

Unit 6.3 – Personal Hygiene and Safety Measures

Unit Objectives

By the end of this unit, participants will be able to:

1. Demonstrate the practices to maintain personal hygiene, workplace hygiene and site/ workplace sanitization.
2. Explain the importance of housekeeping works.
3. Demonstrate safe housekeeping practices.
4. Explain the importance of participation of workers in safety drills.
5. Explain the purpose and importance of vertigo test at construction site.
6. List out basic medical tests required for working at construction site.
7. Demonstrate vertigo test

Say

In this session, we will learn about personal hygiene, workplace hygiene and site/ workplace sanitization, housekeeping practices, etc.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask

- What does personal hygiene mean to you, and why is it essential in both personal and professional settings?
- Can you name some common personal hygiene practices that are crucial for maintaining good health and preventing the spread of infections??

Elaborate

- Personal Hygiene and Cleanliness
- Good Housekeeping

- Workplace Cleanliness and Sanitization
- Safety Drills at Construction Site
- Medical Examination for Construction Workers

Activity

- **Topic:** Personal Hygiene and Safety Measures Workshop
- **Purpose:** The purpose of this workshop is to educate participants about the importance of personal hygiene and safety measures in maintaining good health and preventing the spread of illnesses. Participants will learn practical hygiene practices and safety measures that they can incorporate into their daily lives.
- **Tentative Duration:** 60-90 minutes
- **Resources:**
 - Presentation materials (slides, videos, or infographics) on personal hygiene and safety measures.
 - Hand sanitizers, tissues, and waste disposal bins for demonstrations.
 - Posters or visual aids illustrating proper handwashing and hygiene techniques.
 - Safety equipment (e.g., masks, gloves) for demonstrating safety measures.

Procedure:

- Introduction:
 - Begin with an introduction to the workshop, highlighting the significance of personal hygiene and safety measures in safeguarding health and well-being.
 - Explain that the workshop will cover practical tips and techniques to maintain good personal hygiene and safety practices.
- Personal Hygiene Presentation:
 - Conduct a presentation on the importance of personal hygiene, covering topics such as hand hygiene, respiratory hygiene, oral hygiene, and body cleanliness.
 - Emphasize how proper hygiene practices can prevent the spread of infections and diseases.
- Handwashing Demonstration:
 - Demonstrate the proper handwashing technique using soap and water for at least 20 seconds.
 - Encourage participants to practice handwashing with the provided materials.
- Respiratory Hygiene:
 - Discuss the importance of covering coughs and sneezes with a tissue or elbow to prevent the spread of respiratory droplets.
 - Demonstrate the correct way to use a tissue and dispose of it properly.
- Oral Hygiene:
 - Provide tips on maintaining good oral hygiene, including regular brushing and flossing.
 - Discuss the importance of oral health in preventing oral diseases.

- Body Cleanliness:
 - Explain the significance of regular bathing and maintaining clean clothes to prevent body odor and skin infections.
- Safety Measures Presentation:
 - Conduct a presentation on safety measures, covering topics such as wearing masks, proper glove usage, and maintaining physical distancing.
 - Highlight the importance of safety measures in preventing the spread of contagious illnesses, including respiratory infections.
- Safety Measures Demonstration:
 - Demonstrate how to wear a mask properly and the correct way to remove and dispose of masks.
 - Show proper glove usage and disposal techniques.
- Group Discussion:
 - Facilitate a group discussion on the challenges and benefits of practicing personal hygiene and safety measures in different settings (e.g., home, workplace, public spaces).
- Q&A Session:
 - Open the floor for questions and clarifications from participants about personal hygiene and safety measures.
- Commitment to Personal Hygiene and Safety:
 - Ask participants to make a personal commitment to incorporating hygiene practices and safety measures into their daily routines.
- Conclusion:
 - Summarize the key takeaways from the workshop, reinforcing the importance of personal hygiene and safety measures in maintaining good health and well-being.
 - Encourage participants to spread awareness and knowledge about personal hygiene and safety in their communities.

Expected Outcome: By the end of this workshop, participants should have a better understanding of the importance of personal hygiene and safety measures. They will be equipped with practical tips and techniques to practice good hygiene, such as proper handwashing and respiratory etiquette, as well as the correct usage of safety measures, including mask-wearing and glove usage. Participants will be motivated to incorporate these practices into their daily lives, promoting a safer and healthier environment for themselves and others.

Say

Did you find this activity interesting? Do you have a better understanding of the topics covered?

Ask 

- What are the key takeaways from the workshop regarding personal hygiene? How do you plan to incorporate these practices into your daily routine?
- How does practicing respiratory hygiene, such as covering coughs and sneezes, contribute to maintaining a healthier environment for everyone?

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation 

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Notes

Lined writing area for notes, containing 20 horizontal lines.

Unit 6.4 – Waste Management

Unit Objectives

By the end of this unit, participants will be able to:

1. Demonstrate safe waste disposal practices followed at construction site.
2. Explain different types of waste at construction sites and their disposal method.

Say

In this session, we will learn about waste management and methods of waste disposal.

Notes for Facilitation

- Initiate the session with the participants by discussing the objectives of the module.
- Make the session interactive by asking the participants to share their expectations from the module on the blackboard/whiteboard.
- Introduce the topics to be covered and give some information about them.
- Give the participants a general idea about what will be covered in the module.

Ask

- Can you name some common types of waste materials produced in construction electrical projects?

Elaborate

- Waste Management
- Methods of Waste Disposal
- Methods of Waste Management
- Waste Management on a Construction Site

Activity

- **Topic:** Waste Management in Construction Electrical Works
- **Purpose:** The purpose of this activity is to create awareness about the importance of proper waste management in construction electrical works. Participants will learn about the types of waste generated during electrical installations, their impact on the environment, and strategies for efficient waste disposal and recycling.

- **Tentative Duration:** 60-90 minutes
- **Resources:**
 - Presentation materials (slides, videos, or infographics) on waste management in construction electrical works.
 - Examples of common electrical waste items (e.g., old cables, damaged fixtures).
 - Visual aids or posters illustrating waste segregation and recycling practices.
- **Procedure:**
 - **Introduction:**
 - Begin with an introduction to the activity and its objective: to understand the significance of waste management in construction electrical works.
 - Explain the environmental impact of improper waste disposal and the importance of reducing, reusing, and recycling electrical waste.
 - **Presentation on Waste Management:**
 - Conduct a presentation on waste management in construction electrical works, covering the types of waste generated (e.g., outdated equipment, surplus materials) and their potential hazards.
 - Discuss the benefits of effective waste management, including cost savings and environmental conservation.
 - **Types of Electrical Waste:**
 - Display examples of common electrical waste items and discuss their proper disposal methods.
 - Highlight the importance of identifying and segregating different types of waste for efficient recycling.
 - **Waste Segregation and Recycling:**
 - Educate participants on waste segregation techniques specific to construction electrical works, emphasizing the separation of hazardous and non-hazardous waste.
 - Explain recycling processes for electrical waste components, such as metal recycling and responsible electronic waste disposal.
 - **Hands-On Sorting Activity:**
 - Divide participants into small groups and provide them with a collection of electrical waste items.
 - Instruct each group to sort the items into different categories based on their recyclability and proper disposal methods.
 - **Group Discussions:**
 - Facilitate group discussions on the challenges and benefits of waste management in construction electrical works.
 - Encourage participants to share their insights and experiences related to waste disposal practices.
 - **Waste Reduction Strategies:**

- Introduce waste reduction strategies, such as effective inventory management, minimizing surplus materials, and selecting energy-efficient equipment.
- Role-Play Scenario:
 - Conduct a role-play scenario where participants act out waste management practices on a construction site, including proper waste segregation and disposal.
- Importance of Collaboration:
 - Discuss the importance of collaboration among construction teams, contractors, and waste management service providers to ensure effective waste disposal.
- Commitment to Responsible Waste Management:
 - Ask each participant to make a personal commitment to implementing responsible waste management practices in their future electrical construction projects.
- Conclusion:
 - Summarize the key points covered during the activity, emphasizing the role of waste management in construction electrical works.
 - Encourage participants to share the knowledge gained with their colleagues and advocate for responsible waste management.

Expected Outcome: By the end of this activity, participants should have a better understanding of waste management in construction electrical works and the importance of proper waste disposal and recycling. They will be familiar with strategies to segregate and recycle electrical waste, reducing its environmental impact. Participants will be motivated to adopt responsible waste management practices in their future electrical construction projects, promoting sustainability and environmental conservation in the construction industry.

Say

Did you find this activity interesting? Do you have a better understanding of the concept of waste management?

Ask

- Describe the different types of electrical waste you encountered during the sorting activity. How did you ensure proper segregation and disposal of these waste items?
- Discuss the potential hazards of improper disposal of electrical waste. How can responsible waste management practices mitigate these hazards?

Do

- Jot down the crucial points on the whiteboard as the students speak.
- Share your input and insight to encourage the students and add onto what they talk about.
- Ensure that all students participate in the class.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topics
- Arrange audio-visual aids for a better understanding of the topics.
- Ask the participants if they have any questions.
- Encourage every participant to answer those questions and encourage peer learning in the class.

Exercise

Key Solutions to PHB Exercise

1. There are five main types of fire extinguishers:
 1. Water.
 2. Powder.
 3. Foam.
 4. Carbon Dioxide (CO₂)
 5. Wet chemical.
2. Personal protective equipment, or “PPE,” is equipment worn to reduce exposure to risks that might result in significant occupational injuries or illnesses. Chemical, radiological, physical, electrical, mechanical, and other job dangers may cause these injuries and diseases.
3. The benefits of workplace safety are:
 - Employee retention increases if they are provided with a safe working environment.
 - Failure to follow OSHA’s laws and guidelines can result in significant legal and financial consequences.
 - A safe environment enables employees to stay invested in their work and increases productivity.
 - Employer branding and company reputation can both benefit from a safe working environment.
4. Good housekeeping on construction sites refers to the practice of keeping the site clean and tidy. After all, construction work is messy, and cleaning up now will only result in more mess later. A clean work environment reduces the likelihood of accidents and improves fire safety. There are fewer things to trip you up if there are no materials, waste, or discarded tools.
5. Construction is a hazardous field in which employees must become proficient. Fortunately, safety training can reduce workplace injuries while informing employees of necessary precautions to take.

Notes



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Transforming the skill landscape



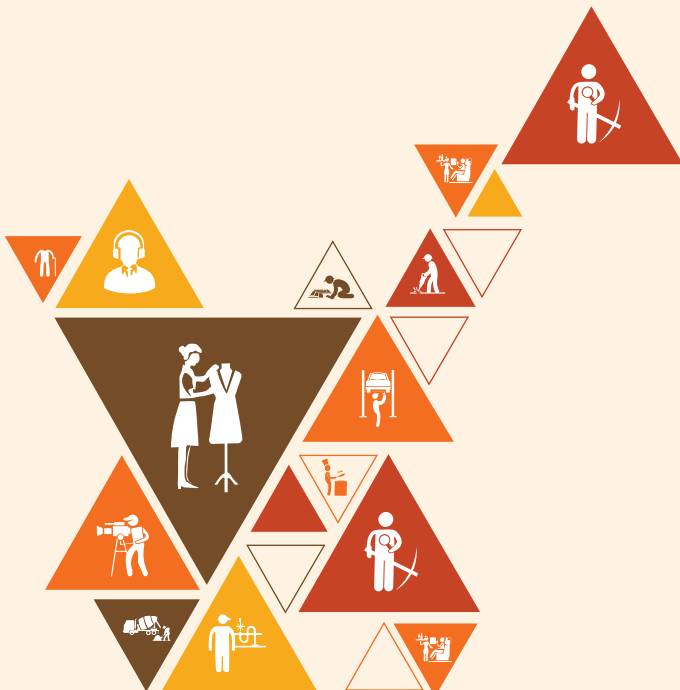
Construction Skill
Development Council of India

7. Employability Skills (30 Hours)

To access content on Employability Skills, click here

<https://www.skillindiadigital.gov.in/content/list>

Scan the QR code below to access the eBook



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Transforming the skill landscape

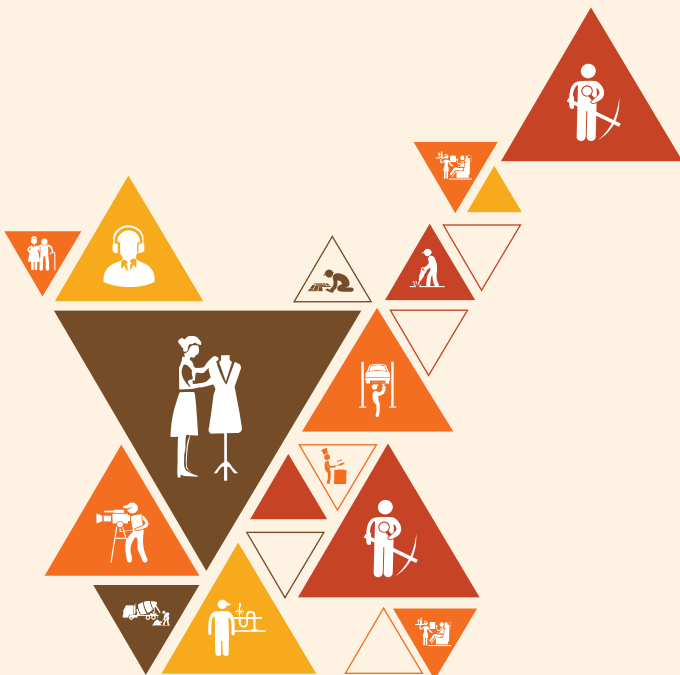


9. Annexures

Annexure I- Training Delivery Plan

Annexure II- Assessment Criteria

Annexure III- QR Codes –Video Links



Annexure I- Training Delivery Plan

Training Delivery Plan			
Program Name:	Helper Electrician		
Qualification Pack Name & Ref. ID	CON/Q0601		
Version No.	2.0	Version Update Date	31/03/2022
Prerequisites to Training (if any)	Minimum Educational Qualification: Ability to read and write		
Training Outcomes	<p>After completing this program, participants will be able to:</p> <ul style="list-style-type: none"> • Handle different tools, measuring devices and materials used for LV electrical work. • Shift and stack various materials and tools used for electrical work. • Perform wall chasing work in concealed wiring work. • Perform laying of conduits in concealed wiring work. • Perform external threading on MS conduit. • Identify different components of scaffold. • List tools, materials components required for erection of 3.6-meter scaffold. • Erect and dismantle scaffold up to 3.6 metres height. • Stack all the components of the scaffold after dismantling. • Demonstrate effective communication with co-workers, superiors and sub-ordinates across different teams. • Provide support to co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task. • Demonstrate practices sensitive to disabilities (physical, mental, intellectual or sensory impairment), cultural diversity and gender neutrality. • Identify various hazards at construction site. • Use PPE's relevant to electrical works. • Perform safe waste disposal at construction site. • Demonstrate the activities to check the spread of infection as per medical/ organizational guidelines. 		

S.no	Module name	Session name	Session objectives	NOS reference	Methodology	Training tools/ aids	Duration
1.	Introduction to Helper Electrician Job Role T- 08:00 (HH: MM)	1. Icebreaker	<ul style="list-style-type: none"> Introduce each other and build rapport with fellow trainees and the trainer. 	Bridge Module	Classroom lecture, games, group participation, group activity, Expert session	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	T- 00:30
		2. Roles and Responsibilities of Helper Electrician	<ul style="list-style-type: none"> Define the role of a Helper Electrician Explain the personal attributes required to be a Helper Electrician Discuss future possible progression and career options for Helper Electrician 				T- 07:30
2.	Identify and handle different tools, measuring devices and materials relevant to LV electrical works T- 07:00 P- 45:00 (HH: MM)	1. Electric Current and Circuit	<ul style="list-style-type: none"> Explain basic concept of electrical current flow and factors which influence electrical flow through conductor. 	CON/N0606 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, P10, PC11, PC12, PC13 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13	Classroom Lecture, Group Participation, Group Activity, Demonstration Tools Required: Batteries or power supply (preferably low voltage), Light bulbs or LEDs, Resistors, Connecting wires, Breadboards, Multimeter, LV wiring diagram examples, Handouts with basic electrical symbols.	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	T- 01:00
		2. Electrical measuring devices	<ul style="list-style-type: none"> Explain the use of common electrical measuring devices required to undertake LV electrical tests/ inspections. Demonstrate the use of measuring and marking tools relevant to LV electrical installation work. 				T- 01:00
		3. Electrical material and fixtures	<ul style="list-style-type: none"> List the types of circuit breakers, starters, relays including their areas of use. Explain physical and chemical properties of good conductor, semi-conductor and bad conductor materials. List the different materials, fixtures, tools and 				T- 01:00
							P- 07:00

			equipment relevant to LV electrical work.				
		4. LV Wiring	<ul style="list-style-type: none"> Explain the concept of LV Wiring 				T- 01:00 P- 06:00
		5. Hand and Power Tools	<ul style="list-style-type: none"> Demonstrate the use of different hand and power tools relevant to LV electrical works. 				T- 01:00 P- 06:00
		6. Material handling and storing at workplace	<ul style="list-style-type: none"> Explain standard practice of material handling and storing at workplace. Demonstrate standard procedure of shifting lights, cables, conduits, cable trays, brackets, DBs, ladders and other relevant materials. Demonstrate storing and stacking of electrical materials as per standard practices. 				T- 01:00 P- 06:00
		7. Equipment Tagging	<ul style="list-style-type: none"> Demonstrate standards practice of tagging materials, tools and tackles. 				T- 01:00 P- 06:00
3.	Carry out wall chasing and external threading on MS (mild steel) conduit T- 22:30 P- 67:30 (HH: MM)	1. Electrification of Buildings	<ul style="list-style-type: none"> Explain electrical wiring methods adopted in electrification of buildings. 	CON/N0607 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13	Classroom lecture, group participation, field-visit	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, PPE for construction site, hammer drills, chasers, saw, conduits (PVC or	T- 02:00 P- 05:00
		2. Electrical Wiring	<ul style="list-style-type: none"> Explain concealed electrical wiring and its use. 				T- 02:00 P- 05:00
		3. Types of Electrical Wiring	<ul style="list-style-type: none"> Types of electrical wiring 	KU1, KU2 KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13			T- 02:00 P- 05:00
		4. Marking Out tools	<ul style="list-style-type: none"> Demonstrate marking and measurement on the wall prior to chasing. 				T- 02:00 P- 05:00

		5. Electrical Fixtures	<ul style="list-style-type: none"> Identify electrical fixtures used in electrical wiring works. 			metal), wiring, and electrical boxes, building plans or drawings of the electrical layout, Safety signage and barriers.	T- 02:00 P- 05:00
		6. Power tools and hand tools	<ul style="list-style-type: none"> Discuss the use of power tools and hand tools required for wall chasing and threading of conduits 				T- 02:00 P- 05:00
		7. Common accessories used for fixing of conduits	<ul style="list-style-type: none"> Explain common accessories used for fixing of conduits 				T- 01:30 P- 05:30
		8. Handling and storing of electrical materials	<ul style="list-style-type: none"> Explain standard procedure of handling and storing of electrical materials required for wiring work 				T- 01:30 P- 05:30
		9. Electrical Conduits	<ul style="list-style-type: none"> Explain specification of conduits and their uses. 				T- 01:30 P- 05:30
		10. MS Conduits	<ul style="list-style-type: none"> Perform cutting and edge preparation of MS conduits Demonstrate threading of MS conduits using die and tap 				T- 01:30 P- 05:30
		11. Electrical Wall Chase	<ul style="list-style-type: none"> Demonstrate marking and measurement on the wall prior to chasing 				T- 01:30 P- 05:30
		12. Process of Wall Chasing	<ul style="list-style-type: none"> Demonstrate how to chase the wall of given depth using appropriate tools Perform fixing of conduit in the chased wall using appropriate accessories. 				T- 01:30 P- 05:30
		13. Safety Guidelines	<ul style="list-style-type: none"> Demonstrate maintenance/ upkeep of 				T- 01:30 P- 04:30

			electrical fixtures, tools and equipment.				
6.	Erect and dismantle temporary scaffold up to 3.6-meter height T- 07:30 P- 52:30 (HH: MM)	1. Scaffolding	<ul style="list-style-type: none"> Explain scaffolding and its purpose 	CON/0101 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12 KU1, KU2 KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU13, KU14, KU15, KU16, KU17	Classroom lecture, games, group participation, group activity, field visit	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop, and PPE for construction site.	T- 01:00
		2. Uses of Scaffold	<ul style="list-style-type: none"> Explain scaffolding and its purpose. 				P- 07:00
		3. Components of Scaffolding	<ul style="list-style-type: none"> Identify different components of a temporary scaffolding 				T- 01:00
		4. Base Preparation	<ul style="list-style-type: none"> Demonstrate preparation of scaffolding base for a scaffold up to 3.6 m height 				P- 07:00
		5. Tools used in Erection/Dismantle	<ul style="list-style-type: none"> List the functions of different hand tools like hammer, spanner, pulleys, hooks, ropes, etc., used for erection/dismantling of scaffolds 				T- 01:00
		6. Scaffolding Erection	<ul style="list-style-type: none"> List the common materials and tools used for erection of scaffolding (pipe, cup lock (vertical and ledgers), H-frames, bamboo and ballis Demonstrate erection of a scaffold up to 3.6 m height 				P- 06:00
		7. Safety Checks in Scaffolding	<ul style="list-style-type: none"> List the visual checks to be carried out on the scaffolding components to ascertain their usability Explain various checks to be done on completion of erection of scaffolds, such as verticality check, stability check etc. Demonstrate the checks required for 				T- 01:00
							P- 06:00

			verticality, rigidity and stability during erection of scaffold				
		8. Scaffolding Dismantle	<ul style="list-style-type: none"> Explain the sequence and standard procedure of dismantling and stacking of scaffold Demonstrate the dismantling of the erected scaffold 				T- 00:30 P- 06:30
7.	Work effectively in a team to deliver desired results at the workplace T- 07:30 P- 22:30 (HH: MM)	1. Effective communication and Team work	<ul style="list-style-type: none"> Explain the importance of proper and effective communication and its adverse effects in case of failure of proper communication. Apply effective communication skills while interacting with co-workers, trade seniors and others during the assigned task. Use appropriate writing skills and verbal communication reporting 	CON/N800 1 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9	Classroom lecture, games, group participation, group activity	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	T- 02:00 P- 06:00
		2. Discipline at Work	<ul style="list-style-type: none"> Explain the effects and benefits of timely actions relevant to the task at hand with examples. 				T- 02:00 P- 06:00
		3. Interpersonal conflicts and resolution	<ul style="list-style-type: none"> Discuss how to take initiative in resolving issues among co-workers in a given situation. Discuss reporting procedure followed at the workplace. 				T- 02:00 P- 06:00
		4. Social Diversity at Work	<ul style="list-style-type: none"> Discuss about gender and its related concept: gender equality, gender equity (group work) 				T- 01:30 P- 04:30

			<ul style="list-style-type: none"> Discuss different types of disabilities (physical, mental, intellectual or sensory impairment). Discuss the activities sensitive to the cultural diversity, disabilities and gender neutrality at the workplace. 				
8.	<p>Work according to personal health, safety and environment protocol at construction site</p> <p>T- 07:30 P- 22:30 (HH: MM)</p>	1. Workplace hazards	<ul style="list-style-type: none"> Explain the types of hazards at the construction sites and identify the hazards specific to the domain related works. Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories. List different types of infectious disease that can spread/originate at a construction site Discuss the ways of transmission of the various infectious disease. Recall the safety control measures and actions to be taken under emergency situation. Explain the reporting procedure to the concerned authority in case of emergency situations. Explain the types and benefits of basic ergonomic principles 	<p>CON/N900 1</p> <p>PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14,</p> <p>KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU14</p>	Classroom lecture, games, group participation, group activity, field visit	<p>Training Kit- Trainer Guide, Presentation s, Whiteboard, Marker, Projector, Laptop</p> <p>Tools and Equipment Required:</p> <p>Safety Helmets, Face shield, Overalls, Knee pads, Safety shoes, Safety belts, Safety harness, Safety Gloves, Safety goggles, Particle masks, Ear Plugs, Reflective jackets, Fire Extinguisher, Fire prevention kit, First Aid</p>	<p>T- 02:00 P- 06:00</p>

		2. Fire safety	<ul style="list-style-type: none"> Explain the classes of fire and types of fire extinguishers. Demonstrate the operating procedure of the fire extinguishers. 			box, Safety tags, Safety Notice board	T- 02:00 P- 06:00
		3. Personal Hygiene and Safety Measures	<ul style="list-style-type: none"> Explain the importance of housekeeping works. Explain the importance of participation of workers in safety drills. Explain the purpose and importance of vertigo test at construction site. List out basic medical tests required for working at construction site. 				T- 02:00 P- 06:00
		6. Waste Management	<ul style="list-style-type: none"> Demonstrate safe waste disposal practices followed at construction site. Explain different types of waste at construction sites and their disposal method. 				T- 01:30 P- 04:30
9.	Employability Skills (30 hours)	1. Introduction to Employability Skills	<ul style="list-style-type: none"> Describe the importance of Employability Skills Prepare a note on different industries, trends, required skills 	DGT/VSQ/N0101	Classroom lecture, discussion, Demonstration, practical, Team Activity: Role play, video session	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	01:00
		2. Constitutional values - Citizenship	<ul style="list-style-type: none"> Detail the principles of the Constitution of India Identify the various environmentally sustainable practices 				01:00
		3. Becoming a Professional in the 21st	<ul style="list-style-type: none"> Discuss relevant 21st century skills required for 				01:00

	Century	<p>employment.</p> <ul style="list-style-type: none"> Practice critical thinking and decision making skill 				
	4. Basic English Skills	<ul style="list-style-type: none"> Read English text with appropriate articulation. Practice English words, sentences and punctuation. 				02:00
	5. Communication Skills	<ul style="list-style-type: none"> Explain the importance of communication at workplace. Demonstrate effective communication strategies Demonstrate how to communicate effectively using verbal and nonverbal communication 				04:00
	6. Diversity & Inclusion	<ul style="list-style-type: none"> Explain the need of diversity at workplace Identify the various PwD policies applicable at workplace Discuss the significance of PSH Act 				01:00
	7. Financial and Legal Literacy	<ul style="list-style-type: none"> Discuss various financial institution, products and services Explain the common component of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), Tax 				04:00
	8. Essential Digital Skills	<ul style="list-style-type: none"> Detail the use and features of various MS Office tools, like MS Word, MS Excel, MS PowerPoint, etc. Demonstrate how to operate digital 				03:00

			<p>devices</p> <ul style="list-style-type: none"> • Create an email id and follow e-mail etiquette to exchange e-mails • Describe the role of digital technology in day-to-day life and the workplace 				
		9. Entrepreneurship	<ul style="list-style-type: none"> • Describe the types of entrepreneurship and enterprises • Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement 				07:00
		10. Customer Service	<ul style="list-style-type: none"> • Identify types of customers and how to deal with them • Identify methods to get customer feedback and how to implement them • Explain various tools used to collect customer feedback • Discuss the significance of maintaining hygiene and dressing appropriately 				04:00
		11. Apprenticeships and Jobs	<ul style="list-style-type: none"> • Practice personal grooming strategies • Illustrate the use of online platforms for job hunting • Detail the concept of Apprenticeship • Demonstrate how to enrol for Apprenticeship programs. • Draft a professional Curriculum Vitae (CV) 				02:00
			<ul style="list-style-type: none"> • Role play a mock interview 				

Annexure II- Assessment Criteria**CRITERIA FOR ASSESSMENT OF TRAINEES**

For updated Assessment criteria please refer to Qualification Pack of this Job role available at <https://www.nqr.gov.in/>



Assessment Criteria for CSDCI- Helper Electrician	
Job Role	Helper Electrician
Qualification Pack	CON/Q0601
Sector Skill Council	Construction



S. No.	Guidelines for Assessment
1.	Criteria for assessment for each Qualification File will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2.	The assessment for the 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 50%. To pass the Qualification Pack, every trainee should score a minimum of 50% 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.
7.	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.
8.	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.
9.	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.
10.	Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N0606. Identify and handle different tools, measuring devices and materials relevant to LV electrical works	20	80	-	-	100	30
CON/N0607. Carry out wall chasing and external threading on MS(mild steel) conduit	20	80	-	-	100	30
CON/N0101: Erect and dismantle temporary scaffold up to 3.6-meter height	20	80	-	-	100	10
CON/N8001: Work effectively in a team to deliver desired results at the workplace	20	80	-	-	100	10
CON/N9001: Work according to personal health, safety and environment protocol at construction site	20	80	-	-	100	10
DGT/VSQ/N0101: Employability Skills	20	30	-	-	50	10
Total	120	430	-	-	550	100

Annexure III- QR Codes –Video Links

Chapter Name	Unit Name	Topic Name	URL	QR Code
Chapter 1: Introduction to Helper Electrician Job Role	Unit 1.1: Introduction to Construction Industry	Construction Industry	https://youtu.be/nndLyZrGfWc	 Construction Industry
		Types of Construction	https://youtu.be/1WVzo2UFyo8	 Types of Construction
	Unit 1.2: Role and Responsibilities of a Helper Electrician	Role and Responsibilities of a Helper Electrician	https://youtu.be/fwVndSUFeeEg	 Role and Responsibilities of a Helper Electrician
Chapter 2: LV (Low Voltage) Electrical Works Tools, Devices and Materials Handling	Unit 2.1: Understanding Electric Current	Electric Current	https://youtu.be/kAL17fHlv4U	 Electric Current
		Electric Circuit	https://youtu.be/VnnpLaKsqGU	 Electric Circuit
		Parts of Electric Circuit	https://youtu.be/RQ3dj0s_LY8	 Parts of Electric Circuit
		Passive Circuit Elements	https://youtu.be/V93nP6sCmsQ	 Passive Circuit Elements
		Circuit Breaker	https://youtu.be/-K8yV1saoKQ	 Circuit Breaker

Chapter Name	Unit Name	Topic Name	URL	QR Code
		Relay	https://youtu.be/5Baz70n5qhY	 Relay
		Starter Motor	https://youtu.be/gXKqhFENnQc	 Starter Motor
	Unit 2.2: LV Electrical Works	Electrical Drawings	https://youtu.be/IHHCT43sdYM	 Electrical Drawings
		Hand Tools	https://youtu.be/rBYI10QeoRY	 Hand Tools
		Electrical Material	https://youtu.be/vKKhxwn4P4o	 Electrical Material
		Electrical Measuring Instruments	https://youtu.be/eS9nA5x0TFo	 Electrical Measuring Instruments
Chapter 3: Wall Chasing and External Threading on MS (mild steel) Conduit	Unit 3.1: Electrification of Buildings	Electrification of Buildings	https://youtu.be/2i4ugBLR1KU	 Electrification of Buildings
		Types of Electric Wiring	https://youtu.be/A5P-buWX-dA	 Types of Electric Wiring
		Electrical Fixtures	https://youtu.be/OdnApA_GXsk	 Electrical Fixtures

Chapter Name	Unit Name	Topic Name	URL	QR Code
Chapter 4: Erect and Dismantle Scaffold	Unit 4.1: Erect and Dismantle Scaffold	Scaffolding Components	https://www.youtube.com/watch?v=wdcq4EYST2c	 Scaffolding Components
		Dismantling the Scaffold	https://www.youtube.com/watch?v=OKawvyUhUkA	 Dismantling the Scaffold





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