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Construction Skill Development Council

Facilitator Guide



Sector
Construction

Sub-Sector
Real Estate and Infrastructure Construction

Occupation
Fabrication

Reference ID: CON/Q1202, Version 3.0
NSQF Level 3

Assistant Construction Fitter

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Disclaimer

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

Shri Narendra Modi
Prime Minister of India

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 the successful rollout of the skill development initiatives, helping greatly our stakeholders particularly trainees, trainers and assessors etc. We are thankful to our Subject Matter Expert for the content and for 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 future.

About the Book

The objective of the guide is to provide an approach map for interacting with the trainees undergoing training in this job role. The course aims to provide both theoretical and practical knowledge to the trainees and also to guide them about Assistant Construction Fitter. The guide is neither a substitute nor a 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 in covering a topic and includes some additional information that may be necessary for the trainer to develop better comprehension of 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 through hands-on training. But it has to be ensured that these are following the knowledge imparted and time spent on each unit. It is expected that irrespective of the region, knowledge of all aspects will be imparted to trainees.

Symbols Used

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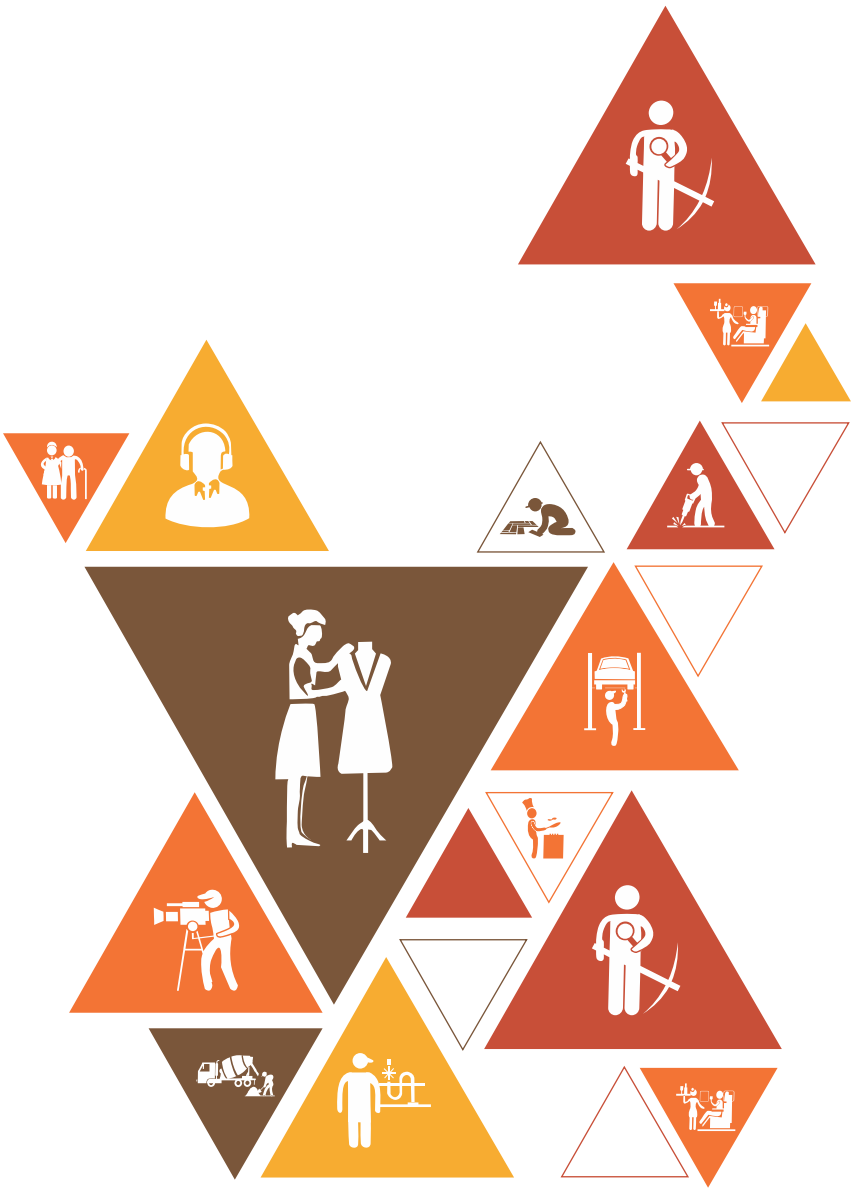
It is recommended that all trainings include the appropriate Employability skills Module. Content for the same can be accessed https://www.skillindiadigital.gov.in/content/list



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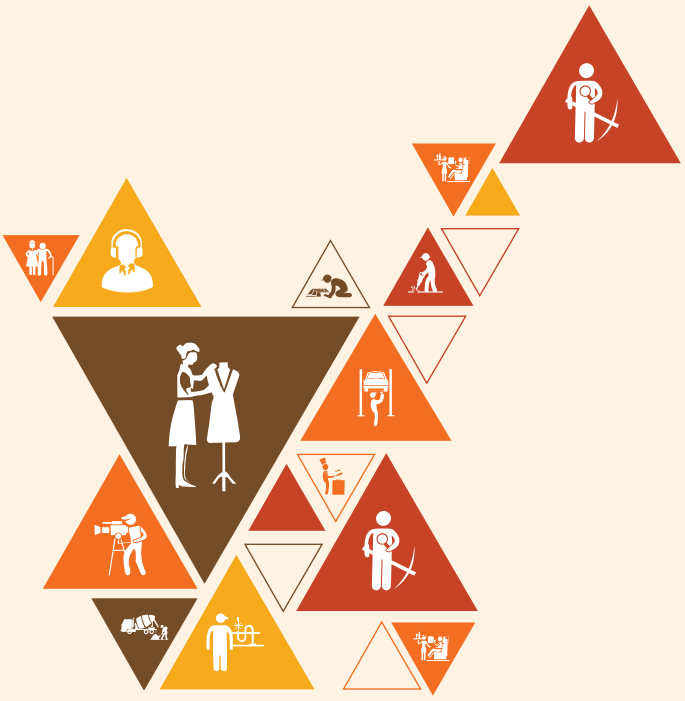
1. Introduction to Fabrication Occupation

Unit 1.1 – Introduction to Construction Industry
Unit 1.2 – Role and Responsibilities of an Assistant Construction Fitter



Bridge Module

Key Learning Outcomes

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

1. Describe the role and responsibilities of an assistant construction fitter.
2. Explain general hierarchy of fabrication occupation.
3. Discuss future possible progression and career options for assistant construction fitter.
4. Explain trade terminologies like orientation, alignment etc. used in fabrication occupation.

Unit 1.1: Introduction to Construction Industry

Unit Objectives

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

1. Give an 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.

Say

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

Ask

- What do you understand 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

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.

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. Analyze 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.

Notes

Unit 1.2 Role and Responsibilities of an Assistant Construction Fitter

Unit Objectives

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

1. Describe the role and responsibilities of an assistant construction fitter.
2. Explain general hierarchy of fabrication occupation
3. Discuss future possible progression and career options for assistant construction fitter
4. Explain trade terminologies like orientation, alignment etc. used in fabrication occupation

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 role and responsibilities, personal attributes, and career path of an assistant construction fitter.

Say

- In this session, we shall learn key facts about the role and responsibilities, personal attributes, and career path of an assistant construction fitter.

Ask

- What do you know about the job role of an assistant construction fitter?
- Do you know the career opportunities available for an assistant construction fitter?

Elaborate

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

- Introduction to Assistant Construction Fitter
- Role and Responsibilities of an Assistant Construction Fitter
- Personal Attributes required by an Assistant Construction Fitter

Say

Let us now perform an activity based on various career opportunities available for an assistant construction fitter.

Activity

- **Purpose:** Familiarize participants with diverse employment opportunities for an assistant construction fitter, highlighting roles, responsibilities, and potential career paths.
- **Resources Required:** PowerPoint Presentation, Handouts or printouts of job descriptions.
- **Tentative Duration:** 60 Mins
- **Procedure:**

1. Explain the importance of an assistant construction fitter in the construction industry.
2. Emphasize the objective of exploring employment opportunities in the industry.
3. Encourage participants to share their initial thoughts on the roles and responsibilities of an assistant construction fitter.
4. Provide handouts or printouts of various employment opportunities in the construction industry as per different NSQF Levels.
5. Discuss each opportunity, highlighting roles, responsibilities, and required skills.
6. Divide participants into small groups.
7. Assign each group a specific employment opportunity to discuss key aspects, qualifications, skills, and career progression.
8. Now ask each group to provide a short researched explanation of the opportunity assigned.
9. Summarize key points, emphasizing the range of career paths and the importance of an Assistant construction fitter.

Key Outcome

Participants gain awareness of the wide range of employment opportunities in the construction industry, understand the specific roles and responsibilities of an assistant construction fitter, and will be inspired to explore potential career paths within the field.

Say

There are various career opportunities available for an assistant construction fitter, I'm hoping now you have a better idea of them.

Summarize

- Note down the important points related to the role and responsibilities, personal attributes, and career path of an assistant construction fitter.
- Revise these points with the participants.

Notes for Facilitation

- Arrange the relevant handouts and leaflets for a better understanding of the topic:
- Arrange audio-visual aids to make them understand
- 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 career path of an Assistant Construction Fitter involves progressing through different levels, starting with same Level 3 as a Grinder Construction and Gas Cutter, and advancing to Level 4 as a Construction Fitter and Plasma Cutter.

2. An Assistant Construction Fitter is responsible for his own work up to a certain limit and works closely with the trade senior to complete tasks on time and well, following standard working procedures and safety rules. The responsibilities include:

    - Identifying materials based upon instructions
    - Measuring and marking structural steel elements as per instructions and hand sketches
    - Operating a bevelling machine for edge preparations
    - Preparing platforms for fitup
    - Placing and fixing elements as per instruction
    - Assisting in shifting of heavy materials under supervision

3. An Assistant Construction Fitter should be:

    - Physically fit, mentally alert, and safety-minded
    - Able to work in different places with different weather and site conditions
    - Ideally, not suffering from any breathing problems, vision problems, or skin allergies caused by light and heat
    - Able to work well as part of a team
    - Able to use different tools and materials for fabrication

4. The different types of fabrication:

    a. Metal Fabrication

    b. Sheet Metal Fabrication

    c. Welding Fabrication

d. Structural Fabrication

e. Plastic Fabrication

f. Wood Fabrication

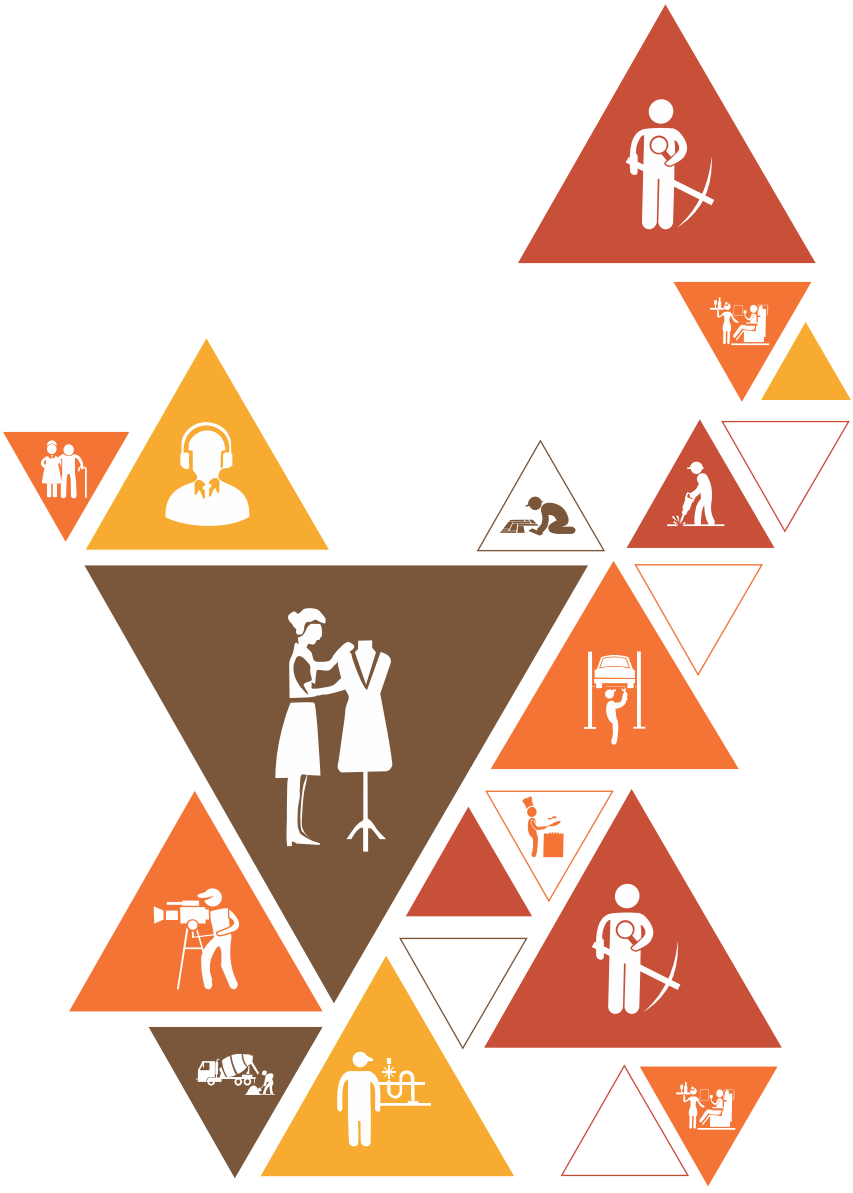
g. Composite Fabrication

h. Electronic Fabrication

i. Glass Fabrication

j. Textile Fabrication

Notes



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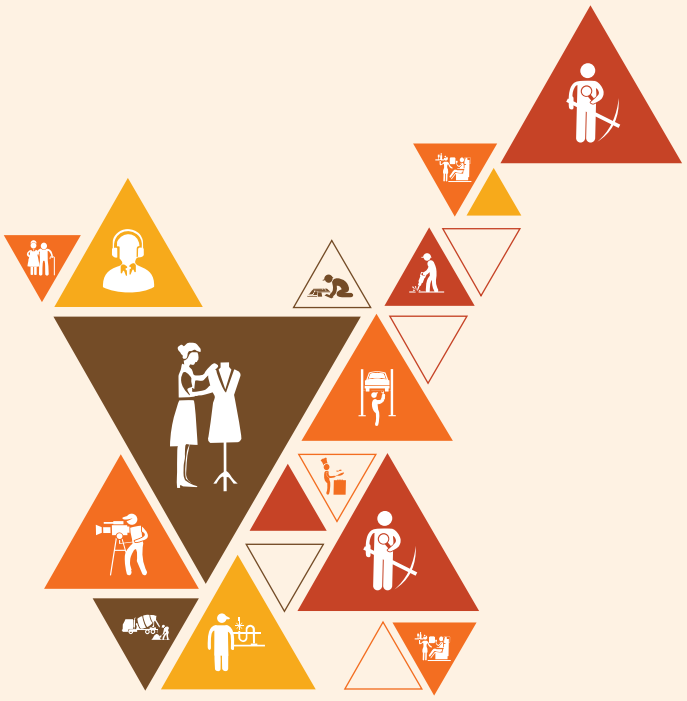
2. Identify and Mark Structural Elements

Unit 2.1 Identify and mark structural elements



(CON/N1203)

Key Learning Outcomes

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

1. Compute dimensions of structural elements by interpreting hand sketches and simple drawings.
2. Determine the location and orientation of sections for marking by interpreting the sketches
3. Explain the process of measuring and marking structural steel
4. Categorize materials used in fit up based upon the weight (light, medium and heavy materials)
5. Describe the ergonomics involved in material shifting
6. Explain various methods of shifting and stacking heavy materials
7. Explain undulations and their effect on the quality of overall output.
8. Identify various sections on basis of shapes
9. Differentiate between sheet and plate sections based on size
10. Identify the sections (I, C, H, UC) from the hand sketches or fabrication shop drawings.
11. Demonstrate measuring and marking on steel sections specifying location of components (plate sections, bar section, rolled sectioned.)

Unit 2.1 Identify and mark structural elements

Unit Objectives

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

1. Compute dimensions of structural elements by interpreting hand sketches and simple drawings.
2. Determine the location and orientation of sections for marking by interpreting the sketches
3. Explain the process of measuring and marking structural steel
4. Categorize materials used in fit up based upon the weight (light, medium and heavy materials)
5. Describe the ergonomics involved in material shifting
6. Explain various methods of shifting and stacking heavy materials
7. Explain undulations and their effect on the quality of overall output.
8. Identify various sections on basis of shapes
9. Differentiate between sheet and plate sections based on size
10. Identify the sections (I, C, H, UC) from the hand sketches or fabrication shop drawings.
11. Demonstrate measuring and marking on steel sections specifying location of components (plate sections, bar section, rolled sectioned.)

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters computing dimensions of structural elements by interpreting hand sketches and simple drawings, ergonomics in Material Handling measuring and marking on steel sections specifying location of components, etc.

Say

In this session, we shall learn about the depicting computing dimensions of structural elements by interpreting hand sketches and simple drawings, determine the location and orientation of sections for marking, various methods of shifting and stacking heavy materials, and measuring and marking on steel sections specifying location of components.

Ask

- Does anyone know what structural elements are?

Elaborate

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

- Structure Steel Fabrication
- Anatomy of a Steel Structure
- Types of Structural Steel
- Drawings of Steel Structure
- Shop Drawings
- Computing Dimensions of Structural Elements by Interpreting Drawings
- Measuring Out Structural Steel
- Marking Structural Steel
- Fit up of Structural Steel
- Material Handling
- Ergonomics in Material Handling
- Shifting and Stacking Heavy Materials
- Undulations and Bends

Demonstrate

Use a projector and show the following YouTube video- https://www.youtube.com/watch?v=9u4ggEkmZHY to participants on structural steel fabrication - basic and essential methods of marking out steel beams, RSJ & columns.

Activity

- **Purpose:** The aim of the activity is to develop students' skills in interpreting engineering drawings and calculating dimensions of structural elements accurately.
- **Resources Required:** Engineering drawings of different structural elements, rulers or callipers for measurements, graph paper, pencils, erasers, and calculators.
- **Tentative Duration:** 2-3 Hours
- **Procedure:**

1. Start the class by providing a brief overview of the importance of interpreting engineering drawings in the construction and engineering fields.
2. Explain the significance of accurate calculations for dimensions in ensuring the stability and safety of structural elements.
3. Distribute copies of engineering drawings representing different structural elements, such as beams, columns, trusses, or foundations.
4. Instruct students to carefully analyze the drawings, identify the relevant dimensions, and label them appropriately.
5. Encourage them to discuss their observations in groups, fostering collaborative learning and problem-solving skills.
6. Provide each group with a set of measuring tools (rulers, tapes, or calipers) and engineering computation sheets or graph paper.
7. Instruct students to measure the dimensions of the identified structural elements accurately.
8. Guide them in performing the necessary calculations using formulas relevant to each structural element (e.g., beam length, column cross-sectional area, truss member lengths, etc.).
9. Assist students in resolving any challenges they encounter during the measurements or calculations.
10. Ask each group to present their findings, explaining the process they followed to interpret the drawing and compute the dimensions.
11. Summarize the key takeaways from the activity, emphasizing the importance of precision in interpreting drawings and calculating dimensions for structural elements.

- **Expected outcome:** The participants will have the improved interpretation skills, enhanced mathematical abilities, increased awareness of accuracy, strengthened teamwork, and improved critical thinking.

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. Structural steel fabrication is the process of cutting, bending, and assembling steel components to create frameworks, beams, columns, and other structural elements used in construction projects such as buildings, bridges, and industrial structures. This fabrication process ensures that the steel components are precisely crafted to meet engineering specifications and design requirements for strength, stability, and durability in the final construction.
2. Different types of structural steel include I-beams, H-beams, channels, angles, and hollow structural sections (HSS).
3. Fabrication drawings are detailed drawings used by fabricators to manufacture and assemble structural components. The process of interpreting fabrication drawings involves understanding the dimensions, specifications, and symbols to accurately fabricate the required parts and ensure proper assembly.
4. Methods of marking structural steel include using paint, chalk, stickers, or stamps to label pieces with relevant information, such as part numbers, assembly marks, and orientation. This helps fabricators identify and arrange the steel components correctly during the assembly process.
5. Ergonomics is the study of designing and arranging the work environment to fit the capabilities and needs of the workers, aiming to optimize efficiency, safety, and comfort. It is crucial in preventing work-related injuries, improving productivity, and enhancing overall well-being of the workforce.

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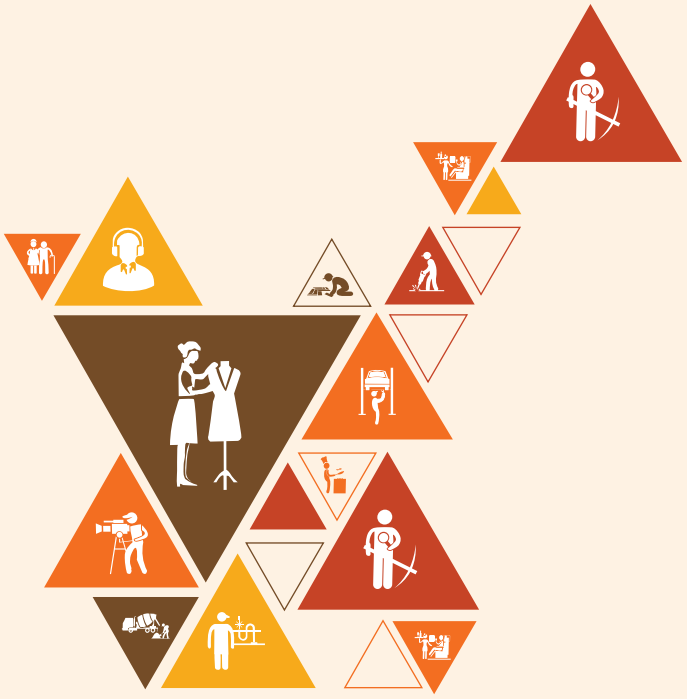
3. Tools and Heavy Materials Used in Fit-Up of Fabricated Components

Unit 3.1 Tools and Instrument used in Construction Fitting



(CON/N1204)

Key Learning Outcomes

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

1. Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.
2. Explain the areas of application of each instrument.
3. List major equipment manufacturers, the models, cost and specifications of instruments and equipment used for fabrication
4. Use various tools and tackles required for performing lifting and shifting of heavy materials
5. Apply various do's and don'ts while performing lifting and shifting of heavy materials
6. Apply safe working practices while lifting and shifting heavy materials
7. Demonstrate visual checks carried out for serviceability of hand tools
8. Demonstrate checks performed for ensuring no obstruction of load
9. Describe process of controlling the position of suspended load
10. Demonstrate anchoring and control position of suspended object during lifting
11. Demonstrate material shifting as per standard practices.
12. Demonstrate safe stacking of heavy materials as per standard practices.

Unit 3.1 Tools and Instrument used in Construction Fitting

Unit Objectives

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

1. Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.
2. Explain the areas of application of each instrument.
3. List major equipment manufacturers, the models, cost and specifications of instruments and equipment used for fabrication
4. Use various tools and tackles required for performing lifting and shifting of heavy materials
5. Apply various do's and don'ts while performing lifting and shifting of heavy materials
6. Apply safe working practices while lifting and shifting heavy materials
7. Demonstrate visual checks carried out for serviceability of hand tools
8. Demonstrate checks performed for ensuring no obstruction of load
9. Describe process of controlling the position of suspended load
10. Demonstrate anchoring and control position of suspended object during lifting
11. Demonstrate material shifting as per standard practices.
12. Demonstrate safe stacking of heavy materials as per standard practices.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters of various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting

Say

In this session, we shall learn about the depicting various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting, major equipment manufacturers, the models, cost and specifications of instruments and equipment used for fabrication, use various tools and tackles required for performing lifting and shifting of heavy materials, safe working practices while lifting and shifting heavy materials, etc.

Ask

- Does anyone know which tool or equipment are used for marking in construction fitting?

Elaborate

In this unit, we will discuss the following topics:

- Fabrication
- Marking out Tools and Instruments
- Linear Measurements Tools and Instruments
- Angular Measurements Tools and Instruments
- Holding and Tightening Metal Pieces Tools and Instruments
- Cutting and Striking Tools and Instruments
- Lifting and Shifting of Heavy Materials
- Do's and Don'ts for Heavy Lifting
- Safe Practices while Heavy Lifting
- Checking for Obstruction of Load
- Controlling the Position of Suspended Load
- Stacking of Heavy Materials
- Visual Checks of Hand Tools

Demonstrate

Use a projector and show the following YouTube video- https://www.youtube.com/watch?v=1Ci9-Mp2KVg to participants on structural steel fabrication - measuring tools for welding and fabrication.

Activity

- **Purpose:** The aim of the activity is to familiarize students with identifying reputable equipment manufacturers used in construction fitting.
- **Resources Required:** Computers/smartphones with internet access, tool list, manufacturer databases, and online directories.

- **Tentative Duration:** 2 Hours
- **Procedure:**

1. Begin by introducing the importance of using high-quality tools and equipment in construction fitting.
2. Distribute a list of common tools and equipment used in construction fitting. The list should include items like wrenches, saws, drills, measuring instruments, safety equipment, etc.
3. Instruct students to use their computers or smartphones to research major equipment manufacturers. They should focus on identifying well-known and reputable companies that produce the tools and equipment from the provided list.
4. Students can use search engines, industry-specific websites, manufacturer databases, and online directories. Have students present their findings to the class.
5. Ask each student or small group to present their findings to the class. They should share information about the manufacturers they discovered, the types of tools and equipment they produce, and any notable features or advantages of their products.
6. Guide the class in developing a set of evaluation and selection criteria for choosing equipment manufacturers. Factors to consider may include product quality, warranty and customer support, product reviews, certifications, and the company's reputation in the industry.
7. As a class, compile the information gathered into a reference guide. This guide should list the major equipment manufacturers along with their respective products and key features.

- **Expected outcome:** The participants will be able to identify major equipment manufacturers, understand the significance of quality equipment, and apply evaluation criteria for selection. They collaborate on a reference guide for future use.

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. Fabrication is the process of creating, shaping, or assembling materials to construct various products or structures. Common instruments and equipment used in fabrication include welding machines, grinders, shears, plasma cutters, and bending machines.
2. Marking out tools and instruments in construction fitting include scribers, center punches, combination squares, protractors, and chalk lines.

3. Angular gauges in construction are used to measure and mark angles accurately, ensuring precise alignment and fit of components in various construction tasks.

4. Tools and instruments used for cutting and striking in construction fitting include hacksaws, chisels, hammers, mallets, and sledgehammers.

5. Do's for heavy lifting in construction fitting: Use proper lifting techniques, seek assistance when needed, wear appropriate personal protective equipment (PPE). Don'ts: Avoid lifting beyond your capacity, avoid twisting while lifting, and never lift with your back; use your legs instead.

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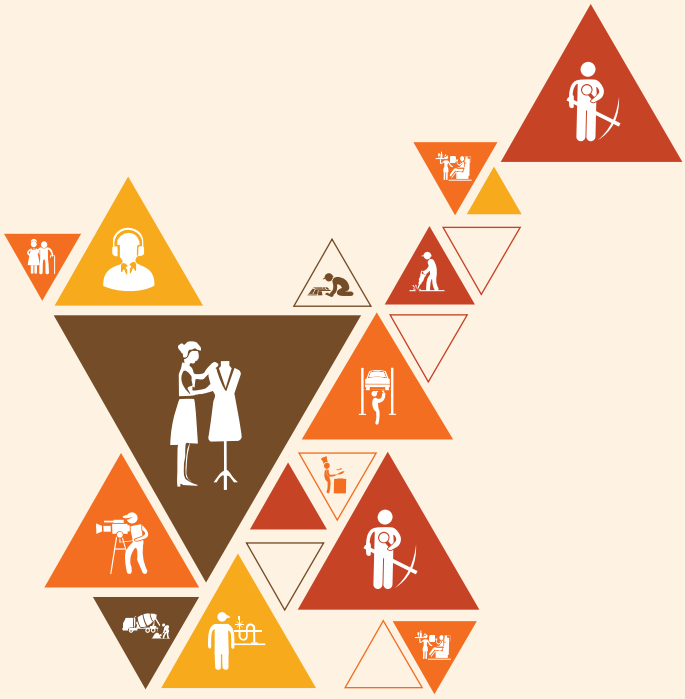
4. Edge Preparation and Positioning of Steel Sections for Fit-Up

Unit 4.1 Edge Preparation and Positioning of Steel Sections for Fit-Up



(CON/N1205)

Key Learning Outcomes

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

1. Explain fit-up, its role and purpose and common trade terminologies
2. Describe fabrication platform, its preparation and use
3. Explain scrap and its disposal
4. Describe and use the anchoring devices, explain their operation and purpose
5. Introduction to various types of jacks
6. Interpret the drawings/ hand sketches to obtain relevant details like dimensions, orientation, alignment etc. for edge preparation.
7. Use equipment and tools for edge preparation
8. Demonstrate operation of bevelling machine to obtain required edge preparation as per the drawings, following standard safety parameters
9. Perform measurements of the edge preparation to confirm its dimensional correction, following standard safety parameters
10. Carryout marking on the structural steel sections from the hand sketches provided
11. Describe the procedure for placing and fixing the structural steel sections on the fabrication platform
12. Demonstrate the procedure for placing and fixing the structural steel sections on the fabrication platform

Unit 4.1 Edge Preparation and Positioning of Steel Sections for Fit-Up

Unit Objectives

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

1. Explain fit-up, its role and purpose and common trade terminologies
2. Describe fabrication platform, its preparation and use
3. Explain scrap and its disposal
4. Describe and use the anchoring devices, explain their operation and purpose
5. Introduction to various types of jacks
6. Interpret the drawings/ hand sketches to obtain relevant details like dimensions, orientation, alignment etc. for edge preparation.
7. Use equipment and tools for edge preparation
8. Demonstrate operation of bevelling machine to obtain required edge preparation as per the drawings, following standard safety parameters
9. Perform measurements of the edge preparation to confirm its dimensional correction, following standard safety parameters
10. Carryout marking on the structural steel sections from the hand sketches provided
11. Describe the procedure for placing and fixing the structural steel sections on the fabrication platform
12. Demonstrate the procedure for placing and fixing the structural steel sections on the fabrication platform

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters of edge preparation as per the drawings, following standard safety parameters.

Say

In this session, we shall learn about the depicting fit-up, fabrication platform, scrap disposal, using the anchoring devices, types of jacks, edge preparation, etc.

Elaborate

In this unit, we will discuss the following topics:

- Fit-Up
- Common Terminologies
- Fabrication Platforms
- Scrap Disposal
- Anchoring Devices
- Jacks
- Edge Preparation
- Tools and Equipment used in Edge Preparation
- Interpretation of Drawings for Edge Preparation
- Bevelling Machine for Edge Preparation
- Measurements of the Edge Preparation
- Marking on the Structural Steel Sections from the Hand Sketches
- Placing and Fixing the Structural Steel Sections on the Fabrication Platform

Demonstrate

Use a projector and show the following YouTube video- https://www.youtube.com/watch?v=8kbUZLuhrW8 to participants on understand different types of edge preparation for weld joints.

Activity

- **Purpose:** The aim of the activity is to help participant understand the importance of interpreting technical drawings for edge preparation in engineering and manufacturing.
- **Resources Required:** Technical drawings of edge preparations, projector, handouts, and safety equipment (optional: workshop with edge preparation tools).
- **Tentative Duration:** 2 Hours
- **Procedure:**

1. Start the session by explaining the importance of edge preparation in various engineering processes. Discuss different types of edge preparations and their applications.
2. Display technical drawings of various edge preparations.

1. Explain the symbols and notations used in the drawings related to edge preparation.
2. Discuss how to interpret the drawings to understand the required edge preparation for a particular job.
3. Demonstrate edge preparation techniques on a sample workpiece.
4. Show students how to identify the correct edge preparation based on the provided technical drawing.
5. Emphasize safety procedures while performing the demonstration.
6. Divide the students into small groups.
7. Distribute different technical drawings of edge preparations to each group.
8. Ask each group to interpret the drawings and discuss the appropriate edge preparation technique based on the given information.

- **Expected outcome:** The participants will understand edge preparation, interpret technical drawings, and recognize appropriate edge preparation techniques.

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. Fit-Up: Fit-up refers to the process of aligning and positioning structural components, such as steel sections, accurately before welding or bolting to ensure proper assembly and dimensional accuracy in construction projects.
2. Placing and Fixing Structural Steel Sections: Structural steel sections are placed on the fabrication platform using cranes or hoists, and they are fixed in position by tack welding or temporary fasteners to maintain alignment during the welding or bolting process.
3. Importance of Jacks in Construction Fitting: Jacks are vital tools in construction fitting as they provide adjustable support to lift and hold heavy components, ensuring precise positioning and alignment during assembly.
4. Anchoring Devices: Anchoring devices are fasteners used to secure structural elements to their foundation or other supporting structures. Commonly used ones include anchor bolts, expansion anchors, and concrete screws.

5. Edge Preparation: Edge preparation involves the process of shaping and beveling the edges of metal plates or pipes before welding to achieve proper joint penetration and improve the quality and strength of the weld in construction fabrication.

Notes

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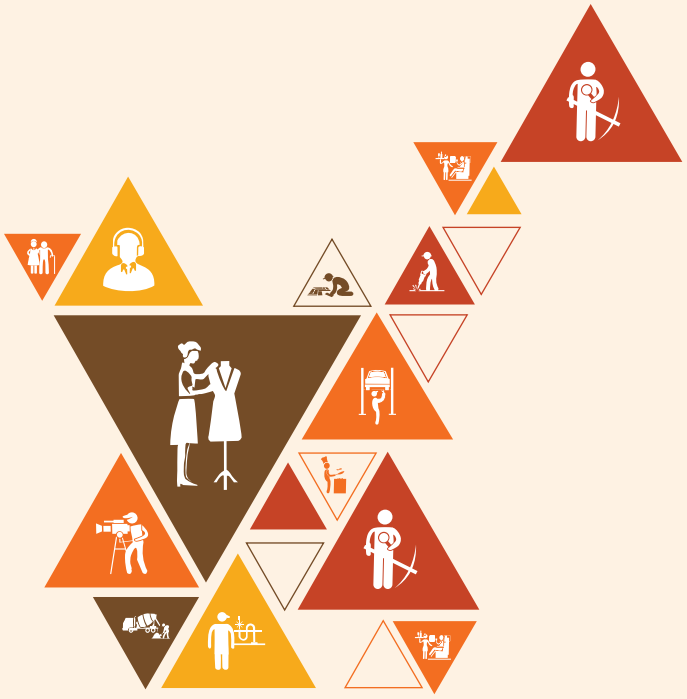
5. Work Effectively in a Team

Unit 5.1 Effective Interaction and Communication



(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.

Unit 5.1 Effective Interaction and Communication

Unit Objectives

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

1. Demonstrate effective communication skills while interacting with co-workers, trade seniors and others during the assigned task.
2. Interpret work sketches, formats, permits, protocols, checklists and work-related requirements which are to be conveyed to other team members
3. Handle material/ tools by adhering to instructions or consulting with seniors
4. Demonstrate effective reporting to seniors as per applicable organisational norms
5. Explain effects and benefits of timely actions relevant to fabrication works with examples
6. Explain importance of team work and its effects relevant to fabrication works with examples
7. Demonstrate team work skills during assigned task.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts etc.
- PowerPoint slides, pictures/posters depicting effective interaction and communication at the workplace.

Say

In this session, we shall learn about effective communication skills while interacting with co-workers, trade seniors and others during the assigned task, interpret work sketches, formats, permits, protocols, checklists and work-related requirements, handle material/ tools by adhering to instructions or consulting with seniors, effects and benefits of timely actions relevant to fabrication works with examples, etc.

Demonstrate

Use a projector and show the following YouTube video- 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 an assistant construction fitter 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
- Time Management
- Time Management for Assistant Construction Fitter
- Construction Reporting
- Handle material/ tools by adhering to instructions or consulting with seniors

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 WorkersYou 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 PlanDuring 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:

1. Improved understanding of effective communication.
2. Application of knowledge in real-life scenarios.
3. Ability to adapt communication style.
4. Enhanced collaboration and teamwork.
5. 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.

Exercise

Key Solutions to PHB Exercise

1. The 7 Cs of effective communication are clear, concise, concrete, correct, coherent, complete, and courteous.
2. Poor communication in construction projects leads to several issues:

    1. Creating Confusion: Miscommunications among stakeholders and construction professionals can cause misunderstandings, leading to errors, delays, and cost overruns in both the construction site and office. Clear and concise messages are essential to prevent confusion.

2. Unnecessary Delays: Inefficient communication, such as delays in information flow, incorrect recipients, or confusing messages, can result in errors that cause project delays. This includes ordering unsuitable materials, skipping construction steps, or misallocating labor.

3. Budget/Cost Overruns: Inefficient project communications and time management contribute to over 50% of project budget risks. Poor communication often leads to increased expenditures, affecting the project's budget negatively.

4. Injuries and Safety Issues: Poor safety communication is often attributed to workers' lack of safety training vocabulary, fear of speaking out about hazards, and a negative perception of safety communication, focusing only on negatives.

5. Issues with Stakeholders: Effective and thorough communication among various stakeholders, including owners, designers, contractors, and laborers, is crucial for project success. Poor project data and miscommunications contribute to a significant portion of project rework, leading to increased expenses and disputes among stakeholders.

3. 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.

4. The teamwork can be enhanced in the workplace by:

1. Concentrate more on "us" than "me"

A minor step is to begin speaking in the plural, so that all members feel as though they are a part of the effort. The greater our involvement, the harder we work to obtain the finest results.

2. Communicate Explicitly

Communication is the fundamental prerequisite. We must create an atmosphere in which team members are free to share their thoughts. It is advisable to make an effort to prevent such misunderstandings.

3. Delegate and believe

When working in a team, each assignment symbolises a problem that can be readily overcome via teamwork. Team leaders should be aware of the abilities and qualities of their team members and assign them jobs where they may demonstrate their value. For this, they must feel at ease while working and have confidence that their bosses have faith in them.

4. Establish shared aims and objectives

It is crucial to establish a unified business objective and effectively communicate it to team members.

5. Recognize and honour the achievements of others.

This attitude strengthens the team's trust and teamwork, which will inspire them to achieve the following objectives.

6. Conquer a conflict with success

Workplace conflicts are prevalent, and people with conflict management abilities are in high demand. Learn this talent if you still lack it.

7. **Build a diverse group**

   People with varied origins, personalities, and experiences can be a source of innovative ideas. Through intelligent reading, we will recognise that we have the opportunity to maximise each individual's qualities.

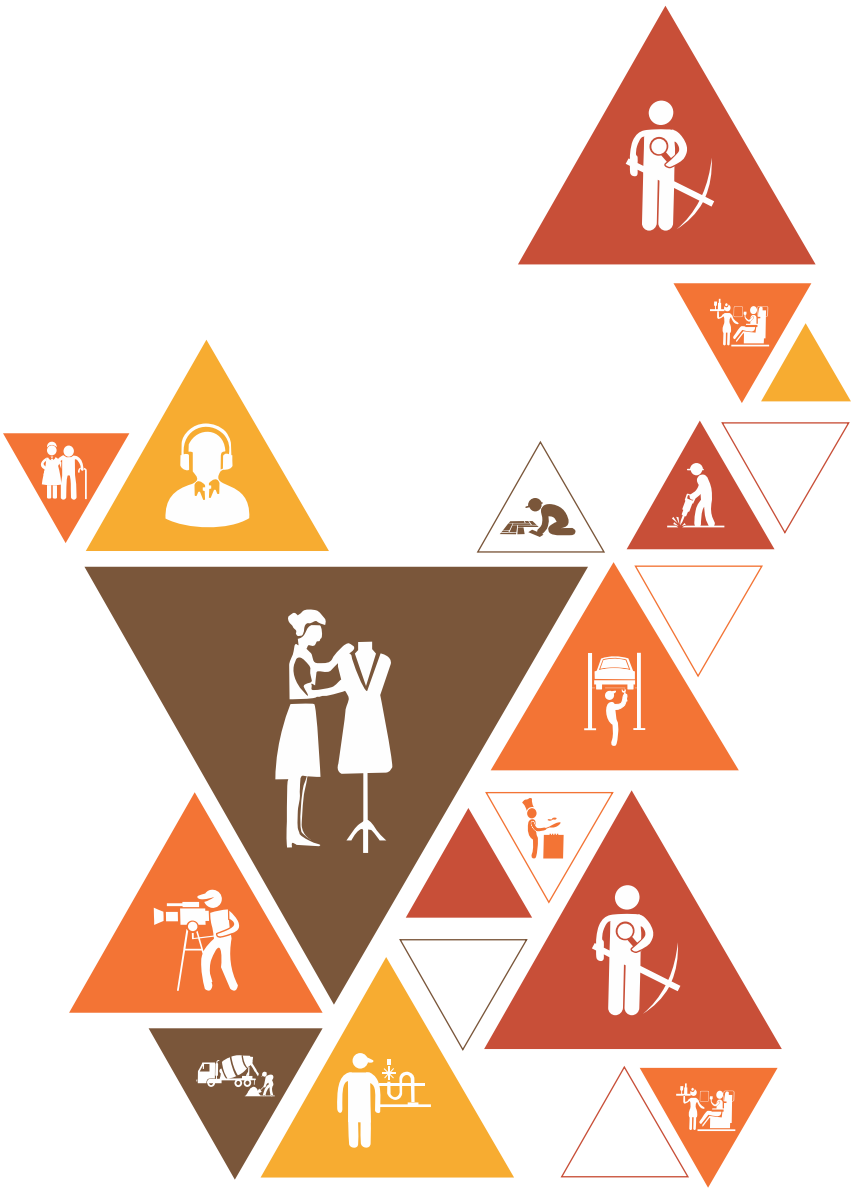
8. **Believe in Team Building**

   It's been said that teams that have fun remain together, thus establishing personal relationships in the workplace is a fantastic way to boost teamwork.

5. The benefits of time management skills to both the person and the company are:

1. Enhanced productivity and performance: Poor time management causes employees to feel overwhelmed, whereas excellent time management leads to increased efficiency, which in turn improves performance.
2. Providing work on schedule: This is the most visible advantage of excellent time management, but it is also one of the most crucial. Time management enables workers to meet deadlines, which is essential for meeting client expectations.
3. Less anxiety and stress: When employees are stressed and anxious, not only do they miss deadlines and produce subpar work, but it also negatively affects their health. As an employer, you are responsible for ensuring that the mental health of your employees is a top priority. Stressed employees are more prone to take sick days and seek alternative jobs.
4. Better-quality work: With effective time management, employees have the necessary time to produce work that is not only completed on time but also of superior quality.
5. Boosts confidence: When employees are on top of their responsibilities, it boosts their confidence and enables them to believe in their talents. In turn, this reduces tension and anxiety because the body produces dopamine.
6. Reduces procrastination and wasted time: Knowing how to prioritise decreases procrastination and promotes a "eat the frog" mentality among staff. This saves downtime and increases productivity.
7. Enhances the work-life balance: An effective work-life balance When an employee is well-rested and has the opportunity to re-energize, they are in the best position possible to produce their finest work.
8. Make better decisions: When employees have time to concentrate and work thoroughly, they are not required to make decisions under duress. Instead, individuals can make selections based on all the necessary information to make the greatest choice.

Notes



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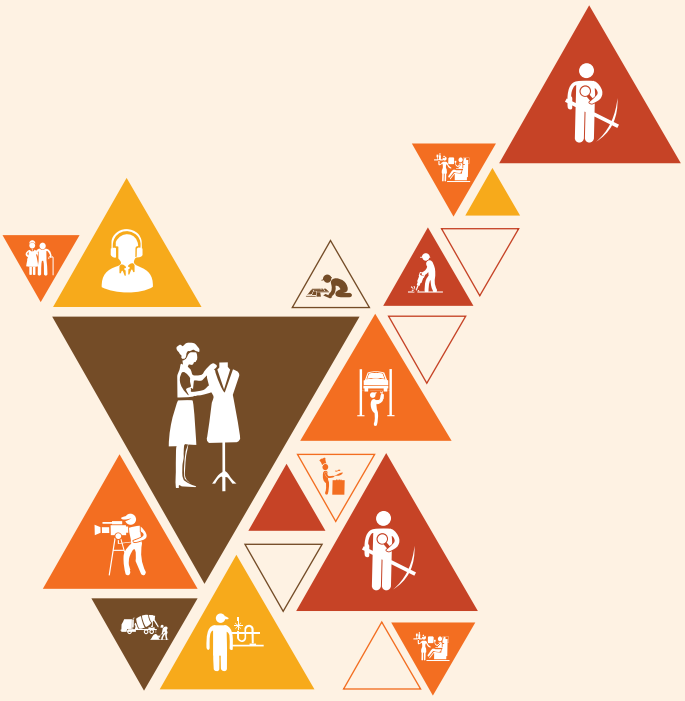
6. Follow Safety Norms at Workplace

Unit 6.1 – Workplace Hazards
Unit 6.2 – Fire Safety
Unit 6.3 – Safety Measures at Workplace



(CON/N9001)

Key Learning Outcomes

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

1. Explain the types of hazards at the construction sites
2. Identify the hazards specific to the fabrication works
3. Recall the safety control measures and actions to be taken under emergency situations
4. Explain the classes of fire and types of fire extinguishers
5. Demonstrate the operation of fire extinguisher
6. Demonstrate different methods involved in providing first aid to the affected person.
7. Explain the importance of worker participation in safety/mock drills
8. Demonstrate the use of all Personal Protective Equipment (PPE) like helmet, safety shoe, safety belt, safe jackets and other safety equipment relevant to fabrication works requirement
9. Explain the reporting procedures adopted during emergency situations
10. Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories
11. Explain different types of wastes produced at a construction site including their disposal method
12. Explain the purpose and importance of vertigo test at construction site
13. Demonstrate vertigo test
14. List out basic medical tests required for working at construction site
15. Explain the types of ergonomic principles adopted while carrying out specific task at the construction
16. Explain the benefits of basic ergonomic principles used at construction sites.
17. Explain the importance of housekeeping works
18. Demonstrate housekeeping practice followed after construction fitter works.

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
2. Identify the hazards specific to the fabrication works
3. Recall the safety control measures and actions to be taken under emergency situation.
4. Explain the reporting procedures adopted during emergency situations.
5. Describe the standard procedure for handling, storing and stacking of material, tools, equipment and accessories.
6. Explain the types and benefits of basic ergonomic principles, which should be adopted while carrying out specific task at the construction sites.
7. Demonstrate the use of all Personal Protective Equipment (PPE) like helmet, safety shoe, safety belt, safe jackets and other safety equipment relevant to fabrication works requirement.

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 PPEs as per work requirements, etc.

Say

In this session, we shall learn about the importance of the types of hazards at the construction sites and identify the hazards, standard procedure for handling, storing and stacking of material, tools, equipment and accessories, PPEs as per work requirements, safety control measures and actions to be taken under an emergency situation, the types and benefits of basic ergonomic principles, etc.

Ask

- Does anyone know the types of hazards at the construction sites?
- Why do you think it is important to use PPEs as per work requirements during construction jobs?

Elaborate

In this unit, we will discuss the following topics:

- 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, 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

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.

Resources to be used

- Available objects such as whiteboard, duster, marker, notepad, pens, participant handbooks, computers, projectors, flipcharts, etc.
- PowerPoint slides and pictures/posters depicting the operating procedure of the fire extinguishers.

Say

In this session, we shall learn about fire safety.

Ask

- What will you do if a fire breaks out in the workplace?
- What are the emergency situations?
- Explain the method of using a fire extinguisher.

Demonstrate

Demonstrate the step-by-step evacuation process to the participants; it should include:

- Detection
- Decision
- Alarm
- Reaction

The movement to an area of refuge or an Assembly station

Transportation

Also, explain these points, in brief, to make the participants more clear about the process of evacuation and ask them to jot down these points in their notes: -

Clear passageways to all escape routes

- Signage indicating escape routes should be marked.
- Enough exits and routes should be present to allow a large number of people to be evacuated quickly.
- Emergency doors that open easily.
- Emergency lighting where needed.
- Training for all employees to know and use the escape routes.
- A safe meeting point or assembly area for staff.
- Instructions on not using the elevator during a fire.

Elaborate

In this unit, we will discuss the following topics:

- Fire and its Classes
- Fire Safety
- Prevention of a Workplace Fire
- Fire Extinguisher

Say

Let us now participate in an activity to understand the concept better.

Activity

- **Purpose:** The purpose of this activity is to educate participants about the various safety signage at construction sites.
- **Resources Required:** Signage posters/PPT of the following:

- **Tentative Duration:** 60 minutes
- **Procedure:**
  1. Show the PPT with various signs used in safety drills.
  2. Later randomly select the participant and ask them to identify the signage.
- Expected outcome: The participant in this activity will be able to recall the various safety signage at construction sites.

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 6.3 – Safety Measures at Workplace

Unit Objectives

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

1. Explain the importance of housekeeping practice followed after construction fitter works.
2. Demonstrate safe housekeeping practices.
3. Explain the importance of participation of workers in safety drills.
4. Explain the purpose and importance of vertigo test at construction site.
5. List out basic medical tests required for working at construction site.
6. Demonstrate vertigo test.
7. Demonstrate different methods involved in providing First aid to the affected person
8. Demonstrate safe waste disposal practices followed at construction site.
9. Explain different types of waste at construction sites and their disposal method.

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 steps in safety drills, different methods involved in providing First aid to the affected person, safe waste disposal practices followed at construction site, etc.

Say

In this session, we shall learn about the importance of housekeeping works, purpose and importance of vertigo test at construction site, basic medical tests required for working at construction site, different methods involved in providing First aid to the affected person, safe waste disposal practices, etc.

Ask

- Why do you think the safe housekeeping practices are important at construction site?
- Can you tell me how should the construction waste disposed of?

Elaborate

In this unit, we will discuss the following topics:

- Safety, Health and Environment at Work Place
- Good Housekeeping
- Safety Drills at Construction Site
- Medical Examination for Construction Workers
- Vertigo Test
- First Aid
- Treating Minor Cuts and Scrapes
- Waste Management

Activity

- **Purpose:** The participant will learn more about the first aid kits in this activity.
- **Resources Required:** Computer, internet.
- **Tentative Duration:** 1 Hour
- **Process:**
  1. Divide participants into 5 groups and provide them with first aid kit essentials.
  2. Ask them to surf the internet and explain the usage of each item included in the kit.
  3. Alternatively show them a video about the usage and ask them to make notes.
  4. Also, provide them cardboard, paper, scissors, glue stick, and colour pens to make the first aid box.
- **Estimated Outcome:** The participants will have detailed knowledge about first aid kits

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.
6. 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.
7. 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.
8. 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.
9. 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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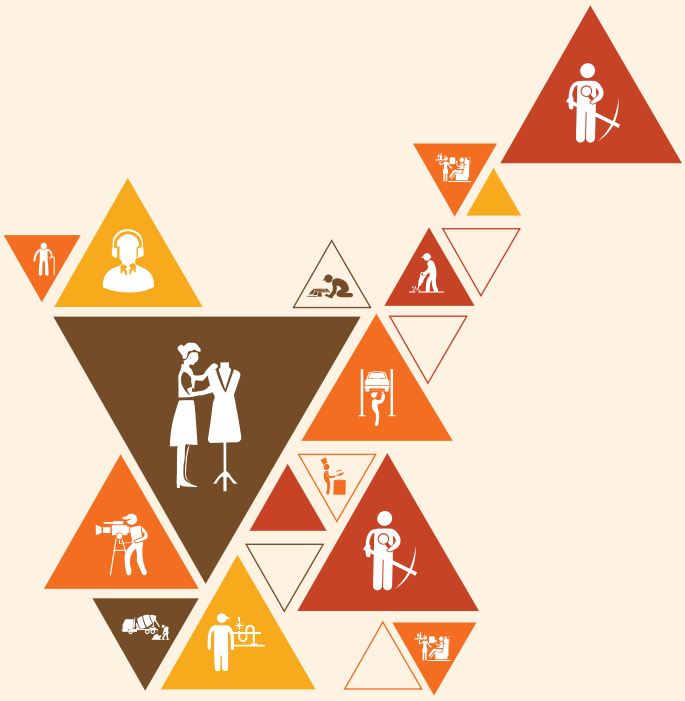
7. Employability Skills (30 Hours)

The details of Employability module is available on the below link.

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

Scan the QR code below to access the ebook



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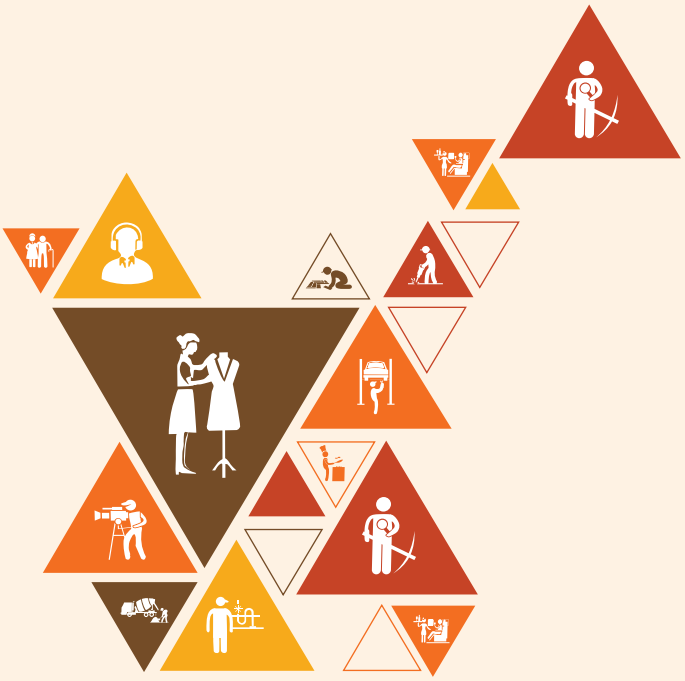
8. Annexures

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:	Assistant Construction Fitter		
Qualification Pack Name & Ref. ID	CON/Q1202		
Version No.	3.0	Version Update Date	31-08-2023
Pre-requisites to Training (if any)	Minimum Educational Qualification: 10th Class with 1-2 Years of experience as a certified Helper Fabrication OR 10th Class with 1-2 Years of experience in case of a Non trained worker: experience of working in fitup works		
Training Outcomes	After completing this program, participants will be able to: • Identify and mark structural elements to assist in the fit-up of the same. • Identify, use various tools, tackles and handle heavy materials used in fit-up of fabricated components. • Assist in preparatory activities, edge preparation and positioning of steel sections for fit-up • Interact, communicate & support effectively with co-workers, superiors and sub-ordinates within the team and across interfacing teams to ensure effective execution of assigned task. • Follow safety norms as defined by organization, adopt healthy and safe work practices		

S.no	Module name	Session name	Session objectives	NOS reference	Methodology	Training tools/ aids	Duration
1.	Role and Responsibilities of an Assistant Construction Fitter T- 08:00 (HH: MM)	1. Introduction to Construction Industry	• Overview of construction industry	Bridge Module	Classroom lecture, games, group participation, group activity	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	T- 02:00
		2. Role and Responsibilities of an Assistant Construction Fitter	• Describe the role and responsibilities of an assistant construction fitter. • Explain general hierarchy of fabrication				T- 06:00

			occupation • Discuss future possible progression and career options for assistant construction fitter • Explain trade terminologies like orientation, alignment etc. used in fabrication occupation				
2	Identify and mark structural elements to assist in the fit-up of the same T- 24:00 P- 56:00 (HH: MM)	1. Introduction	• Explain structural steel fabrication and types.	CON/N1203 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12	Classroom lecture, games, group participation, group activity, field visit	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop Tools and Equipment Required: Hand Gloves, Apron leather, Gas welding, Goggles with Colour glass, Chipping hammer, Chisel, Clamps, Gas Pressure measuring guage, Trolley for cylinder, Plasma cutting torch, nozzle with consumables (tip and cap), Cutting cart, Head protector, Electrodes,	T- 02:00 P- 06:00
		2. Computation of dimensions of structural elements	• Compute dimensions of structural elements by interpreting hand sketches and simple drawings.				T- 02:00 P- 06:00
		3. Locating markings by interpreting the sketches	• Determine the location and orientation of sections for marking by interpreting the sketches				T- 02:00 P- 06:00
		4. Measuring and marking structural steel	• Explain the process of measuring and marking structural steel • Demonstrate measuring and marking on steel sections specifying location of components (plate sections, bar section, rolled				T- 02:00 P- 06:00

			sectioned.)			Cutting guides, Power source and compression unit with internal cooling system, Exhaust fan, Light source	
		5. Categorization of materials	• Categorize materials used in fit up based upon the weight (light, medium and heavy materials)				T- 02:00 P- 06:00
		6. Ergonomics	• Describe the ergonomics involved in material shifting				T- 02:00 P- 06:00
		7. Shifting and stacking heavy materials	• Explain various methods of shifting and stacking heavy materials				T- 02:00 P- 06:00
		8. Undulations	• Explain undulations and their effect on the quality of overall output.				T- 02:00 P- 06:00
		9. Identification of various sections	• Identify various sections on basis of shapes.				T- 02:00 P- 06:00
		10. Fabrication shop drawings	• Identify the sections (I, C, H, UC) from the hand sketches or fabrication shop drawings.				T- 06:00 P- 02:00
3	Identify, use various tools, tackles and handle heavy materials used in fit up of fabricated components T- 24:00 P- 72:00 (HH: MM)	1. Fabrication	• Define fabrication and common instrument used.	CON/N1204 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10,	Classroom lecture, games, group participation, group activity, field visit	Training Kit-Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop Tools and Equipment Required:	T- 02:00 P- 06:00
		2. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and				T- 02:00 P- 06:00

			cutting and striking, lifting and shifting.	KU11, KU12, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21, KU22		Hand Gloves, Apron leather, Gas welding, Goggles with Colour glass, Chipping hammer, Chisel, Clamps, Gas Pressure measuring guage, Trolley for cylinder, Plasma cutting torch, nozzle with consumables (tip and cap), Cutting cart, Head protector, Electrodes, Cutting guides, Power source and compression unit with internal cooling system, Exhaust fan, Light source	
		3. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.				T- 02:00 P- 06:00
		4. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.				T- 02:00 P- 06:00
		5. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.				T- 02:00 P- 06:00
		6. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.				T- 02:00 P- 06:00

		7. Tools and instruments	• Identify the various tools and instruments used for marking, measuring, anchoring (holding and tightening), cutting and striking, lifting and shifting.			T- 02:00 P- 06:00
		8. Equipment Manufacturers	• List major equipment manufacturers, the models, cost and specifications of instruments and equipment used for fabrication			T- 02:00 P- 06:00
		9. Lifting and shifting tools and tackles	• Use various tools and tackles required for performing lifting and shifting of heavy materials			T- 02:00 P- 06:00
		10. Safe working practices while lifting and shifting heavy materials	• Apply various do's and don'ts while performing lifting and shifting of heavy materials • Apply safe working practices while lifting and shifting heavy materials			T- 02:00 P- 06:00
		11. Visual checks	• Demonstrate visual checks carried out for serviceability of hand tools •			T- 02:00 P- 06:00

			• Demonstrate checks performed for ensuring no obstruction of load				
		12. Safe stacking	• Demonstrate safe stacking of heavy materials as per standard practices.				T- 02:00 P- 06:00
4	Assist in preparatory activities, edge preparation and positioning of steel sections for fit-up T- 24:00 P- 70:00 (HH: MM)	1. Fit-Up	• Explain fit-up, its role and purpose and common trade terminologies	CON/N1205 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC22, PC23, PC24, PC25, PC26, PC27, PC28, PC29 KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU14, KU15, KU16, KU17, KU18, KU19, KU20, KU21, KU22, KU23	Classroom lecture, games, group participation, group activity, field visit	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop Tools and Equipment Required: Hand Gloves, Apron leather, Gas welding, Goggles with Colour glass, Chipping hammer, Chisel, Clamps, Gas Pressure measuring guage, Trolley for cylinder, Plasma cutting torch, nozzle with consumables (tip and cap), Cutting cart, Head protector, Electrodes, Cutting guides, Power source and compression unit with	T- 02:00 P- 06:00
		2. Fabrication platforms	• Describe fabrication platform, its preparation and use				T- 02:00 P- 06:00
		3. Scrap disposal	• Explain scrap and its disposal				T- 02:00 P- 06:00
		4. Anchoring devices	• Describe and use the anchoring devices, explain their operation and purpose				T- 02:00 P- 06:00
		5. Types of jacks	• Introduction to various types of jacks				T- 02:00 P- 06:00
		6. Edge preparation	• Interpret the drawings/ hand sketches to obtain relevant details like dimensions, orientation, alignment etc. for edge preparation.				T- 02:00 P- 06:00
		7. Edge preparation	• Interpret the drawings/ hand sketches to obtain relevant details like dimensions, orientation,				T- 02:00 P- 06:00

			alignment etc. for edge preparation.			internal cooling system, Exhaust fan, Light source	
		8. Tools and equipment used for edge preparation	• Use equipment and tools for edge preparation				T- 02:00 P- 06:00
		9. Bevelling machine used for edge preparation	• Demonstrate operation of bevelling machine to obtain required edge preparation as per the drawings, following standard safety parameters				T- 02:00 P- 06:00
		10. Measurements of the edge preparation	• Perform measurements of the edge preparation to confirm its dimensional correction, following standard safety parameters				T- 02:00 P- 06:00
		11. Marking on the structural steel sections	• Carryout marking on the structural steel sections from the hand sketches provided				T- 02:00 P- 04:00
		12. Placing and fixing	• Describe the procedure for placing and fixing the structural steel sections on the fabrication platform • Demonstrate the procedure for placing and fixing the structural steel sections				T- 02:00 P- 06:00

			on the fabrication platform				
5	Work effectively in a team to deliver desired results at the work place T- 08:00 P- 16:00 (HH: MM)	1. Time management	• Explain effects and benefits of timely actions relevant to fabrication works with examples.	CON/N8001 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9	Classroom lecture, games, group participation, group activity, field visit	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop	T- 02:00 P- 04:00
		2. Effective communication	• Explain importance of proper and effective communication and its adverse effects in case of failure of proper communication. • Demonstrate effective communication skills while interacting with co-workers and trade seniors during the assigned task.				T- 02:00 P- 04:00
		3. Team work and effective reporting	• Explain importance of team work and its effects relevant to fabrication works with examples. • Demonstrate Steamwork skills during assigned tasks. • Demonstrate effective reporting to seniors as per applicable organisational norms.				T- 02:00 P- 04:00
		4. Construction drawings	• Interpret work sketches, formats, permits,				T- 02:00 P- 04:00

			protocols, checklists and work-related requirements which are to be conveyed to other team members.				
6	Work according to personal health, safety and environment protocol at construction site T- 16:00 P- 32:00 (HH: MM)	1. Workplace hazards	• 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.	CON/N9001 PC1, PC2, PC3, PC4, PC5, PC6, PC7, PC8, PC9, PC10, PC11, PC12, PC13, PC14, KU1, KU2, KU3, KU4, KU5, KU6, KU7, KU8, KU9, KU10, KU11, KU12, KU14	Classroom lecture, games, group participation, group activity, field visit	Training Kit- Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop Tools and Equipment Required: 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 box, Safety tags, Safety Notice board	T- 03:00 P- 05:00
		2. Use of PPEs and emergency situation	• Demonstrate the use of all Personal Protective Equipment (PPE) like helmet, safety shoe, safety belt, safe jackets and other safety equipment relevant to fabrication works requirement. • Recall the safety control measures and actions to be taken under emergency situation.				T- 03:00 P- 05:00
		3. Reporting and basic ergonomic principles	• Explain the reporting procedure to the				T- 03:00 P- 05:00

			concerned authority in case of emergency situations. • Explain the types and benefits of basic ergonomic principles, which should be adopted while carrying out specific task at the construction sites.				
		4. Fire safety	• Explain the classes of fire and types of fire extinguishers. • Demonstrate the operating procedure of the fire extinguishers.				T- 03:00 P- 05:00
		5. Safety measures at workplace	• Explain the importance of housekeeping works. • Demonstrate safe housekeeping practices. • Explain the importance of participation of workers in safety drills. • Explain the purpose and importance of vertigo test at construction site.				T- 03:00 P- 05:00
		6. Medical tests and waste disposals	• List out basic medical tests required for working at construction				T- 01:00 P- 07:00

			site. • Demonstrate vertigo test. • Demonstrate different methods involved in providing First aid to the affected person • Demonstrate safe waste disposal practices followed at construction site. • Explain different types of waste at construction sites and their disposal method.				
7.	Employability Skills (30 hours)	1. Introduction to Employability Skills	• 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	T- 01:00
		2. Constitutional values - Citizenship	• Detail the principles of the Constitution of India • Identify the various environmentally sustainable practices	DGT/VSQ/N0101			T- 01:00
		3. Becoming a Professional in the 21st Century	• Discuss relevant 21st century skills required for employment. • Practice critical thinking and decision	DGT/VSQ/N0101			T- 01:00

			making skill				
		4. Basic English Skills	• Read English text with appropriate articulation. • Practice English words, sentences and punctuation.	DGT/VSQ/N0101			T- 02:00
		5. Communication Skills	• Explain the importance of communication at workplace. • Demonstrate effective communication strategies • Demonstrate how to communicate effectively using verbal and nonverbal communication	DGT/VSQ/N0101			T- 04:00
		6. Diversity & Inclusion	• Explain the need of diversity at workplace • Identify the various PwD policies applicable at workplace • Discuss the significance of PSH Act	DGT/VSQ/N0101			T- 01:00
		7. Financial and Legal Literacy	• Discuss various financial institution, products and services • Explain the common component of salary such as Basic, PF, Allowances (HRA, TA, DA, etc.), Tax	DGT/VSQ/N0101			T- 04:00
		8. Essential Digital Skills	• Detail the use and features of various MS Office tools	DGT/VSQ/N0101			T- 03:00

			like MS Word, MS Excel, MS PowerPoint, etc. • Demonstrate how to operate digital devices • 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	● Describe the types of entrepreneurship and enterprises ● Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement	DGT/VSQ/N0101			T- 07:00
		10. Customer Service	• 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	DGT/VSQ/N0101			T- 04:00

		11. Apprenticeships and Jobs	• Practice personal grooming strategies • Illustrate the use of online platforms for job hunting • Detail the concept of Apprenticeship • Demonstrate how to enroll for Apprenticeship programs. • Draft a professional Curriculum Vitae (CV) • Role play a mock interview	DGT/VSQ/N0101			T- 02:00

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- Assistant Construction Fitter	
Job Role	Assistant Construction Fitter
Qualification Pack	CON/Q1202
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 theory part will be based on knowledge bank of questions created by the SSC.
3.	Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective / option NOS/set of NOS
4.	Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below)
5.	Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on this criterion
6.	To pass a QP, a trainee should score an average of 70% across generic NOS' and a minimum of 70% for each technical NOS
7.	In case of unsuccessful completion, the trainee may seek reassessment on the Qualification File.

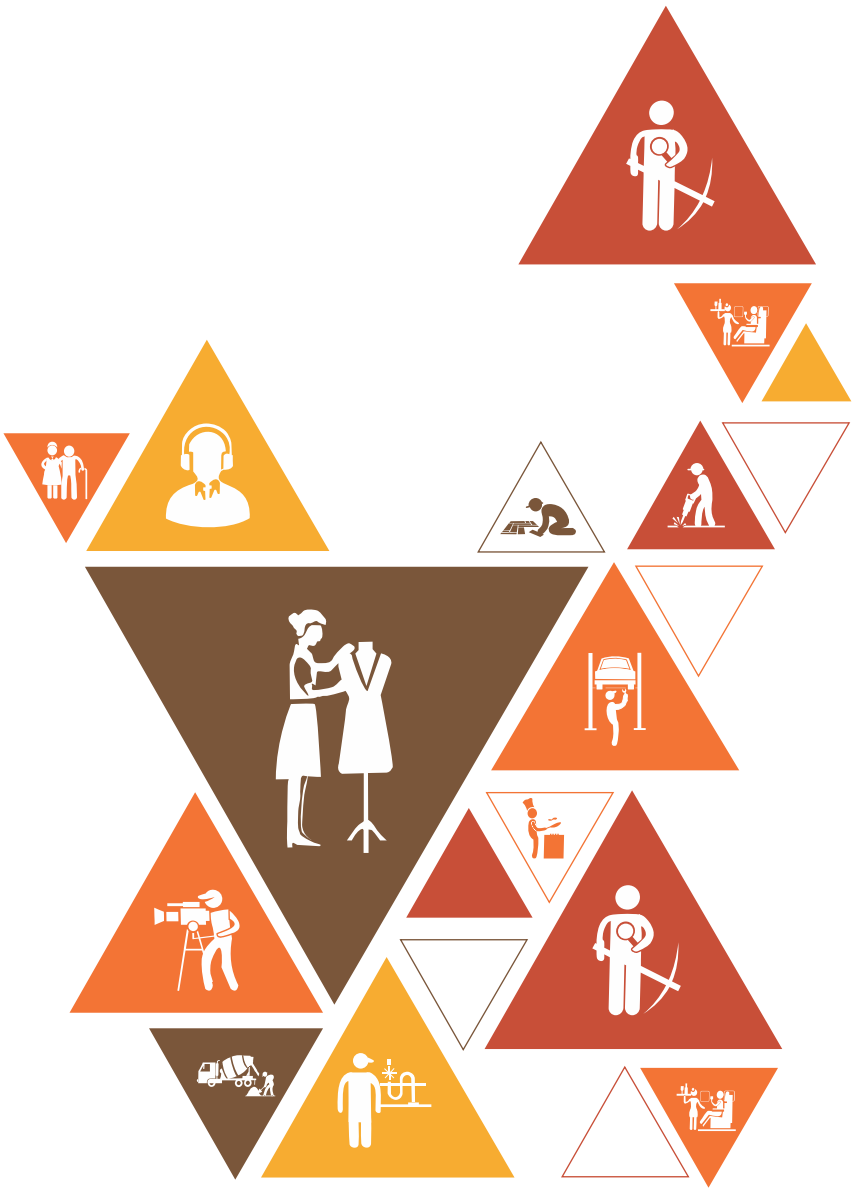
National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
CON/N1203.Identify and mark structural steel elements to assist in fit-up of the same	30	70	-	-	100	20
CON/N1204.Identify, use various tools, tackles and handle heavy materials used in fit-up of fabricated components	30	70	-	-	100	25
CON/N1205.Assist in preparatory activities, edge reparation and positioning of steel sections for fit-up	30	70	-	-	100	30
CON/N8001.Work effectively in a team to deliver desired results at the workplace	30	70	-	-	100	10
CON/N9001.Work according to personal health, safety and environment protocol at construction site	30	70	-	-	100	10
DGT/VSQ/N0101- Employability Skills (30 Hours)	20	30	-	-	50	5
Total	**170**	**380**	**-**	**-**	**550**	**100**

Annexure III- QR Codes –Video Links

Chapter Name	Unit Name	Topic Name	URL	QR Code
Chapter 1: Introduction to Construction Industry	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
		Fabrication	https://youtu.be/wi0uRrI_yz8	Fabrication
	Unit 1.2: Role and Responsibilities of an Assistant Construction Fitter	Assistant Construction Fitter	https://youtu.be/F4s_QE8mRWA	Assistant Construction Fitter

Chapter Name	Unit Name	Topic Name	URL	QR Code
Chapter 2: Identify and Mark Structural Elements	Unit 2.1: Identify and mark structural elements	Structure Steel Fabrication	https://youtu.be/9-yd1QGwng4	Structure Steel Fabrication
		Types of Structural Steel	https://youtu.be/9-yd1QGwng4	Types of Structural Steel
		Drawings of Steel Structure	https://youtu.be/hVQoohvbvNI	Drawings of Steel Structure
		Material Handling	https://youtu.be/1uMf4Ky0nyM	Material Handling
Chapter 3: Tools and Heavy Materials used in Fit-Up of Fabricated Components	Tools and Instrument used in Construction Fitting	Marking out Tools and Instruments	https://youtu.be/w83NMv9c4I4	Marking out Tools and Instruments
		Linear Measurements Tools and Instruments	https://www.youtube.com/live/	Linear Measurements Tools and Instruments

Chapter Name	Unit Name	Topic Name	URL	QR Code
		Angular Measurements Tools and Instruments	https://youtu.be/Smi2jX18IFc	Angular Measurements Tools and Instruments
		Do's and Don'ts for Heavy Lifting	https://youtu.be/b4wXRrfKQ2c	Do's and Don'ts for Heavy Lifting
Chapter4: Edge Preparation and Positioning of Steel Sections for Fit-Up	Unit 4.1: Edge Preparation and Positioning of Steel Sections for Fit-Up	Fit-Up	https://youtu.be/F4s_QE8mRWA	Fit-Up
		Fabrication Platforms	https://youtu.be/VJWnFGBVbSg	Fabrication Platforms



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