

# Competency Based Training (CBT) Curriculum Guide for Shuttering Carpenter

[Market Oriented Short Term (MOST), Modular Curriculum]

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## **1. INTRODUCTION:**

The TVET system has a large role to play in economic growth and social development as workforce provider to the labor market and as provider of skills to those who are looking for employment. In the case of Bangladesh, the TVET sector needs major reforms to ensure that issues of quality and capacity, relevance, and access are properly addressed.

This curriculum guide is designed and developed using competency based training (CBT) approach with the aim of producing skilled human resources for respective trade and occupation. This is based on the tasks to be performed for Shuttering Carpenter occupation. The modules are included in course structure section of this curriculum guide. The training methodology is learner friendly where theoretical inputs, demonstration, guided and individual practices will be sufficiently provided to master the skills at the industry standards. Sufficient and updated tools and equipment will also be used during the training to provide hands on skills to the trainees. The curriculum guide is developed in consultation with the trainer, mid-level industry supervisors, and skilled workers. Curriculum Design Africa has been involved to develop the curriculum.

## **2. AIMS:**

The main aim of this training program is to produce medium level skilled workforce required for the construction sector in the formal and informal sector and create better opportunities for employment as well as two (2) International Consultants from South Africa.

## **3. OBJECTIVES:**

At the end of the training course, the trainees will be able to:

- Apply occupational safety and health procedures at the work place
- Apply fundamental skills of shuttering work
- Prepare formwork for shuttering work
- Install formwork for shuttering work
- Dismantle formwork

## **4. DESCRIPTION:**

This is a competency based training package for the unemployed and underemployed workforce of Bangladesh. The curriculum is based on the tasks to be performed in the Shuttering Carpenter occupation and subsequently these tasks have been grouped to form various modules. This will provide flexibility for the trainees to learn one module at a time. The modules are included in the 'Course Structure' section of this curriculum guide. The training methodology will be **learner-centered** where theoretical input, demonstration, guided and individual practices will sufficiently be provided to the trainees to **master their skills at business and industry standards**. Sufficient tools, equipment and aids will also be used during the training to provide hands on skills to the trainees.

## 5. COURSE STRUCTURE:

Job title: Shuttering Carpenter				Time (hrs.)		
S.N.	Modules	Tasks	Nature	Th.	Pr.	Tot.
1.	Practice Occupational Health and Safety (OHS) Procedure	5	T+P	2.5	3.5	6.0
2.	Apply Fundamental Skills of Shuttering Work	3	T+P	6.5	40.5	47.0
3.	Prepare formwork for shuttering work	5	T+P	3.5	32.5	36.0
4.	Install formwork for shuttering work	7	T+P	3.5	62.5	66.0
5.	Dismantle formwork	4	T+P	2.5	22.5	25.0
	<b>All total:</b>	<b>31</b>		<b>18.5</b>	<b>161.5</b>	<b>180.0</b>

Timings are subject to verification during pilot phase.

It should further be noted that although Health and Safety is dealt with as a separate module, the principles should be integrated into each task. It should be seen as a way of life and not an activity to be done during training only.

## 6. DURATION:

Total duration of the training is **180 hours** excluding soft skills and On-the-Job Training (OJT)/Apprenticeship. The participants will be sent for wage employment after completion of the training. Only technical modules have been considered under this duration.

## 7. TARGET GROUP:

The target group of this training course will be dropped out youths from the formal schooling, job seekers/underemployed young men or women, disadvantaged people. Male and female both are entitled to receive this training. The basic education for the trainees would be grade-V or equivalent. Above 18 years of age trainees will be enrolled in the training course.

## 8. GROUP SIZE:

A total of maximum 20 trainees will be placed in each group and provided adequate resources.

## 9. TARGET LOCATION:

The training will be implemented in partnership with private training providers situated in the different areas of the country.

## 10. MEDIUM OF INSTRUCTION:

The medium of instruction for this course will be Bangla but the trainees will be oriented on technical terminology in English.

**11. PATTERN OF ATTENDANCE:**

At least 90% attendee will be required during the theory and practical classes to appear in the internal and final assessment.

**12. FOCUS OF THE PROGRAM:**

Since this course is a competency based training, the focus is given on the performance of the trainees rather than the theoretical input. Where practicable at least 80% of the total training time is allocated for practical training and 20% for theory.

**13. ENTRY CRITERIA:**

The following criteria will be considered for the individual to enter into this training program:

- Education: Class 5 or equivalent
- Age: 18 years and above
- Physical and mental health

**14. FOLLOW UP SUGGESTION:**

The training institutes who implement CBT program will build rapport with the employers to link graduates with the industries for employment.

Placement: Within one month after completion of the training program, the graduates will be assisted in finding out appropriate and decent wage-based job relevant to the occupation concerned.

To measure the success in job, the follow up will be taken as below:

First follow-up- three months after placement of graduates in job and the next follow up six months after placement of graduates in job.

**15. CERTIFICATE REQUIREMENT:**

Training service provider will certify the graduates as a Semi-Skilled Shuttering Carpenter only after successful completion of the training program through systematic skills testing. Certification can also be linked to the Bangladesh Technical and Education Board (BTEB) at the relevant NTVQF level through Recognition of Prior Learning (RPL).

**16. TRAINEES EVALUATION DETAILS:**

Monthly evaluation will be conducted to ensure the performance of the learners. Final evaluation will be conducted to evaluate the participants at the end of the training course. Trainees must secure 100% marks in practical and 80% marks in theoretical examination.

### **17. TRAINERS' QUALIFICATION:**

Preference will be given to the trainer's having the following criteria:

- Minimum five years' experience in the respective occupation
- Working experience as an Instructor/Trainer
- Trade course/Diploma Engineering in Civil Technology

### **18. TRAINER – TRAINEES RATIO:**

- For theoretical class, trainer and trainee ratio should be 1:20.
- For practical class, trainer and trainee ratio should be 1:10.
- And for final practical assessment 1:1

### **19. SUGGESTION FOR INSTRUCTION:**

Where practicable:

- At least 80% time of the course will be allocated for practical purpose
- At least 20% time of the course will be allocated for theoretical purpose
- Follow the safety rules
- Create a friendly learning environment
- Arrange the materials and equipment at the right place
- Trainer/Instructor will be available in the training classes/labs in time
- Take attendance of participants
- Learner centered training
- Encourage the participants to speak
- Arrange question and answer (Q&A) sessions
- Make plans for classroom / workshop instructions
- Prepare lesson plans for theoretical and practical classes

**20. LIST OF MODULES AND SUB MODULES:**

**Module: 1: Practice occupational health and safety (OHS) procedure**

**Module: 2: Apply fundamental skills of shuttering work**

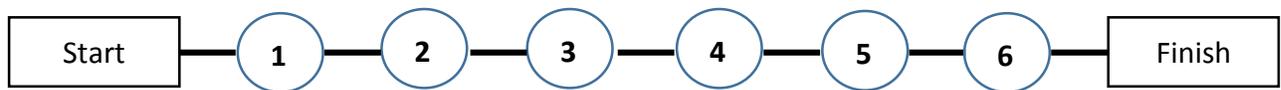
**Module: 3: Prepare form work for shuttering work**

**Module: 4: Install formwork for shuttering work**

**Module: 5: Dismantle formwork**

**21. MODULE SEQUENCE:**

**MODULE SEQUENCE:**



**22. DETAILS OF MODULES AND SUB MODULES:**

# Module 1: Practice Occupational Health and Safety (OHS) Procedure

## 22.1 Module- 1: Practice Occupational Health and Safety (OHS) Procedure

22.1 Module- 1: Practice Occupational Health and Safety (OHS) Procedure					
	<b>Description:</b> It consists of skills and knowledge related to occupational health and safety applicable to the related performance.	Hours			
	<b>Module outcomes:</b> After completion of this module, trainees will be able to <ul style="list-style-type: none"> <li>• Follow safety sign and regulations</li> <li>• Apply personal protective equipment</li> <li>• Control house-keeping hazards</li> <li>• Apply First Aid on minor injuries</li> </ul>	<b>Th.</b> <b>2.5</b>	<b>Pr.</b> <b>3.5</b>	<b>Tot.</b> <b>6.0</b>	
<b>1.</b>	<b>Task:</b> Follow safety sign and regulations	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Simulated situation  <b>What:</b> Follow safety sign and regulations  <b>How well:</b> <ul style="list-style-type: none"> <li>• All safety signs and regulations must be followed in the workplace</li> </ul>	Th. 0.5	Pr. 0.5	Tot. 1.0
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect the safety sign, emergency exit plan and list of rules and regulation</li> <li>2. Explain the application of safety sign and regulation</li> <li>3. Follow the emergency exit plan</li> <li>4. Comply with safety signs and regulations</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>• Explain about the uses of safety sign and regulation</li> <li>• Explain how to use the regulation</li> <li>• Explain what are the safety sign</li> <li>• List the safety sign and regulation</li> <li>• Use the all safety items and rules</li> <li>• Explain the emergency exit way</li> </ul>			
	<b>Tools/equipment/materials required:</b> Safety sign, visual aids, danger zone area indicators and regulation charts				
<b>2.</b>	<b>Task:</b> Apply personal protective equipment	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Protective equipment  <b>What:</b> Apply personal protective equipment	Th. 0.5	Pr. 1.0	Tot. 1.5

		<p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• The status of the protective equipment must be checked</li> <li>• Safety goggle, helmet, gloves to be worn at all times during execution of tasks and safety belt must be tightened properly</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect the personal protective equipment</li> <li>2. Check the condition of protective equipment</li> <li>3. Use the protective equipment</li> <li>4. Maintain the protective equipment</li> <li>5. Preserve the protective equipment in organized way at safe place</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• Explain about the uses of protective equipment</li> <li>• Explain how to use the protective equipment</li> <li>• Explain what are the protective equipment in hazards works</li> <li>• Use the protective equipment properly</li> <li>• Explain the positive and negative side of uses the protective equipment</li> <li>• List the protective equipment</li> </ul>			
	<p><b>Tools/equipment/materials required:</b> Hamlet, Life Jacket, Safety Goggles, Hand Gloves, Safety Belt and Safety shoes/Gumboot.</p>				
3.	<p><b>Task:</b> Control house-keeping hazards</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Simulated situation</p> <p><b>What:</b> Control house-keeping hazards</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Tools, equipment and safety materials of workplace must be placed in organized way</li> <li>• The periodical maintenance of tools, equipment and safety materials of workplace must be done.</li> </ul>	Th. 0.5	Pr. 0.5	Tot. 1.0

	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. List the expected hazards exist in workplace</li> <li>2. Place the tools and equipment in workplace following organized way</li> <li>3. Follow up the periodic maintenance of tools and equipment</li> <li>4. Handle the tools/equipment carefully</li> <li>5. Follow up the maintenance of all the electrical fittings and fixtures</li> <li>6. Identify the faulty tools/equipment</li> <li>7. Dispose the wastage/outdated tools &amp; equipment from workplace</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• Define house-keeping hazards</li> <li>• Identify the types of housekeeping hazards</li> <li>• Explain the necessity of keeping the house neat and clean (including dining place, washroom/toilets, store and exit path)</li> <li>• Understand safety precautions to be taken for housekeeping hazards</li> <li>• List the expected house-keeping hazards in the workplace</li> </ul>			
<p><b>Tools/equipment/materials required:</b> Tools and equipment including safety materials.</p>					
<p>4.</p>	<p><b>Task:</b> Apply First Aid on minor injuries</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Dummy of a simulated victim</p> <p><b>What:</b> Apply First Aid on minor injuries</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Injured person must be isolated from the crowd</li> <li>• Information of accident must be given to the administration</li> </ul>	<p>Th. 0.5</p>	<p>Pr. 1.0</p>	<p>Tot. 1.5</p>
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Isolate the injured person</li> <li>2. Collect first aid box with necessary medicine, materials and equipment</li> <li>3. Clean the injured area</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• Define the minor injury</li> <li>• Explain about the first aid treatment</li> <li>• Describe the steps of dressing</li> <li>• List out the first aid medicine, equipment and materials</li> </ul>			

	<p>4. Dress the injured portion properly</p> <p>5. Use the necessary medicine and other materials as per requirement</p> <p>6. Inform the administration</p> <p>7. Restore the First Aid Box</p>				
<p><b>Tools/equipment/materials required:</b> First Aid Box with required medicine and materials</p>					
5.	<p><b>Task:</b> Control Electrical Fire Hazards</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Work place situation (real/simulation)</p> <p><b>What:</b> Control Electrical Fire Hazards</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Firefighting aids must be checked periodically</li> <li>• Emergency exit must be followed during evacuation</li> </ul>	Th. 0.5	Pr. 0.5	Tot. 1.0
<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Check the availability of fire extinguishers, sands buckets/ reservoir</li> <li>2. Wear safety device to work closed to the electrification area.</li> <li>3. Check the fire extinguisher</li> <li>4. Apply fire extinguisher during small electric fire.</li> <li>5. Inform the police and fire station for mass electric fire</li> </ol>		<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• Describe the possible electrical fire hazards in workplace</li> <li>• List the types of electrical hazards</li> </ul>			
<p><b>Tools/equipment/materials required:</b> Safety materials like fire Extinguisher, Sands, Vacuum cleaner/hand blower etc.</p>					

## Module 2: Apply Fundamental Skills of Shuttering Work

## 22.2 Module- 2: Apply Fundamental Skills of Shuttering Work

22.2 Module- 2: Apply Fundamental Skills of Shuttering Work						
	<p><b>Description:</b> This module deals with the basic knowledge and skills on required fundamental works related to shuttering &amp; Carpentry works e.g. Apply Tools &amp; Equipment, Identify materials for shuttering works, Interpret specification &amp; drawing, taking measurement, making different types of layouts, sawing and making joints..</p>			Hours		
	<p><b>Module outcomes:</b> After completion of this module, trainees will be able to:</p> <ul style="list-style-type: none"> <li>• Apply Different Types of Tools &amp; Equipment used in shuttering works.</li> <li>• Identify materials for shuttering works.</li> <li>• Interpret specification &amp; drawing.</li> <li>• Measure dimension of different objects.</li> <li>• Take measurement of rectangular shuttering formwork</li> <li>• Take measurement of angular shuttering formwork</li> <li>• Take measurement of Circular shuttering formwork</li> <li>• Prepare Layout for shuttering work</li> <li>• Perform sawing using hand saw</li> <li>• Extend wooden member using butt joint</li> </ul>			<b>Th.</b> <b>6.5</b>	<b>Pr.</b> <b>40.5</b>	<b>Tot.</b> <b>47.0</b>
1.	<p><b>Task:</b> Apply Different Types of Tools &amp; Equipment used in Shuttering Works.</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Different Tools &amp; Equipment</p> <p><b>What:</b> Apply Different Types of Tools &amp; Equipment used in Shuttering Works.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Tools and Equipment must be identified.</li> <li>• Safety and precaution must be followed while using and handling tools &amp; equipment.</li> </ul>	Th. 1.0	Pr. 4.0	Tot. 5.0	
	<p><b>Steps:</b></p> <p>1. Collect tools and equipment for shuttering works.</p>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools and equipment.</li> <li>• Explain the procedure of handling &amp; uses of different tools and equipment.</li> </ul>				

	<ol style="list-style-type: none"> <li>2. Identify tools and equipment as per nature of the job.</li> <li>3. Use safety materials before working.</li> <li>4. Apply tools &amp; equipment as per nature of the job.</li> <li>5. Clean tools, equipment and workplace work place.</li> <li>6. Restore tools and equipment.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain safety and precautions in handling tools &amp; equipment.</li> </ul>							
<p><b>Tools/equipment/materials required:</b> Measuring tape, claw hammer, claw bar, hand saw, cold chisel, plum bob, spirit level, water level, tri square, electric hand drill Tin Snips, Table vice etc.</p>									
2.	<p><b>Task:</b> Identify materials for shuttering works.</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Different materials and a simulated work place.</p> <p><b>What:</b> Identify materials for shuttering works.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Materials must be identified.</li> <li>• Shuttering materials must be well seasoned, Termite free and durable.</li> <li>• Shutter materials must be straight and regular shape.</li> </ul>	<table border="1"> <tr> <td>Th.</td> <td>Pr.</td> <td>Tot.</td> </tr> <tr> <td>1.0</td> <td>4.0</td> <td>5.0</td> </tr> </table>	Th.	Pr.	Tot.	1.0	4.0	5.0
Th.	Pr.	Tot.							
1.0	4.0	5.0							
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect materials for shuttering works.</li> <li>2. Place the materials on the table.</li> <li>3. List out the name of each material</li> <li>4. Stick label on each material with sticky paper.</li> <li>5. Clean the work place.</li> <li>6. Restore the materials.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List the required materials for shuttering work.</li> <li>• Explain the procedure uses of different materials.</li> <li>• Explain safety and precautions in handling of shuttering materials.</li> </ul>							

	<b>Tools/equipment/materials required:</b> Bamboo, wood plunk, batten, plain sheet (rup ban sheet), GI sheet, nail, pin , thread , chalk, pencil, Mobil oil etc.				
3.	<b>Task:</b> Interpret drawing & specification.	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing and study table.  <b>What:</b> Interpret drawing & specification. <b>How well:</b> <ul style="list-style-type: none"> <li>Terms and abbreviation are identified and explained.</li> </ul>	Th. 1.0	Pr. 5.0	Tot. 6.0
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect working drawing.</li> <li>2. Identify the terms and abbreviation.</li> <li>3. Interpret schedule, dimension, contain of the drawing.</li> <li>4. Take note and record the dimension, specifications and materials.</li> <li>5. Restore the drawing in a dry and safe place.</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>Explain units and measurement.</li> <li>Explain the procedure to covert simple measurement units.</li> <li>Explain scale , Dimension , abbreviations etc.</li> </ul>			
	<b>Tools/equipment/materials required:</b> Drawing, note book, pencil etc.				
4.	<b>Task:</b> Measure Dimension of the Object.	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Measuring tape and drawing specification  <b>What:</b> Measure dimension of the object.  <b>How Well:</b> <ul style="list-style-type: none"> <li>Unit of measurement must be mentioned</li> <li>The tolerance of measuring length, width and height are <math>\pm 2\text{mm}</math></li> </ul>	Th. 0.5	Pr. 2.5	Tot. 3.0

	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools and drawing.</li> <li>2. Identify the starting point of length i.e. one corner.</li> <li>3. Identify the end point of length i.e. other corner.</li> <li>4. Take the measurement of length</li> <li>5. Repeat step 2 and 3 for measuring width</li> <li>6. Take the measurement of width</li> <li>7. Repeat step 2 and 3 for measuring height or thickness.</li> <li>8. Take the measurement of height or thickness</li> <li>9. Clean workplace and measuring tools</li> <li>10. Restore the tools and materials</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• Identify tools</li> <li>• Explain dimension</li> <li>• Explain the steps of measurement</li> </ul>			
<p><b>Tools/equipment/materials required:</b> Measuring tape, marker, drawing</p>					
5.	<p><b>Task:</b> Take Measurement of Rectangular Shuttering Formwork</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing and workplace</p> <p><b>What:</b> Take measurement of rectangular shuttering formwork</p> <p><b>How Well:</b></p> <ul style="list-style-type: none"> <li>• Each angle must be 90°</li> <li>• Units of measurement must be mentioned</li> <li>• Calculation tolerance error is approximately <math>\pm 4\text{mm}</math>.</li> </ul>	Th. 0.5	Pr. 3.0	Tot. 3.5
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment, Rectangular Shuttering Formwork and working drawing</li> </ol>	<p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools and equipment</li> <li>• Explain rectangular shape</li> <li>• Explain measurement procedure</li> <li>• Explain angle measurement instrument.</li> </ul>			

	<ol style="list-style-type: none"> <li>2. Identify the starting point of length measurement</li> <li>3. Identify the end point of length measurement</li> <li>4. Measure length i.e. 5ft</li> <li>5. Repeat step 2 and 3 for measuring width</li> <li>6. Measure width i.e. 3ft</li> <li>7. Check measurement of rectangle top and bottom also each sides.</li> <li>8. Check angle of rectangle 90°</li> <li>9. Clean workplace and tools</li> <li>10. Restore the tools and materials.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain error tolerance.</li> </ul>			
<b>Tools/equipment/materials required:</b> Drawing, notebook, pen, measuring tape, try square					
6.	<b>Task:</b> Take Measurement of Angular Shuttering Formwork	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, measuring instrument and worksite  <b>What:</b> Take measurement of angular shuttering formwork  <b>How Well:</b> <ul style="list-style-type: none"> <li>• Measurement error in angular measurement must be within <math>\pm 0.05^\circ</math></li> </ul>	Th. 0.5	Pr. 3.0	Tot. 3.5
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect tools, equipment, Angular Shuttering Formwork and drawing.</li> <li>2. Select base line</li> <li>3. Place protractor on the base line</li> <li>4. Read angle from protractor</li> <li>5. Note down the readings of angular formwork</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>• List of tools and equipment</li> <li>• Explain angular measurement</li> <li>• Explain the reading procedure of protector</li> </ul>			

	6. Clean workplace and tools. 7. Restore the tools and materials.				
<b>Tools/equipment/materials required:</b> Drawing, protractor, pen, Notebook					
7.	<b>Task:</b> Take Measurement of Circular Shuttering Formwork	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing and measuring tape  <b>What:</b> Drawing, notebook, pen, measuring tape, try square  <b>How Well:</b> Measurement tolerance must be $\pm 2\text{mm}$	Th. 0.5	Pr. 3.0	Tot. 3.5
	<b>Steps:</b> 1. Collect tools, equipment, Circular Shuttering Formwork and working drawing 2. Take circumferential measurement of the circle, $P=20\text{ft}$ 3. Calculate radius of the circle i.e. $P=2\pi r$ , $r=P/2\pi = 20/2 \times 3.1416 = 3.18\text{ft}$ 4. Mark Centre of the radius. 5. Take 3.18ft length rope or measuring tape and draw two arc from two circumferential point 6. Mark intersection point i.e. center of the circle. 7. Clean workplace and tools. 8. Restore the tools and materials.	<b>Enabling Objectives:</b> <ul style="list-style-type: none"> <li>• Explain circle, diameter and radius</li> <li>• Explain perimeter or circumference</li> <li>• Explain the step to measure the circle</li> </ul>			
<b>Tools/equipment/materials required:</b> Drawing, Measuring tape or rope, calculator.					
8.	<b>Task:</b> Prepare Layout for Shuttering Work	<b>Terminal Performance Objective (TPO):</b>	Th. 0.5	Pr. 6.5	Tot. 7.0

		<p><b>Given:</b> Drawing and workplace</p> <p><b>What:</b> Prepare Layout for shuttering work</p> <p><b>How Well:</b></p> <ul style="list-style-type: none"> <li>• All measurements of layout must be taken as per the drawing</li> <li>• Alignment, level and marking must be done as per the drawing</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and working drawing</li> <li>2. Interpret the layout plan (drawing) carefully</li> <li>3. Identify the position/location of the shuttering</li> <li>4. Set out the center line of the column, beam by thread.</li> <li>5. Mark the outline of the column and beam</li> <li>6. Hang thread along the outer line of the column</li> <li>7. Clean the work place</li> <li>8. Restore tools and materials</li> </ol>	<p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools and equipment to make layout for shuttering work</li> <li>• Explain the layout for shuttering work</li> <li>• Explain different types of measurement</li> </ul>			
	<b>Tools/equipment/materials required:</b> Drawing, thread, Measuring tape, Nail, Notebook, pen.				
9.	<p><b>Task:</b> Perform Sawing using Hand Saw</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, Hand saw</p> <p><b>What:</b> Perform sawing using hand saw</p> <p><b>How well:</b></p>	Th. 0.5	Pr. 6.5	Tot. 7.0

		<ul style="list-style-type: none"> <li>• Cutting edge perpendicular tolerance <math>\pm 1\text{mm}</math></li> <li>• Cutting Length tolerance error within <math>\pm 5\text{mm}</math></li> <li>• Angular edge tolerance <math>\pm 0.05^\circ</math></li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools equipment and drawing.</li> <li>2. Take one piece of plank.</li> <li>3. Measure the plank say 5ft.</li> <li>4. Mark 5ft length of the plank.</li> <li>5. Set up the plank at vice.</li> <li>6. Cut the plank with cross cut using hand saw.</li> <li>7. Check perpendicular with try square.</li> <li>8. Separate the seasoned plank from the vice.</li> <li>9. Clean the work place.</li> <li>10. Restore tools and materials.</li> </ol>	<p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools and equipment</li> <li>• Describe the functions of hand saw</li> <li>• Explain perpendicular</li> </ul>			
	<p><b>Tools/equipment/materials required:</b> Drawing, Hand saw, Try square, Marker, measuring tape, table-vice</p>				
10.	<p><b>Task:</b> Extend wooden member using butt joint</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, worksite</p> <p><b>What:</b> Extend wooden member using butt joint</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Piece of wooden plank must be set in straight</li> <li>• The tolerance gap in joint is <math>\pm 4\text{mm}</math></li> <li>• The surface of the joint area must be flat/plane.</li> </ul>	Th. 0.5	Pr. 3.0	Tot. 3.5

<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and drawing</li> <li>2. Take a plank of 5ft long and 1 ft width</li> <li>3. Take a small piece of plank 1.5ft long and 6" width</li> <li>4. Take another plank size 5'x1'</li> <li>5. Set small piece at the bottom of first plank</li> <li>6. Set second plank face to face of the first plank</li> <li>7. Join top two plank with small piece using nail.</li> <li>8. Check straightness by placing thread at starting point to end point</li> <li>9. Check the up and down of the joint by sprit level or water level or eye estimate</li> <li>10. Clean the work place</li> <li>11. Restore tools and materials.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List the required tools, equipment and drawing</li> <li>• Explain the process to join the pieces of plank</li> <li>• Explain the procedure to check the plane/flat surface by sprit level or water level</li> </ul>
<p><b>Tools/equipment/materials required:</b> Drawing, Plank, measuring tape, Nail, Hammer, Saw, sprit level or water level.</p>	

## Module 3: Prepare Formwork for Shuttering Work

### 22.3 Module-3: Prepare formwork for shuttering work.

22.3 Module-3: Prepare formwork for shuttering work.						
	<b>Description:</b> This module provides skills and knowledge about preparing form work for shuttering work. It includes to make shutter for foundation, square/rectangular column, circular column, prepare wooden/bamboo post to support shuttering or formwork.			Hours		
	<b>Module outcomes:</b> After completion of this module, trainees will be able to: <ul style="list-style-type: none"> <li>• Make shutter for foundation.</li> <li>• Make shutter for rectangular/square column.</li> <li>• Make shutter for circular column.</li> <li>• Make shutter for Beam.</li> <li>• Prepare wooden/bamboo post to support shuttering or, formwork.</li> </ul>			Th. 3.5	Pr. 32.5	Tot. 36.0
<b>1.</b>	<b>Task:</b> Make Shutter for Foundation	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, Tools &amp; Equipment, Shuttering materials, Simulated work place.</p> <p><b>What:</b> Make Shutter for Foundation.</p> <p><b>How Well:</b></p> <ul style="list-style-type: none"> <li>• Measurement error for shuttering work must be kept within <math>\pm 5\text{mm}</math></li> <li>• Surface must be even</li> <li>• No leak/gap found in the joints</li> <li>• Shuttering materials must be well seasoned, Termite free and durable.</li> </ul>	Th. 0.5	Pr. 5.5	Tot. 6.0	
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect required materials, tools and drawing.</li> <li>2. Interpret dimension of the foundation from drawing.</li> <li>3. Select wood plank and batten as per the measurement</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List out the required tools and materials for making foundation sides.</li> <li>• Explain the procedure of making sides of foundation.</li> </ul>				

	<ol style="list-style-type: none"> <li>4. Mark the wood plank as per dimension of drawing (Two side board as per drawing, measurement and another two side board 50 to 75mm too longer than drawing dimension).</li> <li>5. Cut the wood planks and batten along the marked line.</li> <li>6. Join the wood planks using batten and nail with butt joint to make sides of the foundation shutter.</li> <li>7. Fill the gaps of wooden planks with 0.5 mm thick Galvanized Iron (GI) sheet strip of 40 to 50 mm width.</li> <li>8. Clean the workplace</li> <li>9. Restore surplus materials, tools and equipment.</li> </ol>				
<b>Tools/equipment/materials required:</b> Hand saw, claw hammer, wood plank, batten, nail, GI sheet, pencil, try square, chisel etc.					
<b>2.</b>	<b>Task:</b> Make shutter for rectangular/square column.	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, Tools & Equipment, Shuttering materials and Simulated work place.  <b>What:</b> Make shutter for rectangular/square column  <b>How well:</b> <ul style="list-style-type: none"> <li>• Measurement error for wood plank must be kept within <math>\pm 5</math>mm</li> <li>• Surface must be even</li> <li>• No leak /gap found in the joints</li> </ul>	<b>Th.</b> 1.0	<b>Pr.</b> 8.0	<b>Tot.</b> 9.0

		<ul style="list-style-type: none"> <li>Shuttering materials must be well seasoned, Termite free and durable.</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect required materials, tools and drawing.</li> <li>2. Interpret dimension of the square column from drawing.</li> <li>3. Select wood plank and batten as per the measurement</li> <li>4. Mark the wood plank as per dimension</li> <li>5. Cut the wood planks and batten as per the dimension.</li> <li>6. Join the wood planks using batten and nail with butt joint to make sides of the square/rectangular column.</li> <li>7. Fill the gaps of wooden planks with 0.5 mm Galvanized Iron (GI) sheet strip of 40 to 50 mm width.</li> <li>8. Clean the workplace</li> <li>9. Restore surplus materials, tools and drawing.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>List out the required tools and materials for making foundation shutter.</li> <li>Explain the procedure of making sides of square /rectangular column.</li> </ul>			
	<p><b>Tools/equipment/materials required:</b> Hand saw, claw hammer, wood plank, nail, GI sheet, pencil, try square, chisel etc.</p>				
3.	<p><b>Task:</b> Make Shutter for Circular Column.</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, Tools &amp; Equipment's, Shuttering materials and simulated work place.</p> <p><b>What:</b> Make shutter for circular column.</p> <p><b>How well:</b></p>	Th. 1.0	Pr. 9.0	Tot. 10.0

		<ul style="list-style-type: none"> <li>• Measurement error for wood plank must be kept within <math>\pm 5</math>mm</li> <li>• Surface must be round and even.</li> <li>• No leak/gap found in the joints</li> <li>• Shuttering materials must be well seasoned, Termite free and durable.</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect required materials, tools and drawing.</li> <li>2. Interpret dimension of the circular column from drawing.</li> <li>3. Select wood batten as per the measurement.</li> <li>4. Make three or more round tie by M.S. Rod as per required diameter.</li> <li>5. Mark the batten as per dimension and measurement.</li> <li>6. Cut the wood batten as per the measurement</li> <li>7. Arrange the wood batten one by one around the tie at inner sides of column</li> <li>8. Fix each batten by nails with the round tie.</li> <li>9. Place the 0.5 mm thick Galvanized Iron (GI) sheet around at inner side of the batten.</li> <li>10. Clean the workplace.</li> <li>11. Restore surplus materials, tools and drawing.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List out the required tools and materials for making circular column shutter.</li> <li>• Explain the procedure of making shutter of circular column.</li> <li>• Explain the procedure of making tie.</li> </ul>			
	<p><b>Tools/equipment/materials required:</b> Hand saw, claw hammer, wood plank, M.S. Rod , nail, GI sheet, pencil, try square, chisel etc.</p>				
4.	<b>Task:</b> Make shutter for Beam.	<b>Terminal Performance Objective (TPO):</b>	Th. 0.5	Pr. 6.5	Tot. 7.0

		<p><b>Given:</b> Drawing, Tools &amp; Equipment, shuttering materials and simulated work place.</p> <p><b>What:</b> Make shutter for Beam.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Measurement error for wood plank within <math>\pm 5</math>mm</li> <li>• Surface must be straight and smooth.</li> <li>• No leakage found in the joints</li> <li>• Shuttering materials must be well seasoned, Termite free and durable.</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect required materials, tools and drawing.</li> <li>2. Interpret dimension (length, Width and Height) of the beam from drawing.</li> <li>3. Select good quality of wood plank and batten as per the measurement.</li> <li>4. Mark the wood plank as per dimension and measurement.</li> <li>5. Cut the wood planks as per the measurement</li> <li>6. Join bottom part of the beam with batten and nail.</li> <li>7. Make another two equal side parts following step 5.</li> <li>8. Fill the gaps of wooden planks with 0.5 mm Galvanized Iron (GI) sheet strip of 40 to 50 mm width.</li> <li>9. Clean the workplace.</li> <li>10. Restore surplus materials, tools and equipment.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List out the required tools and materials for making beam sides.</li> <li>• Explain the procedure of making sides of beam.</li> </ul>			

	<b>Tools/equipment/materials required:</b> Hand saw, claw hammer, wood plank, Batten, nail, GI sheet, pencil, try square, chisel etc.				
5.	<b>Task:</b> Prepare Bamboo Post for Supporting the Formwork.	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, necessary tools and materials and simulated work place.  <b>What:</b> Prepare Bamboo Post for Supporting the Formwork.  <b>How well:</b> <ul style="list-style-type: none"> <li>Bamboo post must be made from lower portion of bamboo.</li> <li>Bamboo must be matured, strong and termed free.</li> </ul>	Th. 0.5	Pr. 3.5	Tot. 4.0
	<b>Steps:</b> <ol style="list-style-type: none"> <li>Collect necessary tools and materials.</li> <li>Calculate the length of bamboo post for the relevant work.</li> <li>Mark up the post according to the length.</li> <li>Cut the bamboo as per measurement using hand saw.</li> <li>Cut groove at top of the bamboo post at a height of 75 mm apprx.</li> <li>Use wooden Ledge &amp; brace to make bracket at the top portion of the bamboo post by using nail for lintel and beam shuttering.</li> <li>Clean the work place.</li> <li>Restore the surplus materials.</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>Explain the use of bamboo post in shuttering work.</li> <li>Explain how to make bamboo post.</li> </ul>			
	<b>Tools/equipment/materials required:</b> Hand saw, claw hammer, Batten, nail, pencil, and tripod.				

## Module 4: Install Formwork for Shuttering Work

## 22.4 Module- 4: Install Formwork for Shuttering Work

22.4 Module- 4: Install Formwork for Shuttering Work					
	<b>Description:</b> This module deals with the basic knowledge and skills required for erecting shuttering carpenter works. It provides various types of erect shuttering carpenter e.g. erect column, shear wall, foundation, lintel, beam and slab, stair and steel column form work.	Hours			
	<b>Module outcomes:</b> After completion of this module, trainees will be able to: <ul style="list-style-type: none"> <li>• Erect shuttering form work for column</li> <li>• Erect Shuttering formwork for shear wall</li> <li>• Erect shuttering formwork for foundation</li> <li>• Erect shuttering formwork for lintel</li> <li>• Erect shuttering formwork for beam and slab</li> <li>• Erect shutter for stair</li> <li>• Erect steel form work for column.</li> </ul>	Th. 3.5	Pr. 62.5	Tot. 66.0	
1.	<b>Task:</b> Erect Shuttering Formwork for Column	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, workplace, making shutter  <b>What:</b> Erect shuttering form work for column  <b>How well:</b> <ul style="list-style-type: none"> <li>• Vertical level tolerance is <math>\pm</math> 2mm</li> <li>• Column center and shutter center coincide tolerance is <math>\pm</math> 2mm</li> <li>• Shutter must be water proved i.e. no leakage between joint</li> </ul>	Th. 0.5	Pr. 7.5	Tot. 8.0
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect tools equipment and drawing</li> <li>2. Make two right angles by four part of shutter.</li> <li>3. Join two parts of shutter set at right angle.</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>• List the tools and equipment</li> <li>• Explain how to make right angle</li> <li>• Discuss center line and outside marking</li> <li>• Explain the necessity of mobil oil on shutter</li> <li>• Explain erection procedure.</li> <li>• Explain the functions of Plumb bob</li> </ul>			

	<ol style="list-style-type: none"> <li>4. Set out the center line of the column by thread putting wooden or bamboo pegs / nails.</li> <li>5. Mark outline of the bottom of the columns providing half column width plus clear covering at both side of the center line.</li> <li>6. Apply Mobil or shutter oil inside the shutter by brush</li> <li>7. Set first right angle of shutter vertically one side of the mark.</li> <li>8. Set second right angle of shutter vertically other side of the mark.</li> <li>9. Join the right angle shutter with nail.</li> <li>10. Place wedge or cleat outside of the vertical shutter to protect the movement of the shutter.</li> <li>11. Check clear covering by measuring tape</li> <li>12. Check vertical alignment using plumb bob.</li> <li>13. Use bamboo or steel props to pull or push the shutter for keep it proper position.</li> <li>14. Push and Pull one side level and similarly push and pull other side level of shutter.</li> <li>15. Check the overall joints of shuttering formwork.</li> <li>16. Clean the work place.</li> <li>17. Restore the tools, equipment and materials.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain vertical level checking process.</li> </ul>			
<p><b>Tools/equipment/materials required:</b> Hammer, Nail, bamboo, steel prop, wire or rope, plumb bob, measuring tape try square.</p>					
2.	<p><b>Task:</b> Erect Shuttering Formwork for Shear Wall</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, workplace, making shutter</p>	Th. 0.5	Pr. 8.5	Tot. 9.0

		<p><b>What:</b> Erect Shuttering formwork for shear wall</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Vertical level tolerance <math>\pm</math> 2mm</li> <li>• Shear wall center and shutter center coincide tolerance <math>\pm</math> 2mm</li> <li>• Shutter must be water tight i.e. no leakage between joint</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and drawing</li> <li>2. Join two parts of shutter at right angle.</li> <li>3. Set out the center line of the column by thread putting wooden or bamboo pegs / nails.</li> <li>4. Mark outline of the bottom of the shear wall providing half shear wall width plus clear covering at both sides of the center line.</li> <li>5. Apply Mobil or shutter oil inside the shutter by brush</li> <li>6. Set the right angle shutter vertically around the mark.</li> <li>7. Join the two right angles shutter with nail.</li> <li>8. Place wedge or cleat outside of the vertical shutter to protect the movement of the shutter.</li> <li>9. Check clear covering by measuring tape</li> <li>10. Check vertical alignment using plumb bob.</li> <li>11. Use bamboo or steel props to pull or push the shutter for keep it proper position.</li> <li>12. Push and Pull one side level and similarly push and pull other side level of shutter.</li> </ol>	<p><b>Enabling Objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools and equipment</li> <li>• Explain how to make right angle</li> <li>• Discuss center line and outside marking</li> <li>• Explain oil applying process</li> <li>• Explain erection procedure.</li> <li>• Explain vertical level checking process.</li> </ul>			

	<p>13. Check the overall joints of shuttering formwork.</p> <p>14. Clean the work place.</p> <p>15. Restore the tools, equipment and materials.</p>				
<p><b>Tools/equipment/materials required:</b> Hammer, Nail, bamboo, steel prop, wire or rope, plumb bob, measuring tape, try square</p>					
3.	<p><b>Task:</b> Erect Shuttering Formwork for Foundation</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, workplace, Making shutter</p> <p><b>What:</b> Erect shuttering formwork for foundation</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Vertical level tolerance must be kept within <math>\pm 2\text{mm}</math></li> <li>• The tolerance of foundation column center and shutter center is <math>\pm 2\text{mm}</math></li> <li>• Shutter must be water protected i.e. no leakage between joint</li> </ul>	Th. 0.5	Pr. 7.5	Tot. 8.0
<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools equipment and drawing</li> <li>2. Set out the center line of the foundation column by thread putting wooden or bamboo pegs / nails.</li> <li>3. Mark outline of the bottom of the foundation providing half footing width from column center line at each side of the center line.</li> <li>4. Apply Mobil or shutter oil inside the shutter by brush.</li> <li>5. Place one side shutter vertically around the mark.</li> <li>6. Place other three side shutter similarly</li> <li>7. Join them with nail and batten.</li> </ol>		<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List the required tools and equipment</li> <li>• Discuss center line and outside marking</li> <li>• Explain oil applying process</li> <li>• Explain erection procedure.</li> <li>• Explain vertical level checking process.</li> </ul>			

	8. Check clear covering by measuring tape 9. Check vertical alignment by plumb bob. 10. Use bamboo or steel prop to pull or push the shutter for keep it proper position. 11. Push and Pull one side level and similarly push and pull other side level of shutter. 12. Check the overall joints of shuttering formwork. 13. Clean the work place. 14. Restore the tools, equipment and materials.				
<b>Tools/equipment/materials required:</b> Hammer, Nail, bamboo, steel prop, wire or rope, plumb bob, measuring tape, try square, hand saw, hack saw, claw bar.					
4.	<b>Task:</b> Erect Shuttering Formwork for Lintel	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, worksite  <b>What:</b> Erect shuttering formwork for lintel  <b>How well:</b> <ul style="list-style-type: none"> <li>• Vertical level tolerance must be kept within <math>\pm 2\text{mm}</math></li> <li>• Shutter must be water protected i.e. no leakage between joint</li> </ul>	Th. 0.5	Pr. 5.5	Tot. 6.0
<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and materials.</li> <li>2. Mark on plank as per drawing i.e. bottom plank length 5ft. and width 5 inch.</li> <li>3. Mark site plank similarly i.e. length 6ft and width 6 inch.</li> <li>4. Cut bottom and site plank according to the measurement.</li> </ol>		<b>Enabling Objectives:</b> <ul style="list-style-type: none"> <li>• List the required tools, equipment</li> <li>• Explain erection procedure.</li> <li>• Explain the steps to make formwork for lintel.</li> <li>• Explain vertical level checking process.</li> </ul>			

	<ol style="list-style-type: none"> <li>5. Take bamboo length i.e. 4ft 3 inch</li> <li>6. Cut groove at top of the bamboo-groove depth 2.5 inch.</li> <li>7. Take a piece of horizontal bar length i.e. 4.5 inch</li> <li>8. Attach horizontal bar at the top groove of the bamboo using nail.</li> <li>9. Set a piece of wooden plank both side of the wall to support the end of bottom plank</li> <li>10. Check level using water level.</li> <li>11. Set bottom plank at the top of side plank.</li> <li>12. Set bamboo with horizontal bar vertically spacing 2 ft center to center and nailing with plank.</li> <li>13. Check level of bottom plank with thread.</li> <li>14. Set both side plank with bottom plank by nail.</li> <li>15. Set a horizontal bar at the top of side plank with nail to maintain top level.</li> <li>16. Check the overall joints of shuttering formwork.</li> <li>17. Clean the work place.</li> <li>18. Restore the tools, equipment and materials.</li> </ol>				
<p><b>Tools/equipment/materials required:</b> Drawing, Measurement tape, props, or bamboo, plumb bob, marker, thread, nail, hammer, plank, bracing bar.</p>					
5.	<p><b>Task:</b> Erect Shuttering Formwork for Beam and Slab</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, worksite and materials</p> <p><b>What:</b> Erect shuttering formwork for beam and slab</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Vertical level tolerance must be kept within <math>\pm 2</math>mm</li> </ul>	Th. 0.5	Pr. 15.5	Tot. 16.0

		<ul style="list-style-type: none"> <li>• The tolerance of beam center and shutter center coincide is <math>\pm 2\text{mm}</math></li> <li>• Shutter must be water protected i.e. no leakage between join</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment, materials and drawing.</li> <li>2. Take inside measurement of the column as per drawing i.e. 10ft.</li> <li>3. Mark on plank as per measurement i.e. 10ft.</li> <li>4. Cut the plank as per marking (If plank length is below 10ft then join the plank as required).</li> <li>5. Cut horizontal bar or runner (2"x2.5"). (length will be 1" shorter than width)</li> <li>6. Place the runner at smooth surface of floor.</li> <li>7. Lay cutting plank on runner and nailing.</li> <li>8. Use 30 gauge GI sheet at joint area of plank to protect leakage.</li> <li>9. Repeat step 2 to 7 to make the required number of shutter.</li> <li>10. Attach cleat all side of the column at height of 8ft 5 inch.</li> <li>11. Cut bamboo length as per required measurement i.e. 8ft 5 inch</li> <li>12. Cut grove at top of the bamboo i.e. grove depth 2.5 inch.</li> <li>13. Set the beam bottom shutter on top of column cleat.</li> <li>14. Attach runner at the top grove of the bamboo with nail.</li> <li>15. Check beam bottom level by thread and measuring tape</li> <li>16. Check all beam bottom level tap marking in the column rods</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools, equipment, material</li> <li>• Explain runner</li> <li>• Explain cleat</li> <li>• Explain erection procedure.</li> <li>• Explain vertical level checking process.</li> </ul>			

<ol style="list-style-type: none"> <li>17. Check formwork level using thread measuring tape.</li> <li>18. Make inside shutter using step 2 to 4 and height of inside shutter 1feet 1 inch.</li> <li>19. Set the all inside shutter by nailing with bottom shutter plank.</li> <li>20. Check vertical level of the inside shutter by plumb bob and thread.</li> <li>21. Attach a piece of plank (called chamfer) at the top of inside shutter by nail.</li> <li>22. Place runner in shorter direction spacing @ 2ft c/c. up to the runner length 10 ft (if 10 ft runner is not available, join runner and extend length)</li> <li>23. Cut bamboo length 9ft 6 inch and cut 2.5 inch grove at the top of bamboo.</li> <li>24. Place bamboo vertically @ 2ft c/c and nail with runner.</li> <li>25. Place 5 inch wide plank at the top of runner and set plank in opposite direction of the runner.</li> <li>26. Place GI sheet (4'x8') size at the top of slab plank.</li> <li>27. Check level of the slab shutter by thread and tape which is done by joining thread at the tap marking rod.</li> <li>28. Make outer side of the shutter and similar for inside shutter.</li> <li>29. Set the all outside shutter and nailing with bottom shutter plank.</li> <li>30. Check vertical level of the outside shutter by plumb bob and thread.</li> <li>31. Set a GI wire at the top of inside and top of the outside plank with nail to maintain top level.</li> <li>32. Clean the work place.</li> <li>33. Restore the tools, equipment and materials.</li> </ol>	
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	<b>Tools/equipment/materials required:</b> Drawing, Measurement tape, props, or bamboo, plumb bob, marker, thread, nail, hammer, plank, bracing bar, hand saw, hack saw, claw bar.				
6.	<b>Task:</b> Erect Shutter for Stair	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Drawing, worksite, materials  <b>What:</b> Erect shutter for stair  <b>How well:</b> <ul style="list-style-type: none"> <li>Vertical level tolerance must be kept within <math>\pm 2\text{mm}</math></li> <li>Angular or inclined level tolerance is <math>\pm 0.05^\circ</math></li> <li>Coincide tolerance of beam center and shutter center is <math>\pm 2\text{mm}</math></li> <li>Shutter must be water protected i.e. no leakage between joint</li> </ul>	Th. 0.5	Pr. 12.5	Tot. 13.0
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and materials.</li> <li>2. Cut Bamboo at length 4ft 6 inch and make grove 2.5" at its top.</li> <li>3. Cut runner at length i.e. 4ft 6 inch.</li> <li>4. Place bamboo @2ft c/c and fit runner with bamboo grove.</li> <li>5. Place Runner @2ft c/c and set it as step 4.</li> <li>6. Set the making bamboo post vertically.</li> <li>7. Make platform using plank on runner with nail.</li> <li>8. Take inclined measurement from drawing i.e. 12 ft</li> <li>9. Cut Bamboo at various height and grove its top.</li> <li>10. Set runner following step 4.</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>List the required tools, equipment, material</li> <li>Explain runner</li> <li>Explain cleat</li> <li>Explain how to make the process the formwork</li> <li>Explain erection procedure.</li> <li>Explain vertical level checking process.</li> </ul>			

	<ol style="list-style-type: none"> <li>11. Set chamfer from grade beam to platform and place it both side of the waist slab.</li> <li>12. Place making bamboo post from small height to big height and nail.</li> <li>13. Place 5" wide plank at the top of runner in inclined portion.</li> <li>14. Place GI sheet (4'x8') size at the top of inclined slab (waist slab) and platform.</li> <li>15. Take out side measurement of the inclined slab as per drawing i.e. 12ft.</li> <li>16. Mark on plank as per measurement i.e. 12ft.</li> <li>17. Cut the plank as per marking (If plank length is below 12ft then join the plank piece).</li> <li>18. Cut vertical bracing height 1ft.</li> <li>19. Set inclined plank with bracing by nail.</li> <li>20. Set the making inclined plank and bracing with inclined shutter by nail.</li> <li>21. Calculate the size of the tread and riser as per drawing.</li> <li>22. Fix the planks as riser marked in the sides.</li> <li>23. Check the riser and tread using spirit level.</li> <li>24. Fix a bracing from bottom riser to top riser to maintain width of tread.</li> <li>25. Check level (Plumb bob and spirit level) the sides of rises and waist slab.</li> <li>26. Clean the work place.</li> <li>27. Restore the tools, equipment and materials.</li> </ol>				
<p><b>Tools/equipment/materials required:</b> Hammer, Nail, bamboo, steel prop, wire or rope, plumb bob, measuring tape, try square, hand saw, hack saw, claw bar</p>					
7.	<p><b>Task:</b> Erect Steel Formwork for Column</p>	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Drawing, steel shutter, worksite</p>	<p>Th. 0.5</p>	<p>Pr. 5.5</p>	<p>Tot. 6.0</p>

		<p><b>What:</b> Erect steel form work for column</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Vertical level tolerance must be kept within <math>\pm 2\text{mm}</math></li> <li>• The coincide tolerance of Column center and shutter center is <math>\pm 2\text{mm}</math></li> <li>• Shutter must be water protected i.e. no leakage between joint</li> </ul>			
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect tools, equipment and drawing</li> <li>2. Set out the center line of the column by thread putting wooden or bamboo pegs / nails.</li> <li>3. Mark outline of the bottom of the columns providing half column width plus clear covering at both side of the center line.</li> <li>4. Apply Mobil or Shutter oil inside the shutter with brush.</li> <li>5. Use joint tape (jute, foam, gestate) at joint area to protect leakage.</li> <li>6. Make right angle by two rectangular steel shutter</li> <li>7. Set the right angle steel shutter vertically around the mark.</li> <li>8. Join the right angle shutter with nut and bolt.</li> <li>9. Check clear covering by measuring tape</li> <li>10. Check vertical alignment using plumb bob.</li> <li>11. Use bamboo or steel props to pull or push the shutter for keep it proper position.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List the required tools and equipment</li> <li>• Explain how to make right angle</li> <li>• Explain how to make the process the formwork</li> <li>• Discuss center line and outside marking</li> <li>• Explain oil applying process</li> <li>• Explain erection procedure.</li> <li>• Explain vertical level checking process.</li> </ul>			

	<p>12. Push and Pull one side level and similarly for other side level of shutter.</p> <p>13. Clean the work place.</p> <p>14. Restore the tools, equipment and materials.</p>	
<p><b>Tools/equipment/materials required:</b> Drawing, Measurement tape, shutter oil (Mobil), props, or bamboo, gasket or jute, plumb bob, marker, thread, nut bolt, nail hammer, adjustable range tongue bolt and wire or rod.</p>		

## Module 5: Dismantle Formwork

22.5 Module : 5 Dismantle Formwork.						
	<b>Description:</b> This module provides skills and knowledge about dismantle form work. It includes dismantle formwork for column .beam and slab and stair.			Hours		
	<b>Module outcomes:</b> After completion of this module, trainees will be able to: <ul style="list-style-type: none"> <li>• Dismantle formwork for column.</li> <li>• Dismantle formwork for beam and slab.</li> <li>• Dismantle formwork for cantilever beam and slab.</li> <li>• Dismantle formwork for stair.</li> </ul>			Th. 2.5	Pr. 22.5	Tot. 25.0
1.	<b>Task:</b> Dismantle formwork for column.	<b>Terminal Performance Objective (TPO):</b>  <b>Given:</b> Erected formwork, necessary tools & equipment and simulated work place.  <b>What:</b> Dismantle formwork for column.  <b>How well:</b> <ul style="list-style-type: none"> <li>• Precaution must be adapted during dismantling form work to avoid damage of structure and personal safety.</li> <li>• PPE (Personal Protective Equipment's) must be used.</li> </ul>	Th. 0.5	Pr. 4.5	Tot. 6.0	
	<b>Steps:</b> <ol style="list-style-type: none"> <li>1. Collect necessary tools and equipment.</li> <li>2. Remove all inclined support.</li> <li>3. Remove all collars from top to bottom.</li> <li>4. Remove floor beat.</li> </ol>	<b>Enabling objectives:</b> <ul style="list-style-type: none"> <li>• List tools &amp; equipment's for Dismantle formwork.</li> <li>• Explain the procedure of dismantle formwork for column.</li> <li>• Explain safety precaution and safe period for Dismantle formwork of column.</li> <li>• Explain PPE.</li> </ul>				

	<p>5. Remove side board carefully, (Minimum 24 hours after casting).</p> <p>6. Repair, clean and store the board for re-use.</p> <p>7. Clean the workplace.</p> <p>8. Restore the tools &amp; equipment</p>				
<b>Tools/equipment/materials required:</b> Claw hammer , Claw bar, Chisel etc.					
<b>2.</b>	<b>Task:</b> Dismantle formwork for beam and slab.	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Erected formwork, necessary tools &amp; equipment and simulated work place.</p> <p><b>What:</b> Dismantle formwork for beam and slab.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Precaution must be adapted during dismantling formwork to avoid damage of structure and personal safety.</li> <li>• PPE (Personal Protective Equipment's) must be used before starting works.</li> </ul>	Th. 0.5	Pr. 5.5	Tot. 6.0
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect necessary tools and equipment's and materials.</li> <li>2. Put the un-fixed member in a proper place.</li> <li>3. Remove side shuttering at first for beam and slab using ladder/trestle or scaffolding.</li> <li>4. Remove bottom support gradually only after 21 days of curing.</li> <li>5. Remove alternative props of slab and beam.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List the required tools &amp; equipment to dismantle formwork.</li> <li>• Explain the procedure to dismantle formwork for beam and slab.</li> <li>• Explain safety precaution and safe period for dismantling formwork of beam and slab.</li> <li>• Explain PPE.</li> </ul>			

	<p>6. Remove bottom of slab first before removing of beam.</p> <p>7. Clean the workplace.</p> <p>8. Restore the tools &amp; equipment.</p>				
<b>Tools/equipment/materials required:</b> Claw hammer, Claw bar, Chisel, Ladder, safety net .etc.					
<b>3.</b>	<b>Task:</b> Dismantle formwork for cantilever beam and slab.	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Erected formwork, necessary tools &amp; equipment and simulated work place.</p> <p><b>What:</b> Dismantle formwork for Cantilever beam and Slab.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Precaution must be adapted during dismantling form work to avoid damage of structure and personal safety.</li> <li>• PPE (Personal Protective Equipment's) must be used.</li> </ul>	Th. 0.5	Pr. 5.5	Tot. 6.0
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect necessary tools and equipment's and materials.</li> <li>2. Put the un-fixed member in a proper place.</li> <li>3. Remove side shuttering at first for beam and slab using ladder/trestle or scaffolding.</li> <li>4. Remove bottom support gradually only after 21 days of curing.</li> <li>5. Remove props from end to support in cantilever slab and beam.</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools &amp; equipment's for Dismantle formwork.</li> <li>• Explain the procedure of dismantle formwork for column.</li> <li>• Explain safety precaution and safe period for Dismantle formwork of cantilever beam and slab.</li> <li>• Explain PPE.</li> </ul>			

	<p>6. Remove bottom of slab first before removing of beam.</p> <p>7. Clean the workplace.</p> <p>8. Restore the tools &amp; equipment</p>				
<b>Tools/equipment/materials required:</b> Claw hammer, Claw bar, Chisel, Ladder, safety net .etc.					
<b>4.</b>	<b>Task:</b> Dismantle formwork for stair.	<p><b>Terminal Performance Objective (TPO):</b></p> <p><b>Given:</b> Erected formwork, necessary tools &amp; equipment and simulated work place.</p> <p><b>What:</b> Dismantle formwork for stair.</p> <p><b>How well:</b></p> <ul style="list-style-type: none"> <li>• Precaution must be adapted during dismantling form work to avoid damage of structure and personal safety.</li> <li>• PPE (Personal Protective Equipment's) must be used.</li> </ul>	Th. 1.0	Pr. 7.0	Tot. 8.0
	<p><b>Steps:</b></p> <ol style="list-style-type: none"> <li>1. Collect necessary tools, equipment and materials.</li> <li>2. Put the un-fixed member in a proper place.</li> <li>3. Remove side shuttering at first for Wrist slab and rise.</li> <li>4. Remove bottom support gradually only after 21 days of curing.</li> <li>5. Remove props from bottom of stair.</li> <li>6. Remove bottom of wrist slab first before removing of stair beam.</li> <li>7. Clean the workplace.</li> <li>8. Restore the tools &amp; equipment's</li> </ol>	<p><b>Enabling objectives:</b></p> <ul style="list-style-type: none"> <li>• List tools &amp; equipment's for Dismantle formwork for stair.</li> <li>• Explain the procedure of Dismantle formwork for stair.</li> <li>• Explain safety precaution and safe period for Dismantle formwork of stair.</li> <li>• Explain PPE.</li> </ul>			
<b>Tools/equipment/materials required:</b> Claw hammer, Claw bar, Chisel, Ladder, safety net .etc.					

### 23. LIST OF TOOLS, EQUIPMENT & MATERIALS:

SI No	Name of the items	Specification	QTY.	Unit
<b>Tools and Equipment:</b>				
1.	Claw hammer	1 to1.5 lb	20	Pcs
2.	Claw bar	600mm to 800mm	20	Pcs
3.	Hand saw	450 mm	20	Pcs
4.	Cold chisel	200mm	20	Pcs
5.	Plum bob	16 Nos.	20	Pcs
6.	Spirit level	450mm	20	Pcs
7.	Water level( 5mm $\phi$ -6mm $\phi$ )	30m	1	Pcs
8.	Tri square (150mm x300mm)	150mm x300mm	20	Pcs
9.	Sheet nipper(Katan)/ Tin Snips	250mm-300mm	5	Pcs
10.	File (sharpness)	150mm	5	Pcs
11.	Measuring tape	3m	20	Pcs
12.	Adjustable wrench	200mm-250mm	5	Pcs
13.	Table –vice (Table size 3'x4')	150mm-200mm	5	Pcs
<b>Materials:</b>				
1.	Wood plank	1500mmx150mmx25mm	20	cft
2.	Bamboo (10m long)	100mm-125mm dia.	10	Pcs
3.	Steel Props (height 1600-2900mm, 1700-3000mm,)	48mm, 56mm , 60mm,70mm dia.	10	Pcs
4.	Mobil, oil	Standard quality	5	litre
5.	Sutter Oil(Mobil)	Standard quality	5	litre
6.	Batten (mango) 1800mm long	50mm x 75mm	7	cft
7.	Batten (mango) 1800mm long	25mm x 50mm	3	cft
8.	Plain sheet (G.I Sheet) (2mm to 3mm)	900mm x 1800mm	5	Pcs
9.	Rup ban (GI) sheet	0.5mm thick	5	kg
10.	Nail	50mm , 60mm	10	kg
11.	Pin	20mm	3	kg
12.	Thread	22 no.	0.5	kg
13.	Chalk	Standard quality	5	box
14.	Pencil HB	Standard quality	20	Pcs
15.	Gasket	40mm	5	kg
16.	Jute Tap	40mm	2	Role
17.	Marker	Standard quality	20	Pcs

SI No	Name of the items	Specification	QTY.	Unit
18.	Nut bolt with washer(50mm long)	10mm dia	5	kg
19.	Steel form work for column ( 1500mm height)	250mm x250mm	4	set

#### 24. PHYSICAL FACILITIES FOR 20 TRAINEES:

SI No	Name of the items	Specification	QTY.	Unit
1.	Working Place/Practical Room	30' X 25'	1	Room
2.	Stool	Plastic (RFL)	20	Pcs
3.	Tool Box	Steel (Standard size)	20	Pcs
4.	Instructor Chair Arm Less (Wooden)	Size: 18" X 16" X 36"	2	Pcs
5.	Class Room Table (Wooden)	Size: 24" X 30" X 36"	2	Pcs
6.	White Board	6'X4'X3/4" Surface Cover With White Formica, Border bracing with 3/4 " Aluminum Angle	1	Pcs
7.	Steel Rack	44" X 72" X 15" 20-22 SWG	2	Pcs
8.	First Aid Box with accessories	standard	1	Pcs
9.	Steel Almira	Standard Size , 20-22 SWG	2	Pcs
10.	White Board Marker	Red leaf	5	Doz.
11.	Water Filter	40 Ltr.	1	Pcs
12.	Drinking Glass	Standard Quality	2	Doz.
13.	Safety Goggles	Plastic (Transparent )	20	Pcs
14.	Safety Belt(leather)	Standard Quality	5	Pcs
15.	Hand Gloves	Skin/ruber type	20	Pair
16.	Safety Shoes	APS	20	Pair
17.	Apron set (free size)	Standard	20	Pcs
18.	Hamlet	Plastic	20	Pcs
19.	Wall clock	Standard	2	Pcs
20.	Fire extinguisher	ABC	2	cylinder

## 25. LIST OF TOOLS IN THE HAND TOOL BOX:

Sl.No		Specification	QTY.	Unit
1.	Claw hammer	1 to1.5 lb	1	Pcs
2.	Claw bar	600mm to 800mm	1	Pcs
3.	Hand saw	450 mm	1	Pcs
4.	Cold chisel	200mm	1	Pcs
5.	Plum bob	16 Nos.	1	Pcs
6.	Spirit level	450mm	1	Pcs
7.	Tri Square (150mm x300mm)	150mm x300mm	1	Pcs
8.	File	150mm	1	Pcs
9.	Measuring tape	3m	1	Pcs

## 26. SUGGESTED REFERENCE BOOKS:

- Internet browse
- Construction 1 & 2 BTEB(Class IX and X) by Md. Zillur Rahman Khan and Md. Syedur Rahman

## 27. CURRICULUM TERMS AND DEFINITION:

<b>Competency</b>	Competency means a cluster of related abilities, commitments, knowledge, and skills that enable a trainees or person to act effectively in a job.
<b>Curriculum Guide</b>	A curriculum guide is a detail resource for trainers/instructors to conduct training programs effectively. The guide intends to add the trainers/instructors in developing lesson plan, handouts/learning materials, training manuals, and evaluation criteria etc, which are basic elements in the teaching learning process.
<b>Curriculum</b>	A plan for providing sets of learning opportunity to achieve broad goal and related specific objectives for the people by a single school center.
<b>DACUM/RJA</b>	<u>D</u> eveloping <u>A</u> <u>C</u> urriculum / <u>R</u> apid <u>J</u> ob <u>A</u> nalysis. DACUM/RJA is a technique that is used to identify the competencies relevant to a particular occupation. Then the competencies of the DACUM/RJA have been formulated in details to build a curriculum guideline
<b>Duty</b>	Duty is an arbitrary clustering of related tasks in to broad functional area or general area of responsibility of trainees.
<b>Enabling Objective</b>	A statement expressing a knowledge, skills or attitudes those will enable the trainee to accomplish a terminal performance objective.
<b>Instructional Guide</b>	Instructional guide is a well-planned and structured document for the instructor to deliver effective instruction so that trainees can attain learning objectives as per training standards.

<b>Module</b>	A module is defined as a specific learning material. Modules are essentially self-contained. Self-instructional packages, with learning paced by each learner according to his/her individual ability and needs. A module covers either a single element of subject matter content or a group of content elements forming a discrete unit of subject matter or area of skills.
<b>Occupational Analysis</b>	Occupational analysis is a process used to identify the duties and tasks those are important to workers in any given occupation. A number of alternative and acceptable approaches to occupational analysis are available.
<b>Program guide</b>	A program guide is a comprehensive resource for trainers/instructors, planners, and top-level management for planning and implementation of any training programs.
<b>Program Objectives</b>	The objectives are set in a broad way to target to achieve mastery learning of the complete occupation.
<b>Skill</b>	The ability to perform on occupational task with the degree of proficiency required for a given occupation
<b>Step</b>	The smallest discrete or observable aspect of a task.
<b>Task Analysis</b>	Task analysis is the process of identifying and writing down the specific skills, knowledge and attitudes that distinguish someone who performs a task competently from someone who cannot perform the task at all.
<b>Task</b>	A unit of work complete in itself that forms a logical part of an occupation. It can be broken down into discrete steps.
<b>Terminal Performance Objective</b>	The objectives set to attain at the end of the training completion. It includes condition, unit of work and standard of teaching and learning.

## 28. CURRICULUM DEVELOPMENT TEAM:

SL #	Name	Designation	Organization	Contact Number
1.	Fakir Mohammad Abdul Mannan	Work shop Super (Civil)	Dhaka Poly technic Institute, Tejgaon, Dhaka-1208	01716759677
2.	Md. Zillur Rahman Khan	Jr. Instructor (Civil)	Dhaka Poly technic Institute, Tejgaon, Dhaka-1208	01711158084
3.	Md. Hashmot Ali Biswas	Instructor (Civil)	B.K.TTC, Dhaka	01712-561057
4.	Ripon Chandra Dhar,	Site Engineer	MONICO Ltd	01716424145
5.	Md. Mehadi Hasan Roni	Site Engineer	MONICO Ltd	01921118404
6.	Md. Abdus Shobhan	Supervisor	DIENCO Ltd.	01686151733

7.	Md. Zakir Hossain	Foreman	MONICO Ltd	01728707781
8.	Md. Iftakharul Alam Khan	Project Officer	SEP-B	01913-854349
9.	Md. Anisuzzaman	Training Coordinator	SEP-B	01912-153859
10.	Simon Coetzee	Consultant	SEP-B (Curriculum Design Africa)	01706-271675
11.	Mohammad Zulfikar Ali	Secretary	BACI	01911-425077

**Supervision:** Md. Anisuzzaman and Simon

**Record and Documentation:** Md. Anisuzzaman and Simon

**Overall Supervision:** Suresh Mahto, Skills and Employment Director (SEP-B)

### **29. REFERENCES (FOR DEVELOPING CURRICULUMS):**

- Competency Profile developed by SEP-B
- Curriculum Guideline of TITI

### **30. LINKAGES OF SEP-B CURRICULUM WITH BTEB COMPETENCY STANDARDS:**

Bangladesh Technical Education Board has not yet published the Competency Standard

### **31. SPECIAL NOTE FOR TRAINING PROVIDERS:**

Since the technology is moving fast, if there will have any new demand/skills beyond the curriculum guide, please send the comments and suggestions to the address given in the curriculum. The project believes that the development has no boundaries.

[Skills and Employment Programme-Bangladesh \(SEP-B\)](#)

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