

# **Assessment Evidence Guide**

**For**

## **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Prepare Bar Bending Schedule**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Prepare Bar Bending Schedule	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p style="text-align: center;"><b>Assessment Task 1:</b> Candidate is required to prepare bar bending schedule of given structural member assigned by assessor.</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li>1. Knowledge assessment test (Written or Oral)</li> <li>2. Portfolios at the time of assessment (if any)</li> </ol>
Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b>Identify direction and position of rebars from the drawing</p> <p><b>Performance Criteria 2:</b>Calculate number of chairs and spacer rebars</p> <p><b>Performance Criteria 3:</b> Identify size and type of cover block</p> <p><b>Performance Criteria 4:</b>Identify types, diameter&amp; shape of rebars</p> <p><b>Performance Criteria 5:</b> Calculate cutting length of straight rebars , bent up rebars, stirrups, rings and ties of concrete structure</p> <p><b>Performance Criteria 6:</b>Calculate the number of each shape of rebars</p> <p><b>Performance Criteria 7:</b>Calculate unit weight for each dia. of rebar</p> <p><b>Performance Criteria 8:</b>Calculate the total length of each type of rebars</p> <p><b>Performance Criteria 9:</b>Calculate the total weight of rebars for each dia of rebars</p> <p><b>Performance Criteria 10:</b>Fill the measurement in the relevant columns of table</p>
	<b>Portfolios required at the time of assessment (if any) for</b>

## Assessors Judgment Guide

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

Assessment Task 1		Description of Assessment Task 1 Prepare bar bending schedule of given structure member assigned by assessor		
During the practical assessment, candidate demonstrated the following:			No	Remarks
1.	Identify direction and position of rebars from the drawing			
2.	Calculate number of chairs and spacer rebars			
3.	Identify size and type of cover block			
4.	Identify types, diameter & shape of rebars			
5.	Calculate cutting length of straight rebars, bent up rebars, stirrups, rings and ties of concrete structure			
6.	Calculate the number of each shape of rebars			
7.	Calculate unit weight for each dia. of rebar			
8.	Calculate the total length of each type of rebars			
9.	Calculate the total weight of rebars for each dia of rebars			
10.	Fill the measurement in the relevant columns of table			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		
Each Assessment Task (with performance criteria)				

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/ Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Prepare Bar Bending Schedule	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number: .....  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code: .....  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Define Civil Drawing .	
2. Define reinforcement in structural drawing	
3. What is importance and use of coding in reinforcement	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

4. Describe unit weight of reinforcement	
5. Define concrete cover in RCC Drawing.	
6. Enlist types of steel used in construction.	
7. Explain how to compute number of rebars?	
8. Explain how to compute cut length of rebar having bent and hooks?	
9. What is density of steel?	

### ANSWER KEY

Sr.	Answers
1.	A civil drawing, or site drawing, is a type of technical drawing that shows information about grading, landscaping, or other site details. These drawings are intended to give a clear picture of all things in a construction site to a civil engineer.
2.	Reinforcement drawings are execution drawings that represent the reinforcing bars (rebar) to be laid in the concrete. With rebar detailing, you can break the rebars down into separate positions according to their bending shape, length, steel grade and diameter.
3.	A <i>code</i> will give the structural engineer the minimum requirements for the design of the <i>reinforced</i> concrete member to meet safety and durability requirements
4.	Steel unit weight is defined as mass per unit length, if weight rebar measured in pounds per foot known as Unit weight of rebar/steel in lb/ ft
5.	A distance of concrete from outer edge to rebar without reinforcement
6.	Followings are types of steel commonly used in structural drawing <ol style="list-style-type: none"><li>1. Plain Steel</li><li>2. Deform Steel</li><li>3. TOR Steel</li></ol>
7.	No of bars may be calculated as: Distance for bars/center to center distance + 1
8.	Cut length of rebars may be calculated as: Span to be covered + 2(Hook) + Increase of bend – 2(concrete Cover)
9.	7750 kg/m <sup>3</sup> to 8050 kg/m <sup>3</sup>

# **Assessment Evidence Guide**

## **For**

### **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Fabricate Steel Reinforcement for Bridges**  
(Formative Assessment)



**National Vocational & Technical  
Training Commission**



## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Fabricate Steel Reinforcement for Box Culverts/ Bridges Plan& Supervise work Manage Safety at Construction Site Perform Basic Green Skills for Steel Fixing	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b>Candidate is required to prepare reinforcement for pile foundation and pile cap as per drawing given by assessor</p> <p><b>Assessment Task 2:</b>Candidate is required to prepare reinforcement for wing wall, abutment wall of bridge as per drawing given by assessor</p> <p><b>Assessment Task 3:</b>Candidate is required to prepare reinforcement for pier as per drawing given by assessor</p> <p><b>Assessment Task 4:</b>Candidate is required to prepare reinforcement for deck slab over post-tensioned girder as per drawing given by assessor</p> <p><b>Assessment Task 5:</b>Candidate is required to prepare reinforcement for pier cap/ transom as per drawing given by assessor</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li><b>Knowledge assessment test (Written or Oral)</b></li> <li><b>Portfolios at the time of assessment (if any)</b></li> </ol>

Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b> Select&amp; wearPPEs</p> <p><b>Performance Criteria 2:</b>Check there is no immediate risk of danger at workplace.</p> <p><b>Performance Criteria 3:</b> Identify sizes of piles and its location</p> <p><b>Performance Criteria 4:</b>Interpret drawing for length and diameter of rebars</p> <p><b>Performance Criteria 5:</b> Measure and mark the required cut length of spiral tie bar</p> <p><b>Performance Criteria 6:</b>Bind the pile reinforcement with spiral at specified distance</p> <p><b>Performance Criteria 7:</b> Identify length, width and depth of pile cap and its location.</p> <p><b>Performance Criteria 8:</b>Mark and cut rebars of required length</p> <p><b>Performance Criteria 9:</b>Bend the stirrups as per bending dimension</p> <p><b>Performance Criteria 10:</b>Make the bundle of prepared stirrups and rebars and mark the bar code by using tag for reference.</p> <p><b>Performance Criteria 11:</b>Bind the bottom and top rebars with stirrups in the pile cap mold.</p> <p><b>Performance Criteria 12:</b>Fix concrete spacer in bottom, sides of pile cap.</p> <p><b>Performance Criteria 13:</b>Insert dowel rebars on pile cap</p> <p><b>Performance Criteria 14:</b>Identify nature of emergency</p>
	<p><b>Assessment Task 2</b></p> <p><b>Performance Criteria 1:</b> Mark and cut the required length on rebars, as per bar bending schedule</p> <p><b>Performance Criteria 2:</b>Make the bundle of prepared rebars and mark the bar code using tag for reference.</p> <p><b>Performance Criteria 3:</b> Bind/assembled wing wall rebars and abutment rebars with dowel on pile cap as per bar bending schedule.</p> <p><b>Performance Criteria 4:</b>Fix concrete spacer in sides, of wingwall and abutment.</p> <p><b>Performance Criteria 5:</b> Evacuate the workplace</p> <p><b>Performance Criteria 6:</b>Follow the emergency plan</p>

	<p><b>Assessment Task 3</b></p> <p><b>Performance Criteria 1:</b> Identify sizes and diameter of pier and its location.</p> <p><b>Performance Criteria 2:</b> Determine length and dia of main vertical rebars, diameter of spiral ties.</p> <p><b>Performance Criteria 3:</b> Prepare spiral ties of required dia.</p> <p><b>Performance Criteria 4:</b> Cut the vertical main rebars for piers as per bar bending schedule.</p> <p><b>Performance Criteria 5:</b> Make the bundle of prepared rebars and mark the bar code using tag for reference.</p> <p><b>Performance Criteria 6:</b> Bind the pier reinforcement with spiral ties, having round concrete spacers, with dowels rebars on pile cap.</p> <p><b>Performance Criteria 7:</b> Identify length, width and depth of pier cap</p> <p><b>Performance Criteria 8:</b> mark and cut rebars of required length</p> <p><b>Performance Criteria 9:</b> Bend the stirrups as per bending dimension</p> <p><b>Performance Criteria 10:</b> Make the bundle of prepared stirrups and rebars and mark the bar code by using tag for reference.</p> <p><b>Performance Criteria 11:</b> Bind the bottom and top rebars with stirrups in the pier cap mold.</p> <p><b>Performance Criteria 12:</b> Fix concrete spacer in bottom, sides of pier cap</p> <p><b>Performance Criteria 13:</b> Insert dowel rebars on pier cap</p> <p><b>Performance Criteria 14:</b> Lubricate metallic components with appropriate protective materials.</p> <p><b>Performance Criteria 15:</b> Store/stack the rebars fixing materials at dry place.</p> <p><b>Performance Criteria 16:</b> Use hand signal while lifting and placing load</p>
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	<p><b>Assessment Task 4</b></p> <p><b>Performance Criteria 1:</b> Wear full body harness and check the connections.</p> <p><b>Performance Criteria 2:</b> Identify physical hazards at work place</p> <p><b>Performance Criteria 3:</b> Recognize the quality standards and the requirements stipulated within the standards to perform the particular job, like equipment, personals, physical facilities and storage capacity etc.</p> <p><b>Performance Criteria 4:</b> Mark and cut the required length on rebars as per bar bending schedule</p> <p><b>Performance Criteria 5:</b> Bend the end hooks of rebars as per bending dimension</p> <p><b>Performance Criteria 6:</b> Make the bundle of prepared rebars and tag rebars</p> <p><b>Performance Criteria 7:</b> Place the bundle of prepared rebars of structural members to the required central place</p> <p><b>Performance Criteria 8:</b> Separate the rebars of different sizes of beams/slabs</p> <p><b>Performance Criteria 9:</b> Put all stirrups in bottom and top rebars of the beam</p> <p><b>Performance Criteria 10:</b> Bind the stirrups with bottom and top rebars</p> <p><b>Performance Criteria 11:</b> Bind curtails rebars with in the top and bottom rebars</p> <p><b>Performance Criteria 12:</b> Spread the rebars and distribution rebars for slab in two direction</p> <p><b>Performance Criteria 13:</b> Bind rebars with one another with binding wire</p> <p><b>Performance Criteria 14:</b> Add spacer according to bar bending schedule</p> <p><b>Performance Criteria 15:</b> Assemble the components of bridge according to the drawing</p> <p><b>Performance Criteria 16:</b> Add bearing pads under the deck slab as shock absorbers</p> <p><b>Performance Criteria 17:</b> Prepare Break down work of activities into small achievable components and efficient sequences</p> <p><b>Performance Criteria 18:</b> Allocate appropriate responsibility to appropriate team member to avoid conflicts.</p> <p><b>Performance Criteria 19:</b> Dispose unusable waste as per set standards.</p> <p><b>Performance Criteria 20:</b> Place reusable material at designated storage area</p> <p><b>Performance Criteria 21:</b> Transport waste material to designated place</p> <p><b>Performance Criteria 22:</b> Select lifting equipment accordingly</p> <p><b>Performance Criteria 23:</b> Assemble the lifting equipment</p>
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	<p><b>Assessment Task 5</b></p> <p><b>Performance Criteria 1:</b>Mark and cut the required length on rebars as per bar bending schedule</p> <p><b>Performance Criteria 2:</b>Bend the end hooks of rebars as per bending dimension</p> <p><b>Performance Criteria 3:</b> Make the bundle of prepared rebars and tag rebars</p> <p><b>Performance Criteria 4:</b>Place the bundle of prepared rebars of structural members to the required central place</p> <p><b>Performance Criteria 5:</b>Separate the rebars of different sizes of beams/slabs</p> <p><b>Performance Criteria 6:</b>Put all stirrups in bottom and top rebars of the beam</p> <p><b>Performance Criteria 7:</b>Put extra rebars at the top of the transom</p> <p><b>Performance Criteria 8:</b>Bind the stirrups with bottom and top rebars</p> <p><b>Performance Criteria 9:</b>Bind curtailed rebars with in the top and bottom rebars</p> <p><b>Performance Criteria 10:</b>Spread the rebars for transom</p> <p><b>Performance Criteria 11:</b>Bind rebars with one another with binding wire</p> <p><b>Performance Criteria 12:</b>Add spacer according to bar bending schedule</p> <p><b>Performance Criteria 13:</b> Conduct physical inspection of processes &amp;materials in accordance with the inspection plan.</p> <p><b>Performance Criteria 14:</b>Maintain security and confidentiality of workplace information</p> <p><b>Performance Criteria 15:</b> Select lifting equipment accordingly</p> <p><b>Performance Criteria 16:</b> Assemble the lifting equipment</p>
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## Assessors Judgment Guide

(To be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

<b>Assessment Task 1</b>		<b>Description of Assessment Task 1</b> Candidate is required to prepare reinforcement for pile foundation and pile cap as per drawing given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Select& wear PPEs			
2.	Check there is no immediate risk of danger at workplace.			
3.	Identify sizes of piles and its location			
4.	Interpret drawing for length and diameter of rebars			
5.	Measure and mark the required cut length of spiral tie bar			
6.	Bind the pile reinforcement with spiral at specified distance			
7.	Identify length, width and depth of pile cap and its location.			
8.	mark and cut rebars of required length			
9.	Bend the stirrups as per bending dimension			
10.	Make the bundle of prepared stirrups and rebars and mark the bar code by using tag for reference.			
11.	Bind the bottom and top rebars with stirrups in the pile cap mold.			
12.	Fix concrete spacer in bottom, sides of pile cap.			
13.	Insert dowel rebars on pile cap			
14.	Identify nature of emergency			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

<b>Assessment Task 2</b>		<b>Description of Assessment Task 2</b>		
		Candidate is required to prepare reinforcement for wing wall, abutment wall of bridge as per drawing given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Mark and cut the required length on rebars, as per bar bending schedule			
2.	Make the bundle of prepared rebars and mark the bar code using tag for reference.			
3.	Bind/assembled wing wall rebars and abutment rebars with dowel on pile cap as per bar bending schedule.			
4.	Fix concrete spacer in sides, of wing wall and abutment.			
5.	Evacuate the workplace			
6.	Follow the emergency plan			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		



Assessment Task 3		Description of Assessment Task 3		
		Candidate is required to prepare reinforcement for pier as per drawing given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Identify sizes and diameter of pier and its location.			
2.	Determine length and dia of main vertical rebars, diameter of spiral ties.			
3.	Prepare spiral ties of required dia.			
4.	Cut the vertical main rebars for piers as per bar bending schedule.			
5.	Make the bundle of prepared rebars and mark the bar code using tag for reference.			
6.	Bind the pier reinforcement with spiral ties, having round concrete spacers, with dowels rebars on pile cap.			
7.	Identify length, width and depth of pier cap			
8.	Mark and cut rebars of required length			
9.	Bend the stirrups as per bending dimension			
10.	Make the bundle of prepared stirrups and rebars and mark the bar code by using tag for reference.			
11.	Bind the bottom and top rebars with stirrups in the pier cap mold.			
12.	Fix concrete spacer in bottom, sides of pier cap			
13.	Insert dowel rebars on pier cap			
14.	Lubricate metallic components with appropriate protective materials.			
15.	Store/stack the rebars fixing materials at dry place			
16.	Use hand signal while lifting and placing load			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 4		Description of Assessment Task 4		
		Candidate is required to Interpret bar bending schedule assigned by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Wear full body harness and check the connections.			
2.	Identify physical hazards at work place			
3.	Recognize the quality standards and the requirements stipulated within the standards to perform the particular job, like equipment, personals, physical facilities and storage capacity etc.			
4.	Mark and cut the required length on rebars as per bar bending schedule			
5.	Bend the end hooks of rebars as per bending dimension			
6.	Make the bundle of prepared rebars and tag rebars			
7.	Place the bundle of prepared rebars of structural members to the required central place			
8.	Separate the rebars of different sizes of beams/slabs			
9.	Put all stirrups in bottom and top rebars of the beam			
10.	Bind the stirrups with bottom and top rebars			
11.	Bind curtails rebars with in the top and bottom rebars			
12.	Spread the rebars and distribution rebars for slab in two direction			
13.	Bind rebars with one another with binding wire			
14.	Add spacer according to bar bending schedule			
15.	Assemble the components of bridge according to the drawing			
16.	Add bearing pads under the deck slab as shock absorbers			
17.	Prepare Break down work of activities into small achievable components and efficient sequences			
18.	Allocate appropriate responsibility to appropriate team member to avoid conflicts.			
19.	Dispose unusable waste as per set standards.			
20.	Place reusable material at designated storage area			
21.	Transport waste material to designated place			
22.	Select lifting equipment accordingly			

23.	Assemble the lifting equipment			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 5		Description of Assessment Task 5		
		Candidate is required to prepare reinforcement for pier cap/ transom as per drawing given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Mark and cut the required length on rebars as per bar bending schedule			
2.	Bend the end hooks of rebars as per bending dimension			
3.	Make the bundle of prepared rebars and tag rebars			
4.	Place the bundle of prepared rebars of structural members to the required central place			
5.	Separate the rebars of different sizes of beams/slabs			
6.	Put all stirrups in bottom and top rebars of the beam			
7.	Put extra rebars at the top of the transom			
8.	Bind the stirrups with bottom and top rebars			
9.	Bind curtailed rebars with in the top and bottom rebars			
10.	Spread therebars for transom			
11.	Bind rebars with one another with binding wire			
12.	Add spacer according to bar bending schedule			
13.	Conduct physical inspection of processes & materials in accordance with the inspection plan.			
14.	Maintain security and confidentiality of workplace information			
15.	Select lifting equipment accordingly			
16.	Assemble the lifting equipment			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/ Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Fabricate steel reinforcement for bridges Manage safety at construction site Plan and supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you  need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Define pile foundation	
2. Define pile cap	
3. Define wing wall,	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

4. Define abutment	
5. Define Pier cap/transom.	
6. Define Deck slab	
7. Define culvert	
8. Enlist types of culvert.	
9. What are the types of safety system in foundation?	

### **ANSWER KEY**

<b>Sr.</b>	<b>Answers</b>
1.	Pile foundation is defined as a column constructed into the ground to transmit loads to a lower level of subsoil
2.	a block used to protect the head of pile and to hold it in the leads while being driven in the ground
3.	A <i>wing wall</i> is a smaller wall attached or next to a larger wall for a bridge structure
4.	An <i>abutment</i> is the substructure at the ends of a <i>bridge</i> span or dam supporting its superstructure
5.	Pier cap is the component of a bridge, which transfers loads from the superstructure to the piers. It is also called head stock
6.	Deck slab is a slab of concrete used to make the base for the roadway, railway, pedestrian walkway, etc. on the bridge
7.	It is a small bridge whose length is less than 6 meter
8.	<ul style="list-style-type: none"><li>• Pipe culvert</li><li>• Arch culvert</li><li>• Slab culvert</li><li>• Box culvert etc.</li></ul>
9.	Shielding. Shoring. Sloping

# **Assessment Evidence Guide**

## **For**

### **“Steel Fixer/ Erector”**

**Level-4**

**Perform 2D Engineering Drawings using CAD  
Software**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector (Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:4</b>	<b>Version:01</b>
<b>Competency Standard Title:</b> Perform 2D Engineering Drawings using CAD Software Maintain Safety at Site	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b> Candidate is required to draw and plot a set of 2D civil drawings assign by assessor.</p> <p><b>And complete:</b></p> <p><b>2. Knowledge assessment test (Written or Oral)</b></p> <p><b>3. Portfolios at the time of assessment (if any)</b></p>
Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b>Setup user interface settings for required drawing.</p> <p><b>Performance Criteria 2:</b> Create different 2D shapes with given measurements.</p> <p><b>Performance Criteria 3:</b> Edit different 2D shapes to meet requirement.</p> <p><b>Performance Criteria 4:</b>Insert dimensions and symbols as per requirement</p> <p><b>Performance Criteria 5:</b>Save the file in different drawing formats</p> <p><b>Performance Criteria 6:</b>Develop 2D Drawing with given project specification and measurements.</p> <p><b>Performance Criteria 7:</b>Plot drawing on scale according to required size &amp; orientation.</p> <p><b>Performance Criteria 8:</b>Check the connectivity of earthing with power equipment</p> <p><b>Performance Criteria 9:</b>Check leads and cable for any visual damage before use.</p> <p><b>Performance Criteria 10:</b>Tag damaged lead, cable and connection points and report to the supervisor.</p>



## Assessors Judgment Guide

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

Each Assessment Task (with performance criteria)				
Assessment Task 1		Description of Assessment Task 1		
		Candidate is required to draw and plot a set of 2D civil drawings assign by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Setup user interface settings for required drawing.			
2.	Create different 2D shapes with given measurements.			
3.	Edit different 2D shapes to meet requirement.			
4.	Insert dimensions and symbols as per requirement			
5.	Save the file in different drawing formats			
6.	Develop 2D Drawing with given project specification and measurements.			
7.	Plot drawing on scale according to required size & orientation.			
8.	Check the connectivity of earthing with power equipment			
9.	Tag damaged lead, cable and connection points and report to the supervisor.			
10.	Check leads and cable for any visual damage before use.			

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector (Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Perform 2D Engineering Drawings using CAD Software Maintain Safety at Site	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you  need to answer the questions on the following pages successfully.</b>
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candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Short keys: H O	
2. Short keys: E M	
3. Short keys: G F	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

4. Short key: D J	
5. What is file extension of Auto CAD file?	
6. How to set scale on auto cad?	
7. What is the function of layer command?	
8. What is the purpose of o snap?	

### ANSWER KEY

Sr	Answers
.	
1.	Hatch Offset
2.	Erase Move
3.	Group Fillet
4.	Dim style Join
5.	DWG file
6.	<b>Select the object(s), type SCALE, and then specify a number larger than 1. Hit Enter. The size of the object(s) will SCALE UP by that scale factor.</b>
7.	With the LAYER command and its associated dialogue box, <b>one can turn various layers on or off (displayed or not displayed)</b> , change layer colors, line type, and display modes, as well as lock layers to prevent inadvertent or mistaken changes.
8.	Osnap is <b>used when two objects appear to intersect on the screen, but do not truly intersect</b> . It also works when any two objects do not intersect, but you need to find the point where they would.

# **Assessment Evidence Guide**

**For**

## **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Perform Computer Applications**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Perform Computer Applications	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the giventime frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b> Candidate is required toprepare a spreadsheet in MS Excel specified by assessor.</p> <p><b>Assessment Task 2:</b>Candidate is required toprepare a presentation in power point specified by assessor.</p> <p><b>And complete:</b></p> <p><b>4. Knowledge assessment test (Written or Oral)</b></p> <p><b>5. Portfolios at the time of assessment (if any)</b></p>
Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance criteria 1:</b> Develop a worksheet as per given data.</p> <p><b>Performance criteria 2:</b> Format the worksheet according to given criteria.</p> <p><b>Performance criteria 3:</b> Apply Formulas according to the requirement.</p> <p><b>Performance criteria 4:</b> Generate Charts/Graphs according to the given data.</p> <p><b>Performance criteria 5:</b> Print Worksheet according to requirements.</p>

	<p><b>Assessment Task 2</b></p> <p><b>Performance criteria 1:</b> Insert Slides with different Layouts according to requirements of presentation.</p> <p><b>Performance criteria 2:</b> Insert text, tables, images, etc. according to the requirement.</p> <p><b>Performance criteria 3:</b> Apply a set of effects to animate the slide according to requirement.</p> <p><b>Performance criteria 4:</b> Apply Slide Transitions on Slides according to requirement.</p> <p><b>Performance criteria 5:</b> Apply Sound Effects on Objects/text/images according to requirement.</p> <p><b>Performance criteria 6:</b> Present a presentation according to 7Cs of communication.</p>
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## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

<b>Assessment Task 1</b>		<b>Description of Assessment Task 1</b> Prepare a spreadsheet in MS Excel specified by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Develop a worksheet as per given data.			
2.	Format the worksheet according to given criteria.			
3.	Apply Formulas according to the requirement.			
4.	Generate Charts/Graphs according to the given data.			
5.	Print Worksheet according to requirements.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

<b>Assessment Task 2</b>		<b>Description of Assessment Task 2</b> Prepare a presentation in power point specified by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Insert Slides with different Layouts according to requirements of presentation.			
2.	Insert text, tables, images, etc. according to the requirement.			
3.	Apply a set of effects to animate the slide according to requirement.			
4.	Apply Slide Transitions on Slides according to requirement.			
5.	Apply Sound Effects on Objects/text/images according to requirement.			
6.	Present a presentation according to 7Cs of communication			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Perform Computer Applications	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. What is MS Excel spreadsheet?	
2. What are the four uses of Microsoft Power Point?	
3. What is the short key to erase, find, copy?	
4. How to inert a table?	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

5. How to select entire worksheet?	
6. What are the sizes of paper used in printing.	
7. How to add slides?	
8. How to add smart charts?	
9. What is the purpose of powerpoint?	

### **ANSWER KEY**

<b>Sr.</b>	<b>Answers</b>
1.	Spreadsheets present tables of values arranged in rows and columns that can be manipulated mathematically using both basic and complex arithmetic operations and functions.
2.	Documents ,Performed calculations ,Analyzed data ,Reports in slides shows
3.	CLT+E , CLT+F, CLT+C
4.	Click on INSERT , click on TABLE, select rows and column
5.	CLT+A
6.	A4, A3, A2, A1
7.	Click on new slide , select format of slide
8.	Click on INSERT, click SMART CHART, select style of smart chart
9.	It allows users to create visual presentations comprised of individual slides

# **Assessment Evidence Guide**

**For**

## **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Execute Steel Work In Confined Spaces**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Execute Steel Work in Confined Spaces Manage Safety at Construction Site Plan& Supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p style="text-align: center;"><b>Assessment Task 1:</b> Candidate is required to prepare reinforcement for confined spaceas per instruction given by assessor.</p> <p style="text-align: center;"><b>Assessment Task 2:</b>Candidate is required to perform final inspection as per check list given by assessor.</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li><b>1. Knowledge assessment test (Written or Oral)</b></li> <li><b>2. Portfolios at the time of assessment (if any)</b></li> </ol>

Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b> Fill the safety check list for confined spaces</p> <p><b>Performance Criteria 2:</b> Select and wear PPEs</p> <p><b>Performance Criteria 3:</b> Select appropriate tools and equipments</p> <p><b>Performance Criteria 4:</b> Interpret of bar bending schedule</p> <p><b>Performance Criteria 5:</b> Interpret structure drawings</p> <p><b>Performance Criteria 6:</b> Straighten the rebars.</p> <p><b>Performance Criteria 7:</b> Measure and mark the required cut length on rebars</p> <p><b>Performance Criteria 8:</b> Cut the rebars</p> <p><b>Performance Criteria 9:</b> Make the bundle of prepared rebars and mark the bar code using tag for pre stressed girder for reference.</p> <p><b>Performance Criteria 9:</b> Mark spacing of rebars on prepared bed</p> <p><b>Performance Criteria 10:</b> Place rebars according to drawing</p> <p><b>Performance Criteria 11:</b> Bind rebars</p> <p><b>Performance Criteria 12:</b> Place spacers as per requirement</p> <p><b>Performance Criteria 13:</b> Identify physical hazards at work place</p> <p><b>Performance Criteria 14:</b> Check adequacy of ventilation at work place</p> <p><b>Performance Criteria 15:</b> Examine the illumination level at work place</p> <p><b>Performance Criteria 16:</b> Check there is no immediate risk of danger at work place.</p> <p><b>Performance Criteria 17:</b> Trace the lacking in work procedure and deficiencies in safety measures.</p> <p><b>Performance Criteria 18:</b> Conduct emergency response drill for assessing the deficiencies and review the emergency response plan &amp; procedures.</p>
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	<p><b>Assessment Task 2</b></p> <p><b>Performance Criteria 1:</b> Recover tools, equipment and materials from the confined space</p> <p><b>Performance Criteria 2:</b> Clear work area and dispose of or recycle materials</p> <p><b>Performance Criteria 3:</b> Remove, clean and store barriers and signs</p> <p><b>Performance Criteria 4:</b> Consult with the client or site in-charge and obtain relevant information, including the level of supervision required, drawings and specifications</p> <p><b>Performance Criteria 5:</b> Conduct physical inspection of processes &amp; materials in accordance with the inspection plan.</p> <p><b>Performance Criteria 6:</b> Identify the defects and deficiencies in product &amp; processes and record with evidence</p> <p><b>Performance Criteria 7:</b> Collect and review the information relevant to inspection activities for recoding inspection results</p> <p><b>Performance Criteria 8:</b> Prepare and issue a final project report detailing supervision and statement of compliance and relevant tables and plans as required.</p>
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## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

Candidate Details	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							
Each Assessment Task (with performance criteria)							

## Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Candidate is required to prepare reinforcement for confined spaces as per instruction given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Fill the safety check list for confined spaces			
2.	Select and wear PPEs			
3.	Select appropriate tools and equipments			
4.	Interpret of bar bending schedule			
5.	Interpret structure drawings			
6.	Straighten the rebars.			
7.	Measure and mark the required cut length on rebars			
8.	Cut the rebars			
9.	Make the bundle of prepared rebars and mark the bar code using tag for pre stressed girder for reference.			
10.	Mark spacing of rebars on prepared bed			
11.	Place rebars according to drawing			
12.	Bind rebars			
13.	Place spacers as per requirement			
14.	Identify physical hazards at work place			
15.	Check adequacy of ventilation at work place			
16.	Examine the illumination level at work place			
17.	Check there is no immediate risk of danger at work place.			
18.	Trace the lacking in work procedure and deficiencies in safety measures.			
19.	Conduct emergency response drill for assessing the deficiencies and review the emergency response plan & procedures.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

<b>Assessment Task 2</b>		<b>Description of Assessment Task 2</b>		
		Perform final inspection as per check list given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Recover tools, equipment and materials from the confined space			
2.	Clear work area and dispose of or recycle materials			
3.	Remove, clean and store barriers and signs			
4.	Consult with the client or site in-charge and obtain relevant information, including the level of supervision required, drawings and specifications			
5.	Conduct physical inspection of processes & materials in accordance with the inspection plan.			
6.	Identify the defects and deficiencies in product & processes and record with evidence			
7.	Collect and review the information relevant to inspection activities for recoding inspection results			
8.	Prepare and issue a final project report detailing supervision and statement of compliance and relevant tables and plans as required.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/ Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Execute steel work in confined spaces Manage safety at construction site Plan and supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Define confined spaces in civil works.	
2. Enlist confined spaces to work in civil works.	
3. Explain entry procedure for confined spaces.	
4. What is importance of air containment system?	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

5. Enlist dangerous toxic gases.	
6. Describe important points for reinforcement in trench/mine.	
7. Explain final inspection before exit from trench?	
8. Enlist factors for working in confined spaces	

## ANSWER KEY

Sr.	Answers
1.	A space rather difficult and different to work as compared to other works in civil.
2.	<p>Followings maybe considered as confined spaces:</p> <ol style="list-style-type: none"> <li>1. To work in mines</li> <li>2. To work in cutting hilly areas</li> <li>3. To work in deep tank or trenches</li> <li>4. Work at harbor and decks</li> <li>5. Working at such area where space is not sufficient for laborer to work easily.</li> </ol>
3.	<p>A check list be completed and signed for entering confined spaces containing special checks according to that area like entering in a trench or mine</p> <ol style="list-style-type: none"> <li>1. Oxygen level</li> <li>2. Humidity</li> <li>3. Illumination</li> <li>4. Communication equipment</li> <li>5. Temperature</li> <li>6. Escape plan</li> </ol>
4.	In simple terms, a containment system provides a physical separation between the cold supply air and the hot return air, optimizing airflow distribution in a specific place.
5.	Hydrogen Sulfide. Carbon Monoxide. Nitrogen Oxides are dangerous gases which may be harmful for human
6.	<p>Followings points are important.</p> <ol style="list-style-type: none"> <li>4. Prepare as per check list before entry.</li> <li>5. Arrange the tools for the job</li> <li>6. Use PPEs</li> </ol>
7.	<p>Inspect the work done as per drawing</p> <ol style="list-style-type: none"> <li>1. Recover tools/equipment</li> <li>2. Clear work area and dispose of or recycle materials</li> </ol>
8.	<ol style="list-style-type: none"> <li>1. Ensure that the atmosphere is tested and monitored for harmful elements.</li> <li>2. Enter the confined space according to agreed procedure</li> <li>3. Maintain <i>communication</i> with the stand-by person</li> </ol>
Competent <input type="checkbox"/> <span style="float: right;">Not Yet Competent <input type="checkbox"/></span>	

# **Assessment Evidence Guide**

**For**

## **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Fabricate Steel Reinforcement for Pre Stressed  
Structure Member**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**



## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Fabricate Steel Reinforcement for Pre Stressed Structural Member Manage Safety at Construction Site Plan& Supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b>  <b>Assessment Task 1:</b> Candidate is required to perform prestressing of structural member as per specification given by assessor. <b>And complete:</b>  1. Knowledge assessment test (Written or Oral) 2. Portfolios at the time of assessment (if any)

Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b> Interpret of bar bending schedule</p> <p><b>Performance Criteria 2:</b> Interpret structural drawings</p> <p><b>Performance Criteria 3:</b> Barricate the area</p> <p><b>Performance Criteria 4:</b> Select and wear PPE's</p> <p><b>Performance Criteria 5:</b> Straighten rebars.</p> <p><b>Performance Criteria 6:</b> Measure and mark required cut length on rebars</p> <p><b>Performance Criteria 7:</b> Cut the rebars</p> <p><b>Performance Criteria 8:</b> Make the bundle of prepared rebars and mark the bar code using tag for prestressed girder for reference.</p> <p><b>Performance Criteria 9:</b> Mark spacing of rebars on prepared bed</p> <p><b>Performance Criteria 10:</b> Fix the steel sheets of required size</p> <p><b>Performance Criteria 11:</b> Place the flexible conduits in the mould</p> <p><b>Performance Criteria 12:</b> Place top and bottom steel</p> <p><b>Performance Criteria 13:</b> Fix the shear reinforcement with top and bottom steel</p> <p><b>Performance Criteria 14:</b> Place steel/strands in conduits</p> <p><b>Performance Criteria 15:</b> Provide tension by pulling tendons from the anchorage points</p> <p><b>Performance Criteria 16:</b> Provide dead end anchors</p> <p><b>Performance Criteria 17:</b> Fill flexible conduits with plain cement mortar</p> <p><b>Performance Criteria 18:</b> Perform injection method</p> <p><b>Performance Criteria 19:</b> Perform curing</p> <p><b>Performance Criteria 20:</b> Select steel as per site conditions.</p> <p><b>Performance Criteria 21:</b> Dispose unusable waste as per set standards</p> <p><b>Performance Criteria 22:</b> Identify physical hazards at work place</p> <p><b>Performance Criteria 23:</b> Recognize the quality standards and the requirements stipulated within the standards to perform the particular job, like equipment, personals, physical facilities and storage capacity etc.</p>
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## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Perform prestressing of structure member as per specification given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Interpret of bar bending schedule			
2.	Interpret structural drawings			
3.	Barricate the area			
4.	Select and wear PPE's			
5.	Straighten rebars.			
6.	Measure and mark required cut length on rebars			
7.	Cut the rebars			
8.	Make the bundle of prepared rebars and mark the bar code using tag for prestressed girder for reference.			
9.	Mark spacing of rebars on prepared bed			
10.	Fix the steel sheets of required size			
11.	Place the flexible conduits in the mould			
12.	Place top and bottom steel			
13.	Fix the shear reinforcement with top and bottom steel			
14.	Place steel/strands in conduits			
15.	Provide tension by pulling tendons from the anchorage points			
16.	Provide dead end anchors			
17.	Fill flexible conduits with plain cement mortar			
18.	Perform injection method			
19.	Perform curing			
20.	Select steel as per site conditions.			
21.	Dispose unusable waste as per set standards			
22.	Identify physical hazards at work place			
23.	Recognize the quality standards and the requirements stipulated within the standards capacity etc.			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/ Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Fabricate steel reinforcement for pre stressed Structure Member Manage safety at construction site Plan and supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Define fabrication of steel	
2. Define pre stressed structure	
3. Enlist basic types of prestressing	
4. Define conduits	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

5. Define mould	
6. Define pre stressed girders	
7. What are types of barrication?	
8. What are PPEs for foot safety?	
9. Define strands?	

### **ANSWER KEY**

<b>Sr.</b>	<b>Answers</b>
1.	Steel <i>fabrication</i> is the creation of <i>metal</i> structures by cutting, bending and assembling processes
2.	A <i>prestressed structure</i> is one whose overall integrity, stability and security depend, primarily on <i>prestressing</i>
3.	<ul style="list-style-type: none"><li>• Precompression with mostly the structure's own weight</li><li>• <a href="#">Pre-tensioning</a> with high-strength embedded tendons</li><li>• <a href="#">Post-tensioning</a> with high-strength bonded or unbounded tendons</li></ul>
4.	a channel for placing strands and concrete in pre stressing.
5.	a hollow container used to give shape to fresh concrete .
6.	Prestressed girders is a type of concrete girder that facilitates the rapid construction of a bridge
7.	Concrete blocks, plastic blocks, safety tapes , safety signs
8.	Steel/Composite Safety Toe. Metatarsal Guard Static Dissipative – Electrostatic Discharge – ESD – Conductive Electrical Hazard (EH) – Non-Conductive Dielectric Electric Overshoes Thermal Insulated Shoes Waterproof Shoes Chemical-Resistant Shoes.
9.	Each of the strings which, twisted together, make up a yarn, rope or cord

# **Assessment Evidence Guide**

**For**

**“Steel Fixer/ Erector”**

**Level-4**

**Execute Splicing and Anchoring Using  
Mechanical Methods**

**(Formative Assessment)**



**National Vocational & Technical  
Training Commission**



## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Execute Splicing and Anchoring using Mechanical Methods Manage Safety at Construction Site Plan& Supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b>Candidate is required to perform splicing and anchoring cycle on a minimum of three occasions as per drawing given by assessor.</p> <p><b>Assessment Task 2:</b>Candidate is required to perform reinforcement checks as per drawings given by assessor.</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li><b>1. Knowledge assessment test (Written or Oral)</b></li> <li><b>2. Portfolios at the time of assessment (if any)</b></li> </ol>

Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1</b></p> <p><b>Performance Criteria 1:</b> Interpret drawing and specification.</p> <p><b>Performance Criteria 2:</b> Prepare material as per requirement</p> <p><b>Performance Criteria 3:</b> Thread reinforcement rebars as detailed in job specifications</p> <p><b>Performance Criteria 4:</b> Fit and secure splicing couplers to rebar in accordance with job specifications</p> <p><b>Performance Criteria 5:</b>Free coupler connections and rebars from mill scaling and residual debris</p> <p><b>Performance Criteria 6:</b> Locate and anchor reinforcement as prescribed in job specifications</p> <p><b>Performance Criteria 7:</b> Identify various types of steel fixing waste.</p> <p><b>Performance Criteria 8:</b> Sort and categorize reusable waste.</p> <p><b>Performance Criteria 9:</b> Dispose unusable waste as per set standards.</p> <p><b>Performance Criteria 10:</b> Identify physical hazards at work place</p> <p><b>Performance Criteria 11:</b>Carry out special tool box talks which require discussion on highly critical safety related matters, hazardous site conditions pertaining to particular work etc.</p> <p><b>Performance Criteria 12:</b>Ensure appropriate use of Personal Protective Equipment (PPE)</p> <p><b>Performance Criteria 13:</b>Implement safe handling and stacking methods at workplace / store</p> <p><b>Performance Criteria 14:</b>Recognize the quality standards and the requirements stipulated within the standards to perform the particular job, like equipment, personals, physical facilities and storage capacity etc.</p> <p><b>Performance Criteria 15:</b>Prepare the process flow diagram in order to achieve Quality outcome.</p> <p><b>Performance Criteria 16:</b>Organize site induction for self and support personnel as required</p> <p><b>Performance Criteria 17:</b>Clarify allocated work targets and timelines set by Management.</p> <p><b>Performance Criteria 18:</b>Prepare Break down work of activities into small achievable components and efficient sequences</p> <p><b>Performance Criteria 19:</b>Plan housekeeping activities prior to and post completion of work</p>
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	<p><b>Assessment Task 2</b></p> <p><b>Performance Criteria 1:</b> Fix ties to reinforcement</p> <p><b>Performance Criteria 2:</b> Check depth of coverage, clearance, spacing and overlap of reinforcement material according to drawing</p> <p><b>Performance Criteria 3:</b> Clean, maintain and store plant tools &amp; equipment</p>
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## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Perform splicing and anchoring cycle on a minimum of three occasions as per drawing given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Interpret drawing and specification.			
2.	Prepare material as per requirement			
3.	Thread reinforcement rebars as detailed in job specifications			
4.	Fit and secure splicing couplers to rebar in accordance with job specifications			
5.	Free coupler connections and rebars from mill scaling and residual debris			
6.	Locate and anchor reinforcement as prescribed in job specifications			
7.	Identify various types of steel fixing waste.			
8.	Sort and categorize reusable waste.			
9.	Dispose unusable waste as per set standards.			
10.	Identify physical hazards at work place			
11.	Carry out special tool box talks which require discussion on highly critical safety related matters, hazardous site conditions pertaining to particular work etc.			
12.	Ensure appropriate use of Personal Protective Equipment (PPE)			
13.	Implement safe handling and stacking methods at workplace / store			
14.	Recognize the quality standards and the requirements stipulated within the standards to perform the particular job, like equipment, personals, physical facilities and storage capacity etc.			
15.	Prepare the process flow diagram in order to achieve Quality outcome.			
16.	Organize site induction for self and support personnel as required			

17.	Clarify allocated work targets and timelines set by Management.			
18.	Prepare Break down work of activities into small achievable components and efficient sequences			
19.	Plan housekeeping activities prior to and post completion of work			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

Assessment Task 2		Description of Assessment Task 2		
		Perform reinforcement checks as per drawings given by assessor		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Fix ties to reinforcement			
2.	Check depth of coverage, clearance, spacing and overlap of reinforcement material according to drawing			
3.	Clean, maintain and store plant tools & equipment			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/ Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 3	<b>Version:</b> 01
<b>Competency Standard Title:</b> Execute Splicing and anchoring using mechanical methods Manage safety at construction site Plan and supervise work	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidate	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code: ..... Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. Define splicing in RCC structure	
2. Advantage of splice system in RCC Structure	
3. What is the need of anchoring in RCC?	
4. What are the types of splicing	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

5. What is the use of Ground anchor bolts?	
6. What is the steps of anchoring in reinforcement?	
7. Define W/C ?	
8. What are the factors affecting concrete?	
9. How lap splice is created?	
10. What are PPEs used in face safety ?	
11. What are PPEs used in head safety?	



### **ANSWER KEY**

<b>Sr.</b>	<b>Answers</b>
<b>1.</b>	Join or connect (a rebar or rebars) by interweaving the threads at the end is called splicing.
<b>2.</b>	The strong safe and easy to use , saves forms by eliminating drilling holes
<b>3.</b>	Anchoring steel bars in concrete is needed when an additional structural concrete member is to be linked to existing structure or to increase the section of the existing structure.
<b>4.</b>	There are four main types of splice joints: half lap, bevel lap, tabled, and tapered finger.
<b>5.</b>	Ground anchor bolts in construction are use to connect the structural and non-structural elements to the concrete.
<b>6.</b>	Structural rebar anchoring is to drill holes in the original concrete structure, insert steel bar into the hole of concrete, and inject structural glue. In recent years, the production and operation of some enterprises have changed under the influence of the market.
<b>7.</b>	The ratio of the weight of water to the weight of cement is called Water/Cement ratio. ...
<b>8.</b>	Water/Cement Ratio. Compaction of Concrete. ... Ingredients of Concrete. ... Curing of Concrete. ... The Shape of Aggregate. ... Maximum Size of Aggregates. ... Grading of Aggregate. ... Weather Condition.
<b>9.</b>	The lap splice, as the name suggests, is created by overlapping two lengths of rebar, then wiring them together.
<b>10.</b>	Face shields: Laser safety glasses: Impact goggles: General safety glasses
<b>11.</b>	Hard hats, bum caps, nets

# **Assessment Evidence Guide**

## **For**

### **“Steel Fixer/ Erector Supervisor”**

**Level-4**

**Practice Entrepreneurial Skills**

**(Formative assessment)**



**National Vocational & Technical  
Training Commission**

## Instruction Sheet for the Candidate

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Practice Entrepreneurial Skills	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time :</b>		

Candidate Details	Name: .....  Registration/Roll Number:.....
Guidance for Candidate	<p><b>To meet this standard, you are required to complete the following within the given time frame (for practical demonstration &amp; assessment):</b></p> <p><b>Assessment Task 1:</b> Candidate is required to describe concept of entrepreneurship and the skills of entrepreneur as per instructions given by assessor.</p> <p>(Note: provide simulated environment if necessary for ASSESSMENT TASK 1 )</p> <p><b>And complete:</b></p> <ol style="list-style-type: none"> <li>1. Knowledge assessment test (Written or Oral)</li> <li>2. Portfolios at the time of assessment (if any)</li> </ol>

Minimum Evidence Required	<p><b>During a practical assessment, under observation by an assessor, you will complete:</b></p> <p><b>Assessment Task 1 :</b></p> <p><b>Performance Criteria 1:</b>Describe concept of entrepreneurship</p> <p><b>Performance Criteria 2:</b>Identify Skills of entrepreneur</p> <p><b>Performance Criteria 3:</b>Apply good practices relating to workplace operations following workplace policy.</p> <p><b>Performance Criteria 4:</b>Comply with quality procedures and practices according to workplace requirements</p> <p><b>Performance Criteria 5:</b>Communicate good practices relating to workplace operations to project director.</p> <p><b>Performance Criteria 6:</b>Communicate quality procedures and practices to project director</p> <p><b>Performance Criteria 7:</b>Communicate cost-conscious habits in resource utilization based on industry standards</p> <p><b>Performance Criteria 8:</b>Optimize workplace resources in accordance with enterprise policy.</p> <p><b>Performance Criteria 9:</b>Use the workplace tools, equipment and materials according to manual and work requirements.</p> <p><b>Performance Criteria 10:</b>Work within project timeline and finances.</p>
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## Assessors Judgment Guide

(to be completed by the Assessor and signed both by the assessor and the candidate after the assessment)

<b>Candidate Details</b>	Name: ..... Registration/Roll Number: ..... Candidate Signature: .....
<b>Assessment Outcome</b>	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/> Name of the Assessor:..... Assessor's code:..... Signature of the Assessor: .....

Assessment Summary (to be filled by the assessor)							
Activity	Method					Result	
Nature of Activity	Written	Oral	Observation	Portfolio	Role Play	Competent	Not Yet Competent
Practical Skill Demonstration			✓				
Knowledge Assessment	✓	✓					
Other Requirement							

## Observation Checklist

Assessment Task 1		Description of Assessment Task 1		
		Candidate is required to describe concept of entrepreneurship and the skills of entrepreneur as per instructions given by assessor.		
During the practical assessment, candidate demonstrated the following:		Yes	No	Remarks
1.	Describe concept of entrepreneurship			
2.	Identify Skills of entrepreneur			
3.	Apply good practices relating to workplace operations following workplace policy.			
4.	Comply with quality procedures and practices according to workplace requirements			
5.	Communicate good practices relating to workplace operations to project director.			
6.	Communicate quality procedures and practices to project director			
7.	Communicate cost-conscious habits in resource utilization based on industry standards			
8.	Optimize workplace resources in accordance with enterprise policy.			
9.	Use the workplace tools, equipment and materials according to manual and work requirements.			
10.	Work within project timeline and finances			

11.	Collect tools, equipment and materials from the trench			
12.	Remove, clean and store barriers and signs			
13.	Identify physical hazards (risk of slip, trip and fall etc.) at work site.			
14.	Erect barricades, hoardings, signage in the hazardous areas.			
15.	Remove obstacles from work area.			
16.	Identify risk associated with job to be done			
17.	Report unsafe condition to immediate supervisor			
Competent <input type="checkbox"/>		Not Yet Competent <input type="checkbox"/>		

## Knowledge Assessment

<b>Title of Qualification:</b> National Vocational Certificate Level 4 in Steel Fixer& Erector(Steel Fixer/Erector Supervisor)	<b>CS Code:</b>	<b>Level:</b> 4	<b>Version:</b> 01
<b>Competency Standard Title:</b> Practice Entrepreneurial Skills	<b>Assessment Date (DD/MM/YY):</b>  <b>Assessment Time:</b> 30 min		

Guidance for Candidat e	<b>To complete your assessment for this Competency Standard, you need to answer the questions on the following pages successfully.</b>
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Candidate Details	Name: ..... Registration/Roll Number:  Candidate Signature: .....
Written Assessment Outcome	COMPETENT <input type="checkbox"/> NOT YET COMPETENT <input type="checkbox"/>  Name of the Assessor:..... Assessor's code:  Signature of the Assessor: .....

<b>Questions</b> (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)	
1. How many activities are in business?	
2. Describe concept of entrepreneurship?	
3. Explain planning a small business?	
4. Write any four basic functions of management?	

**Questions** (Candidate confidently answered questions correctly and demonstrated understanding of the topics and their application)

5. Define communication?	
6. Write the names of principals of communication?	
7. Define memorandum?	
8. Define invoicing?	
9. Define business opportunity?	
10. Define labor market?	
11. Define career management?	
12. Define creative destruction?	
13. Define supply chain management?	
14. Define physical count?	
15. Define inventory management?	
16. Define GAAP principle?	
17. Define subsidiary books?	
18. Define Green business?	
19. Define business ethics?	



### **ANSWER KEY**

<b>Sr.</b>	<b>Answers</b>
1.	<ol style="list-style-type: none"><li>1. Industry</li><li>2. Commerce</li><li>3. Trade</li></ol>
2.	Entrepreneurship refers to the concept of developing and managing a business venture in order to gain profit by taking several risks in the corporate world. Simply put, entrepreneurship is the willingness to start a new business.
3.	<ol style="list-style-type: none"><li>1. Research</li><li>2. Determine the purpose of plan</li><li>3. Create a company profile</li><li>4. Document all aspects of business</li><li>5. Have a strategic marketing plan in place</li><li>6. Make it adaptable based on audience</li><li>7. Explain all the necessary points briefly</li></ol>
4.	<ol style="list-style-type: none"><li>1. Planning</li><li>2. Organizing</li><li>3. Staffing</li><li>4. Leading</li><li>5. Organizing</li></ol>
5.	In the words of Keith Davis, "Communication is the process of passing information and understanding from one person to another. It is essentially a bridge of meaning between people."
6.	Completeness; Concreteness; Courtesy; Correctness; Clarity; Consideration; Conciseness
7.	Memorandum is a written message or information from one person or department to another in the same business. It is less formal than a letter.
8.	An invoice, bill or tab is a commercial document issued by a seller to a buyer, relating to a sale transaction and indicating the products, quantities, and agreed prices for products or services the seller had provided the buyer.
9.	Business opportunity is a packaged business investment that allows the buyer to begin a business A business opportunity involves the sale or lease of any product, service, equipment, etc. that will enable the purchaser-licensee to begin a business.
10.	Labor market regulation and laws are useful economic and social institutions designed to protect workers from undesirable consequences of market failure such as arbitrary or discriminatory actions by employers
11.	Career management is the combination of structured planning and the active

	management choice of one's own professional career.
12.	Creative destruction refers to the nonstop product and process innovation mechanism by which new production units replace outdated ones.
13.	Supply chain management is the flow of goods and services and includes all processes that transform raw materials into final products. It involves the active streamlining of a business's supply-side activities to maximize customer value and gain a competitive advantage in the marketplace.
14.	A physical count of inventory is an actual count of all the products that a business store or stock.
15.	Inventory management is a discipline primarily about specifying the shape and placement of stocked goods.
16.	Generally accepted accounting principles, or GAAP, are a set of rules that encompass the details, complexities, and legalities of business and corporate accounting
17.	Subsidiary books are of original entry in which transactions of similar nature are recorded at one place and in sequential order
18.	Green business functioning in a capacity where no negative impact is made on local or global environment, the community and the economy.
19.	Business ethics is the study of appropriate business policies and practices regarding potentially controversial subjects including corporate governance, insider trading, bribery, discrimination, corporate social responsibility, and fiduciary responsibilities