

# **Curriculum For “Crush Plant Site Manager”**

**(Level -5)**

*25<sup>th</sup> to 29<sup>th</sup> October 2021*



**National Vocational & Technical  
Training Commission**

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## **Introduction**

### **Definition/ Description of the training programme for “Crush Plant Site Manager”**

There is an increasing demand of the crush plant site manager in construction industry. If an individual is planning to pursue a career in crush plant technology, this program will be helpful in targeting various industries including construction and mining.

### **Purpose of the training programme**

The purpose of this training is to develop a range of skills and techniques, soft skills and attributes essential for successful performance in construction and mining sector in accordance with industry requirements. Diploma holder of this program may find employment in local and international industries.

### **Overall objectives of training programme**

The main objective of this training program is to improve the employability of young diploma holders through qualifying job-related training in the construction and mining sector, and to train them so that they can prove to be an asset to this sector.

### **Competencies to be gained after completion of course**

- Manage and Safety at Crushing Plant Site
- Apply and Testing Basic Electronic Components
- Perform Sampling of Crushing Material
- Perform Testing of Stones before Crushing
- Perform Quality Test on Coarse Aggregates
- Manage and Supervise the Job Activities
- Plan for Owning and Operating Crushing Plant
- Plan a Project in Primavera P6
- Install & Commissioning of Crushing Plant
- Develop Entrepreneurial Skills
- Practice Professionalism

### **Possible available job opportunities available immediately and later in the future**

- Site Lab Technician
- Quality Inspector
- Plant Master Technician
- Site Manager

**Trainee entry level**

Middle or Equivalent (with English, Urdu, Numeracy, reading and writing skills)

**Minimum qualification of trainer**

Teaching staff should have certification (Level-5) in Crushing Plant installation and operation with at least five years' experience in Crushing Industry with adequate computer skills.

OR

Teacher should have DAE in Mechanical / Mechanical with specialization in construction machinery with at least three years' experience in Crushing Industry with adequate computer skills.

OR

Teacher should have B.Sc Eng. / B.Eng. Tech in Mechanical / Mining with at least one years' experience in Crushing Industry with adequate computer skills.

**Recommended trainer: trainee ratio**

The recommended maximum trainer: trainee ratio for this programme is 1 trainer for 25 trainees.

**Medium of instruction i.e. language of instruction**

Instruction will be Urdu and English.

### Duration of the course (Total time, Theory & Practical time)

This curriculum comprises 11 modules. The recommended delivery time is 1200 hours.

Delivery of the course could therefore be full time, 5 days a week. Training providers are at liberty to develop other models of delivery, including part-time and evening delivery.

The full structure of the course is as follow:

No	Modules Title	Level	Theory		Practical		Total	
			C	Hr.	C	Hr.	C	Hr.
1.	Manage Safety at Crushing Plant Site	5	2.4	24	3.6	36	6	60
2.	Apply and Testing Basic Electronic Components	5	4	40	6	60	10	100
3.	Perform Sampling of Crushing Material	5	3.6	36	5.4	54	9	90
4.	Perform Testing of Stones before Crushing	5	4.8	48	7.2	72	12	120
5.	Perform Quality Test on Coarse Aggregates	5	4.8	48	7.2	72	12	120
6.	Manage and Supervise the Job Activities	5	3.2	32	4.8	48	8	80
7.	Plan for Owning and Operating Crushing Plant	5	2.4	24	3.6	36	6	60
8.	Plan a Project in Primavera P6	5	6	60	9	90	15	150
9.	Install & Commissioning of Crushing Plant	5	3.2	32	4.8	48	8	80
10.	Develop Entrepreneurial Skills	5	1.6	16	2.4	24	4	40
11.	Practice Professionalism	5	112	120	18	180	30	300
Total			41	410	79	790	120	1200

## Sequence of the Modules

Each module covers a range of learning components. These are intended to provide detailed guidance to teachers (for example the Learning Elements component) and give them additional support for preparing their lessons (for example the Materials Required component). The detail provided by each module will contribute to a standardized approach to teaching, ensuring that training providers in different parts of the country have clear information on what should be taught. Each module also incorporates the industrial needs of Pakistan.

The distribution table is shown below:

<b>Module 1:</b> Manage Safety at Crushing Plant Site 60 Hours	<b>Module 4:</b> Perform Testing of Stones before Crushing 120 Hours
<b>Module 2:</b> Apply and Testing Basic Electronic Components 100 Hours	<b>Module 5:</b> Perform Quality Test on Coarse Aggregates 120Hours
<b>Module 3:</b> Perform Sampling of Crushing Material 90 Hours	<b>Module 6:</b> Manage and Supervise the Job Activities 80 Hours

<b>Module 6:</b> Manage and Supervise the Job Activities 80 Hours	<b>Module 9:</b> Install & Commissioning of Crushing Plant 80 Hours
<b>Module 7:</b> Plan for Owning and Operating Crushing Plant 60 Hours	<b>Module 8:</b> Plan a Project in Primavera P6 150 Hours
<b>Module 10:</b> Develop Entrepreneurial Skills 40 Hours	<b>Module 11:</b> Practice Professionalism 300 Hours

## Summary – overview of the curriculum

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 1:</b> Manage Safety at Crushing Plant Site  <b>Aim:</b> After successful completion of this module, the trainee is competent in Managing Safety at Crushing Plant Site	<b>LU1.</b> Implement safe working practices at site <b>LU2.</b> Maintain safe work environment <b>LU3.</b> Report and Investigate the accident at plant site <b>LU4.</b> Follow vehicle safety at workplace	24	36	60
<b>Module 2:</b> Apply and Testing Basic Electronic Components  <b>Aim:</b> After successful completion of this module, the trainee is competent in Applying and Testing Basic Electronic Components	<b>LU1.</b> Recognize basic electronic components <b>LU2.</b> Recognize basic types of Sensors and Transducers <b>LU3.</b> Test sensor / transducer voltage with multi-meter <b>LU4.</b> Detect and diagnose faults	40	60	100



Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 3:</b> Perform Sampling of Crushing Material  <b>Aim:</b> After successful completion of this module, the trainee is competent in performing Sampling of Crushing Material	<b>LU1.</b> Carry Out Initial Preparatory Activities <b>LU2.</b> Collect Aggregates Samples <b>LU3.</b> Collect Stone Samples <b>LU4.</b> Preserve and Document the Sampling <b>LU5.</b> Handle, Store & Transport The Samples	36	54	90
<b>Module 4:</b> Perform Testing of Stones before Crushing  <b>Aim:</b> After successful completion of this module, the trainee is competent in Performing Testing of Stones before Crushing	<b>LU1.</b> Carry out initial preparatory activities <b>LU2.</b> Perform water Absorption test for stone samples <b>LU3.</b> Perform durability test for stone samples <b>LU4.</b> Perform abrasion test for stone samples <b>LU5.</b> Perform Crushing Strength test for stones	48	72	120

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 5:</b> Perform Quality Test on Coarse Aggregates  <b>Aim:</b> After successful completion of this module, the trainee is competent in Performing Quality Test on Coarse Aggregates	<b>LU1.</b> Carry out initial preparatory activities. <b>LU2.</b> Perform the Gradation Test <b>LU3.</b> Compute the Specific Gravity and water absorption of the aggregate <b>LU4.</b> Perform Flaky & Elongated Particles test on aggregate <b>LU5.</b> Perform the Los Angeles Abrasion Test for A & B class Material <b>LU6.</b> Perform the Aggregate Impact Value Test <b>LU7.</b> Execute the Aggregate Crushing Value Test	48	72	120
<b>Module 6:</b> Manage and Supervise the Job Activities  <b>Aim:</b> After successful completion of this module, the trainee is competent in Managing and Supervise the Job Activities	<b>LU1.</b> Plan for on-site operations <b>LU2.</b> Supervise work activities to achieve desired results <b>LU3.</b> Perform on- site inspection <b>LU4.</b> Prepare the inspection report.	32	48	80

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 7:</b> Plan for Owning and Operating Crushing Plant  <b>Aim:</b> After successful completion of this module, the trainee is competent in Planing for Owning and Operating Crushing Plant	<b>LU1.</b> Calculate depriciation of plant/machinery <b>LU2.</b> Maintenance Cost of machines <b>LU3.</b> Estimate operating cost <b>LU4.</b> Determine productivity of crushing plant. <b>LU5.</b> Determine productivity of Wheel Loader <b>LU6.</b> Determine productivity of dumper truck <b>LU7.</b> Calculate the cost of owning for crushing plant and its attachments	24	36	60
<b>Module 8:</b> Plan a Project in Primavera P6  <b>Aim:</b> After successful completion of this module, the trainee is competent in Planning a Project in Primavera P6	<b>LU1.</b> Perform Basic operation in Primavera P6 <b>LU2.</b> Perform Project Activities Scheduling in Primavera P6 <b>LU3.</b> Perform Project Resources Costing &Planning in Primavera P6 <b>LU4.</b> Manage Project in Primavera P6	60	90	150

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 09:</b> Install & Commissioning of Crushing Plant  <b>Aim:</b> After successful completion of this module, the trainee is competent in Installing& Commissioning of Crushing Plant	<b>LU1.</b> Interpret Installation drawing through instruction manual <b>LU2.</b> Perform commissioning activities <b>LU3.</b> Prepare the crusher for operation <b>LU4.</b> Set parameters on control panel <b>LU5.</b> Test run of engine <b>LU6.</b> Perform test run on the plant	32	48	80
<b>Module 10:</b> Develop Entrepreneurial Skills  <b>Aim:</b> After successful completion of this module, the trainee is competent in Developing Entrepreneurial Skills	<b>LU1.</b> Develop a business plan <b>LU2.</b> Collect information regarding funding sources <b>LU3.</b> Develop a marketing plan <b>LU4.</b> Develop basic business communication skills	16	24	40

Module Title and Aim	Learning Units	Theory hours	Workplace hours	Timeframe of modules
<b>Module 11:</b> Practice Professionalism  <b>Aim:</b> After successful completion of this module, the trainee is competent in Practicing Professionalism	<b>LU1.</b> Develop Portfolio for industry <b>LU2.</b> Perform Internship	120	180	300

## Modules

### Module 1: Manage Safety at Crushing Plant Site

**Objective of the module:** This competency standard covers the skills and knowledge required to implement and maintain safe working practices at site. Your underpinning knowledge will be sufficient to provide you the basis for your work.

**Duration:** 60 hours    **Theory:** 24 hours    **Practical:** 36 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU 1</b> Implement safe working practices at site	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Carry out tool box talks which require discussion on critical safety matters and hazardous site conditions pertaining to particular work etc.</li> <li>2. Practice of Personal Protective Equipment (PPE)</li> <li>3. Implement health and safety practices and ensure it is followed by</li> </ol>	<ul style="list-style-type: none"> <li>• Explain unsafe act and unsafe conditions</li> <li>• Describe physical hazards at work site and its controlling measures</li> <li>• Describe standard procedure of handling, storing and stacking of hazardous materials</li> <li>• Explain Safe disposal of hazardous waste</li> <li>• Describe the OHS standards</li> <li>• Describe the Importance of reporting near miss</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Conduct emergency response drill for enhancing importance</li> </ul>	<b>Total</b> 15 hrs <b>Theory:</b> 6 hrs <b>Practical:</b> 9 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• White board marker</li> <li>• PPEs</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• PPEs</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>

	<p>subordinates</p> <p><b>4.</b> Implement safe handling and stacking methods at workplace / store</p> <p><b>5.</b> Perform appropriate posting of safety signs and boards at designated places)</p> <p><b>6.</b> Barricade all un-protected openings at the workplace</p> <p><b>7.</b> Implement and check near miss reporting</p> <p><b>8.</b> Provide safe access at work place for movement of workers &amp; materials.</p> <p><b>9.</b> Conduct emergency response drill for enhancing importance of safety among the workers</p>	<p>of safety</p> <ul style="list-style-type: none"> <li>• Perform risk assessment at the workplace</li> </ul>			
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	as per the policy of organization				
<b>LU 2</b> Maintain safe work environment	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Use defined safe work practices and personal protective equipment to ensure personal safety at the workplace</li> <li>2. Collect and/or dispose of all waste in accordance with environmental requirements and workplace procedures</li> <li>3. Check condition and serviceability of equipment before storage.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain Standard procedure of handling, storing and stacking of hazardous materials</li> <li>• knowledge about methods of safe disposal of hazardous waste</li> <li>• Describe standard procedure of serviceability and storing of equipment</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to collect, segregate and dispose of hazardous waste</li> <li>• Investigate work site accident and develop the incident report along with corrective measures to avoid future accident.</li> </ul>	15 hrs <b>Theory:</b> 6 hrs <b>Practical:</b> 9 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• White board marker</li> <li>• PPEs</li> <li>• Labels</li> <li>• Barrication tape</li> <li>• Tags</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• PPEs</li> <li>• Disposal container</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>
<b>LU 3</b> Report and	<b>The trainee will be able to:</b>		<b>Total</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated</li> </ul>



Investigate the accident at plant site	<ol style="list-style-type: none"> <li>1. Identify any injured employee and check severity of the injury</li> <li>2. Provide first aid treatment if required</li> <li>3. Interview injured person and other involved personnel in the accident</li> <li>4. Collect all information related to the incident/accident at workplace</li> <li>5. Analyse the facts and figures by observing the accident scene</li> <li>6. Review your recording</li> <li>7. Perform risk assessment and hazard identification at the workplace</li> <li>8. Develop the incident</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the ABC of first aid</li> <li>• Describe the first aid procedure for severe wound</li> <li>• Describe investigation procedure of accident</li> </ul> <p><b>Activity:</b></p> <p>Investigate and report of mock accident at work place</p>	<p><b>Theory:</b></p> <p>6 hrs</p> <p><b>Practical:</b></p> <p>9 hrs</p>	<ul style="list-style-type: none"> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• White board marker</li> <li>• PPEs</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• PPEs</li> </ul>	environment
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	report along with corrective measures to avoid future accidents				
<b>LU 4</b> Follow vehicle safety at workplace	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Follow the speed limit as per the company policy while driving vehicle at site</li> <li>2. Use high visibility safety vest</li> <li>3. Keep flag man while driving/reversing vehicle in operational areas</li> <li>4. Follow standard procedure related to vehicle safety at workplace</li> </ol>	<ul style="list-style-type: none"> <li>• Explain the Importance of vehicle safety at work place</li> <li>• Describe standard procedure related to vehicle safety at workplace.</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Demonstrate vehicle driving safety as per policy of the organization</li> </ul>	<b>Total</b> 15 hrs <b>Theory:</b> 6 hrs <b>Practical:</b> 9 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• Barrication tape</li> <li>• PPEs</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Sign board</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>

## Module2: Apply and Testing Basic Electronic Components

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to apply and testing basic electronic components

**Duration:** 100 hours    **Theory:** 40 hours    **Practical:** 60 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1:</b> Recognize basic electronic components	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Identify diodes</li> <li>2. Identify its types &amp; polarities</li> <li>3. Identify resistor &amp; its types</li> <li>4. Recognize color coding of resistor</li> <li>5. Identify capacitor &amp; its types</li> </ol>	<ul style="list-style-type: none"> <li>• Describe diodes, polarities &amp; their applications in circuits</li> <li>• Differentiate between capacitor &amp; its applications in circuits</li> <li>• knowledge about the Inductor &amp; its applications in circuits</li> <li>• Describe ICs and Transistors (FETS, MOSFETs)</li> <li>• Describe resistor and thermistor</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen.</li> <li>• Insulation tap</li> <li>• Sensor</li> <li>• Resister</li> <li>• Capacitor</li> </ul>	Class Room / Work Shop

	<p>6. Recognize coding &amp; rating of capacitor</p>	<p><b>Activity</b></p> <ul style="list-style-type: none"> <li>Practice to recognize the basic electrical components (Resistor, Capacitor, Transistor, Thermistor, ICs, Inductor, Diodes)</li> </ul>	<ul style="list-style-type: none"> <li>Transistor</li> <li>Thermistor</li> <li>ICs</li> <li>Inductor</li> <li>Diodes</li> <li>Electrical Wires</li> <li>Thimbles</li> <li>Metallic Sleeves</li> <li>White board marker</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Bread board</li> <li>Multi meter</li> <li>Star Kit</li> <li>Cutter</li> <li>Clipper</li> </ul>	
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<b>LU2:</b> Recognize basic types of Sensors and Transducers	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Identify temperature sensors</li> <li>2. Identify pressure sensors</li> <li>3. Identify speed sensors</li> <li>4. Identify position sensors</li> <li>5. Identify voltage sensors</li> <li>6. Identify current sensors</li> <li>7. Identify temperature transducers</li> <li>8. Identify motion transducers (Speed, Velocity, Acceleration)</li> <li>9. Identify vibration transducer</li> <li>10. Identify pressure transducer</li> </ol>	<ul style="list-style-type: none"> <li>• Describe transducer and its types</li> <li>• explain sensor and its types</li> <li>• Describe resistor and its type</li> <li>• Differentiate between Sensor and transistor.</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to identify types of sensors (Position, Speed, pressure)</li> <li>• Practice to identify types of transducer (Temperature, motion, pressure, vibration)</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen.</li> <li>• Insulation tap</li> <li>• Sensor</li> <li>• Resister</li> <li>• Capacitor</li> <li>• Transistor</li> <li>• Thermistor</li> <li>• ICs</li> <li>• Inductor</li> <li>• Diodes</li> <li>• Electrical Wires</li> <li>• Thimbles</li> <li>• Thimble puncture</li> <li>• Metallic Sleeves</li> <li>• White board marker</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> </ul>	Class Room / Work Shop
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				<ul style="list-style-type: none"> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Bread board</li> <li>• Multi meter</li> <li>• Star Kit</li> <li>• Cutter</li> <li>• Clipper</li> </ul>	
<b>LU3:</b> Test sensor / transducer voltage with multi-meter	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Check connecting pins of sensor/transducer</li> <li>2. Apply required power to transducer/sensor power pins</li> <li>3. Connect signal pin with multi-meter</li> <li>4. Write down the obtained data</li> <li>5. Compare the data with transducer/sensor datasheet</li> </ol>	<ul style="list-style-type: none"> <li>• Explain the function of multi meter.</li> <li>• Describe the procedure to check the voltage of sensors</li> <li>• Explain the procedure to check the voltage of transducers</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to test and replace the sensors</li> <li>• Practice to check the voltage of transducers</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen.</li> <li>• Insulation tap</li> <li>• Sensor</li> <li>• Resister</li> <li>• Capacitor</li> <li>• Transistor</li> <li>• Thermistor</li> <li>• ICs</li> <li>• Inductor</li> <li>• Diodes</li> <li>• Electrical Wires</li> <li>• Thimbles</li> </ul>	Class Room / Work Shop

				<ul style="list-style-type: none"> <li>• Thimble puncture</li> <li>• Metallic Sleeves</li> <li>• White board marker</li> </ul> <div>Non</div> <div>Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Bread board</li> <li>• Multi meter</li> <li>• Star Kit</li> <li>• Cutter</li> <li>• Clipper</li> </ul>	
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<b>LU4:</b>  Detect and diagnose faults	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Check cable connections</li> <li>2. Check power supply</li> <li>3. Check the status of LEDs on Power Supply, CPU, I/O Cards</li> <li>4. Contact resistance, signal electrical parameters</li> <li>5. Put PLC in test mode</li> <li>6. Check protective devices</li> <li>7. Check emergency stop buttons</li> <li>8. Check connection points of input and output devices</li> <li>9. Test software</li> </ol>	<ul style="list-style-type: none"> <li>• Explain the procedure to troubleshoot frequently occurring errors and it causes.</li> <li>• Explain the preventive measures of repairing/replacement of various components in a PLC(Programmable Logic Controller)</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to detect the electrical faults.</li> <li>• Practice to troubleshoot the electrical circuits and components.</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen.</li> <li>• Insulation tap</li> <li>• Sensor</li> <li>• Resister</li> <li>• Capacitor</li> <li>• Transistor</li> <li>• Thermistor</li> <li>• ICs</li> <li>• Inductor</li> <li>• Diodes</li> <li>• Electrical Wires</li> <li>• Thimbles</li> <li>• Thimble puncture</li> <li>• Metallic Sleeves</li> <li>• White board marker</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> </ul>	Class Room / Work Shop
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				<ul style="list-style-type: none"> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Bread board</li> <li>• Multi meter</li> <li>• Star Kit</li> <li>• Cutter</li> <li>• Clipper</li> </ul>	
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## Module3: Perform Sampling of Crushing Material

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to perform sampling of crushing material.

**Duration:** 90 hours

**Theory:** 36

**Practical:** 54 hours

hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1: Carry Out Initial Preparatory Activities	<p><b>The trainee will be able to:</b></p> <ul style="list-style-type: none"> <li>Select sampling equipment, sample container and accessories</li> <li>Identify faulty or unsafe components and equipment</li> <li>Clean/decontaminate the sample container and sampling tools</li> <li>Plan work sequences for optimum efficiency and safety for collection of multiple samples.</li> </ul>	<ul style="list-style-type: none"> <li>Differentiate between various types and properties of stones</li> <li>Explain the different equipment used for testing the properties of stones</li> </ul> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to prepare work sequence for collection of aggregate / stone samples</li> <li>Practice to select and clean the sampling tool and accessories.</li> </ul>	<p><b>Total:</b>18 hrs</p> <p><b>Theory:</b> 7hrs</p> <p><b>Practical:</b>11hrs</p>	<p><b>Consumable</b></p> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Aggregate</li> <li>Stone</li> <li>Sampling bag</li> <li>Gloves</li> <li>White board marker</li> <li>Lables</li> </ul> <p><b>Non Consumable</b></p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Testing</li> </ul>	Class Room / Plant Site

				Equipment's <ul style="list-style-type: none"> <li>• Preservatives</li> <li>• Brick Hammer</li> </ul>	
<b>LU2:</b> Collect Aggregates Samples	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Collect required quantity of aggregates samples as per sampling plan</li> <li>2. Take photos/snaps of sampling sites and samples</li> <li>3. Perform sample preparations( washing, weighing, &amp; sieving)in required quantity of material</li> <li>4. Record sample appearance, environmental conditions and any other factors</li> </ol>	<ul style="list-style-type: none"> <li>• Differentiate various methods of collecting test samples based upon the types of tests and materials.</li> <li>• Describe different sampling rules for various materials.</li> </ul>	<b>Total:</b> 18 hrs  <b>Theory:</b> 7hrs  <b>Practical:</b> 11hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Gloves</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> </ul>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• Preservatives</li> <li>• Brick Hammer</li> </ul>	
<b>LU3:</b> Collect Stone Samples	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Collect required quantity of stone samples from the stacks as per sampling plan</li> <li>2. Take photos/snaps of sampling sites and samples</li> <li>3. Perform test as per standard procedure for determining the physical properties of stone</li> </ol>	<ul style="list-style-type: none"> <li>• Describe tagging/numbering/labelling</li> <li>• Explain the procedures of packing of test samples for transportation.</li> </ul>	<b>Total:</b> 18 hrs  <b>Theory:</b> 7hrs  <b>Practical:</b> 11hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Gloves</li> </ul>	Class Room / Plant Site

	<p>4. Carry out weighing and packing of sample as per standard sampling procedure</p> <p>5. Record sample appearance, environmental conditions and any other factors that may impact on sample integrity</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to collect, weighing, record sample appearance, label and store stone as per standard procedure.</li> </ul>		<ul style="list-style-type: none"> <li>White board marker</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Testing Equipment's</li> <li>Preservatives</li> <li>Brick Hammer</li> </ul>	
<p><b>LU4:</b></p> <p>Preserve and Document the Sampling</p>	<p><b>The trainee will be able to:</b></p> <p>1. Prepare sub-samples and back-up sub-sample that are representative of the source</p> <p>2. Seal the sample &amp; sub-samples in the presence of</p>	<ul style="list-style-type: none"> <li>Explain the procedure to collect result data.</li> <li>Describe the sampling documents</li> </ul>	<p><b>Total:</b> 18 hrs</p> <p><b>Theory:</b> 7hrs</p> <p><b>Practical:</b> 11hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Aggregate</li> <li>Stone</li> <li>Sampling bag</li> </ul>	Class Room / Plant Site

	<p>witnesses</p> <p>3. Label samples in accordance with traceability requirements</p> <p>4. Complete the sampling document; fill in the sample date, time, weight/volume, sample ID, preservative used, sample location and sampler name etc.</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to prepare the sub-sample.</li> <li>Practice to seal and label the sample</li> <li>Practice of filling sampling documents for the collected samples</li> </ul>		<ul style="list-style-type: none"> <li>Gloves</li> <li>White board marker</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Testing Equipment's</li> <li>Preservatives</li> <li>Brick Hammer</li> </ul>	
<p><b>LU5:</b></p> <p>Handle, Store &amp; Transport The Samples</p>	<p><b>The trainee will be able to:</b></p> <p>1. Store sub-samples in accordance with the sampling procedure &amp; rules for maintaining the sample integrity and traceability</p> <p>2. Deliver sample store reception</p>	<ul style="list-style-type: none"> <li>Describe the sampling tools and equipment, , quantity of each sample, weighing, measuring, sieving as per type of sample and tests.</li> <li>Explain the procedure of reporting any unwanted situation</li> </ul>	<p><b>Total:</b>18 hrs</p> <p><b>Theory:</b>8 hrs</p> <p><b>Practical:</b>10 hrs</p>	<p>Consumable</p> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Aggregate</li> <li>Stone</li> <li>Sampling bag</li> </ul>	Class Room / Plant Site

	<p>pointing accordance with standard of operating procedures</p> <p>3. Report any unwanted situation to management</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to collect, label and handle the sample and transport to the testing lab as per standard procedure.</li> </ul>		<ul style="list-style-type: none"> <li>Gloves</li> <li>White board marker</li> </ul> <p>Non</p> <p>Consumable</p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Testing Equipment's</li> <li>Preservatives</li> <li>Brick</li> <li>Hammer</li> </ul>	
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## Module 4: Perform Testing of Stones before Crushing

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to perform testing of stones before crushing

**Duration:**120hours

**Theory:** 48 hours

**Practical:** 72

hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1:Carry out initial preparatory activities	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Prepare workplace for task</li> <li>• Interpret test request to confirm samples to be tested</li> <li>• Collect required equipment and materials</li> <li>• Plan task sequences for optimum efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiate various types of physical test</li> <li>• Describe the operations of physical tests.</li> <li>• Explain the importance of physical tests</li> <li>• Differentiate various types of techniques of physical test</li> <li>• Describe the capacity of physical test equipment</li> <li>• Differentiate various types of measuring tools and techniques</li> <li>• Describe sizes and uses stones in samples.</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Result sheets templates</li> <li>• White board marker</li> <li>• Labels</li> </ul> <b>Non Consumable</b>	Class Room / Plant Site



		<b>Activity:</b> <ul style="list-style-type: none"> <li>Practice to plan the task sequence to conduct specific test on stone</li> <li>Practice to select and inspect the testing tool and accessories</li> </ul>		<ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> <li>Testing Equipment's</li> <li>Preservatives</li> <li>Brick Hammer</li> </ul>	
<b>LU2.</b> Perform water Absorption test for stone samples	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>Collectsample</li> <li>Weight the sample</li> <li>Dip sample in water for specified time</li> <li>Differentiate sample weight</li> <li>Calculate percentage of absorption</li> <li>Record test data in register</li> </ul>	<ul style="list-style-type: none"> <li>Describe the importance of abrasion test for materials</li> <li>Differentiate various types of Stones and its properties</li> <li>Explain the Porosity</li> <li>Explain the procedure to perform water absorption test for stone samples</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Aggregate</li> <li>Stone</li> <li>Sampling bag</li> <li>Result sheets templates</li> <li>White board marker</li> <li>Labels</li> </ul> <div>Non Consumable</div>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> </ul>	
<b>LU3.</b> Perform durability test for stone samples	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Collect sample</li> <li>• Drop sample from specified height on hard surface</li> <li>• Segregate the sample</li> <li>• Calculate average weight of samples</li> <li>• Maintain record in register</li> </ul>	<ul style="list-style-type: none"> <li>• Describe compressive / Crushing Strength test for samples.</li> <li>• Explain different techniques of Compressive / impact tests</li> <li>• Describe the procedure to perform durability test for stone samples</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Result sheets templates</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> </ul>	
<b>LU4.</b> Perform abrasion test for stone samples	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Collect samples in required numbers and weight</li> <li>• Put sample in drum in specified numbers</li> <li>• Lock the Drum</li> <li>• Check angle of inclination for drum</li> <li>• Rotate drum for specified revolutions and time</li> <li>• Open Drum Safely</li> <li>• Clean &amp; Weigh the samples</li> <li>• Compute result percentage</li> <li>• Maintain Test record in register</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the capacity of Crushing equipment / machine</li> <li>• Describe the procedure to perform abrasion test for stone samples</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Result sheets templates</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer</li> </ul>	Class Room / Plant Site

				system <ul style="list-style-type: none"> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> </ul>	
<b>LU5.</b> Perform Crushing Strength test for stones	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Select sample</li> <li>• Apply Capping</li> <li>• Fix stone in Compressive testing machine</li> <li>• Apply load at convenient rate on fixed sample</li> <li>• Note crushing strength</li> <li>• Maintain record in register</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiate between Hardness and Crushing strength.</li> <li>• Explain Weight and its types</li> <li>• Describe the procedure to perform Crushing Strength test for stones</li> </ul>	<b>Total:</b> 20 hrs  <b>Theory:</b> 8 hrs  <b>Practical:</b> 12 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Result sheets templates</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing</li> </ul>	Class Room / Plant Site

				<div>Equipment's</div> <ul style="list-style-type: none"><li>• Preservatives</li><li>• Brick Hammer</li><li>• Scrunch shovel</li></ul>	
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## Module 5: Perform Quality Test on Coarse Aggregates

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to perform quality test on coarse aggregates

**Duration:**

**Theory:** 48hours

**Practical:** 72hours

1200hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1:</b> Carry out initial preparatory activities.	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare workplace for task</li> <li>2. Interpret test request to confirm samples to be tested</li> <li>3. Collect required equipment and materials</li> <li>4. Plan task sequences for optimum efficiency</li> </ol>	<ul style="list-style-type: none"> <li>Describe the classification of aggregates according to nature of formation, size and shape</li> <li>Explain characteristics of graded, fine and coarse aggregates</li> <li>Describe preparatory planning for sampling</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>Practice to plan the task sequence to conduct the sampling and testing of aggregates</li> </ul>	<b>Total:</b> 19hrs  <b>Theory:</b> 8hrs  <b>Practical:</b> 12 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Aggregate</li> <li>Stone</li> <li>Sampling bag</li> <li>Labels</li> <li>Result sheets templates</li> <li>White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> </ul>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU2:</b> Perform the Gradation Test	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare the Samples as per standard guidelines</li> <li>2. Select the appropriate sieve set as per requirements</li> <li>3. Carry out the sieving procedure</li> <li>4. Compute the results of the test</li> <li>5. Record the test result</li> </ol>	<ul style="list-style-type: none"> <li>• Describe fine aggregates (Fineness, impurities) and on coarse aggregates (sieve analysis, Flakiness, elongation and Specific gravity)</li> <li>• Explain the importance of gradation of aggregate</li> <li>• Describe the procedure to perform the Gradation Test</li> </ul>	<b>Total:</b> 28 hrs  <b>Theory:</b> 10hrs  <b>Practical:</b> 18 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer</li> </ul>	Class Room / Plant Site

				system <ul style="list-style-type: none"> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU3:</b> Compute the Specific Gravity and water absorption of the aggregates	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare the test samples</li> <li>2. Select the apparatus to be used</li> <li>3. Conduct the test as per standard</li> <li>4. Compute the results of the test</li> <li>5. Record the test result</li> </ol>	<ul style="list-style-type: none"> <li>• Describe Sieve analysis</li> <li>• Differentiate between test procedures for Specific Gravity &amp; Unit weight</li> <li>• Describe the procedure to compute the Specific Gravity and water absorption of the aggregate</li> <li>• Describe ASTM (American society for testing and materials) standards relevant to aggregates.</li> </ul>	<b>Total:</b> 16hrs  <b>Theory:</b> 8 hrs  <b>Practical:</b> 12 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> </ul>	Class Room / Plant Site



				<ul style="list-style-type: none"> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU4:</b> Perform Flaky & Elongated Particles test on aggregates	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare the test samples</li> <li>2. Select the apparatus to be used</li> <li>3. Conduct the test</li> <li>4. Compute the results of the test</li> <li>5. Record the test result</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the procedure to perform Flaky &amp; Elongated Particles test on aggregate</li> <li>• Describe flakiness and elongation index</li> </ul>	<b>Total:</b> 17hrs  <b>Theory:</b> 8hrs  <b>Practical:</b> 9hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU5:</b> Perform the Los Angeles Abrasion Test for A & B class Material	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare the test samples</li> <li>2. Select the apparatus to be used</li> <li>3. Conduct the test</li> <li>4. Compute the results of the test</li> <li>5. Record the test result</li> </ol>	<ul style="list-style-type: none"> <li>• Explain abrasion of aggregates</li> <li>• Describe the procedure to perform the Los Angeles Abrasion Test for A &amp; B class Material</li> </ul>	<b>Total:</b> 20hrs  <b>Theory:</b> 8hrs  <b>Practical:</b> 12hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> </ul>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU6:</b> Perform the Aggregates Impact Value Test	<b>The trainee will be able to:</b> <ul style="list-style-type: none"> <li>• Prepare the test samples</li> <li>• Select the apparatus to be used</li> <li>• Conduct the test</li> <li>• Compute the results of the test</li> <li>• Record the test result</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the procedure to perform the Aggregates Impact Value Test</li> </ul>	<b>Total:</b> 20 hrs  <b>Theory:</b> 8hrs  <b>Practical:</b> 12 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non Consumable</b>	Class Room / Plant Site

				<ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
<b>LU7:</b> Execute the Aggregate Crushing Value Test	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare the test samples</li> <li>2. Select the apparatus to be used</li> <li>3. Conduct the test</li> <li>4. Compute the results of the test</li> <li>5. Record the test result</li> </ol>	<ul style="list-style-type: none"> <li>• Describe aggregate crushing Value Tests</li> <li>• Describe the procedure to execute the Aggregate Crushing Value Test</li> </ul>	<b>Total:</b> 25 hrs  <b>Theory:</b> 10 hrs  <b>Practical:</b> 15 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Aggregate</li> <li>• Stone</li> <li>• Sampling bag</li> <li>• Labels</li> <li>• White board marker</li> <li>• Result sheets templates</li> </ul> <b>Non</b>	Class Room / Plant Site
		<b>Activity:</b> <ul style="list-style-type: none"> <li>• Perform aggregate crushing value test of different grade and quarry</li> </ul>			

				<div>Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Testing Equipment's</li> <li>• Preservatives</li> <li>• Brick Hammer</li> <li>• Scrunch shovel</li> </ul>	
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## Module 6: Manage and Supervise the Job Activities

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to manage and supervise the job activities

**Duration:** 80 hours

**Theory:** 32 hours

**Practical:** 48hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1:Plan for on-site operations	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Consult with the client to obtain required information</li> <li>2. Prepare SOP's in accordance with the identified requirements.</li> <li>3. Prepare the process flow diagram in order to achieve Quality outcome.</li> <li>4. Break down work of activities into small achievable components and efficient sequences</li> <li>5. Recognize site hazards and the personal protective equipment (PPE) and safety procedures specified for job</li> <li>6. Organize site induction for support personnel as required</li> <li>7. Plan housekeeping activities prior to and post completion of work</li> </ol>	<ul style="list-style-type: none"> <li>• Explain principles of planning and project management</li> <li>• Explain roles and responsibilities for different levels of site supervision.</li> <li>• Explain planning method for on-site operations</li> <li>• Knowledge about process flow diagram</li> <li>• Understanding of health and safety standards</li> <li>• Understanding of house keeping</li> </ul>	<b>Total:</b> 15hrs  <b>Theory:</b> 6hrs  <b>Practical:</b> 9 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• White board marker</li> </ul> <b>Non</b> <b>Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>•</li> </ul>	Class Room / Plant Site
		<b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to prepare activities plan for a specific crushing job order including break down of activities, recognize site hazards, prepare the demand of required</li> </ul>			

		equipment's and man power.			
<b>LU2:</b> Supervise work activities to achieve desired results	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. List and arrange required resources prior to commencement of work</li> <li>2. Recognize the areas of work which could result in a delay of work, wastage of material or damage to tools.</li> <li>3. Allocate responsibility to required team members to avoid conflicts</li> <li>4. Review work plan in response to new information, urgent requests, changed situations or instructions from concern personnel</li> <li>5. Cooperate with team members to achieve common goals</li> </ol>	<ul style="list-style-type: none"> <li>•</li> <li>• Understanding about causes of delay in work, wastage of material or damage to tools.</li> <li>• Explain documentation and record system of the inspection body</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to manage task allocation to team member for the specific crushing job order, trace out the weak area of work and review the work plan.</li> </ul>	<b>Total: 15 hrs</b>  <b>Theory: 6 hrs</b>  <b>Practical: 9hrs</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room/ Plant Site</li> </ul>

<b>LU3:</b> Perform on- site inspection	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Conduct inspection of processes &amp; materials according to inspection plan</li> <li>2. Identify defects and deficiencies in product &amp; processes</li> <li>3. Record defects and deficiencies with evidence in product &amp; processes (if required)</li> <li>4. Perform test as per standard procedure for determining the physical properties of materials and product.</li> <li>5. Collect the samples of materials &amp; products for lab testing as per standards</li> <li>6. Complete the sampling document as per requirement</li> <li>7. Check the actions taken for rectification of snag list</li> <li>8. Record the non-compliance and expected breaches of contract as per SOPs.</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the information relevant to inspection activities and document preparation for recoding inspection results.</li> <li>• Differentiate various types of deficiencies in inspection activities</li> <li>• Describe site problems and recommended corrective actions</li> <li>• Describe the procedure to perform on- site inspection</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Conduct inspection of crushing plant with emphasizes on deficiencies and defects in process &amp; production including collection of sample of material &amp; product and collect pictorial evidence etc.</li> </ul>	<b>25 hrs</b>  <b>Theory:</b> <b>10 hrs</b>  <b>Practical:</b> <b>15 hrs</b>	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• White board marker</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• Class Room/ Plant Site</li> </ul>
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<b>LU4:</b> Prepare the inspection report.	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Collect and review the information relevant to inspection activities for recoding in section results</li> <li>2. Verify the integrity of information supplied by other party as a part of the inspection process</li> <li>3. Record inspection observations and findings</li> <li>4. Recommend the necessary corrective actions for tackling the identified problems</li> </ol>	<ul style="list-style-type: none"> <li>• Explain the procedure to prepare the inspection report.</li> <li>• Understanding about third/other party inspection process</li> <li>• Explain reporting standards</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Prepare the inspection report with respect to standards</li> </ul>	<b>Total: 25 hrs</b>  <b>Theory: 10 hrs</b>  <b>Practical: 15 hrs</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Whit board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• </li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> </ul>
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## Module7: Plan for Owning and Operating Crushing Plant

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to plan for owning and operating crushing plant

**Duration:** 60hours

**Theory:** 24 hours

**Practical:** 36 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1:</b> Calculate depriciation of plant/machinery	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Estimate The purchase price of equipment</li> <li>2. Estimate the 'Recovery' period</li> <li>3. Estimate the salvage value</li> <li>4. Select the method of depreciation as per data</li> <li>5. Compute the depreciation by selected formula</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the principles of management</li> <li>• Explain the importance of management</li> <li>• Explain the purchase price ,useful life and salvage value</li> <li>• Explain various methods of calculating depreciation</li> <li>• Explain factors effecting the depreciation.</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to calculate depriciation of plant/machinery by different methods</li> </ul>	<b>Total:</b> <b>9hrs</b>  <b>Theory:</b> 3hrs  <b>Practical:</b> <b>6 hrs</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> </ul>	Class Room
<b>LU2:</b> Maintenance Cost of machines	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Interpret the operational manual of machines for maintenance.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain maintenance cost of machines and equipment</li> <li>• Explain calculating methods of maintenance cost</li> <li>• Describe types of maintenance cost.</li> </ul>	<b>Total: 5 hrs</b>  <b>Theory: 3 hrs</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• White board marker</li> </ul>	Class Room

	2. Calculate the hourly and annual maintenance cost	<b>Activity:</b> <ul style="list-style-type: none"> <li>Practice to calculate maintenance cost of different machines</li> </ul>	<b>Practical:</b> 3 hrs	<b>Non Consumable</b> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> </ul>	
LU3: Estimate operating cost	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>Identify capacity and capability of engine</li> <li>Calculate fuel and lubricant cost</li> <li>Calculate tire cost</li> <li>Calculate operator man hours</li> <li>Calculate total operating cost</li> </ol>	<ul style="list-style-type: none"> <li>Differentiate different types of operating cost of machine/plant.</li> <li>State the importance of determining operating cost of machines/plant.</li> </ul>	<b>Total:</b> 5hrs  <b>Theory:</b> 3 hrs  <b>Practical:</b> 3 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> </ul>	Class Room
LU4: Determine productivity of crushing plant, Wheel Loader, dumper truck	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>Identify factors affecting productivity</li> <li>Gather data required for productivity</li> </ol>	<ul style="list-style-type: none"> <li>Define productivity of machinery / plant and its importance.</li> <li></li> <li>Explain the factors effecting the productivity</li> <li>Explain the methods of productivity</li> </ul>	<b>Total: 13 hrs</b>  <b>Theory:</b> 6 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>White board marker</li> </ul> <b>Non Consumable</b>	Class Room

	<p>calculation.</p> <p><b>3.</b> Compute productivity of crushing plant.</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to determine productivity of crushing plant</li> <li>Practice to determine productivity of wheel loader</li> <li>Practice to determine productivity of dumper truck</li> </ul>	<p><b>Practical:</b></p> <p><b>9 hrs</b></p>	<ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Internet</li> <li>Computer system</li> </ul>	
	1.	<ul style="list-style-type: none"> <li></li> </ul>		<ul style="list-style-type: none"> <li></li> </ul>	
		<ul style="list-style-type: none"> <li></li> </ul>			
	1.	<ul style="list-style-type: none"> <li></li> </ul>		<ul style="list-style-type: none"> <li></li> </ul>	Class Room / Plant Site
		<ul style="list-style-type: none"> <li></li> </ul>			
<p><b>LU7:</b></p> <p>Calculate the cost of owning for crushing plant</p>	<p><b>The trainee will be able to:</b></p> <p><b>1.</b> Gather data about initial cost</p>	<ul style="list-style-type: none"> <li>Differentiate between different Components of operating cost</li> <li>Describe importance of productivity.</li> </ul>	<p><b>Total: 23 hrs</b></p>	<p><b>Consumable</b></p> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> </ul>	Class Room

and allied hauling machinery	<p><b>2.</b> Gather calculated miscellaneous cost</p> <p><b>3.</b> Compute total ownership cost</p>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Practice to calculate the owning and operating cost of portable crushing plant for a specified quantum of crush material required</li> <li>• Practice to calculate the owning and operating cost of a wheel dumper for a specified quantum of job</li> <li>• Practice to calculate the owning and operating cost of a wheel loader for a specified quantum of job</li> </ul>	<p><b>Theory:</b> 9hrs</p> <p><b>Practical:</b> <b>15 hrs</b></p>	<ul style="list-style-type: none"> <li>• White board marker</li> </ul> <p><b>Non Consumable</b></p> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> </ul>	
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## Module 8: Plan a Project in Primavera P6

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to plan a project in primavera p6

**Duration:** 150 hours    **Theory:** 60 hours    **Practical:** 90 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
LU1:Perform Basic operation in Primavera P6	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Load &amp; unload primavera P6 Software.</li> <li>2. Prepare interface of software</li> <li>3. Customize P6 Screen Layout</li> <li>4. Work Breakdown Structure (WBS)</li> </ol>	<ul style="list-style-type: none"> <li>• Explain the importance of Primavera P6</li> <li>• Describe interface of software</li> <li>• Describe physical performance to customised screen layout.</li> <li>• Explain work breakdown structure (WBS)</li> <li>• Differentiate different types of values.</li> <li>• Describe the total float and free float.</li> </ul>	<b>Total:</b> 32hrs  <b>Theory:</b> 11hrs  <b>Practical:</b> 21hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• Pen</li> </ul>	Class room/Computer Lab
		<b>Activity:</b> <ol style="list-style-type: none"> <li>1. Load Primavera P6 Software and prepare interface according to the assigned task.</li> <li>2.</li> </ol> <ul style="list-style-type: none"> <li>• Practice to create dummy activity.</li> <li>• Practice to identify different types of activities.</li> </ul>		<b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Printer</li> </ul>	

<b>LU2:Perform</b> Project Activities Scheduling in Primavera P6	<b>The trainee will be able to:</b>  1. Add Project in Primavera 2. Create WBS of project in Primavera. 3. Create Activities of project in Primavera. 4. Create Relationships between activities of project in Primavera. 5. Create Schedule of activities of project in Primavera. 1. Display Gantt Chart	<ul style="list-style-type: none"> <li>• Explain Gantt Chart</li> <li>• Explain types of activities</li> <li>• Describe relationships between activities of project in Primavera</li> <li>• Elaborate Activity Constraints</li> <li>• Differentiate between Work calendar, work/non-work days and working hours</li> <li>• Describe to calculate the activity time and job critical time.</li> <li>• Describe procedure to prepare Gantt chart.</li> </ul> <b>Activity:</b>  1. Create WBS of assigned task in Primavera. Prepare a Gantt chart of assigned task in Primavera P6. <ul style="list-style-type: none"> <li>• Practice to add project in</li> <li>• Practice of creating activities and the relation between activities of project in Primavera P6.</li> <li>• Practice of creating schedule of activities Primavera P6.</li> <li>• Practice to prepare Gantt chart.</li> </ul>	<b>Total:36hrs</b>  <b>Theory: 15hrs</b>  <b>Practical:21hrs</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• Pen</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Printer</li> </ul>	Class room/Computer Lab
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<b>LU3:Perform</b> Project Resources Costing &Planning in Primavera P6	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Add constraints of activities of project</li> <li>2. Create Calendar for activities of project</li> <li>3. Assign Calendars to activities of project</li> <li>4. Add Resources of activities of project</li> <li>5. Assign Resources of activities of project</li> <li>6. Add Cost of activities of project</li> <li>7. Analyse Resources of activities of project</li> </ol> <ol style="list-style-type: none"> <li>1. Perform Baseline process for Project.</li> </ol>	<ul style="list-style-type: none"> <li>• Explain resources of activities of project</li> <li>• Describe baseline process for project.</li> <li>• Explain Critical Path Method (CPM)</li> <li>• Explain Program Evaluation and Review Technique (PERT) Analysis</li> <li>• Describe the procedure to draw the activity diagram for CPM.</li> <li>• Explain the stages of project execution</li> </ul> <hr/> <b>Activity:</b>  <ul style="list-style-type: none"> <li>• Practice of adding constraints, creating and assigning calendar to the activities in Primavera P6</li> <li>• Practice of adding and assigning resources of activities in Primavera P6</li> <li>• Practice of adding cost of activities in Primavera P6</li> </ul> <ol style="list-style-type: none"> <li>1. Practice of performing</li> </ol>	<b>Total:</b> 45hrs  <b>Theory:</b> 18hrs  <b>Practical:</b> 27hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• Pen</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> <li>• Printer</li> </ul>	Class room/Computer Lab
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		baseline process of project. 2. Draw CPM of assigned project in Primavera P6. 3. Draw PERT of assigned project in Primavera P6. 4. <ul style="list-style-type: none"> <li></li> </ul>			
LU4:Manage Project in Primavera P6	<b>The trainee will be able to:</b> 1. Status the Project 1. Prepare Mitigation plan of the project	<ul style="list-style-type: none"> <li>• Explain impact analysis</li> <li>• Describe mitigation techniques</li> <li>• Explain crash program</li> <li>• Describe the project monitoring and control</li> <li>• State the status of the project.</li> </ul>	<b>Total:</b> 37hrs  <b>Theory:</b> 16hrs  <b>Practical:</b> 21hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• Pen</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Internet</li> <li>• Computer system</li> </ul> Printer	Class room/Computer Lab

## Module 9: Install & Commissioning of Crushing Plant

**Objective of the module:** The aim of this module to get knowledge, skills and understanding to install & commissioning of crushing plant

**Duration:** 80 hours    **Theory:** 32 hours    **Practical:** 48 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU1:</b> Interpret Installation drawing through instruction manual	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Elaborate installation drawings of the plant</li> <li>2. Select location of in/out and the dump yard</li> <li>3. Mark the position of components of plant on the land</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the plant drawings and its interpretation</li> <li>• Describe the production process and requirements</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Preliminary planning for general layout of crushing plant.</li> </ul>	<b>Total:</b> 100hrs  <b>Theory:</b> 04hrs  <b>Practical:</b> 6hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen</li> <li>• Marker</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Computer</li> <li>• Internet</li> <li>• Installation drawing</li> </ul>	Classroom / Plant Site
<b>LU2:</b> Perform commissioning activities	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Interpret Installation drawing through instruction manual</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the plant design in production process</li> <li>• Explain the plant Legs set up procedure</li> <li>• Describe the risk assessment.</li> </ul>	<b>Total:</b> 19hrs  <b>Theory:</b> 04hrs  <b>Practical:</b> 15hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen</li> <li>• Aggregates</li> </ul>	Classroom / Plant Site

	<ol style="list-style-type: none"> <li>2. Identify risk of falling hazards</li> <li>3. Remove temporary sealing and transport straps</li> <li>4. Inspect visually for any impact damage and leakage of oils etc</li> <li>5. Check all safety devices are in place</li> <li>6. Coordinate with rigger for erection of plant units as per Installation drawings</li> <li>7. Align the conveyors, hoppers and crusher as per standards</li> <li>8. Stabilize the crusher by raising &amp; lowering the legs and tighten the all bolts</li> <li>9. Fix all safety guards and devices</li> </ol>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Develop schedules of activity for commissioning and erection of plant.</li> <li>• Conduct the risk assessment for the commissioning and erection of plant and devise the control measures.</li> <li>• Demonstrate commission and erection procedure through e-learning tool.</li> </ul>		<ul style="list-style-type: none"> <li>• Lubricant</li> <li>• Seals</li> <li>• Nuts and bolts</li> <li>• Wire brush</li> <li>• Fuel</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Computer</li> <li>• Internet</li> <li>• Crush Plant</li> <li>• Tool Kit</li> </ul>	
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<b>LU3:</b> Prepare the crusher for operation	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Fit clips &amp; pins to secure the feed hopper</li> <li>2. Place mast into working position</li> <li>3. Place dust suppression bucket</li> <li>4. Install bracing across the feed conveyor</li> </ol>	<ul style="list-style-type: none"> <li>• Differentiate different machine crushing modes</li> <li>• Describe different method of operations, Automatic mode &amp; manual mode</li> </ul> <hr/> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Practice to prepare the crusher for operation including adjustment, stabilized the crusher, align the conveyor and fix the guard rails etc</li> </ul>	<b>Total:</b> 13hrs  <b>Theory:</b> 4hrs  <b>Practical:</b> 6hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen</li> <li>• Aggregates</li> <li>• Lubricant</li> <li>• Seals</li> <li>• Nuts and bolts</li> <li>• Wire brush</li> <li>• Fuel</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Computer</li> <li>• Internet</li> <li>• Crush Plant</li> <li>• Tool Kit</li> </ul>	Classroom / Plant Site
<b>LU4:</b> Set parameters on control panel	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Configure the plant</li> <li>2. View the engine information</li> <li>3. Carryout machine settings</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the procedure of daily calibration of crusher wears parts</li> <li>• Explain the control panel and its working.</li> <li>• Describe the procedure to set parameters on control panel</li> </ul>	<b>Total:</b> hrs  <b>Theory:</b> 06hrs  <b>Practical:</b> 9hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen</li> <li>• Aggregates</li> <li>• Lubricant</li> <li>• Seals</li> </ul>	Classroom / Plant Site

	4. Set fuel levels 5. Set track operations	<b>Activity:</b> <ul style="list-style-type: none"> <li>Practice to set input parameters on control panel to make the plant functional.</li> </ul>		<ul style="list-style-type: none"> <li>Nuts and bolts</li> <li>Wire brush</li> <li>Fuel</li> </ul> Non Consumable <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> <li>Computer</li> <li>Internet</li> <li>Crush Plant</li> <li>Tool Kit</li> </ul>	
<b>LU5:</b> Test run of engine	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>Turn battery isolation switch to on position</li> <li>Turn ignition key to the first run position</li> <li>Press emergency stop reset button, flashing for few seconds and alarm will start</li> <li>Turn the ignition key to start position and release it slowly</li> </ol>	<ul style="list-style-type: none"> <li>Describe the procedure to feed material into machine.</li> <li>Describe the procedure to test run the engine.</li> </ul>	<b>Total:</b> 12hrs  <b>Theory:</b> 05hrs  <b>Practical:</b> 3hrs	Consumable <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pen</li> <li>Aggregates</li> <li>Lubricant</li> <li>Seals</li> <li>Nuts and bolts</li> <li>Wire brush</li> <li>Fuel</li> </ul> Non Consumable <ul style="list-style-type: none"> <li>White board</li> </ul>	Classroom / Plant Site

				<ul style="list-style-type: none"> <li>• Multimedia</li> <li>• Computer</li> <li>• Internet</li> <li>• Crush Plant</li> <li>• Tool Kit</li> </ul>	
<b>LU6:</b>  Perform test run on the plant	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Perform pre-operative checks</li> <li>2. Inspect Material buckets</li> <li>3. Inspect electric and electronic circuits</li> <li>4. Start the engine</li> <li>5. Shutdown machine</li> <li>6. Report malfunctions</li> </ol>	<ul style="list-style-type: none"> <li>• Describe the procedure to feed conveyor metal detector</li> <li>• Describe the procedure to test run on the plant</li> </ul>	<b>Total:</b> 17hrs  <b>Theory:</b> 09hrs  <b>Practical:</b> 9hrs	<div>Consumable</div> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pen</li> <li>• Aggregates</li> <li>• Lubricant</li> <li>• Seals</li> <li>• Nuts and bolts</li> <li>• Wire brush</li> <li>• Fuel</li> </ul> <div>Non Consumable</div> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> <li>• Computer</li> <li>• Internet</li> <li>• Crush Plant</li> <li>• Tool Kit</li> </ul>	Classroom / Plant Site

## Module 10: Develop Entrepreneurial Skills

**Objective of the module:** This Competency Standard identifies the competencies required to develop entrepreneurial skills, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

**Duration:** 40 hours    **Theory:** 16 hours    **Practical:** 24 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU 1</b> Develop a business plan	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Conduct market survey to collect information</li> <li>2. Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses</li> <li>3. Compile the information collected through the market survey, in the business plan format</li> </ol>	<ul style="list-style-type: none"> <li>• Describe market survey and types of information collected such as Customer /demand               <ul style="list-style-type: none"> <li>✓ Tools, equipment, machinery and furniture with rates</li> <li>✓ Raw material</li> <li>✓ Supplier</li> <li>✓ Credit / funding sources</li> <li>✓ Marketing strategy</li> <li>✓ Market trends</li> <li>✓ Overall expenses</li> <li>✓ Profit margin</li> </ul> </li> <li>• ∴</li> <li>• Explain market survey tools such as questionnaire, interview, observation etc</li> <li>• Explain elements of business plan</li> <li>• State the procedure to fill the business plan format</li> </ul> <p><b>Activity:</b></p>	<b>Total</b> 15hrs <b>Theory:</b> 6 hrs <b>Practical:</b> 12 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>

		<ul style="list-style-type: none"> <li>Conduct market survey and formulate business plan in terms of feasibility, investment potential, risk, and completeness.</li> </ul>			
<b>LU 2</b> Collect information regarding funding sources	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate</li> <li>Choose the best available option according to investment requirement</li> <li>Prepare documents according to the loan agreement requirement</li> <li>Include the</li> </ol>	<ul style="list-style-type: none"> <li>Explain different funding sources</li> <li>Describe the documents required to get loan to start a new business</li> </ul> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Prepare the documents for financial feasibility for external investment / loan for the business plan.</li> <li>Prepare loan documents.</li> </ul>	<b>Total</b> 15 hrs <b>Theory:</b> 4 hrs <b>Practical:</b> 6 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>Notebooks</li> <li>Pencils</li> <li>Erasers</li> <li>Sharpeners</li> <li>White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> </ul>	<ul style="list-style-type: none"> <li>Class Room</li> <li>Simulated environment</li> </ul>



	information of funding sources in the business plan				
<b>LU 3</b> Develop a marketing plan	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Collect information required to devise marketing plan Prepare marketing plan for new business</li> </ol>	<ul style="list-style-type: none"> <li>• Prepare the product promotion strategy</li> <li>• State elements of business plan</li> <li>• Describe 7 Ps of marketing</li> <li>• Prepare human resource strategy plan.</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Devise marketing strategy for product promotion</li> </ul>	<b>Total</b> 5hrs <b>Theory:</b> 2 hrs <b>Practical:</b> 3 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> <li>• White board marker</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>
<b>LU 4</b> Develop basic business communication skills	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Communicate with internal customers and external</li> </ol>	<ul style="list-style-type: none"> <li>• Describe 7Cs of business communication</li> <li>• Explain different modes of communication and their application in the industry</li> <li>• Describe business terms used</li> </ul>	<b>Total</b> 5 hrs <b>Theory:</b> 2 hrs <b>Practical:</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>

	<p>customers :</p> <p><b>2.</b> Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc.</p> <p><b>3.</b> Use specific business terms used in the market</p>	<p>in the industry</p> <ul style="list-style-type: none"> <li>Describe organization's procedures and policy related to information and communication systems, protocol and procedures</li> </ul> <p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>Practice to prepare a report about shortage of labour</li> <li>Practice to play a role to communicate with customer about the product.</li> </ul>	3 hrs	<ul style="list-style-type: none"> <li>White board marker</li> </ul> <p>Non Consumable</p> <ul style="list-style-type: none"> <li>White board</li> <li>Multimedia</li> </ul>	
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## Module 11: Practice Professionalism

**Objective of the module:** This competency standard deal with learning the competencies needed to develop portfolio for industry.  
You can perform internship. Your underpinning knowledge will be sufficient to provide you the basis for your work.

**Duration:** 300 hours    **Theory:** 100 hours    **Practical:** 200 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
<b>LU 1</b> Develop Portfolio for industry	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Select previous assignments for portfolio</li> <li>2. Work on previous selected assignments for portfolio</li> <li>3. Compile variety of assignments for portfolio</li> <li>4. Make Professional Portfolio for industry</li> <li>5. Develop Digital Portfolio for industry</li> </ol>	<ul style="list-style-type: none"> <li>• Describe different styles/format of portfolio</li> <li>• Explain the importance of portfolio</li> </ul> <b>Activity:</b> <ul style="list-style-type: none"> <li>• Compile important assignments</li> <li>• Prepare folder for assignments manually</li> <li>• Prepare portfolio digitally</li> </ul>	<b>Total</b> 50 hrs <b>Theory:</b> 25 hrs <b>Practical:</b> 25 hrs	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> </ul> <b>Non Consumable</b> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Simulated environment</li> </ul>
<b>LU 2</b> Perform Internship	<b>The trainee will be able to:</b> <ol style="list-style-type: none"> <li>1. Prepare for internship               <ul style="list-style-type: none"> <li>• Personal Presentation</li> <li>• Portfolio</li> </ul> </li> </ol>	<ul style="list-style-type: none"> <li>• Explain importance of personal grooming for professional life</li> <li>• Describe the importance of internship</li> <li>• Explain ethics for work/internship</li> </ul>	<b>Total</b> 250hrs <b>Theory:</b> 75hrs <b>Practical:</b>	<b>Consumable</b> <ul style="list-style-type: none"> <li>• Notebooks</li> <li>• Pencils</li> <li>• Erasers</li> <li>• Sharpeners</li> </ul>	<ul style="list-style-type: none"> <li>• Class Room</li> <li>• Crush plant site</li> </ul>

	<p>Presentation</p> <ol style="list-style-type: none"> <li>2. Interview preparation</li> <li>3. Demonstrate Ethics for Internship</li> <li>4. Identify Industry for internship</li> <li>5. Perform Internship in Industry <ul style="list-style-type: none"> <li>• Fill the Performa of Internship</li> </ul> </li> <li>5. Report the performance of internship</li> </ol>	<p><b>Activity:</b></p> <ul style="list-style-type: none"> <li>• Practice of presentation</li> <li>• Prepare CV for internship</li> <li>• Prepare report on performance of internship</li> <li>• Perform internship</li> </ul>	175 hrs	<p>Non Consumable</p> <ul style="list-style-type: none"> <li>• White board</li> <li>• Multimedia</li> </ul>	
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## General assessment guidance for “Crushing Plant Site Manager”

Good practice in Pakistan makes use of sessional and final assessments, the basis of which is described below. Good practice by vocational training providers in Pakistan is to use a combination of these sessional and final assessments, combined to produce the final qualification result.

**Sessional assessment** is going on all the time. Its purpose is to provide feedback on what students are learning:

- To the student: to identify achievement and areas for further work
- To the teacher: to evaluate the effectiveness of teaching to date, and to focus future plans.

Assessors need to devise sessional assessments for both theoretical and practical work. Guidance is provided in the assessment strategy

**Final assessment** is the assessment, usually on completion of a course or module, which says whether or not the student has "passed". It is – or should be – undertaken with reference to all the objectives or outcomes of the course, and is usually fairly formal. Considerations of security – ensuring that the student who gets the credit is the person who did the work – assume considerable importance in final assessment.

### **Methods of assessment**

For lessons with a high quantity of theory, written or oral tests related to learning outcomes and/ or learning content can be conducted. For workplace lessons, assessment can focus on the quality of planning the related process, the quality of executing the process, the quality of the product and/or evaluation of the process.

Methods include direct assessment, which is the most desirable form of assessment. For this method, evidence is obtained by direct observation of the student's performance.

Examples for direct assessment of a Crush Plant Site Manager include:

- Work performances, for example Manage and Safety at Crushing Plant Site
- Demonstrations, for example Perform Testing of Stones before Crushing

- Direct questioning, where the assessor would ask the student how to manage and safety at crushing plant site, how they can testing of stones before crushing
- Paper-based tests, such as multiple choice or short answer questions on manage and safety at crushing plant site, testing of stones before crushing
- Indirect assessment is the method used where the performance could not be watched and evidence is gained indirectly.

Examples for indirect assessment of a Crush Plant Site Manager include:

- Work products, such as Developing Entrepreneurial Skills, Installation & Commissioning of Crushing Plant

Indirect assessment should only be a second choice. (In some cases, it may not even be guaranteed that the work products were produced by the person being assessed.)

### **Principles of assessment**

All assessments should be valid, reliable, fair and flexible:

Fairness means that there should be no advantages or disadvantages for any assessed person. For example, it should not happen that one student gets prior information about the type of work performance that will be assessed, while another candidate does not get any prior information.

Validity means that a valid assessment assesses what it claims to assess. For example, if documentation or testing of stones before crushing is to be assessed and certificated, the assessment should involve performance criteria that are directly related to that documentation activity. An interview about the testing of stones before crushing would not meet the performance criteria.

Reliability means that the assessment is consistent and reproducible. For example, if the work performance of preparing documents in words has been assessed, another assessor (e.g. the future employer) should be able to see the same work performance and witness the same level of achievement.

Flexibility means that the assessor has to be flexible concerning the assessment approach. For example, if there is a power failure during the assessment, the assessor should modify the arrangements to accommodate the students' needs.

## Assessment strategy for Crushing Plant Site Manager

This curriculum consists of 11 modules:

- **Module 1:** Manage Safety at Crushing Plant Site
- **Module 2:** Apply and Testing Basic Electronic Components
- **Module 3:** Perform Sampling of Crushing Material
- **Module 4:** Perform Testing of Stones before Crushing
- **Module 5:** Perform Quality Test on Coarse Aggregates
- **Module 6:** Manage and Supervise the Job Activities
- **Module 7:** Plan for Owning and Operating Crushing Plant
- **Module 8:** Plan a Project in Primavera P6
- **Module 9:** Install & Commissioning of Crushing Plant
- **Module 10:** Develop Entrepreneurial Skills
- **Module 11:** Practice Professionalism

### Sessional assessment

The sessional assessment for all modules shall be in two parts: theoretical assessment and practical assessment. The sessional marks shall contribute to the final qualification.

Theoretical assessment for all learning modules must consist of a written paper lasting at least one hour per module. This can be a combination of multiple choice and short answer questions.

For practical assessment, all procedures and methods for the modules must be assessed on a sessional basis. Guidance is provided below under Planning for assessment.

### Final assessment

Final assessment shall be in two parts: theoretical assessment and practical assessment. The final assessment marks shall contribute to the final qualification.

### **The assessment team**

The number of assessors must meet the needs of the students and the training provider. For example, where two assessors are conducting the assessment, there must be a maximum of five students per assessor. In this example, a group of 25 students shall therefore require assessments to be carried out over a four-day period. For a group of only 10 to 15 students, assessments would be carried out over a two-day period only.

### **Planning for assessment**

Sessional assessment: assessors need to plan in advance how they will conduct sessional assessments for each module. The tables on the following pages are for assessors to use to insert how many hours of theoretical and practical assessment will be conducted and what the scheduled dates are.

Final assessment: Training providers need to decide ways to combine modules into a cohesive two-day final assessment programme for each group of five students. Training providers must agree the content for practical assessments in advance.



## Complete List of Tools and Equipment

Sr #	Description	Quantity
1.	Computer Systems	26
2.	Scanner	1
3.	Printer	1
4.	Hardness Testers	1
5.	Universal testing machine(UTM)	1
6.	Impact Testing Machines	1
7.	Steel Rulers	10
8.	Tri Square	10
9.	Inside Vernier Caliper	10
10.	Odd leg Vernier Caliper	10
11.	Trammel Vernier Caliper	10
12.	Outside Vernier Caliper	10
13.	Vernier Depth gauge	5
14.	Vernier Bevel protractor	5
15.	Thread gauges	5
16.	Screw pitch gauges	5
17.	Fillet gauges	5

<b>18.</b>	Feeler gauges	5
<b>19.</b>	Vernier Height gauge	5
<b>20.</b>	Dial indicators with magnetic stand	5
<b>21.</b>	Vernier Micrometer	5
<b>22.</b>	Inside Micrometer	5
<b>23.</b>	Outside Micrometer	10
<b>24.</b>	Depth Micrometer	5
<b>25.</b>	Snap Gauge set	2
<b>26.</b>	Dial Bore Gauge	5
<b>27.</b>	Set of Adjustable Wrench	5
<b>28.</b>	Set of Spanners (Open end, Ring)	5 each
<b>29.</b>	Pipe wrench	2
<b>30.</b>	L-key sets	5
<b>31.</b>	Nose pliers	5
<b>32.</b>	Grip pliers	5
<b>33.</b>	Wrenches	5
<b>34.</b>	Pliers	5
<b>35.</b>	Screw driver (Positive and negative)	5
<b>36.</b>	Hammer	5
<b>37.</b>	Vice grip	5
<b>38.</b>	Grease gun	5 each

<b>39.</b>	Paint brush	10
<b>40.</b>	Steel brush	25
<b>41.</b>	Measuring tape	10
<b>42.</b>	Hopper	10
<b>43.</b>	Conveyor	10
<b>44.</b>	Torque gauge	5
<b>45.</b>	Steel rule	5
<b>46.</b>	Multi-meter	5
<b>47.</b>	Thermometers	5
<b>48.</b>	Spanner set	10 packs
<b>49.</b>	Socket set	1
<b>50.</b>	Star Kit	1
<b>51.</b>	ST(special service Tool)	1
<b>52.</b>	Drilling Machines	1
<b>53.</b>	Location Determining Devices	1
<b>54.</b>	Digging slant determining devices	1
<b>55.</b>	Communication Devices	10
<b>56.</b>	Sample Boxes	10
<b>57.</b>	Exploration and Scanning Devices	2
<b>58.</b>	Drawing board	25
<b>59.</b>	Lathe Machine	05

60.	Welding Plant	05
61.	Crush Plant	01
62.	Wheel Loader	02
63.	Dumper	02

### List of consumable supplies

Sr no	Material	Quantity
1.	Note book	25
2.	Pencil	25
3.	White sheets	25
4.	Eraser	25
5.	Sharpener	25
6.	Pen	25
7.	Cleaning brush	25
8.	Cotton rags	25
9.	PPE's	100
10.	Lubricants	25
11.	Sampling Bag	20
12.	Aggregate	In Cum cm
13.	Inventory Register	5

## Credit values

The credit value of the National Certificate Level 5 in Crush Plant Site Manager is defined by estimating the amount of time/ instruction hours required to complete each competency unit and competency standard. The NVQF uses a standard credit value of 1 credit = 10 hours of learning (Following Higher Education Commission (HEC) guidelines).

The credit values are as follows:

Competency Standard	Estimate of hours	Credit
A. Manage Safety at Crushing Plant Site	60	6
B. Apply and Testing Basic Electronic Components	100	10
C. Perform Sampling of Crushing Material	90	9
D. Perform Testing of Stones before Crushing	120	12
E. Perform Quality Test on Coarse Aggregates	120	12
F. Manage and Supervise the Job Activities	80	8
G. Plan for Owning and Operating Crushing Plant	60	6
H. Plan a Project in Primavera P6	150	15
I. Install & Commissioning of Crushing Plant	80	8

Competency Standard	Estimate of hours	Credit
J. Develop Entrepreneurial Skills	40	4
K. Practice Professionalism	300	30