

Curriculum
For
Certificate in Marble Cutting
And
In-Lays
(Duration of Course Six Months)
Code:VD35S001
(2013)

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SCHEME OF STUDIES

Marble Cutting and In-Lays:

Sr. #	Module	Theory (Hours)	Practical (Hours)	Total (Hours)
1	G. Ensure Safety Precautions	16	64	80
2	F. Maintain Tools and Equipment	16	64	80
3	A. Handling of Stones	20	80	100
4	C. Perform Marble Cutting	20	80	100
5	B. Apply sizing to Marble Blocks	20	80	100
6	D. Perform In-Lays Cutting	48	192	240
7	E. Perform Polishing	20	80	100
TOTAL HOURS		160	640	800

Introduction: Marble Cutting and In-Lays

Name of Course: Marble Cutting and In-Lays

Overall objective of course

To provide the basic skill to the workers in the field of Marble handling, cutting and then value addition to it in the shape of In- Lays. It will enable the students to meet the challenges in the field of marble industry. Further, to improve the skill level of the workers and prepare them for the marble industry to meet the market competition.

Specific objectives of the course

1. Basic information about Marble
2. Provision of basic skills in marble handling, storage, cutting, designing and fixing.
3. Prepare students as per industrial requirement
4. Educate them with latest techniques in marble processing
5. Maximum exposure to the machines
6. Importance of skilled workers in the market
7. Knowledge about different machines for marble cutting and processing
8. Knowledge of different techniques for marble cutting and processing
9. Knowledge of designing for in-Lays
10. Apply and fix marble pieces in the in-Lays
11. To make the students capable of using of cutting, grinding and polishing machines

Competencies gained after completion of course

On successful completion of this course the trainee would be able to:

1. Safe handling of Marble blocks
2. use the tools and measuring instruments used in marble industry
3. Cut marble slabs
4. Carry out all safety rules and precautions for personal and equipment
5. Use gang saw, horizontal and vertical cutting machines
6. Identify the quality of the marble and able to distinguish good and poor quality of marble.
7. Handle industrial machines

8. Develop design pattern for In-Lays
9. Control the material wastage
10. Make marble In – Lays

Job opportunities available immediately and in the future

After completion of this course the candidates can be employed in the following areas/field:

1. Marble industries engaged in the business of marble cutting and In-Lay
2. Start their own business for marble In-Lays
3. Opportunities to work abroad like Middle East, Europe

Trainee entry level:

Secondary School Certificate (Matric)

Minimum qualification of trainer

Intermediate with 6 months certificate of Marble Cutting and In-Lays with 3 year industrial experience in Marble Cutting and In-Lays.

Medium of Instruction

Urdu/English

Sequence of the modules

- i. Module A – Handling of Stone
- ii. Module C – Perform Marble Cutting
- iii. Module B – Apply sizing to Marble Blocks
- iv. Module D – Perform In-Lays Cutting
- v. Module E – Perform Polishing
- vi. Module F – Maintain Tools and Equipment
- vii. Module G – Ensure Safety Precautions

Timeframe of Assessment

Duration of Course:	6 Months
Total Hours:	800 hrs.
Days Per Week:	06
Per Week Hours:	40 hrs
Per Day Hours:	07 Hrs. (Friday, 5 Hrs.)
Training Methodology:	Practical 80%
	Theory 20%

Curriculum Overview

Module Title and Aim	Learning Units	Theory ¹ Days/hours	Workplace Days/hours	Timeframe of modules
<p>Module A Handling of Stones</p> <p>Aim This module deals with the skill and knowledge of grading of Marble stone and storage.</p>	<ol style="list-style-type: none"> 1. Allocate space for placement of stone 2. Inspection of Stone 3. Unload Stone from vehicle 4. Ensure proper placement of stone 5. Use Overhead crane for transportation of stone 6. Ensure safety of stone 7. Maintain inventory register 	20	80	Independent
<p>Module B Apply Sizing to Marble Blocks</p> <p>Aim This module deals with the skill and knowledge of grading and sizing of marble slabs.</p>	<ol style="list-style-type: none"> 1. Select machine 2. Check machine 3. Measure Blocks 4. Ensure Water supply 5. Check voltage 6. Cut slabs in horizontal shape 7. Cut slabs in vertical shapes 8. Cut slabs in rectangular shape 9. Cut slabs in square shape 10. Perform resizing according to requirement 	20	80	Independent
<p>Module C Perform Marble Cutting</p> <p>Aim This module deals with the skill and knowledge of preparation of marble stones</p>	<ol style="list-style-type: none"> 1. Select relevant tools 2. Arrange Material for Cutting 3. Adjust cutting machine 4. Measure Stone 5. Ensure water supply 6. Check voltage 7. Perform bridge cutting 8. Perform gang saw cutting 	20	80	After module B
Module D	<ol style="list-style-type: none"> 1. Select color of stone 	40	200	After module

<p>Perform In-Lays Cutting</p> <p>Aim This module deals with the skill and knowledge of making new pattern and apply design on base pattern</p>	<ol style="list-style-type: none"> 2. Select design of stone 3. Draw sketch on Stone 4. Cut stone according to design 5. Perform finishing of cut pieces 6. Bind pieces according to design 			C
<p>Module E</p> <p>Perform Polishing</p> <p>Aim This module deals with the skill and knowledge of surface finishing</p>	<ol style="list-style-type: none"> 1. Fix material in the polishing machine 2. Select proper disc for grinding 3. Perform grinding 4. Ensure water supply on material 5. Prepare surface for Polishing 6. Prepare Chemical Polish 7. Apply Polish on material 8. Remove material from machine 9. Perform buffing on material 10. Ensure safe placement of the finished product 	20	80	After module D
<p>Module F</p> <p>Maintain Tools and Equipment</p> <p>Aim This module deals with the skill and knowledge of maintenance of tools and equipment</p>	<ol style="list-style-type: none"> 1. Clean tools and machines 2. Apply oiling to machines 3. Protect machines from dust 4. Place tools in proper position 5. Check the supply of water 6. Ensure cleanliness of the work place 7. Ensure supply of electricity 8. Check the condition of the machine 	16	64	Independent
<p>Module G</p> <p>Ensure Safety Precautions</p> <p>Aim This module deals with the skill and knowledge of personal and equipment safety</p>	<ol style="list-style-type: none"> 1. Wear proper clothing 2. Ensure safety of machines 3. Ensure drainage of waste water 4. Ensure safety of the workplace 5. Practice general safety. 	16	64	Independent

Curriculum Contents

Module A: Handling of Stones

Objective of the Module: To be able to handle the marble stone.

Duration: Theory: 20 hours Practice: 80 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
A.1 Allocate space for placement of stone	Able to: Able to allocate the area / space for stock of marble stone	Knowledge of: <ul style="list-style-type: none"> – Available area – Type of vehicle carrying stone – Importance of Stone – Space required for the movement of vehicle – Knowledge of stock to be maintained – How to recognize different types of stones – Block size Ability to: <ul style="list-style-type: none"> – Estimate the area required – Identify the area for various type of stocks – Utilization of maximum area – Assess utility of the block 	Theory 02 Hrs Practical 08 Hrs	Blocks of marble stone	Marble Industry
A-2 Inspection of Stone		Knowledge of: <ul style="list-style-type: none"> – Quality of the marble (physical defects) Ability to: <ul style="list-style-type: none"> – Pass or reject the stone based on physical defects 	Theory 02 Hrs Practical 08 Hrs	Marble Blocks	Marble Industry
A.3		Knowledge of:	Theory	Blocks of	Marble

<p>Unload Stone from vehicle</p>	<p>Able to: Perform / manage unloading of stone from the vehicle</p>	<ul style="list-style-type: none"> - Standing Position of worker and movement of machines - Crane / hoist (steel wire rope) and tools used for unloading - Space required for vehicle movement <p>Ability to:</p> <ul style="list-style-type: none"> - Place stone safely on ground - Guide the operator of machine for safe unloading 	<p>02 Hrs Practical 08 Hrs</p>	<p>marble stone</p>	<p>Industry</p>
<p>A.4 Ensure proper placement of stone</p>	<p>Able to : Place the stone safely after unloading from the vehicle</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> - Types of stone being stocked - Labelling the stone <p>Ability to:</p> <ul style="list-style-type: none"> - Carefully labelling and numbering to the stone - Maintain the record of stone - Place stone according to the types and grades 	<p>Theory 02 Hrs Practical 08 Hrs</p>	<p>Blocks of marble stone</p>	<p>Marble Industry</p>
<p>A.5 Use Overhead crane for transportation of stone</p>	<p>Able to: Operate overhead crane for the safe transport of marble blocks</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> - Tools required for movement of stone - Area to which the stone is required to place <p>Ability to:</p> <ul style="list-style-type: none"> - Operate the overhead crane - Fasten the stone with steel rope - Safe transportation of stone - Troubleshoot the fault of overhead crane 	<p>Theory 06 Hrs Practical 24 Hrs</p>	<p>Blocks of marble stone Overhead crane</p>	<p>Marble Industry</p>

<p>A.6</p> <p>Ensure Safety of stone</p>	<p>Able to:</p> <p>Follow the safety precautions at work place for personal and stone</p> <p>Take the safety measure while using tools and other equipments</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> - Worth of the stone - Usage of stone <p>Ability to:</p> <ul style="list-style-type: none"> - Manage for safe movement during transportation and handling 	<p>Theory 04 Hrs</p> <p>Practical 16 Hrs</p>	<p>Slabs / Blocks of marble stone</p>	<p>Marble Industry</p>
<p>A.7</p> <p>Maintain inventory register</p>	<p>Able to:</p> <p>Generate inventory report for various type of stone</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> - Color of the stone - Various types of stone - Quality / terminology used for stone identification <p>Ability to:</p> <ul style="list-style-type: none"> - Identify the stone - Place the stone in respective area - Dispatch the proper product - Generate the inventory report 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Stationary, Register, pen</p>	<p>Class room</p>

Module B:

Apply sizing to Marble Blocks

Objective of the Module: To enable the trainee to be able to make slabs from blocks of marble stone

Duration: Theory: 20 hours Practice: 80 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
B.1 Select machine	Able to : Select the machine for required production	Knowledge of: <ul style="list-style-type: none"> – Requirements of the order / customer for Inlay – Capacity of the machine – Availability of tools Ability to: <ul style="list-style-type: none"> – Estimate the production requirement – Assess the capability of the machine 	Theory 1.2 Hrs Practical 4.8 Hrs	Gang saw Bridge cutter Sizing Machine	Marble industry
B.2 Check machine	Able to : Check the machine before production and take necessary maintenance steps when required	Knowledge of: <ul style="list-style-type: none"> – Required tools / spare parts for machine – Maintenance schedule / check list of the machine Ability to: <ul style="list-style-type: none"> – Maintain the machines according to machine manuals – Assess the correct working of the machine – Adjustment / setting of the machine when required 	Theory 02 Hrs Practical 08 Hrs	Gang saw Bridge cutter Sizing Machine	Marble industry
B.3 Measure Blocks	Able to : Take measurements of the marble block at different points	Knowledge of: <ul style="list-style-type: none"> – Measuring tools – Terminology used in the industry – Estimation 	Theory 02 Hrs Practical 08 Hrs	Marble blocks	Marble industry

		Ability to: <ul style="list-style-type: none"> – Use measuring tape to measure in inches and centimetres – Follow common terminology of measuring 			
B.4 Ensure water supply	Able to : Manage the water supply at machine	Knowledge of: <ul style="list-style-type: none"> – Water supply line – clean water Ability to: <ul style="list-style-type: none"> – Adjust water pressure / flow 	Theory 0.4 Hr Practical 1.6 Hrs	Water pipe Water Storage tank	Marble industry
B.5 Check voltage	Able to: check voltage for safe operation of machine	Knowledge of: <ul style="list-style-type: none"> – A.C voltage Ability to: <ul style="list-style-type: none"> – Understand required correct voltage – Use volt meter 	Theory 0.4 Hrs Practical 1.6 Hrs	Single phase and 3 - phase Electrical connection	Marble industry / class room
B.6 Cut slabs in horizontal shape	Able to: Cut the marble slabs with machine in horizontal shape	Knowledge of: <ul style="list-style-type: none"> – Type / quality of stone – Cutting tools – Start / stop of machine Ability to: <ul style="list-style-type: none"> – Fix the stone on cutter for horizontal cutting – Adjust machine for required size – Assess the quality of cutting tool – Adjust the speed of machine 	Theory 3 Hrs Practical 12 Hrs	Gang saw Bridge cutter Sizing Machine	Marble industry
B.7 Cut slabs in vertical shape	Able to: Cut the marble slabs with machine in vertical shape	Knowledge of: <ul style="list-style-type: none"> – Type / quality of stone – Cutting tools – Start / stop of machine 	Theory 3 Hrs Practical 12 Hrs	Bridge cutter	Marble industry

		<p>Ability to:</p> <ul style="list-style-type: none"> – Fix the stone on cutter for vertical cutting – Adjust machine for required size – Assess the quality of cutting tool – Adjust the speed of machine 			
B.8 Cut slabs in rectangular shape	<p>Able to:</p> <p>Cut the marble slabs with machine in rectangular shape</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Type / quality of stone – Cutting tools – Start / stop of machine <p>Ability to:</p> <ul style="list-style-type: none"> – Fix the stone on cutter for rectangular cutting – Adjust machine for required size – Assess the quality of cutting tool – Adjust the speed of machine 	<p>Theory 3 Hrs</p> <p>Practical 12 Hrs</p>	<p>Marble cutting machine</p> <p>Bridge cutter</p> <p>Sizing Machine</p>	Marble industry
B.9 Cut slabs in square shape	<p>Able to:</p> <p>Cut the marble slabs with machine in square shape</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Type / quality of stone – Cutting tools – Start / stop of machine <p>Ability to:</p> <ul style="list-style-type: none"> – Fix the stone on cutter for square cutting – Adjust machine for required size – Assess the quality of cutting tool – Adjust the speed of machine 	<p>Theory 3 Hrs</p> <p>Practical 12 Hrs</p>	<p>Marble cutting machine</p> <p>Sizing Machine</p>	Marble industry
B.10 Perform resizing according to requirement	<p>Able to:</p> <p>Use resizing machine for resizing of</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Type / quality of stone – Cutting tools – Start / stop of machine 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Marble cutting machine</p> <p>Sizing Machine</p>	Marble industry

	marble slabs according to sizes	Ability to: <ul style="list-style-type: none"> – Fix the stone on cutter for resizing – Adjust machine for required size – Assess the quality of cutting tool – Adjust the speed of machine 			
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Module C: Perform Marble Cutting

Objective of the Module: To enable the trainee to be able to perform marble cutting

Duration: Theory: 20 hours Practice: 80 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
C.1. Select relevant tools	Able to : Select relevant tools for different operations	Knowledge of: <ul style="list-style-type: none"> – Cutting tools – Grinding tools Ability to: <ul style="list-style-type: none"> – Assess the quality of tools – Select relevant tool 	Theory 02 Hrs Practical 08 Hrs	Grinder(p edestal /handy) Grinding disc, Drill Machine with Bits	Class room/ Marble industry
C.2 Arrange material for cutting	Able to: Manage the material as per requirements	Knowledge of: <ul style="list-style-type: none"> – Different type / quality of stones – Estimated quantity of material – Size of material Ability to: <ul style="list-style-type: none"> – Select correct size of material – Select correct hardness / type of material 	Theory 02 Hrs Practical 08 Hrs	Marble slabs	Marble industry
C.3 Adjust cutting machine	Able to: Adjust the machine for required cutting	Knowledge of: <ul style="list-style-type: none"> – Cutting machine – Cutting disc / tools – Measuring tools Ability to: <ul style="list-style-type: none"> – Understand machine adjustments – Fix the cutting tools in machine – Adjust the cutter in required size 	Theory 06 Hrs Practical 24 Hrs	Marble cutting machine Bridge cutter Sizing Machine	Marble industry
C.4 Measure Stone	Able to :	Knowledge of: <ul style="list-style-type: none"> – Measuring tools – Terminology used in 	Theory 1.2 Hrs Practical	Marble block, Measuring tape	Marble industry

	Take measurements at different points of the marble pieces	<p>the industry</p> <ul style="list-style-type: none"> – Estimation <p>Ability to:</p> <ul style="list-style-type: none"> – Use measuring tape to measure in inches and centimetres – Follow common terminology of measuring 	4.8 Hrs			
C.5	Ensure water supply	<p>Able to : Manage the water supply at machine</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Water supply line – clean water <p>Ability to:</p> <ul style="list-style-type: none"> – Adjust water pressure / flow 	<p>Theory 0.4 Hr</p> <p>Practical 1.6 Hrs</p>	<p>Rubber pipe / G.I. Pipe</p> <p>Water Storage Tank</p>	Marble industry
C.6	Check voltage	<p>Able to: Use volt meter and ensure correct voltage for safe operation of machine</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – A.C voltage – voltmeter <p>Ability to:</p> <ul style="list-style-type: none"> – Understand required correct voltage – Use volt meter 	<p>Theory 0.4 Hr</p> <p>Practical 1.6 Hrs</p>	<p>3 - phase Electrical connection</p> <p>Single phase electrical connection</p>	Marble industry / class room
C.7	Perform bridge cutting	<p>Able to: Operate bridge cutter safely for making slabs</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Quality / Type of stone – Cutting blades / tools – Machine operation <p>Ability to</p> <ul style="list-style-type: none"> – Fix the stone on cutting machine – Adjust the speed of the cutter – Adjust the cutting blades in required size – Assess quality of cutting blade / discs 	<p>Theory 4Hrs</p> <p>Practical 16 Hrs</p>	Bridge cutter	Marble industry

<p>C.8</p> <p>Perform gang saw cutting</p>	<p>Able to:</p> <p>Use gang saw cutter safely to Cut slabs in required sizes in good quality</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> - Quality / Type of stone - Cutting blades / tools - Machine operation <p>Ability to</p> <ul style="list-style-type: none"> - Fix the stone on gang saw - Adjust the speed of the Gang saw - Adjust the cutting blades in required size - Assess quality of cutting blades of gang saw 	<p>Theory 4 Hrs</p> <p>Practical 16 Hrs</p>	<p>Gang saw cutter</p>	<p>Marble industry</p>
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Module D: Perform In-Lays Cutting

Objective of the Module: To enable the trainee to be able to make new pattern to perform In-Lays

Duration: Theory: 40 hours Practice: 200 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
D.1 Select color of stone	Able to : Choose color stone for new product	Knowledge of: <ul style="list-style-type: none"> – Colour scheme – Basic color Ability to: <ul style="list-style-type: none"> – Develop samples with different color schemes for different product 	Theory 4Hrs Practical 16 Hrs	Marble stone of different colors	Class room
D.2 Select design of stone	Able to: Select design / shape of stone to develop In-Lay using different shapes of the stone	Knowledge of: <ul style="list-style-type: none"> – Geometrical shapes – Material required – Kind of material use in the sample development – Kinds of pattern to be made for one product – Pattern numbering Ability to: <ul style="list-style-type: none"> – Search the stone for required color and design 	Theory 4 Hrs Practical 16 Hrs	Marble stone of different dimensions / shades	Class room
D.3 Draw sketch on stone	Able to : Develop different designs with innovative ideas	Knowledge of: <ul style="list-style-type: none"> – Free hand sketching Ability to: <ul style="list-style-type: none"> – Draw basic sketch – Apply basic calculations to work with design 	Theory 12 Hrs Practical 48 Hrs	measuring tape, sketch paper, pencils	Class room

<p>D.4 Cut stone according to design</p>	<p>Able to : Use cutting machine for fine cutting and grinding of stone pieces to fit into the design</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Quality of stone – Cutting machine and tools – Measuring tools <p>Ability to:</p> <ul style="list-style-type: none"> – Applying design according to drawing sheet – Convert design with proper shapes – Adjust tools and speed of the machine 	<p>Theory 10 Hrs</p> <p>Practical 40 Hrs</p>	<p>Marble stone of different colors, Vertical / cross cutting machine</p>	<p>Class room / marble industry</p>
<p>D.5 Perform finishing of cut pieces</p>	<p>Able to : Make the small pieces of marble for fitting into the designs</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Extracting design pieces – Cutting instruments – Need of ready shape pattern <p>Ability to:</p> <ul style="list-style-type: none"> – Operate machine for fine cutting and grinding – Adjust tools and speed of the machine 	<p>Theory 10 Hrs</p> <p>Practical 40 Hrs</p>	<p>Marble stone of different colors, Vertical / cross cutting machine</p>	<p>Class room / marble industry</p>
<p>D.6 Bind pieces according to design</p>	<p>Able to: Place small pieces of marble into design and fix them with glue</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Importance of design – Aesthetics – Lining style – Kinds of lining – Fixing material / glue <p>Ability to:</p> <ul style="list-style-type: none"> – Maintaining shapes after applying cutting pieces – Use of lining – Use of fixing material without wastage 	<p>Theory 8 Hrs</p> <p>Practical 32 Hrs</p>	<p>Marble stone of different colors, Glue, Mesh,</p>	<p>Class room / marble industry</p>

Module E: Perform Polishing

Objective of the Module: To enable the trainee to be able to perform polishing

Duration: Theory: 20 hours Practice: 80 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
E.1 Select proper disc for grinding	Able to: Select proper tools /disc for safe operation of grinding	Knowledge of: <ul style="list-style-type: none"> – Abrasives – Grain size of the abrasives – Different types of tools Ability to: <ul style="list-style-type: none"> – Choose correct tool – to assess the quality of the abrasives – Fix grinding disc properly in the machine 	Theory 02 Hrs Practical 08 Hrs	Abrasives of different sizes	Class room / marble industry
E.2 Perform grinding	Able to: Use grinding machine safely	Knowledge of: <ul style="list-style-type: none"> – Abrasives – Grain size of the abrasives – Handling the grinding machine Ability to: <ul style="list-style-type: none"> – Able to assess the quality of the abrasives – Fix abrasives properly in the machine – Hold the machine safely on to the material – Able to assess the required level of grinding 	Theory 2.4 Hrs Practical 3.6 Hrs	Grinding pads of different sizes, Grinder (pedestal / handy)	Class room / marble industry
E.3 Ensure water on material	Able to: Use water according to the cutting requirement	Knowledge of : <ul style="list-style-type: none"> – Water supply Ability to: <ul style="list-style-type: none"> – Adjust water pressure – Avoid water wastage – Adjust water on abrasives 	Theory 0.4 Hrs Practical 1.6 Hrs	G.I. /rubber pipe	Class room / marble industry

<p>E.4</p> <p>Fix material in the polishing machine</p>	<p>Able to: Fix material accurately in the machine for further processing</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Different kinds of marble – Machine operations – Tools for polishing <p>Ability to:</p> <ul style="list-style-type: none"> – Handle the material safely – Fix the material in the machine – Operate the machine – Identify the tools for polishing – Adjust the material in level 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Polish machine, polishing stones</p>	<p>Class room / marble industry</p>
<p>E.5</p> <p>Prepare surface for polishing</p>	<p>Able to: Make the surface of the marble ready for polishing</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> – Material to be polished – Material used in polishing <p>Ability to:</p> <ul style="list-style-type: none"> – Assess the cleanliness before polishing – Use tools to make surface ready for polish 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Sand paper, dry cloth</p>	<p>Class room / marble industry</p>
<p>E.6</p> <p>Prepare chemical polish</p>	<p>Able to: Mix the materials in correct ratio to prepare chemical polish</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> – Chemical used in polishing – Quality of different polishes like Five Extra (Yellow) <p>Ability to:</p> <ul style="list-style-type: none"> – Mix the ingredient of polish safely – Prepare polish in required quantity 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Ingredient of chemical polish</p>	<p>Class room / marble industry</p>
<p>E.7</p> <p>Apply polish on material</p>	<p>Able to: Apply polish on the surface in correct quantity</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> – Area to be polished – Material used in polishing <p>Ability to:</p> <ul style="list-style-type: none"> – Assess the cleanliness before polishing – Apply polish in minimum required thickness – Take safety measure – Use machine safely for polishing 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Chemical polish, dry cloth</p>	<p>Class room / marble industry</p>

<p>E.8 Remove material from machine</p>	<p>Able to: Remove the job safely from machine after polishing</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> - Polished surface <p>Ability to:</p> <ul style="list-style-type: none"> - Handle material safely after polishing - Store material safely 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Polishing machine</p>	<p>Class room / marble industry</p>
<p>E.9 Perform buffing on material</p>	<p>Able to: Make the surface finish smooth by buffing</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> - Material to be buffed - Material used in buffing <p>Ability to:</p> <ul style="list-style-type: none"> - Assess the cleanliness before buffing - Handle the machine safely - Fix the buffing material in the machine 	<p>Theory 3.2 Hrs</p> <p>Practical 12.8 Hrs</p>	<p>Grinder (handy), buffing pads</p>	<p>Class room / marble industry</p>
<p>E.10 Ensure safe placement of finished product</p>	<p>Able to: Pack the finished goods as per packing standards and keep record of inventory</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> - Material handling - Storage of fragile materials <p>Ability to:</p> <ul style="list-style-type: none"> - Store and pack the finished product safely - Use strong packing - Numbering for identification 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Packing box, dry matt, packing material</p>	<p>Class room / marble industry</p>

Module F: Maintain Tools and Equipment

Objective of the Module: To enable the trainee to be maintain the tools and equipments.

Duration: Theory: 16 hours Practice: 64 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
F.1 Clean tools and machine	Able to: Keep the machine and tools clean and ready for next use	Knowledge of: – tools – machines – material used for cleaning Ability to: – Use cleaning material safely – Handle tools safely – Handle machine safely	Theory 4 Hrs Practical 16 Hrs	Cutting machines, grinding disc, hammer, wrench set	Class room
F.2 Apply oiling to machines	Able to: Lubricate the machine as per manufacturer's recommendations	Knowledge of: – Types of oil – Oiling points of machines Ability to: – Maintain the oiling record – Oil the machines in required quantity – Clean the machines after oiling	Theory 02 Hrs Practical 08 Hrs	Cutting machines, grinding machines, overhead crane	Marble industry
F.3 Protect machines from dust	Able to Keep the machine in perfect operating condition	Knowledge of : – Machines to be protected Ability to: – Cover the machines with dust protection covers – De dusting of machines at regular intervals	Theory 02 Hrs Practical 08 Hrs	Cutting machines, grinding machine, vertical cutting machine, horizontal cutting machine	Marble industry

<p>F.4</p> <p>Place tools in proper position</p>	<p>Able to: Keep tools safely at designated area and maintain inventory record</p>	<p>Knowledge of :</p> <ul style="list-style-type: none"> – Tools – Tool box – Tool holder <p>Ability to:</p> <ul style="list-style-type: none"> – Place tools at designated place – Maintain the record of tools – Place the tools at safe place 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Screw driver, pliers, hammer, wrench set, grinding tips, tool box</p>	<p>Class room</p>
<p>F.5</p> <p>Check the water supply</p>	<p>Able to : Manage the water supply at machine</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Water supply line <p>Ability to:</p> <ul style="list-style-type: none"> – Adjust water pressure / flow 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>G.I. / Rubber pipe</p> <p>Water storage tank</p>	<p>Class room / marble industry</p>
<p>F.6</p> <p>Ensure cleanliness of the workplace</p>	<p>Able to Make the workplace clean and tidy after the job is finished</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Necessity of cleanliness <p>Ability to:</p> <ul style="list-style-type: none"> – Keep the workplace neat and clean after the job is finished 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Cutting / grinding area</p>	<p>Marble industry</p>
<p>F.7</p> <p>Ensure supply of electricity</p>	<p>Able to: Volt meter and ensure correct voltage for safe operation of machine</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> – Electricity supply – voltmeter <p>Ability to:</p> <ul style="list-style-type: none"> – Use voltmeter – Take safety precautions at electrical equipments 	<p>Theory 02 Hrs</p> <p>Practical 08 Hrs</p>	<p>Single phase and 3 - phase Electrical connection</p>	<p>Marble industry / class room</p>

<p>F.8</p> <p>Check the condition of the machine</p>	<p>Able to:</p> <p>Maintain the machine in perfect condition as recommended by the machine manufacturer for smooth operation</p>	<p>Knowledge of:</p> <ul style="list-style-type: none"> - Machines working <p>Ability to:</p> <ul style="list-style-type: none"> - Assess the correct working of the machine - Take prompt maintenance when required - Follow routine maintenance - Maintain the register for maintenance - Stop the machine for maintenance when it is not in good condition 	<p>Theory 4 Hrs</p> <p>Practical 16 Hrs</p>	<p>Gang saw, bridge cutter, polishing machine, vertical cutter, horizontal cutter</p>	<p>Marble industry</p>
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Module G: Ensure Safety Precautions

Objective of the Module: To enable the trainee to be able to ensure safety precautions.

Duration: Theory: 16 hours Practice: 64 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
G.1 Wear proper clothing	Able to Use safety / working clothes as per work environment	Knowledge of: <ul style="list-style-type: none"> – Work safety and environment – Type of safety clothing Ability to: <ul style="list-style-type: none"> – Identify the work environment and select proper clothes 	Theory 02 Hrs Practical 08 Hrs	Pant shirt, gloves, masks, shoes,	Class room
G.2 Ensure safety of the machines	Able to: Identify and select the proper safety steps for machine	Knowledge of: <ul style="list-style-type: none"> – Safety of machines and its importance Ability to: <ul style="list-style-type: none"> – Make routine checks of the machine – Follow the procedure for operation as described in manual of the machine – Fix / ensure safe guards at the machine 	Theory 02 Hrs Practical 08 Hrs	Safety sign boards	Class room
G.3 Ensure drainage of waste water	Able to: Perform steps for proper drainage of the water	Knowledge of: <ul style="list-style-type: none"> – Waste water – Channels for drainage Ability to: <ul style="list-style-type: none"> – Make the drainage passage clear – Routine cleaning of the drain channels 	Theory 4Hrs Practical 16 Hrs	Drain channels	Marble industry
G.4 Ensure safety of the workplace	Able to: Take necessary safety measure for the work place	Knowledge of: <ul style="list-style-type: none"> – Safety code – Follow safety precautions at workplace 	Theory 4Hrs Practical 16 Hrs	Safety sign boards	Class room

		Ability to: <ul style="list-style-type: none"> - Keep the work place neat and clean - Point out the hazard areas 			
G.5 Practice general safety	Able to: Take necessary measures for the safety of personal , machine and work place	Knowledge of: <ul style="list-style-type: none"> - Safety tools /equipments Ability to: <ul style="list-style-type: none"> - Manage general safety equipments - Ensure to use safety equipments before entering work place 	Theory 4 Hrs Practical 16 Hrs	Safety sign boards	Class room

Assessment Template

Module A: Handling of Stones

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
A.1 Allocate space for placement of stone	20	80	Describe the importance of space allocation for placement of stone. Identify the quality of the stone	Q & A Illustrative test	At the end of module
A.2 Inspection of the Stone			Describe the types of physical defects in the marble stone	Q & A	At the end of module
A.3 Unload stone from vehicle			Demonstrate how to unload the stone from vehicle List down tools and equipment and safety precautions during unloading	Practical Direct Observation Q & A	At the end of module
A.4 Ensure proper placement of stone			Demonstrate how to place the stone at safe place Explain and Identify a situation and object in which certain problem occurs while placing stone	Practical Direct Observation Q & A	At the end of module
A.5 Use overhead crane for transportation of stone			Demonstrate how to shift the stone with overhead crane Describe the major faults of the crane	Practical Direct Observation	At the end of module
A.6 Ensure safety of stone			Explain why the safety of stone is necessary	Q & A	At the end of module
A.7 Maintain inventory register			Describe the importance of inventory Explain types of quality of marble	Q & A	At the end of module

Module B: Apply sizing to Marble Blocks

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
B.1 Select machine	20	80	Demonstrate the criteria for selection of machine Explain different types of the tools used in sizing of marble	Illustrative test Direct Observation Q & A	At the end of module
B.2 Check machine			Demonstrate how to check the machine before starting the work Demonstrate how to adjust the machine for different types of jobs	Practical Direct Observation Q & A	At the end of module
B.3 Measure Blocks			Explain and Identify tools and equipment used for measuring the block Describe various terms used for measurement Give estimated dimensions of the marble block	Q & A Direct Observation	At the end of module
B.4 Ensure water supply			Explain why the supply of water is necessary for cutting	Q & A	At the end of module
B.5 Check voltage			What is difference between single and three phase electric supply Demonstrate How to check voltage	Q & A Direct Observation Practical	At the end of module
B.6 Cut slabs in horizontal shape			Explain difference between vertical and horizontal slabs Illustrate what tools are required for horizontal cutting	Practical Direct Observation Q & A	At the end of module
B.7 Cut slabs in vertical shape			Explain difference between vertical and horizontal slabs Demonstrate how to fix the stone in the machine for cutting Demonstrate how to adjust the speed of the machine	Q & A Direct Observation	At the end of module
B.8 Cut slabs in rectangular shape			Demonstrate how to cut irregular stone into rectangular shape slabs	Practical Direct Observation Q & A	At the end of module
B.9 Cut slabs in square shape			Demonstrate how to cut irregular stone into square shape slabs Describe how to check the	Practical Direct Observation Q & A	At the end of module

			quality of the cutting tools		
B.10 Perform resizing according to requirement			Demonstrate the procedure of resizing of slabs Demonstrate how to fix the stone in the machine for resizing	Practical Direct Observation Q & A	At the end of module

Module C: Perform Marble Cutting

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
C.1. Select relevant tools	20	80	Explain and identify the tools required for marble cutting	Practical Direct Observation Q & A Illustrative test	At the end of module
C.2 Arrange material for cutting			Identify different type of stones based on the hardness	Q & A Direct Observation	At the end of module
C.3 Adjust cutting machine			Explain and Identify a situation and object in which certain problem occurs while adjusting machine	Practical Direct Observation Q & A	At the end of module
C.4 Measure Stone			Demonstrate how to take measurement with measuring tape Give an estimated dimension of the marble stone	Practical Direct Observation Q & A	At the end of module
C.5 Ensure water supply			Explain why water is necessary for cutting of marble stone	Q & A	At the end of module
C.6 Check voltage			Which instrument is used to check voltage Demonstrate to check the voltage	Practical Direct Observation Q & A	At the end of module
C.7 Perform bridge cutting			Explain what steps are involved in bridge cutting. Demonstrate how to fix the stone under the bridge saw Demonstrate how to adjust the speed of the machine	Practical Direct Observation Q & A	At the end of module
C.8 Perform gang saw cutting			Explain what steps are involved in gang saw cutting. Demonstrate how to fix the stone under the bridge saw Demonstrate how to adjust the speed of the machine	Practical Direct Observation Q & A	At the end of module

Module D: Perform In-Lays Cutting

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
D.1 Select color of stone	40	200	Illustrate the importance of color scheme for a design by the customer.	Q & A	At the end of module
D.2 Select design of stone			Demonstrate how to select the design by the customer	Q & A	At the end of module
D.3 Draw sketch on stone			Draw a sketch List of tools and equipment and safety precautions	Practical Direct Observation Q & A	At the end of module
D.4 Cut stone according to design			Demonstrate the cutting of stone for a specific design List of tools and equipment and safety precautions	Practical Direct Observation Q & A	At the end of module
D.5 Perform finishing of cut pieces			Demonstrate how to develop a finished surface Illustrate how to adjust machine for fine cutting	Q & A Practical Direct Observation	At the end of module
D.6 Bind pieces according to design			Explain different type of binding / fixing materials Demonstrate how to bind the stones for a specific design	Q & A Practical Direct Observation	At the end of module

Module E: Perform Polishing

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
E.1 Select proper disc for grinding	20	80	What factors are kept in mind while selecting abrasives Demonstrate how to fix abrasives in the machine	Q & A Direct Observation	At the end of module
E.2 Perform grinding			Explain the procedure for grinding What are different types of abrasives What precautions should be taken during grinding	Practical Direct Observation	At the end of module
E.3 Ensure water on material			Describe the need of water for cutting	Q & A	At the end of module
E.4 Fix material in the polishing machine			Explain and Identifying the different types of polishing machines and tools Illustrate how to abrasives in the machine	Illustrative test Q & A Direct Observation	At the end of module
E.5 Prepare surface for polishing			Demonstrate how to prepare the surface for polishing	Q & A Practical Direct Observation	At the end of module
E.6 Prepare chemical polish			Demonstrate how to prepare chemical polish What materials are required for polish	Q & A Practical Direct Observation	At the end of module
E.7 Apply polish on material			Demonstrate how to apply polish on the surface Describe the safety measures to be taken during polishing of stone	Q & A Practical Direct Observation	At the end of module
E.8 Remove material from machine			Demonstrate how and when to remove the material from the machine	Q & A Practical Direct Observation	At the end of module
E.9 Perform buffing on material			Demonstrate how to prepare the surface for buffing What materials are used in buffing Demonstrate how to fix the buffing pads in the machine	Q & A Practical Direct Observation	At the end of module

E.10 Ensure safe placement of finished product			Explain why and how to place material safely Illustrate how to pack and label the finished product	Q & A Direct Observation	At the end of module
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Module F: Maintain Tools and Equipment

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
F.1 Clean tools and machine	16	64	Demonstrate how to clean tools List of tools and equipment and safety precautions	Q & A Practical Direct Observation	At the end of module
F.2 Apply oiling to machines			Demonstrate how to oil the machine	Q & A Practical Direct Observation	At the end of module
F.3 Protect machines from dust			Demonstrate how to protect the machines from dust	Q & A Practical Direct Observation	At the end of module
F.4 Place tools in proper position			Demonstrate how to place tools in tool box List of tools and equipment	Q & A Practical Direct Observation	At the end of module
F.5 Check the water supply			Describe the need of water for cutting	Q & A	At the end of module
F.6 Ensure cleanliness of the workplace			Describe why it is important to keep the work place clean	Q & A	At the end of module
F.7 Ensure supply of electricity			Which instrument is used to check voltage Demonstrate to check the voltage	Practical Direct Observation Q & A	At the end of module
F.8 Check the condition of the machine			Describe how to check the condition of machine Explain the procedure for machine maintenance	Q & A Practical Direct Observation	At the end of module

Module G: Ensure safety Precautions

Learning Units	Theory Days/ hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
G.1 Wear proper clothing	16	64	Identify the tools, equipment needed for safety What kind of clothes to be used	Practical Direct Observation Q & A	At the end of module
G.2 Ensure safety of the machines			what are the check list for the safety of the machine	Q & A	At the end of module
G.3 Ensure drainage of waste water			Explain what will happen if the drainage is not clear List of tools and equipment cleaning of drainage	Illustrative test Q & A	At the end of module
G.4 Ensure safety of the workplace			Identify the safety signs Why the work place safety is important	Q & A Direct Observation MCQs	At the end of module
G.5 Practice general safety			Explain what safety measure should be taken for personal and machine at work place	Q & A	At the end of module

Supportive notes

Assessment context:

Introduction and explanation about the marble cutting and In-Lays process will be in the class room where as practical will be in a marble factory.

Critical aspect:

The learner should be properly guided about the self safety and about care to be taken while operating machines.

Assessment condition:

Learner will have access to all tools related with marble cutting and In - Lays.

Resources required for assessment:

Marble cutting machines, bridge cutter, gang saw cutter, Sizing machine, polishing machine, measuring tape, handy grinder, hammer, cutting disc.

List of Tools, Machinery & Equipment

Name of Trade	Marble cutting and In-Lays
Duration	6 months

Sr. No.	Name of Item/ Equipment / Tools
1.	Grinder (Handy / Pedestal)
2.	Overhead Crane
3.	Tripod stand with pulley
4.	Bridge Cutter
5.	Polish machine
6.	Buff pad
7.	Measurement tape
8.	Cutting tools, blades
9.	Hammer
10.	Water pump
11.	Gloves
12.	Masks
13.	Safety shoes
14.	Wrench set
15.	Vertical cutting machine
16.	Cross cutting machine
17.	Jelly / Glue
18.	Tester
19.	Section Cutting machine
20.	Marble block / slab
21.	Drill Machine with Diamond bits
22.	Sizing Machine
23.	Volt meter / Ampere meter

List of Consumable Supplies

Sr. No.	Name of Consumable Supplies
1.	Paper tape 1 inch.
2.	Note book
3.	Paper rim A4
4.	Box board sheet
5	Lead Pencil
6	Lubricating oil

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