SKILLEDTRADESBC

PROGRAM OUTLINE

Tilesetter

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SKILLED TRADES BC

TILESETTER

PROGRAM OUTLINE

November 2010

Developed By
SkilledTradesBC
Province of British Columbia

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FOREWORD

The revised Tilesetter Program Outline is intended as a guide for instructors, apprentices, and employers of apprentices as well as for the use of industry organizations, regulatory bodies, and provincial and federal governments. It reflects updated standards based on the new Tilesetter Occupational Analysis (2010) and British Columbia industry and instructor subject matter experts.

Practical instruction by demonstration and student participation should be integrated with classroom sessions. Safe working practices, even though not always specified in each operation or topic, are an implied part of the program and should be stressed throughout the apprenticeship.

The Program Outline was prepared with the advice and assistance of the Tilesetter Review Committee and will form the basis for further updating of the British Columbia Tilesetter Program and learning resources by the Construction Industry Training Organization (CITO) on behalf of SkilledTradesBC.

Achievement Criteria are included for those competencies that require a practical component. The intent of including Achievement Criteria in the Program Outline is to ensure consistency in training across the many training institutions in British Columbia. Their purpose is to reinforce the theory and to provide a mechanism for evaluation of the learner's ability to apply the theory to practice. It is important that these performances be observable and measureable and that they reflect the skills spelled out in the competency as those required of a competent journeyperson. The conditions under which these performances will be observed and measured must be clear to the learner as well as the criteria by which the learner will be evaluated. The learner must also be given the level of expectation of success.

The performance spelled out in the Achievement Criteria is a suggested performance and is not meant to stifle flexibility of delivery. Training providers are welcome to substitute other practical performances that measure similar skills and attainment of the competency. Multiple performances may also be used to replace individual performances where appropriate.

SAFETY ADVISORY
Be advised that references to the WorkSafeBC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: http://www.worksafebc.com). Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.

ACKNOWLEDGEMENTS

This Program Outline was prepared with advice and direction from the Tilesetter Review Committee with funding support from SkilledTradesBC.

SkilledTradesBC would like to acknowledge the dedication and hard work of the industry representatives appointed to identify the training requirements of the Tilesetter Trade:

Don Iversen
Gord Johnston
Tony Sarangelo
Guy Zecchini

SECTION 1

OCCUPATIONAL ANALYSIS CHART

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Tilesetter
Occupational Analysis Chart

Use Safe Work Practices A	Control Workplace Hazards A1	Use Information in the WorkSafeBC OHS Regulations A2	Use WHMIS A3	Use Personal Protective Equipment A4	Practice Fire Prevention Procedures A5
	1	1	1	1	1
Use Tools and Equipment B	Use Hand Tools B1	Use Power Tools B2	Use Measuring and Levelling Tools B3	Use Access Equipment B4	Use Rigging and Hoisting Equipment B5
	1	1	1	1	2 3
Organize Work C	Describe the Tilesetter Trade C1	Use Trade Related Mathematics C2	Read and Interpret Blueprints C3		
	1	1 2 3	1 2		
Prepare Worksite and Materials D	Prepare Substrate D1	Lay Out Work Area D2	Apply Backing and Base Materials D3	Describe Special Applications D4	
	1	1 2 3	1	2 3	
Install Material E	Install Tile on the Vertical E1	Install Tile on Floors and the Horizontal E2	Install Stairways E3	Install Glass and Mosaics E4	Install Ceramic Veneer E5	Install Columns and Walls E6
	1 2	1 2	1 2 3	2	2	2 3
	Install Marble and Stone Slabs E7	Install Terrazzo E8	Install Arches E9	Install Tile to Swimming Pools E10		
	2	2	2	3		
Finish Installed Product F	Mix and Apply Grout F1	Caulk and Seal Installed Product F2	Finish Terrazzo and Stone F3		
	1	1 2	2		

SECTION 2

TILESETTER

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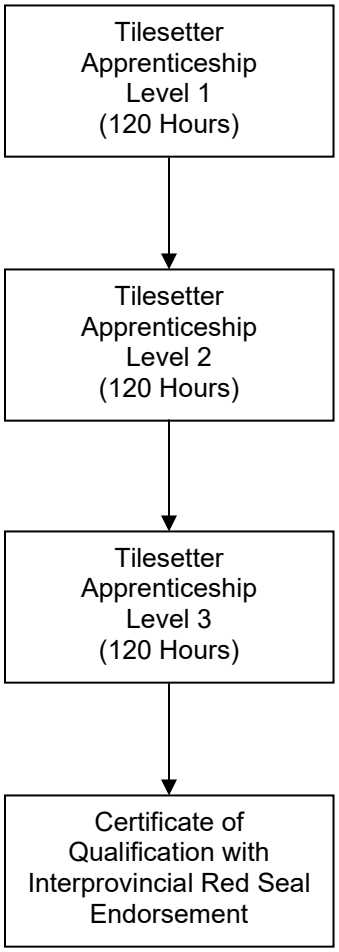
TILESETTER INDUSTRY TRAINING MODEL



Persons completing a formal apprenticeship also receive a Certificate of Apprenticeship

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LEVEL ONE		Theory %	Practical %	Page
Line A	**Use Safe Work Practices**	**3**	**5**	**9**
A-1	Control Workplace Hazards	30		9
A-2	Use Information in the WorkSafeBC OHS Regulations	5		11
A-3	Use WHIMIS	30		13
A-4	Use Personal Protective Equipment	30		15
A-5	Practice Fire Prevention Procedures	5		16
Line B	**Use Tools and Equipment**	**7**	**20**	**17**
B-1	Use Hand Tools	10		17
B-2	Use Power Tools	35		18
B-3	Use Measuring and Levelling Tools	45	✓	19
B-4	Use Access Equipment	10		20
Line C	**Organize Work**	**20**	**15**	**22**
C-1	Describe the Tilesetter Trade	35		22
C-2	Use Trade Related Mathematics	60	✓	24
C-3	Read and Interpret Blueprints	5	✓	25
Line D	**Prepare Worksite and Materials**	**20**	**15**	**27**
D-1	Prepare Substrate	50	✓	27
D-2	Lays Out Work Area	15		28
D-3	Apply Backing and Base Materials	35		29
Line E	**Install Material**	**40**	**40**	**31**
E-1	Install Tile on the Vertical	38	✓	31
E-2	Install Tile on Floors and the Horizontal	50	✓	33
E-3	Install Stairways	12		34
Line F	**Finish Installed Product**	**10**	**5**	**35**
F-1	Mix and Apply Grout	80	✓	35
F-2	Caulk and Seal Installed Product	20		37
	Total Percentage for Level 1	100%	100%	

The composite level mark is to consist of **20% Theory** and **80% Practical.** The final exam counts for 30% of the theory mark.

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SUGGESTED SCHEDULE OF TIME ALLOTMENT FOR TILESETTER

LEVEL TWO		Theory %	Practical %	Page
Line B	**Use Tools and Equipment**	**2**	**10**	**39**
B-5	Use Rigging and Hoisting Equipment	100		39
Line C	**Organize Work**	**13**	**10**	**40**
C-2	Use Trade Related Mathematics	40	✓	40
C-3	Read and Interpret Blueprints	60		41
Line D	**Prepare Worksite and Materials**	**20**	**20**	**42**
D-2	Lays Out Work Area	90	✓	42
D-4	Describe Special Applications	10		43
Line E	**Install Material**	**60**	**50**	**45**
E-1	Install Tile on the Vertical	16	✓	45
E-2	Install Tile on Floors and the Horizontal	34	✓	46
E-3	Install Stairways	8	✓	48
E-4	Install Glass and Mosaics	5		49
E-5	Install Ceramic Veneer	4		50
E-6	Install Columns and Walls	5		51
E-7	Install Marble and Stone Slabs	16		52
E-8	Install Terrazzo	8		53
E-9	Install Arches	4		54
Line F	**Finish Installed Product**	**5**	**10**	**55**
F-2	Caulk and Seal Installed Product	20		55
F-3	Finish Terrazzo and Stone	80		56
	Total Percentage for Level 2	100%	100%	

The composite level mark is to consist of **20% Theory** and **80% Practical.** The final exam counts for 30% of the theory mark.

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SUGGESTED SCHEDULE OF TIME ALLOTMENT FOR TILESETTER

LEVEL THREE		Theory %	Practical %	Page
Line B	**Use Tools and Equipment**	**5**	**10**	**58**
B-5	Use Rigging and Hoisting Equipment	100	✓	58
Line C	**Organize Work**	**25**	**25**	**59**
C-2	Use Trade Related Mathematics	100	✓	59
Line D	**Prepare Worksite and Materials**	**35**	**30**	**60**
D-2	Lays Out Work Area	85	✓	60
D-4	Describe Special Applications	15		61
Line E	**Install Material**	**35**	**35**	**62**
E-3	Install Stairways	70		62
E-6	Install Columns and Walls	15		63
E-10	Install Tile to Swimming Pools	15		64
	Total Percentage for Level 3	100%	100%	

The composite level mark is to consist of **20% Theory** and **80% Practical.** The final exam counts for 30% of the theory mark..

PROGRAM OUTLINE
FOR
LEVEL 1

SKILLED TRADES BC

LINE A: USE SAFE WORK PRACTICES

Competency: **A-1 Control Workplace Hazards**

Learning Objectives:

1 The learner will be able to describe workplace hazards.
2 The learner will be able to manage workplace hazards.
3 The learner will be able to demonstrate emergency procedures.
4 The learner will be able to describe non-emergency injury reporting procedures.
5 The learner will be able to describe how worksite safety policies are established.

LEARNING TASKS	CONTENT

1 Describe short term hazards in the Tilesetter industry.	• Excavations
	• Working around heavy equipment
	• Sharp objects
	• Ladders
	• Work platforms
	• Electrical
	• Explosive material (dust)
	• Lifting
	  – Procedures
	• Personal
	  – Clothing
	  – Hair and beards
	  – Jewellery
	  – Audio devices
	  – Poor housekeeping
	• Horseplay
	• Respect for others safety
	• Constant awareness of surroundings
	• Safe attitude
	• Management of hazards
	• Weather
	  – Heat
	  – Cold

2 Describe long term hazards in the Tilesetter industry.	• Respiratory disease • Repetitive strain injuries • Management of hazards
3 Describe safety precautions when working at elevations.	• Wind • Floor openings • Guard rails • Safety lines • Weather • Stressed cables

4	Describe emergency procedures.	• Emergency shutoffs • Fire control systems • Eye wash facilities • Emergency exits • Emergency contact/phone numbers • Outside meeting place • Disaster meeting place
5	Describe non-emergency injury reporting procedures.	• First aid facilities • Reports

6	Describe how a workplace safety policy is established.	• Process
		  – Hazard assessment
		  – Conditions
		  – Meeting requirements
		  ‣ Tool box
		  – Reporting hazards and incidents
		  – Reporting injuries
		  – Investigations
		  – Committees
		  – Employee orientation
		  – First-aid
		  – Hearing
		  – Records and statistics
		  – Lock-out
		  – Non-compliance procedures
		• Minimum standards
		  – Acts and Regulations

7	Describe lock-out and tag-out procedures.	• Understanding of system operation
		• Components requiring lock-out
		• Identification requirements
		• Situations where lock-out is required
		• Lock-out equipment
		  – Tags
		  – Locks

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LINE A: USE SAFE WORK PRACTICES

Competency: **A-2 Use Information in the WorkSafeBC OHS Regulation**

Learning Objectives:

1 The learner will be able to locate the Parts of the Occupational Health and Safety Regulation as it applies to the Tilesetter workplace.
2 The learner will be able to use applicable codes and standards.

LEARNING TASKS	CONTENT
1 Use terms used in the Workers' Compensation Act.	• Applicable section of the Act
2 Describe the conditions under which compensation will be paid.	• Applicable section of the Act
3 Describe the general duties of employers, employees and others.	• Applicable section of the Act
4 Describe the Workers' Compensation Act requirements for the reporting of accidents.	• Applicable section of the Act
5 Describe the Core Requirements of the Occupational Health and Safety Regulation.	• Definitions • Application • Rights and responsibilities – Health and safety programs – Young worker orientation – Contractor's safety policy manuals – Investigations and reports – Workplace inspections – Right to refuse work • General conditions – Building and equipment safety – Emergency preparedness – Preventing violence – Working alone – Ergonomics – Illumination and indoor air quality – Smoking and lunchrooms

6	Apply the General Hazard Requirements of the Occupational Health and Safety Regulation.	• Chemical and biological substances • Substance specific requirements • Noise, vibration, radiation and temperature • Personal protective clothing and equipment • Confined spaces • De-energization and lockout • Fall protection • Tools, machinery and equipment • Ladders, scaffolds and temporary work platforms • Cranes and hoists • Mobile equipment • Transportation of workers • Traffic control • Electrical safety

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LINE A: USE SAFE WORK PRACTICES

Competency: A-3 Use WHMIS

Learning Objectives:

1 The learner will be able to describe the purpose of the Workplace Hazardous Materials Information System (WHMIS) Regulations.
2 The learner will be able to explain the contents of Material Safety Data Sheets (MSDS).
3 The learner will be able to explain the contents of a WHMIS label.
4 The learner will be able to apply WHMIS regulations.

LEARNING TASKS	CONTENT
1 State the legislation that requires suppliers of hazardous materials to provide MSDS's and label products as a condition of sale and importation.	• Hazardous Product Act – Controlled Products Regulations – Ingredient Disclosure List • Hazardous Materials Information Review Act
2 Describe Provincial legislation.	• Use of hazardous materials in the workplace
3 State the purpose of the Workplace Hazardous Materials Information System (WHMIS).	• Protection of Canadian workers from the adverse effects of hazardous materials through the provision of relevant information while minimizing the economic impact on industry and the disruption of trade • Responsibilities – Workers – Employers – Suppliers – Regulators
4 Describe the key elements of WHMIS.	• Material safety data sheets (MSDSs) • Labelling of containers of hazardous materials • Worker education programs
5 Describe the responsibilities of suppliers under WHMIS.	• Provide MSDSs • Provide supplier labels
6 Describe the responsibilities of employers under WHMIS.	• Provide worker access to MSDSs • Work education programs in the workplace • Ensure proper storage and handling of materials
7 Describe the responsibilities of workers.	• Understand information on MSDSs and labels • Inform employers of missing or illegible labels
8 Describe information to be disclosed on a MSDS.	• Hazardous ingredients • Preparation information • Product information • Physical data • Fire or explosion • Reactivity data • Toxicological properties • Preventive measures

9	Identify symbols found on WHMIS labels and their meaning.	• First-aid measures
		• Compressed gases
		• Flammable and combustible materials
		• Oxidizing materials
		• Poisonous and infectious materials
		  – Materials causing immediate and serious toxic effects
		  – Materials causing other toxic effects
		  – Bio hazardous infectious materials
		• Corrosive materials
		• Dangerously reactive materials

10	Identify symbols on consumer product labels used in the workplace and their meaning.	• Toxic • Corrosive • Flammable • Explosive
11	Apply WHMIS regulations as they apply to hazardous materials used in the shop.	• Use, storage and disposal of shop materials

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LINE A: USE SAFE WORK PRACTICES

Competency: **A-4 Use Personal Protective Equipment**

Learning Objectives:

1 The learner will be able to select and use personal protective equipment.

LEARNING TASKS	CONTENT
1 Describe personal protective equipment requirements.	• WorkSafeBC regulations • Fall protection – Fall restraint – Fall arrest – Harnesses, lanyards, lifelines • Safety footwear – CSA Standards • Eye protection – Glasses – Goggles – Face shields • Hearing protection – Hearing testing – Earplugs and canal caps – Earmuffs – Class/grade selection based on exposure level • Head protection – CSA and ANSI types • Respiratory protection – Respirator types – Positive and negative seal check – Fit testing – Types of breathing hazards – Filters and cartridges – Protection factors – Warning signs of respirator failure Hazard/product specific • Clothing – High visibility – Hazard/product specific • Hand protection – Gloves – Barrier creams • Knee protection
2 Use personal protective equipment.	• Selection • Purpose • Training requirements • Inspection • Maintenance • Storage

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LINE A: USE SAFE WORK PRACTICES

Competency: **A-5 Practice Fire Prevention Procedures**

Learning Objectives:

1 The learner will be able to prevent and identify various classes of fires.

2 The learner will be able to select appropriate fire extinguishers for the class of fire and environmental condition.

LEARNING TASKS	CONTENT
1 Describe the conditions necessary to support a fire.	• Oxygen • Fuel • Heat
2 Describe the classes of fires according to the materials being burned.	• Classes A, B, C and D • Symbols and colours

3 Apply preventative fire safety precautions when working near, handling or storing flammable liquids or gases, combustible materials and electrical apparatus.	• Pre-planning
	• Hot work permit (site specific)
	• Handling and storage of flammable materials
	• Symbols
	• Fuels
	  – Diesel
	  – Gasoline
	  – Propane
	  – Natural gas
	• Ventilation
	  – Purging
	• Lubricants
	• Oily rags
	• Combustible metals
	• Aerosols

4 Describe the considerations and steps to be taken prior to fighting a fire.	• Warning others and fire department • Evacuation of others • Fire contained and not spreading • Personal method of egress • Training

5 Describe the procedure for using a fire extinguisher.	• Extinguisher selection
	• P.A.S.S.
	  – Pull
	  – Aim
	  – Squeeze
	  – Sweep

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LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-1 Use Hand Tools**

Learning Objectives:

1 The learner will be able to select hand tools appropriate to tilesetting, terrazzo and stone installations.
2 The learner will be able to use hand tools.
3 The learner will be able to inspect and maintain hand tools.

LEARNING TASKS	CONTENT
1 Describe hand tools used in the trade.	• Tile cutters • Chipping hammer • Chisels • Nippers and biters • Rubbing stone • Hand drills • Mortar tools – Margin Trowels – Flat Trowels – Hawk – Wood floats – Mortar hoe – Mortar mixer • Specialty tools – China marker – Float strips – Beating block and scratchers – Notched trowels – Jamb saw • Files • Metal saws • Chisels • Drifts • Punches • Wrenches • Pliers • Shears and snips • Screwdrivers
2 Use hand tools.	• Types • Parts • Purpose/uses • Procedures/operations • Safety • Adjustment • Inspection • Maintenance • Storage

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LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-2 Use Power Tools**

Learning Objectives:

1 The learner will be able to select power tools appropriate to tilesetter, terrazzo and stone installations.
2 The learner will be able to use power tools.
3 The learner will be able to inspect and maintain power tools.

LEARNING TASKS	CONTENT
1 Describe power tools.	• Cutting tools – Portable electric saw – Mini-grinder • Drilling tools – Portable electric drills – Pneumatic – Variable speed drill • Electric • Powder actuated – Training requirements – Types of charges – Types of fasteners – Methods of propulsion • Impact tools • Cutting tools – Wet diamond saw • Grinding and abrasive tools • Drilling and boring tools • Mixers – Gas – Electric • Accessories
2 Use portable power tools.	• Types • Parts • Guards • Purpose/uses • Procedures/operations • Capacities • Safety • Adjustment • Inspection • Maintenance • Storage
3 Use powder actuated tools.	• Types and applications of charges and fasteners • Safe operation • Maintenance

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LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-3 Use Measuring and Levelling Tools**

Learning Objectives:

1 The learner will be able to describe measuring and levelling tools.
2 The learner will be able to use measuring and levelling tools.

	LEARNING TASKS	CONTENT
1	Describe layout tools.	• Types – Measuring tapes – Framing square – Compass Scribe – Dividers – Storey pole • Reading the scales • Imperial and metric scales • Accuracy
2	Use layout tools.	• Determine square • Measure • Record
3	Describe levelling tools.	• Types – Rules – Plumbs – Square – Levels ‣ Spirit ‣ Water ‣ Laser – Chalk line • Applications – Levelling – Aligning
4	Use levelling tools.	• Procedures • Care and maintenance

Achievement Criteria:

1 Performance The learner will accurately measure and record an installation project.
Conditions The learner will be given:
- Project specifications
- Tools
- Paper

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Efficiency
- Completeness

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LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-4 Use Access Equipment**

Learning Objectives:

1 The learner will be able to describe ladders, scaffolds and aerial work platforms.
2 The learner will be able to select and use ladders and scaffolds.
3 The learner will be able to describe the safe use of aerial work platforms.

LEARNING TASKS	CONTENT
1 Describe ladders.	• Types – Step – Extension and straight – Access • Uses
2 Use ladders.	• Hazard recognition • Selection • Inspection • Safety regulations – Fall arrest equipment • Operating procedures • Limitations • Securing • Maintenance • Manufacturers recommendations – Selection – Limitations • Care and storage
3 Describe scaffolds.	• Types – Tube and coupler – End frame – Baker's • Parts – Outriggers – Guardrails – Wheels – Base pads – Toe boards – Clips and locking devices – Coupling pins – Jacks – Platforms/planks/decks – Tie backs/anchors

4	Use scaffolds.	• Hazard recognition • Selection • Inspection • Safety regulations • Erecting and dismantling • Access • Fall arrest equipment • Operating procedures • Limitations • Securing • Maintenance • Manufacturers recommendations • Selection • Limitations • Care and storage
5	Describe aerial lifts.	• Types: – Scissor and vertical lifts – Boom lifts, straight mast and articulated boom • Training requirements • Regulations • Parts – Base section – Elevating section – Platform section • Safety – Fulcrum point – Load capacity rating – Centre of gravity – Side slope and grade
6	Describe fuel types and batteries.	• Site specific selection • Gas and diesel • Propane • Batteries
7	Describe safe operation of aerial lifts.	• Limitations • Pre-shift inspection – Log book/check off sheet – Manual – Machine certification – Operator certification • Loading the platform • Operating the lift • Working on the platform • Energized power lines • Care and storage

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LINE C: ORGANIZE WORK

Competency: **C-1 Describe the Tilesetter Trade**

Learning Objectives:

1 The learner will be able to describe the scope and nature of the Tilesetter Trade.
2 The learner will be able to describe the types, uses and manufacture of tiles.

LEARNING TASKS	CONTENT
1 Describe the scope of the trade.	• History of tiles – Past construction – Present construction • Types of work – Tile – Terrazzo – Stone • Applications – Walls – Floors – Ceilings – Countertops • Specialty applications – Steam room – Swimming pools • Importance of blueprint reading and interpretation • Layout – Balance – Appearance • Maintenance and repair of a variety of tile installations
2 Describe the nature of the trade.	• History • Apprenticeship system • Certification requirements • Employer/employee relations • Journeyperson/apprentice relations • Responsibilities • Interpersonal relations – Communication and listening skills – Personal appearance – Conflict resolution – Cooperation and teamwork – Coordination with other trades
3 Describe types of tiles.	• Types – Interior – Exterior – Wall – Floor • Uses and properties of tile

		– Quarry tile – Ceramic mosaics – Paver tile – Glass mosaic tile – Cement tile – Ceramic veneer – Porcelain – Marble – Slate – Stone
4	Describe the manufacture of tiles.	• Types of manufacturing processes and finish of various tiles – Ram-press run-press process – Manual – Firing – Baking • Shapes and sizes of tiles • Applications of glazes • Colours • Standards of grading – Vitreous – Semi-vitreous – Quality control

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LINE C: ORGANIZE WORK

Competency: **C-2 Use Trade Related Mathematics**

Learning Objectives:

1 The learner will be able to use mathematics to solve problems in the Tilesetter Trade.

	LEARNING TASKS	CONTENT
1	Add, subtract, multiply and divide.	• Whole numbers • Fractions • Decimals • Percentages • Ratios • Proportion
2	Transpose formulas.	• Hierarchy • Processes
3	Use formulas to calculate area.	• Circles, cylinders, squares, rectangles, triangles
4	Use formulas to calculate volumes.	• Liquids • Solids • Liquid to sold proportions
5	Use formulas to calculate lineal measurements.	• Perimeter • Circumference
6	Use formulas to calculate capacity.	• Imperial gallons, US gallons, litres
7	Perform conversions between metric and imperial systems.	• Length • Volume • Capacity • Area • Mass • Weight • Temperature – Fahrenheit – Centigrade
8	Use the Pythagorean theorem of right angles.	• Hypotenuse (3-4-5) • Side opposite • Side adjacent

Achievement Criteria:

1 Performance The learner will use trade related mathematics to perform calculations.

Conditions The learner will be given:

- Mathematical questions
- Paper

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Accuracy
- Completeness

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LINE C: ORGANIZE WORK

Competency: **C-3 Read and Interpret Blueprints**

Learning Objectives:

1 The learner will be able to use drafting tools.
2 The learner will be able to use drafting symbols, lettering and line conventions.
3 The learner will be able to convert between isometric and orthographic projections.
4 The learner will be able to interpret information found on a set of drawings.

LEARNING TASKS	CONTENT
1 Describe drafting tools and materials.	• Drawing boards • T-squares • Triangles • Protractors • Scale rulers • Compasses • Dividers • Templates
2 Use scale rulers to determine actual dimensions from a drawing.	• Types • Typical scales • Calculate scales
3 Describe drawing symbols currently used in the trade.	• Components • Accessories • Architectural • Coordinates • Details • Finishing schedules • Specifications
4 Describe lettering and dimensioning in drawings.	• Hidden lines • Object lines • Border lines • Center lines • Dimension lines • Extension lines • Phantom lines • Cutting plane lines
5 Describe drawing projections.	• Isometric • Orthographic – Elevations – Plan – Section • Oblique • Views • Elevations
6 Use drawing projections.	• Isometric
7 Interpret mechanical drawings.	• Interpret specifications • Read architectural prints

Achievement Criteria:

1	Performance	The learner will draw a scaled detail or floor plan from a set of dimensions.
	Conditions	The learner will require: • Dimensions • Sketching tools • Paper
	Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Correct use of symbols, lines and lettering • Scaled • Accuracy • Completeness

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LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-1 Prepare Substrate**

Learning Objectives:

1 The learner will be able to describe and demonstrate the removal of existing finishes using appropriate equipment in preparation for installation of tiles.

2 The learner will be able to describe suitability of substrate for installation of tiles.

	LEARNING TASKS	CONTENT

1	Remove existing finishes.	• Type of coverings
		• Removal techniques
		• Disposal
		• Hazardous materials
		  – Identify only
		• Removal equipment
		  – Selection
		  – Use

2	Determine suitability of substrate.	• Types
		• Integrity
		• Acceptability
		• TTMAC specifications
		  – Moisture
		  – Rot
		  – Cracks
		• Slope
		• Drainage

Achievement Criteria:

1 Performance: The learner will be able to determine the suitability of a substrate prior to tile installation.

Conditions: The learner will be given:
- Project specifications
- Substrate conditions
- Tools and materials

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Efficiency
- Completeness

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LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-2 Lays Out Work Area**

Learning Objectives:

1 The learner will be able to determine worksite suitability.
2 The learner will be able to prepare and organize required supplies and materials.
3 The learner will be able to describe and demonstrate inspection of materials prior to installation.

	LEARNING TASKS	CONTENT
1	Demonstrate the ability to organize work.	• Identify site condition • Suitability of worksite for tile installation • Clean and cover worksite
2	Demonstrate ability to inspect materials.	• Tile consistencies – Shading – Colour – Calibre – Gauge • Natural stone – Shading – Consistency – Stability • Check for damage • Vein direction

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LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-3 Apply Backing and Base Materials**

Learning Objectives:

1 The learner will be able to describe and install backings for mortar on walls and floors.
2 The learner will be able to describe and demonstrate the preparation, advantages, precautions and use of lime cement mortar on walls and cement mortar on floors.

LEARNING TASKS	CONTENT
1 Apply backings for mortar on walls and floors.	• Fasteners – Types ‣ Screws ‣ Staples ‣ Nails – Use • Membranes – Types ‣ Waterproof ‣ Antifracture ‣ Cleavage – Installation – Manufacturer's specifications • Metal lathe – Grades of lathe – Cutting – Installation techniques
2 Describe use of lime cement mortar on walls.	• Mix lime cement mortar – Types ‣ Applications ‣ Uses ‣ Advantages – Proportions/ratios – Consistency – Equipment • Safe handling precautions
3 Describe use of cement mortar on floors.	• Mix cement mortar – Types ‣ Applications ‣ Uses ‣ Advantages – Proportions/ratios – Consistency – Equipment • Safe handling precautions

4	Prepare mortar base to receive tiles.	• Cleaning of floors
		  – Contaminates
		  – Bond breakers
		• Screeding
		  – Tools
		  ‣ Straight edge
		  – Raking
		  – Placement
		  – Elevation
		• Application
		  – Material
		  – Bond coat
		  – Trowel notch size
		• Combing techniques

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-1 Install Tile on the Vertical**

Learning Objectives:

1 The learner will be able to install inserts and accessories using appropriate materials and tools.
2 The learner will be able to demonstrate preparation, application and setting tiles to walls.

	LEARNING TASKS	CONTENT
1	Install inserts and accessories.	• Soap dishes • Corner caddies • Benches
2	Demonstrate application to walls.	• Diamond mesh to studs (wood-metal) – Fastening – Layout • Diamond mesh to plywood – Vapour barriers • Lime and cement mortar setting bed – Diamond mesh ‣ Hawk and trowel techniques – Concrete ‣ Surface preparation
3	Install tiles to walls.	• Measurement • Layout – Centering of tiles on walls – Level and plumb • Application of various types of tiles – Closure of decorative tile with continuous pattern – Sculptured tiles at the corners • Application techniques – Hawk and trowels – Screeding – Floating • Expansion joints • Use of fern strips and straightedges
4	Demonstrate use of adhesives.	• Thinset/dry-set mortar – Mixing – Slaking – Application ‣ Mortar ‣ Gypsum plaster • Organic adhesives – Use – Application ‣ Mortar ‣ Drywall ‣ Wood • Trowel notch size selection • Safety precautions

Achievement Criteria:

1 Performance — The learner will install tiles on the vertical.

Conditions — The learner will be given:

- Project specifications
- Tools and equipment
- Materials

Criteria — The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Tools and equipment selection
- Surface preparation
- Application techniques
- Completeness
- Aesthetics
- Safety

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-2 Install Tile on Floors and the Horizontal**

Learning Objectives:

1 The learner will be able to describe and demonstrate the application of tiles to floors.
2 The learner will be able to set tiles to floors.

	LEARNING TASKS	CONTENT
1	Demonstrate application to floors.	• Wood construction floors – Sub-floor types – Suitability • Concrete slabs or mortar floors – Integrity – Contaminates • Levelling substrate – Tools – Techniques • Mortar beds – Mixing – Consistency – Application techniques
2	Install tiles to floors.	• Inspection of substrate – Bond breakers – Structural integrity • Layout and install the tile to floor

Achievement Criteria:

1 Performance The learner will install tiles on the horizontal.

Conditions The learner will be given:

- Project specifications
- Tools and equipment
- Materials

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Tools and equipment selection
- Surface preparation
- Application techniques
- Completeness
- Aesthetics
- Safety

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-3 Install Stairways**

Learning Objectives:

1 The leaner will be able to describe parts of a stairway and knowledge of the Building Code as it relates to stairways.
2 The learner will be able to describe stair and riser formulas.
3. The learner will be able to lay tiles on stairways.

LEARNING TASKS	CONTENT
1 Describe stairway parts.	• Building code • Parts of a stairway – Treads – Risers – Stringers ‣ Open ‣ Closed – Nosings
2 Describe stair and riser formulas.	• Calculations
3 Describe methods of preparation.	• Layout and screeding for risers and treads • Laying tiles on stairways – Procedure ‣ Sequencing – Interior – Exterior

SKILLED TRADES BC

LINE F: FINISH INSTALLED PRODUCT

Competency: **F-1 Mix and Apply Grout**

Learning Objectives:

1 The learner will be able to describe common types and uses of grout for a variety of applications.
2 The learner will be able to describe the use and application of Portland cement grout in a variety of applications.
3 The learner will be able to describe and demonstrate the use of specialty grouts in a variety of applications.

LEARNING TASKS	CONTENT
1 Identify common types of grout and application.	• Definition • Use • Selection of grout – Composition – Sanded – Non-sanded – Waterproofing • Admixtures – Use – Mixing
2 Demonstrate use of Portland cement grout.	• Types of application – Glazed wall and ceramic mosaic tiles – Quarry tiles – Preparatory grouts. • Mixing • Use • Application techniques • Equipment • Washing and cleaning techniques • Disposal
3 Demonstrate use of specialty grout.	• Types – Epoxy – Furan – Luminite cement • Mixing – Equipment – Consistency • Application techniques • Washing and cleaning techniques • Environmental conditions • Safety precautions • Disposal
4 Apply grout.	• Tools and equipment selection – Grout float – Margin trowel – Buckets – Sponges

- Remove contaminants from grout joints
- Grout application
- Time between application and cleaning
  - Environmental considerations
    - Temperature
    - Humidity
    - Manufacturer's specifications
- Wash tiles and shape joints
- Polish or wash surface to remove grout haze

Achievement Criteria:

1	Performance	The learner will mix and apply grout.
	Conditions	The learner will be given: • Project specifications • Tools and material
	Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Mixing consistency • Use of tools and equipment • Application techniques • Adapting working time to environment • Appearance • Safety

SKILLED TRADES BC

LINE F: FINISH INSTALLED PRODUCT

Competency: **F-2** **Caulk and Seal Installed Product**

Learning Objectives:

1 The learner will be able to caulk and seal the tiles to finish the installation.

LEARNING TASKS	CONTENT
1 Caulk joints.	• Tools and equipment selection – Caulking gun – Shaping tools • Material selection – Application – Colour – Location and exposure • Application techniques – Primer – Backer rod (if required) – Apply – Tooling
2 Seal material.	• Tools and equipment selection – Brush – Roller – Sealant applicator – Sponge • Sealant selection – Usage – Finished look – Location and exposure • Clean surface and drying time • Apply sealant on grout and tile (if required)

SKILLED TRADES BC

PROGRAM OUTLINE
FOR
LEVEL 2

SKILLED TRADES BC

LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-5 Use Rigging and Hoisting Equipment**

Learning Objectives:

1 The learner will be able to describe hoisting, lifting and rigging equipment.

	LEARNING TASKS	CONTENT
1	Describe the principles of lifting and hoisting.	• Mechanical advantage • Balance points
2	Describe hoisting, lifting and rigging equipment.	• Lifting and hoisting – Cranes – Boom trucks – Loaders – Helicopter – Tirfors – Come-alongs – Chain falls – Accessories – Slings – Chokes – Shackles – Chains – Tag lines – Spreader bars – Snatch blocks – Turnbuckles
3	Describe lifting and hoisting communication.	• Types, purposes and meanings – Hand signals – Radio communication with the operator – Communication with others

SKILLED TRADES BC

LINE C: ORGANIZE WORK

Competency: C-2 Use Trade Related Mathematics

Learning Objectives:

1 The learner will be able to identify and demonstrate the use of linear measurement related to the trade.
2 The learner will be able to calculate areas of various shapes related to the trade.
3 The learner will be able to calculate volumes and weights related to the trade.
4 The learner will be able to read plans and specifications using metric measurements.
5 The learner will be able to calculate using metric measurements.

	LEARNING TASKS	CONTENT
1	Demonstrate use of linear measurements.	• Adding • Subtracting • Dividing • Multiplying of whole numbers and fractions
2	Calculate various areas.	• Squares • Triangles • Circles • Composite shapes
3	Calculate volumes and weights.	• Liquids • Solids • Liquid to solid proportions
4	Calculate using metric measurements.	• Metric measurements related to plans and specifications • Linear measurements • Area measurements • Volume and weights • Adding • Subtracting • Dividing • Multiplying whole numbers and decimals

Achievement Criteria:

1 Performance The learner will use trade related mathematics to perform calculations.
Conditions The learner will be given:
- Mathematical questions
- Paper

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness

SKILLED TRADES BC

LINE C: ORGANIZE WORK

Competency: **C-3 Read and Interpret Blueprints**

Learning Objectives:

1 The learner will be able to identify and read plan specifications from a variety of drawings used in the trade.

	LEARNING TASKS	CONTENT
1	Read plan specifications.	• Types – Architectural – Structural – Mechanical • Differentiate between types of drawings • Views – Plan view – Elevations – Sectional views – Details – Finishing schedules • Addendums • Change orders • Sections • Special instructions
2	Interpret lines, symbols and abbreviations.	• Types • Purposes
3	Identify different types of materials.	• Read mechanical drawings • Types of materials used in the trade • Setting material – Trim – Finishing – Grouting – Colour
4	Use scales.	• Architectural rulers • Scale rules • Interpret scales • Calculate

SKILLED TRADES BC

LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-2 Lays Out Work Area**

Learning Objectives:

1 The learner will be able to describe and demonstrate the layout of various tile types on a variety of surfaces.

2 The learner will be able to calculate estimates for quantities of materials and labour using plans and specifications.

	LEARNING TASKS	CONTENT
1	Perform tile layout.	• Layout patterns • Layout techniques • Surfaces – Floors – Walls – Ceilings – Stairways – Special applications
2	Calculate estimates.	• Quantities of materials from plans and specifications • Time/labour estimates • Backing Materials • Cements and grouts • Tiles • Accessories and inserts

Achievement Criteria:

1 Performance: The learner will calculate estimates for quantities of materials required.

Conditions: The learner will be given:
- Plans and specifications

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness

SKILLED TRADES BC

LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-4 Describe Special Applications**

Learning Objectives:

1 The learner will be able to describe a variety of ceiling layouts and applications using appropriate materials and trade methods.
2 The learner will be able to describe the application ceiling tiles.
3 The learner will be able to describe and demonstrate methods used for installing tiles in areas that have special conditions.

	LEARNING TASKS	CONTENT
1	Describe ceiling layouts.	• Alignment of ceiling to walls – Centering of walls for a ceiling layout – Compatibility of ceilings and walls • Control joints – Purpose
2	Describe ceiling installation.	• Check structural suitability and integrity • Ceiling tile application techniques • Bonding agents • Mortars • Adhesives • Grouts • Placing or setting tiles to a ceiling – Application techniques – Backbuttering – Temporary support for setting purposes – Selecting appropriate setting materials
3	Describe methods used for steam rooms.	• Temperature effect on tiles and setting mortar – Steam – Heat • Waterproofing • Caulking techniques – Caulk wall expansion joints ‣ Materials ‣ Methods • Techniques for pitched ceiling • Properties of heat resistant or special cements
4	Describe methods used for energy conservation.	• Sealants and caulking for energy conservation – Attributes – Use • Tiles for energy conservation – Types – Attributes

5	Describe methods used for marine installations.	• Surface preparation – Structural soundness – Contaminants • Finished elevation – Reference points ‣ Bulkheads • Bonding agents used – Drains – Specified slopes • Mortar for marine applications – Mixing – Application – Manufacturer's instructions

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-1 Install Tile on the Vertical**

Learning Objectives:

1 The learner will be able to describe and demonstrate the installing a variety of types and patterns for tiles and trim using appropriate installation techniques.

	LEARNING TASKS	CONTENT
1	Demonstrate installing types and patterns.	• Types of patterns and modular sizing • Installation techniques – Diagonally laid tile – Hexagon tile • Layout grid • Trim – Sizes – Styles – Application

Achievement Criteria:

1 Performance The learner will install tiles on the vertical using patterns, ensuring that it is dimensionally compatible and includes trim application.

Conditions The learner will be given:

- Project specifications
- Tools and equipment
- Materials

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Safety
- Accuracy
- Completeness
- Aesthetics

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-2 Install Tile on Floors and the Horizontal**

Learning Objectives:

1 The learner will be able to determine the appropriate method of covering sub-floors according to the type.
2 The learner will be able to install tiles to floors.
3 The learner will be able to describe and install divider strips for setting tiles on floors and horizontal surfaces.

LEARNING TASKS	CONTENT
1 Review application to floors.	• Methods of covering sub-floors – Wood construction floors – Concrete slabs or mortar floors • Levelling of sub-floors – Tools – Techniques • Mortar beds – Mixing – Consistency – Application
2 Review installation of tiles.	• Clean floors – Contaminants – Bond breakers • Install tiles – Materials – Bond coat – Trowel notch size – Combing techniques
3 Review installation of divider strips.	• Types – Base strips – Floor strips • Function • Purpose • Sizes • Shapes • Grid layout – Designs – Patterns • Special applications

Achievement Criteria:

1	Performance	The learner will install tiles on the horizontal using designs and patterns.
	Conditions	The learner will be given: • Project specifications • Tools and equipment • Materials
	Criteria	The learner will score 70% or better on a rating sheet that reflects the following criteria: • Safety • Accuracy • Completeness • Aesthetics

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-3 Install Stairways**

Learning Objectives:

1 The learner will be able to calculate the area on stairways to be tiled.
2 The learner will be able to install tile on stairways.

	LEARNING TASKS	CONTENT
1	Review installation of tiles on stairways.	• Building code • Material requirements • Tools and equipment selection
2	Review methods of preparation.	• Layout • Screeding for risers and treads • Calculate area to be covered – Formulas ‣ Stairs ‣ Risers ‣ Treads ‣ Stringers * Open * Closed ‣ Nosings
3	Review types of steps.	• Wooden • Concrete • Steel pan • Pre-cast terrazzo
4	Review installation of tiles on stairways.	• Installation methods • Layout • Levelling • Exterior slopes • Tactile • Procedures and techniques • Nosing treatments

Achievement Criteria:

1 Performance The learner will calculate an area to be covered for tiling a stairway.
Conditions The learner will be given:
- Project specifications

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Efficiency
- Completeness

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-4 Install Glass and Mosaics**

Learning Objectives:

1 The learner will be able to describe common mosaic products and their applications.
2 The learner will be able to install glass and mosaic tiles.

LEARNING TASKS	CONTENT
1 Describe common mosaic products and applications.	• Types of mosaic products – Glass – Stainless steel – Porcelain – Ceramic – Marble • Applications for mosaic products – Floors – Bathrooms – Kitchens – Pools – Showers – Mural – Fireplaces
2 Describe methods of layout.	• Layout techniques • Laying out of sheets prior to installation – Consistent use of directional arrows
3 Install glass tile.	• Surface preparation – Smooth – Even – Dry • Setting material – Trowel use – Spreading technique • Mosaic sheets – Application ‣ Handling ‣ Positioning ‣ Tool selection ‣ Clean tiles

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-5 Install Ceramic Veneer**

Learning Objectives:

1 The learner will be able to describe types of ceramic veneer.
2 The learner will be able to install ceramic veneer.

	LEARNING TASKS	CONTENT
1	Describe layout of tiles before application.	• Types of veneer – Marble – Granite – Large ceramic – Large porcelain • Tile layout prior to application
2	Describe tools used to install ceramic veneer.	• Storey pole • Butter board • Rubber mallet • Layout tools • Mortar tools
3	Install ceramic veneer.	• Installation techniques • Keep work surface clean and free of mortar

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-6 Install Columns and Walls**

Learning Objectives:

1 The learner will be able to prepare and install tiles on square or rectangular columns.
2 The learner will be able to prepare and install tiles on circular columns.

	LEARNING TASKS	CONTENT
1	Install tiles to square, rectangular columns.	• Types of columns • Preparation – Suitability of column surface – Column preparation for mortar – Methods of levelling mortar • Methods of setting tile on columns
2	Install tiles to circular columns.	• Types of columns • Preparation – Screeding ‣ Vertical wood floats strips ‣ Screed diameters and jigs – Mortar application • Methods of setting tile on columns – Setting techniques – Use of a water level

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-7 Install Marble and Stone Slabs**

Learning Objectives:

1 The learner will be able to cut and install marble and stone slabs on various surfaces.

	LEARNING TASKS	CONTENT
1	Describe methods of handling marble.	• Properties of marble • Lifting and carrying methods • Storage • Vertical stacking method • Cutting methods • A-frames
2	Use marble cutting and finishing tools.	• Cutting tools – Mini-grinder with diamond blade – Hammer drill with carbide bit – Wet saw – Worm drive saw • Finishing and polishing tools – Polishing stone – Diamond impregnated pads
3	Install marble.	• Types of installation – Walls – Stairway risers and treads – Floors • Tools and equipment selection • Installation – Procedures – Setting techniques • Caulking and grouting of marble walls and floors
4	Install stone slabs.	• Tools and equipment • Preparation • Layout • Hoisting techniques • Stone slab mechanical installation • Place stone slabs

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-8 Install Terrazzo**

Learning Objectives:

1 The learner will be able to describe and install divider strips.
2 The learner will be able to mix a variety of terrazzo aggregate using manufacturers' instructions and use equipment to produce appropriate mixture consistencies.
3 The learner will be able to pour terrazzo mixtures using appropriate procedures and techniques for the trade.

	LEARNING TASKS	CONTENT
1	Describe and install divider strips.	• Plans and specs for installation • Patterns and designs • Installation methods
2	Mix terrazzo aggregate.	• Ratios • Mix equipment • Pigment mixing • Consistency
3	Use Portland cement terrazzo.	• Ratios • Mix equipment • Pigment mixing • Consistency
4	Mix epoxy terrazzo.	• Ratios • Mix equipment • Pigment mixing • Consistency • Manufacturer's instructions
5	Pour terrazzo mixtures.	• Bond coat application • Setting times • Troweling techniques • Broadcast and roll uniformity • Degree of compaction • Smooth surface • Grout • Uniform thickness

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-9 Install Arches**

Learning Objectives:

1 The learner will be able to install tiles on flat arches.
2 The learner will be able to install tiles on curved arches.

LEARNING TASKS	CONTENT
1 Install tiles on flat arches.	• Types – Flat arches – Jack arches • Layout tiles for flat arches • Installation of tiles to flat arches
2 Install tiles on curved arches.	• Types of arches – Curved – Segmented – Semi-circular – Elliptical – Gothic • Layout tiles for curved arches – Templates – Considerations for each type ‣ Selection of backing material ‣ Use of membranes and vapour barriers for wet areas ‣ Use of metal lathe ‣ Expansion joints • Installation of tiles to curved arches – Preparation – Application techniques

SKILLED TRADES BC

LINE F: FINISH INSTALLED PRODUCT

Competency: **F-2** **Caulk and Seal Installed Product**

Learning Objectives:

1 The learner will be able to evaluate the effect of temperature and moisture content on the installed product.

2 The learner will be able to finish tile installations with the appropriate caulking and sealing methods.

LEARNING TASKS	CONTENT
1 Read and evaluate effects of temperatures and moisture content on the installed product.	• Setting of materials – Properties – Effect of temperature – Effect of moisture • Worksite climate conditions
2 Finish installed products.	• Caulk • Seal • Clean-up • Safety

LINE F: FINISH INSTALLED PRODUCT

Competency: **F-3 Finish Terrazzo and Stone**

Learning Objectives:

1 The learner will be able to describe and demonstrate finishing processes for terrazzo surfaces.

LEARNING TASKS	CONTENT
1 Finish terrazzo.	• Grinding procedures • Stone grits • Repairing grinding indents • Grout application techniques • Type of sealers • Application of sealers • Safety hazards

SKILLED TRADES BC

PROGRAM OUTLINE
FOR
LEVEL 3

SKILLED TRADES BC

LINE B: USE TOOLS AND EQUIPMENT

Competency: **B-5 Use Rigging and Hoisting Equipment**

Learning Objectives:

1 The learner will be able to tie knots and hitches.

2 The learner will be able to select and use hoisting, lifting and rigging equipment.

	LEARNING TASKS	CONTENT
1	Tie knots and hitches.	• Parts of a rope • Types – Clove hitch – Figure of eight – Reef knot – Sheet bend – Bowline • Purposes • Limitations
2	Describe use of hoisting, lifting and rigging equipment.	• Safety • Certification requirements • Estimation of weights • Equipment capacities • Equipment selection • Lifting location • Operating procedures • Communication/hand signals • Securing of loads • Equipment inspection • Equipment maintenance • Equipment storage • Disposal procedures

Achievement Criteria:

1 Performance: The learner will demonstrate knot tying.

Conditions: The learner will be given:

- Various types of rope

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Proper equipment use
- Safety

SKILLED TRADES BC

LINE C: ORGANIZE WORK

Competency: C-2 Use Trade Related Mathematics

Learning Objectives:

1 The learner will be able to use trade related mathematics.

	LEARNING TASKS	CONTENT
1	Review calculation of areas.	• Squares • Triangles • Circles • Composite shapes
2	Review calculation of volumes and weights.	• Liquids • Solids • Liquid to solid proportions
3	Review use of metric measurements.	• Linear • Area • Volume and weight • Temperature • Adding • Subtracting • Dividing • Multiplying

Achievement Criteria:

1 Performance The learner will use trade related mathematics to perform calculations.

Conditions The learner will be given:

- Mathematical questions
- Paper

Criteria The learner will score 70% or better on a rating sheet that reflects the following criteria:

- Accuracy
- Completeness

SKILLED TRADES BC

LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-2 Lays Out Work Area**

Learning Objectives:

1 The learner will be able to develop layouts using layout tools, blueprints and specifications.
2 The learner will be able to estimate materials and labour requirements to complete a project.

	LEARNING TASKS	CONTENT
1	Develop layouts.	• Tools • Blueprints • Specifications

2	Review calculation of estimates.	• Time/labour
		• Quantity
		  – Materials
		  – Tiles
		• Accessories and inserts

Achievement Criteria:

1 Performance: The learner will implement a layout for the required tile floor.
Conditions: The learner will be given:
- Layout tools
- Plans
- Specifications

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness

2 Performance: The learner will implement a layout for a number of inserts and accessories.
Conditions: The learner will be given:
- Layout tools
- Plans
- Specifications

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness

3 Performance: The learner will calculate an estimate required quantities of materials to complete a tile project from a given set of plans and specifications.
Conditions: The learner will be given:
- Plans
- Specifications

Criteria: The learner will score 70% or better on a rating sheet that reflects the following criteria:
- Accuracy
- Completeness

SKILLED TRADES BC

LINE D: PREPARE WORKSITE AND MATERIALS

Competency: **D-4 Describe Special Applications**

Learning Objectives:

1 The learner will be able to describe the installation of in-floor heating systems using manufacturer's specifications.
2 The learner will be able to install glass blocks.
3 The learner will be able to describe sound rated installations.
4 The learner will be able to describe conductive floor installations.

	LEARNING TASKS	CONTENT
1	Describe installation of in-floor heating systems.	• Types • Uses • Application techniques • Installation • Manufacturer's specifications
2	Install glass blocks.	• Styles • Sizes • Installation • Special application considerations
3	Describe sound rated installations.	• Types • Uses • Application techniques • Installation • Manufacturer's specifications
4	Describe conductive floor installations.	• Types – Terrazzo – Tile • Uses • Application techniques • Installation • Manufacturer's specifications

LINE E: INSTALL MATERIAL

Competency: **E-3 Install Stairways**

Learning Objectives:

1 The learner will be able to calculate material requirements for tile installation on stairways with knowledge of building code requirements.

LEARNING TASKS	CONTENT
1 Review stairway parts and formulas.	• Building code • Stair and riser calculations • Material requirements

LINE E: INSTALL MATERIAL

Competency: **E-6 Install Columns and Walls**

Learning Objectives:

1 The learner will be able to describe methods of applying tiles to contour walls.

LEARNING TASKS	CONTENT
1 Describe methods of contour wall assembly.	• Screeding – Hard screed floated setting bed on contour walls • Bridle assembly – Use – Method • Application techniques

SKILLED TRADES BC

LINE E: INSTALL MATERIAL

Competency: **E-10 Install Tile to Swimming Pools**

Learning Objectives:

1 The learner will be able to describe and demonstrate the floor layout for applying tiles to swimming pools using the appropriate methods, tools and materials.

LEARNING TASKS	CONTENT
1 Describe floor layout.	• Waterproofing • Blueprints – Pool floors – Racing lanes – Depth markers • Layout – Racing lines – Depth of mortar – Screeding of cement mortar for floors – Finished dimensions • Grouts – Types – Uses
2 Describe application of walls.	• Waterproofing • Screeding of liquid latex Portland cement mortar – Screeding techniques – Setting – Application • Setting tiles on walls – Levelling specifications – Special tools – Finished dimensions
3 Describe application of curbs.	• Blueprint specifications – Layout – Sketching • Layout of curbs – Techniques for curbs • Application techniques – Screeding • Setting of tiles on a curb – Special tools

4	Describe application of gutters.	• Blueprint specifications – Layout of gutters • Screeding of mortar – Jigs ‣ Construct ‣ Use • Setting of tiles in the gutters – Application techniques – Special tools
5	Describe coping stones.	• Types • Applications • Installations

SECTION 3

FACILITY REQUIREMENTS

SKILLED TRADES BC

FACILITY REQUIREMENTS

Classroom Areas

- Comfortable seating and tables suitable for learning
- Compliance with the local and national fire code and occupational safety requirements
- Overhead and multimedia projectors with a projection screen
- Whiteboard with marking pens and erasers
- Lighting controls to allow easy visibility of the projection screen while allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room temperature control to ensure comfortable room temperature
- Acoustics in the room must allow audibility of the instructor
- Library complete with reference material for student and instructor use

Shop Areas

- Combined shop space of 3,500 square feet per group of 16 students
- Tool crib
- Lockers
- Adequate lighting and lighting control
- Ventilation as per WorkSafeBC standards
- Refuse and recycling bins for used shop materials
- First-aid facilities

Student Facilities

- Adequate lunch room as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal Storage lockers

Instructor's Office Space

- Desk and filing space
- Computer

SKILLED TRADES BC

TOOLS AND EQUIPMENT

MINIMUM LIST OF SHOP EQUIPMENT REQUIRED FOR LEVELS 1, 2 and 3 OF THE TILESETTER APPRENTICESHIP PROGRAM

COMMON TOOLS

broom
bucket
caulking gun
chalk line
chipping hammer
chisels
claw hammer
cove vase trowel
extension cords
finishing trowel
floor scraper
grinding stone
grout float
grout scrapers
hack saw
hand brush
hawk
heavy gauge trowel
lights
magnesium float
mallet
margin trowels
marking instruments
masking tape
mesh cutters
mortar board
mortar holder
notch trowel
plastic sheets
pliers
point trowel
power bar
pry bar
putty knife
rages
rubber hammer
screwdrivers
shovel
socket set
sponges
straightedge
suction cups
tile cutters
tile nippers
tin snips
utility knife
vice grips
wheelbarrow
wonder bar
wood float

MEASURING AND LAYOUT EQUIPMENT

- builder's level
- 4' and 2' levels
- laser leveller
- laser square
- plumb bob
- squares
- straightedge
- tape measure
- water levels

SAFETY EQUIPMENT

- caution tape
- coveralls (fire retardant)
- dust collectors
- dust masks
- ear plugs and muffs
- exhaust fans
- eye wash facilities
- face shields
- fall arresters
- fire extinguishers
- first aid kit/equipment
- full body harness
- hard hat
- knee pads
- leather gloves
- life line
- lock-out kit
- portable lighting
- respirators
- rope grabs
- safety glasses/goggles
- safety vest
- saw guards
- signage
- steel toe boots
- vapour masks
- warning signs

SCAFFOLDING AND ACCESS EQUIPMENT

- aluminum planks
- boom lifts
- ladder jacks
- ladders
- mechanical scaffolds
- ramps
- rolling scaffolds
- sawhorses
- scissor-lift
- stationary scaffolds
- step ladders

SKILLED TRADES BC

POWER TOOLS AND EQUIPMENT

- angle grinder
- base grinder
- buffer
- drum cement mixer
- electric winch
- floor grinding machine
- floor polisher
- floor scrubber
- hammer drill
- hole drills
- hot glue gun
- jack hammer
- mini-grinder
- mixing drill
- power chisel
- power drill
- power grout washing machine
- power grouting machine
- power scarifier
- power undercut saw
- router
- stand-up screw gun
- wet and dry vacuum
- wet saw

SPECIALTY TOOLS AND EQUIPMENT

- air compressor
- cement mixer
- communication devises
- gas powered heater
- generator
- jigs, racks
- sealer applicator
- stone grinder
- stone polisher
- terrazzo roller
- transit (levelling)
- wire rack

SECTION 4

FACULTY CREDENTIAL AND EXPERIENCE REQUIREMENTS

FACULTY CREDENTIAL AND EXPERIENCE REQUIREMENTS

The instructor must possess:

- A BC Certificate of Qualification preferably with a Red Seal Endorsement.
- Certificate of Qualification from another Canadian jurisdiction complete with Red Seal Endorsement only.
- A minimum of 5 years experience working in the industry as a journeyperson.

It is preferred that the instructor also possesses:

- An Instructors Diploma or equivalent
- A Bachelor's Degree in Education
- A Master's Degree in Education

SECTION 5

REQUIRED AND RECOMMENDED RESOURCES

SKILLED TRADES BC

RECOMMENDED TEXTBOOKS, LAB OR SHOP MANUALS, ETC.:

BUILDING STANDARDS
National Research Council Canada
http://www.nrc-cnrc.gc.ca/eng/ibp/irc/codes/codes-guides.html .....Current Edition

BUILDING TRADES BLUEPRINT READING-PART I FUNDAMENTALS-FIFTH EDITION
Elmer W. Sundberg
Chicago: American Technical Publisher's Inc. ..... ISBN 0-8269-0441-6

CERAMIC TILE INSTITUTE'S TILE MANUALS
(Available online only)
Ceramic Tile Institute of America
http://www.ctioa.org/ .....Current Editions

DIMENSION STONE DESIGN MANUAL VII
The Marble Institute of America
http://www.marble-institute.com/industryresources/manual.cfm 2005

WorkSafeBC OCCUPATIONAL HEALTH AND SAFETY REGULATIONS
(Available online)
http://www2.worksafebc.com/publications/OHSRegulation/Home.asp .....Current Edition

SPECIFICATION GUIDES
(Available online)
Terrazzo, Tile and Marble Association of Canada
http://www.ttmac.com/ .....Current Guides

MEASUREMENT AND CALCULATIONS FOR THE TRADES
Skill Plan BC Construction Industry Skills Improvement Council..... ISBN 0-9685027-9-2

MEASURING, MARKING & LAYOUT-A BUILDER'S GUIDE
John Carroll
The Taunton Press, Inc. ..... ISBN 1-56158-335-9

SPECIFICATION GUIDE 09 30 00 TILE INSTALLATION MANUAL
Terrazzo, Tile and Marble Association of Canada
http://www.ttmac.com/ 2009/2010

09 66 00 TERRAZZO INSTALLATION MANUAL
Terrazzo, Tile and Marble Association of Canada
http://www.ttmac.com/ 2007

TILESETTING WORKBOOK
California State Department of Education ..... ISBN 0-8011-0490-4

WORKSHOP MATH
Robert Scharff
Sterling Publishing Co., Inc. ..... ISBN 0-8069-5802-2

GLOSSARY OF VERBS

SKILLED TRADES BC

GLOSSARY

Adjust:	To bring to a more satisfactory state. To bring the parts of to a true or more effective relative position.
Align:	To bring into alignment.
Analyze:	To examine critically so as to determine appropriate procedures, process, or course of action.
Apply:	To put to use especially for some practical purpose.
Assemble:	To fit together the parts of.
Assess:	To determine the value, significance, or extent of; appraise.
Calculate:	To arrive at a precise numerical answer – often through the use of mathematical formulas.
Construct:	To make or form by combining or arranging parts or elements.
Control:	Lesson the intensity of, temper, hold in restraint, hold or keep within limits
Define:	To set forth the meaning of a word or expression.
Demonstrate:	To exhibit, show clearly or perform, to a competency standard, a process or competence.
Describe:	To set forth the properties or characteristics of an object. To give a detailed or graphic account of a process or procedure. (To use correct terminology, sequencing and inter-relationship of the elements is implied where required.)
Determine:	To arrive at, or locate, information by a simple process (e.g. by rule of thumb).
Explain:	To show the logical development or relationships of.
Evaluate:	To determine the significance, worth, or condition of usually by careful appraisal and study.
Identify:	To use the correct terminology to describe objects, both individually and collectively; to state their application or use, and to point out and name them.
Inspect:	To look into, or at carefully. To examine, or observe, critically in order to detect flaws, errors, etc.
Install:	To set up for use or service.
Interpret:	To make sense of. To give meaning to.
List:	To give in point form, several items of information; no sequence or inter-relationship is implied.
Locate:	To seek out and determine the location of.
Maintain:	To keep in good condition. To keep functional, and in good repair.

Obtain:	To gain or attain usually by planned action or effort.
Operate:	To perform a function**:** exert power or influence.
Overhaul:	To check thoroughly for needed service, and to make the repairs, replacements, adjustments, etc., necessary to restore to good working order.
Perform:	To carry out. To do in a formal manner or according to prescribed ritual.
Read:	To look at carefully so as to understand the meaning of. To attribute meaning to: Interpret.
Rebuild:	To restore to an original state.
Remove:	To move by lifting, pushing aside, or taking away or off.
Repair:	To put back into good condition after damage or wear. To mend or fix.
Replace:	To put something new in the place of.
Select:	To choose the most appropriate object, process or procedures, given a specific situation; (when used in relation to an object it also implies the ability to identify and describe).
Service:	To remove, maintain, repair, or replace items and/or components.
Set up:	To assemble the parts of and erect in position.
Sketch:	To make a sketch, rough draft, or outline of.
State:	To set out briefly (in the equivalent or a sentence or two) an idea.
Test:	To try something against a criterion or standard.
Troubleshoot:	To investigate a problem. To look at, or into, critically and methodically in order to find out the causes, facts, conditions, etc.
Use:	The act or practice of employing something.