# Apprenticeship and Industry Training

## Tilesetter

## Apprenticeship Course Outline

**2005.2 (2005)**

Government of Alberta

Apprenticeship and Industry Training

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# Tilesetter
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### Course Outline

## Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Tilesetter Provincial Apprenticeship Committee.

The graduate of the Tilesetter apprenticeship program is a certified journeyperson who will be able to:

- know the principles of sound and safe construction
- know the characteristics and proper use of tilesetting materials
- read blueprints, shop drawings and calculate quantities of materials
- be proficient in the safe use and maintenance of hand and powered tools
- be familiar with the work of other tradespeople in the building industry
- perform assigned tasks in accordance with quality and production standards required by industry

## Apprenticeship and Industry Training System

### Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta Apprenticeship and Industry Training Board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

### Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the Apprenticeship and Industry Training Act. The board also provides advice to the Minister of Advanced Education and Technology on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

### Industry Committee Network

Alberta's apprenticeship and industry training system relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

**Local Apprenticeship Committees (LAC)**

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's provincial apprenticeship committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

**Provincial Apprenticeship Committees (PAC)**

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - standards and requirements for training and certification in their trade
    - courses and examinations in their trade
    - apprenticeship and certification
    - designation of trades and occupations
    - regulations and orders under the Apprenticeship and Industry Training Act
- monitor the activities of local apprenticeship committees in their trade
- determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- consult with other committees under the Apprenticeship and Industry Training Act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- may participate in resolving certain disagreements between employers and employees
- carry out functions assigned by the board

**Tilesetter PAC Members at the Time of Publication**

Mr. J. Strikwerda .....Edmonton.....Presiding Officer
Mr. D. Hergenhein.....Calgary.....Employer
Mr. A. Novello.....Calgary.....Employer
Mr. A. Vaccaro.....Calgary.....Employer
Mr. P. Imperato.....Edmonton.....Employer
Mr. K. Allan.....Calgary.....Employee
Mr. B. Mcallister.....Calgary.....Employee
Mr. C. Imperato .....Edmonton.....Employee

**Alberta Government**

Alberta Advanced Education and Technology works with industry, employer and employee organizations and technical training providers to:

- facilitate industry's development and maintenance of training and certification standards
- provide registration and counselling services to apprentices and employers
- coordinate technical training in collaboration with training providers
- certify apprentices and others who meet industry standards

### Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education and Technology to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

## Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

### Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board (board) fully supports safe learning and working environments and emphasizes the importance of safety awareness and education throughout apprenticeship training- in both on-the- job training and technical training. The board also recognizes that safety awareness and education begins on the first day of on-the-job training and thereby is the initial and ongoing responsibility of the employer and the apprentice as required under workplace health and safety training. However the board encourages that safe workplace behaviour is modeled not only during on-the-job training but also during all aspects of technical training, in particular, shop or lab instruction. Therefore the board recognizes that safety awareness and training in apprenticeship technical training reinforces, but does not replace, employer safety training that is required under workplace health and safety legislation.

The board has established a policy with respect to safety awareness and training:

> **The board promotes and supports safe workplaces, which embody a culture of safety for all apprentices, employers and employees. Employer required safety training is the responsibility of the employer and the apprentice, as required under legislation other than the *Apprenticeship and Industry Training Act.***

The board's complete document on its 'Apprenticeship Safety Training Policy' is available at www.tradesecrets.gov.ab.ca; access the website and conduct a search for 'safety training policy'.

Implementation of the policy includes three common safety learning outcomes and objectives for all trade course outlines. These common learning outcomes ensure that each course outline utilizes common language consistent with workplace health and safety terminology. Under the title of 'Standard Workplace Safety', this first section of each trade course outline enables the delivery of generic safety training; technical training providers will provide trade specific examples related to the content delivery of course outline safety training.

**Addendum**
As immediate implementation of the board's safety policy includes common safety learning outcomes and objectives for all course outlines, this trade's PAC will be inserting these safety outcomes into the main body of their course outline at a later date. In the meantime the addendum below immediately places the safety outcomes and their objectives into this course outline thereby enabling technical training providers to deliver the content of these safety outcomes.

## STANDARD WORKPLACE SAFETY

### A. Safety Legislation, Regulations & Industry Policy in the Trades .....

***Outcome:*** ***Describe legislation, regulations and practices intended to ensure a safe work place in this trade.***

1. Demonstrate the ability to apply the Occupational Health and Safety Act, Regulation and Code.
2. Explain the role of the employer and employee in regard to Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations, and related advisory bodies and agencies.
3. Explain industry practices for hazard assessment and control procedures.
4. Describe the responsibilities of workers and employers to apply emergency procedures.
5. Describe positive tradesperson attitudes with respect to housekeeping, personal protective equipment and emergency procedures.
6. Describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE).
7. Select, use and maintain appropriate PPE for worksite applications.

### B. Climbing, Lifting, Rigging and Hoisting .....

***Outcome:*** ***Describe the use of personal protective equipment (PPE) and safe practices for climbing, lifting, rigging and hoisting in this trade.***

1. Select, use and maintain specialized PPE for climbing, lifting and load moving equipment.
2. Describe manual lifting procedures using correct body mechanics.
3. Describe rigging hardware and the safety factor associated with each item.
4. Select the correct equipment for rigging typical loads.
5. Describe hoisting and load moving procedures.

### C. Hazardous Materials & Fire Protection.....

***Outcome:*** ***Describe the safety practices for hazardous materials and fire protection in this trade.***

1. Describe the roles, responsibilities features and practices related to the workplace hazardous materials information system (WHMIS) program.
2. Describe the three key elements of WHMIS.
3. Describe handling, storing and transporting procedures when dealing with hazardous material.
4. Describe safe venting procedures when working with hazardous materials.
5. Describe fire hazards, classes, procedures and equipment related to fire protection.

**Workplace Health and Safety**

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Workplace Health and Safety (Alberta Employment, Immigration and Industry) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.worksafely.org

## Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Tilesetter apprenticeship technical training:

Southern Alberta Institute of Technology – Mayland Heights Campus) and Edmonton Campus

## Procedures for Recommending Revisions to the Course Outline

Advanced Education and Technology has prepared this course outline in partnership with the Tilesetter Provincial Apprenticeship Committee.

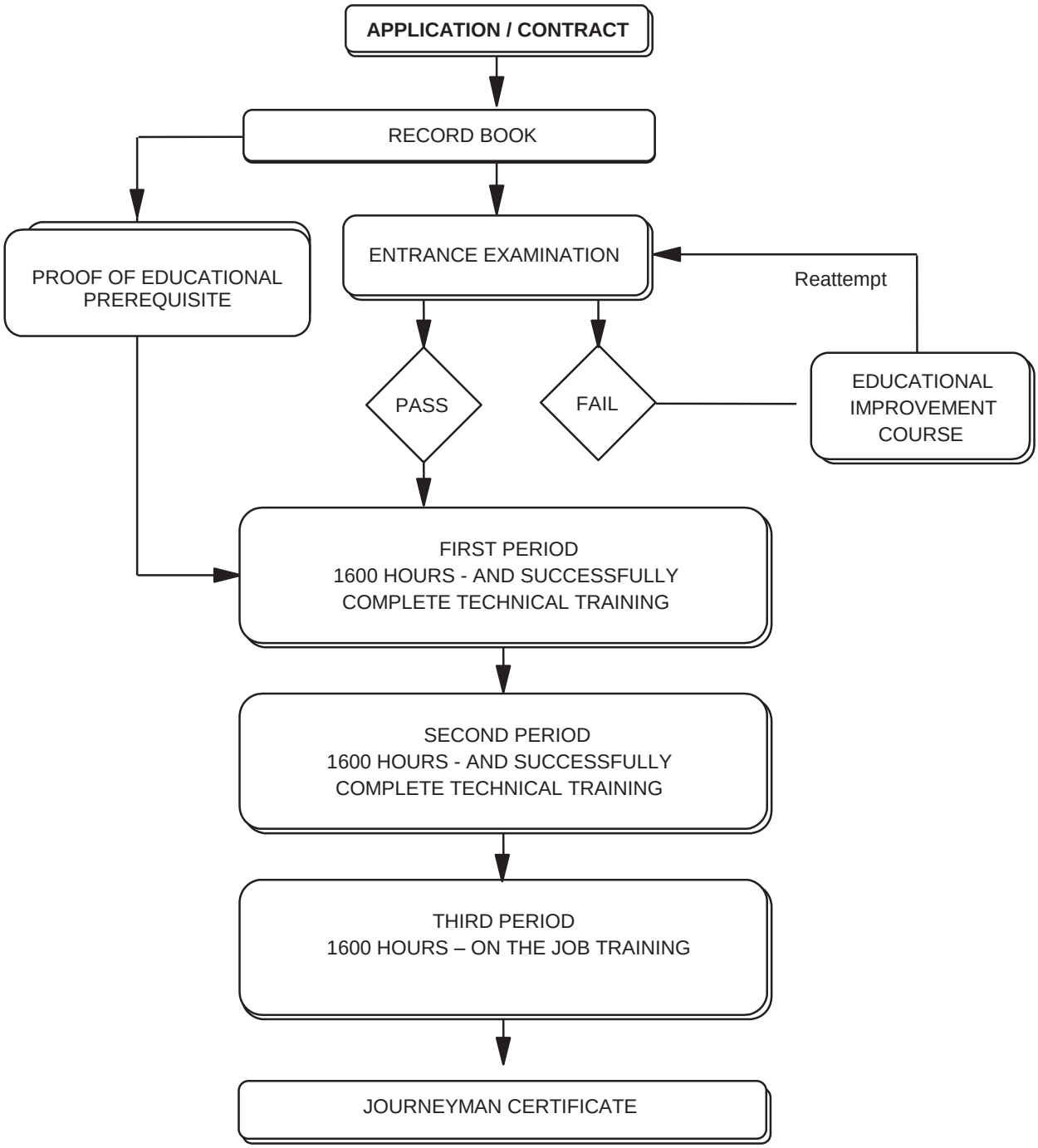
This course outline was approved on February 4, 2005 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the Provincial Apprenticeship Committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

Tilesetter Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education and Technology
10th floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Tilesetter Provincial Apprenticeship Committee.

**Apprenticeship Route toward Certification**



## Tilesetter Training Profile
## First Period
## (8 Weeks 30 Hours per Week – Total of 240 Hours)

**SECTION ONE**

**HAND AND POWER TOOLS** — **72 HOURS**

| | | |
|---|---|---|
| **A** Measuring and Layout Tools — 3 Hours | **B** Cutting Tools — 3 Hours | **C** Tools for Mortar, Grout and Finishing — 3 Hours |
| **D** Hand Tool Exercises — 18 Hours | **E** Optical Levels, Water Levels and Laser Levels — 3 Hours | **F** Optical Level, Water Level and Laser Level Exercises — 6 Hours |
| **G** Power Hand Tools — 3 Hours | **H** Power Hand Tool Exercises — 4 Hours | **I** Power Equipment — 6 Hours |
| **J** Power Equipment Exercises — 6 Hours | **K** Grinding and Polishing Tools and Equipment — 3 Hours | **L** Grinding and Polishing Tools and Equipment Exercises — 8 Hours |
| **M** Explosive Actuated Tools — 3 Hours | **N** Explosive Actuated Tools Practical Exercises — 3 Hours | |

**SECTION TWO**

**SAFETY** — **20 HOURS**

| | | |
|---|---|---|
| **A** Construction Safety Regulations and Procedures — 6 Hours | **B** Regulatory Bodies — 2 Hours | **C** Personal Protection and Health Concerns — 6 Hours |
| **D** Scaffolding Systems — 6 Hours | | |

**SECTION THREE**

**MATERIALS** — **24 HOURS**

| | | |
|---|---|---|
| **A** Substrates, Preparation for Tile — 7 Hours | **B** Tile Materials — 5 Hours | **C** Setting Materials — 3 Hours |
| **D** Grouts — 3 Hours | **E** Expansion Joints, Sealants and Isolation Membranes — 3 Hours | **F** Inserts, Moldings and Accessories — 3 Hours |

**SECTION FOUR**

**TILE INSTALLATION** — **60 HOURS**

| | | |
|---|---|---|
| **A** Basic Tile Installation — 15 Hours | **B** Basic tile Projects — 30 Hours | **C** Tile Repairs — 6 Hours |
| **D** The Repair Projects — 9 Hours | | |

**SECTION FIVE**

**ESTIMATING AND PLANS** — **64 HOURS**

| A | B | C |
|---|---|---|
| Basic Mathematics Functions — 3 Hours | Perimeters, Areas and Volumes — 4 Hours | Ratio and Proportion and Percentage — 3 Hours |
| **D** | **E** | **F** |
| Quantity Calculations for Tilesetting Materials — 10 Hours | Estimating Materials From Residential Blueprints — 12 Hours | Basic Drawing — 8 Hours |
| **G** | | |
| Residential and Light Commercial Blueprints — 24 Hours | | |

## Second Period
## (8 Weeks 30 Hours per Week – Total of 240 Hours)

**SECTION ONE**

**TILE LAYOUT AND INSTALLATION** — **50 HOURS**

| A | B |
|---|---|
| Tile Installation — 16 Hours | Tile Project — 34 Hours |

**SECTION TWO**

**NATURAL STONE** — **52 HOURS**

| A | B | C |
|---|---|---|
| Natural Stone Products — 6 Hours | Marble, Stone and Slate Installation — 16 Hours | Marble, Stone and Slate Projects — 18 Hours |
| **D** | **E** | |
| Marble and Stone Repair — 3 Hours | Marble and Stone Repair Projects — 9 Hours | |

**SECTION THREE**

**TERRAZZO** — **74 HOURS**

| A | B | C |
|---|---|---|
| Terrazzo Materials — 6 Hours | Portland Terrazzo Installation — 15 Hours | Epoxy Terrazzo Installation — 8 Hours |
| **D** | **E** | **F** |
| Terrazzo Projects — 33 Hours | Terrazzo Repair — 3 Hours | Terrazzo Repair Projects — 9 Hours |

**SECTION FOUR**

**ESTIMATING AND PLANS** — **64 HOURS**

| A | B | C |
|---|---|---|
| Calculations — 8 Hours | Quantity Calculations for Terrazzo and Stone Materials — 20 Hours | Material and Labour Estimates From Commercial Blueprints — 8 Hours |
| **D** | **E** | |
| Commercial Blueprints — 24 Hours | Workplace Coaching Skills and Advisory Network — 4 Hours | |

NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

**FIRST PERIOD TECHNICAL TRAINING**
**TILESETTER TRADE**
**COURSE OUTLINE**

*UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.*

**SECTION ONE: ..... HAND AND POWER TOOLS ..... 72 HOURS**

**A. Measuring and Layout Tools .....3 Hours**

***Outcome: Identify and describe the typical tools used and their correct application.***

1. Recognize and describe the use of lines and measuring tools.
2. Recognize and describe the use of various squares and related layout tools.
3. Recognize and describe the use of spirit levels.

**B. Cutting Tools .....3 Hours**

***Outcome: Identify and describe the typical tools used and their correct application.***

1. Recognize and describe the use of tilecutters and rubbing stones.
2. Recognize and describe the use of nippers, chisels and hammers.
3. Recognize and describe the use of saws.

**C. Tools for Mortar, Grout and Finishing .....3 Hours**

***Outcome: Identify and describe the typical tools used and their correct application.***

1. Recognize and describe the use of trowels and floats.
2. Recognize and describe the use of mortar mixing and handling tools.
3. Recognize and describe the use of special tools.

**D. Hand Tool Exercises .....18 Hours**

***Outcome: Competently use hand tools in the construction of projects.***

1. Demonstrate the use of measuring and layout tools:
   a) lines and measuring tools
   b) various squares and related layout tools
   c) levels
2. Demonstrate the safe use of cutting tools:
   a) tilecutters and rubbing stones
   b) nippers, chisels and hammers
   c) saws
3. Demonstrate the use of trowels and finishing tools:
   a) trowels and floats
   b) mortar mixing and handling tools
   c) special tools

**E. Optical Levels, Water Levels and Laser Levels .....3 Hours**

***Outcome:*** ***The ability to describe methods for establishing elevations and transferring elevations.***

1. Identity and describe the use of optical levels (builder's levels and transits).
2. Identity and describe the use of laser levels.
3. Identity and describe the use of water levels.
4. Identity and describe the use of survey rods.

**F. Optical Level, Water Level and Laser Level Exercises .....6 Hours**

***Outcome:*** ***Establish elevations and working lines.***

1. Set up a builder's level and prepare it for operation.
2. Transfer elevations.
3. Sight and record back sights and fore sights for establishing elevations.
4. Run lines horizontally and vertically.
5. Turn angles for large layouts.
6. Set up a laser level and prepare it for operation.
7. Run lines horizontally and vertically with a laser level.
8. Set up a water level and prepare it for operation.
9. Establish elevations using a water level.

**G. Power Hand Tools.....3 Hours**

***Outcome:*** ***Identify and describe and typical power tools used in the tilesetter trade.***

1. Describe the use of power handsaws.
2. Describe the use of drills and screw guns.
3. Describe the use of hammer drills and anchors.

**H. Power Hand Tool Exercises.....4 Hours**

***Outcome:*** ***Identify, select and safely operate hand tools.***

1. Demonstrate the safe use of power handsaws.
2. Demonstrate the safe use of drills and screw guns.
3. Demonstrate the safe use of hammer drills and install anchors.

**I. Power Equipment.....6 Hours**

***Outcome:*** ***Identify and describe and typical power equipment used in the tilesetter trade.***

1. Describe the use of tile and stone saws.
2. Describe the selection and care of saw blades.
3. Describe the use of mixing equipment and pumps.
4. Describe the use of power grouters.
5. Describe the use of pallet jacks.

**J. Power Equipment Exercises.....6 Hours**

***Outcome:*** ***Identify, select and safely operate power equipment.***

1. Demonstrate the safe use of tile and stone saws.
2. Select appropriate saw blades.
3. Demonstrate the safe use of mixing equipment and pumps.
4. Demonstrate the safe use of power grouters.
5. Demonstrate the sale use of pallet jacks.

**K. Grinding and Polishing Tools and Equipment.....3 Hours**

***Outcome:*** ***Identify and describe and typical grinding, polishing tools and equipment used in the tilesetter trade.***

1. Describe the use of grinders.
2. Select grinding stones and wheels.
3. Describe the use of polishers.
4. Select polishing wheels and compounds.

**L. Grinding and Polishing Tools and Equipment Exercises.....8 Hours**

***Outcomes:*** ***Identify, select and safely operate grinding and polishing equipment.***

1. Safely use grinders.
2. Select appropriate grinding stones and wheels.
3. Safely use polishers.
4. Select appropriate polishing wheels and compounds.

**M. Explosive Actuated Tools .....3 Hours**

***Outcome:*** ***Identify and describe the use of explosive actuated tools.***

1. Differentiate between high and low velocity explosive actuated tools.
2. Describe explosive actuated tool power loads (low and high velocity), power load strength and safety requirements.
3. Describe explosive actuated tool fasteners, accessories and applications.
4. Assess base material suitability and related fastening requirements.
5. Describe explosive actuated system safety, firing procedure and tool maintenance.

**N. Explosive Actuated Tools Practical Exercises .....3 Hours**

***Outcome:*** ***Demonstrate the safe operation and servicing of explosive actuated tools.***

1. Dismantle and reassemble explosive actuated tools.
2. Select pins and power loads for various materials.
3. Install various pins and anchors.
4. Clean explosive actuated tools.
5. Safely store explosive actuated tools, pins and power loads.

**SECTION TWO: ..... SAFETY ..... 20 HOURS**

**A. Construction Safety Regulations and Procedures .....6 Hours**

***Outcome:*** ***Identify safety regulations as they apply to the safe work practices in the tilesetter and related trades.***

1. Define selected terms in the Occupational Health and Safety (O.H. & S.) Act.
2. Describe selected general provisions and use of safeguards.
3. Describe minimum requirements of ramps and ladders.
4. Describe minimum requirements of personal protective equipment.
5. Describe scaffolding requirements.
6. Identify types of fires and fire control.
7. Identify asbestos hazards.
8. Describe the scope of W.H.M.I.S. in the workplace.

**B. Regulatory Bodies .....2 Hours**

***Outcome:*** ***Ability to interpret and comply with the various regulatory bodies.***

1. Discuss the origin and purpose of the National and Provincial Building Codes.
2. Recognize the Terrazzo, Tile and Marble Association of Canada (TTMAC) and Construction Specifications Canada (CSC) specifications and guidelines.
3. Recognize American Society for Testing and Materials (ASTM) and American National Standards Institute (ANSI) specifications related to tilesetting.

**C. Personal Protection and Health Concerns .....6 Hours**

***Outcome:*** ***Identify and describe potential industrial health hazards and the use of personal protection.***

1. Describe noise induced hearing loss.
2. Describe back problems and proper lifting techniques.
3. Describe knee and elbow problems and preventative measures.
4. Describe reactions to chemicals.
5. Identify the causes of eye damage.
6. Describe breathing hazards and breathing apparatus.

**D. Scaffolding Systems.....6 Hours**

***Outcome:*** ***Use scaffold systems.***

1. Define scaffold systems and structures.
2. Describe scaffold components and materials.
3. Describe scaffold safety and access.
4. Describe tying and bracing scaffolds.
5. Describe base conditions for scaffolds.
6. Describe erection and dismantling of scaffolds.

**SECTION THREE: ..... MATERIALS .....24 HOURS**

**A. Substrate, Preparation for Tile .....7 Hours**

***Outcome: Describe substrates, preparation for tile.***

1. Describe drywall backings.
2. Describe masonry, concrete and cement board backings.
3. Describe metal substrates.
4. Describe vapour barriers, metal lath and shrinkage mesh.
5. Describe concrete slab bases:
   a) types of concrete slabs
   b) identify when tile can be applied to a slab
   c) surface finishes for various tile and stone materials
6. Describe wood backings and bases:
   a) identify acceptable wood backings
   b) describe the application of mortar beds to wood backings
   c) describe the use of adhesives on wood backings
   d) describe the use of thin set mortars on wood backings
7. Inspect suitable substrates for:
   a) integrity
   b) drainage
   c) clean surfaces
8. Prepare surface for the installation of tile:
   a) identify repairs needed for substrate
   b) install membrane
   c) install reinforcement mesh
   d) install mortar beds
   e) install underlayments
   f) parge surfaces
   g) install sound attenuation products
   h) identify/place in-floor heating requirements

**B. Tile Materials .....5 Hours**

***Outcome: Identify tile materials.***

1. Describe glazed wall tile.
2. Describe ceramic mosaic tile.
3. Describe quarry tile.
4. Describe clay (Mexican) and cement pavers.
5. Describe glass mosaic tile.
6. Describe porcelain tile.

**C. Setting Materials .....3 Hours**

***Outcome:*** ***Describe setting materials.***

1. Describe the use cement, lime, and sand.
2. Describe thin set mortars.
3. Describe tile adhesives.
4. Describe epoxies for tile.
5. Describe grouts.
6. Describe latex and acrylic additives.

**D. Grouts .....3 Hours**

***Outcome:*** ***Identify and describe grouts for tile.***

1. Identify the types of grout used for tile.
2. Describe the use of coloured grouts.
3. Describe the safety precautions used for working with grout.
4. Describe mixing and curing grout.
5. Describe the cleaning of grout (acid wash).

**E. Expansion Joints, Sealants and Isolation Membranes.....3 Hours**

***Outcome:*** ***Describe joints, sealants and membranes.***

1. Describe expansion and control joints.
2. Describe waterproof and isolation membranes and sound control underlayments.
3. Describe caulking sealants.
4. Describe the use of tile and grout sealers.
5. Describe tile and grout cleaners.

**F. Inserts, Moldings and Accessories.....3 Hours**

***Outcome:*** ***Describe inserts and accessories.***

1. Describe schluder strips.
2. Describe inset accessories.
3. Describe surface mounted accessories.

**SECTION FOUR: ..... TILE INSTALLATION .....60 HOURS**

**A. Basic Tile Installation .....15 Hours**

***Outcome:*** ***Describe procedures for tile installation.***

1. Describe basic tile layouts.
2. Describe methods for setting screeds for mortar beds.
3. Describe procedures for installing tile on walls and other vertical surfaces.
4. Describe procedures for installing tile on floors and other horizontal surfaces.
5. Describe procedures for grouting tile.

6. Describe procedures for cleaning tile work after installation.

**B. Basic Tile Projects .....30 Hours**

***Outcome: With given specification, install tile.***

1. Complete wall tile projects.
2. Complete floor tile projects.
3. Install tile on tub enclosures.
4. Install tile on countertops.
5. Install tile on straight stairs.
6. Complete tile projects using basic geometric designs.

**C. Tile Repairs .....6 Hours**

***Outcome: Identify and describe how to repair tile.***

1. Describe circumstances that cause damage to tile work.
2. Explain procedures for removing damaged tile.
3. Describe procedures for repairing and replacing backings for tile.
4. Describe the replacement, grouting, painting (staining) and sealing of tiles.

**D. The Repair Projects .....9 Hours**

***Outcome: Repair tile.***

1. Remove damaged and loose tile.
2. Repair and prepare backings for new tile.
3. Describe the replacement, re-grout and seal repaired tile work.

**SECTION FIVE: .....ESTIMATING AND PLANS ..... 64 HOURS**

**A. Basic Mathematics Functions .....3 Hours**

***Outcome: Demonstrate the ability to complete basic math operations.***

1. Demonstrate the use of metric/imperial conversion calculators.
2. Solve problems related to rounding off numbers.
3. Solve problems related to basic arithmetic functions (addition, subtraction, multiplication and division).
4. Apply the metric system to measuring lengths.
5. Apply the metric system to measuring capacity and mass.
6. Apply the imperial system to measuring lengths.
7. Apply the imperial system to measuring capacity and mass.
8. Use fractions in addition, subtraction, multiplication and division.
9. Convert between fractions and decimals.

**B. Perimeters, Areas and Volumes .....4 Hours**

***Outcome:*** ***Demonstrate the ability to solve perimeters, areas and volume problems.***

1. Calculate perimeters and circumferences.
2. Calculate hypotenuse using Pythagorean' Theorem (3-4-5 method).
3. Use formulas to calculate the areas of various shapes.
4. Calculate volumes of various shapes.

**C. Ratio and Proportion and Percentage .....3 Hours**

***Outcome:*** ***Demonstrate the ability to solve ratio and proportion and percentage problems.***

1. Convert between decimal and percentage numbers.
2. Calculate the percentage value of a number.
3. Calculate the percentage value of one number relative to another.
4. Calculate the numeric value of a percentage.
5. Solve ratio and proportion problems.

**D. Quantity Calculations for Tilesetting Materials .....10 Hours**

***Outcome:*** ***Demonstrate the ability to calculate quantity tilesetting materials.***

1. Calculate quantities for tile, agglomerate tile, natural and manufactured stone:
   a) tile and stone quantities for basic projects
   b) tile and stone quantities for special shapes and applications
2. Calculate base and backing materials:
   a) base material quantities for tile and stone
   b) backing material quantities for tile and stone
3. Calculate setting materials and grouts:
   a) setting material quantities for tile and stone
   b) grout quantities for tile and stone
4. Calculate placement, location and cuts for the installation of accessory materials (recessed mirrors, schluder strips, sealers, etc.).

**E. Estimating Materials From Residential Blueprints.....12 Hours**

***Outcomes:*** ***Interpret plans and specifications for material quantities.***

1. Calculate material quantities from blueprints and specifications.

**F. Basic Drawing .....8 Hours**

***Outcome:*** ***Demonstrate the ability to use drawing instruments and produce drawings.***

1. Describe the function of drawing instruments.
2. Complete exercises using metric and imperial scales.
3. Draw basic geometric layouts.
4. Interpret floor plans.
5. Sketch orthographic projections.

**G. Residential and Light Commercial Blueprints .....24 Hours**

***Outcome:*** ***Interpret blueprints.***

1. Interpret schedules and specifications.
2. Interpret elevation drawings.
3. Interpret section views.
4. Interpret floor plans.
5. Interpret symbols and notations.
6. Interpret scaling and dimensioning.
7. Interpret plot plans.
8. Interpret and sketch details.

Note: Identify tilesetting elements in blueprints. Sketch tilesetting details.

**SECOND PERIOD TECHNICAL TRAINING**
**TILESETTER TRADE**
**COURSE OUTLINE**

*UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.*

**SECTION ONE:.....TILE, LAYOUT AND INSTALLATION ..... 50 HOURS**

**A. Tile Installation.....16 Hours**

***Outcome:*** ***Describe procedures for tile installation.***

1. Describe advanced geometric tile layouts.
2. Describe procedures for installing tile in spas and steam rooms.
3. Describe procedures for installing tile on pools, curbs and gutters.
4. Describe procedures for installing tile on stairs.
5. Describe procedures for installing tile on ceilings, columns, pillars, arches, etc.

**B. Tile Projects .....34 Hours**

***Outcome:*** ***With given specification, install tile.***

1. Complete tile projects using complex geometric designs.
2. Install tile in spas and steam rooms.
3. Install tile on pools, curbs and gutters.
4. Install tile on circular and curved stairs.
5. Install tile on ceilings, columns, pillars, arches, etc.
6. Complete a tile mural project.

**SECTION TWO:.....NATURAL STONE ..... 52 HOURS**

**A. Natural Stone Products.....6 Hours**

***Outcome:*** ***Identify and describe natural stone products.***

1. Describe the processing methods for granite, marble, agglomerate and slate slabs.
2. Describe the manufacture of granite, marble, agglomerate and slate tiles.
3. Describe types, characteristics and uses for marble.
4. Describe types, characteristics and uses for granite.
5. Describe types, characteristics and uses for slate.
6. Describe types, characteristics and uses for agglomerate tile and slabs.

**B. Marble, Stone and Slate Installation .....16 Hours**

***Outcome:*** ***Describe installation procedures for marble, stone and slate.***

1. Describe inspection and preparation procedures for stone products.
2. Describe procedures for the installation of stone products on horizontal surfaces.

3. Describe restraint and support anchors, ties, bolts, and inserts for vertical state, stone and marble applications.
4. Describe polishing of stone and marble edges and cuts.
5. Describe stone grouting and cleaning and sealing.

**C. Marble, Stone and Slate Projects ..... 18 Hours**

***Outcome:*** ***With given specification, install marble, stone and slate.***

1. Install stone, marble and state on horizontal surfaces.
2. Install stone, marble and slate on vertical surfaces.
3. Polish stone and marble edges and cuts.
4. Grout, clean and seat stone projects.
5. Install marble, granite and slate for stairs and special projects.

**D. Marble and Stone Repair ..... 3 Hours**

***Outcome:*** ***Describe repairing of marble and stone.***

1. Describe the conditions that cause stone and marble slabs to deteriorate, crack and spall.
2. Describe the procedures to remove cracked and spelled stone and marble slabs.
3. Describe the procedures to repair and prepare backings and substrates for stone and marble.
4. Describe the procedures to replace detective stone and marble anchors.
5. Describe the procedures to replace stone and marble slabs.

**E. Marble and Stone Repair Projects ..... 9 Hours**

***Outcome:*** ***Repair marble and stone.***

1. Describe the conditions that cause stone and marble slabs to deteriorate, crack and spall.
2. Describe the procedures to remove cracked and spalled stone and marble slabs.
3. Describe the procedures to repair and prepare backings and substrates for stone and marble.
4. Describe the procedures to replace defective stone and marble anchors.
5. Describe the procedures to replace stone and marble slabs.

**SECTION THREE: ..... TERRAZZO ..... 74 HOURS**

**A. Terrazzo Materials ..... 6 Hours**

***Outcome:*** ***Describe terrazzo procedures.***

1. Describe types of terrazzo.
2. Describe the materials used and mixes for underbeds for terrazzo.
3. Describe divider strips.
4. Describe the materials used and mixes for terrazzo.
5. Describe the materials used for epoxy terrazzo and monorazzo.

**B. Portland Terrazzo Installation ..... 15 Hours**

***Outcome:*** ***Describe installation procedures for Portland terrazzo.***

1. Describe rollers and grinders for Portland terrazzo.
2. Describe the procedures for the mixing and placement of underbeds for terrazzo.
3. Describe the placement of divider strips and expansion joints.
4. Describe the procedures for the placement of terrazzo mixes.
5. Describe seeding and rolling of terrazzo topcoats.
6. Describe procedures for curing terrazzo.
7. Describe the process for grinding and finishing terrazzo.
8. Describe applications for precast terrazzo.

**C. Epoxy Terrazzo Installation ..... 8 Hours**

***Outcome:*** ***Describe installation procedures for epoxy terrazzo.***

1. Describe rollers and grinders for epoxy terrazzo.
2. Describe the procedures to inspect and prepare surfaces for epoxy-bonded terrazzo.
3. Describe the placement of divider strips and expansion joints.
4. Describe epoxy terrazzo mixes.
5. Describe the procedures for the placement of epoxy terrazzo mixes.
6. Describe the process for grinding and finishing epoxy terrazzo.

**D. Terrazzo Projects ..... 33 Hours**

***Outcome:*** ***With given specification produce terrazzo project.***

1. Mix and place underbeds for terrazzo.
2. Place divider strips and expansion joints.
3. Place and screed terrazzo mixes.
4. Seed terrazzo topcoats.
5. Cure terrazzo.
6. Grind and finish terrazzo.
7. Inspect and prepare surfaces for epoxy bonded terrazzo.
8. Mix and place epoxy terrazzo.
9. Grind and finish epoxy terrazzo.

**E. Terrazzo Repair ..... 3 Hours**

***Outcome:*** ***Describe repairing of terrazzo.***

1. Describe the conditions that cause terrazzo to deteriorate, crack and spall.
2. Describe the procedures to repair cracked and spelled terrazzo.
3. Describe the procedures to repair and prepare underbeds for terrazzo.
4. Describe the procedures to match existing terrazzo.
5. Describe the procedures to patch and finish a terrazzo repair.

**F. Terrazzo Repair Projects ..... 9 Hours**

***Outcome:*** ***Repair terrazzo.***

1. Describe the conditions that cause terrazzo to deteriorate, crack and spall.
2. Describe the procedures to repair cracked and spelled terrazzo.
3. Describe the procedures to repair and prepare underbeds for terrazzo.
4. Describe the procedures to match existing terrazzo.
5. Describe the procedures to patch and finish a terrazzo repair.

**SECTION FOUR: ..... ESTIMATING AND PLANS ..... 64 HOURS**

**A. Calculations ..... 8 Hours**

***Outcome:*** ***Solve calculation problems.***

1. Solve problems using basic arithmetic formulae.
2. Calculate tilesetting material quantities and basic costs.

**B. Quantity Calculations for Terrazzo and Stone Materials ..... 20 Hours**

***Outcome:*** ***Demonstrate the ability to calculate quantity tilesetting materials.***

1. Calculate sand and cement quantities for Portland terrazzo underbeds.
2. Calculate chip quantities for terrazzo toppings.
3. Calculate divider strip and expansion joint lengths for terrazzo.
4. Calculate quantities of chips, dust and resin for epoxy terrazzo.
5. Calculate stone and marble slab quantities.
6. Calculate anchors, grout and sealer quantities for stone.

**C. Material and Labour Estimates from Commercial Blueprints ..... 8 Hours**

***Outcome:*** ***Calculate quantities.***

1. Calculate material quantities, including waste factors from commercial blueprints and specifications.
2. Estimate manpower requirements for jobs. (crew size and hours).

**D. Commercial Blueprints ..... 24 Hours**

***Outcome:*** ***Interpret blueprints.***

1. Interpret schedules and specifications.
2. Interpret elevation drawings.
3. Interpret section views.
4. Interpret floor plans.
5. Interpret symbols & notations.
6. Interpret scaling & dimensioning.
7. Interpret plot plans.
8. Interpret and sketch details.

Note: Identify tilesetting elements in blueprints. Sketch tilesetting details.

**E. Workplace Coaching Skills and Advisory Network .....4 Hours**

1. Describe the following coaching skills used for training apprentices.
   a) identify the point of the lesson
   b) link the lesson
   c) demonstrate a skill
   d) provide opportunity to practice a skill
   e) give feedback to the learner
   f) assess the learner's progress
2. Describe the roles and purpose of the advisory network and the Provincial Apprenticeship Committee for the Tilesetter trade.

*Excellence through training and experience*

**2005.2**