



**Skilled  
Trades**  
Ontario

**Métiers  
spécialisés**  
Ontario

Apprenticeship  
Curriculum Standard

Drywall, Acoustic and  
Lathing Applicator

Levels 1 and 2

451A

2003



# Apprenticeship Pathway to a Certificate of Qualification

Phase 1: Registration

**Submit Application for Apprenticeship Training through the on-line portal or to local Service Delivery Office**

For on-line portal, please follow instructions for registration. You will need to create a *My Ontario* account to access online services.

**Training agreement signed and registered by both apprentice and sponsor**

**Access your Apprenticeship Training Standard Logbook\*\***  
skilledtradesontario.ca/about-trades/trades-information

\*\* This is the official record of your training progress. You are responsible for keeping it up-to-date.

**Complete on-the-job training**

*Demonstrate and receive sign-off on the competencies/skills in your Apprenticeship Training Standard Logbook*

**Complete in-school training**

*Attend and complete the in-class training set out in the Curriculum Training Standard*

Apprentices eligible to apply for apprenticeship incentive grants (Red Seal trades) and loans.

**Review and finalize your logbook with your sponsor**

**Submit proof of apprenticeship completion**  
via email, in-person or digital portal

Your Apprenticeship Training Standard Logbook details completion requirements. Submit the following:

- completed Apprenticeship Training Standard Logbook with signatures
- proof of hours

**Certificate of Apprenticeship is issued**

Trades without examination

**CofA is the final step of the program**

Trades with examination (compulsory and non-compulsory trades)\*

**Provisional Certificate of Qualification issued for a 12 month term**

To prepare for the CofQ examination download the Provincial and/or Red Seal Exam preparation guides.

**Make payment for your Certificate of Qualification examination**

Call to make a payment (647-847-3000 or 1-855-299-0028)

**Schedule a date to write your Examination**

To schedule your examination, contact your local Service Delivery Office.

**Pass Certificate of Qualification examination**

Apprentices eligible to apply for Apprenticeship Completion Grant (Red Seal trades) or Apprentice Completion Bonus (non-Red Seal)

**Certificate of Qualification is issued**

Upon completion, Sponsors may be eligible for Apprenticeship grants, incentives, bonuses or tax credits

Phase 2: Apprenticeship

Phase 3: Certification

\* For a list of trades subject to a certification examination, visit: skilledtradesontario.ca

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**Please Note:** This Standard has been revised to reflect the visual identity of Skilled Trades Ontario (STO) which replaced the Ontario College of Trades on January 1, 2022. The content of this Standard may refer to the former organization; however, all trade specific information or content remains relevant and accurate based on the original date of publishing.

Please refer to STO's website: [skilledtradesontario.ca](https://skilledtradesontario.ca) for the most accurate and up to date information. For information about BOSTA and its regulations, please visit [\*\*Building Opportunities in the Skilled Trades Act, 2021 \(BOSTA\)\*\*](#).

Any updates to this publication are available on-line; to download this document in PDF format, please follow the link: [Skilled Trades Ontario.ca](https://skilledtradesontario.ca).

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*Maintained with transfer to Skilled Trades Ontario 2003 (V100)*

### **Preface**

This curriculum standard for the Drywall, Acoustic and Lathing Applicator trade program is based upon the on-the-job performance objectives, located in the industry-approved training standard.

The curriculum is organized into 2 levels of training. The Reportable Subjects Summary chart (located on page 4) summarizes the training hours for each reportable subject.

The curriculum identifies the learning that takes place in-school. The in-school program focuses primarily on the theoretical knowledge and the essential skills required to support the performance objectives of the Apprenticeship Training Standards.

Employers/Sponsors are expected to extend the apprentice's knowledge and skills through practical training on a work site. Regular evaluations of the apprentice's knowledge and skills are conducted throughout training to verify that all apprentices have achieved the learning outcomes identified in the curriculum standard.

It is not the intent of the in-school curriculum to perfect on-the-job skills. The practical portion of the in-school program is used to reinforce theoretical knowledge. Skill training is provided on the job.

Please refer to Skilled Trades Ontario website ([www.skilledtradesontario.ca](http://www.skilledtradesontario.ca)) for the most accurate and up-to-date information about Skilled Trades Ontario. For information on *Building Opportunities in the Skilled Trades Act, 2021 (BOSTA)* and its regulations, please visit [Building Opportunities in the Skilled Trades Act, 2021, S.O. 2021, c. 28 - Bill 288 \(ontario.ca\)](http://www.skilledtradesontario.ca/building-opportunities-in-the-skilled-trades-act-2021-s.o.-2021-c.-28-bill-288)

### **Pre-requisites**

In order to advance to Level 2 of the apprenticeship program, an individual must have completed all of the units outlined in Level 1.

### **Hours Disclaimer** (if applicable)

It is agreed that Training Delivery Agents (TDAs) may need to make slight adjustments (with cause) according to particular apprentice needs and may deviate from the unit sequencing and the prescribed practical and theoretical hours shown within the standard. However, all TDAs will comply with the hours at the reportable subject level.

### **Suggested Equipment for Training Delivery Agencies**

The listing of tools on page 39 and page 40 does not list minimum quantities based on the understanding that the delivering TDA is in the best position to determine the need based on its delivery methodology.

**Personal and Safety Equipment:** Personal protective equipment is at the discretion of the TDA who must conform to Ontario Provincial Health and Safety Regulations.

### Introduction

The Drywall, Acoustic and Lathing Applicator curriculum has been developed in keeping with the prescribed Ministry of Labour, Immigration, Training and Skills Development Training Standards. The curriculum is designed to adhere to the current grade-reporting structures for the respective program specialties.

For easy reference, a time allocation has been included for each respective subject and unit, along with the Theory/Practical breakdown for the delivery of the Learning Content.

The curriculum has been designed to give the instructor every reasonable opportunity for flexibility and innovation without deviating to any significant degree from the subject requirements, as determined by the Provincial Advisory Committee, and as prescribed in the Regulations for the Trades. Since the scope of the prescribed curriculum is quite extensive, the apprentices must be expected to reinforce the acquired knowledge through regular independent out-of-classroom assignments. The curriculum has been presented in a chronological sequence in keeping with sound teaching methodologies. However, the actual application of the sequence may differ somewhat between Training Delivery Agencies because of scheduling, staffing, and facilities utilization.

The curriculum includes specific references to the Ministry of Labour, Immigration, Training and Skills Development Apprenticeship Training Standards. While these references to various performance objectives in the Training Standards have been linked to the respective in-school outcomes, employers should not assume complete coverage to a journeyperson level. The in-school delivery focuses primarily on the knowledge required to master the respective objectives outlined in the Training Standards. Employers, therefore, are expected to complete the training of these respective objectives by applying the prescribed in-school knowledge to the required practical learning experienced in the work setting.

To ensure that apprentices will be able to successfully demonstrate the learning outcomes according to performance criteria, specific times have been allocated in the respective areas to allow for some applications enhancement. It is of utmost importance that all application assignments relate to prescribed experiences only. Time constraints will not permit engaging apprentices in tasks of limited learning benefits that are unrelated to the curriculum outcomes. If the statement in the assigned operations begins with “perform,” “outline,” “describe,” or “explain,” the student is expected to complete the activity.

Regular evaluations of the apprentices' learning achievements must be performed in both theory and practical applications throughout the program to ensure consistency with learning outcome expectations. Testing of apprentice knowledge and skills will take place during the allotted delivery hours for each unit. In addition to providing an evaluation of apprentice competency, the review of test question answers is considered to be a valuable learning opportunity.

In all practical activities, the apprentices will observe the Occupational Health and Safety Act and the applicable regulations including use of personal protective equipment. Institutional regulations and policies may also apply.

## **Participation By Stakeholders**

A Steering Committee comprised of five members from four Training Delivery Agencies worked in collaboration with the Ministry of Labour, Immigration, Training and Skills Development and industry stakeholders, participated in the development of this document. The format that is used in this document has been approved by the Ministry of Labour, Immigration, Training and Skills Development .

Implementation  
September 2004



**Summary of Total Program In-School Training Hours**

<b>Number</b>	<b>Reportable Subjects</b>	<b>Hours Total</b>	<b>Hours Theory</b>	<b>Hours Practical</b>
<b>Level 1</b>				
1.1	Trade Knowledge and Safety Orientation	42	32	10
1.2	Trade Calculations	36	36	0
1.3	Plan Reading	36	36	0
1.4	Computers	24	24	0
1.5	Suspended Ceiling Systems	24	8	16
1.6	Partitions and Curtain Walls	96	20	76
1.7	Residential Steel-Stud Construction	42	12	30
	<b>Total</b>	<b>300</b>	<b>168</b>	<b>132</b>
<b>Level 2</b>				
2.1	Geometry Theory and Application	48	16	32
2.2	Suspended Ceilings	48	12	36
2.3	Drywall Partitions and Ceilings	54	20	34
2.4	Demountable Partitions	36	8	28
2.5	Raised-Access Flooring	12	4	8
2.6	Trade Calculations	24	24	0
2.7	Plan Reading	36	36	0
2.8	Metal Cutting and Welding	36	8	28
2.9	Thermal and Sound Theory and Application	6	6	0
	<b>Total</b>	<b>300</b>	<b>134</b>	<b>166</b>

# **Level 1**

**Reportable Subject Summary – Level 1**

<b>Number</b>	<b>Reportable Subjects</b>	<b>Hours Total</b>	<b>Hours Theory</b>	<b>Hours Practical</b>
1.1	Trade Knowledge and Safety Orientation	42	32	10
1.2	Trade Calculations	36	36	0
1.3	Plan Reading	36	36	0
1.4	Computers	24	24	0
1.5	Suspended Ceiling Systems	24	8	16
1.6	Partitions and Curtain Walls	96	20	76
1.7	Residential Steel-Stud Construction	42	12	30
	<b>Total</b>	<b>300</b>	<b>168</b>	<b>132</b>

Number:	1.1		
Title:	Trade Knowledge and Safety Orientation		
Duration:	Total Hours: 42	Theory: 32	Practical: 10
Prerequisites:	None		
Corequisites:	None		
Cross Reference to Learning Outcomes: U4315.01 – U4316.03			

### **General Learning Outcome**

Upon successful completion of the reportable subject, the apprentice is able to apply the requirements of safety practices, regulations and legislation while able to demonstrate knowledge of trade terminology and the tools of the trade.

### **Learning Outcomes**

Upon successful completion, the apprentice will be able to:

- 1.1.1 Describe the history and orientation of the trade.
- 1.1.2 Identify the tools of the trade and describe their safe use and maintenance.
- 1.1.3 Describe the relationship between attitude and safety on and off the job.
- 1.1.4 Describe various equipment, materials, and construction operations of the trade.

### **Learning Content**

- 1.1.1 Describe the history and orientation of the trade.
  - Describe the place of lathers in history and culture.
  - Describe current trends in the trade and list the advantages for continuous training towards a well rounded Drywall, Acoustic and Lathing Applicator.
- 1.1.2 Identify the tools of the trade and describe their safe use and maintenance.
  - Identify and describe the use and maintenance of hand tools, portable power tools, and laser levels used in the Drywall, Acoustic and Lathing Applicator trade.

- 1.1.3 Describe the relationship between attitude and safety on-and off-the-job.
- Select, wear, and maintain personal protective equipment.
  - Describe Workplace Hazardous Materials Information System (WHMIS) principles.
  - Describe safe operation of generic powder-actuated tools.
  - Identify and describe correct procedures for ladders and scaffolds and scissors lift.
  - Identify and describe the main aspects of electrical safety on the jobsite.
  - Apply proper lifting and handling techniques of construction materials as per safety legislation.
  - Describe the relevant government legislation and regulations.
- 1.1.4 Describe various equipment, materials, and construction operations of the trade.
- Identify the equipment, materials, and the construction elements of the trade by the correct name and the colloquial expression.
  - Describe and select metal lath material by size, gauge, and type for installation operations.
  - Identify and diagram framing of substructures for flat ceilings.
  - Layout and install hangers and ties as per plans and specifications.
  - Erect furring and carrying channels as per plans and specifications.
  - Install metal wire lath and accessories as per plans and specifications.
  - Plan and prepare a daily/periodical log of shop activities.

Evaluation Structure	
Theory Testing	Application Exercises
57%	10%

Number:	1.2		
<b>Title:</b>	<b>Trade Calculations</b>		
Duration:	Total Hours: 36	Theory: 36	Practical: 0
Prerequisites:	Unit 1		
Corequisites:	Unit 1		
Cross Reference to Learning Outcomes: U4316.03, U4316.04, U4322.05, U4324.04			

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to construct percentage calculations and perform operations using both the Imperial and Metric systems of measure.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 1.2.1 Construct geometric lines, arcs, angles, and figures as used in the trade.
- 1.2.2 Perform operations in the Imperial and Metric systems of measure.
- 1.2.3 Apply formulae for perimeter, area, and volume in both the Imperial and Metric systems of measure.
- 1.2.4 Perform percentage calculations as applied to money management.

### Learning Content

- 1.2.1 Construct geometric lines, arcs, angles, and figures as used in the trade.
  - Perform geometric development of common angles (90, 60, 45, 30, and 22.5), parallel lines, perpendicular lines, bisection of lines and angles, regular polygons (pentagon, hexagon, octagon, etc.).
  - Draw archways of various styles including circular, segmented arcs, elliptical, Tudor, and gothic.
- 1.2.2 Perform operations in the Imperial and Metric systems of measure.
  - Perform measurements and computations in both metric (millimeters and meters to two decimal places) and imperial systems (feet, inches, sixteenths of an inch).
  - Perform soft conversions (approximations) between metric and imperial measurements.

- 1.2.3 Apply formulae for perimeter, area, and volume in both the Imperial and Metric systems of measure.
- Perform perimeter, area, and volume calculations (rectangles, triangles, circles) in both the metric and imperial systems.
  - Perform hard conversions in linear, area, and volume calculations within each system of measurement e.g., inches to feet, square inches to square feet, millimeters squared to meters squared, etc.
- 1.2.4 Perform percentage calculations as applied to money management.
- Perform percentage calculations as applied to discounts, increases, payroll deductions, benefits, salary increases, RRSP's, etc.
  - Prepare a personal money management budget that includes rent, mortgage, food and clothing expenses, transportation expenses, entertainment expenses, etc.

Evaluation Structure	
Theory Testing	Application Exercises
30%	0%

Number:	1.3		
Title:	Plan Reading		
Duration:	Total Hours: 36	Theory: 36	Practical: 0
Prerequisites:	Unit 1, 2		
Corequisites:	Unit 1, 2		
Cross Reference to Learning Outcomes: U4316.01			

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to interpret the language of construction drawings with both material take-off of floor plans and reflected ceilings.

### Learning Outcomes

Upon successful completion the apprentice will be able to:

- 1.3.1 Construct drawings using lines, symbols, abbreviations, and scales.
- 1.3.2 Apply the techniques of producing an orthographic projection of a small building.
- 1.3.3 Interpret the language of construction drawings.
- 1.3.4 Perform the proper sketching, interpretation, and material take-off of floor plans and reflected ceiling plans.

### Learning Content

- 1.3.1 Construct drawings using lines, symbols, abbreviations, and scales.
  - Identify commonly-used drafting equipment and materials.
  - Distinguish between the different lines, symbols, scales, and dimensioning conventions.
  - Produce floor plans and reflected ceiling plans.
- 1.3.2 Apply the techniques of producing an orthographic projection of a small building.
  - Identify plan, elevation, and section drawings and state their application.
  - Sketch an orthographic projection of a simple building including all plan, elevation, and section drawings.



- 1.3.3 Interpret the language of construction drawings.
- Identify and interpret the different lines, symbols, and scales of the various plan, elevation, and section drawings of a given set of construction drawings.
  - Identify and interpret floor plans and reflected ceiling plans.
- 1.3.4 Perform the proper sketching, interpretation, and material take-off of floor plans and reflected ceiling plans.
- Perform a material take-off from a set of floor plans and reflected ceiling plans.

Evaluation Structure	
Theory Testing	Application Exercises
25%	0%

Number:	1.4		
<b>Title:</b>	<b>Computers</b>		
Duration:	Total Hours: 24	Theory: 24	Practical: 0
Prerequisites:	None		
Corequisites:	None		
Cross Reference to Learning Outcomes: U4315.13, U4315.14			

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice is able to identify all components of a personal computer (PC) and produce various reports / assignments with the use of Microsoft Applications.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 1.4.1            Develop the basic computer skills for use in word-processing and spreadsheet applications.

### Learning Content

- 1.4.1            Develop the basic computer skills for use in word-processing and spreadsheet applications.
- Identify the main components of the personal computer and state their function.
  - Perform the basic actions of turning on the computer and accessing software packages using DOS and/or WINDOWS.
  - Perform basic applications in a word processing environment.
  - Perform basic applications in a spreadsheet format.

Evaluation Structure	
Theory Testing	Application Exercises
75%	0%

Number:	1.5		
<b>Title:</b>	<b>Suspended Ceiling Systems</b>		
Duration:	Total Hours: 24	Theory: 8	Practical: 16
Prerequisites:	Unit 1, 2, 3		
Corequisites:	Unit 1, 2, 3		
Cross Reference to Learning Outcomes: U4324.01			

### **General Learning Outcome**

Upon successful completion of the reportable subject, the apprentice will be able to identify all components and apply the proper tools to installing suspended ceiling systems.

### **Learning Outcomes**

Upon successful completion, the apprentice will be able to:

- 1.5.1 Identify the tools, components, accessories, layout, and installation procedures of suspended ceiling systems.
- 1.5.2 Select the proper installation of suspended ceiling systems as per plans and specifications.

### **Learning Content**

- 1.5.1 Identify the tools, components, accessories, layout, and installation procedures of suspended ceiling systems.
  - Identify the components, accessories, and types of tile of T-BAR and suspended drywall systems.
  - Sketch a grid system and layout pattern for a suspended ceiling system including spacing, hangers, and wire gauge.
  - Describe leveling techniques associated with water levels, lasers, lines, etc.

1.5.2 Select the proper installation of suspended ceiling systems as per plans and specifications.

- List the steps for the installation of suspended ceiling systems.
- Identify ceiling types and components as per plans and specifications.
- Install fasteners and hangers for ceilings as per specifications.
- Install and level ceiling suspensions as per plans and specifications.
- Install bulkheads and soffits as per plans and specifications.
- Install ceiling tile finishes as per plans and specifications.
- Fabricate and install access panels as per plans and specifications.

Evaluation Structure	
Theory Testing	Application Exercises
8%	11%

Number:	1.6		
<b>Title:</b>	<b>Partitions and Curtain Walls</b>		
Duration:	Total Hours: 96	Theory: 20	Practical: 76
Prerequisites:	Unit 1, 2, 3, 5		
Corequisites:	Unit 1, 2, 3, 5		
Cross Reference to Learning Outcomes: U4317.03, U4320.01-U4320.09, U4322.01 –U4322.08			

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to erect steel-stud walls, apply drywall and describe the application of acoustic and thermal insulation at a basic level.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 1.6.1 Describe the components and installation procedures for steel-stud walls and curtain walls.
- 1.6.2 Identify the types, components, accessories, and installation procedures of drywall products.
- 1.6.3 Select and install steel-stud walls and curtain walls and their accessories as per plans and specifications.
- 1.6.4 Select and apply drywall and its accessories to walls and ceilings as per plans and specifications.

### Learning Content

- 1.6.1 Describe the components and installation procedures for steel-stud walls and curtain walls.
  - Identify the components, sizes, spacing, gauges (structural vs. non-structural), fasteners, openings, and framing of steel-stud walls and curtain walls.
  - Describe the squaring, layout, plumbing, and alignment procedures for steel stud walls.
  - Identify jigs and templates and bracing techniques used in the installation of curtain walls.

- 1.6.2 Identify the types, components, accessories, and installation procedures of drywall products.
- Identify types of drywall and components, fasteners, spacing, thicknesses, fire ratings, MR, WR, exterior board, foil-backed, coreboard, vinyl board, gyplap sheeting, gypsum lath, blueboard, cement board, etc.
  - Describe cutting techniques and installation procedures for drywall application.
  - Describe the application of drywall to ceilings, soffits and bulkheads.
  - Identify drywall accessories and trim (corner bead, L-trim, J-trim, paper corners, etc., expansion joints, control joints, acoustical sealants, caulking) and state their application.
- 1.6.3 Select and install steel-stud walls and curtain walls and their accessories as per plans and specifications.
- Describe the steps for the installation, fastening, leveling, plumbing, and squaring of metal door frames.
  - Layout and install track, studs, stiffeners, and insulation as per plans and specifications.
  - Layout partition walls plumb and aligned as per plans and specifications.
  - Fasten the floor and ceiling tracks.
  - Select the required hollow metal door and window frames for openings.
  - Install studs and accessories as per plans and specifications.
  - Install hollow metal frames with reinforcing studs at doors and window openings.
- 1.6.4 Select and apply drywall and its accessories to walls and ceilings as per plans and specifications.
- Select wallboard as per plans and specifications.
  - Determine starting point for wallboard application.
  - Install wallboard to studs fastening and spacing screws as per plans and specifications.
  - Apply wallboard to curved surfaces as per plans and specifications.
  - Apply a double layer of wallboard as per plans and specifications.
  - Apply accessories to wallboard as per specifications.

Evaluation Structure	
Theory Testing	Application Exercises
25%	50%

Number:	1.7		
Title:	<b>Residential Steel-Stud Construction</b>		
Duration:	Total Hours: 42	Theory: 12	Practical: 30
Prerequisites:	Unit 1, 2, 3, 5, 6		
Corequisites:	Unit 1, 2, 3, 5, 6		
Cross Reference to Learning Outcomes:	U4317.01 – U4317.06		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to describe and apply the proper material and techniques used in residential construction.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 1.7.1 Describe the material and framing techniques of steel studs used in residential construction.
- 1.7.2 Layout and install residential steel-framed floors, walls, ceilings, and roofs as per plans and specifications.

### Learning Content

- 1.7.1 Describe the material and framing techniques of steel studs used in residential construction.
  - Identify types of structural steel studs and components, fasteners, spacing, thicknesses, fire ratings, etc., as used in residential construction.
  - Describe cutting techniques and installation procedures of track and stud.
  - Describe and sketch floor framing systems – beams, joists, and stairwell openings.
  - Identify load-bearing walls, and calculate lengths of headers (lintels), jacks, cripples, etc.
  - Describe the design of trusses and calculate and sketch the layout of the connection points of trusses.
  - Identify the accessories and trim related to residential steel construction.

- 1.7.2      Layout and install residential steel-framed floors, walls, ceilings, and roofs as per plans and specifications.
- Apply layout procedures as per plans and specifications and develop a materials' cutting list.
  - Measure, cut, and install headers, jacks, lintels, cripples, load-bearing walls.
  - Measure, cut, and install floor framing complete with stairwell opening.
  - Measure, cut, and install roof framing with rafters and trusses.
  - Measure, cut, and apply decking, sheathing and rigid insulation.

Evaluation Structure	
Theory Testing	Application Exercises
11%	18%



## **Level 2**

**Reportable Subject Summary – Level 2**

<b>Number</b>	<b>Reportable Subjects</b>	<b>Hours Total</b>	<b>Hours Theory</b>	<b>Hours Practical</b>
2.1	Geometry Theory and Application	48	16	32
2.2	Suspended Ceilings	48	12	36
2.3	Drywall Partitions and Ceilings	54	20	34
2.4	Demountable Partitions	36	8	28
2.5	Raised-Access Flooring	12	4	8
2.6	Trade Calculations	24	24	0
2.7	Plan Reading	36	36	0
2.8	Metal Cutting and Welding	36	8	28
2.9	Thermal and Sound Theory and Application	6	6	0
	<b>Total</b>	<b>300</b>	<b>134</b>	<b>166</b>

Number:	2.1		
Title:	<b>Geometry Theory and Application</b>		
Duration:	Total Hours: 48	Theory: 16	Practical: 32
Prerequisites:	Level 1, Unit 2		
Corequisites:	None		
Cross Reference to Learning Outcomes:	U4316.04, U4322.05, U4322.06, U4324.04		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to apply the techniques of advanced geometric construction as applied to the trade.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.1.1            Layout and construct archways, dome ceilings, vaulted groin ceilings, and curved walls and bulkheads as per plans and specifications.

### Learning Content

- 2.1.1            Layout and construct archways, dome ceilings, vaulted groin ceilings, and curved walls and bulkheads as per plans and specifications.
- Describe and draw:
    - Segmental, gothic, elliptical, parabolic, hyperbolic arches.
    - Regular polygons: pentagon, hexagon, and octagon.
    - Vaulted groin layout.
    - Dome ceilings and light coves.
    - Curved walls and bulkheads.
  - Layout and construct:
    - Segmental, gothic, elliptical, parabolic, hyperbolic arches.
    - Regular polygons: pentagon, hexagon, and octagon.
    - Vaulted groin ceilings.
    - Dome ceilings and light coves.
    - Curved walls and bulkheads.

Evaluation Structure	
Theory Testing	Application Exercises
25%	23%

Number:	2.2		
Title:	<b>Suspended Ceilings</b>		
Duration:	Total Hours: 48	Theory: 12	Practical: 36
Prerequisites:	Level 1, Unit 5		
Corequisites:	Level 1, Unit 1 - 3		
Cross Reference to Learning Outcomes:	U4324.01 – U4324.06		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to identify, and apply all the components and installation techniques of the more advanced suspended ceiling systems.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.2.1 Identify and list all components and installation techniques of advanced suspended ceiling systems.
- 2.2.2 Select and install suspended ceiling systems as per plans and specifications.

### Learning Content

- 2.2.1 Identify and list all components and installation techniques of advanced suspended ceiling systems.
  - List the components of, sketch the layout of, and describe the installation techniques of rectangular layout, 45° layout, bulkheads, soffits, etc., of the following:
    - Accessible Tile Systems (ATS);
    - Coffered Ceilings (Metal Pan);
    - Linear Systems.
- 2.2.2 Select and install suspended ceiling systems as per plans and specifications.
  - Select the components of, layout, and install rectangular layout, 45° layout, bulkheads, soffits, riveting, etc., of the following:
    - Accessible Tile Systems (ATS);
    - Coffered Ceilings (Metal Pan);
    - Linear Systems.

Evaluation Structure	
Theory Testing	Application Exercises
19%	25%

Number:	2.3		
Title:	Drywall Partitions and Ceilings		
Duration:	Total Hours: 54	Theory: 20	Practical: 34
Prerequisites:	Level 1, Unit 6		
Corequisites:	Level 1, Unit 1 – 3, 5		
Cross Reference to Learning Outcomes:	U4318, U4320, U4323		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to identify the procedures to select and install drywall partitions and shaft wall systems.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.3.1 Select the materials, components, and installation procedures of drywall partitions and shaft wall systems as per plans and specifications.
- 2.3.2 Select and install moulded and cast forms as per plans and specifications.

### Learning Content

- 2.3.1 Select the materials, components, and installation procedures of drywall partitions and shaft wall systems as per plans and specifications.
  - Identify and select metal components for specific installations as per plans and specifications.
  - List components of a shaft wall system.
  - Identify coreboard and accessories as per plans and specifications.
  - Describe the installation of exterior finish board and Exterior Insulation Finish Systems (EIFS).
  - Describe the installation of X-ray shielding to wall studs.
  - Describe the importance of air leakage control and sound dampening and the application of acoustical sealants and caulking as per plans and specifications.

2.3.2 Select and install moulded and cast forms as per plans and specifications.

- Select metal components for specific installations as per plans and specifications.
- Install components of a shaft wall system.
- Install coreboard and accessories as per plans and specifications.
- Apply exterior finish board.
- Layout and install the substructure for moulded and cast forms as per plans and specifications.
- Apply the finish forms to the substructure.

Evaluation Structure	
Theory Testing	Application Exercises
31%	25%



Number:	2.4		
Title:	<b>Demountable Partitions</b>		
Duration:	Total Hours: 36	Theory: 8	Practical: 28
Prerequisites:	Level 1, Unit 6		
Corequisites:	Level 1, Unit 1 – 3, 5 & 6		
Cross Reference to Learning Outcomes:	U4326		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to identify and select proper materials, components and installation procedures to install demountable partitions.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.4.1 Select the materials, components, and installation procedures of demountable partitions as per plans and specifications.
- 2.4.2 Install demountable partitions.

### Learning Content

- 2.4.1 Select the materials, components, and installation procedures of demountable partitions as per plans and specifications.
  - Identify the components of de-mountable partition walls on a construction project (progressive and non-progressive) as per plans and specifications.
  - Describe the installation of pre-finished tracks on a construction project as per plans and specifications.
  - Describe the framing of rough openings for windows and doors as per plans and specifications.
  - List the steps in the application of pre-finished panels and finished trims and accessories as per plans and specifications.
  - List the properties of sound insulation and sound baffles and describe the installation procedures.
  - List the different products and processes for cleanup procedures for vinyl drywall upon completion of the job.

2.4.2 Install demountable partitions.

- Install de-mountable partitions as per plans and specifications.
- Install pre-finished tracks as per plans and specifications.
- Frame openings for windows and doors as per plans and specifications.
- Apply pre-finished panels as per plans and specifications.
- Apply finished trims and accessories as per plans and specifications.
- Perform cleanup procedures on the vinyl drywall.

Evaluation Structure	
Theory Testing	Application Exercises
13%	21%

Number:	2.5		
Title:	<b>Raised-Access Flooring</b>		
Duration:	Total Hours: 12	Theory: 4	Practical: 8
Prerequisites:	None		
Corequisites:	Level 1, Unit 1 – 3, 5 - 7		
Cross Reference to Learning Outcomes:	U4325		

### **General Learning Outcome**

To develop in the apprentice knowledge of the materials, components, and installation procedures of raised-access flooring as per plans and specifications.

To develop in the apprentice skill in the selection and installation of raised-access flooring as per plans and specifications.

### **Learning Outcomes**

Upon successful completion, the apprentice will be able to:

- 2.5.1 Identify the materials, components and installation procedures of raised-access flooring.
- 2.5.2 Select and install raised-access flooring.

### **Learning Content**

- 2.5.1 Identify the materials, components, and installation procedures of raised-access flooring.
  - Identify the materials and components of raised-access flooring.
  - Apply the principles of construction geometry to the layout of square grid lines.
  - Describe the installation of the substructure for raised-access floors as per manufacturers' specifications.
  - Describe the installation of access floor panels into the grid using suction lift tool.
  - Describe the installation of vinyl baseboard mouldings around perimeter of the floor as per plans and specifications.
  - Describe the installation of ramps, stairs, and handrails for raised-access floors as per plans and specifications.

2.5.2 Select and install raised-access flooring.

- Layout grid lines for raised-access flooring as per plans and specifications.
- Install and level the pedestals of the substructure for raised-access floors with a laser level as per manufacturers' specifications.
- Install access floor panels into the grid using suction lift tool.
- Install ramps, stairs, and handrails for raised-access floors as per plans and specifications.

Evaluation Structure	
Theory Testing	Application Exercises
5%	6%

Number:	2.6		
Title:	Trade Calculations		
Duration:	Total Hours: 24	Theory: 24	Practical: 0
Prerequisites:	Level 1, Unit 2		
Corequisites:	Level 1, Unit 1 - 3		
Cross Reference to Learning Outcomes:	U4316.03		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to apply trade calculations to trade applications.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.6.1 Apply knowledge of trade applications of ratio and proportion.
- 2.6.2 Apply equations and formulae used in the trade computations.
- 2.6.3 Apply the basic trigonometric ratios of the right-angles triangle.

### Learning Content

- 2.6.1 Apply knowledge of trade applications of ratio and proportion.
  - Relate fractions and ratios.
  - Solve simple ratio equations by cross-multiplication.
  - Apply ratio and proportion computations to scaling up or down of geometric figures.
- 2.6.2 Apply equations and formulae used in the trade computations.
  - Apply Pythagoras' theorem to find the unknown length of a side of a right-angled triangle.
  - Apply stair calculation formulae to determine unit rise, unit run, tread size, headroom, and stairwell opening as governed by the Ontario Building Code.
  - Apply roof calculations formulae to determine rafter lengths and truss chord positions for residential steel framing.

- 2.6.3 Apply the basic trigonometric ratios of the right-angles triangle.
- Define the trigonometric ratios of sine, cosine, and tangent for a right-angled triangle.
  - Apply the appropriate trigonometric ratio to find the unknown lengths of the sides of a right-angled triangle.
  - Apply the inverse of the appropriate trigonometric ratio to find the unknown angles of a right-angled triangle.

Evaluation Structure	
Theory Testing	Application Exercises
100%	0%

Number:	2.7		
Title:	Plan Reading		
Duration:	Total Hours: 36	Theory: 36	Practical: 0
Prerequisites:	Level 1, Unit 3		
Corequisites:	Level 1, Unit 1 - 3		
Cross Reference to Learning Outcomes:	U4316.01		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to interpret computerized plans and specifications, engineered drawings and section details as well as room finishes and change orders.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.7.1 Interpret computerized plans and specifications.
- 2.7.2 Interpret engineered drawings and section details.
- 2.7.3 Interpret room finishes, finish schedules, and change orders.

### Learning Content

- 2.7.1 Interpret computerized plans and specifications.
  - Access construction drawings on the computer and identify and interpret: lines, symbols, abbreviations, scales, elevations, and floor and ceiling plans.
  - Access construction specifications on the computer and determine the requirements for a given job.
- 2.7.2 Interpret engineered drawings and section details.
  - Access engineered drawings on the computer and identify the requirements for a given job.
  - Access section details on the computer and determine the requirements for a given job.

2.7.3 Interpret room finishes, finish schedules, and change orders.

- Access finish schedules on the computer and determine the requirements for a given job.
- Access change orders on the computer and determine the requirements for a given job.

Evaluation Structure	
Theory Testing	Application Exercises
100%	0%



Number:	2.8		
Title:	<b>Metal Cutting and Welding</b>		
Duration:	Total Hours: 36	Theory: 8	Practical: 28
Prerequisites:	None		
Corequisites:	Level 1, Unit 1		
Cross Reference to Learning Outcomes:	U4315.11, U4315.12		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to identify and apply health regulations and safe operation practices for electrical welding equipment, using both Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW).

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.8.1 List and identify the health regulations, safe operation practices, and the setup procedures of electrical welding equipment - Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW).
- 2.8.2 Select and apply specific electrodes for the production of various welded joint designs and thickness.

### Learning Content

- 2.8.1 List and identify the health regulations, safe operation practices, and the setup procedures of electrical welding equipment - Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW).
  - Select, wear, and maintain personal protective equipment for SMAW.
  - State the correct procedures for the setup and operation of SMAW equipment.
  - List the units of basic electricity and identify the relationships and principles from which the units are derived.
  - Distinguish between direct and alternating current (AC – DC).
  - Select the current and polarity to perform a welding task.
  - Strike and maintain arc.
  - Select, wear, and maintain personal protective equipment for GMAW.
  - Identify the parts and components of a Metallic Inert Gas (MIG) welder.

- Identify personal protective equipment pertaining to safety in welding.
- Distinguish between the types of welding and their applications.
- Identify the types of welding equipment and their components.
- Identify the type of fire extinguisher as per type of fire.

2.8.2 Select and apply specific electrodes for the production of various welded joint designs and thickness.

- Select specific electrodes as per welding task.
- Operate SMAW and GMAW equipment to complete a minimum of two tee and lap joints using a variety of electrodes and sizes.
- Select specific wires for use in the production of various joint designs and thickness.
- Operate GMAW equipment to complete a minimum of two tee and lap joints using 0.035" wire on a variety of metal thickness.

Evaluation Structure	
Theory Testing	Application Exercises
60%	40%

Number:	2.9		
Title:	<b>Thermal and Sound Theory and Application</b>		
Duration:	Total Hours: 6	Theory: 6	Practical: 0
Prerequisites:	None		
Corequisites:	Level 1, Unit 1 - 3, 5 - 7		
Cross Reference to Learning Outcomes:	U4319		

### General Learning Outcome

Upon successful completion of the reportable subject, the apprentice will be able to identify and select the materials, components, and installation procedures of thermal and sound insulation as per plans and specifications.

### Learning Outcomes

Upon successful completion, the apprentice will be able to:

- 2.9.1 Identify the materials, components, and installation procedures of thermal and sound insulation.

### Learning Content

- 2.9.1 Identify the materials, components, and installation procedures of thermal and sound insulation.
- Identify thermal and sound insulation and barriers as per plans and specifications.
  - Select fastening methods as per plans and specifications.
  - Describe the installation of insulation or sound attenuation blankets.
  - Describe the installation of air-vapour barriers.
  - Describe the sealing of air-vapour barriers as per plans and specifications.
  - Plan the layout and installation of baffles as per plans and specifications.

Evaluation Structure	
Theory Testing	Application Exercises
8%	0%

## **APPENDIX A: Tools and Equipment List**

### **Shop Tool List**

- 1 Laser Level and Tripod
- 1 Water Level
- 1 Metal Shears
- 1 Metal Nibblers
- 2 Electric Drills
- 2 Right Angle Drills
- 1 Hammer Drill
- 2 Screw Guns (Heavy Duty)
- 1 Compound Mitre Saw
- 1 Metal Chop Saw
- 1 Circular Saw
- 1 Table Saw
- 2 Powder-Actuated Nail Guns (Low-velocity)
- 1 Set of Benders
- 1 Bolt Cutters (24")
- 1 Deck Punch
- 4 4' Spirit Levels with magnets

### **Shop Equipment**

- 10 Step Ladders @ 6' (fiberglass or wood)
- 1 Drywall Cart
- 3 Sections scaffolding, leveling jacks, legs, wheels, outriggers, pins, banana clips
- 6 Aluminum Scaffold Planks (approved)
- 8 Baker's Scaffold
- 1 Rigging Kit
- 16 Extension Cords (14-3)
- 1 Shop Vacuum
- 6 Shop Floor Brooms
- 3 Flat Shovels (Cleanup)
- 2 Garbage carts on wheels (Rubbermaid)

**Minimum FACILITY REQUIREMENTS for 16 Apprentices**

Classroom:	Desks / Tables, Chairs, Audio-Visual Equipment
Computer Room:	16 Computers with capability to run Win 3.1 and CAD program
Welding Shop:	ARC and MIG welding equipment to serve 16 apprentices
Shop Floor Area:	180 sq. ft. per apprentice**, adequate power supply & ventilation
	Storage Area of 1500 sq. ft.
	Instructor Office Area adjoining the Shop
**	200 ft <sup>2</sup> per extra apprentice



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Lather (Interior Systems Mechanic)