

SKILLED**TRADES**^{BC}

PROGRAM OUTLINE

Landscape Horticulturist

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LANDSCAPE HORTICULTURIST PROGRAM OUTLINE

BASED ON RSOS 2025

**Developed by
SkilledTradesBC
Province of British Columbia**

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Section 1

INTRODUCTION

Landscape Horticulturist

Foreword

The revised Landscape Horticulturist 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 Landscape Horticulturist Occupational Analysis (2028) and British Columbia industry and instructor subject matter experts.

Practical instruction by demonstration and student participation should be integrated with the classroom session. 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.

Practical exercises are included for those competencies that require a practical component. The intent of including practical exercises 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 measurable and that they reflect the skills spelled out in the competency as those required of a competent journey person. The conditions, under which these performances will be observed, as well as the criteria by which the learner will be evaluated and measured, must be clear to the learner. The learner must also be given the level of expectation of success.

SAFETY ADVISORY

Be advised that references to the WorkSafe BC 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 themselves about the Occupational Health and Safety Regulation pertaining to their work.

Acknowledgements

Industry and Instructor Subject Matter Experts retained to assist in the development and review of this Program Outline:

- Lindsay Lindholm HortEducationBC
- Janis Matson Shoreline Landscape Design Ltd.
- Christine Quist North Arrow Landscapes Ltd.
- Sheldon Ridout The Silent Gardener Ltd.
- Jack van Duynhoven School of Horticulture Kwantlen Polytechnic University

SkilledTradesBC would like to acknowledge the dedication and hard work of all the industry representatives appointed to identify the training requirements of the Landscape Horticulturist occupation.

Previous Contributors

Industry and Instructor Subject Matter Experts retained to assist in the development and review of the 2021 Program Outline:

- Jeff Foley Para Space Landscaping Inc.
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- Catherine Dale Burnaby School District
- Kevin Jones Vancouver Island University
- Anne Kadwell Horticulture Consultant
- Laura Principe City of Vancouver Parks Department
- Laura Biggs Pacific Horticulture College

How to Use this Document

This Program Outline has been developed for the use of individuals from several different audiences. The table below describes how each section can be used by each intended audience.

Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Program Credentialing Model	Communicates program length and structure, and all pathways to completion	Illustrates the length and structure of the program	Illustrates the length and structure of the program, and pathway to completion	Illustrates the challenger pathway to Certificate of Qualification
OAC	Communicates the competencies that industry has defined as representing the scope of the occupation	Displays the competencies that an apprentice is expected to demonstrate in order to achieve certification	Displays the competencies apprentices will achieve as a result of program completion	Displays the competencies challengers must demonstrate in order to challenge the program
Training Topics and Suggested Time Allocation	Shows proportionate representation of general areas of competency (GACs) at each program level, the suggested proportion of time spent on each GAC, and percentage of time spent on theory versus practical application	Shows the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Shows the scope of competencies covered in the technical training, the suggested proportion of time spent on each GAC, and the percentage of that time spent on theory versus practical application	Shows the relative weightings of various competencies of the occupation on which assessment is based
Program Content	Defines the objectives, learning tasks, high level content that must be covered for each competency, as well as defining observable, measurable achievement criteria for objectives with a practical component	Identifies detailed program content and performance expectations for competencies with a practical component; may be used as a checklist prior to signing a recommendation for certification (RFC) for an apprentice	Provides detailed information on program content and performance expectations for demonstrating competency	Allows individual to check program content areas against their own knowledge and performance expectations against their own skill levels
Assessment Guidelines	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the general areas of competency covered in the technical training, the grading weight for each GAC, and the percentage of that time spent on theory versus practical application	Shows the general areas of competency covered in each level of technical training, the theory and practical grading weight, and the calculation method for final percentage marks	Shows the relative weightings of various general areas of competency within the occupation on which assessment is based

Section	Training Providers	Employers/ Sponsors	Apprentices	Challengers
Training Provider Standards	Defines the facility requirements, tools and equipment, reference materials (if any) and instructor requirements for the program	Identifies the tools and equipment an apprentice is expected to have access to; which are supplied by the training provider and which the student is expected to own	Provides information on the training facility, tools and equipment provided by the school and the student, reference materials they may be expected to acquire, and minimum qualification levels of program instructors	Identifies the tools and equipment a tradesperson is expected to be competent in using or operating; which may be used or provided in a practical assessment
Appendix A – Glossary of Acronyms			Defines program specific acronyms	
Appendix B – Summary of Achievement Criteria	Summarizes and organizes expected practical assessments by level		Summarizes and organizes expected practical assessments by level	

Section 2

PROGRAM OVERVIEW

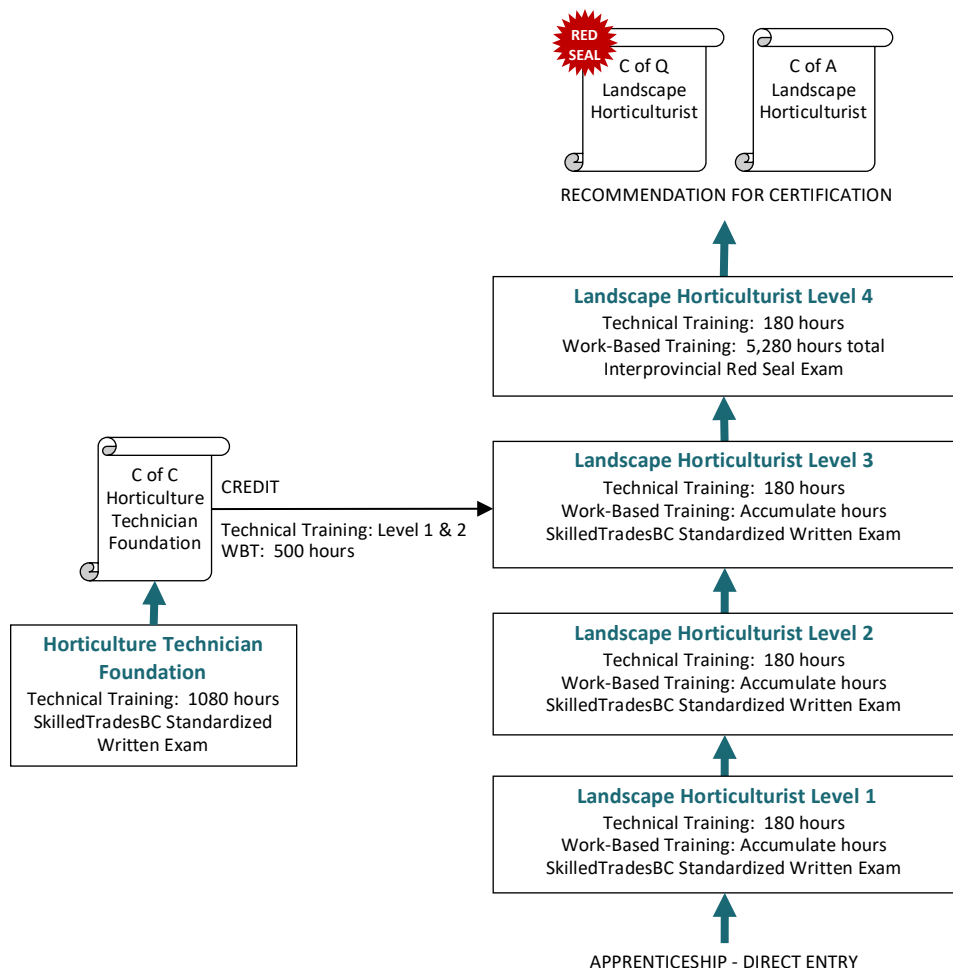
Landscape Horticulturist

Program Credentialing Model

Apprenticeship Pathway

This graphic provides an overview of the Landscape Horticulturist apprenticeship pathway.

*C of Q = Certificate of Qualification
C of A = Certificate of Apprenticeship
C of C = Certificate of Completion
WBT = Work-Based Training*



CROSS-PROGRAM CREDITS

Individuals who hold the credentials listed below are entitled to receive partial credit toward the completion requirements of this program



Occupational Analysis Chart

LANDSCAPE HORTICULTURIST

Occupation Description: Landscape horticulturists design, build, and maintain both living landscapes and structural hardscapes while providing expert plant care and project management for diverse environments.

Landscape horticulturists lead environmentally responsible practices by applying specialized skills in sustainable landscape management. They focus on efficient water use and conservation, supporting biodiversity, and minimizing maintenance and resource demands, while increasingly using new technologies to improve sustainability outcomes.

Landscape horticulturists work with machinery and equipment ranging from simple hand tools to heavy equipment. They may be responsible for routine maintenance of tools and equipment. Landscape horticulturists work with a variety of products such as soils, plant health products and fuels, and must be aware of their safe use, environmental best practices and government regulations.

Some landscape horticulturists specialize in areas such as landscape design, construction and maintenance, and greenhouse, sod and nursery production. Most of the work, such as landscape construction and maintenance, and snow and ice management is performed outdoors in all types of weather. The work may be strenuous and may involve activities such as lifting, climbing, carrying and bending. Employment in this trade can vary from workplace to workplace and may be seasonal and based on weather.

To meet tight production deadlines, landscape horticulturists must prioritize efficiency and effective time management. With experience and proven competence, landscape horticulturists may advance to supervisory positions or become business owners.

This standard recognizes similarities, overlaps and collaborations with the work of other tradespeople such as arborists, bricklayers/stone masons, heavy equipment operators, roofers, electricians, plumbers, gasfitters, small engine mechanics and carpenters.

PERFORM SAFETY-RELATED FUNCTIONS A	Use personal protective equipment (PPE) and safety equipment A1					Maintain safe work environment A2					Participate in healthy and respectful workplace practices A3				
	1					1					1				

USE TOOLS, EQUIPMENT AND VEHICLES B	Use hand tools B1					Use power tools B2					Use measuring equipment B3					Use vehicles and motorized equipment, trailers and attachments B4				
	1	2	3			1	2	3			1	2	3			1	2	3		

Section 2 Program Overview

ORGANIZE WORK C	Perform site assessments C1 1 2 3 4	Use documentation and reference material C2 1 2 3 4	Maintain records C3 1 2 3 4	Participate in job planning activities C4 4	Order materials C5 3	Organize materials and equipment C6 2 3
	Transport materials C7 1 2	Transport equipment C8 1 2				
PARTICIPATE IN MARKETING AND SALES D	Control inventory D1 4	Sell products and services D2 4	Maintain customer relations D3 4	Prepare estimates D4 4		
USE CONTINUOUS LEARNING TECHNIQUES E	Upgrade in new trade practices and procedures E1 4	Upgrade in emerging technologies E2 4				
USE COMMUNICATION AND MENTORING TECHNIQUES F	Use communication techniques F1 1	Use mentoring techniques F2 4				
APPLY HORTICULTURAL PRACTICES G	Practice plant science G1 1 2	Identify plants G2 1 2 3 4	Manage plant health, soil and growing conditions G3 1 2	Prune plant materials G4 1 2 3	Propagate plant material G5 2	Manage pests, diseases and invasive species G6 2 3 4

Section 2 Program Overview

APPLY ENVIRONMENTAL PRACTICES H	Practice environmental stewardship H1	Practice biodiversity enhancement H2	Practice soil stewardship H3	Practice water stewardship H4	Practice fire safety and prevention in landscaping H5
	1234	4	12	23	4
PERFORM PRE-CONSTRUCTION ACTIVITIES I	Participate in landscape design activities I1	Prepare construction site I2	Perform grading I3	Install drainage systems I4	
	4	2	12	12	
INSTALL HARDSCAPE J	Install landscape structures J1	Install surface materials J2	Install steps and retaining walls J3	Install irrigation systems J4	Install water features J5
	3	23	2	3	3
INSTALL SOFTSCAPE K	Install growing media K1	Install exterior landscape plants K2	Transplant plants K3	Install mulch K4	Install turf from seed K5
	1	2	2	2	1
	Install interior landscape plants K7				
	3				
INSTALL GREEN INFRASTRUCTURE SYSTEMS L	Participate in green infrastructure design activities L1	Install green roofs L2	Install green walls L3	Install rainwater and stormwater management systems L4	Install erosion control L5
	4	4	4	4	4
					Install biodiverse plantings and natural areas L6
					4

**Section 2
Program Overview**

MAINTAIN HARDSCAPE M	Maintain drainage systems M1	Maintain landscape structures M2	Maintain surface materials M3	Maintain steps and retaining walls M4	Maintain irrigation systems M5	Maintain water features M6																													
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MAINTAIN SOFTSCAPE N	Maintain extra-low voltage landscape lighting and other extra-low voltage electrical systems M7	Practice snow and ice control M8	Repair hardscape M9																																
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		3																																	
MAINTAIN GREEN INFRASTRUCTURE O	Maintain exterior softscape N1	Maintain interior softscape N2	Maintain turfgrass N3	Repair softscape N4																															
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MAINTAIN GREEN INFRASTRUCTURE O	Maintain green roofs O1	Maintain green walls O2	Maintain rainwater and stormwater management systems O3	Maintain erosion control O4	Maintain biodiverse plantings and natural areas O5																														
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Training Topics and Suggested Time Allocation

LANDSCAPE HORTICULTURIST – LEVEL 1

			% of Time Allocated to:			
			% of Time	Theory	Practical	Total
Line A	PERFORM SAFETY-RELATED FUNCTIONS		3%	40%	60%	100%
A1	Use personal protective equipment (PPE) and safety equipment			✓	✓	
A2	Maintain safe work environment			✓	✓	
A3	Participate in healthy and respectful workplace practices			✓	✓	
Line B	USE TOOLS, EQUIPMENT AND VEHICLES		8%	30%	70%	100%
B1	Use hand tools			✓	✓	
B2	Use power tools			✓	✓	
B3	Use measuring equipment			✓	✓	
B4	Use vehicles and motorized equipment, trailers and attachments			✓	✓	
Line C	ORGANIZE WORK		7%	70%	30%	100%
C1	Perform site assessments			✓	✓	
C2	Use documentation and reference material			✓	✓	
C3	Maintain records			✓	✓	
C7	Transport materials			✓	✓	
C8	Transport equipment			✓	✓	
Line F	USE COMMUNICATION AND MENTORING TECHNIQUES		2%	70%	30%	100%
F1	Use communication techniques			✓	✓	
Line G	APPLY HORTICULTURAL PRACTICES		33%	50%	50%	100%
G1	Practice plant science			✓	✓	
G2	Identify plants			✓	✓	
G3	Manage plant health, soil and growing conditions			✓	✓	
G4	Prune plant materials			✓	✓	
Line H	APPLY ENVIRONMENTAL PRACTICES		11%	80%	20%	100%
H1	Practice environmental stewardship			✓	✓	
H3	Practice soil stewardship			✓	✓	
Line I	PERFORM PRE-CONSTRUCTION ACTIVITIES		10%	40%	60%	100%
I3	Perform grading			✓	✓	
I4	Install drainage systems			✓	✓	
Line K	INSTALL SOFTSCAPE		11%	30%	70%	100%
K1	Install growing media			✓	✓	
K5	Install turf from seed			✓	✓	
K6	Install sod			✓	✓	

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line N	MAINTAIN SOFTSCAPE	15%	20%	80%	100%
N1	Maintain exterior softscape		✓	✓	
N3	Maintain turfgrass		✓	✓	
Total Percentage for Landscape Horticulturist Level 1		100%			

Training Topics and Suggested Time Allocation: Level 2

LANDSCAPE HORTICULTURIST – LEVEL 2

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line B	USE TOOLS, EQUIPMENT AND VEHICLES	7%	30%	70%	100%
B1	Use hand tools		✓	✓	
B2	Use power tools		✓	✓	
B3	Use measuring equipment		✓	✓	
B4	Use vehicles and motorized equipment, trailers and attachments		✓	✓	
Line C	ORGANIZE WORK	8%	60%	40%	100%
C1	Perform site assessments		✓	✓	
C2	Use documentation and reference material		✓	✓	
C3	Maintain records		✓	✓	
C6	Organize materials and equipment		✓	✓	
C7	Transport materials		✓	✓	
C8	Transport equipment		✓	✓	
Line G	APPLY HORTICULTURAL PRACTICES	36%	40%	60%	100%
G1	Practice plant science		✓	✓	
G2	Identify plants		✓	✓	
G3	Manage plant health and growing conditions		✓	✓	
G4	Prune plant materials		✓	✓	
G5	Propagate plant materials		✓	✓	
G6	Manage pests, diseases and invasive species		✓	✓	
Line H	APPLY ENVIRONMENTAL PRACTICES	12%	90%	10%	100%
H1	Practice environmental stewardship		✓	✓	
H3	Practice soil stewardship		✓	✓	
H4	Practice water stewardship		✓	✓	
Line I	PERFORM PRE-CONSTRUCTION ACTIVITIES	7%	30%	70%	100%
I2	Prepare construction site		✓	✓	
I3	Perform grading		✓	✓	
I4	Install drainage systems		✓	✓	
Line J	INSTALL HARDSCAPE	14%	30%	70%	100%
J2	Install surface materials		✓	✓	
J3	Install steps and retaining walls		✓	✓	
Line K	INSTALL SOFTSCAPE	8%	20%	80%	100%
K2	Install exterior landscape plants		✓	✓	
K3	Transplant plants		✓	✓	
K4	Install mulch		✓	✓	

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line M	MAINTAIN HARDSCAPE	2%	60%	40%	100%
M1	Maintain drainage systems		✓	✓	
M3	Maintain surface materials		✓	✓	
M4	Maintain steps and retaining walls		✓	✓	
M8	Practice snow and ice control		✓	✓	
Line N	MAINTAIN SOFTSCAPE	6%	20%	80%	100%
N1	Maintain exterior softscape		✓	✓	
N3	Maintain turfgrass		✓	✓	
Total Percentage for Landscape Horticulturist Level 2		100%			

Training Topics and Suggested Time Allocation: Level 3

LANDSCAPE HORTICULTURIST – LEVEL 3

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line B	USE TOOLS, EQUIPMENT AND VEHICLES	4%	20%	80%	100%
B1	Use hand tools		✓	✓	
B2	Use power tools		✓	✓	
B3	Use measuring equipment		✓	✓	
B4	Use vehicles and motorized equipment, trailers and attachments		✓	✓	
Line C	ORGANIZE WORK	11%	40%	60%	100%
C1	Perform site assessments		✓	✓	
C2	Use documentation and reference material		✓	✓	
C3	Maintain records		✓	✓	
C5	Order materials		✓	✓	
C6	Organize materials and equipment		✓	✓	
Line G	APPLY HORTICULTURAL PRACTICES	26%	40%	60%	100%
G2	Identify plants		✓	✓	
G4	Prune plant materials		✓	✓	
G6	Manage pests, diseases and invasive species		✓	✓	
Line H	APPLY ENVIRONMENTAL PRACTICES	6%	50%	50%	100%
H1	Practice environmental stewardship		✓	✓	
H4	Practice water stewardship		✓	✓	
Line J	INSTALL HARDSCAPE	35%	30%	70%	100%
J1	Install landscape structures		✓	✓	
J2	Install surface materials		✓	✓	
J4	Install irrigation systems		✓	✓	
J5	Install water features		✓	✓	
J6	Install extra-low voltage landscape lighting and other extra-low voltage electrical systems		✓	✓	
Line K	INSTALL SOFTSCAPE	3%	50%	50%	100%
K7	Install interior landscape plants		✓	✓	
Line M	MAINTAIN HARDSCAPE	9%	60%	40%	100%
M2	Maintain landscape structures		✓	✓	
M3	Maintain surface materials		✓	✓	
M5	Maintain irrigation systems		✓	✓	
M6	Maintain water features		✓	✓	
M7	Maintain extra-low voltage landscape lighting and other extra-low voltage electrical systems		✓	✓	
M9	Repair hardscape		✓	✓	

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line N	MAINTAIN SOFTSCAPE	6%	70%	30%	100%
N2	Maintain interior softscape		✓	✓	
N4	Repair softscape		✓	✓	
Total Percentage for Landscape Horticulturist Level 3		100%			

Training Topics and Suggested Time Allocation: Level 4

LANDSCAPE HORTICULTURIST – LEVEL 4

		% of Time Allocated to:			
		% of Time	Theory	Practical	Total
Line C	ORGANIZE WORK	10%	60%	40%	100%
C1	Perform site assessments		✓	✓	
C2	Use documentation and reference material		✓	✓	
C3	Maintain records		✓	✓	
C4	Participate in job planning activities		✓	✓	
Line D	PARTICIPATE IN MARKETING AND SALES	11%	60%	40%	100%
D1	Control inventory		✓	✓	
D2	Sell products and services		✓	✓	
D3	Maintain customer relations		✓	✓	
D4	Prepare estimates		✓	✓	
Line E	USE CONTINUOUS LEARNING TECHNIQUES	2%	90%	10%	100%
E1	Upgrade in new trade practices and procedures		✓	✓	
E2	Upgrade in emerging technologies		✓	✓	
Line F	USE COMMUNICATION AND MENTORING TECHNIQUES	3%	90%	10%	100%
F2	Use mentoring techniques		✓	✓	
Line G	APPLY HORTICULTURAL PRACTICES	18%	30%	70%	100%
G2	Identify plants		✓	✓	
G6	Manage pests, diseases and invasive species		✓	✓	
Line H	APPLY ENVIRONMENTAL PRACTICES	9%	80%	20%	100%
H1	Practice environmental stewardship		✓	✓	
H2	Practice biodiversity enhancement		✓	✓	
H5	Practice fire safety and prevention in landscaping		✓	✓	
Line I	PERFORM PRE-CONSTRUCTION ACTIVITIES	14%	50%	50%	100%
I1	Participate in landscape design activities		✓	✓	
Line L	INSTALL GREEN INFRASTRUCTURE SYSTEMS	26%	70%	30%	100%
L1	Participate in green infrastructure design and activities		✓	✓	
L2	Install green roofs		✓	✓	
L3	Install green walls		✓	✓	
L4	Install rainwater and stormwater management systems		✓	✓	
L5	Install erosion control		✓	✓	
L6	Install biodiverse plantings and natural areas		✓	✓	
Line O	MAINTAIN GREEN INFRASTRUCTURE	7%	70%	30%	100%
O1	Maintain green roofs		✓	✓	
O2	Maintain green walls		✓	✓	

		% of Time Allocated to:		
		% of Time	Theory	Practical
O3	Maintain rainwater and stormwater management systems		✓	✓
O4	Maintain erosion control		✓	✓
O5	Maintain biodiverse plantings and natural areas		✓	✓
Total Percentage for Landscape Horticulturist Level 4		100%		

Section 3

PROGRAM CONTENT

Landscape Horticulturist

Level 1

Landscape Horticulturist

Line (GAC):	A	PERFORM SAFETY-RELATED FUNCTIONS
Competency:	A1	Use personal protective equipment (PPE) and safety equipment

Objectives

To be competent in this area, the individual must be able to:

- Demonstrate personal safety in the workplace
- Demonstrate proper use of PPE
- Demonstrate proper use of safety equipment
- Describe the procedure for using a fire extinguisher
- Identify jurisdictional regulations

LEARNING TASKS

1. Select and use PPE as required for task, tools, equipment, machinery and environment
2. Inspect PPE prior to use
3. Store PPE to maintain its integrity
4. Describe the process to check PPE inventory
5. Recognize damaged and expired PPE
6. Check and replace PPE components
7. Recognize PPE requirements for chemical handling

CONTENT

- Protection
 - Ear
 - Eye
 - Hand
 - Foot
 - Safety vests
 - Respiratory
 - Fall
- Training and certification
- Jurisdictional regulations
- Operation
- Condition
- Dry
- Protected
- Clean
- Ready supply
- Expiration dates
- Integrity of PPE
- Manufacturers' specifications
- Workplace requirements
- Jurisdictional regulations
 - Recycle and dispose
- Goggles
- Rubber gloves
- Face shields
- Chemical protection suits

LEARNING TASKS

8. Select, use, and store safety equipment

9. Describe the procedure for using a fire extinguisher

CONTENT

- Ventilation fans
- Spill kits
- Fire extinguishers
- Safety barriers
- First aid kits
- Signage
- Guards
- Jurisdictional regulations

- Uses
- Conditions to support a fire
- Classes of fires
- Extinguisher selection
 - Types

Achievement Criteria

Performance The learner will be able to use appropriate PPE for job tasks.

Conditions The learner will be given

- Instructions
- Procedures
- Equipment

Criteria The learner will be evaluated on

- Safety
- Accuracy
- Procedure

Line (GAC): A PERFORM SAFETY-RELATED FUNCTIONS
Competency: A2 Maintain safe work environment

Objectives

To be competent in this area, the individual must be able to:

- Assess site hazards and potential risks
- Follow specified safety procedures
- Follow WHMIS procedures

LEARNING TASKS

1. Assess site hazards and potential risks

CONTENT

- Motorized equipment
- High voltage
- Working at heights
- Utility hazards
 - Overhead
 - Underground
- Ergonomic
- Gravitational
 - Slips
 - Trips
 - Falls
- Public
- Personnel
 - Fatigue
 - Rushing
 - Complacency
 - Stress
 - Substance abuse
 - Ignorance
 - Frustration
 - Heat and cold stress
- Chemical
 - Tanks
 - Hazardous and toxic debris
- Environmental
 - Animals
 - Insects
 - Plants
 - Weather
 - Hazardous trees
 - Stewardship
- Injury avoidance
 - Self
 - Co-workers
 - Others

2. Coordinate task with other workers

LEARNING TASKS	CONTENT
3. Maintain worksite to avoid injuries to self and others	• Clean • Tidy
4. Use safety barriers when working in traffic areas	• Flags • Pylons • Signage
5. Participate in safety meetings and discussion	• Documents • Record keeping • Distribution
6. Report unsafe conditions to supervisor	• Recognizing • Reporting
7. Recognize safety warning signals	• Back-up signals • Back-up alarms • Warning lights • Universal hand signals
8. Recognize safety symbols	• Signage ○ Workplace ○ Job-site • Truck signage
9. Describe considerations to coordinate with other agencies	• Private and public line locators • Emergency response teams
10. Describe how to mitigate the risks of workplace accidents and injuries	• Visual assessments • Safe work plan • Post-job inspection
11. Describe WHMIS requirements	• Certification • Pictograms • Labels
12. Handle hazardous materials in accordance with government regulations and WHMIS procedures	• Types ○ Pesticides ○ Fertilizers ○ Fuels ○ Batteries • Contain spills • Recycle and dispose • Label • PPE

LEARNING TASKS

CONTENT

13. Identify relevant WorkSafeBC regulations

- Lock-out/tag-out
- Confined spaces
- Reporting
- Responsibilities
 - Employer
 - Supervisor

Line (GAC): **A PERFORM SAFETY-RELATED FUNCTIONS**
Competency: **A3 Participates in healthy and respectful workplace practices**

Objectives

To be competent in this area, the individual must be able to:

- Describe techniques to manage personal health and well-being
- Describe aspects of professionalism

LEARNING TASKS

1. Describe personal health and well-being

CONTENT

- Professional practice
- Healthy work environment
- Requirements
 - Physical
 - Emotional
- Workplace stressors
- Organizational cultures
 - Collaboration
 - Community
- Physical and mental health
 - Factors
 - Diet
 - Fitness
 - Sleep
- Management
 - Stress
 - Emotions

2. Describe techniques to manage personal health and well-being

- Management
 - Stress
 - Time
- Supports
- Substance usage
 - Effects

3. Describe aspects of professionalism

- Professional ethics
 - Values
 - Codes of conduct

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B1	Use hand tools

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain hand tools
- Store hand tools

LEARNING TASKS

1. Select and use hand tools
2. Perform hand tool maintenance (for level appropriate tools)
3. Store hand tools (for level appropriate tools)

CONTENT

- Common types
 - Environmental implications
 - Manufacturers' specifications
-
- Cleaning and disinfecting
 - Lubricating
 - Damage
 - Excessive wear
 - Proper operation
 - Sharpening
 - Replacing components
-
- Organization
 - Safety
 - Security
 - Preservation

Line (GAC): **B USE TOOLS, EQUIPMENT AND VEHICLES**

Competency: **B2 Use power tools**

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain power tools
- Store power tools and batteries

LEARNING TASKS

1. Select and use power tools
2. Perform power tool maintenance (for level appropriate tools)

CONTENT

- Common types
 - Adjusting
 - Environmental implications
 - Carbon reduction
 - Manufacturers' specifications
 - Remove from service
 - Company policy
 - Safety features
-
- Operational maintenance
 - Cleaning and disinfecting
 - Lubricating
 - Fluid levels
 - Tire pressure
 - Adjusting
 - Damage
 - Excessive wear
 - Malfunction
 - Proper operation
 - Sharpening
 - Balancing
 - Replacing components
 - Cooling fins
 - Maintenance schedule
 - Manufacturers' specifications
 - Safety features
-
- Preventative maintenance
 - Fuel
 - Filters
 - Air
 - Fuel
 - Lubrication
 - Oil
 - Grease
 - Spark plug

LEARNING TASKS**CONTENT**

- Controls and drive mechanisms
 - Bolts, belts, fittings, hoses
 - Tire pressure
 - Batteries

- 3. Store power tools
 - Organization
 - Safety
 - Security
 - Preservation

- 4. Handle batteries
 - Store
 - Recycle
 - Charge
 - Transport
 - Jurisdictional regulations

Line (GAC): **B USE TOOLS, EQUIPMENT AND VEHICLES**
Competency: **B3 Use measuring equipment**

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain measuring equipment
- Store measuring equipment

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Select and use measuring equipment | <ul style="list-style-type: none"> • Common types |
| 2. Perform maintenance on measuring equipment | <ul style="list-style-type: none"> • Cleaning and disinfecting • Proper operation • Contaminants • Calibrating • Batteries • Damage • Excessive wear |
| 3. Store measuring equipment | <ul style="list-style-type: none"> • Organization • Safety • Security • Manufacturer's specifications |

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B4	Use vehicles and motorized equipment, trailers and attachments

Objectives

To be competent in this area, the individual must be able to:

- Identify basic engine systems
- Discuss pre-operation checks, maintenance and repair
- Clean and inspect vehicles, motorized equipment, attachments and trailers
- Operate vehicles and motorized equipment

LEARNING TASKS

CONTENT

1. Identify basic engine systems	• Diesel • Electric • 2-stroke • 4-stroke
2. Inspect vehicles, motorized equipment, attachments and trailers	• Equipment ○ Turfgrass maintenance ○ Utility vehicles • Defects • Damage • Wear • Safety features
3. Operate vehicles and motorized equipment	• Equipment ○ Turfgrass maintenance – Cutting height ○ Utility vehicles • Jurisdictional regulations • Manufacturer's specifications • Company policy
4. Clean vehicles, motorized equipment, attachments and trailers	• Disinfection • Appearance • Leaks • Sanitation • Site conditions • Jurisdictional regulations • Environmental considerations
5. Discuss the procedures for pre-operation check and maintenance	• Safety features ○ Lock-out devices ○ Chutes ○ Guards

LEARNING TASKS

CONTENT

- | | |
|--|--|
| | <ul style="list-style-type: none"> ○ Rollover protection devices (ROP) ○ Operator presence switches ○ Seat belts ○ Jurisdictional regulations • Maintenance checks • Circle checks • Cold starts • Changing seasonal tires • Fluid levels • Lubricants • Components • Air pressure • Connections, fittings and hoses • Manufacturers' specifications • Company policy |
| 6. Discuss equipment maintenance and repairs | <ul style="list-style-type: none"> • Damaged and worn components <ul style="list-style-type: none"> ○ Spark plugs ○ Belts ○ Hoses ○ Pull cords ○ Bushings ○ Blades ○ Tines |

Line (GAC): **C ORGANIZE WORK**
Competency: **C1 Perform site assessments**

Objectives

To be competent in this area, the individual must be able to:

- Inspect site and determine requirements
- Assess soils
- Examine soil compaction
- Identify existing and proposed grading and drainage patterns

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Select and use specific tools and equipment as directed | <ul style="list-style-type: none"> • Tools <ul style="list-style-type: none"> ○ Soil probe ○ Shovels ○ Rakes |
| 2. Perform visual inspection | <ul style="list-style-type: none"> • Site <ul style="list-style-type: none"> ○ Parking ○ Access ○ Utilities • Environmental conditions • Neighbouring properties • Bylaws <ul style="list-style-type: none"> ○ Noise ○ Pollution |
| 3. Assess access points | <ul style="list-style-type: none"> • Site restrictions • Challenges for work |
| 4. Identify security requirements | <ul style="list-style-type: none"> • Theft protection • Risk of vandalism • Human health and safety • Wildlife |
| 5. Assess landscape site soils | <ul style="list-style-type: none"> • Soil or growing media depth • Soil quality concepts |
| 6. Examine soil compaction and drainage | <ul style="list-style-type: none"> • Impact of compaction <ul style="list-style-type: none"> ○ Soil permeability ○ Drainage |
| 7. Identify existing and proposed grading and drainage patterns | <ul style="list-style-type: none"> • Visual inspection <ul style="list-style-type: none"> ○ Positive drainage ○ Slope |

Line (GAC): **C ORGANIZE WORK**
Competency: **C2 Use documentation and reference material**

Objectives

To be competent in this area, the individual must be able to:

- Reference and interpret relevant documentation

LEARNING TASKS

1. Reference documentation pertaining to worker safety

2. Reference documentation pertaining to industry standards

3. Reference additional information resources

4. Interpret location documentation

CONTENT

- WHMIS
 - Safety Data Sheets (SDS)
- WorkSafeBC
- Company policy
- Jurisdictional regulations
 - Employment standards

- Types
- Canadian Landscape Standard (CLS)
- Material specifications
- Acronym lists

- Textbooks
- Field books
- Operator equipment manuals
- Internet
 - Resource credibility

- Locate utility lines (BC One Call)
- Other services

Line (GAC): **C ORGANIZE WORK**
Competency: **C3 Maintain records**

Objectives

To be competent in this area, the individual must be able to:

- Describe the types of tool and equipment records
- Describe the purpose of completing safety records

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe the types of tool and equipment records | <ul style="list-style-type: none"> • Sign-out records • Training sign-off sheets • Maintenance records • Calibration records |
| 2. Describe the purpose of completing safety records | <ul style="list-style-type: none"> • Company accountability <ul style="list-style-type: none"> ○ Accident reports ○ Lock out/ tag out ○ Safety meeting sheets ○ Safety data sheets • Regulations <ul style="list-style-type: none"> ○ Governmental ○ Industry ○ Company |

Line (GAC): **C ORGANIZE WORK**
Competency: **C7 Transport materials**

Objectives

To be competent in this area, the individual must be able to:

- Describe the procedure to cover and secure materials
- Describe the procedure to load/unload materials

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Describe the protection of plant materials | <ul style="list-style-type: none"> • Tarps • Anti-desiccants • Enclosed trailers • CLS |
| 2. Describe the procedure to secure materials | <ul style="list-style-type: none"> • Approved tie-downs • Jurisdictional regulations • Loose materials • Hazardous materials • Spillage prevention • Environmental protection |
| 3. Describe the procedure to load/unload materials | <ul style="list-style-type: none"> • Tools and equipment <ul style="list-style-type: none"> ○ Dollies ○ Forklifts • Optimal transport • Sequence • Direction • Weight distribution • Jurisdictional regulations <ul style="list-style-type: none"> ○ Gross vehicle weight ratings |
| 4. Describe the procedure to cover materials | <ul style="list-style-type: none"> • Jurisdictional regulations • Company policy |

Line (GAC): **C ORGANIZE WORK**
Competency: **C8 Transport equipment**

Objectives

To be competent in this area, the individual must be able to:

- Describe the procedure to secure loads
- Describe the procedure to load and unload equipment

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Describe the selection of vehicle/trailer type | <ul style="list-style-type: none"> • Equipment <ul style="list-style-type: none"> ○ Attachments • Weight restrictions • Licensing requirements |
| 2. Describe the procedure to secure loads | <ul style="list-style-type: none"> • Approved tie-downs • Jurisdictional regulations • Shifting |
| 3. Describe the procedure to load equipment | <ul style="list-style-type: none"> • Flags and signs • Ramps • Traffic cones • Blocks • Company policy • Jurisdictional regulations |
| 4. Describe the procedure to unload equipment | <ul style="list-style-type: none"> • Location • Proximity to work area • Level ground • Vehicle/trailer stabilization <ul style="list-style-type: none"> ○ Traffic cones ○ Blocks • Company policy • Jurisdictional regulations |

Line (GAC):	F	USE COMMUNICATION AND MENTORING TECHNIQUES
Competency:	F1	Use communication techniques

Objectives

To be competent in this area, the individual must be able to:

- Describe effective group functioning
- Use effective verbal and written communication

LEARNING TASKS

1. Describe characteristics of an effective team

CONTENT

- High performing crew/team
- Ineffective work crews
- Supervisory role

2. Participate in safety and information meetings

- Preparation
- Attendance
- Participation

3. Describe conflict management

- **Conflict**
 - Definition
 - Sources
- **Managing conflict**
 - Guidelines
 - Strategies
 - Styles

4. Use effective verbal and written communication techniques

- Basic communication skills
 - Listening
 - Speaking
 - Reading
 - Writing
- Non-verbal
- Barriers
- Active listening
- Mirroring
- Repeating back
- Report discrepancies
- Direction from supervisor
- Relaying information
 - Co-workers
 - Clients
 - Suppliers
 - Office staff
- Relaying information in laypersons' terms
 - Clients
 - Public

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 5. Describe effective feedback | <ul style="list-style-type: none"> • Giving • Receiving • Responding |
| 6. Describe the use of communication equipment | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Two-way radios ○ Digital ○ Calls ○ Text ○ Video ○ Mobile apps |
| 7. Use hand signals | <ul style="list-style-type: none"> • Other tradespeople <ul style="list-style-type: none"> ○ Machine operators ○ Truckers ○ Crane operators • Jurisdictional regulations |

Line (GAC): **G APPLY HORTICULTURAL PRACTICES**
Competency: **G1 Practice plant science**

Objectives

To be competent in this area, the individual must be able to:

- Describe external plant anatomy and morphological characteristics
- Explain the function of modified plant organs and their response to environmental stressors
- Describe basic plant life cycles and the germination requirements of seeds
- Identify cultural requirements and factors impacting growth and development

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Define plant morphology and morphological descriptors | <ul style="list-style-type: none"> • Definitions • Descriptors |
| 2. Describe the external anatomy of stems | <ul style="list-style-type: none"> • Herbaceous • Woody <ul style="list-style-type: none"> ○ Characteristics <ul style="list-style-type: none"> – Buds – Bark |
| 3. Describe leaf morphology and external anatomy | <ul style="list-style-type: none"> • Parts of a simple leaf • Leaf <ul style="list-style-type: none"> ○ Shapes ○ Tips ○ Bases ○ Margins ○ Surfaces ○ Venation • Simple and compound leaves • Leaf arrangement • Foliage types <ul style="list-style-type: none"> ○ Needle ○ Scale ○ Awl |
| 4. Describe parts of the flower | <ul style="list-style-type: none"> • Structure • Complete and incomplete • Perfect vs. imperfect • Monoecious vs. dioecious plants • Flower symmetry <ul style="list-style-type: none"> ○ Actinomorphic ○ Zygomorphic |

LEARNING TASKS

5. Identify typical inflorescences

6. Identify fruit types

7. Describe seed characteristics and development

8. Identify organ modifications

9. Identify the cultural requirements of plants

CONTENT

- Pattern types
 - Catkin
 - Capitulum (head)
 - Corymb
 - Cyme
 - Panicle
 - Raceme
 - Spike
 - Umbel
- Fleshy
- Dry
 - Dehiscent
 - Indehiscent
- Parts of a seed
- Germination requirements
 - Basic
 - Special treatments
- Dormancy and viability
- Monocot vs. dicot germination
- Roots, stems, leaves
- Reasons for modification
 - Storage
 - Protection
 - Propagation
 - Environmental stressors
- Light
- Moisture
- Soil type
- Hardiness
- Provenance
- Nutrients
- Tolerance
 - Salt
 - Wind
 - Drought
- Temperature range

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G2 Identify plants

Objectives

To be competent in this area, the individual must be able to:

- Identify plants and plant requirements for 50 woody and non-woody plants
- Identify morphological characteristics, growing requirements, use and availability

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>1. Classify a range of plant materials by life cycle and habit</p> | <ul style="list-style-type: none"> • Life cycle <ul style="list-style-type: none"> ○ Stages <ul style="list-style-type: none"> – Seed – Germination – Vegetative – Reproductive – Senescence ○ Annuals ○ Biennials ○ Perennials <ul style="list-style-type: none"> – Herbaceous perennials – Woody perennials ○ Monocarpic plants • Habit (growth form) <ul style="list-style-type: none"> ○ Foliage retention (Deciduous vs evergreen plants) <ul style="list-style-type: none"> – Deciduous – Evergreen – Broadleaf evergreens – Coniferous evergreens ○ Climbing plants <ul style="list-style-type: none"> – Specialized stems ○ Growth Patterns (Form) <ul style="list-style-type: none"> – Prostrate (creeping) – Upright – Weeping – Mounded |
| <p>2. Employ correct naming and plant identification terminology</p> | <ul style="list-style-type: none"> • Origin of plant naming systems • Common names • Plant taxonomy • Nomenclature • Binomial system for naming plants <ul style="list-style-type: none"> ○ Genus |

LEARNING TASKS

CONTENT

- | | |
|---|---|
| | <ul style="list-style-type: none"> ○ Species • Classification of plants <ul style="list-style-type: none"> ○ Hierarchy ○ Meanings • Writing botanical names <ul style="list-style-type: none"> ○ Basic naming rules |
| 3. Identify plants by family | <ul style="list-style-type: none"> • Plant families • Plant families commonly found in British Columbia <ul style="list-style-type: none"> ○ ASTERACEAE – Aster Family ○ CARYOPHYLLACEAE – Pink Family ○ ERICACEAE – Heath Family ○ LAMIACEAE – Mint Family ○ LILIACEAE – Lily Family ○ RANUNCULACEAE – Buttercup Family ○ ROSACEAE – Rose Family ○ SAPINDACEAE – Soapberry Family |
| 4. Examine and compare plant characteristics | <ul style="list-style-type: none"> • Form • Growth <ul style="list-style-type: none"> ○ Patterns ○ Habits • Root type • Foliage and foliage pattern • Stems and bark • Bud • Fruit • Seeds • Flower • Colour and texture • Mature size • Plant life cycle • Hardiness |
| 5. Use reference material to classify and identify plants | <ul style="list-style-type: none"> • Plant databases • Identification keys <ul style="list-style-type: none"> ○ Dichotomous keys ○ Limitations of plant keys ○ Coniferous key ○ Deciduous key • Books • Supplier catalogues • Mobile apps |

LEARNING TASKS

6. Identify and describe 50 woody and non-woody plants

CONTENT

- Botanical terms
- Requirements
 - Cultural
 - Maintenance

Line (GAC): **G APPLY HORTICULTURAL PRACTICES**
Competency: **G3 Manage plant health and growing conditions**

Objectives

To be competent in this area, the individual must be able to:

- Describe the conditions and practices that affect plant health
- Examine plant organs for signs of stress

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Select and use tools and equipment | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Hand lens ○ Soil probe ○ pH meter |
| 2. Describe the conditions that affect plant health | <ul style="list-style-type: none"> • Environmental <ul style="list-style-type: none"> ○ Air quality <ul style="list-style-type: none"> – Ozone – pollutants ○ Light ○ Humidity ○ Wind ○ Heating, ventilation and air conditioning (HVAC) systems ○ Temperature ○ Moisture ○ Reflective heat load • Growing <ul style="list-style-type: none"> ○ Microclimate ○ Available space ○ Plant hardiness ○ Topography • Soil <ul style="list-style-type: none"> ○ Type ○ Depth ○ pH level ○ Water availability |
| 3. Recognize basic practices that affect plant health | <ul style="list-style-type: none"> • Integrated Pest Management (IPM) principles • Maintenance practices • Installation practices • Canadian Standards for Nursery Stock |
| 4. Visually inspect growing media | <ul style="list-style-type: none"> • Signs and symptoms of health • Needs of growing media |

LEARNING TASKS

5. Use appropriate terminology to describe plant stress
6. Examine plant organs for evidence of stress

CONTENT

- Signs
- Symptoms
- Abiotic
 - Nutrient deficiencies
 - Environmental conditions
- Biotic
 - Diseases
 - Pests

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G4 Prune plant materials

Objectives

To be competent in this area, the individual must be able to:

- Demonstrate pruning techniques for shrubs, vines, and groundcovers
- Use common arboricultural hand tools to prune shrubs, vines, and groundcovers

LEARNING TASKS

1. Select and use tools and equipment

CONTENT

- Secateurs
- Hand saw
- Loppers
- Shears
 - Manual
 - Power
- Types of ladders
 - Orchard
 - Extension
 - Step
- Rakes
- String levels

2. Describe shrub, vine and groundcover pruning considerations

- Reasons for pruning shrubs, vines, and groundcovers
 - Health and vigour
 - Direct, control, or modify growth
 - Enhancing fruit and flower production
 - Dead, diseased, damaged, and interfering (DDDI)
 - Aesthetics
- Factors affecting the pruning of shrubs, vines, and groundcovers.
 - Plant form
 - Function
 - Age
 - Location
 - Timing
 - Pre-pruning treatments
 - Severe pruning
 - Alternatives to pruning

3. Establish pruning objectives

- Efficiencies while pruning
 - Hand pruning vs. mechanical tools
 - Efficiencies and maintenance standards
- Clearance

LEARNING TASKS

CONTENT

- | | |
|---|--|
| <p>4. Identify pruning techniques for young and established shrubs, vines, and groundcovers</p> | <ul style="list-style-type: none"> • Shade • Managing loads <ul style="list-style-type: none"> ○ Dynamic ○ Static • Health <ul style="list-style-type: none"> ○ DDDI • Flower and fruit production • View • Aesthetics • Training structure • Response <ul style="list-style-type: none"> ○ Recessive ○ Dominance ○ Two to three buds |
| <p>5. Describe timing of pruning shrubs, vines, and groundcovers</p> | <ul style="list-style-type: none"> • Pruning cuts <ul style="list-style-type: none"> ○ Thinning (removal) ○ Reducing ○ Heading • Three-cut method • Pruning methods <ul style="list-style-type: none"> ○ Cleaning ○ Thinning ○ Raising ○ Reduction ○ Restoration / rejuvenation ○ Shearing ○ Pinching ○ Heading • Plant groups according to growth and flowering habits • Factors that affect pruning time <ul style="list-style-type: none"> ○ Dormant season ○ Growth response ○ Wind and frost damage ○ Non-dormant pruning ○ Scorch ○ Site activities |

LEARNING TASKS

6. Demonstrate safe working practices and operation of common pruning equipment and tools
7. Organize and dispose of pruned material

CONTENT

- Safe working practices
 - PPE required
 - Safe working environment
 - Ergonomics
 - Lifting and carrying safety
 - Power equipment
 - Operation
 - Procedure
 - Jurisdictional regulations
- Maintenance of tools
 - Cleaning procedures
 - Pruning equipment
 - Ladders
- Jurisdictional regulations
- Efficiencies

Achievement Criteria

Performance	The learner will be able to demonstrate shrub pruning techniques.
Conditions	The learner will be given: • Materials, tools and equipment • PPE required for the task
Criteria	The learner will be evaluated on: • Pruned shrubs according to industry standards • Sustainable and safe work practice

Line (GAC): H APPLY ENVIRONMENTAL PRACTICES

Competency: H1 Practice environmental stewardship

Objectives

To be competent in this area, the individual must be able to:

- Define environmental stewardship
- Discuss standards and opportunities for stewardship related to site assessment and preparation

LEARNING TASKS

CONTENT

- | | | |
|----|---|---|
| 1. | Define environmental stewardship | <ul style="list-style-type: none"> • Natural and urban habitats and ecosystems <ul style="list-style-type: none"> ○ Conservation ○ Preservation ○ Reclamation ○ Protection ○ Function ○ Purpose <ul style="list-style-type: none"> – Psychosocial health ○ Structure |
| 2. | Describe standards for environmental protection and sustainability | <ul style="list-style-type: none"> • Silt fencing • Environmental construction practices • Material storage • Sourcing information |
| 3. | Discuss opportunities for sustainability related to site assessment and preparation | <ul style="list-style-type: none"> • Tools • Equipment • Plants • Materials • Disposal • Organized workflow • Site protection • Maintenance practices • Installation practices • Non-sustainable versus sustainable practices |
| 4. | List benefits of plants | <ul style="list-style-type: none"> • Carbon sequestration • Symbiotic relationships • Pollution mitigation • Cost savings • Aesthetics • Psychosocial health • Medicinal • Food source • Wildlife habitat |

LEARNING TASKS

CONTENT

- Building materials

Line (GAC): H APPLY ENVIRONMENTAL PRACTICES

Competency: H3 Practice soil stewardship

Objectives

To be competent in this area, the individual must be able to:

- Recognize soil and soil stewardship as keys to the successful practice of horticulture
- Describe the physical properties and behaviour of soil and soilless media

LEARNING TASKS

1. Describe factors of soil formation

2. Define soil quality

3 Identify soil and growing media profiles

CONTENT

- Mineral soil
 - Sand
 - Silt
 - Clay
- Formation factors
 - Parent material
 - Horizons
 - Biotic – living organisms
 - Topography
 - Climate
 - Time
- Manufactured/soilless media vs. natural soils
- Productivity vs. environmental health
 - Yield capacity
 - Biological function
 - Human/animal health connection
- Environmental stewardship
 - Environmental quality
 - Pollution prevention
 - Carbon sequestration
- Biosecurity
 - Invasive species prevention
 - Disease suppression
- Soil profile
 - Soil horizons
 - LFH (Organic layer)
 - A Horizon (Topsoil)
 - Organic matter (Integrated)
 - Microbiome
 - Subgrade

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <p>4. Explain the physical properties of soil and soilless media</p> | <ul style="list-style-type: none"> • Soil <ul style="list-style-type: none"> ○ Texture <ul style="list-style-type: none"> – Particle sizes – Specific surface area ○ Structure ○ Density ○ Bulk density • Porosity • Cultivation <ul style="list-style-type: none"> ○ Implications • Soil compaction <ul style="list-style-type: none"> ○ Causes ○ Impacts <ul style="list-style-type: none"> – Microbiome – Hardpan formation ○ Remediation |
| <p>5. Describe the behaviour of water in soil</p> | <ul style="list-style-type: none"> • Forces acting on water <ul style="list-style-type: none"> ○ Gravity ○ Capillary action • Retention and moisture levels <ul style="list-style-type: none"> ○ Soil water holding capacity ○ Field capacity ○ Permanent wilting point ○ Available water • Movement processes and infiltration factors <ul style="list-style-type: none"> ○ Infiltration <ul style="list-style-type: none"> – Infiltration factors <ul style="list-style-type: none"> • Composition (texture) • Compaction • Permeability ○ Percolation ○ Wetting front ○ Hydraulic conductivity • Site-specific movement <ul style="list-style-type: none"> ○ Native vs. urban/layered soils ○ Texture-driven flow interruptions • Drainage concepts <ul style="list-style-type: none"> ○ Surface and structural modifications <ul style="list-style-type: none"> – Function – Mounded plant beds – Raised plant beds – Subsoil sculpturing |

Achievement Criteria

Performance The learner will be able to perform soil testing.

Conditions The learner will be given:

- Soil samples for testing
- Materials, tools, and equipment

Criteria The learner will be evaluated on:

- Percolation
- Texture tests
- Topsoil depth
- Sustainable and safe work practice

Line (GAC):	I	PERFORM PRE-CONSTRUCTION ACTIVITIES
Competency:	I3	Perform grading

Objectives

To be competent in this area, the individual must be able to:

- Describe site grading
- Describe the effects of grading

LEARNING TASKS

1. Identify and use tools and equipment

CONTENT

- Tools
 - Builder level
 - Builder square
 - Spirit level
 - String level
 - Water level
 - Laser level
 - Landscape rakes
- Equipment
 - Excavators
 - Trenchers
 - Skid steers

2. Describe the considerations for grading

- Terminology
- Hazards
- Site function
- Specifications
- Jurisdictional regulations
- Grading plans
 - Existing grades
 - Proposed grades (finished)
 - Contour plans
- Verification

3. Describe the concept of salvaging and storing native soils

- Planning
- Stripping
- Storing
- Stockpiling
- Preservation
- CLS
- Jurisdictional regulations

4. Describe site grading

- Cut and fill
- Rough grading
- Grading for drainage
- Finish grading

LEARNING TASKS

5. Describe the effects of grading

CONTENT

- Environmental stewardship
- Soils
 - Erosion
 - Compaction
- Site hydrology

Line (GAC): I **PERFORM PRE-CONSTRUCTION ACTIVITIES**
Competency: I4 **Install drainage systems**

Objectives

To be competent in this area, the individual must be able to:

- Describe subsurface and surface draining systems

LEARNING TASKS

1. Identify tools and equipment

2. Describe types of drainage systems, their characteristics, and applications

3. Describe drainage components and their function

CONTENT

- Tools
 - Trenching shovels
 - Picks
 - Wheelbarrows
 - Pipe cutter
 - Glue
- Equipment
 - Excavators
 - Trenchers
- Drainage systems
 - Surface
 - Retention/detention ponds
 - Rain gardens
 - Open channels
 - Ditches
 - Swales
 - Subsurface
 - French drain
 - Perimeter drain
- Drainage system components
 - Surface
 - Storm drains
 - Utility hole covers
 - Drain outlets
 - Catch basins
 - Subsurface
 - Pipes
 - Geotextiles
 - Blind inlets
 - Bedding material
 - Clear crush
 - Drain rock
 - Washed sand

LEARNING TASKS

CONTENT

4. Describe drainage system planning and installation

- Plans
 - Drainage
 - Grading
- CLS
- Jurisdictional regulations
- Site
 - Protection
 - Preparation
- Installation

Line (GAC): **K** **INSTALL SOFTSCAPE**
Competency: **K1** **Install growing media**

Objectives

To be competent in this area, the individual must be able to:

- Install growing media using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand tools and equipment

CONTENT

- Tools
 - Shovels
 - Picks
 - Rakes
 - Wheelbarrows
- Equipment
 - Skid steers
 - Loaders
 - Excavators
- Truck blowers

2. Verify functioning of drainage systems

- Surface
- Subsurface

3. Scarify subsoil

- Soil layering
- Glazing
- Nutrient cycling

4. Identify growing media

- Types
 - Native
 - Soilless medium
 - Manufactured
 - Compost
- Drawings and specifications

5. Select growing media

- Types
 - Native
 - Soilless medium
 - Manufactured
 - Compost

6. Add growing media

- Drawings and specifications
- Lifts
- Standards for compaction
- Irrigation
- Verify depth

7. Add and incorporate amendments, fertilizers, and bio stimulants according to soil test results
 - Composts
 - Bark fines
 - Soil microorganisms
 - Mycorrhizae
 - Aggregates
 - Peat moss
 - Mycorrhizae
 - Humic acid
 - Beneficial bacteria

8. Shape and grade growing media
 - Standards
 - Drawings
 - Specifications

Line (GAC):	K	INSTALL SOFTSCAPE
Competency:	K5	Install turf from seed

Objectives

To be competent in this area, the individual must be able to:

- Install turf from seed using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand tools and equipment
2. Describe turfgrass functions and standards for quality
3. Describe turfgrass nutrition and application technology
4. Describe turfgrass and water use

CONTENT

- Tools
 - Rollers
 - Landscape rakes
 - Seed spreaders
- Equipment
 - Hydro-seeders
 - Seed drills
 - Tractors and attachments
- Functions of lawns
 - Recreational use
 - Aesthetic use
 - Environmental function
- Turf quality
 - Visual turf quality
 - Functional turf quality
- Nutrition and soil amendments
 - Roles of nitrogen, phosphorous and potassium
- Selection of fertilizer
 - Coated fertilizers
 - Synthetic organic sources/natural organic sources
- Fertilizer calculations
 - Cost of nutrient/product and cost of nutrient/site
 - Application technology
 - Calibration of drop rotary spreaders
- Water use
 - Water use characteristics in common turfgrass
 - Turfgrass with drought resistance ranking
- Symptoms of water stress
- Irrigation monitoring strategies

LEARNING TASKS

5. Describe turfgrass selection and identification

CONTENT

- Common turfgrass species and blends
- Standards for species selection
 - Perennial ryegrass
 - Annual ryegrass
 - Annual bluegrass
 - Kentucky bluegrass
 - Fine fescues
 - Creeping bentgrass
 - Colonial bentgrass
- Seed quality
 - Drought resistance
 - Biotic
 - Chafer
 - The national turfgrass evaluation program
 - Certified and common seed
 - Jurisdictional regulations
 - Standards
 - Seed germination
 - Seed purity
 - Calculating pure live seed (PLS)

6. Prepare seedbed

- Grading
- Debris removal
- Soil depth
- Compaction
- Amendments
 - Organic matter
 - Compost
 - Coir
 - Fertilizers
 - Sulfur
 - Lime
- Bio stimulants
 - Mycorrhizae
- Irrigation
- Scarify
- Standards and specifications

7. Verify seed variety and seeding rate

- Manufacturer's specifications
 - Application rate
 - Seed variety
- Calibration

LEARNING TASKS

8. Apply seed to prepared area

9. Apply organic matter

10. Describe procedures for post-seeding care

CONTENT

- Landscape rollers
- Seed distribution
 - Seed count
 - Cross-directional seeding
- Uniform and targeted application
- Weather conditions
 - Wind
 - Temperature
 - Precipitation
- Types
 - Hydro mulch
 - Straw
 - Compost
- Application
 - Moisture retention
 - Seed mobility
 - Erosion control
- Irrigation
- Weeding
- Reapplication
- Establishment

Line (GAC): **K** **INSTALL SOFTSCAPE**
Competency: **K6** **Install sod**

Objectives

To be competent in this area, the individual must be able to:

- Install sod using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand tools

2. Select and use equipment

3. Describe turfgrass functions and characteristics for quality

4. Prepare the area to be sodded

CONTENT

- Tools
 - Rollers
 - Landscape rakes
 - Sod knives
- Equipment
 - Rollers
 - Tractors and attachments
- Functions of lawns
 - Recreational use
 - Aesthetic use
 - Environmental function
- Turf viability
 - Wildlife prevalence
- Turf quality
 - Visual turf quality
 - Functional turf quality
- Grading
- Debris removal
- Utility marking
- Soil depth
- Compaction
- Amendments
 - Organic matter
 - Compost
 - Coir
 - Fertilizers
 - Sulfur
 - Lime
 - Bio stimulants
 - Mycorrhizae
- Irrigation
- Scarify
- Standards and specifications

LEARNING TASKS	CONTENT
5. Verify sod	• Variety • Quality ○ Standards ○ Contract documents • Quantity
6. Lay sod	• Procedures ○ Seams ○ Orientation of sod ○ Grade ○ Shape and features ○ Minimal cuts • Landscape rollers • Drawings and specifications
7. Describe procedures for post-sod care	• Establishment ○ Root attachment ○ Plant health ○ Deficiencies ○ Pooling • Standards and specifications • Irrigation • Pest control • Jurisdictional regulations • First mow • Top dressing / overseeding
8. Dispose of or recycle excess materials	• Jurisdictional regulations • Industry standard

Achievement Criteria

Performance	The learner will be able to install sod.
Conditions	The learner will be given: • Materials, tools and equipment • Drawings and specifications • Outdoor surface area for preparation and installation
Criteria	The learner will be evaluated on: • Sod selection meeting specifications and CLS • Site preparation according to specifications and CLS • Installation of sod according to specifications and CLS • Initial care plan • Sustainable and safe work practice

Line (GAC): **N MAINTAIN SOFTSCAPE**
Competency: **N1 Maintain exterior softscape**

Objectives

To be competent in this area, the individual must be able to:

- Describe the purpose of exterior softscape maintenance
- Describe the procedure for exterior softscape maintenance
- Create a basic maintenance plan for an exterior softscape

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Select and use tools and equipment | <ul style="list-style-type: none"> • Rakes • Hoes • Spades • Shovels • Edgers • Hand pruners • Broom • Blowers • Hoses • Watering wand • Forks |
| 2. Describe the purpose of softscape maintenance | <ul style="list-style-type: none"> • Landscape <ul style="list-style-type: none"> ○ Function ○ Integrity • Design intent • Contract documents • Site-specific • Plant preservation • Structure preservation |
| 3. Perform visual inspection | <ul style="list-style-type: none"> • Plant health • Appearance • Maintenance levels • Contract documents |
| 4. Describe plant irrigation | <ul style="list-style-type: none"> • Plant requirements • Water-soil relationship • Annual • Automatic • Overhead • Drip • Jurisdictional regulations |

LEARNING TASKS	CONTENT
5. Describe cultivation of growing media	• Soil structure and biota • Aesthetics • Ease of planting • Aeration • Weeding
6. Describe hardening-off practices	• Plant hardiness • Season • Weather • Standards
7. Perform bed edging	• Contract documents • Definition • Weed control
8. Describe inspection and maintenance of natural and manufactured edges	• Aesthetics • Edges ○ Plastic ○ Wood ○ Metal ○ Brick ○ Stone
9. Remove weeds and debris	• Plant life cycles • Contract documents • Maintenance levels • IPM • Disposal • Jurisdictional regulations
10. Perform deadheading	• Contract documents • Appearance • Plant life cycles
11. Perform site cleanup	• Contract documents • Litter pickup • Removal of excess clippings • Surface cleaning • Jurisdictional regulations

Achievement Criteria

Performance The learner will be able to create a basic maintenance plan for an exterior softscape.

Conditions The learner will be given:

- Materials, tools and equipment
- Suitable site for conditions

Criteria The learner will be evaluated on:

- Site assessment
- Goal and task identification
- Maintenance plan and schedule
- Hazard identification
- Sustainable and safe work practice

Line (GAC): N **MAINTAIN SOFTSCAPE**
Competency: N3 **Maintain turfgrass**

Objectives

To be competent in this area, the individual must be able to:

- Describe the maintenance of grass/turf according to specifications
- Mow and trim turfgrass
- Create a maintenance plan for grass/turf

LEARNING TASKS

1. Select and use tools and equipment

2. Describe turfgrass cultivation

3. Describe maintenance scheduling

CONTENT

- Reel and rotary mowers
- Blade edgers
- String trimmers
- Core aerators
- Slice seeders
- Spreaders
- Power raking equipment
- Reel and rotary mowers
- Verticutters

- Aeration
- Topdressing
- Overseeding
 - Seed selection
 - Repair
 - Rejuvenate
 - Introduce new species
- Thatch removal (de-thatching)
- Soil test recommendations
 - pH level
 - Fertility

- Mowing frequency and height of cut
- Length of maintenance season
- Site use
- Maintenance level
 - Response to abiotic and biotic stressors
- Fertilization

LEARNING TASKS

4. Describe the monitoring of turfgrass

CONTENT

- Visual inspection
 - Colour
 - Thinning
 - Grades
 - Drainage
 - Pests and diseases
 - Divots
 - Patching
 - Poor mowing quality
 - Root zone concerns

5. Perform mowing and trimming of turfgrass

- Cutting heights
- Mower sanitation
- Frequency
- Procedure
 - Cutting patterns
- Site use
- Topography
- Weather conditions
- Contract documents
- Standards and specifications

6. Describe turfgrass repair

- Seed
- Sod

Achievement Criteria

Performance The learner will be able to create a maintenance plan for grass/turf.

Conditions The learner will be given:

- Materials, tools and equipment
- Grass/turf area for assessment
- Jurisdictional regulations

Criteria The learner will be evaluated on:

- Turf and soil assessment
- Identified problems
- Maintenance plan
- Sustainability of turf and environment
- Safe work practice

Level 2

Landscape Horticulturist

Competency: B1 Use hand tools

To be competent in this area, the individual must be able to:

- ## LEARNING TASKS

- ## CONTENT

- Common types
 - Environmental implications
 - Manufacturer's specifications
-
- Cleaning and disinfecting
 - Lubricating
 - Damage
 - Excessive wear
 - Proper operation
 - Sharpening
 - Replacing components
-
- Organization
 - Safety
 - Security
 - Preservation

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B2	Use power tools

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain power tools
- Store power tools

LEARNING TASKS

1. Select and use power tools
2. Perform power tool maintenance (for level appropriate tools)

CONTENT

- Common types
- Adjusting
- Manufacturer's specifications
- Environmental implications
 - Carbon reduction
- Removal from service
 - Company policy
- Safety features

- Operational maintenance
 - Cleaning and disinfecting
 - Lubricating
 - Fluid levels
 - Tire pressure
 - Adjusting
 - Damage
 - Excessive wear
 - Malfunction
 - Proper operation
 - Sharpening
 - Balancing
 - Replacing components
 - Cooling fins
 - Maintenance schedule
 - Manufacturers' specifications
 - Safety features
- Preventative maintenance
 - Fuel
 - Air
 - Fuel
 - Lubrication
 - Oil
 - Grease
 - Spark plug
 - Controls and drive mechanisms

LEARNING TASKS

CONTENT

3. Store power tools

- Bolts, belts, fittings, hoses
- Tire pressure
- Batteries
 - Transport
 - Store
 - Charge
 - Recycle

- Organization
- Safety
- Security
- Preservation

Line (GAC): B USE TOOLS, EQUIPMENT AND VEHICLES

Competency: B3 Use measuring equipment

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain measuring equipment
- Store measuring equipment

LEARNING TASKS

1. Select and use measuring equipment

2. Perform maintenance on measuring equipment

3. Store measuring equipment

CONTENT

- Common types

- Cleaning and disinfecting
- Proper operation
- Contaminants
- Calibrating
- Batteries
- Damage
- Excessive wear

- Organization
- Safety
- Security
- Manufacturer's specifications

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B4	Use vehicles and motorized equipment, trailers and attachments

Objectives

To be competent in this area, the individual must be able to:

- Identify basic vehicle systems and components
- Describe the procedure to attach a trailer to a vehicle
- Inspect and consider factors for the selection of vehicles, motorized equipment, attachments and trailers
- Operate vehicles and motorized equipment

LEARNING TASKS

CONTENT

1. Identify basic vehicle systems and components	• Drive systems • Brakes • Control/safety systems • Carburetor • Ignition system • Starter components • Piston
2. Consider factors for the selection of vehicles, motorized equipment, attachments and trailers	• Characteristics • Applications • Operation • Environmental considerations • Equipment types ○ Trucks ○ Turfgrass maintenance equipment ○ Skid steers ○ Utility vehicles ○ Tractors ○ Buckets ○ Aerators ○ Rototiller ○ Trailers – Flatbed – Dump
3. Describe the procedure to attach a trailer to a vehicle	• Jurisdictional regulations • Vehicle/trailer type • Safety
4. Inspect vehicles, motorized equipment, attachments and trailers	• Equipment and attachments ○ Skid steers ○ Vehicle/trailer

LEARNING TASKS

CONTENT

5. Operate vehicles and motorized equipment

- Defects
 - Damage
 - Wear
 - Safety features
-
- Equipment and attachments
 - Skid steer
 - Jurisdictional regulations
 - Licencing requirements
 - Manufacturer’s specifications
 - Company policy
 - Three-point contact
 - Safe equipment operation
 - Starting
 - Speed
 - Slopes
 - Power take-off precautions

Line (GAC): **C ORGANIZE WORK**
Competency: **C1 Perform site assessments**

Objectives

To be competent in this area, the individual must be able to:

- Identify and mark public and private utilities
- Examine soil conditions
- Examine soil compaction and drainage
- Perform soil analysis and identify existing plants

LEARNING TASKS

1. Select and use specific tools and equipment independently
2. Identify markings for public and private utilities
3. Mark locations of private utilities
4. Identify existing plants
5. Assess landscape site soils
6. Examine soil compaction and drainage

CONTENT

- Tools
 - Soil probe
 - Shovels
 - Rakes
- Site locates
 - Overhead
 - Underground
 - Private
 - Public
- Irrigation lines
- Drainage systems
- Landscape lighting components
- Extra low voltage electrical systems
- Locate septic components if necessary
- Health
- Suitability
- Management practices
- Indicator plants
- Sampling and testing for quality
- Collecting samples
 - Analysis
 - Nutrient
 - Chemical
 - Textural
- Samples for soil layering
- Soil layering or horizons
- Impact of soil layers on water movement

LEARNING TASKS

CONTENT

7. Recognize soil erosion

- Characteristics
 - Gullies
 - Rills
 - Topsoil depth
 - Displaced soil
 - Exposed roots
- Environmental conditions
 - Wind
 - Rain

8. Perform soil tests

- Percolation
- Core sampling
- Texture tests

Line (GAC):	C	ORGANIZE WORK
Competency:	C2	Use documentation and reference material

Objectives

To be competent in this area, the individual must be able to:

- Interpret project specifications
- Read plans

LEARNING TASKS

1. Interpret symbols and abbreviations to determine the scope of work

2. Interpret project specifications

3. Read plans

CONTENT

- Property lines
- Grades
- Elevations
- Hardscape and softscape elements
- Utilities

- Planting plan
- Softscape and hardscape details
- Contract documentation
- Government legislation

- Information components
- Construction and landscape plans
 - Site
 - Layout
 - Contour
 - Grading
 - Irrigation
 - Planting
 - Lighting
- Detailed drawings
- Views
 - Plan
 - Section
 - Exploded
- Elevation
- Perspective
- Specification

Competency: C3 Maintain records

To be competent in this area, the individual must be able to:

- ## LEARNING TASKS

- ## CONTENT

2. Describe the purpose of comparing packing slips with original orders

- Quoted pricing
- Quantities
- Species

Line (GAC): **C ORGANIZE WORK**
Competency: **C6 Organize materials and equipment**

Objectives

To be competent in this area, the individual must be able to:

- Describe the purpose of inspection and verification of plants and materials
- Describe storage area specifications for equipment and hazardous materials

LEARNING TASKS

1. Describe the purpose of inspection and verification of plants and materials

2. Describe storage area specifications for equipment and hazardous materials

CONTENT

- Accuracy
- Quality
- Quantity

- Jurisdictional regulations
- Company policy
- CLS
- Environmental protection

Competency: C7 Transport materials

To be competent in this area, the individual must be able to:

- ## LEARNING TASKS

- ## CONTENT

- Weight and height restrictions
 - Load distribution requirements
 - Jurisdictional regulations
 - Company policy
-
- Logbook
 - Vehicle
 - Towed equipment
 - Jurisdictional regulations
 - Company policy

Line (GAC): C ORGANIZE WORK

Competency: C8 Transport equipment

Objectives

To be competent in this area, the individual must be able to:

- Describe considerations in determining route
- Describe the procedure to perform circle checks
- Describe the transportation of equipment and attachments

LEARNING TASKS

1. Describe considerations in determining route
2. Describe the procedure to perform circle checks
3. Describe the transportation of equipment and attachments

CONTENT

- Heavy hauling
 - Jurisdictional regulations
 - Signage
 - Certification
- Weight and height restrictions
- Road closures
- Weather
- Efficiency
- Environmental protection
- Carbon reduction
- Logbook
- Vehicle
- Towed equipment
- Jurisdictional regulations
- Company policy
- Weight and height restrictions
- Load distribution requirements
- Jurisdictional regulations
- Company policy

Line (GAC):	G	APPLY HORTICULTURAL PRACTICES
Competency:	G1	Practice plant science

Objectives

To be competent in this area, the individual must be able to:

- Examine internal plant anatomy and its role in photosynthesis, respiration, and transpiration
- Describe the reproductive stages and life cycles of angiosperms and gymnosperms
- Explain the influence of environmental factors, external stimuli, and hormones on plant physiology
- Explain the role of plant anatomy in environmental protection and sustainability

LEARNING TASKS

CONTENT

1. Describe the microscopic anatomy of plants	• Generalized plant cell • Cell division • Cell types, tissues, and their functions
2. Describe plant organ internal anatomy	• Monocots versus dicots • Herbaceous and woody stems • Herbaceous and woody roots • Leaves
3. Describe plant growth	• Primary growth ○ Meristems – Apical – Intercalary • Secondary growth ○ Vascular cambium ○ Cork cambium • Developmental zones ○ Division ○ Elongation ○ Maturation/differentiation
4. Describe stages in the life cycle of angiosperms and gymnosperms	• Gamete production • Pollination • Double fertilization • Angiosperms vs. Gymnosperms
5. Describe water movement through a plant	• Diffusion • Osmosis • Active transport • Transpiration ○ Capillary attraction ○ Adhesion and cohesion • Environmental effects

LEARNING TASKS	CONTENT
6. Describe basic principles of photosynthesis	• Light and dark reactions • Chlorophyll • Translocation • Storage and respiration • Environmental effects
7. Explain the influence of environmental factors on plant physiology	• Light • Water • Temperature • Air quality ○ Pollution ○ Carbon dioxide availability • Nutrient availability
8. Describe the growth response to external stimuli	• Photoperiod and flower production • Tropisms ○ Plant responses • Environmental acclimation
9. Describe basic growth responses to plant hormones	• Hormone groups ○ Growth promoters – Auxins – Gibberellins (GA) – Cytokinins ○ Growth regulators/inhibitors – Ethylene – Absciscic acid (ABA) • Commercial applications ○ Rooting ○ fruit ripening ○ growth regulation
10. Explain the role of anatomy in environmental protection and sustainability	• Protective Anatomy (Survival & Maintenance) ○ Morphological Adaptations ○ Compartmentalization of decay in trees (CODIT) • Functional Anatomy (Sustainability & Remediation) ○ Photosynthetic efficiency – C4 and CAM anatomy ○ Phyto-remediation ○ Nitrogen fixation – Root nodule anatomy

Line (GAC): **G APPLY HORTICULTURAL PRACTICES**
Competency: **G2 Identify plants**

Objectives

To be competent in this area, the individual must be able to:

- Identify plants and plant requirements for 75 woody and non-woody plants
- Identify plants used in all segments of horticulture
- Identify weeds and invasive plants

LEARNING TASKS

1. Recognize a range of plant materials by habitat and use

2. Explain plant hardiness zones

3. Identify weeds

4. Describe the classifications of weeds

5. Identify and describe woody and non-woody plants

CONTENT

- Provenance
- Natural habitat
 - Ecologically specific
- Plant use characteristics
 - Bedding plants
 - Cut flowers
 - Trees and shrubs
 - Groundcovers
 - Climbers
- Characteristics of individual plants and plant groups
 - Plant size
 - Texture
 - Colour
 - Plant form
- Plant hardiness zones
- Relationship between plant health and zone
- Lifecycle
 - Annual
 - Biennial
 - Perennial
 - Woody
 - herbaceous
- Invasive
- Noxious
- Nuisance
- Advanced morphological characteristics and descriptions
- Cultural requirements
- Maintenance requirements
- Health and vigour

LEARNING TASKS

CONTENT

- | | |
|---|--|
| <p>6. Identify and describe 75 woody and non-woody plants</p> | <ul style="list-style-type: none"> • Botanical terms • Requirements <ul style="list-style-type: none"> ○ Cultural ○ Maintenance |
|---|--|

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G3 Manage plant health and growing conditions

Objectives

To be competent in this area, the individual must be able to:

- Describe tests and interpret results
- Determine factors for plant selection and placement
- Amend growing conditions
- Apply fertilizers and amendments

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Select and use tools and equipment | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Hand lens ○ Soil probe ○ pH meter ○ Spreaders |
| 2. Identify growing media and their properties that affect interior and exterior growth development | <ul style="list-style-type: none"> • Native soils • Soilless medium • Manufactured soil • Compost |
| 3. Collect and test growing media and implement corrective measures | <ul style="list-style-type: none"> • Sample collection • Test • Interpretation of results • Corrective measures |
| 4. Collect and test water and implement corrective measures | <ul style="list-style-type: none"> • Sample collection • Test • Interpretation of results • Corrective measures |
| 5. Examine plant tissue samples to identify nutrient deficiencies, diseases, and pests | <ul style="list-style-type: none"> • Visually inspect • Identify stress factors • Corrective measures |
| 6. Determine factors for plant selection and placement | <ul style="list-style-type: none"> • Plant <ul style="list-style-type: none"> ○ Requirements ○ Health ○ Materials • ‘Right plant, right place’ |
| 7. Amend growing conditions to meet plant requirements | <ul style="list-style-type: none"> • Microclimate • Available space • Topography |

LEARNING TASKS

CONTENT

8. Measure and apply fertilizers, amendments and bio-stimulants

- Soil
 - Type
 - Fertility
 - Depth
- pH level
- Water availability

- Lime
- Equipment calibration
- Plant life cycle
- Product labels
 - Grade
 - Analysis
- Application
 - Rate
 - Types
 - Foliar feed
 - Injection
 - Liquid
 - Granular
- Compost
- Mycorrhizae
- Humic acid
- Beneficial bacteria

Achievement Criteria

Performance The learner will be able to apply fertilizer/lime.

Conditions The learner will be given

- Materials, tools and equipment
- Area to apply fertilizer/lime

Criteria The learner will be evaluated on:

- Safety and procedures (WHMIS)
- Calculated product quantity
- Calibrated equipment
- Applied product uniformly
- Recognition of environmental protection factors
- Sustainable and safe work practice

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G4 Prune plant materials

Objectives

To be competent in this area, the individual must be able to:

- Demonstrate pruning techniques for shrubs, groundcovers, and vines
- Use common arboricultural hand tools to prune shrubs, groundcovers, and vines

LEARNING TASKS

1. Describe shrub, vine and groundcover pruning considerations

CONTENT

- Reasons
 - Health and vigour
 - Direct, control, or modify growth
 - Enhancing fruit and flower production
 - DDDI
 - Aesthetics
- Affecting factors
 - Plant form
 - Function
 - Age
 - Location
 - Timing
 - Pre-pruning treatments
 - Severe pruning
 - Alternatives to pruning
- Analyze plant and site function
 - Use and purpose
 - Type
 - Health
 - Structure
 - Growth
 - Desire and goal
- Previous management
- Efficiencies while pruning
 - Hand pruning vs. mechanical tools
 - Efficiencies and maintenance standard

2. Select and use tools and equipment

- Secateurs
- Hand saw
- Loppers
- Shears
 - Manual
 - Power
- Types of ladders
 - Orchard
 - Extension
 - Step

LEARNING TASKS

CONTENT

3. Establish pruning objectives

- Rakes
- String levels
- Clearance
- Shade
- Managing loads
 - Dynamic
 - Static
- Health
 - DDDI
- Flower and fruit production
- Improving view and aesthetics
- Training structure
- Response
 - Recessive
 - Dominance
 - Two to three buds

4. Perform pruning techniques for young and established shrubs, groundcovers and vines

- Pruning cuts
 - Thinning (removal)
 - Reducing
 - Heading
- Three-cut method
- Pruning methods
 - Cleaning
 - Thinning
 - Raising
 - Reduction
 - Restoration / rejuvenation
 - Shearing
 - Pinching
 - Heading
 - Specialty pruning
 - Topiary
 - Coppicing
 - Bonsai

5. Describe timing of pruning shrubs, vines, and groundcover

- Plant groups according to growth and flowering habits
- Factors that affect pruning time
 - Dormant season
 - Growth response
 - Wind and frost damage
 - Non-dormant pruning
 - Scorch
 - Site activities

LEARNING TASKS

6. Demonstrate safe working practices and operation of common pruning equipment and tools

CONTENT

- Safe working practices
 - PPE
 - Safe working environment
 - Ergonomics
 - Lifting and carrying safety
 - Safely operating power equipment
 - General procedures when operating power equipment
 - Jurisdictional regulations
- Maintenance of tools
 - Tool cleaning procedures
 - Pruning equipment
 - Ladders
- Jurisdictional regulations
- Efficiencies

- ## 7. Organize and dispose of pruned material

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G5 Propagate plant material

Objectives

To be competent in this area, the individual must be able to:

- Describe the harvesting and dividing of storage organs
- Describe propagation methods
- Maintain propagated plants

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Select and use hand tools and materials | <ul style="list-style-type: none"> • Tools <ul style="list-style-type: none"> ○ Digging forks ○ Shovels ○ Spades ○ Saws ○ Knives ○ Hand pruners • Materials <ul style="list-style-type: none"> ○ Rooting hormones ○ Growing media ○ Grafting tape |
| 2. Identify considerations used when selecting stock/parent plants | <ul style="list-style-type: none"> • Vigour • Health • True to type • Age • Timing • Propagation methods |
| 3. Describe the harvesting and dividing of storage organs | <ul style="list-style-type: none"> • Rhizomes • Tubers • Bulbs • Corms • Crowns • Roots |
| 4. Describe propagation methods | <ul style="list-style-type: none"> • Layering • Dividing • Cutting • Seeding • Grafting |

LEARNING TASKS

5. Maintain propagated plants

CONTENT

- Environmental conditions
- Cultural requirements
- Hardening off
- Transplanting

Line (GAC): **G APPLY HORTICULTURAL PRACTICES**
Competency: **G6 Manage pests, diseases and invasive species**

Objectives

To be competent in this area, the individual must be able to:

- Describe conditions that contribute to plant stress
- Identify characteristics of pests, invasive species, and beneficial organisms
- Identify principles and practices of Integrated Pest Management

LEARNING TASKS

1. Select and use tools and equipment

CONTENT

- Traps
- Hand lens
- Microscope
- Nets
- Application equipment
- Weed control equipment
- Secateurs

2. Describe conditions that contribute to plant stress

- Abiotic factors
 - Light
 - Temperature
 - Humidity
 - Air quality
 - Water supply
 - Mechanical damage
 - Nutrition
 - pH
- Biotic factors
 - Insects
 - Weeds
 - Pathogens
 - Vertebrates
 - Molluscs
- Susceptibility to abiotic and biotic stress factors

3. Describe basic arthropod biology

- Morphology
 - Beneficial organisms
 - Pests
- Life cycles
- Taxonomy
- Eight orders of insects

4. Describe the characteristics of weeds

- Definition
- Common characteristics

LEARNING TASKS

5. Identify principles and practices of integrated pest management

CONTENT

- Prolific seeding
- Rapid growth
- Vegetative propagation
- Impacts of weeds
 - Competition
 - Human and animal health
 - Structural damage
 - Economic
- Classification of weeds by life cycle
 - Annuals
 - Biennials
 - Herbaceous perennials
- Woody perennials
- Six steps of IPM
 - Prevention
 - Identification
 - Monitoring
 - Thresholds
 - Maintenance levels and classes
 - Treatments
 - Evaluation
- Documentation

Line (GAC): H APPLY ENVIRONMENTAL PRACTICES

Competency: H1 Practice environmental stewardship

Objectives

To be competent in this area, the individual must be able to:

- Discuss opportunities for stewardship relating to landscape maintenance and installation
- Select and use sustainable plant health products

LEARNING TASKS

1. Identify opportunities for stewardship relating to landscape maintenance and installation

CONTENT

- Tools
 - Equipment
 - Plants
 - Materials
 - Waste management and disposal
 - Reduce, reuse and recycle
 - Conservation
 - Preservation
 - Low-impact
 - Organized workflow
 - Site protection
 - Maintenance practices
 - 'Let it lay'
 - Installation practices
-
- Bio stimulants
 - Organic and slow-release fertilizers
 - Biological control
 - Biorational pesticides

2. Select and use sustainable plant health products

Line (GAC): H APPLY ENVIRONMENTAL PRACTICES

Competency: H3 Practice soil stewardship

Objectives

To be competent in this area, the individual must be able to:

- Examine the chemical and biological properties of soils and soilless media as they relate to use, soil quality, and plant growth
- Collect soil samples for lab testing
- Interpret lab test results and amend growing media

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>1. Examine the types and functions of soil biota</p> | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Microfauna <ul style="list-style-type: none"> – Bacteria – Fungi (mycorrhizae) – Protozoa – Nematodes – Viruses – Planaria ○ Macrofauna <ul style="list-style-type: none"> – Arthropods (ground/rove beetles, pill bugs, mites) – Earthworms – Plants • Role in soil quality <ul style="list-style-type: none"> ○ Nutrient cycling ○ Disease suppression • Promotion of beneficial soil organisms |
| <p>2. Explain the role of organic matter in soil</p> | <ul style="list-style-type: none"> • Composition and decomposition • Chemical and physical behaviour <ul style="list-style-type: none"> ○ Humus formation ○ Chelation • Carbon sequestration |
| <p>3. Describe composting considerations</p> | <ul style="list-style-type: none"> • Processes <ul style="list-style-type: none"> ○ Aerobic ○ Anaerobic ○ Food web of the compost pile • Maintenance <ul style="list-style-type: none"> ○ Temperature ○ Moisture • Use of finished compost • Jurisdictional regulations |

4. Describe soil chemistry and nutrients
 - Soil chemistry foundations
 - Soil colloids
 - Cation Exchange Capacity (CEC)
 - Plant Nutrition
 - Macronutrients
 - Primary
 - Secondary
 - Micronutrients
 - Nutrient
 - Availability
 - Uptake
 - pH relationship
 - The Nitrogen Cycle
 - Mineralization
 - Nitrification
 - Denitrification
5. Describe the effect of pH and contaminants on soil properties
 - pH Dynamics
 - Measurement methods
 - Buffering capacity (CEC relationship)
 - pH Management
 - Liming (raising pH)
 - Acidifying (lowering pH)
 - Soil Chemical Issues
 - Salinity
 - Sodicity
 - Chemical contaminants
 - Remediation impacts
 - Plant growth
 - Soil biota
 - Nutrient availability
6. Sample soils
 - Sample Collection
 - Protocols for field settings
 - Protocols for urban/disturbed settings
 - Field test methods
 - Visual
 - Ribbon tests
 - Probes
 - Laboratory Procedures
 - Sample preparation
 - Drying
 - Screening
 - Submission requirements for lab analysis
 - Data Interpretation
 - Organic Matter percentage (OM%)
 - Soluble salts (Electrical Conductivity)

- Cation Exchange Capacity (CEC)
 - Chemical contaminants and thresholds
 - Limitations of soil testing
 - Interpret results

- 7. Analyze Fertilizers and Amendments
 - Fertilizer classification
 - Organic vs. inorganic
 - Organic fertilizers
 - Nutrient cycling
 - Inorganic fertilizers
 - Solubility
 - Salt index
 - Fertilizer formulations
 - Foliar feed
 - Liquid
 - Granular
 - Slow-release
 - Biologicals and specialized amendments
 - Compost and organic matter
 - Mycorrhizae (Fungal associations)
 - Humic and fulvic acids
 - Microbial inoculants
 - Chemical analysis
 - Guaranteed Analysis (NPK ratios)
 - Secondary and micronutrient content

- 8. Select fertilizers/amendments for stewardship
 - Sustainable product stewardship protocols
 - Appropriate use and site-matching
 - Selection
 - Fertilizer
 - Amendments
 - Input/Output auditing (nutrient budgeting)
 - Compliance with manufacturer's specifications
 - Stewardship rationale
 - Economic vs. environmental impact
 - Economic
 - Reduced water usage
 - Reduced fertilizer inputs
 - Reduced waste hauling
 - Environmental
 - Carbon sequestration
 - Biosecurity
 - Invasive species spread
 - Structural integrity

- Erosion
 - Soil organisms' protection
 - Long-term soil health considerations
 - Maintaining optimum growing conditions (plant health)
 - Minimize environmental impacts (pollution)

- 9. Discuss site remediation
 - Compaction remediation (mechanical intervention)
 - Mechanical aeration
 - Soil fracturing
 - Radial trenching
 - Vertical mulching
 - Subsoiling techniques
 - Structural recovery
 - Coarse organic matter incorporation
 - Aggregation promotion
 - Hydraulic remediation
 - Drainage system design (Surface vs. sub-surface)
 - Infiltration rate restoration

- 10. Implement advanced soil stewardship methods
 - Regenerative cultural management methods
 - Conservation tillage (No till / minimum tillage)
 - Sheet mulching (Lasagna gardening)
 - Natural decomposition (let-it-lay)
 - Site stability and protection
 - Erosion and siltation control
 - Silt fences
 - Straw wattles
 - Cover cropping
 - Tree and root zone protection
 - Tree Protection Zones (TPZ) establishment
 - Fencing and exclusionary zones
 - Stewardship considerations
 - Site protection measures
 - Cultivation
 - Cut and fill method

- 11. Environmental protection and jurisdictional regulations
 - Codes
 - Standards
 - Materials handling
 - Bulk soil storage protocols
 - Contamination prevention during construction

Line (GAC):	H	APPLY ENVIRONMENTAL PRACTICES
Competency:	H4	Practice water stewardship

Objectives

To be competent in this area, the individual must be able to:

- Describe water stewardship
- Describe procedures for environmental water sampling

LEARNING TASKS

1. Describe elements of water stewardship
2. Describe procedures for environmental water sampling

CONTENT

- Protection of endangered species in waterways
 - Water retention
 - Water conservation
 - Pollution prevention
 - Infiltration promotion
 - Riparian restoration
 - Prevention of invasive species spread in waterways
 - Preservation of tree canopy
-
- Collection
 - Labelling
 - Shipping
 - Interpretation
 - pH
 - Contaminants
 - Nutrient levels

Line (GAC): I PERFORM PRE-CONSTRUCTION ACTIVITIES

Competency: I2 Prepare construction site

Objectives

To be competent in this area, the individual must be able to:

- Plan and prepare the site according to plans, specifications, and jurisdictional regulations

LEARNING TASKS

CONTENT

- | | |
|---|---|
| 1. Select and use tools and equipment | <ul style="list-style-type: none"> • Tools <ul style="list-style-type: none"> ○ Levels ○ Transits ○ Hammers • Equipment <ul style="list-style-type: none"> ○ Skid steers ○ Loaders ○ Excavators |
| 2. Interpret and extract information | <ul style="list-style-type: none"> • Plans • Grading plans • Planting plans • Layout plans • Site conditions • Discrepancies • Communication |
| 3. Describe site preparation and protection of existing site elements | <ul style="list-style-type: none"> • Jurisdictional regulations • Soil • Existing <ul style="list-style-type: none"> ○ Plant material ○ Hard features • Site protection • CLS • Drawings • Standards |
| 4. Remove unwanted materials | <ul style="list-style-type: none"> • Hazards • Debris • Invasive species • CLS |
| 5. Create site access | <ul style="list-style-type: none"> • Efficiency • Security • Site conditions |

LEARNING TASKS

6. Locate utilities

7. Locate and cordon off areas to minimize environmental impact

8. Lay out site

9. Establish grade

10. Verify site is prepared and ready for the next phase

CONTENT

- Site locates
 - Public
 - Private
- Markers
- Utility hazards
 - Underground
 - Overhead
- Environmental considerations
- Plans and specifications
- Environmental mitigation mechanisms
 - Filters
 - Silt fencing
 - Storm sewer guards
- Marking and staking elements
- Positive drainage
- CLS
- Rough grade
- Finished grade
- Communication
 - Identify stakeholders

Line (GAC):	I	PERFORM PRE-CONSTRUCTION ACTIVITIES
Competency:	I3	Perform grading

Objectives

To be competent in this area, the individual must be able to:

- Perform site grading
- Identify the effects of grading

LEARNING TASKS

1. Select and use tools and equipment

2. Describe the considerations for grading

3. Perform calculations

4. Salvage and store native soils

CONTENT

- Tools
 - Builder's level
 - Spirit level
 - String level
 - Water level
 - Landscape rakes
- Equipment
 - Excavators
 - Trenchers
 - Skid steers
- Terminology
- Hazards
- Site function
- Specifications
- Jurisdictional regulations
- Grading plans
 - Existing grades
 - Proposed grades (finished)
 - Contour plans
- Verification
- Elevation
- Slope
- Cut and fill
- Planning
- Stripping
- Storing
- Stockpiling
- Preservation
- CLS
- Jurisdictional regulations

LEARNING TASKS

5. Perform site grading

6. Describe the effects of grading

CONTENT

- Cut and fill
- Rough grading
- Grading for drainage
- Finish grading

- Environmental stewardship
- Soils
 - Erosion
 - Compaction
- Site hydrology

Achievement Criteria

Performance The learner will be able to perform grading to achieve a specified slope.

Conditions The learner will be given:

- Materials, tools and equipment
- Practice area
- Site locates

Criteria The learner will be evaluated on:

- Performed calculations
- Equipment set up properly
- Measurement of distance intervals
- Performed rod readings
- Determined elevations for grade
- Set up and marked grade stakes
- Performed grading
- Sustainable and safe work practice

Line (GAC):	I	PERFORM PRE-CONSTRUCTION ACTIVITIES
Competency:	I4	Install drainage systems

Objectives

To be competent in this area, the individual must be able to:

- Install a sub surface and surface drainage system using the correct tools, equipment and materials

LEARNING TASKS

1. Use tools and equipment

CONTENT

- Tools
 - Trenching shovels
 - Picks
 - Wheelbarrows
 - Pipe cutter
 - Glue
- Equipment
 - Excavators
 - Trenchers

2. Describe the considerations for drainage system selection

- Hydrologic cycle
- Precipitation
 - Rain
 - Snow
- Runoff
 - Overland flow
 - Sub-surface flow
 - Saturated overland flow
 - Urbanization runoff
- Soil texture and structure
- Benefits of good drainage
 - Plant health
 - Root development
 - Nutrient uptake
 - Plant tolerance
 - Pathogenic organisms
- Over-drained soils
- General water table changes
- Environmental stewardship
- Topography
- Jurisdictional regulations

3. Install drainage systems

- Surface drainage systems
 - Retention/detention ponds
 - Rain gardens
 - Open channels
 - Ditches
 - Swales

LEARNING TASKS

CONTENT

- | | |
|---|--|
| <p>4. Identify drainage components and their function</p> | <ul style="list-style-type: none"> • Subsurface drainage systems <ul style="list-style-type: none"> ○ French drain ○ Perimeter drain • Surface drainage system components <ul style="list-style-type: none"> ○ Storm drains ○ Utility hole covers ○ Drain outlets ○ Catch basins • Subsurface drainage system components <ul style="list-style-type: none"> ○ Pipes ○ Pipe envelope fabrics ○ Blind inlets ○ Bedding material <ul style="list-style-type: none"> – Drain rock – Washed sand |
| <p>5. Identify drainage system planning and design considerations</p> | <ul style="list-style-type: none"> • Plans <ul style="list-style-type: none"> ○ Drainage ○ Grading • Drainage system capacity • Subsurface drainage <ul style="list-style-type: none"> ○ Drain depth and spacing ○ Drain diameter ○ Grades for drains ○ Installation of sub-surface drains • Surface drainage <ul style="list-style-type: none"> ○ Land grading • Velocities • CLS • Jurisdictional regulations • Site protection |
| <p>6. Perform drainage system installation</p> | <ul style="list-style-type: none"> • Elevation and slope calculations • Subsoil excavation • Storage or removal of excavated materials • Layout, assembly and placement of drainage components • Verification of operation • Drainage system backfilling • Installation meets specifications • CLS • Jurisdictional regulations |

Achievement Criteria

Performance The learner will be able to install a sub-surface drainage system.

Conditions The learner will be given:

- Materials, tools and equipment
- Practice area
- Site locates

Criteria The learner will be evaluated on:

- Sub-grade properly prepared
- Drain installed at proper grade
- Correct size drain and type of aggregate used
- Drain placed to correct depth
- Filter fabric properly installed
- Sustainable and safe work practice

Line (GAC):	J	INSTALL HARDSCAPE
Competency:	J2	Install surface materials

Objectives

To be competent in this area, the individual must be able to:

- Install non-masonry surface materials using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand tools, power tools, and equipment

CONTENT

- Tools
 - Shovels
 - Picks
 - Chisels
 - Cut saw
 - Rakes
 - Wheelbarrows
 - Brooms
 - Power blowers
- Equipment
 - Excavators
 - Plate compactors
 - Skid steers

- ## 2. Select and use surface materials

- Documents
- Surface materials
 - Natural stones
 - Aggregates

- ### 3. Prepare for installation

- Standards and specifications
- Site assessment
- Layout
- Excavation
- Subgrade preparation
- Excavated materials
 - Removal
 - Recycle
 - Storage

- #### 4. Install surface materials

- Sleeving
- Geotextiles
- Aggregate base
 - Lifts
- Grade
- Drainage
- Restraints
- Bedding materials

LEARNING TASKS

CONTENT

- Sand
 - Bases
 - High performance
 - Concrete
 - Manufactured
 - Compaction
 - Screeding
 - Dimensions
 - Measure
 - Cut
 - Fit
 - Surface cleaning
 - Joint materials
 - Mortars
 - Sand
 - Polymeric sand
 - Cleaners and sealants
 - Standards and specifications

- 5. Clean-up site
 - Surfaces
 - Repair damages
 - Debris
 - Dispose

Achievement Criteria

- | | |
|-------------|--|
| Performance | The learner will be able to construct a small surface area, such as a patio or walkway, with natural stone. |
| Conditions | The learner will be given: <ul style="list-style-type: none"> • Materials, tools and equipment • Installation area • Drawings and specifications |
| Criteria | The learner will be evaluated on: <ul style="list-style-type: none"> • Installation according to drawings, specifications and CLS • Calculations • Accuracy of dimensions • Quality of final product • Sustainable and safe work practice |

Line (GAC):	J	INSTALL HARDSCAPE
Competency:	J3	Install steps and retaining walls

Objectives

To be competent in this area, the individual must be able to:

- Install steps and retaining walls using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand tools, power tools, and equipment
2. Perform safe work practices
3. Select stair, retaining walls and retaining wall materials

CONTENT

- Tools
 - Shovels
 - Picks
 - Rakes
 - Cut saw
 - Stone chisels
 - Hand tampers
 - Wheelbarrows
 - Brooms
 - Power blowers
 - Equipment
 - Excavators
 - Plate compacters
 - Skid steers
 - Vibrator plate tampers
 - PPE
 - Work hazards
 - Moving of materials
 - Training and certification
-
- Wall types
 - Modular precast concrete landscape wall units
 - Poured concrete features
 - Landscape wood features
 - Natural stone
 - Stair types
 - Natural stone
 - Modular precast concrete wall units
 - Natural stone pavers
 - Precast concrete pavers and slabs
 - Materials
 - Timber
 - Natural stone
 - Manufactured stone
 - Gabion basket
 - Mass-stabilized earth walls

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 4. Lay out and mark construction area | <ul style="list-style-type: none"> • Layout <ul style="list-style-type: none"> ○ Drawings ○ Specifications • Measurements <ul style="list-style-type: none"> ○ Horizontal ○ Vertical • Treads and risers • Staking |
| 5. Prepare and install steps and retaining walls | <ul style="list-style-type: none"> • Layout • Excavation • Subgrade compaction • Excavated materials <ul style="list-style-type: none"> ○ Store ○ Remove ○ Recycle • Standards and specifications |
| 6. Install steps and retaining walls | <ul style="list-style-type: none"> • Foundation <ul style="list-style-type: none"> ○ Concrete ○ Aggregate • Drainage systems • Procedures <ul style="list-style-type: none"> ○ Base preparation ○ Course <ul style="list-style-type: none"> – Stacking – Assemble ○ Leveling ○ Geogrid installation ○ Joint seam staggering ○ Batter creation • Backfill • Compaction • Adhesives and mortar • Cleaners and sealants • Standards and specifications |
| 7. Cleanup site | <ul style="list-style-type: none"> • Surfaces • Damage repairs • Debris <ul style="list-style-type: none"> ○ Disposal ○ Removal ○ Recycle |

Achievement Criteria

Performance	The learner will be able to construct a small retaining wall (optional: with steps).
Conditions	The learner will be given: • Materials, tools and equipment • Installation area • Drawings and specifications • Jurisdictional regulations
Criteria	The learner will be evaluated on: • Installed retaining wall (with steps) according to drawings, specifications and CLS • Calculations • Accuracy of dimensions • Quality of final product • Sustainable and safe work practice

Line (GAC): **K INSTALL SOFTSCAPE**
Competency: **K2 Install exterior landscape plants**

Objectives

To be competent in this area, the individual must be able to:

- Install exterior landscape plants.

LEARNING TASKS

1. Select and use hand tools and equipment

CONTENT

- Tools
 - Tree dollies
 - Shovels
 - Rakes
- Equipment
 - Tree spade
 - Boom trucks
 - Skid steers
 - Attachments

2. Select plant materials

- Types
 - Trees
 - Shrubs
 - Perennials
 - Annuals
- Stock types
 - Container
 - Ball and burlap
 - Bare root
 - Caliper stock
- Containers
- Plant tags
- Root balls
- Irrigation

3. Prepare plant materials

- Suitability
- Removal of containers
- Scarifying root ball
- Nutrient balance
- Irrigation

4. Monitor and maintain plant health

- Desiccation
- Storage

5. Lay out plant materials

- Placement
- Drawings and specifications
- Suitability

LEARNING TASKS
CONTENT

	○ Elements exposure ○ Proximity to building ○ Water availability
6. Describe procedures to install and care for exterior plants materials	• Drawings and specifications • Contract documents • Industry standards ○ Depth and width of planting hole • Prepare planting ○ Site ○ Beds • Root flare • Install ○ Trees ○ Herbaceous ○ Woody plant material
7. Describe procedures for post-planting care	• Mulching • Protection and Stabilization • Stake and guy ○ Wind exposure • Irrigation
8. Prune plant materials	• Roots • DDDI • Appearance
9. Verify moisture content	• Growing media • Irrigation • Plant material
10. Dispose of or recycle excess materials	• Jurisdictional regulations • Industry standard

Achievement Criteria

Performance The learner will be able to install exterior landscape plants. (Also see K3 Transplant plants)

Conditions The learner will be given:

- Materials, tools and equipment
- Installation area
- Drawings and specifications

Criteria The learner will be evaluated on:

- Selection and use of appropriate tools and equipment
- Monitored and maintained plant health throughout installation
- Planting hole excavation

- Lay out and install planting materials according to specifications.
- Sustainable and safe work practice

Line (GAC): K **INSTALL SOFTSCAPE**

Competency: K3 Transplant plants

Objectives

To be competent in this area, the individual must be able to:

- Perform basic planting and transplanting techniques
- Use common arboricultural hand tools to prune trees, shrubs, groundcovers, and vines

LEARNING TASKS

1. Select and use hand tools and equipment

CONTENT

- Shovels
- Tree dolly
- Tree spades
- Axes

2. Describe reasons for transplanting plants

- Site use
- Growth control
- Prevention of root girdling
- Relocation
- Infrastructure conflicts
- Drawings and specifications
- Jurisdictional regulations

3. Verify plant is viable for transplant

- Perennial type
 - Woody
 - Herbaceous
- Health
- Transpiration rate
- Plant growth stage
 - Dormancy
- Cultural requirements
- Environmental conditions
 - Humidity
 - Temperature
 - Precipitation
 - Wind

- #### 4. Prepare plant for transplantation

- Root pruning
- Irrigation
- Plant size
- Tying branches

- ## 5. Dig plant material

- Irrigation
- Industry standard
 - International Society of Arborists (ISA) caliper guidelines

LEARNING TASKS

CONTENT

6. Transplant plants

- Canadian Nursery Landscape Association (CNLA) Standards for nursery stock
- Root mass
- Protection
 - Ball and burlap
 - Boxing
 - Bare root
- Timing
 - Dormant vs. non-dormant transplanting
- Plant protection during transport
- Root ball size
- Height relationship to caliper by types
- Planting techniques
 - Site drainage characteristics
 - Planting
 - Air pocket prevention
 - Plant staking
 - Methods
 - One vs. two stakes
 - Guyed staking
 - Duration
 - Materials

7. Install plant material

- Size of planting hole
- Stabilization
- Irrigation
- Site drainage characteristics
- Backfill
 - Growing media
 - Air-pocket prevention

8. Prune plant material

- Roots
- DDDI
- Appearance

9. Verify moisture content

- Growing media
- Irrigation
- Plant material
 - Transplant shock
 - Flagging

LEARNING TASKS

10. Dispose of or recycle excess materials

11. Describe procedures for post-transplanting care

CONTENT

- Jurisdictional regulations
- Industry standard

- Mulching
- Protection
- Stabilizing
- Irrigation

Achievement Criteria

Performance	The learner will be able to install exterior landscape plants. (Also see K2 Install exterior landscape plants)
Conditions	The learner will be given: • Materials, tools and equipment • Installation area • Drawings and specifications
Criteria	The learner will be evaluated on: • Selection and use of appropriate tools and equipment • Monitored and maintained plant health throughout installation • Plant material is extracted and planted as directed • Lay out and install planting materials according to specifications. • Sustainable and safe work practice

Line (GAC): K INSTALL SOFTSCAPE

Competency: K4 Install mulch

Objectives

To be competent in this area, the individual must be able to:

- Install mulch using the correct tools, equipment and materials.

LEARNING TASKS

1. Select and use hand tools
2. Select and use equipment
3. Describe properties and purpose of mulch
4. Prepare the area to be mulched

CONTENT

- Tools
 - Wheelbarrows
 - Landscape rakes
 - Pitchforks
 - Shovels
- Equipment
 - Skid steers
 - Blower trucks
 - Loaders
- Types
 - Organic
 - Wood chips
 - Shredded bark
 - Straw
 - Compost
 - Inorganic
 - Aggregates
- Purpose
 - Weed suppression
 - Water retention
 - Soil amending
 - Erosion prevention
 - Compaction prevention
 - Temperature regulation
- Storage
- Fire prevention
- Standards and specifications
- Jurisdictional regulations
- Standards and specifications
- Volume calculations
- Contracts
- Grades
- Soil compaction

LEARNING TASKS
CONTENT

- | | |
|------------------------------|---|
| 5. Apply mulch | <ul style="list-style-type: none"> • Depth • Timing <ul style="list-style-type: none"> ○ Soil temperature ○ Soil moisture • Distribution • Proximity <ul style="list-style-type: none"> ○ Plant material ○ Structures • Plant health |
| 6. Verify mulch installation | <ul style="list-style-type: none"> • Standards and specifications • Contract documents |

Achievement Criteria

Performance The learner will be able to install mulch.

Conditions The learner will be given:

- Materials, tools and equipment
- Area for installation

Criteria The learner will be evaluated on:

- Measurements and calculations
- Selected and used appropriate tools and equipment
- Verified mulch and installation specifications
- Sustainable and safe work practice

Line (GAC): **M MAINTAIN HARDSCAPE**
Competency: **M1 Maintain drainage systems**

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for drainage systems

LEARNING TASKS

1. Describe maintenance requirements of drainage systems

2. Describe indicators of failure

3. Describe drainage components

4. Describe optimal flow

5. Describe securing of drain covers

CONTENT

- Surface
- Retention and detention ponds
- Bioswales
- Rain barrels
- Cisterns
- Sub-surface
- Site and environmental protection
- Codes
- Standards
- Specifications

- Ponding
- Blowouts
- Washouts
- Erosion at drain outlet
- Sediment blockage
- Root blockage
- Iron oxide blockage

- Drains
- Catch basins
- Retention and detention ponds

- Filters
- Screens
- Debris removal
- Sedimentation control
- Flushing
- Grading
 - Rough
 - Drainage
 - Finish
- Standards and specifications

- Jurisdictional regulations

6. Describe winterizing of drainage systems
 - Heating cables
 - Hydro flush
 - Cleaning
 - Extending pipe systems

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M3	Maintain surface materials

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for non-masonry surface materials

LEARNING TASKS

1. Describe surface defects and hazards

CONTENT

- Types
 - Cracks
 - Frost heave
 - Settling
 - Staining
- Undesirable conditions
 - Algae
 - Weeds
 - Debris
 - Stains
- Environmental protection
- Types
 - Walkways
 - Patios
 - Driveways
- Inspection
 - Debris removal
 - Undesirable growth removal
 - Jointing sand top up
 - Sealants
- Clean
 - Pressure washer
 - Blow
 - Broom
- Debris
 - Dispose and recycle
- Specifications and standards

2. Describe maintenance procedures for surfaces

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M4	Maintain steps and retaining walls

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for steps and retaining walls

LEARNING TASKS

1. Describe defects, undesirable conditions and hazards for steps and retaining walls
2. Describe maintenance procedures for steps and retaining walls

CONTENT

- Defects
 - Structural
 - Components
 - Drainage system outlets
- Undesirable conditions
 - Algae
 - Efflorescence
 - Weeds
 - Debris
- Types
 - Walls
 - Natural stone
 - Precast concrete
 - Wall units
 - Poured concrete features
 - Wood features
- Stairs
 - Natural stone
 - Porcelain
 - Natural stone pavers
 - Concrete pavers and slabs
- Debris
 - Removal
 - Recycle
- Jointing sand top up
- Sealants
- Adhesives
- Paint
- Stain
- Clean
 - Pressure washer
 - Broom
 - Blow
- Specifications and standards
- Environmental considerations

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M8	Practice snow and ice control

Objectives

To be competent in this area, the individual must be able to:

- Describe ice and snow removal considerations

LEARNING TASKS

1. Select and use tools and equipment

CONTENT

- Vehicles with blades
 - Blowers
 - Walk-behind
 - Tractor mounted
 - Backpack
 - Spreaders
 - De-icer spreaders
 - Liquid sprayers
 - Power brushes
 - Snow shovels
 - Loaders
 - Graders
-
- Environmental protection
 - Safe work practices
 - Storage locations
 - Removal requirements
 - Potential damage to landscape elements
 - Access points
 - Contract documents
 - Jurisdictional regulations
 - Snow markers
 - Site requirements
-
- Contract documents
 - Jurisdictional regulations
 - Industry standards
 - Site requirements
 - Types
 - Potential damages
-
- Snow fence
 - Wind breaks
-
- Conditions
 - Precipitation

2. Describe snow clearing

- ### 3. Describe application of ice control products

4. Describe installation of protective structures

5. Describe weather monitoring factors

LEARNING TASKS

CONTENT

- Wind
- Scheduling
- Selection
 - Equipment
 - Material
- Inventory

Line (GAC): **N MAINTAIN SOFTSCAPE**

Competency: **N1 Maintain exterior softscape**

Objectives

To be competent in this area, the individual must be able to:

- Describe seasonal planting and protection practices
- Describe fertilization of plants
- Describe mulching of beds and containers

LEARNING TASKS

1. Select and use tools and equipment

2. Describe seasonal planting and removal of plants

3. Describe seasonal protection practices

CONTENT

- Hand tools
- Hand pruners
- Spreaders
- Scales
- Gators
- Wheelbarrows
- Tarps

- Annuals
- Biennials
- Perennials
- Bulbs
- Weeds
- Planting plans
- Contract documents

- Anti-desiccants
- Burlap wrapping
- Geotextile fabric
- Binding with twine or rope
- Flax straw
- Animal protection
- Snow fencing
- Standards and specifications
- Weather
 - Snow
 - Frost
 - Heat
 - Sun
 - Wind
 - Ice
- Structures
 - Overwintering
- Ground cover

LEARNING TASKS

CONTENT

- | | |
|---|--|
| | <ul style="list-style-type: none"> ○ Fabric ○ Mulch |
| 4. Describe removing staking and guying materials | <ul style="list-style-type: none"> • Standards and specifications • Plant stabilization |
| 5. Describe fertilization of plants | <ul style="list-style-type: none"> • Soil test recommendations • Application rates • Calibration • Nitrogen – Phosphorus – Potassium (N-P-K) • Environmental considerations • Methods <ul style="list-style-type: none"> ○ Manual ○ Automated • Jurisdictional regulations |
| 6. Describe mulching of beds and containers | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Organic ○ Inorganic • Depth • Appearance • Re-distribution • Plant protection • Standards and regulations |

Line (GAC): N **MAINTAIN SOFTSCAPE**

Competency: N3 Maintain Turfgrass

Objectives

To be competent in this area, the individual must be able to:

- Use tools and equipment
- Describe maintenance of grass / turf according to specifications
- Manage pest and disease
- Manage irrigation
- Practice Environmental Stewardship

LEARNING TASKS

1. Use tools and equipment

CONTENT

- Timing
- Purpose

2. Describe the monitoring of turfgrass

- Visual inspection
 - Colour
 - Thinning
 - Grades
 - Drainage
 - Pests and diseases
 - Divots
 - Patching
 - Poor mowing quality
- Root zone concerns

3. Describe turfgrass irrigation

- Water management
 - Timing
 - Coverage
 - Usage
 - Species
 - Environment conditions
 - Jurisdictional regulations
- Contract documents

4. Describe pest and disease management of turfgrass

- IPM
- Biotic pests
- Abiotic factors
- Jurisdictional regulations
- Standards and specifications

- ## 5. Practice Environmental Stewardship

- Cultural practice
 - Cutting heights
 - Frequency
- Watering restrictions

LEARNING TASKS

CONTENT

- Top-dress
- Biodiverse borders

Level 3

Landscape Horticulturist

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B1	Use hand tools

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain hand tools
- Store hand tools

LEARNING TASKS

1. Select and use hand tools
2. Perform hand tool maintenance (for level appropriate tools)
3. Store hand tools (for level appropriate tools)

CONTENT

- Common types
 - Environmental implications
 - Manufacturer's specifications
-
- Cleaning and disinfecting
 - Lubricating
 - Damage
 - Excessive wear
 - Proper operation
 - Sharpening
 - Replacing components
-
- Organization
 - Safety
 - Security
 - Preservation

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B2	Use power tools

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain power tools
- Store power tools

LEARNING TASKS

1. Select and use power tools
2. Perform power tool maintenance (for level appropriate tools)

CONTENT

- Common types
 - Adjusting
 - Manufacturer's specifications
 - Environmental implications
 - Carbon reduction
 - Removal from service
 - Company policy
 - Safety features
-
- Operational maintenance
 - Cleaning and disinfecting
 - Lubricating
 - Fluid levels
 - Tire pressure
 - Adjusting
 - Damage
 - Excessive wear
 - Malfunction
 - Proper operation
 - Sharpening
 - Balancing
 - Replacing components
 - Cooling fins
 - Maintenance schedule
 - Manufacturers' specifications
 - Safety features
 - Preventative maintenance
 - Fuel
 - Air
 - Fuel
 - Lubrication
 - Oil
 - Grease
 - Spark plug

LEARNING TASKS

CONTENT

- | | |
|--|---|
| | <ul style="list-style-type: none"> ○ Controls and drive mechanisms ○ Bolts ○ Belts ○ Fittings ○ Hoses ○ Tire pressure ○ Batteries <ul style="list-style-type: none"> – Transport – Store – Charge – Recycle |
| 3. Store power tools (for level appropriate tools) | <ul style="list-style-type: none"> • Organization • Safety • Security • Preservation |

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B3	Use measuring equipment

Objectives

To be competent in this area, the individual must be able to:

- Use and maintain measuring equipment
- Store measuring equipment

LEARNING TASKS

CONTENT

1. Select and use measuring equipment	• Common types
2. Perform maintenance on measuring equipment	• Cleaning and disinfecting • Proper operation • Contaminants • Calibrating • Batteries • Damage • Excessive wear
3. Store measuring equipment	• Organization • Safety • Security • Manufacturer's specifications

Line (GAC):	B	USE TOOLS, EQUIPMENT AND VEHICLES
Competency:	B4	Use vehicles and motorized equipment, trailers and attachments

Objectives

To be competent in this area, the individual must be able to:

- Describe the environmental considerations of selecting and using vehicles, motorized equipment, attachments and trailers
- Describe the maintenance of equipment attachments

LEARNING TASKS

1. Describe the environmental considerations of selecting and using vehicles, motorized equipment, attachments and trailers

CONTENT

- Fuel type
 - Lubricants
 - Longevity
 - Emissions
 - Noise
 - Site conditions
 - Site type
 - Idling
 - Jurisdictional regulations
-
- Grease fittings
 - Lock-out and tag-out
 - Hydraulic fluids
 - Cleaning and disinfecting
 - Damage and wear
 - Safety features

2. Describe the maintenance of equipment attachments

Line (GAC): **C ORGANIZE WORK**
Competency: **C1 Perform site assessments**

Objectives

To be competent in this area, the individual must be able to:

- Interpret documentation pertaining to site assessment
- Assess site conditions for protection
- Identify existing and proposed grading and drainage patterns

LEARNING TASKS

CONTENT

- | | |
|---|---|
| 1. Interpret documentation pertaining to site assessment | <ul style="list-style-type: none"> • Grading plan • Drawings |
| 2. Assess existing site conditions for protection | <ul style="list-style-type: none"> • Soil • Structures • Plants |
| 3. Assess landscape site soils | <ul style="list-style-type: none"> • Construction impact • Change in site conditions |
| 4. Identify growing media conditions and properties | <ul style="list-style-type: none"> • Contamination • Viability • Tilth |
| 5. Identify existing and proposed grading and drainage patterns | <ul style="list-style-type: none"> • Grading plan • Topography <ul style="list-style-type: none"> ○ Contour plans |

Line (GAC):	C	ORGANIZE WORK
Competency:	C2	Use documentation and reference material

Objectives

To be competent in this area, the individual must be able to:

- Identify current government legislation and company policies
- Apply relevant legislation and policies
- Use reference materials

LEARNING TASKS

1. Identify and apply current government legislation and company policies
2. Use catalogues
3. Use text and field books for referencing

CONTENT

- Relevant legislation
 - Federal
 - Municipal
 - Provincial
- Transportation
- Water
- Habitat and wildlife preservation
- Pest control
- Plant identification
- Product comparisons
- Ordering
 - Tools
 - Equipment
- Plant materials
- Identifying
 - Pests
 - Diseases
 - Methods of control

Line (GAC): **C ORGANIZE WORK**
Competency: **C3 Maintain records**

Objectives

To be competent in this area, the individual must be able to:

- Describe examples of additional records
- Describe types of shipping and receiving information

LEARNING TASKS

1. Describe examples of additional records

2. Describe types of shipping and receiving information

CONTENT

- Temperatures
- Client communications

- Inventory adjustments
- Regulatory documentation
- Phytosanitary Certificates

Line (GAC): **C ORGANIZE WORK**
Competency: **C5 Order materials**

Objectives

To be competent in this area, the individual must be able to:

- Describe the considerations for ordering materials
- Describe the process for keeping records

LEARNING TASKS

1. Identify required materials

CONTENT

- Types
- Size
- Quality
- Quantity
- CLS
- Jurisdictional requirements
- Contract documents

2. Describe the considerations when ordering materials

- Accuracy of ordering
 - Botanical nomenclature
 - Industry terminology
- Budget
 - Price comparisons
- Delivery and pick up schedules
 - Site staging
 - Sequence of tasks
 - Coordination with on site contractors
 - Carbon reduction
- Size and weight

3. Confirm documents are complete

- Order number
- Tracking number
- Suppliers contact information

4. Identify required documents to prevent delays

- Movement certificates
- Permits
- Plans
- Specifications
- Jurisdictional regulations
- Purchase orders

Line (GAC):	C	ORGANIZE WORK
Competency:	C6	Organize materials and equipment

Objectives

To be competent in this area, the individual must be able to:

- Receive plants and materials
- Handle substandard plants and materials

LEARNING TASKS

1. Receive plants and materials

CONTENT

- Unloading
- Recording
- Protection
- Storage
 - Size and species groupings
 - Designated areas
 - Product quality
 - Contamination
- CLS

2. Handle substandard plants and materials

- Quarantine
- Rejection
- Disposal
- CLS
- Jurisdictional regulations
- Company policy
- Site specifications

Achievement Criteria

Performance	The learner will be able to organize plant materials and equipment on-site.
Conditions	The learner will be given: • Materials, tools and equipment
Criteria	The learner will be evaluated on: • Confirmed order • Performed final check • Properly handled plants and materials when unloading • Organized and stored materials according to size, type and requirements • Reported and processed substandard materials • Sustainable and safe work practice

Line (GAC): **G APPLY HORTICULTURAL PRACTICES**
Competency: **G2 Identify plants**

Objectives

To be competent in this area, the individual must be able to:

- Identify plants and plant requirements for 90 woody and non-woody plants
- Recognize plants suitable for common tropical, floral and interior landscape situations
- Identify plants suitable for specific uses
- Identify plants suitable for planting in difficult situations

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Recognize plants suitable for common tropical, floral and interior landscape situations | <ul style="list-style-type: none"> • Interior landscaping • House plants • Floral uses |
| 2. Identify considerations for selection of plants based on specific uses | <ul style="list-style-type: none"> • Specific uses <ul style="list-style-type: none"> ○ Residential ○ Commercial ○ Reclamation ○ Restoration ○ Environmental ○ Medicinal ○ Indigenous |
| 3. Recognize plants suitable for planting in difficult situations | <ul style="list-style-type: none"> • Difficult planting conditions <ul style="list-style-type: none"> ○ Sunny arid conditions ○ Shade ○ Dry shade ○ Dry soil conditions ○ Wetlands ○ Compacted soils ○ Slopes |
| 4. Identify and describe 90 woody and non-woody plants | <ul style="list-style-type: none"> • Botanical terms • Requirements <ul style="list-style-type: none"> ○ Cultural ○ Maintenance |

Line (GAC): G APPLY HORTICULTURAL PRACTICES
Competency: G4 Prune plant materials

Objectives

To be competent in this area, the individual must be able to:

- Demonstrate pruning techniques for trees
- Use common arboricultural hand tools to prune trees

LEARNING TASKS

1. Select and use tools and equipment
2. Establish pruning objectives
3. Describe tree pruning considerations

CONTENT

- Pole saw
- Pole pruner
- Hand saw
- Clearance
- Shade
- Managing loads
 - Dynamic
 - Static
- Health
 - DDDI
- Flower and fruit production
- Aesthetics
- Training structure
- Reasons
 - Health and vigour
 - Direct, control, or modify growth
 - Fruit and flower production
 - Aesthetics
- Affecting factors
 - Plant form
 - Function
 - Age
 - Location
 - Timing
 - Pre-pruning treatments
 - Severe pruning
 - Alternatives to pruning
- Efficiencies
 - Hand pruning vs. mechanical tools
 - Efficiencies and maintenance standard

LEARNING TASKS

CONTENT

4. Recognize factors contributing to tree failure

- Structural defects
- Damage
 - Types
 - Cultural
 - Mechanical
 - Environmental
- Plant species
- Size
- Age
- Site conditions
- Past maintenance practices
 - Planting
 - Training
 - Guying and staking
- Post planting care
- Risks associated with trees

5. Describe basic plant morphology, anatomy, and physiology with regard to pruning trees

- Plant morphology
 - Roots
 - Trunk
 - Crown
 - Branching

6. Perform pruning techniques for young and established trees

- Pruning cuts
 - Thinning (removal)
 - Reducing
 - Heading
- Three-cut method
- Pruning methods
 - Cleaning
 - Thinning
 - Raising
 - Reduction
 - Restoration / rejuvenation
 - Heading
 - Specialty pruning
 - Pollarding
 - Espalier

7. Describe training techniques for young trees

- Structural pruning
 - Developing trunk caliper
 - Scaffold spacing
 - Co-dominant stems
 - Root pruning and training

LEARNING TASKS

8. Describe timing of pruning trees

9. Describe compartmentalization

CONTENT

- Factors
 - Dormant season
 - Growth response
 - Wind and frost damage
 - Non-dormant pruning
 - Scorch
 - Site activities
- Compartmentalization of decay in trees (CODIT): Resisting decay in trees
- Callus and wound wood

Achievement Criteria

Performance The learner will be able to demonstrate juvenile tree pruning techniques.

Conditions The learner will be given:

- Materials, tools and equipment
- PPE required for the task

Criteria The learner will be evaluated on:

- Pruned juvenile tree according to industry standards
- Sustainability and safe work practices

Line (GAC):	G	APPLY HORTICULTURAL PRACTICES
Competency:	G6	Manage pests, diseases and invasive species

Objectives

To be competent in this area, the individual must be able to:

- Describe conditions that cause plant stress
- Examine characteristics of pests, diseases, and invasive species
- Apply treatment methods for pests

LEARNING TASKS

1. Describe basic pathogen biology

2. Describe established methods for controlling pests

3. Describe the damage and management of vertebrate pests

4. Describe the characteristics of invertebrate pests

CONTENT

- Morphology and life cycles
 - Fungi
 - Bacteria
 - Viruses
 - Nematodes
- IPM
 - Six steps
- Documentation
 - Jurisdictional regulations
- Methods
 - Cultural
 - Biological
 - Chemical
- Wildlife management
- Vertebrate plant-feeding pests
 - Birds
 - Deer
 - Rodents
 - Moles
 - Racoons
- Ecology
- Pest success
- Signs of damage
- Common pests
 - Aphids
 - Leafhoppers
 - Scales
 - Weevils and beetles
 - Caterpillars and moths
 - Lacebugs
 - Sawflies

LEARNING TASKS

CONTENT

	○ Thrips ○ Mites ○ Fungus gnats ○ Leaf miners ○ Slugs and snails
5. Describe the characteristics of pathogens	• Pest success • Disease triangle • Disease development cycle • Common categories • Bacterial ○ Galls ○ Blights ○ Canker • Fungal ○ Rots ○ Molds ○ Mildews ○ Rusts ○ Wilts • Nematode ○ Foliar ○ Root ○ Viral ○ Mosaic
6. Describe the integrated strategies for pest control	• Viruses • Bacteria • Invertebrates • Fungi • Nematodes • Weeds
7. Identify the factors for selecting and applying treatment methods	• Pest identification ○ Life cycle stage • Site conditions ○ Proximity to sensitive areas ○ Weather ○ Site use ○ Topography • Availability ○ Product ○ Resources • Perishability • Jurisdictional regulations

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>8. Apply management and treatment methods</p> <p>9. Describe safe disposal of products and materials</p> | <ul style="list-style-type: none"> • Contracts documents
 • Cultural • Biological • Chemical <ul style="list-style-type: none"> ○ Calibrate application equipment • Physical / mechanical
 • Pest- and disease-ridden plant material • Invasive species • Products and containers • Jurisdictional regulations |
|---|---|

Line (GAC):	H	APPLY ENVIRONMENTAL PRACTICES
Competency:	H1	Practice environmental stewardship

Objectives

To be competent in this area, the individual must be able to:

- Discuss opportunities for stewardship related to pest and disease management

LEARNING TASKS

1. Identify opportunities for stewardship related to pest and disease management

CONTENT

- Tools
- Equipment
- Plants
- Materials
- Waste management and disposal
 - Reduce, reuse and recycle
 - Conservation
 - Preservation
 - Low-impact
- Organized workflow
- Site protection
- Maintenance practices
- Installation practices

Line (GAC): **H APPLY ENVIRONMENTAL PRACTICES**
Competency: **H4 Practice water stewardship**

Objectives

To be competent in this area, the individual must be able to:

- Describe practices that promote water stewardship
- Describe irrigation system auditing and scheduling procedures

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>1. Describe practices that promote water stewardship</p> | <ul style="list-style-type: none"> • Low impact development (LID) <ul style="list-style-type: none"> ○ Rain barrels ○ Infiltration trenches ○ Bioswales ○ Bioretention cells ○ Rain gardens ○ Green roofs • Irrigation systems • Erosion prevention • Chemical use • Jurisdictional regulations • Waterwise principles <ul style="list-style-type: none"> ○ Xeriscaping |
| <p>2. Describe irrigation system auditing and scheduling procedures</p> | <ul style="list-style-type: none"> • Scheduling <ul style="list-style-type: none"> ○ Irrigation Industry Association of BC worksheets (IIABC) ○ Controller programs ○ Plant health ○ Jurisdictional regulations • Auditing <ul style="list-style-type: none"> ○ Irrigation system efficiency ○ Lower quarter distribution uniformity ○ Scheduling coefficient ○ Auditing kit requirements ○ Sprinkler head pressure <ul style="list-style-type: none"> – Procedure ○ Practical auditing procedures <ul style="list-style-type: none"> – Head spacing – Levelling |

Line (GAC):	J	INSTALL HARDSCAPE
Competency:	J1	Install landscape structures

Objectives

To be competent in this area, the individual must be able to:

- Identify landscape structure types
- Construct landscape structures using the correct tools, equipment and materials

LEARNING TASKS

CONTENT

1. Select and use hand and power tools	• Tools ○ Power saws ○ Power drills ○ Hammers ○ Brooms ○ Water and power blowers
2. Select and use equipment	• Equipment ○ Excavators ○ Skid steers ○ Attachments
3. Identify products and materials used in feature construction	• Wood • Lumber grades • Composite • Stone • Segmented block • Concrete
4. Identify landscape structures	• Types ○ Decks ○ Pergolas/arbour ○ Outdoor kitchens ○ Gazebos ○ Fences ○ Sheds ○ Cabanas
5. Prepare for the installation of landscape structures	• Specifications and drawings • Environmental protection ○ Arborist report • Site locates ○ Daylighting • Foundation preparation • Layout

- Grade level
 - Stake interpretation
 - Triangulation
 - Grid systems
 - Area excavation

- 6. Construct landscape structures
 - All types
 - Installation verification
 - Jurisdictional regulations
 - Drawing specifications
 - Manufacturer's specifications
 - Building codes

- 7. Describe protective products
 - Preservatives
 - Stains
 - Sealants

- 8. Clean-up site
 - Surfaces
 - Repair damage
 - Excess material
 - Disposal
 - Recycle

Line (GAC): J **INSTALL HARDSCAPE**
Competency: J2 **Install surface materials**

Objectives

To be competent in this area, the individual must be able to:

- Install masonry surface materials using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand and power tools

2. Select and use equipment

3. Select and use surface materials

4. Prepare for installation

5. Install surface materials

CONTENT

- Tools
 - Shovels
 - Picks
 - Chisels
 - Cut saw
 - Guillotine
 - Wheelbarrows
 - Brooms
 - Power blowers
- Equipment
 - Excavators
 - Plate compactors
 - Skid steers
- Interpret documents
- Surface materials
 - Concrete
 - Asphalt
 - Permeable pavement
 - Synthetic materials
 - Paving stones
- Site assessment
- Layout
- Excavation
- Subgrade compaction
- Excavated materials
 - Removal
 - Recycle
 - Storage
- Standards and specifications
- Sleeving
- Geotextiles
- Geogrid

LEARNING TASKS

CONTENT

6. Clean-up site

- Aggregate base
 - Lifts
 - Grade
 - Positive drainage
 - Edge restraints
 - Base materials
 - High performance base
 - Concrete base
 - Manufactured base
 - Compact
 - Bedding layer
 - Sand
 - Screeding
 - Dimensions
 - Measure
 - Cut
 - Fit
 - Surface cleaning
 - Joint materials
 - Mortars
 - Sand
 - Polymeric sand
 - Cleaners and sealants
 - Standards and specifications
-
- Surfaces
 - Repair damage
 - Debris
 - Dispose
 - Recycle

Line (GAC):	J	INSTALL HARDSCAPE
Competency:	J4	Install irrigation systems

Objectives

To be competent in this area, the individual must be able to:

- Install irrigation systems using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand and power tools
2. Select and use equipment
3. Apply irrigation terminology
4. Examine factors that determine irrigation rates and methods

CONTENT

- Tools
 - Pipe cutters
 - Crimping tools
 - Trenching shovels
 - Wheelbarrows
- Equipment
 - Excavators
 - Trenchers
 - Skid steers and attachments
- Gallons per minute (GPM)
- Precipitation
 - Rate
- Pressure
 - Static
 - Dynamic
- Feet of head
- Pounds per square inch (PSI)
 - Friction loss
- Evapotranspiration (ET)
- Head-to-head spacing
- Velocity
- Plant material
 - Growth stage
 - Mature size
 - Water use rate
- Root zone assessment
- Soil / water relationship
- Site conditions
- Application
 - Time
 - Rate
 - Duration
- Climate

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 5. Identify considerations and procedures for determining water quality and availability | <ul style="list-style-type: none"> • Sample preparation • Water <ul style="list-style-type: none"> ○ Testing ○ Pressure • Flow rates • Results interpretation |
| 6. Identify irrigation systems | <ul style="list-style-type: none"> • Manual • Automatic • Drip / low water volume • Sprinkler <ul style="list-style-type: none"> ○ In ground ○ Above ground |
| 7. Identify irrigation components | <ul style="list-style-type: none"> • Sprinkler heads <ul style="list-style-type: none"> ○ Swing joints ○ Nozzle <ul style="list-style-type: none"> – Screens – Filters • Valves <ul style="list-style-type: none"> ○ Pressure regulator valves ○ Solenoid ○ Blow out • Backflow preventers • Controllers <ul style="list-style-type: none"> ○ Rain sensor • Piping and pipe fittings <ul style="list-style-type: none"> ○ Pipe scheduling • Water meters |
| 8. Prepare for installation | <ul style="list-style-type: none"> • Site assessment • Layout • Excavation • Subgrade compaction • Excavated materials <ul style="list-style-type: none"> ○ Store ○ Remove ○ Recycle • Standards and specifications |
| 9. Install irrigation systems | <ul style="list-style-type: none"> • Trenching vs. pulling pipe • Pipe • Components |

LEARNING TASKS

CONTENT

- | | |
|---------------------------------------|--|
| | <ul style="list-style-type: none"> • Wires • Backfilling • Test system • Head and nozzle heights • Control system |
| 10. Program the control system | <ul style="list-style-type: none"> • Time • Dates • Duration • Frequency • Jurisdictional regulations |
| 11. Verify installation and operation | <ul style="list-style-type: none"> • Environmental requirements <ul style="list-style-type: none"> ○ Soil type ○ Evapotranspiration rates ○ Plant needs • Specifications and standards |
| 12. Clean up site | <ul style="list-style-type: none"> • Repair damages • Debris <ul style="list-style-type: none"> ○ Dispose ○ Recycle |

Achievement Criteria

Performance The learner will be able to install a small irrigation system.

Conditions The learner will be given:

- Materials, tools and equipment
- Installation area
- Drawings and specifications
- Site locates

Criteria The learner will be evaluated on:

- Installed irrigation system according to plans and specifications
- Pressure tested the system
- Adjusted sprinkler heads
- Programmed the timer correctly
- Sustainable and safe work practice

Line (GAC): J **INSTALL HARDSCAPE**
Competency: J5 **Install water features**

Objectives

To be competent in this area, the individual must be able to:

- Describe installation of water features using the correct tools, equipment and materials

LEARNING TASKS

1. Describe types of water features

2. Select and use hand and power tools

3. Select and use equipment

4. Describe site preparation to install water features

5. Describe procedures to install water features

CONTENT

- Ponds
- Waterfalls
- Gurglers
- Fountains

- Tools
 - Shovels
 - Picks
 - Chisels
 - Wheelbarrows

- Equipment
 - Excavators
 - Loaders
 - Skid steers

- Documentation
- Environmental protection
- Layout
- Excavation
 - Store
 - Remove
 - Recycle

- Regulations and standards
 - Certification and training
- Hazards
- Safe work practices
- Components
 - Sand
 - Geotextiles
 - Drains
 - Water supply components
 - Filtration systems
 - Pumps

LEARNING TASKS

CONTENT

- | | |
|---|--|
| | <ul style="list-style-type: none"> – Flow rates – Pump and pipe sizing charts ○ Electrical conduits ○ Lighting ○ Liners and membranes ○ Adhesives, foams and mortar ○ Aggregates and decorative features |
| 6. Explain maintaining water levels | <ul style="list-style-type: none"> • Volume • Check for leaks • Settling • Optimal performance • Sound • Aesthetics |
| 7. Describe the factors for finalizing installation | <ul style="list-style-type: none"> • Clarity <ul style="list-style-type: none"> ○ Components ○ Water • Ecosystem enhancement products <ul style="list-style-type: none"> ○ Beneficial bacteria ○ pH amendments • Plant material • Fish • Verification • Specifications and standards |
| 8. Describe site clean up | <ul style="list-style-type: none"> • Repairs • Excess material <ul style="list-style-type: none"> ○ Disposal ○ Recycle |

Line (GAC):	J	INSTALL HARDSCAPE
Competency:	J6	Installs extra-low voltage landscape lighting and other extra-low voltage electrical systems

Objectives

To be competent in this area, the individual must be able to:

- Describe installation of extra-low voltage landscape lighting using the correct tools, equipment and materials

LEARNING TASKS

1. Select and use hand and power tools
2. Select and use equipment
3. Identify extra-low voltage landscape systems
4. Describe preparation for installation of extra-low voltage landscape lighting
5. Describe components of extra-low voltage landscape lighting

CONTENT

- Tools
 - Wire strippers
 - Voltmeter
 - Ladders
 - Shovels
- Trenchers
- Vibratory plow
- Types
 - Lighting
 - Speakers
 - Security systems
 - Pet management wiring
 - Wiring for autonomous mowers
- Coordination
- Safe work practices
- Environmental protection
- Trenches
 - Site locates
- Tunnels
- Excavated materials
 - Storage
 - Removal
 - Recycle
- Voltage drop calculation
- Solar panels
- Transformers
- Connectors
- Conduit/sleeves
- Lamps
- Fuses

- Sensors
 - Wire/cable
 - Lighting components
 - LED lights
 - Controller
 - Fixtures

- 6. Describe installation of extra-low voltage landscape lighting
 - Layout
 - Assembly
 - Fixture positioning
 - Operation and voltage verification
 - Manufacturer's specifications
 - Plan
 - Industry Standards

- 7. Describe lighting adjustments
 - Program controller
 - Lighting fixtures
 - Customer requirements
 - Designer effects

- 8. Describe site clean-up
 - Damage repairs
 - Excess material
 - Disposal
 - Recycle

Line (GAC):	K	INSTALL SOFTSCAPE
Competency:	K7	Install interior landscape plants

Objectives

To be competent in this area, the individual must be able to:

- Describe installation requirements for interior landscape plants

LEARNING TASKS

1. Select hand tools
2. Select equipment
3. Prepare plant materials

CONTENT

- Tools
 - Tree dollies
 - Shovels
 - Rakes
- Equipment
 - Skid steers
 - Tree gantries
- Plant types
 - Herbaceous
 - Woody
 - Tropical
- Stock types
 - Container
 - Ball and burlap
 - Bare root
 - Caliper stock
- Containers
- Plant tags
- Foliar washing
- Scarifying root ball
- Plant health
 - Irrigation
 - Equipment
 - Systems
 - Rates
 - Nutrient management
 - Exposure
- Standards and specifications
- Floors, walls, ceilings
- Furniture and structures
- Contract documents
- Standards and specifications

LEARNING TASKS

5. Prepare planting areas

CONTENT

- Growing media
 - Amendments
 - Fertilizer types
 - Biostimulants
 - Quality
 - Level
 - Quantity
- Containers
 - Coating
 - Condition
- Irrigation and drainage
- Undesirable material removal
 - Re-use
 - Recycle

6. Stage plant material

- Security
- Access
- Storage
- Time constraints
- Contract documents

7. Lay out plant materials

- Placement
- Drawings and specifications
- Suitability for conditions
 - Temperature
 - Lighting
 - Proximity to structures
 - Air quality and pollutants

8. Plant interior landscape plants

- Depth
- Drawings and specifications
- Mulch
- Irrigation
- Prune
- Site requirements

9. Verify plant installation

- Moisture content
- Plant health
- Drawings and specifications

10. Clean up site

- Excess materials
- Contract documents
- Floors, walls, ceilings
- Furniture and structures

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M2	Maintain landscape structures

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for landscape structures

LEARNING TASKS

1. Inspect structures for defects and hazards

CONTENT

- Peeling paint
- Rotting wood
- Heaving and settling
- Compromised hardware
- Spalling
- Damage
 - Mechanical
 - Environmental
- Efflorescence
- Re-seal and re-apply
 - Paint
 - Stain
 - Adhesives
- Clean
 - Scrub
 - Sweep
 - Blow
- Codes, specifications and standards
 - Safe work practices
- Environmental protection

2. Describe maintenance procedures for landscape structures

Line (GAC): **M MAINTAIN HARDSCAPE**
Competency: **M3 Maintain surface materials**

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for masonry surface materials

LEARNING TASKS

1. Describe surface defects and hazards

CONTENT

- Types
 - Efflorescence
 - Cracks
 - Frost heave
 - Settling
 - Staining
- Undesirable conditions
 - Efflorescence
 - Algae
 - Weeds
 - Debris
 - Stains

2. Describe maintenance procedures for surfaces

- Environmental protection
- Types
 - Walkways
 - Patios
 - Driveways
 - Parking lots
 - Synthetic surfaces
- Inspection
 - Debris removal
 - Undesirable growth removal
 - Jointing sand top up
 - Sealants
- Clean
 - Pressure washer
 - Blow
 - Broom
- Debris
 - Dispose and recycle
- Specifications and standards

Line (GAC): **M MAINTAIN HARDSCAPE**
Competency: **M5 Maintain irrigation systems**

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance procedures
- Describe requirements for irrigation system start-up and maintenance
- Describe irrigation system auditing and scheduling procedures

Learning tasks

1. Describe start-up to determine functioning of system

content

- Heads
- Nozzles
 - Spray patterns
 - Filters
 - Screens
- Pipes
- Valves
- Wires
- Rain sensors
- Controllers
- Wells and cisterns
- Pumps
 - Prime

2. Describe maintenance requirements

- Spring start-up
- Seasonal operation
- Winterization
- Program scheduling
- Head adjustments
- Cleaning
- Repairs

3. Factors that determine irrigation rates and methods

- Plant material
 - Growth stage
 - Mature size
 - Water use rate
- Root zone assessment
- Soil / water relationship
- Site conditions
- Application
 - Time
 - Rate
 - Duration
- Evapotranspiration rates

Learning tasks

content

- | | |
|---|--|
| | <ul style="list-style-type: none"> • Age and condition <ul style="list-style-type: none"> ○ System ○ Components |
| 4. Describe solutions | <ul style="list-style-type: none"> • Program scheduling • Head adjustments • Cleaning • Sensors • Landscape adjustments |
| 5. Describe water stewardship practices | <ul style="list-style-type: none"> • Scheduling • Auditing |

Line (GAC): **M MAINTAIN HARDSCAPE**
Competency: **M6 Maintain water features**

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for water features

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Select tools and equipment | <ul style="list-style-type: none"> • Common types |
| 2. Describe inspection of water features for defects | <ul style="list-style-type: none"> • Cracks • Leaks • Plugged filters • Faulty gaskets and seals • Debris • Undesirable growth |
| 3. Describe the process for charging systems and replacing pumps | <ul style="list-style-type: none"> • Pump priming • Start up operations |
| 4. Describe the process for setting and resetting timers | <ul style="list-style-type: none"> • Manufacturer's specifications • Contract requirements |
| 5. Describe the process for draining and refilling features | <ul style="list-style-type: none"> • Jurisdictional regulations • Seasonal maintenance • Water levels • Plant coverage • Fish protection <ul style="list-style-type: none"> ○ Wildlife ○ Water depth |
| 6. Describe the process for running systems to ensure functioning | <ul style="list-style-type: none"> • Manufacturer's specifications |
| 7. Describe the process for inspecting and testing water conditions | <ul style="list-style-type: none"> • Lack of clarity • Presence <ul style="list-style-type: none"> ○ Algae ○ Bacteria ○ Debris • Water level • pH levels • Nutrient level <ul style="list-style-type: none"> ○ Nitrogen ○ Oxygen |

LEARNING TASKS

8. Describe the process for testing a ground fault circuit interrupter (GFCI)
9. Describe the process for cleaning components
10. Describe cleaning of water features
11. Describe problems with water features
12. Describe the process for winterizing water features

CONTENT

- Canadian Standards Association (CSA)
- Filters
- Screens
- Nozzles
- Pumps
- Skimmers
- Liners
- Basins
- Fountains
- Aquatic products
- Water amendment
 - Aquatic products
- Flow rates
- Landscape element
- Draining
- Disconnecting
- Disassembling
- Covering
- Avoiding damage
- Storing
- Manufacturer's specifications

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M7	Maintain extra-low voltage landscape lighting and other extra-low voltage electrical systems

Objectives

To be competent in this area, the individual must be able to:

- Describe maintenance requirements for extra-low voltage landscape lighting and other extra-low voltage electrical systems.

LEARNING TASKS

- Describe visual inspection of components for extra-low voltage lighting and other extra-low voltage systems
- Describe adjustment of extra-low voltage lighting and other extra-low voltage systems
- Describe cleaning and clearing of extra-low voltage lighting and other extra-low voltage systems

CONTENT

- Types
 - Speakers
 - Security systems
 - Pet management wiring
 - Wiring for autonomous mowers
 - Aquatic lighting
 - Wiring for irrigation systems
 - Wiring for seasonal displays
- Defect detection
 - Flickering
 - Illumination
- Fixtures
- Lamps
- Fuses
- Transformers
- Connectors
- Sensors
- Solar panels
- Wire/cables
- Fixture positioning
 - Safe work practices
- Coverage
- Timer
 - Seasonal requirements
- Voltage levels
- Exposed wires
- Documentation
- Sensors
- Fixtures
- Solar panels
- Lamps
- Connectors

Section 3
Program Content – Level 3

- Debris
 - Disposal
 - Recycle

Line (GAC):	M	MAINTAIN HARDSCAPE
Competency:	M9	Repair hardscape

Objectives

To be competent in this area, the individual must be able to:

- Describe hardscape repair

LEARNING TASKS

1. Identify hardscape features and components

CONTENT

- Landscape structures
- Aggregate surfaces
- Hardscape surfaces
- Retaining walls
- Water features
- Irrigation

- ## 2. Recognize damage to hardscapes

- Damage
 - Cracks
 - Frost heave
 - Spalling
 - Settling
 - Efflorescence
- Issues
 - Damaged pipes
 - Plugged catch basins
 - Drainage
 - Damaged pipes
 - Plugged catch basin
 - Pooling
 - Failure of heat lines

3. Describe minor repairs

- Environmental protection
- Stones
- Timber
- Pipes
- Leveling structures
- Mortar
- Adhesives
- Sealants
- Lift and re-lay
 - Slope regrading
- Aggregate surfaces
- Low voltage cable
- Standards and specifications

Line (GAC): **N MAINTAIN SOFTSCAPE**
Competency: **N2 Maintain interior softscape**

Objectives

To be competent in this area, the individual must be able to:

- Select tools and equipment
- Describe seasonal plant replacement
- Describe cultivation and amendment of growing media
- Describe irrigation and fertilization of plants

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Select tools and equipment | <ul style="list-style-type: none"> • Common tools |
| 2. Select interior plants | <ul style="list-style-type: none"> • Plant secretions and toxicity • Sustainability Environmental <ul style="list-style-type: none"> ○ Moisture ○ Light ○ Humidity • Cultural • Growing media • Hardiness <ul style="list-style-type: none"> ○ Nutrients |
| 3. Identify pests and diseases | <ul style="list-style-type: none"> • Types • Causes • IPM |
| 4. Perform visual inspection | <ul style="list-style-type: none"> • Standards and specifications • Site assessment <ul style="list-style-type: none"> ○ Site access • Plant health • Appearance • Growth <ul style="list-style-type: none"> ○ Habit ○ Media <ul style="list-style-type: none"> – Crusting – Salinity |
| 5. Discuss irrigation and fertilization of plants | <ul style="list-style-type: none"> • Irrigation water <ul style="list-style-type: none"> ○ Quality <ul style="list-style-type: none"> – Temperature – pH |

LEARNING TASKS

CONTENT

		• Frequency • Fertilization Rates and types • Methods ○ Manual ○ Automatic
6.	Discuss cultivation and amendment of growing media	• Aeration • Aesthetics • Growing media depth and levels • Amendments ○ Perlite ○ Vermiculite ○ Coir ○ Peat moss ○ Mycorrhizae • Mulch ○ Organic ○ Inorganic
7.	Discuss cleaning of foliage and containers	• Aesthetics • Plant health • Damage
8.	Discuss seasonal plant replacement	• Health • Aesthetics • Contract documents
9.	Discuss protection of interior furnishings and surfaces	• Floors, walls, ceilings • Furniture and structures • Contract documents • Standards and specifications
10.	Discuss pruning of interior plants	• DDDI • Space restrictions • Codes and regulations • Plant health • Aesthetics
11.	Discuss managing growth for site conditions	• Pot-on and divide interior plants • Aesthetic • Root prune ○ Growth control ○ Soil volume ○ Girdling roots

LEARNING TASKS

12. Discuss movement and rotation of plant

CONTENT

- Uniform growth
- Lighting
- Space requirements
- Codes and regulations

Line (GAC): **N MAINTAIN SOFTSCAPE**
Competency: **N4 Repair softscape**

Objectives

To be competent in this area, the individual must be able to:

- Select tools and equipment
- Describe management and repair of plant material
- Describe management and repair of landscape materials

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Select tools and equipment | <ul style="list-style-type: none"> • Common types |
| 2. Describe management of damaged plant material | <ul style="list-style-type: none"> • Plant requirements • Sustainability • Standards and specifications • Safe work practices • Structural supports <ul style="list-style-type: none"> ○ Cabling ○ Bracing ○ Staking ○ Propping • Pruning • Amending soils • Anti-desiccants |
| 3. Describe reasons for replacing interior and exterior plants | <ul style="list-style-type: none"> • Dead, Damaged, Diseased • Maintenance level • Contract documents • Threshold levels <ul style="list-style-type: none"> ○ IPM ○ Client preference ○ Species ○ Appearance |
| 4. Describe repair of natural and manufactured edges | <ul style="list-style-type: none"> • Standards and specifications • Types <ul style="list-style-type: none"> ○ Brick ○ Plastic ○ Aluminum ○ Wood |
| 5. Describe repair and adjustment of staking and guying materials | <ul style="list-style-type: none"> • Prevention of plant damage • Standards and specifications |

LEARNING TASKS	CONTENT
6. Describe repair of grading and drainage	• Standards and specifications
7. Describe reasons for replacing growing media	• Remediate • Test results • Non-viable • Pernicious pests • Jurisdictional regulations
8. Describe repair of organic and inorganic mulch	• Materials ○ Aggregate ○ Rubber • Methods ○ Cleaning ○ Replenishing ○ Releveling ○ Replacing

Level 4

Landscape Horticulturist

Line (GAC): **C ORGANIZE WORK**
Competency: **C1 Perform site assessments**

Objectives

To be competent in this area, the individual must be able to:

- Inspect site-specific environmental conditions

LEARNING TASKS

1. Inspect site-specific environmental conditions

CONTENT

- Green infrastructure
- Design intent
- Sun
- Shade
- Wind
- Water
- Microclimates

2. Evaluate soil erosion

- Construction impact
- Change in site conditions
- Watering practices
- Exposure
- Slope
- Soil characteristics

Line (GAC):	C	ORGANIZE WORK
Competency:	C2	Use documentation and reference material

Objectives

To be competent in this area, the individual must be able to:

- Interpret landscape drawings and design intent
- Reference documentation pertaining to estimating

LEARNING TASKS

1. Interpret landscape drawings and design intent

CONTENT

- Design principles
- Plant list
- Notes
- Specifications
- Site protection areas
- Construction and landscape plans
 - Site
 - Layout
 - Contour
 - Grading
 - Irrigation
 - Planting
 - Lighting
- Detailed drawings
 - Plan view
 - Section view
 - Specification
 - Exploded view
 - Perspective
 - Elevations
- Line weight
- Tenders
 - Proposals
- Bid documents
- General conditions
- Supplementary conditions
- Standard form of contract
 - Canadian Construction Documents Committee (CCDC)
- Standards and codes

Line (GAC): C ORGANIZE WORK

Competency: C3 Maintain records

Objectives

To be competent in this area, the individual must be able to:

- Describe examples of additional records
- Describe types of work records

LEARNING TASKS

1. Describe examples of additional records

2. Describe types of work records

CONTENT

- IPM
- Jurisdictional regulations
 - Driver's abstract
 - Work permits
 - Certification records
- Work orders
- Training records
- Daily time sheets
- Change orders
- Site assessment records
- Employee evaluations

Line (GAC):	C	ORGANIZE WORK
Competency:	C4	Participate in job planning activities

Objectives

To be competent in this area, the individual must be able to:

- Identify and prioritize tasks
- Verify practices adhere to industry standards
- Identify and schedule labour, materials, tools and equipment
- Verify scope of project and determine sequence of job

LEARNING TASKS

CONTENT

1. Identify and prioritize tasks	• Time management • Performance efficiency
2. Identify labour requirements	• Historical information ○ Previous records • Skill level • Production hours • Project requirements ○ Weather ○ Materials and equipment • Jurisdictional regulations
3. Select and schedule labour, materials, tools and equipment	• Competing projects • Potential challenges • Site assessments • Designated timelines • Personnel • Sequence of work • On-site staging • Contract documents • Carbon reduction
4. Select and schedule sub-contractors	• Scope of work • Contract documents • Jurisdictional regulations
5. Consider safety requirements	• Safety plan • Site conditions • Contract documents • Jurisdictional regulations
6. Locate utilities	• Private • Public

- Site plan
- 7. Verify scope of project and determine sequence of job
 - Plan
 - Budget
 - Bottlenecks
- 8. Verify materials
 - Plans and specifications
 - Schedule
- 9. Plan site-specific staging
 - Environmental protection
 - Vehicle parking
 - Storage
 - Portable offices
 - Toilets
 - Space availability
- 10. Identify and schedule clean-up
 - Daily
 - End of contract

Line (GAC): D PARTICIPATE IN MARKETING AND SALES

Competency: D1 Control Inventory

Objectives

To be competent in this area, the individual must be able to:

- Describe the considerations for controlling inventory as per company policies and procedures

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Describe the process for identifying and counting inventory | <ul style="list-style-type: none"> • Manual • Electronic systems • Inventory records • Company policy |
| 2. Describe the process for sorting and maintaining inventory | <ul style="list-style-type: none"> • Type • Age • Quality • Size • Efficiency • Cost effectiveness • Safe disposal • Jurisdictional regulations • Environmental protection |
| 3. Describe the considerations for restocking orders | <ul style="list-style-type: none"> • Quantities • Expiration dates • Seasonal needs • Availability • Budget |

Line (GAC):	D	PARTICIPATE IN MARKETING AND SALES
Competency:	D2	Sell products and services

Objectives

To be competent in this area, the individual must be able to:

- Describe selling products and services

LEARNING TASKS

1. Describe considerations for client education and advising
2. Describe merchandising and marketing of products and services
3. Describe considerations for handling payments for products and services

CONTENT

- Client needs
- Plants
- Products
- Seasonal purchases
- Environmental stewardship
 - Sustainability
- Services
- Jurisdictional regulations
- Up-selling
 - Additional products
 - Extended services
 - Special offers
- Visual display
 - Attractiveness
 - Visibility
 - Professional image
- Digital advertising
 - Social media
 - On-line presence
- Print media
 - Brochures
 - Business cards
- Company policy
- Contracts
 - Scope of work
 - Materials
 - Timelines
 - Costs
- Invoices
 - Calculating taxes
- Receipts

Line (GAC): **D PARTICIPATE IN MARKETING AND SALES**
Competency: **D3 Maintain customer relations**

Objectives

To be competent in this area, the individual must be able to:

- Describe methods of maintaining good customer relations

LEARNING TASKS

1. Describe methods of maintaining customer relations

CONTENT

- Customers
 - Qualifying
 - Education
 - Upselling
- Addressing concerns
 - Tact
 - Politeness
 - Timing
 - Conflict resolution
- Professionalism
 - Dress
 - Equipment
 - Social media
 - Behaviour
 - Respect
 - Integrity
- Public relations
 - On site
 - In transit
- After-service follow-up
 - Customer satisfaction

2. Describe methods of maintaining customer records

- Contact information
- Product preferences
- Records
 - Current
 - Accurate
- Company policy
- Jurisdictional regulations

3. Identify stakeholders for future inquiries

- Property owners
- Designers
- Engineers

Line (GAC): **D PARTICIPATE IN MARKETING AND SALES**
Competency: **D4 Prepare estimates**

Objectives

To be competent in this area, the individual must be able to:

- Prepare estimates for basic landscape installation projects

LEARNING TASKS

CONTENT

- | | |
|---|--|
| 1. Interpret site information and documentation | <ul style="list-style-type: none"> • Drawings • Specifications • Tendering documents • Client instructions • Digital mapping • Environmental factors |
| 2. Identify sources of information pertaining to estimating | <ul style="list-style-type: none"> • Suppliers • Operational costs • Standards • Definitions • Calculations |
| 3. Estimate material costs | <ul style="list-style-type: none"> • Quantity take off <ul style="list-style-type: none"> ○ Length ○ Area ○ Volume • Materials <ul style="list-style-type: none"> ○ Types ○ Spoilage • Expansion and compaction factors • Pricing |
| 4. Estimate labour costs | <ul style="list-style-type: none"> • Job requirements • Data • Productivity • Skill level • Scheduling • Wages and labour burden |
| 5. Estimate equipment costs | <ul style="list-style-type: none"> • Job requirements • Data • Rental • Availability • Site considerations • Hourly operational cost |

LEARNING TASKS

CONTENT

6. Estimate additional costs

- Sub-contractors
- Job overhead costs
 - Direct
 - Transportation
 - Change orders
 - Accommodations
 - Permits
 - Waste disposal
 - Surcharges
 - Indirect
 - Safety program
 - Administrative overhead
 - Insurance
- Contingencies
 - Weather
 - Delays
- Profit
 - Risk

7. Coordinate project logistics

- Logistical issues
 - Site access
 - Incidentals
 - Skill requirements
 - Scheduling
 - Equipment availability
- Coordination
 - Suppliers
 - Employees
 - Contractors

8. Provide estimates

- Contract documents
- Recapitulation
- Profit taxes
- Timeline/deadline

Line (GAC): E USE CONTINUOUS LEARNING TECHNIQUES

Competency: E1 Upgrade in new trade practices and procedures

Objectives

To be competent in this area, the individual must be able to:

- Identify continuous learning methods
- Identify supports and resources for learning
- Develop and maintain personal and professional development plan
- Identify factors that may impact learning needs and goals

LEARNING TASKS

1. Identify continuous learning methods

CONTENT

- Performance review processes
 - Seeking feedback
 - Addressing feedback
 - Assessing personal learning needs
- Learning opportunities
 - Seminars
 - Webinars
 - Training courses
 - Podcasts
 - Videos
 - Independent research
- Certifications and training
- Computer and technology skills
- Best practices and concepts
- Knowledge into practice
 - Professionalism
 - Continuous learning
 - Skill development

2. Identify supports and resources for learning

- Professional networks and associations
- Manufacturers' seminars
- Collaboration
 - Colleagues
 - Community members
- Counselling
- Mentoring
- Peer support groups
- Online resources
- Individual education plan (IEP)
- Language supports
- Accommodations

3. Develop and maintain personal and professional development plan

- Elements of a professional portfolio
 - Resume

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>4. Identify factors that may impact learning needs and goals</p> | <ul style="list-style-type: none"> ○ Certificates ○ Licenses ○ Diplomas ○ Degrees ○ Transcripts ○ Marketable skills ○ Professional accomplishments ○ Work samples ○ Awards ○ References
<ul style="list-style-type: none"> ● New technology ● Trade and sector trends and practices ● Skills updating ● Legislative and regulatory changes ● Barriers to learning <ul style="list-style-type: none"> ○ Supports and resources |
|---|---|

Achievement Criteria

Performance The learner will be able to create a professional portfolio.

Conditions The learner will be given:

- Instructions
- Portfolio template
- Resources.

Criteria The learner will be evaluated on:

- Completeness
- Professionalism
- Content

Line (GAC):	E	USE CONTINUOUS LEARNING TECHNIQUES
Competency:	E2	Upgrades in emerging technologies

Objectives

To be competent in this area, the individual must be able to:

- Identify industry advancements
- Participate in professional development activities
- Interpret information about latest advancements and emerging technologies
- Share information on emerging technologies with colleagues and management

LEARNING TASKS
CONTENT

1	Identify industry advancements	• Mechanical • Technical • Biological • Cultural • Digital and data • Ecological • Environmental
2.	Participate in professional development activities	• Seminars • Conferences • Workshops • Webinars • Trade shows
3.	Interpret information about latest advancements and emerging technologies	• Manufacturer's literature • Online resources • Trade journals and magazines
4.	Share information on emerging technologies with colleagues and management	• Sharing information ○ Advantages • Emerging technology ○ Advantages ○ Disadvantages

Line (GAC): F USE COMMUNICATION AND MENTORING TECHNIQUES

Competency: F2 Use mentoring techniques

Objectives

To be competent in this area, the individual must be able to:

- Describe the role and responsibilities of a mentor
- Describe the skills of a mentor

LEARNING TASKS

1. Describe leadership in the organization

2. Define the roles and responsibilities of the mentor

3. Describe training skills

4. Describe learning styles and needs

CONTENT

- Definition
- Roles
- Characteristics
- Leadership skills
 - Delegation
 - Goal Setting
 - Coaching
 - Training
- Communication
- Training
- Modelling
- Supporting
- Enforcing
- Ensuring skills progression
- Assessing suitability
- Lesson objectives
 - Explanation
 - Demonstration
 - Practice
- Lessons
 - Linking
 - Adjusting
- Supportive and constructive feedback
 - Messaging
 - Goal setting
 - Assessing
- Preferences
 - Visual
 - Auditory
 - Kinesthetic
- Diverse learning
- Language proficiency
- Accommodations

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 5. Describe the value of essential skills in the workplace | <ul style="list-style-type: none"> • Reading • Writing • Document use • Oral communication • Numeracy • Thinking • Working with others • Digital technology • Continuous learning |
| 6. Manage time | <ul style="list-style-type: none"> • Supervisor <ul style="list-style-type: none"> ○ Role • Time management <ul style="list-style-type: none"> ○ Personal ○ Work |
| 7. Examine roles and responsibilities in an organization | <ul style="list-style-type: none"> • Structure • Roles • Responsibilities • Application of authority <ul style="list-style-type: none"> ○ Decision making |
| 8. Recognize ethical and social responsibility issues in the workplace | <ul style="list-style-type: none"> • Individual perspectives and experiences • Organizational ethics • Jurisdictional regulations • Managing diversity • Corporate culture |
| 9. Interpret the employment standards | <ul style="list-style-type: none"> • Employment Standards Act <ul style="list-style-type: none"> ○ Impacts |

Line (GAC): G APPLY HORTICULTURAL PRACTICES

Competency: G2 Identify plants

Objectives

To be competent in this area, the individual must be able to:

- Identify plants and plant requirements for 90 woody and non-woody plants
- Describe native and seasonal plants common to the horticulture industry in BC
- Describe plants suitable for green infrastructure and edible landscapes

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Describe native plants common to the horticulture industry | <ul style="list-style-type: none"> • Trees • Shrubs • Groundcovers • Perennials • Biennials • Annuals • Provenance |
| 2. Describe seasonal plants common to the horticulture industry in BC | <ul style="list-style-type: none"> • Exterior • Interior |
| 3. Describe plants suitable for green infrastructure and biodiverse projects | <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> ○ Green roofs ○ Green walls ○ Bioswales ○ Rain gardens ○ Pollinator gardens |
| 4. Describe plants suitable for edible landscapes | <ul style="list-style-type: none"> • Jurisdictional regulations • Wildlife • Types • Design implications • Companion planting |
| 5. Identify and describe 90 woody and non-woody plants | <ul style="list-style-type: none"> • Botanical terms • Requirements <ul style="list-style-type: none"> ○ Cultural ○ Maintenance |

Line (GAC):	G	APPLY HORTICULTURAL PRACTICES
Competency:	G6	Manage pests, diseases and invasive species

Objectives

To be competent in this area, the individual must be able to:

- Discuss implications of pest management in landscapes
- Identify quarantine protocol
- Develop an IPM program for a landscape

LEARNING TASKS

CONTENT

- | | |
|--|--|
| 1. Discuss the implications of pest management | <ul style="list-style-type: none"> • Regulations <ul style="list-style-type: none"> ○ Federal ○ Provincial ○ Municipal • Purchase • Transportation • Storage • Use and disposal • Considerations <ul style="list-style-type: none"> ○ Economic ○ Aesthetic ○ Environmental ○ Social |
| 2. Identify regulated versus non-regulated pests in BC | <ul style="list-style-type: none"> • Exotic • Invasive • Noxious • Introduced • Jurisdictional regulations |
| 3. Identify quarantine protocols | <ul style="list-style-type: none"> • Early detection and eradication • Import/export restrictions • Containment or destruction of contaminated materials • Sanitation practice <ul style="list-style-type: none"> ○ Tools ○ Vehicles ○ Equipment • Jurisdictional regulations • Standards and specifications |
| 4. Prepare samples for lab testing | <ul style="list-style-type: none"> • Submission form • Sample collections • Shipment of sample |

LEARNING TASKS

5. Develop a diagnostic checklist

CONTENT

- Host plant identification
 - Abiotic/biotic
 - Patterns of signs and symptoms
 - Distribution
 - Site
 - Plant
 - Site history
 - Weather conditions
 - Seasonality
 - Geographic location
 - Phenology
-
- Goals
 - Severity of pest damage
 - Monitor
 - Document
 - Maintenance level and site use
 - Costs of control vs. economic/aesthetic losses
 - Calculating risks

6. Develop and implement an IPM program

Achievement Criteria

Performance The learner will be able to develop and implement an IPM program.

Conditions The learner will be given:

- Materials, tools and equipment
- Worksite or scenario
- Threshold goals

Criteria The learner will be evaluated on:

- Integrated and justified, control and maintenance methods
- Established monitoring guidelines
- Established site use and thresholds
- Calculated major risks associated with program
- Established evaluation guidelines
- Sustainable and safe work practice

Line (GAC): H APPLY ENVIRONMENTAL PRACTICES

Competency: H1 Practice environmental stewardship

Objectives

To be competent in this area, the individual must be able to:

- Discuss opportunities for stewardship related to green infrastructure and biodiversity

LEARNING TASKS

1. Identify opportunities for stewardship related to green infrastructure and biodiversity

CONTENT

- Tools
- Equipment
- Plants
- Materials
- Waste management and disposal
 - Reduce, reuse and recycle
 - Conservation
 - Preservation
 - Low-impact
- Organized workflow
- Site protection
- Maintenance practices
- Installation practices

Line (GAC):	H	APPLY ENVIRONMENTAL PRACTICES
Competency:	H2	Practice biodiversity enhancement

Objectives

To be competent in this area, the individual must be able to:

- Describe a variety of habitats to support a range of organisms
- Describe biodiverse enhancement strategies

LEARNING TASKS

1. Define biodiversity
2. Describe selection of plants that ensure diversity within landscapes
3. Describe a variety of habitats that support a range of organisms

CONTENT

- Value
- Purpose
- Jurisdictional regulations
- Aesthetics
- Disease and pest resistance
- Flower time
- Plant type
- Functions
 - Edible
 - Medicinal
 - Cultural
 - Structural
 - Economic
- Benefits
 - Climate control
 - Carbon capture
 - Symbiotic relationships
 - Pollution abatement
 - Energy conservation
 - Water infiltration
- Age
- Hydrozones
- Jurisdictional regulations
- Habitats
 - Refuge and nesting sites
 - Wildlife trees
 - Water and food
- Organisms
 - Beneficial insects
 - Pollinators
 - Biological controls
 - Mycorrhizae and other soil biota
 - Birds

LEARNING TASKS

4. Describe bio-diverse enhancement strategies

CONTENT

- ‘Let it lay’
- Spring cleanup versus fall cleanup
- Reduced chemical use
- Plant selection
- Inter-relationships in nature
- Minimize impact
- Product selection

Line (GAC):	H	APPLY ENVIRONMENTAL PRACTICES
Competency:	H3	Practices fire safety and prevention in landscaping

Objectives

To be competent in this area, the individual must be able to:

- Identify fire safety and prevention in landscapes that mitigate wildfire risk through strategic zoning, plant selection, and environmental management
- Identify fire safety and prevention principles of fire-risk zones and the requirements for creating and maintaining defensible space

LEARNING TASKS

CONTENT

- | | |
|--|---|
| 1. Identify fire-risk zones on a property | <ul style="list-style-type: none"> • Zone 0 - Immediate (Ember-Resistant) • Zone 1 - Intermediate (Lean, Clean, and Green) • Zone 2 - Extended (Reduce Fuel) |
| 2. Assess existing landscape fire risk | <ul style="list-style-type: none"> • Evaluate <ul style="list-style-type: none"> ○ Building proximity ○ Vegetation ○ Fuel Bridges |
| 3. Select plants with fire-resistant characteristics | <ul style="list-style-type: none"> • Traits <ul style="list-style-type: none"> ○ Physical ○ Chemical ○ Maintenance |
| 4. Identify and remove highly flammable plants | <ul style="list-style-type: none"> • Warning Signs • Physical traits |
| 5. Apply techniques for spacing trees and shrubs | <ul style="list-style-type: none"> • Horizontal spacing • Vertical spacing |
| 6. Identify fire-resistant mulches | <ul style="list-style-type: none"> • Inorganic materials <ul style="list-style-type: none"> ○ Rocks ○ Pebbles ○ Gravel ○ Shale ○ Lava rock ○ Slag • Manufactured materials <ul style="list-style-type: none"> ○ Recycled glass ○ Bricks ○ Concrete |

LEARNING TASKS

7. Identify fire-safe practices for hardscape and softscape

8. Identify strategies to raise micro-climate humidity

CONTENT

- Non-combustible building materials
- Fuel breaks
- Pre-configured sprinkler systems
- Emergency hose access

- Jurisdictional regulations
- Professional resources

Line (GAC):	I	PERFORM PRE-CONSTRUCTION ACTIVITIES
Competency:	I1	Participate in landscape design activities

Objectives

To be competent in this area, the individual must be able to:

- Describe the principles of garden design
- Participate in landscape design activities
- Maintain and evaluate landscape design

LEARNING TASKS

1. Select and use tools and equipment

2. Examine influential historical and cultural landscape styles

3. Examine sustainable approaches of design and contemporary gardens

4. Describe the design characteristics of plants and materials

5. Describe the elements of design

CONTENT

- Levels
- GPS
- Measuring devices
- Scaling devices
- Compass
- Ruler
- Computer
- Trace paper
- Drafting pencil
- Formal vs. informal
- Historical and cultural influences
- Contemporary styles
- Types
 - Xeriscaping
 - Green infrastructure
 - Rain gardens
 - Green roofs
 - Native plant gardens
 - Edible gardens
 - Cut flower gardens
 - Bird gardens
 - Pollinator gardens
 - Therapeutic or restorative gardens
- SITES (Sustainable Sites Initiative)
- Plant science
- Plant identification
- Line
- Form
- Colour
 - Hue

LEARNING TASKS

CONTENT

- | | |
|---|--|
| | <ul style="list-style-type: none"> ○ Value ○ Intensity ○ Perception ○ Contrast ○ Combinations ● Texture |
| 6. Describe the principles of design | <ul style="list-style-type: none"> ● Balance ● Emphasis ● Scale ● Sequence / order ● Unity ● Rhythm |
| 7. Describe the design process | <ul style="list-style-type: none"> ● Project research and preparation <ul style="list-style-type: none"> ○ Client consultation ○ Presenting the portfolio ○ Available services and fees ○ Proposal for design services ○ Jurisdictional regulations ● Site plan and analysis <ul style="list-style-type: none"> ○ Inventory ○ Measurements <ul style="list-style-type: none"> – Grade levels – Stake interpretation – Grid system – Triangulation ○ Site analysis ○ Design objectives ● Preliminary design phase <ul style="list-style-type: none"> ○ Functional drawings ○ Conceptual drawings ● Design phase <ul style="list-style-type: none"> ○ Construction documentation ○ Construction detail drawings ○ Layout plan ○ Grading plan ○ Planting plan ○ Irrigation plan ○ Lighting plan ○ Master plan |
| 8. Identify components of a landscape drawing | <ul style="list-style-type: none"> ● Scale ● Copyright ● Drawing specifications |

LEARNING TASKS

CONTENT

- | | |
|---|--|
| | <ul style="list-style-type: none"> • Notes • Title block • Directional arrow • Drawing title |
| 9. Describe the functions of the site | <ul style="list-style-type: none"> • Outdoor use areas • Outside rooms • Recreation space • Outdoor work or service area • Public space • Site ecology |
| 10. Create a preliminary design | <ul style="list-style-type: none"> • Form composition • Plant function • Suitability <ul style="list-style-type: none"> ○ Exposure ○ Macroclimate ○ Microclimate ○ Soil conditions ○ Plant characteristics ○ Plant spacing ○ Hydrozones ○ Cultural requirements • Structures <ul style="list-style-type: none"> ○ Fences and walls ○ Overhead structures ○ Walkways, paths and driveways • Materials and maintenance |
| 11. Create a planting plan | <ul style="list-style-type: none"> • Plant list • Graphic conventions <ul style="list-style-type: none"> ○ Line weight ○ Symbols • Plant spacing • Plant availability |
| 12. Describe maintenance and evaluation | <ul style="list-style-type: none"> • Considerations <ul style="list-style-type: none"> ○ Longevity |

Achievement Criteria

Performance	The learner will be able to create a planting plan.
Conditions	The learner will be given: • Materials, tools and equipment Site scenario that defines environmental conditions and intended purpose
Criteria	The learner will be evaluated on: • Site analysis • Established goals • Produced a complete planting plan • Made appropriate sustainable selections given the conditions • Environmentally sustainable and safe work practice

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L1	Select green infrastructure

Objectives

To be competent in this area, the individual must be able to:

- Select green infrastructure technologies, methods and products
- Identify benefits and applications of green infrastructure technologies

LEARNING TASKS

CONTENT

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Identify and describe characteristics and types of green infrastructure | <ul style="list-style-type: none"> • Green walls • Green roofs • Rain gardens • Rain and storm water management • Green paving systems • Permeable pavement • Bioswales • Urban forests • Engineered wetlands |
| <ol style="list-style-type: none"> 2. Inspect and determine green infrastructure requirements | <ul style="list-style-type: none"> • Site-specific conditions <ul style="list-style-type: none"> ○ Environmental <ul style="list-style-type: none"> – Topography – Water flow – Drainage patterns – Humidity – Air flow – Existing vegetation – Growing media – Precipitation rates – Existing waterways ○ Construction limitations <ul style="list-style-type: none"> – Structural load – Building envelope – Drainage • Natural ecosystem considerations <ul style="list-style-type: none"> ○ Function ○ Purpose ○ Structure |
| <ol style="list-style-type: none"> 3. Describe factors affecting the selection of green infrastructure | <ul style="list-style-type: none"> • Budget • Jurisdictional regulations <ul style="list-style-type: none"> ○ Community plans |

LEARNING TASKS

CONTENT

- | | |
|---|---|
| <p>4. Identify benefits and applications of green infrastructure technologies</p> | <ul style="list-style-type: none"> • Equipment access |
| <p>5. Describe green infrastructure technologies, methods and products</p> | <ul style="list-style-type: none"> • Biodiversity • Water conservation <ul style="list-style-type: none"> ○ Smart water technology • Rain/stormwater management • Climate change mitigation • Air purification • Reduced heat island effect • Protecting natural resources • Site sustainability |
| <p>6. Compare types of green, blue and grey infrastructures</p> | <ul style="list-style-type: none"> • Site conditions • Standards <ul style="list-style-type: none"> ○ CLS • Client needs • Product availability • Design considerations • Materials and equipment • Site access • Certification and personnel qualifications • Filtration systems • Low impact development |
| <p>7. Identify benefits of plants within green infrastructure systems</p> | <ul style="list-style-type: none"> • Feasibility • Cost • Environmental impact • Aesthetics • Maintenance |
| <p>7. Identify benefits of plants within green infrastructure systems</p> | <ul style="list-style-type: none"> • System functionality • Ecosystems service benefits <ul style="list-style-type: none"> ○ Urban forest <ul style="list-style-type: none"> – Environmental – Economic – Social • Carbon sequestration • Symbiotic relationships • Pollution mitigation • Cost savings |

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L2	Install green roofs

To be competent in this area, the individual must be able to:

- Describe the types and functions of green roofs
- Describe the components of green roofs and walls

LEARNING TASKS

1. Identify tools and equipment

2. Describe types and functions of green roof systems

3. Describe the process and procedures to install green roofs and walls

4. Describe the non-organic components used in green roofs and walls

5. Describe the characteristics of organic components used in green roofs and walls

CONTENT

- Lifts
- Booms
- Cranes
- Fall protection

- Types
 - Extensive
 - Semi-intensive
 - Intensive
- Functions
 - Stormwater management
 - Thermal installation
 - Evaporation

- Site preparation
- Growing media
- Plant material
- Safe working procedures
 - Verify anchors
 - Fall protection
- Drawings
- Specifications
- Jurisdictional regulations

- Water retention mats
- Membranes
 - Root barriers
- Drainage
- Structural supports
- Irrigation
- Pumps
- Ballasts

- Growing media
- Plant material

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L3	Install green walls

Objectives

To be competent in this area, the individual must be able to:

- Describe the components of green walls
- Describe the procedure for installation of green walls

LEARNING TASKS

1. Identify tools and equipment
2. Describe the process and procedures to install green walls
3. Describe the non-organic components used in green walls
4. Describe the characteristics of organic components used in green roofs and walls

CONTENT

- Lifts
- Booms
- Cranes
- Fall protection equipment
- Site preparation
- Growing media
- Plant material
- Safe working procedures
 - Fall protection
- Jurisdictional regulations
- Membranes
- Root barriers
- Drainage
- Irrigation
- Pumps
- Ballasts
- Growing media
- Plant material

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L4	Install rainwater and stormwater management systems

Objectives

To be competent in this area, the individual must be able to:

- Describe the components of rainwater/stormwater management, harvesting, and retention systems
- Describe the procedure for installation of rainwater/stormwater systems

LEARNING TASKS

CONTENT

1. Describe types and functions of rainwater/stormwater management systems	• Management • Harvesting • Retention
2. Describe the process and procedures to install rainwater/stormwater systems	• Site preparation • Growing media • Plant material • Safe working procedures • Jurisdictional regulations
3. Describe the components of rainwater/stormwater management systems	• Growing media • Plant materials • Aggregates • Liners • Biofilters • Water aerators
4. Describe the components of rainwater/stormwater harvesting systems	• Cisterns • Pumps • Hoses • Valves • Pipes • Aggregates • Rain barrels • Tanks • Irrigation systems • Soil cells • Water harvesting crates
5. Describe the components of rainwater/stormwater retention systems	• Growing media • Plant materials • Aggregates • Liners • Biofilters • Water aerators

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L5	Install erosion control

Objectives

To be competent in this area, the individual must be able to:

- Describe erosion control materials and methods of installation

LEARNING TASKS

1. Describe tools and equipment

CONTENT

- Tools
 - Shovels
 - Post pounders
 - Knives
- Equipment
 - Augers
 - Trenchers
 - Loaders

2. Identify erosion control methods and their application

- Silt fencing
- Gabion walls
- Roll-type materials
 - Tarps
 - Mats
 - Blankets
- Wattles
- Plant materials
 - Living
 - Non-living
- Boulders
- Aggregates

3. Describe installation methods

- Site preparation
- Placement
- Securement
- Verification
- Recycle
- Jurisdictional regulations

Line (GAC):	L	INSTALL GREEN INFRASTRUCTURE SYSTEMS
Competency:	L6	Install biodiverse plantings and natural areas

Objectives

To be competent in this area, the individual must be able to:

- Describe installation considerations and procedures for biodiverse plantings and natural areas

LEARNING TASKS

CONTENT

1. Select tools and equipment	• Common tools
2. Identify benefits of biodiverse plantings and natural areas	• Biodiverse versus natural areas • Planting and considerations ○ Animal habitat ○ Refugia for organisms ○ Biodiversity ○ Psychosocial health ○ Preservation of natural resources
3. Preparation of planting areas	• Environmental protection • Site assessment • Standards and specifications • Jurisdictional regulations • Plant material selection
4. Install and verify planting	• Safe works practice • Standards and specifications • Sustainability

Line (GAC):	O	MAINTAIN GREEN INFRASTRUCTURE
Competency:	O1	Maintain green roofs

Objectives

To be competent in this area, the individual must be able to:

- Describe processes and procedures for maintaining green roofs and walls
- Identify non-horticultural elements requiring inspection and maintenance

LEARNING TASKS

1. Describe processes and procedures for maintaining green roofs and walls
2. Identify non-horticultural elements requiring inspection and maintenance

CONTENT

- Debris removal
- Weed control
- Pests and disease
 - Fertilizer application
- Irrigation
- Plant coverage assessment
- Plant pruning
- Growing media inspection
- Jurisdictional regulations
 - Fall protection
- Leak detection
- Exposed membrane
- Vents
- Drainage system
 - Standing water
 - Sedimentation
 - Drain pathways
- Pumps
- Pipes

Line (GAC):	O	MAINTAIN GREEN INFRASTRUCTURE
Competency:	O2	Maintain green walls

Objectives

To be competent in this area, the individual must be able to:

- Describe processes and procedures for maintaining green roofs and walls
- Identify non-horticultural elements requiring inspection and maintenance

LEARNING TASKS

1. Describe processes and procedures for maintaining green roofs and walls
2. Identify non-horticultural elements requiring inspection and maintenance

CONTENT

- Debris removal
- Weed control
- Pests and diseases control
 - Fertilizer application
- Irrigation
- Plant coverage assessment
- Plant pruning
- Growing media inspection
- Jurisdictional regulations
 - Fall protection
- Leak detection
- Exposed membrane
- Vents
- Drainage system
 - Standing water
 - Sedimentation
 - Drain pathways
- Pumps
- Pipes

Line (GAC):	O	MAINTAIN GREEN INFRASTRUCTURE
Competency:	O3	Maintain rainwater and stormwater management systems

Objectives

To be competent in this area, the individual must be able to:

- Describe processes and procedures for maintaining the function of rainwater and stormwater management systems
- Identify non-horticultural elements requiring inspection and maintenance

LEARNING TASKS

1. Describe processes and procedures for maintaining the function of rainwater and stormwater management systems

CONTENT

- Debris removal
 - Weed control
 - Pests and disease
 - Fertilizer application
 - Plant health assessment
 - Plant pruning
 - Mulch assessment
 - Depth
 - Quality
 - Growing media inspection
 - Erosion
 - Viability
 - Water testing
 - Jurisdictional regulations
 - Fall protection
-
- Leak detection
 - Exposed membrane
 - Vents
 - Drainage system
 - Standing water
 - Sedimentation
 - Drain pathways
 - Pumps
 - Pipes
 - Mesh
 - Filters
 - Basins
 - Inlet channels and outlet channels
 - Cisterns

2. Identify non-horticultural elements requiring inspection and maintenance

Line (GAC): O **MAINTAIN GREEN INFRASTRUCTURE**

Competency: O4 Maintain erosion control

Objectives

To be competent in this area, the individual must be able to:

- Describe the procedures to inspect and repair erosion control materials

LEARNING TASKS

1. Describe the procedures to inspect erosion control materials

CONTENT

1. Describe the procedures to inspect erosion control materials
 - Functionality
 - Sloughing
 - Rilling
 - Gullies
 - Sedimentation
 - Flooding
 - Weed control
 - Manufactures specifications
2. Describe the procedures to repair erosion control materials
 - Industry standards
 - Jurisdictional regulations

Line (GAC):	O	MAINTAIN GREEN INFRASTRUCTURE
Competency:	O5	Maintain biodiverse plantings and natural areas

Objectives

To be competent in this area, the individual must be able to:

- Identify criteria for monitoring site
- Describe maintenance procedures

LEARNING TASKS

1. Identify criteria for monitoring site

CONTENT

- Safe public access
 - Site disturbances
 - Erosion
 - Vandalism
 - Illegal camping
 - Illegal dumping
 - Wildlife damage
 - Public safety
 - Plant health
 - Invasive and unwanted species
 - Plant establishment
 - Contract documents
-
- Reporting
 - Ensuring integrity of pathways
 - Pruning
 - Planting
 - Plant protection
 - Tree guards
 - Fencing
 - Deterrents
 - Debris
 - Remove
 - Dispose
 - Recycle

2. Describe maintenance procedures

Section 4

ASSESSMENT GUIDELINES

Assessment Guidelines – Level 1

Level 1 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		LANDSCAPE HORTICULTURIST LEVEL 1	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
A	PERFORM SAFETY RELATED FUNCTIONS	5%	5%
B	USE TOOLS, EQUIPMENT AND VEHICLES	10%	0%
C	ORGANIZE WORK	10%	0%
F	USE COMMUNICATION AND MENTORING TECHNIQUES	2%	0%
G	APPLY HORTICULTURAL PRACTICES	20%	0%
H	APPLY ENVIRONMENTAL PRACTICES	15%	10%
I	PERFORM PRE-CONSTRUCTION ACTIVITIES	18%	50%
K	INSTALL SOFTSCAPE	15%	20%
N	MAINTAIN SOFTSCAPE	5%	15%
	Total	100%	100%
In-school theory & practical subject competency weighting		80%	20%
Final in-school mark Apprentices must achieve a minimum 70% for the final in-school mark to be eligible to write the Landscape Horticulturist Standardized Level exam.		IN-SCHOOL %	

In-school Mark Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Mark The exam score is multiplied by	20%
Final Level Mark	FINAL%

Assessment Guidelines – Level 2

Level 2 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		LANDSCAPE HORTICULTURIST LEVEL 2	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	USE TOOLS, EQUIPMENT AND VEHICLES	10%	0%
C	ORGANIZE WORK	12%	0%
G	APPLY HORTICULTURAL PRACTICES	30%	25%
H	APPLY ENVIRONMENTAL PRACTICES	10%	0%
I	PERFORM PRE-CONSTRUCTION ACTIVITIES	5%	0%
J	INSTALL HARDSCAPE	15%	35%
K	INSTALL SOFTSCAPE	10%	40%
M	MAINTAIN HARDSCAPE	3%	0%
N	MAINTAIN SOFTSCAPE	5%	0%
	Total	100%	100%
In-school theory & practical subject competency weighting		70%	30%
Final in-school mark Apprentices must achieve a minimum 70% for the final in-school mark to be eligible to write the Landscape Horticulturist Standardized Level exam.		IN-SCHOOL %	

In-school Mark Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Mark The exam score is multiplied by	20%
Final Level Mark	FINAL%

Assessment Guidelines – Level 3

Level 3 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		LANDSCAPE HORTICULTURIST LEVEL 3	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
B	USE TOOLS, EQUIPMENT AND VEHICLES	5%	0%
C	ORGANIZE WORK	15%	20%
G	APPLY HORTICULTURAL PRACTICES	35%	40%
H	APPLY ENVIRONMENTAL PRACTICES	7%	0%
J	INSTALL HARDSCAPE	20%	40%
K	INSTALL SOFTSCAPE	2%	0%
M	MAINTAIN HARDSCAPE	10%	0%
N	MAINTAIN SOFTSCAPE	6%	0%
	Total	100%	100%
In-school theory & practical subject competency weighting		70%	30%
Final in-school mark Apprentices must achieve a minimum 70% for the final in-school mark to be eligible to write the Landscape Horticulturist Standardized Level exam.		IN-SCHOOL %	

In-School Mark Combined theory and practical subject competency multiplied by	80%
Standardized Level Exam Mark The exam score is multiplied by	20%
Final Level Mark	FINAL%

Assessment Guidelines – Level 4

Level 4 Grading Sheet: Subject Competency and Weightings

PROGRAM: IN-SCHOOL TRAINING:		LANDSCAPE HORTICULTURIST LEVEL 4	
LINE	SUBJECT COMPETENCIES	THEORY WEIGHTING	PRACTICAL WEIGHTING
C	ORGANIZE WORK	10%	5%
D	PARTICIPATE IN MARKETING AND SALES	10%	5%
E	USE CONTINUOUS LEARNING TECHNIQUES	3%	0%
F	USE COMMUNICATION AND MENTORING TECHNIQUES	5%	0%
G	APPLY HORTICULTURAL PRACTICES	28%	30%
H	APPLY ENVIRONMENTAL PRACTICES	9%	0%
I	PERFORM PRE-CONSTRUCTION ACTIVITIES	10%	40%
L	INSTALL GREEN INFRASTRUCTURE SYSTEMS	20%	10%
O	MAINTAIN GREEN INFRASTRUCTURE	5%	10%
	Total	100%	100%
In-school theory & practical subject competency weighting		85%	15%
Final in-school mark Apprentices must achieve a minimum 70% as the final in-school mark to be eligible to write the Landscape Horticulturist Interprovincial Red Seal exam.		IN-SCHOOL %	

All apprentices who complete Level 4 of the Landscape Horticulturist program with a FINAL level mark of 70% or greater will write the Interprovincial Red Seal examination as their final assessment.

SkilledTradesBC will enter the apprentices' Landscape Horticulture Red Seal Interprovincial examination mark in SkilledTradesBC Portal. A minimum mark of 70% on the examination is required for a pass.

Section 5

TRAINING PROVIDER STANDARDS

Facility Requirements

LEVEL 1

Required

Classroom Area

- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire codes and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projector and projection surface
- Internet access

Shop Area

- Access to all tools and equipment as listed for Level One
- Access to secure storage for tools, equipment and materials

Lab Requirements

- Botany and soils indoor teaching lab outfitted with compound and dissecting microscopes
- Access to live in situ plant material and visual samples (slides, photographic databases, etc.)
- Microscope slides showing root, stem and leaf anatomy (monocot and dicot)
- Microscope slides showing woody stem growth
- Hand lens (10X)
- Refrigerator and microwave
- Glassware, lamps, stir plate (with heating capacity)

Student Facilities

- Adequate lunchroom as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements

Instructor's Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Access to gardens

Recommended**Shop Area**

- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – approximately 1 acre

Lab Area

- Botany and Soil teaching lab - approximately 600 square feet
- Lamps, stir plate (with heating capacity)
- Access to a drying oven
- Munsell colour books

Other

- Access to botanical gardens
- Access to herbaria
- Personal storage lockers

LEVEL 2**Required****Classroom Area**

- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire codes and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projector and projection surface
- Internet access

Shop Area

- Access to all tools and equipment as listed for Level Two
- Access to secure storage for tools, equipment and materials

Lab Requirements

- Botany or science teaching lab outfitted with compound and dissecting microscopes
- Access to live in situ plant material and visual samples (slides, photographic databases, etc.)
- Microscope slides showing root, stem and leaf anatomy (monocot and dicot)
- Microscope slides showing woody stem growth
- Hand lens (10X)
- Refrigerator and microwave
- Access to a drying oven
- Nested sieves, shakers, scales
- Access to hydrometers and sedimentation cylinders or equivalent
- pH meters
- Soil sampling equipment

Student Facilities

- Adequate lunchroom as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements

Instructor's Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Access to a garden
- Access to container nursery stock
- Access to live in situ plant material for pruning
- Access to field-grown stock/plant material that can be prepared for transplanting
- Access to installation site
- Access to installation supplies (for hardscapes)

Recommended**Shop Area**

- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – minimum 1 acre

Other

- Access to a botanical garden
- Access to Herbaria
- Nursery hand carts and tree dollies
- Personal storage lockers
- Munsell colour books
- Access to collection of arthropods, disease organisms, and examples of plant stress

LEVEL 3**Required****Classroom Area**

- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire codes and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projector and projection surface
- Internet access

Shop Area

- Access to all tools and equipment as listed for Level Three
- Access to secure storage for tools, equipment and materials

Lab Requirements

- Botany and science teaching lab approximately 600 square feet
- Access to live *in situ* plant material and visual samples (slides, photographic databases, etc.)
- Hand lens (10X)
- Refrigerator, access to a drying oven and microwave
- Nested sieves, shakers, scales
- Access to hydrometers and sedimentation cylinders
- pH meters
- Soil sampling equipment

Student Facilities

- Adequate lunchroom as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements

Instructor's Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Landscape plans and specifications
- Access to a garden
- Access to live *in situ* plant material for pruning
- Access to plant material for planting and staking
- Access to installation site
- Access to installation supplies (for hardscapes and softscapes)
- Access to appropriate site for installations and maintenance of irrigation and drainage
- Access to appropriate site for installation and maintenance of extra low voltage systems and water features

Recommended

- Shop area
- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – approximately 1 acre

Other

- Access to a botanical garden
- Access to Herbaria
- Personal storage lockers
- Munsell colour books

LEVEL 4**Required****Classroom Area**

- Approximately 900 square feet
- Comfortable seating and tables suitable for training, teaching, lecturing and drafting
- Compliance with all local and national fire codes and occupational safety requirements
- Lighting controls to allow easy visibility of projection screen while also allowing students to take notes
- Windows must have shades or blinds to adjust sunlight
- Heating/Air conditioning for comfort all year round
- In-room ventilation sufficient to control training room temperature
- Acoustics in the room must allow audibility of the instructor
- White marking board with pens and eraser (optional: flipchart in similar size)
- Projector and projection surface
- Internet Access

Shop Area

- Access to all tools and equipment as listed for Level Four
- Access to secure storage for tools, equipment and materials

Lab Requirements

- Botany and science teaching lab approximately 600 square feet
- Access to live in situ plant material as well as herbaria, and visual samples (slides, photographic databases, etc.)
- Hand lens (10X)
- Refrigerator and microwave
- Soil science or chemistry teaching lab - approximately 600 square feet
- Refrigerator, access to a drying oven and microwave
- Nested sieves, shakers, scales
- Munsell colour books (recommended)
- pH meters
- Soil sampling equipment

Student Facilities

- Adequate lunchroom as per WorkSafeBC requirements
- Adequate washroom facilities as per WorkSafeBC requirements
- Personal storage lockers

Instructor's Office Space

- Suitable space and office furniture necessary for instructor to prepare lessons and secure file records

Other

- Access to a garden
- Access to live in situ plant material for maintenance
- Access to plant material for planting and staking
- Access to landscape plans and specifications
- Access to appropriate site for installations and maintenance of green roofs and green walls
- Access to appropriate site for installations and maintenance of erosion control, biodiverse plantings and natural plantings
- Access to appropriate site for installations and maintenance of rain gardens, rainwater and stormwater management systems

Recommended**Shop Area**

- Access to a service bay – approximately 600 square feet
- Access to a site for equipment operation – approximately 1 acre

Other

- Access to a botanical garden
- Access to herbaria

Tools and Equipment

Access to Hand Tools

Common	Level 1	Level 2	Level 3	Level 4
• Brooms • Bypass pruners • Calculator • Carts • Files • Flags • Forks • Hammers • Handheld watering equipment • Hoes • Knives • Ladders • Levels • Plumb line • Rakes • Screwdrivers • Secateurs • Sharpening tools • Shovels • Spades • Sprayers • Sprinklers • Squares • String line • Tape measure • Tarps • Trowels • Hoses • Watering can • Weed digger • Wheelbarrow • Wrenches	• Blocks • Chains • Core sampler/probe • Cultivator • Dibbler • Dolly • Edger • Grease gun • Hand lens • Hand saws • Hex keys • Hydro seeder • Loppers • Microscope • Picks • Pipe cutters • Roller • Shears • Sod lifter • Soil screener • Spreaders • String line • Tie-downs	• Axe • Blocks • Box cutters • Brick carriers • Brick splitter • Chains • Chisels • Core sampler/probe • Crimper • Crowbar • Cultivator • Dibbler • Dolly • Grease gun • Guillotine • Hand lens • Hand plane • Hand tamper • Hedge shears • Hex keys • Loppers • Microscope • Mower • Paving stone extractor • Picks • Pliers • Pole pruners • Post maul • Pruning shears • Pry bar • Screeding bars • Shears • Shoring equipment • Sod lifter • Soil screener • Spreaders • Tie-downs • Transplant table	• Axe • Box cutters • Brick carriers • Brick splitter • Chains • Chisels • Crimper • Crowbar • Cultivator • Dolly • Edger • Grease gun • Hand lens • Handsaws • Hand plane • Hand tamper • Heat gun • Hex keys • Loppers • Masonry saws • Microscope • Paving stone cart • Paving stone extractor • Picks • Pipe cutters • Pliers • Pole pruners • Pole saw • Post hole auger • Post maul • Post pounder • Pruning shears • Pry bar • Scaffolding • Scythe • Shears • Shoring equipment • Sod lifter	• Post hole auger • Post maul • Post pounder

- Side cutters
- Spreaders
- Tie-downs
- Water key
- Weed torch
- Wire cutters
- Wire strippers

Access to Power/Motorized Tools

Common	Level 1	Level 2	Level 3	Level 4
• Attachments	• Core aerator • Fertilizer injector • Mechanical digger • Mower • Power seeder/spreader • Trencher • Walk-behind aerator	• Circular saw • Concrete saw • Core aerator • Demolition hammer (electric and pneumatic) • Electric drill • Fertilizer injector • Grinder • Mechanical digger • Mitre/chop saw • Mortar/cement mixer • Mulcher • Plate compactor • Power auger • Power wheelbarrow • Power/pressure washer • Reciprocating saw • Sabre saw • Table saw • Tree spade • Trencher • Vibrating plate tamper • Walk-behind aerator • Wet saw	• Chainsaw • Circular saw • Concrete saw • Demolition hammer (electric and pneumatic) • Electric drill • Grinder • Hammer drill • Mechanical digger • Mister • Mitre/chop saw • Mortar/cement mixer • Plate compactor • Powder-actuated tools • Power auger • Power sprayer • Power wheelbarrow • Power/pressure washer • Reciprocating saw • Sabre saw • Spider lift • Table saw • Trencher • Vacuum • Vacuum lifter • Vibrating plate tamper • Wet saw	• Power auger

Access to Measuring Equipment

Common	Level 1	Level 2	Level 3	Level 4
• Anemometer • Engineer levels • Laser distance measure • Levels • Measuring tape • Measuring wheel • Thermometer	• Barometer • Catch can • Compaction measuring device • Gauges • Graduated cylinders • Moisture meter/sensor • pH meter • Scales • Tensiometer • Tire pressure meter	• Calipers • Catch can • Compaction measuring device • EC meter • Moisture meter/sensor • pH meter • Scales • Soil tester • Tire pressure meter	• Calipers • Catch can • Compaction measuring device • Flow meter • Gauges • Hygrometer • Light meters • Moisture meter/sensor • Timers & controllers • Voltmeter • Water meter	• GPS • Scale ruler

Access to Motorized Equipment

Common	Level 1	Level 2	Level 3	Level 4
• Excavator • Flat deck truck • Front end loader • Generator • Loaders • Compactor • Skid-steer • Sterilizer • Tractor • Truck	• Air compressor • Bale breaker • Bed edger • Blowers • Dethatcher • Forklift • Mower • Paddle broom • Pallet jack • Power rake • Power roller • Seed drill • Shredder • Slit seeder • Sod cutter • Soil screener	• Air compressor • Blowers • Brush cutters • Clearing saw • Forklift • Hedge trimmer • Rototillers • Mortar mixer • Mulcher • Paddle broom • Pallet jack • Pneumatic hammer • Post hole auger • Post pounder • Soil screener	• Air compressor • Bed edger • Blowers • Brush cutters • Chipper • Clearing saw • Flat filler • Lifts • Mortar mixer • Pallet jack • Peat shredder • Pneumatic hammer • Post hole auger • Post pounder • Pot filler	• Backhoe • Lifts • Post hole auger • Post pounder

- Trencher
- Trimmers
- Walk-behinds (various)
- Tree spade
- Trencher
- Trimmers
- Walk-behinds (various)
- Potting machines
- Pumps
- Steam cleaner
- Tree gantry
- Trencher
- Vehicles with blades
- Walk-behinds (various)
- Snowblower

Access to Equipment Attachments

Common	Level 1	Level 2	Level 3	Level 4
• Bucket • Flat deck • Forks • Ladders • Landscape rake • Loaders • Trailer	• Aerator • Back hoe • Cultivator • Dethatcher • Spreader • Grader • Mower baggers • Mowers • Overseeder • Plough • Rollers • Seeders • Top-dresser • Trencher	• Aerator • Auger/post hole digger • Cultivator • Spreader • Grapple • Leaf vacuum • Power sweeper • Snow equipment • Spray equipment • Trencher • Tree dolly • Tree spade	• Auger/post hole digger • Blade • Cultivator • Grader • Plough • Spray equipment • Trencher • Vacuum	• Backhoe • Grader

PPE and Safety Equipment

Common	Level 1	Level 2	Level 3	Level 4
• Ear protection • Eye protection • Eye wash kit • Face shields • Fire extinguisher • First aid kit	• Access to fall protection equipment • Respiratory protection	• Respiratory protection	• Access to fall protection equipment • Respiratory protection • Ventilation fan	• Access to fall protection equipment

- Flares
- Gloves
- Hard hat
- Hearing protection
- High visibility clothing
- Safety boots
- Safety vests
- Scabbard/protective sheath
- Skin protection
- Spill kit
- Sun hat
- Sunblock
- Traffic cones

Reference Materials

Required Reference Materials

- Landscape Horticulturist Level 1 Apprentice Manual, by HortEducationBC (HEBC): <https://horteducation.ca/shop/>
- Landscape Horticulturist Level 2 Apprentice Manual, by HortEducationBC (HEBC): <https://horteducation.ca/shop/>
- Landscape Horticulturist Level 3 Apprentice Manual, by HortEducationBC (HEBC): <https://horteducation.ca/shop/>
- Landscape Horticulturist Level 4 Apprentice Manual, by HortEducationBC (HEBC): <https://horteducation.ca/shop/>
- Landscape Horticulturist Plant Lists: <https://horteducation.ca/plantlists>
- Kwantlen University College School of Horticulture Plant Identification Database: <https://plantdatabase.kpu.ca/>
- Canadian Landscape Standard - Latest Edition, by The Canadian Nursery Landscape Association (CNLA) and the Canadian Society of Landscape Architects (CSLA): <https://www.cnla.ca/publications/standards-guides>
- WorkSafeBC Website: <http://www.worksafebc.com>

Recommended Resources and Texts

- Health and Safety for Landscaping and Lawn Maintenance Companies, by WorkSafeBC: <http://www.worksafebc.com/resources/health-safety/books-guides/health-and-safety-for-landscaping-and-lawn-maintenance-companies?lang=en>
- Botany for Gardeners - Latest edition. Capon, Brian. Timber Press, Portland, OR.
- Soil Science and Management - Latest edition. Plaster J. Edward. Thomson/Delmar Learning, Clifton Park, NY
- Integrated Pest Management Manual for Landscape Pests in British Columbia. Gilkeson, Linda A. 2009. Pollution and Remediation Branch, Victoria, BC.
- Equipment Manufacturers' Websites (Internet)
- Field Guide to Noxious and Other Selected Weeds of British Columbia - Cranston, Roy. 2002. Ministry of Agriculture, Food and Fisheries; Ministry of Forests, Victoria, BC (Also available online at <http://www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm>)
- Soil Management Handbook for the Lower Fraser Valley - Bertrand, R.A., G.A. Hughes-Games, and D.C. Nikkel. 1991. Ministry of Agriculture, Fisheries & Food, Abbotsford, B.C.
- Groundskeepers Safety Guide - Latest edition. Canadian Centre for Occupational Health and Safety, Hamilton, ON.
- Canadian Nursery Stock Standard - Latest edition. Canadian Nursery and Landscape Association: <https://www.cnla.ca/publications/canadian-nursery-stock-standard>
- Arboriculture: Integrated Management of Landscape Trees, Shrubs and Vines. - Latest edition. Harris, Richard W., James R. Clark, Nelda P. Metheny. Prentice Hall, NJ Landscape Standard - Latest edition.
- Botany for Gardeners - Capon, Brian. Latest edition. Timber Press, Portland, OR.
- BC Nursery and Landscape Pest Management and Production Guide - BC Ministry of Agriculture, Latest Edition, Crown Publications, Victoria BC: <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/crop-production/nursery-production-guide.pdf>

- Equipment Manufacturers' Websites (Internet)
- Home and Garden Pest Management Guide for British Columbia - BC Ministry of Agriculture, Latest edition 2019. Crown Publications, Victoria, BC:
<https://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/animals-and-crops/plant-health/insects-and-plant-diseases/home-garden/home-and-garden-guide>
- Integrated pest management manual for landscape pests in British Columbia - Gilkeson, Linda A. 2000. Pollution and Remediation Branch, Victoria, BC.
- Integrated Pest Management (IPM) Manual for Turfgrass Managers, by the Allied Golf Association of BC: <https://aga-bc.org/resources/manual-integrated-pest-management-turf-managers-bc/>
- Pacific Northwest; Plant Disease Management Handbook - 2000. Extension Services of Oregon State University, Washington State University, and the University of Idaho
- Soil Science and Management - Latest edition. Plaster J. Edward. Thomson/Delmar Learning, Clifton Park, NY
- Field Guide to Noxious and Other Selected Weeds of British Columbia - Cranston, Roy. 2002. Ministry of Agriculture, Food and Fisheries; Ministry of Forests, Victoria, BC (Also available online at https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/publications/field_guide_to_noxious_weeds.pdf
<http://www.agf.gov.bc.ca/cropprot/weedguid/weedguid.htm>)
- Knowing and Recognizing the Biology of Glasshouse Pests and Their Natural Enemies - Latest edition. Malais, M.H. and Ravensberg, W.J. Koppert
- Biological Systems - Reed Business Information, Doetinchem, Netherlands
- Applied Bionomics Biological Technical Manual - Latest edition. Matteoni, J.A. and Elliot, D. Applied Bionomics, Sidney, B.C.
- An Illustrated Guide to Pruning - Latest edition. Gilman, Edward F. Delmar-Thomson Learning, NY.
- Drip Irrigation: For Every Landscape and All Climates - Kourik, Robert. 1992. Metamorphic Press, Santa Rosa, CA
- Course and Grounds Irrigation and Drainage - Jarrett, Albert R. Golf. 1985. Prentice-Hall, Reston, VA
- Turf Irrigation Manual - Choate, Richard B. 1994. Weathermatic Publishing, Dallas, TX

Instructor Requirements

Occupation Qualification

The instructor must possess:

- Landscape Horticulturist Certificate of Qualification with an Interprovincial Red Seal Endorsement

Work Experience

- A minimum of 5 years' experience working in the industry as a journey person.
- Diverse industry experience covering all the competencies in this program.

Instructional Experience and Education

It is preferred that the instructor also possesses the following:

- Provincial (BC) Instructor Diploma or completion of a similar Trainer Training / Instructional Methods program, plus 2 years of instructional experience

Appendices

Appendix A Acronyms

ABA	Abscisic acid
AI	Artificial Intelligence
ANSI	American National Standards Institute
ATV	All-Terrain Vehicles
B&B	Balled and Burlapped
C4	Four-Carbon Molecule
CAM	Crassulacean Acid Metabolism
CCDC	Canadian Construction Documents Committee
CCUS	Carbon Capture, Utilization and Storage
CLS	Canadian Landscape Standard
CMHA	Concrete Masonry and Hardscapes Association
CNLA	Canadian Nursery Landscape Association
CNSS	Canadian Nursery Stock Standard
CNZEAA	Canadian Net-Zero Emissions Accountability Act
CODIT	Compartmentalization of decay in trees
CPVC	Chlorinated polyvinyl chloride
CSA	Canadian Standards Association
CSLA	Canadian Society of Landscape Architects
DDDI	Dead, diseased, damaged, and interfering
EAP	Employee Assistance Plan
EC	Electrical Conductivity
ET	Evapotranspiration
GA	Gibberellins
GFCI	Ground Fault Circuit Interrupter
GIS	Geographic Information System
GPM	Gallons per minute
GPS	Global Positioning Systems
GRP	Green Roof Professional
GVWR	Gross Vehicle Weight Ratings
HPB	High Performance Base
HVAC	heating, ventilation and air conditioning
ICPI	Interlocking Concrete Pavement Institute
IEP	Individual education plan
IIABC	Irrigation Industry Association of British Columbia
IP	Interprovincial
IPM	Integrated Pest Management
LED	Light Emitting Diode
LEED	Leadership in Energy and Environmental Design
LFH	Litter, Fermenting, Humified (soil layer)
LID	Low Impact Development
MSE	Mass (mechanically) stabilized earth
N-P-K	Nitrogen – Phosphorus – Potassium
NBC	National Building Code

NECB	National Energy Code of Canada for Buildings
OEM	Operator Equipment Manual
OHS	Occupational Health and Safety
PLS	Pure Live Seed
PMRA	Pest Management Regulatory Agency
PPE	Personal Protective Equipment
PRV	Pressure Reducing Valve
PSI	Pounds per square inch
PVC	Polyvinyl chloride
ROP	Rollover Protection Devices
RSOS	Red Seal Occupational Standard
SDS	Safety Data Sheets
SITES	Sustainable Sites Initiative
TDG	Transportation of Dangerous Goods
UV	Ultraviolet
WHMIS	Workplace Hazardous Materials Information System
ZCB	Zero Carbon Building
ZEV	Zero-Emission Vehicles

Appendix B

Summary of Achievement Criteria

Achievement Criteria are included for competencies that require a practical assessment. 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 theory and to provide a mechanism for evaluation of the learner's ability to apply theory to practice. It is important that these performances be observable and measurable and that they reflect the skills outlined in the competency. 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 evaluation criteria.

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

The following tables summarize the practical assessments for each level. **For details, please refer to the Achievement Criteria following the competency in the Program Content section.**

LANDSCAPE HORTICULTURIST – LEVEL 1 SUMMARY OF ACHIEVEMENT CRITERIA		
SUBJECT COMPETENCY		ACHIEVEMENT CRITERIA TASK
A1	Use personal protective equipment (PPE) and safety equipment	The learner will select PPE for specified tasks.
G4	Prune plant materials	The learner will demonstrate shrub pruning techniques.
H3	Practice soil stewardship	The learner will perform soil tests.
K6	Install Sod	The learner will install sod.
N1	Maintain exterior softscape	The learner will create a basic maintenance plan for an exterior softscape.
N3	Maintain turfgrass	The learner will create a maintenance plan for grass/turf.

LANDSCAPE HORTICULTURIST – LEVEL 2 SUMMARY OF ACHIEVEMENT CRITERIA		
SUBJECT COMPETENCY		ACHIEVEMENT CRITERIA TASK
G3	Manage plant health and growing conditions	The learner will apply fertilizer/lime.
I3	Perform grading	The learner will perform grading to achieve a specified slope.
I4	Install drainage systems	The learner will install a sub-surface drainage system.
J2	Install surface materials	The learner will construct a small surface area, such as a patio or walkway.
J3	Install steps and retaining walls	The learner will construct a small retaining wall (optional: with steps).
K2	Install exterior landscape plants	The learner will install and or transplant exterior landscape plants.

K3	Transplants plants	The learner will install and or transplant exterior landscape plants.
K4	Install mulch	The learner will install mulch.

**LANDSCAPE HORTICULTURIST – LEVEL 3
SUMMARY OF ACHIEVEMENT CRITERIA**

SUBJECT COMPETENCY		ACHIEVEMENT CRITERIA TASK
C6	Organize materials and equipment	The learner will organize plant materials and equipment on-site.
G4	Prune plant materials	The learner will demonstrate juvenile tree pruning techniques.
J4	Install irrigation systems	The learner will install a small irrigation system.

**LANDSCAPE HORTICULTURIST – LEVEL 4
SUMMARY OF ACHIEVEMENT CRITERIA**

SUBJECT COMPETENCY		ACHIEVEMENT CRITERIA TASK
E1	Upgrade in new trade practices and procedures	The learner will create a professional portfolio.
G6	Manage pests, diseases and invasive species	The learner will develop and implement an IPM program.
I1	Participate in landscape design activities	The learner will create a planting plan.