



UNDERGROUND FACILITY LOCATOR COMPETENCY PROFILE

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The Underground Facility Locator (UFL) Competency Profile (CP) was developed for the Canadian Association of Pipeline and Utility Locating Contractors (CAPULC). CAPULC will create a Competency Profile Committee (CPC) to review the Competency Profile and to send the CP out for public review and comment. CAPULC members may request to join the CPC by emailing competencies@capulc.ca.

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DISCLAIMER

The information provided in this Competency Profile is intended for general application only and is not intended for use as a complete reference. Terms used in this Competency Profile may vary between facility owners/operators and jurisdictions. It is not a definitive guide to government regulations nor is it a guide to the practices and procedures wholly applicable to every locate circumstance. The appropriate regulations, company-specific work practices and manufacturers' equipment instructions must be consulted and applied with due diligence. The Canadian Association of Pipeline and Utility Locating Contractors (CAPULC) and Locate Management assume no responsibility whatsoever, for any injury, loss or damage arising from its use.

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General						
1.0	Basic Skills Knowledge	Describe vehicle operation policies for speed rules	Describe vehicle operation policies for speed rules	Describe vehicle operation policies for safety training policy	Describe company QA / QC processes	Describe emergency response strategies
		Know how and where to access an emergency response plan	Know the customers who use our services	Know client specific policies	Explain the importance of maintaining a positive public image	Explain daily operations and procedure
		Explain proper time management	Explain workload planning	Describe proper housekeeping for office	Describe proper housekeeping for vehicle	Describe proper housekeeping for depot
		Describe proper housekeeping for work site	Describe stress in the workplace	Describe workplace electrical safety for qualified and non-qualified workers		
2.0	Perform Basic Skills	Complete owner / operator policy training	Demonstrate proper vehicle operation	Participate in the QA / QC process	Demonstrate ability to activate an emergency response plan	Demonstrate proper time management
		Demonstrate ability to manage workloads effectively	Demonstrate knowledge of customer procedures	Demonstrate proper housekeeping for office	Demonstrate proper housekeeping for vehicle	Demonstrate proper housekeeping for depot
		Demonstrate proper housekeeping for work site	Describe stress management techniques			
3.0	Theory Knowledge	Explain electromagnetic induction	Explain active signals	Explain applying an active signal	Explain passive signals	Describe antennas for locating a signal on buried facility
		Describe horizontal antennas	Describe vertical antennas	Describe electronic depth estimation	Explain frequency as it applies to electromagnetic locating	Explain circuit paths as they apply to electromagnetic locating
		Explain signal distortion	Explain causes and effects of signal distortion	Explain relative conductivity	Identify the components of a circuit	Identify frequencies commonly used in electromagnetic locating
		Explain why signal distortions occur	Describe how conductor types affect conductivity	Describe how conductor sizes affect conductivity	Explain advantages / disadvantages of GPR (ground penetrating radar)	Describe OHM's law
		Explain electromagnetic theory as it applies to the transmitter	Explain electrical isolation	Describe how a signal is received from a target facility	Describe advantages / disadvantages of electromagnetic equipment	Explain air coupling
		Know technical locating terminology	Define an electromagnetic field	Describe how transmitter signal is generated	Describe how transmitter signal is applied using direct hook-up	Describe how transmitter signal is applied using inductive clamp
		Describe how transmitter signal is applied using induction	Explain differences in frequencies transmitted	Explain advantages / disadvantages of infrared imaging	Explain advantages / disadvantages of ultrasonic locating	Explain magnetic locating (pin finder)
		Explain audio leak detection	Explain electromagnetic fault detection	Explain electrical bonding	Explain how to avoid air coupling	Explain the limitation of EM locating equipment
		Explain how far an EM signal may be detected	Explain how deep an EM signal may be detected	Demonstrate knowledge and understanding of electromagnetic locating theory	Demonstrate knowledge and understanding of circuit paths	Demonstrate knowledge and understanding of frequency applications

4.0

4.0	General Knowledge	Demonstrate correctly forming a circuit	Demonstrate knowledge and understanding of electromagnetic theory as it relates to the transmitter	Demonstrate knowledge and understanding of electromagnetic theory as it relates to the receiver	Demonstrate knowledge and understanding of facility materials and their effects on signals	Demonstrate the difference between good and poor conductors
		Demonstrate how AC passes through a conductor	Demonstrate different transmitter/receiver frequency	Demonstrate how EM signals are affected by facility composition and size	Demonstrate how EM signals are affected by facility depth	Demonstrate how EM signals are affected by facility grounding
		Demonstrate how EM signals are affected by facility congestion	Demonstrate how EM signals are affected by soil conditions	Demonstrate how EM signals are affected by external interference		
		Describe why locates are performed for buried facilities	Describe a locate (from start to finish)	Describe the conditions when locates of buried facilities are required	Describe the conditions where locates of buried facilities are required	Describe who is ultimately responsible for identifying buried facilities prior to ground disturbance
		Describe who provides locates of buried facilities	Explain the differences between one call, contract, and private locators	Describe the mission of Canadian Association of Pipeline and Utility Locating Contractors (CAPULC)	Describe the mission of the National Utility Locating Contractors Association (NULCA)	Explain the notification of intent to dig process
		Explain the one call notification of intent to dig process	Explain dispatching	Explain quality assurance for monitoring the locating and marking of buried facilities	Explain advantages/disadvantages of using GPS / GIS in researching and locating	Explain the status of a buried facility
		List the tools required to perform a generic direct hook-up signal application procedure	Describe the general criteria for selecting an effective direct hook-up access point	Describe the general criteria for selecting an effective direct hook-up grounding point	Describe safe procedures for applying a signal using a direct hook-up	Describe the conditions that provide an optimal direct hook-up ground point
		Describe the conditions that provide a poor direct hook-up ground point	Describe the procedures to improve a direct hook-up ground point	Describe a ground rod and ground plate	Describe a multi-point ground	Describe an extended ground lead
		List the tools required to perform a direct hook-up to metal pipe	Describe the criteria for selecting an effective direct hook-up access point to a metal pipe	Describe safe procedure for performing a direct hook-up to a metal pipe	List the tools required to perform a direct hook-up to tracer wire	Describe the criteria for selecting an effective direct hook-up access point to a tracer wire
		Describe safe procedure for performing a direct hook-up to tracer wire	List the tools required to perform a direct hook-up to metal casing pipe	Describe the criteria for selecting an effective direct hook-up access point to a metal casing pipe	Describe safe procedure for performing a direct hook-up to metal casing pipe	List the tools required to perform a direct hook-up to metal conduit
		Describe the criteria for selecting an effective direct hook-up access point to a metal conduit	Describe safe procedure for performing a direct hook-up to metal conduit	List the tools required to perform a direct hook-up to a (safe) cathodic cable	Describe the criteria for selecting an effective direct hook-up access point to a (safe) cathodic cable	Describe safe procedure for performing a direct hook-up to a (safe) cathodic cable

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List the tools required to perform a direct hook-up to a (safe) electrical cable	Describe the criteria for selecting an effective direct hook-up access point to a (safe) electrical cable	Describe safe procedure for performing a direct hook-up to a (safe) electrical cable	List the tools required to perform a direct hook-up to a (safe) communication cable	Describe the criteria for selecting an effective direct hook-up access point to a (safe) communication cable
Describe safe procedure for performing a direct hook-up to a (safe) communication cable	List the tools required to perform a direct hook-up to a (safe) control cable	Describe the criteria for selecting an effective direct hook-up access point to a (safe) control cable	Describe safe procedure for performing a direct hook-up to a (safe) control cable	List the tools required to perform a generic inductive clamping signal application procedure
Describe the general criteria for selecting an effective inductive clamping access point	Describe safe procedures for applying a signal using an inductive clamp	List the tools required to apply a signal to a metal pipe with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to a metal pipe	Describe the safe procedures for applying a signal to a metal pipe with an inductive clamp
List the tools required to apply a signal to a tracer wire with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to a tracer wire	Describe the safe procedures for applying a signal to a tracer wire with an inductive clamp	List the tools required to apply a signal to a metal casing pipe with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access to a metal casing pipe
Describe the safe procedures for applying a signal to a metal casing pipe with an inductive clamp	List the tools required to apply a signal to metal conduit with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to a metal conduit	Describe the safe procedures for applying a signal to a metal conduit with an inductive clamp	List the tools required to apply a signal to a cathodic cable with an inductive clamp
Describe the criteria for selecting an effective inductive clamping access point to a cathodic cable	Describe the safe procedures for applying a signal to a cathodic cable with an inductive clamp	List the tools required to apply a signal to an electrical cable with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to an electrical cable	Describe the safe procedures for applying a signal to an electrical cable with an inductive clamp
List the tools required to apply a signal to a communication cable with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to a communication cable	Describe the safe procedures for applying a signal to a communication cable with an inductive clamp	List the tools required to apply a signal to a control cable with an inductive clamp	Describe the criteria for selecting an effective inductive clamping access point to a (safe) control cable
Describe the safe procedures for applying a signal to a control cable with an inductive clamp	Describe the criteria for selecting an effective general inductive signal application point	Describe the criteria for selecting an effective inductive signal application point for metal pipe	Describe the criteria for selecting an effective inductive signal application point for tracer wire	Describe the criteria for selecting an effective inductive signal application point for casing pipe
Describe the criteria for selecting an effective inductive signal application point for metal conduit	Describe the criteria for selecting an effective inductive signal application point for cathodic cable	Describe the criteria for selecting an effective inductive signal application point for electrical cable	Describe the criteria for selecting an effective inductive signal application point for communication cable	Describe the criteria for selecting an effective inductive signal application point for control cable
Describe the procedures for tracing an EM signal	Describe procedures for verifying a previously located facility	Explain how to properly identify a target facility	Describe the procedures for the Parallel Line Check Method	Describe the procedures for the Inductive Sweeping Method
Describe the procedures for the Inductive Multi-Angle Sweeping Method	Describe the procedures for the 360° Sweeping Method	Describe the procedures for the ALL (Advanced Line Locating) Method	Describe the procedures for the CPS (Cathodic Protection System) Locating Mode	Describe the procedures for the Live Cable (Power) Locating Mode

5.0

General Skills

Describe the procedures for the Radio Locating Mode	Describe the procedures for locating sondes	Describe the procedures for locating transmitter coils	Describe the procedures for locating conductive rodding tools	Describe the procedures for locating a remotely-applied EM signal
Describe the procedures for the Measurement Method	Describe the procedures for the Point A to Point B Method	Describe the procedures for the Visual Evidence Method	Describe the procedures for the Survey Method	Describe the procedures for locating electronic markers
Explain easements	Explain buried facilities in public right of way	Describe the procedures to identify a marked right of way	Describe how to identify and re-establish a pipeline right of way	Describe the importance of measuring and recording distances between facilities and structures
Describe the importance of recording GPS information for work area and locates	Describe the importance of photographing work area and locates	Describe the procedures for locating a metal access cover with a magnetic locator	Describe the procedures for locating metal infrastructure with a magnetic locator	Describe the cathodic protection process
Demonstrate the ability to conduct a locate (from start to finish)	Demonstrate understanding of the conditions when locates of buried facilities are required	Demonstrate understanding of the conditions where locates of buried facilities are required	Demonstrate the ability to respond to one-call locate requests	Demonstrate the ability to respond to contract locate requests
Demonstrate the ability to respond to private locate requests	Describe the ability to incorporate the mission of the CGA (and partners) into daily locate tasks	Describe the ability to incorporate the mission of CAPULC into daily locate tasks	Describe the ability to incorporate the mission of NULCA into daily locate tasks	Demonstrate the ability to participate in each step of the notification of intent to dig process
Demonstrate the ability to participate in each step of the one-call notification of intent to dig process	Demonstrate the ability to dispatch and/or follow dispatch instructions	Demonstrate the ability to participate in quality assurance for monitoring of locating and marking of buried facilities	Demonstrate the ability to utilize GPS / GIS information in researching and locating	Demonstrate the ability to determine the status of a buried facility
Demonstrate the ability to select the tools required to perform a generic direct hook-up signal application procedure	Demonstrate the ability to select an effective direct hook-up access point	Demonstrate the ability to select an effective direct hook-up grounding point	Demonstrate safe procedures for performing a direct hook-up	Demonstrate the conditions that provide an optimal direct hook-up ground point
Demonstrate the conditions that provide a poor direct hook-up ground point	Demonstrate the procedures to improve a direct hook-up ground point	Demonstrate the ability to utilize a ground rod and ground plate	Demonstrate the ability to utilize a multi-point ground	Demonstrate the ability to utilize an extended ground lead
Demonstrate the ability to select the tools required to perform a direct hook-up to metal pipe	Demonstrate the ability to select an effective direct hook-up access point to a metal pipe	Demonstrate safe procedures for performing a direct hook-up to a metal pipe	Demonstrate the ability to select the tools required to perform a direct hook-up to tracer wire	Demonstrate the ability to select an effective direct hook-up access point to a tracer wire
Demonstrate safe procedures for performing a direct hook-up to tracer wire	Demonstrate the ability to select the tools required to perform a direct hook-up to metal casing pipe	Demonstrate the ability to select an effective direct hook-up access point to a metal casing pipe	Demonstrate safe procedures for performing a direct hook-up to metal casing pipe	Demonstrate the ability to select the tools required to perform a direct hook-up to metal conduit
Demonstrate the ability to select an effective direct hook-up access point to a metal conduit	Demonstrate safe procedures for performing a direct hook-up to metal conduit	Demonstrate the ability to select the tools required to perform a direct hook-up to a (safe) cathodic cable	Demonstrate the ability to select an effective direct hook-up access point to a (safe) cathodic cable	Demonstrate safe procedures for performing a direct hook-up to a (safe) cathodic cable

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Demonstrate the ability to select the tools required to perform a direct hook-up to a (safe) electrical cable	Demonstrate the ability to select an effective direct hook-up access point to a (safe) electrical cable	Demonstrate safe procedures for performing a direct hook-up to a (safe) electrical cable	Demonstrate the ability to select the tools required to perform a direct hook-up to a (safe) communication cable	Demonstrate the ability to select an effective direct hook-up access point to a (safe) communication cable
Demonstrate safe procedures for performing a direct hook-up to a (safe) communication cable	Demonstrate the ability to select the tools required to perform a direct hook-up to a (safe) control cable	Demonstrate the ability to select an effective direct hook-up access point to a (safe) control cable	Demonstrate safe procedures for performing a direct hook-up to a (safe) control cable	Demonstrate the ability to select the tools required to perform a generic inductive clamping signal application procedure
Demonstrate the ability to select an effective generic inductive clamping access point	Demonstrate procedures for applying a signal using an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to a metal pipe with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to a metal pipe	Demonstrate safe procedures for applying a signal to a metal pipe with an inductive clamp
Demonstrate the ability to select the tools required to apply a signal to a tracer wire with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to a tracer wire	Demonstrate safe procedures for applying a signal to a tracer wire with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to a metal casing pipe with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to a metal casing pipe
Demonstrate safe procedures for applying a signal to a metal casing pipe with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to metal conduit with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to a metal conduit	Demonstrate safe procedures for applying a signal to a metal conduit with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to a cathodic cable with an inductive clamp
Demonstrate safe procedures for applying a signal to a cathodic cable with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to an electrical cable with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to an electrical cable	Demonstrate safe procedures for applying a signal to an electrical cable with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to a communication cable with an inductive clamp
Demonstrate the ability to select an effective inductive clamping access point to a communication cable	Demonstrate safe procedures for applying a signal to a communication cable with an inductive clamp	Demonstrate the ability to select the tools required to apply a signal to a control cable with an inductive clamp	Demonstrate the ability to select an effective inductive clamping access point to a control cable	Demonstrate safe procedures for applying a signal to a control cable with an inductive clamp
Demonstrate the ability to select an effective general inductive signal application point	Demonstrate the ability to select an effective inductive signal application point for metal pipe	Demonstrate the ability to select an effective inductive signal application point for tracer wire	Demonstrate the ability to select an effective inductive signal application point for casing pipe	Demonstrate the ability to select an effective inductive signal application point for metal conduit
Demonstrate the ability to select an effective inductive signal application point for cathodic cable	Demonstrate the ability to select an effective inductive signal application point for electrical cable	Demonstrate the ability to select an effective inductive signal application point for communication cable	Demonstrate the ability to select an effective inductive signal application point for control cable	Demonstrate the procedures for tracing an EM signal
Demonstrate the procedures for verifying a previously located facility	Demonstrate the ability to properly identify a target facility	Demonstrate the procedures for the Parallel Line Check Method	Demonstrate the procedures for the Inductive Sweeping Method	Demonstrate the procedures for the Inductive Multi-Angle Sweeping Method
Demonstrate the procedures for the 360° Sweeping Method	Demonstrate the procedures for the ALL (Advanced Line Locating) Method	Demonstrate the procedures for the CPS (Cathodic Protection System) Locating Mode	Demonstrate the procedures for the Live Cable (Power) Locating Mode	Demonstrate the procedures for the Radio Locating Mode

6.0

Knowledge of Factors that Affect Locate Accuracy	Demonstrate the procedures for locating sondes	Demonstrate the procedures for locating transmitter coils	Demonstrate the procedures for locating conductive rodding tools	Demonstrate the procedures for locating a remotely-applied EM signal	Demonstrate the procedures for the Measurement Method
	Demonstrate the procedures for the Point A to Point B Method	Demonstrate the procedures for the Visual Evidence Method	Demonstrate the procedures for the Survey Method	Demonstrate the procedures for locating electronic markers	Demonstrate the ability to identify easements
	Demonstrate the ability to identify buried facilities in public right of way	Demonstrate the ability to identify a marked right of way	Demonstrate the ability to identify and re-establish a pipeline right of way	Demonstrate measuring and recording distances between facilities and structures	Demonstrate recording GPS information for work area and locates
	Demonstrate photographing work area and locates	Demonstrate the ability to locate a metal access cover with a magnetic locator	Demonstrate the ability to locate metal infrastructure with a magnetic locator		
	Describe the key elements of a good locate	Explain the importance of anticipating problem locate conditions	Explain the importance of determining problem locate conditions	Explain the importance of following industry best practices to overcome problem locates	Explain circuit paths as they apply to electromagnetic locating
	Explain the importance of OJT (on-the-job training) to overcome problem locates	Explain the importance of methodical troubleshooting procedures to overcome problem locates	Explain the effects on facility identification by limited or restricted access	Explain how non-conductive lines affect the ability to conduct an accurate locate	Describe the effects of obstacles on locating accuracy
	Describe the effects of changes in facilities on the EM signal	Describe the effects of technology limitations on locating accuracy	Explain how extreme environments affect the ability to conduct an accurate locate	Describe the effects of weather on locating equipment	Explain how weather affects the ability to conduct an accurate locate
	Explain how uncleared terrain affects the ability to conduct an accurate locate	Explain how disruptive noises affect the ability to conduct an accurate locate	Explain how inaccurate records affect the ability to conduct an accurate locate	Describe the effects of various types and sizes of facilities on the EM signal	Describe the effects of unwanted coupling on the EM signal
	Describe the effects of a sharp drop of the EM signal	Describe the effects of a complete loss of the EM signal	Describe the effects of a broken tracer wire on the EM signal	Describe the effects of changes of depth on the EM signal	Describe the effects of a nearby guardrail on the EM signal
	Describe the effects of nearby metal fencing on the EM signal	Describe the effects of nearby structures on the EM signal	Describe the effects of pipeline tees and Y-laterals on the EM signal	Describe the effects of common-bonded facilities on the EM signal	Describe the effects of short facilities on the EM signal
	Describe the effects of non-grounded facilities on the EM signal	Describe the effects of facilities that are closer than normal on the EM signal	Describe the effects of congested facilities on the EM signal	Describe the effects of pipe dead ends on the EM signal	Describe the effects of abandoned facilities on the EM signal
	Describe the effects of discontinued facilities on the EM signal	Describe the effects of facilities installed using tunnel construction on locating accuracy	Describe the effects of deeper facilities on locating accuracy	Describe the effects of parallel facilities on locating accuracy	Describe the effects of cathodic protection circuits on locating accuracy
	Describe the effects of cathodic protection bonding on locating accuracy	Describe the effects of cathodic protection signal on the EM signal	Describe the effects of electrical circuits on locating accuracy	Describe the effects of electrical bonding on locating accuracy	Describe the effects of AC electricity on the EM signal

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7.0

Skills for Improving Locate Accuracy	Describe the effects of cable dead ends on the EM signal	Describe the characteristics of the EM signal using direct hook-up	Describe the effects of various grounding points on the EM signal	Describe the characteristics of the EM signal using inductive clamping	Describe the effects of air-coupling on locating accuracy
	Describe the effects of signal-bleeding on the EM signal	Describe the effects of tracing an EM signal for a long distance	Describe the effects of a low-frequency EM signal	Describe the effects of a high-frequency EM signal	Describe the effects of a low-power EM signal
	Describe the characteristics of an optimal inductive EM signal				
	Demonstrate the ability to utilize the key elements of a good locate	Demonstrate the ability to anticipate problem locate conditions	Demonstrate the ability to determine problem locate conditions	Demonstrate the ability to identify and utilize industry best practices to overcome problem locates	Demonstrate the ability to identify and utilize company procedures to overcome problem locates
	Demonstrate the ability to utilize OJT (on-the-job training) experiences to overcome problem locates	Demonstrate the ability to identify and utilize methodical troubleshooting to overcome problem locates	Demonstrate the ability to obtain access to facilities or to overcome limited or restricted access	Demonstrate the ability to determine non-conductive lines and use additional procedures to overcome problem locates	Demonstrate the ability to manage the effects of obstacles to improve locate accuracy
	Demonstrate the ability to manage the effects of changes in facilities on the EM signal	Demonstrate the ability to manage the effects of technology limitations to improve locate accuracy	Demonstrate the ability to manage the effects of extreme environments to improve locate accuracy	Demonstrate the ability to manage the effects of weather to improve locate accuracy	Demonstrate the ability to manage the effects of weather to improve locate accuracy
	Demonstrate the ability to manage the effects of uncleared terrain on to improve locate accuracy	Demonstrate the ability to manage the effects of disruptive noises to improve locate accuracy	Demonstrate the ability to utilize inaccurate records effectively to conduct an accurate locate	Demonstrate the ability to manage the effects of various types and sizes of facilities on the EM signal	Demonstrate the ability to manage the effects of unwanted coupling on the EM signal
	Demonstrate the ability to manage the effects of a sharp drop of the EM signal	Demonstrate the ability to manage the effects of a complete loss of the EM signal	Demonstrate the ability to manage the effects of a broken tracer wire on the EM signal	Demonstrate the ability to manage the effects of changes of depth on the EM signal	Demonstrate the ability to manage the effects of a nearby guardrail on the EM signal
	Demonstrate the ability to manage the effects of nearby metal fencing on the EM signal	Demonstrate the ability to manage the effects of nearby structures on the EM signal	Demonstrate the ability to manage the effects of pipeline tees and Y-laterals on the EM signal	Demonstrate the ability to manage the effects of common-bonded facilities on the EM signal	Demonstrate the ability to manage the effects of short facilities on the EM signal
	Demonstrate the ability to manage the effects of non-grounded facilities on the EM signal	Demonstrate the ability to manage the effects of facilities that are closer than normal on the EM signal	Demonstrate the ability to manage the effects of congested facilities on the EM signal	Demonstrate the ability to manage the effects of pipe dead ends on the EM signal	Demonstrate the ability to manage the effects of abandoned facilities on the EM signal
	Demonstrate the ability to manage the effects of discontinued facilities on the EM signal	Demonstrate the ability to manage the effects of facilities installed using tunnel construction on locating accuracy	Demonstrate the ability to manage the effects of deeper facilities on locating accuracy	Demonstrate the ability to manage the effects of parallel facilities on locating accuracy	Demonstrate the ability to manage the effects of cathodic protection circuits on locating accuracy
	Demonstrate the ability to manage the effects of cathodic protection bonding on locating accuracy	Demonstrate the ability to manage the effects of cathodic protection signal on the EM signal	Demonstrate the ability to manage the effects of electrical circuits on locating accuracy	Demonstrate the ability to manage the effects of electrical bonding on locating accuracy	Demonstrate the ability to manage the effects of AC electricity on the EM signal

8.0	Marking Knowledge	Demonstrate the ability to manage the effects of cable dead ends on the EM signal	Demonstrate the ability to apply an optimal EM signal using direct hook-up	Demonstrate the ability to apply an optimal EM signal using various grounding points	Demonstrate the ability to apply an optimal EM signal using inductive clamping	Demonstrate the ability to manage the effects of air-coupling on locating accuracy
		Demonstrate the ability to manage the effects of signal-bleeding on the EM signal	Demonstrate the ability to manage the effects of tracing an EM signal for a long distance	Demonstrate the ability to apply a low frequency to obtain an optimal EM signal	Demonstrate the ability to apply a high frequency to obtain an optimal EM signal	Demonstrate the ability to apply low output transmitter power to obtain an optimal EM signal
		Explain the APWA Uniform Color Code	Identify each color code associated with the APWA	Explain the CAGC Color Code	Identify each color code associated with the CAGC	Describe situations where other marking systems may be used
		Explain the CGA guidelines for marking practices	Explain single facility marking	Explain multiple facility marking	Explain conduit marking	Explain corridor marking
		Explain changes in direction marking	Explain lateral connection marking	Explain painted offset marking	Explain staked offset marking	Explain operator's identifier marking
		Explain facility detail marking	Explain facilities installed in a vault / inlet / lift station marking	Explain loss of signal / termination / dead ends marking	Explain no conflict marking	Describe different marking materials
	Marking Skills	Identify different marking materials	Describe criteria for selecting marking materials	Explain importance of marking abandoned facilities	Explain proper marking in navigable waterways	Explain the CGA guidelines for excavation markings
		Explain ground and environment conditions that affect locate marks	Explain structure markings (e.g., vault, inlet, lift station)			
		Demonstrate proper ground marking using the APWA Uniform Color Code	Demonstrate use of the CGA common abbreviations for facility identifier	Demonstrate use of CGA common abbreviations for underground construction descriptions	Demonstrate use of the CGA common abbreviations for infrastructure material	Demonstrate operator's identifier marking
		Demonstrate proper selection of marking materials	Demonstrate single facility marking	Demonstrate proper facility distance marking	Demonstrate multiple facility marking	Demonstrate corridor marking
		Demonstrate conduit marking	Demonstrate changes in direction marking	Demonstrate lateral connection marking	Demonstrate painted offset marking	Demonstrate staked offset marking
		Demonstrate facility detail marking	Demonstrate facilities installed in a vault / inlet / lift station marking	Demonstrate loss of signal / termination / dead ends marking	Demonstrate no conflict marking	Demonstrate facility detail marking
10.0	Facility Materials Knowledge	Demonstrate proper pin flag marking	Demonstrate proper whisker marking	Demonstrate proper marking in navigable waterways	Demonstrate the ability to mark facilities under adverse ground and environment conditions	Demonstrate proper pin flag marking
		Demonstrate proper ground marking using the CAGC Color Code	Demonstrate structure markings (e.g., vault, inlet, lift station)			
		Know types of buried facilities	Know the common materials used for buried facilities	Know the common diameters of buried facilities	Know the common locations where buried facilities are found	Know the common depths of buried facilities

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		Know owner/operator facility identifier common abbreviations	Know owner/operator underground construction description common abbreviations	Know owner/operator infrastructure materials common abbreviations	Describe conductive / non-conductive materials	Know the CGA common abbreviations for facility identifier
		Know the CGA common abbreviations for underground construction descriptions	Know the CGA common abbreviations for infrastructure material			
11.0	General Documentation Knowledge	Explain documentation required from client/contractor	Explain importance of accurately recording scope of work	Explain the importance of accurately recording the work (ground disturbance) area	Explain what is required as complete locate documentation	Explain a locate request
12.0	General Documentation Skills	Explain documentation required from client/contractor	Explain importance of accurately recording scope of work	Explain the importance of accurately recording the work (ground disturbance) area	Explain what is required as complete locate documentation	Explain a locate request
13.0		Demonstrate the ability to record a locate request	Demonstrate the ability to review a locate request	Demonstrate the ability to utilize available records	Demonstrate ability to prepare a locate documentation package	Demonstrate ability to complete post-locate documentation process (filing records)
	General Communication Knowledge	Describe proper communication etiquette	Describe the importance of sound interpersonal skills	Describe the importance of timely and effective communication	Describe timely and effective communication between the dispatch office and the field locator	Explain the owner / operator two-way radio / pager / cell phone / smart phone / tablet system
		Explain relevant interviewing questions	Describe topics to be discussed with client/ground disturber before locates	Describe the importance of obtaining relevant information from client/ground disturber	Describe the importance of understanding the scope of work / work area as determined by the ground disturber	Describe the importance of understanding of the nature and scope of work as determined by the ground disturber
		Explain relevant information documentation required from client/ground disturber	Describe the importance of acquiring permission from required parties	Describe site-specific safety requirements (permits, access, etc.)	Describe the procedures and requirements of the facility owner/operator	Explain communication with land owner
14.0		Describe the importance of communicating with locating team members	Describe the importance of communicating with members of other locating teams	Describe the requirements of the locate request	Describe documentation of the completed locate request	Describe topics to be discussed with client/ground disturber after locates
	General Communication Skills	Demonstrate proper communication etiquette	Demonstrate sound interpersonal skills	Demonstrate ability to timely and effectively communicate with client/ground disturber, facility owner, landowner, etc.	Demonstrate timely and effective communication between the dispatch office and the field locator	Demonstrate use of owner / operator two-way radio / pager / cell phone / smart phone / tablet system
		Demonstrate ability to communicate relevant interviewing questions	Demonstrate understanding of topics discussed with client/ground disturber before locates	Demonstrate ability to obtain relevant information from client/ground disturber	Demonstrate understanding of the nature and scope of work as determined by the client/ground disturber	Demonstrate understanding of the nature and scope of work as determined by the client/ground disturber

15.0		Demonstrate ability to obtain relevant information documentation required from client/ground disturber	Demonstrate the ability to acquire permission from required parties	Demonstrate the ability to determine and/or obtain site-specific safety requirements (permits, access, etc.)	Demonstrate the ability to determine the procedures and requirements of the facility owner/operator	Demonstrate the ability to communicate with land owner
		Demonstrate the ability to communicate with locating team members	Demonstrate the ability to communicate with members of other locating teams	Demonstrate the ability to complete the requirements of the locate request	Demonstrate the ability to complete the documentation of the completed locate request	Demonstrate the ability to discuss required topics with client/ground disturber after locates
	Mentor/Train Others in Performing Skills	Mentor/train others in communication skills	Mentor/train others in safety and safe work practices	Mentor/train others in damage prevention	Mentor/train others on the operation of electromagnetic equipment	Mentor/train others on prints and technology
		Mentor/train others on locating and verification methods	Mentor/train others on marking methods, procedures and guidelines	Mentor/train others on drawing procedures	Mentor/train others on QA/QC procedures	Mentor/train others on administrative skills
16.0	Planning Knowledge	Explain maps and safe and effective navigation to site	Describe the importance of researching various record	Explain various types of records to research	Describe the importance of creating and following a work plan	Describe pre-work safety considerations
		Describe the importance of understanding site background data	Describe the importance of site familiarization	Describe the importance of external safety resources (emergency response, etc.)	Describe the importance and information required in and ERP (Emergency Response Plan)	
17.0	Planning Skills	Demonstrate to utilize mapping, determine safe and effective routes, and successfully navigate to site	Demonstrate the ability to research various record	Demonstrate the ability to research various types of records	Demonstrate the ability to create and follow the work plan	Demonstrate the ability to incorporate pre-work safety considerations into planning and work
		Demonstrate the ability to obtain site background data and incorporate it into planning and work	Demonstrate the ability to perform site familiarization and incorporate it into planning and work	Demonstrate the ability to determine external safety resources (emergency response, etc.)	Demonstrate the ability to develop and communicate an ERP (Emergency Response Plan)	

Locator Safety Skills

1.0	Safety Knowledge	Describe the safety process	Describe basic safety awareness training	Describe corporate safety responsibilities	Describe employee safety responsibilities	Explain the facility owner / operator OHS&E policy
		Describe the JSA (job safety analysis) process	Describe the emergency response process	Describe working alone procedures	Describe the JCC (job completion checklist) process	Describe the safety / environmental incident investigation process
		Describe the purpose and content of tailgate safety meetings	Describe the importance and use of PPE (personal protective equipment)	Describe on-street locating safety procedures	Describe managing and channelling traffic	Describe manhole safety procedures
		Describe hand hole safety procedures	Describe vault safety procedures	Describe gas and pressure release hazards	Describe electrical safety	Describe maintaining a safe distance from overhead electrical lines
		Describe ground disturbance	Describe the steps of proper safe digging	Describe the damage prevention process		

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2.0	Safety Skills	Demonstrate the ability to follow the safety process	Demonstrate the ability to determine basic safety concerns	Demonstrate the ability to determine, appropriate, and follow applicable corporate safety responsibilities	Demonstrate the ability to determine and fulfill appropriate employee safety responsibilities	Demonstrate the ability to determine and follow applicable facility owner / operator OHS&E policy
		Demonstrate the ability to determine and follow the JSA (job safety analysis) process	Demonstrate the ability to determine and follow required emergency response processes	Demonstrate the ability to follow working alone procedures	Demonstrate the ability to follow the JCC (job completion checklist) process	Demonstrate the ability to participate in the safety / environmental incident investigation process
		Demonstrate the ability to conduct tailgate safety meetings	Demonstrate the ability to determine and utilize required PPE (personal protective equipment)	Demonstrate the ability to follow on-street locating safety procedures	Demonstrate the ability to manage and channel traffic	Demonstrate the ability to follow manhole safety procedures
		Demonstrate the ability to follow hand hole safety procedures	Demonstrate the ability to follow vault safety procedures	Demonstrate the ability to protect against gas and pressure release hazards	Demonstrate the ability to follow electrical safety procedures	Demonstrate the ability to maintain safe distance from overhead electrical lines
		Demonstrate the ability to follow safe digging ground disturbance and damage prevention procedures	Demonstrate the ability to follow the steps of proper safe digging			
3.0	Safety Training Knowledge	Explain the importance of receiving safety training	Explain the importance of drug awareness	Explain the importance first aid / CPR training	Explain the importance of PPE training	Explain the importance of confined space training
		Explain the importance of extreme weather training	Explain the importance of bear awareness training	Explain the importance of ATV training	Explain the importance of JCC (job completion checklist) training	Explain the importance of defensive driving training
		Explain the importance of WHMIS training	Explain the importance of H2S training	Explain the importance of an owner/operator or client-specific safety training	Explain the importance of JSA (job safety analysis) training	Explain the importance of emergency response training
		Explain the importance of transportation of dangerous goods (TDG) training	Explain the importance of safe digging/ground disturbance training	Explain the importance of voltage detector training	Explain the importance of fire safety training	Explain the importance of training in reading and utilizing information source records
		Explain the importance of owner-specific training	Explain the importance of site-specific training			
4.0	Safety Training Completion and Demonstration	Complete and demonstrate the ability to utilize safety training	Complete and demonstrate the ability to utilize drug awareness training	Complete first aid / CPR training	Complete and demonstrate the ability to utilize PPE training	Complete and demonstrate the ability to utilize confined space training
		Complete and demonstrate the ability to utilize extreme weather training	Complete and demonstrate the ability to utilize bear awareness training	Complete and demonstrate the ability to utilize ATV training	Complete and demonstrate the ability to utilize JCC (job completion checklist) training	Complete and demonstrate the ability to utilize defensive driving training
		Complete and demonstrate the ability to utilize WHMIS training	Complete and demonstrate the ability to utilize H2S training	Complete and demonstrate the ability to utilize owner/operator or client-specific safety training	Complete and demonstrate the ability to utilize JSA (job safety analysis) training	Complete and demonstrate the ability to utilize emergency response training
		Complete and demonstrate the ability to utilize	Complete and demonstrate the ability to utilize	Complete and demonstrate the ability to utilize	Complete fire safety training	Complete training and demonstrate the ability to read and

		transportation of dangerous goods (TDG) training	safe digging/ground disturbance training	voltage detector training		utilize information source records
		Complete and demonstrate the ability to utilize owner-specific training	Complete and demonstrate the ability to utilize site-specific training			
5.0	Safe Work Knowledge	Explain performing locates safely	Describe the purpose and application of hazard assessments and controls	Describe the purpose and application of a control program as it pertains to hazards	Explain site background data	Explain site familiarization
		Explain external resources	Explain work plan	Explain job briefing	Explain suitable equipment	Explain work safety exposures
		Explain work activities	Explain electrical safety at transformers and other electrical housings	Explain electrical safety at pedestals, hand holes and manholes	Explain electrical safety at street and traffic lights	Explain termination of work activities
		Explain post locate safety debriefing	Explain confined space	Provide examples of confined spaces	Explain importance of voltage detector	Explain a four way gas monitor
		Explain voltage detector self-checks	Explain voltage detector safe use at pedestal	Explain voltage detector safe use at ground bar	Describe cable sheath and telephone noise	Describe cable sheath current levels
		Describe a safe work permit	Describe obligation to protect the general public	Describe obligation to protect the work site	Describe obligation to protect any individual at the work site	Describe right and obligation to refuse work
		Describe right and obligation to stop work	Describe safe access/egress and occupancy at vaults	Describe safe access/egress and occupancy at manholes	Describe traffic management	
6.0	Safe Work Skills	Demonstrate knowledge and understanding of government regulations	Demonstrate knowledge and understanding of industry best practices	Demonstrate knowledge, understanding and use of an ERP	Demonstrate participation in safety meetings	Demonstrate defensive driving skills
		Demonstrate participation in tailgate safety meetings	Demonstrate proper use of PPE	Demonstrate on-site safety	Perform a hazard assessment and identify hazards	Complete hazard assessment documentation
		Demonstrate the ability to perform locating while adhering to regulations and best practices	Create a work plan	Demonstrate ability to implement a control program	Demonstrate the use of a clamp-on ammeter	Demonstrate performing locates safely
		Demonstrate the proper use of a four-way gas monitor	Demonstrate voltage detector use	Demonstrate ability to protect any individual at the work site	Demonstrate ability to protect the work site	Demonstrate ability to manage and channel traffic
		Demonstrate ability to protect the general public	Demonstrate safety procedures when accessing permanent structures	Demonstrate vault or manhole safety procedures	Demonstrate hand hole safety procedures	Demonstrate ability to refuse unsafe work
		Demonstrate ability to stop unsafe work	Complete a JCC (job completion checklist)	Demonstrate the use of safety equipment	Demonstrate the safe use of locating equipment	Explain the purpose of a client specific safety orientation
7.0	Communication Skills	Demonstrate the ability to communicate with locator company regarding safety concerns	Demonstrate the ability to communicate with client/ground disturber regarding safety concerns	Demonstrate the ability to communicate with facility owner/operator regarding safety concerns	Demonstrate the ability to communicate with landowner regarding safety concerns	Demonstrate the ability to communicate with locate team members regarding safety concerns

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		Demonstrate the ability to complete hazard assessment documentation	Demonstrate the ability to conduct/participate in a pre-job safety briefing	Demonstrate the ability to conduct/participate in a job briefing	Demonstrate the ability to conduct/participate in a post job debriefing	
Administrative Skills						
1.0	Administrative Knowledge	Explain general computer application and operation	Explain the application and operation of word processing programs	Explain the application and operation of data spreadsheets	Explain the application and operation of email programs	Explain the application and operation of internet search engines
		Explain the application and operation of company intranet system	Explain company, (etc.) sketch drawing requirements	Explain company sketch drawing procedures	Explain company invoicing procedures	Describe company work-time tracking system (timesheets)
2.0		Describe company vehicle operation log policies	Explain the application and operation of company inventory systems			
	Administrative Skills	Demonstrate the ability to utilize computers	Demonstrate the ability to utilize word processing software	Demonstrate the ability to utilize data spreadsheets	Demonstrate the ability to utilize email software	Demonstrate the ability to utilize internet search engines
		Demonstrate the ability to utilize company intranet system	Demonstrate the ability to draw sketches utilizing company (etc.) requirements	Demonstrate the ability to utilize company drawing/mapping software	Demonstrate the ability to follow company invoicing procedures	Demonstrate the ability to complete company work-time tracking system (timesheets)
		Demonstrate the ability to complete company vehicle operation log	Demonstrate the ability to utilizing company inventory systems	Demonstrate the use of work order software	Demonstrate the use of locate ticket management software	
3.0	Administrative Communication Skills	Demonstrate professionalism and proper etiquette in the workplace	Demonstrate ability to effectively communicate with client / contractor	Demonstrate the ability to forward the locate documentation to client	Demonstrate the ability to forward the invoice to client	Demonstrate the ability to forward the invoice to office
		Demonstrate the ability to forward the locate documentation to office				
Prints and Technology Skills						
1.0	Prints & Technology Knowledge	Understand basic map reading	Define mapping terminology	Understand conversion formulas associated with length, area, and angles	Explain right of ways and easements on mapping	Describe third party mapping software
		Understand symbology of various types of prints and third party software	Understand client specific software	Describe details required on a locator sketch / drawing	Describe global positioning systems (GPS) and their uses	Describe the Dominion(Canada) Land Survey system
		Describe the Alberta survey system	Describe the BC survey system	Describe the Manitoba survey system	Describe the Saskatchewan survey system	Describe the Quebec survey system
		Describe the Ontario survey system	Describe map scale	Describe map datum	Describe the universal transverse mercator (UTM) grid	Define UTM zones and their purpose
		Define rectangular grid references	Define civilian UTM reference system	Know the National Topographic System (NTS)	Describe the Western Canada survey system	Describe meridians
		Describe customer/client specific facility symbol identification	Describe plot plans or as-builts	Describe Caveats and Land Titles	Know various map sources	Know various information sources

2.0

Prints & Technology Skills	Explain advantages / disadvantages of using facility prints	Explain advantages/ disadvantages of using satellite/ orthographic images	Define the survey system in your area of responsibility	Describe record verification	Describe a local coordinate system
	Describe the required information to be included on a locator sketch	Describe the required information to be included on other locate documentation	Explain plot plans or as-builts	Describe required information to document record updates for owner / client	Understand the role of technologies in the creation and representation of accurate databases/information
	Describe map cartography	Explain GIS (global information system) information	Describe road / street maps	Explain the importance of the planning phase for ground disturbance	
	Demonstrate the ability to research information and map sources	Demonstrate ability to interpret locator drawings	Demonstrate ability to create locator drawings	Demonstrate knowledge and understanding of plot plans or as-builts	Demonstrate the ability to interpret and utilize customer/client specific facility symbol identification
	Demonstrate ability to utilize software	Demonstrate the ability to recognize facility symbols, line styles and line colors	Demonstrate ability to document and forward record updates to owner / client	Demonstrate ability to interpret and utilize road / street maps	Demonstrate ability to recognize technologies role for accurate databases/information
	Demonstrate the ability to recognize and utilize map cartography information	Demonstrate ability to interpret and utilize GPS information	Demonstrate knowledge and understanding of Caveats and Land Titles	Demonstrate ability to interpret and utilize GIS (global information system) information	Demonstrate the ability to read basic mapping
	Demonstrate the ability to understand and utilize mapping terminology	Demonstrate the ability to utilize conversion formulas associated with length, area, and angles	Demonstrate the ability to identify right of ways and easements on mapping	Demonstrate the ability to utilize third party mapping software	Demonstrate the ability to utilize various types of prints and third party software
	Demonstrate the ability to utilize client specific software	Demonstrate the ability to identify details required on a locator sketch / drawing	Demonstrate the ability to utilize global positioning (GPS) data to interpret and create mapping	Demonstrate the ability to utilize Dominion(Canada) Land Survey system information	Demonstrate the ability to utilize Alberta survey system information
	Demonstrate the ability to utilize BC survey system information	Demonstrate the ability to utilize Manitoba survey system information	Demonstrate the ability to utilize Saskatchewan survey system information	Demonstrate the ability to utilize Quebec survey system information	Demonstrate the ability to utilize Ontario survey system information
	Demonstrate the ability to interpret map scale	Demonstrate the ability to interpret map datum	Demonstrate the ability to interpret and utilize universal transverse mercator (UTM) grid information	Demonstrate the ability to interpret and utilize UTM zone information	Demonstrate the ability to identify and utilize rectangular grid reference information

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utilize satellite/orthographic images	survey system in the area of responsibility		utilize a local coordinate system	included on a locator sketch
Demonstrate the ability to identify and utilize information to create a locator sketch	Demonstrate the ability to identify and utilize included on other locate documentation			

Codes / Regulations / Legislation Skills & Construction Standards & Practices

1.0	Codes, Regulations, Standards, and Practices Knowledge	Describe federal regulations	Describe provincial regulations	Describe municipal / local regulations	Describe industry guidelines and best practices	Describe transportation and utility corridors (TUC)
		Describe utility rights of way (URW)	Describe land titles	Describe caveats	Describe crossing agreements	Describe environmental regulations and policies
		Describe a controlled area as it pertains to high pressure pipelines	Describe the safety authorities in the area of responsibility	Describe the Code of Federal Regulations (CFR) - US	List the CFR steps to locating pipelines	Explain WCB regulations relating to worker safety
		Explain the lifespan of locates - worksite scenarios flowchart	Describe construction standards and common practices in excavation methods	Explain Right-Of-Way markers as they pertain to regulations or standards	Describe warning sign requirements	Describe color code markers as they pertain to company specific R.O.W. standards
		Explain labour code regulations for trenching and excavation	Explain the requirements of R.O.W. maintenance	Explain regulations for R.O.W. monitoring	Explain regulations for foreign crossings	Explain regulations as they pertain to locating with manufacturer instructions
		Explain Abnormal Operating Conditions	Describe equipment operational check in accordance to regulations	Explain the steps to verify the scope of the locate request in accordance to regulations	Explain adjacent facilities, structures, or obstructions that may affect the locate request in accordance to regulations	Explain how to compare prints, records and any written or observed information in accordance to regulations
		Explain how to communicate discrepancies to the proper authorities in accordance to regulations	Describe additional locate requirements that may be included on the locate ticket in accordance to regulations	Describe the proper corrective action to regain an adequate signal in accordance to regulations	Describe how to complete a locate within the entire scope of the locate request in accordance to regulations	Demonstrate the ability to mark the location of the facility in accordance to regulations
		Explain how to compare records to existing conditions after a facility is located and marked in accordance to regulations	Explain how to identify and communicate discrepancies to the proper authorities in accordance to regulations	Explain how to perform safety precautions in accordance with federal and/or state/provincial laws	Explain the "tolerance zone" as it relates to buried facilities	Explain the three stages of the UFL competency cycle
		Explain CAPULC Field Task Competency Manual	Describe the role of Occupational Health and Safety (OH&S) agencies	Describe Occupational Health & Safety (OH&S) rules and regulations		
		Demonstrate knowledge and understanding of WCB regulations relating to worker safety	Demonstrate ability to reference and access specific regulatory information	Demonstrate knowledge of lifespan of locates - worksite scenarios flowchart	Demonstrate knowledge where to access Federal, State/Provincial or local regulations in geographical area	Demonstrate understanding of Federal, State/Provincial or local regulations in geographical area
2.0	Codes, Regulations, Standards, and Practices Skills					

		Demonstrate knowledge of construction standards and common practices in excavation methods	Demonstrate ability to identify Right-Of-Way markers as they pertain to the CFR regulations	Demonstrate ability to identify Right-Of-Way markers as they pertain to CSA standards	Demonstrate ability to identify Right-Of-Way markers as they pertain to company specific standards	Demonstrate ability to know warning sign requirements
		Demonstrate ability to identify color code markers as they pertain to company specific R/W standards	Demonstrate knowledge and understanding of Canada labour code regulations for trenching and excavation	Demonstrate knowledge and understanding of CFR regulations for trenching and excavation	Demonstrate knowledge and understanding of CSA standards for trenching and excavation	Demonstrate knowledge and understanding of the purpose of R.O.W. maintenance
		Demonstrate knowledge and understanding of NEB regulations for R.O.W maintenance	Demonstrate knowledge and understanding of CFR for R.O.W maintenance	Demonstrate knowledge and understanding of CSA regulations for R.O.W maintenance	Demonstrate knowledge and understanding of the NEB regulations for R.O.W monitoring	Demonstrate knowledge and understanding of state/provincial regulations for R.O.W monitoring
		Demonstrate knowledge and understanding of CFR regulations for R.O.W monitoring	Demonstrate knowledge and understanding of CSA standards for R.O.W monitoring	Demonstrate knowledge and understanding of regulations for foreign crossings in accordance to CFR	Demonstrate the ability to select a type of locate in accordance to the CFR	Demonstrate the ability to locate with manufacturer instructions in accordance to CFR
		Demonstrate the ability to recognize AOC while performing a locate in accordance to CFR	Demonstrate what actions should be taken in reacting to an AOC in accordance to CFR	Demonstrate equipment operational check in accordance to CFR	Demonstrate the steps to locating pipelines in accordance to CFR	Demonstrate the steps to verify the scope of the locate request in accordance to CFR
		Demonstrate the ability to identify adjacent facilities, structures, or obstructions that may affect the locate request in accordance to CFR	Demonstrate the ability to compare prints, records and any written or observed information in accordance to CFR	Demonstrate the ability to communicate discrepancies to the proper authorities in accordance with the CFR	Demonstrate locate requirements that may be included on the locate ticket in accordance to CFR	Demonstrate the ability to initiate the proper corrective action to regain an adequate signal in accordance to CFR
		Demonstrate the ability to complete a locate within the entire scope of the locate request in accordance to CFR	Demonstrate the ability to mark the location of the facility in accordance to CFR	Demonstrate comparing records to existing conditions after a facility is located and marked in accordance to CFR	Demonstrate the ability to identify and communicate discrepancies to the proper authorities in accordance to CFR	Demonstrate the ability to perform safety precautions in accordance with federal and/or state/provincial laws
		Demonstrate safety procedures as they pertain to the geographical area of responsibility	Demonstrate the ability to perform locating while observing and adhering to all applicable laws	Demonstrate the "tolerance zone" as it relates to buried facilities		
Equipment Skills						
1.0	Equipment Knowledge	Describe main components of a transmitter and their functions	Describe the main components of a receiver and their functions	Explain transmitter/receiver function testing and its purpose	Describe when to change batteries in transmitter/receiver	Describe safety considerations in the use of the transmitter
		Describe safety considerations in the use of the receiver	Describe proper transmitter connection techniques	Explain importance of proper transmitter grounding and how to improve it	Explain equipment indicators for an effectively applied signal	Describe proper placement of transmitter
		Describe proper receiver to transmitter alignment	Describe consequences of improper alignment	Explain selection of appropriate transmitter power output	Explain selection of appropriate transmitter/receiver frequency	Explain gain and the impact of its adjustment

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2.0	Equipment Operation Skills	Explain peak and null and their proper application	Explain advantages/disadvantages of direct, inductive clamp and inductive mode	Explain advantages/disadvantages of audio and radio frequencies	Describe global positioning systems (GPS) and their use	Describe other survey tools required by locators
		Describe ground penetrating (GPR) and its use	Describe magnetic locators and their uses	Explain industry hand tools	Describe a right angle prism and its uses	Describe ultrasonic locating and its applications
		Describe electromagnetic fault detection and its application	Describe electromagnetic fault detection and its application	Explain auto-shutoff features	Explain interpreting audio/visual information	Explain electromagnetic current and how to measure electromagnetic current
		Explain sondes	Explain transmitting coils	Explain conductive rodding tools	Describe transmitter leads	Describe suitable grounds and alternative grounds
		Explain EM locator depth measurement function	Explain transmitter orientation	Explain receiver orientation	Explain receiver orientation when using a sonde or transmitting coil	Describe a EM transmitter
		Describe an EM receiver	Describe direct hook-up leads	Describe an inductive clamp	Describe inductive signal application	Describe an EM cable fault locator (A-frame)
		Demonstrate transmitter/receiver function testing as per the manufacturers manual	Demonstrate proper use of the transmitter	Demonstrate proper transmitter connection techniques	Demonstrate proper transmitter grounding and how to improve it	Demonstrate ability to recognize equipment indicators for a good applied signal
		Demonstrate proper placement of transmitter	Demonstrate proper receiver to transmitter signal/frequency alignment	Demonstrate the selection of appropriate transmitter power output for an optimum signal	Demonstrate the selection of appropriate transmitter/receiver frequency	Demonstrate ability to utilize gain adjustment to keep meter on scale
		Demonstrate the proper use of the receiver	Demonstrate ability to utilize peak and null signal identification	Demonstrate advantages / disadvantages of direct, inductive clamp and inductive mode	Demonstrate ability to operate the receiver locating different facilities	Demonstrate proper care and use of industry hand tools
		Demonstrate equipment use as per the manufacturer's manual	Demonstrate proper use of magnetic locator	Demonstrate proper uses of measuring tools	Demonstrate proper use of a hand held GPS	Demonstrate measure electromagnetic current
		Demonstrate the use of magnetic locators	Demonstrate the use of ultrasonic locators	Demonstrate the use of electromagnetic fault detection locators	Demonstrate the use of GPR equipment	Demonstrate the ability to recognize that equipment has auto-shutoff
		Demonstrate the ability to control auto-shutoff features	Demonstrate the ability to interpret locating equipment audio/visual information	Demonstrate the use of transmitter leads	Demonstrate the use of suitable grounds and alternative grounds	Demonstrate EM locator depth measurement function
		Demonstrate the use of sondes	Demonstrate the use of transmitting coils	Demonstrate the use of conductive rodding tools	Demonstrate transmitter orientation	Demonstrate receiver orientation
		Demonstrate receiver orientation for locating sondes and transmitting coils				
3.0	Equipment Maintenance Knowledge	Explain maintenance requirements of the transmitter	Explain consequences of inadequate maintenance of transmitter	Explain proper storage of transmitter	Explain proper storage of transmitter	Describe proper cleaning procedures for transmitter

4.0		Explain consequences of inadequate cleaning of transmitter	Describe proper battery care	Explain consequences of improper battery care	Explain maintenance requirements of the receiver	Explain consequences of inadequate maintenance of the receiver
		Explain proper storage of the receiver	Explain consequences of inadequate storage of the receiver	Describe proper cleaning procedures for the receiver	Explain consequences of inadequate cleaning of the receiver	Explain proper maintenance of pin finders
		Explain proper maintenance of a hand held GPS	Explain proper storage of a magnetic locator	Explain proper storage of GPR equipment	Explain removing equipment from service for maintenance or repairs	Explain request order for maintenance or repairs of equipment
		Explain daily field calibration check	Explain manufacturer's calibration specifications			
	Equipment Maintenance Skills	Demonstrate proper storage of the transmitter	Demonstrate proper storage of the receiver	Demonstrate proper transmitter maintenance	Demonstrate proper receiver maintenance	Demonstrate cleaning procedures for the transmitter
		Demonstrate cleaning procedures for the receiver	Demonstrate transmitter/receiver battery test and care	Demonstrate when to change batteries in transmitter/receiver	Demonstrate when to change batteries in a magnetic locator	Demonstrate proper maintenance of magnetic locator
		Demonstrate daily field calibration check	Demonstrate that equipment has been calibrated to manufacturer's specifications	Demonstrate proper storage of GPR equipment	Demonstrate removing equipment from service for maintenance or repairs	Demonstrate the ability to file a request order for maintenance or repairs of equipment
	Damage Prevention Skills					
	1.0	Damage Prevention Knowledge	Describe damage prevention	Explain the damage prevention process	Explain stakeholders within the damage prevention process	Define ground disturbance
			Define buried facility owner/operators	Define privately owned buried facilities	Define the digging community	Describe stages and responsibilities during a typical buried facility crossing
2.0			Describe damages to buried facilities	Describe the incident investigation process	Describe consequences of inaccurate locates	Describe the requirements that a ground disturber must fulfil prior to a ground disturbance
			Define ground disturbers/excavators	Define locators	Describe positive confirmation	Describe guidelines for vehicles and equipment crossing pipelines
		Common Ground Alliance Knowledge	Describe the Common Ground Alliance (CGA)	Explain the mission of the Common Ground Alliance (CGA)	Describe the Canadian Common Ground Alliance (CCGA)	Describe the one-call notification process system
			Describe one call center best practices	Describe locate and marking best practices	Describe excavation best practices	Describe mapping best practices
			Describe public education best practices	Describe reporting best practices	Describe security best practices	Explain lifespan of locates
3.0	One Call Centre Knowledge	Explain how one call systems work	Explain the mission of one call centres	Explain one call centre member's data	Explain limitations of one call centres	Explain absence of one call centres

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		Explain processing and routing of a locate request / ticket	Explain a locate request form	Explain owner/operator response to a one-call notification	Demonstrate knowledge of lifespan of locates - worksite scenarios flowchart	Explain routine locate requests
		Explain priority locate requests	Explain emergency locate requests	Explain a multi locate request	Explain a no facility in work area locate request	Know how to contact one call centres
4.0	One-call Non-member Knowledge	Describe the roles of non-members in the damage prevention process	Describe the limitations of non-members	Describe the intent-to-dig notification process for non-members	Describe the process of identifying non-member facilities	Describe non-member facility identification by the owner/operator
5.0		Describe non-member facility identification by a contract locator	Describe non-member facility identification by a private locator	Explain an urban locate		
	Job Scope Knowledge	Explain the role of a locator in a ground disturbance and damage prevention	Explain locate marks	Explain site-specific marking colors	Explain locate documentation	Explain the responsibilities of ground disturbers after locates
6.0		Explain hand exposure	Explain hand exposure zones	Explain a rural locate	Explain a metro locate (urban core critical infrastructure)	Explain a One Utility locate(no joint use)
		Explain a Two Utility locate(no joint use)	Explain a joint use locate (joint use/common trench)	Explain a multi utility locate (no joint use)	Describe the role of the owner/operator locator in the one-call notification and identification process	Describe the role of the contract locator in the one-call notification and identification process
		Describe the role of the owner/operator locator in the non-member notification and identification process	Describe the role of the contract locator in the non-member notification and identification process	Describe the role of the private locator in the non-member notification and identification process	Describe the role of the private/contract locator in the facilities identification process for ground disturbers	
	Special Situations Knowledge	Explain special situations	Explain various types of field problems	Explain hazardous situations	Explain emergency locate requests	Explain priority locate requests
		Explain short notice locate requests	Explain modifying locate requests	Explain failure to respond to locate requests	Explain pipeline regulations	Explain ground disturbance for major projects
		Explain frozen ground	Explain hand exposure of energized power cables	Explain ground disturbance parallel to a buried facility	Explain marking limits of job site	Explain private property
7.0		Explain homeowners responsibilities	Explain charges for locates			
	Stakeholder Responsibilities Knowledge	Explain stakeholder responsibilities	Explain regulatory agencies responsibilities	Explain responsibilities of owners / operators of buried facilities	Explain the digging community responsibilities	Explain municipalities responsibilities
8.0		Explain one call centre responsibilities	Explain locator responsibilities			
	Damage and Investigation Knowledge	Describe the damage investigation process	Describe the locator role in the damage investigation process	Describe the digging community role in the damage investigation process	Describe the owner/operator role in the damage investigation process	Describe the regulatory agencies role in the damage investigation process
		Describe the one call centre role in the damage investigation process	Demonstrate participation in a damage investigation			