



**UNDERGROUND FACILITY LOCATOR COMPETENCY PROFILE**

### UNDERGROUND FACILITY LOCATOR COMPETENCY PROFILE

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](mailto:competencies@capulc.ca).

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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.

### ACKNOWLEDGEMENTS

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## Telecommunications & CATV

1.0

### General Locating Knowledge

Describe the history of telecommunications	Describe the uses of telecommunications	Describe the users of telecommunications	Describe telecommunications systems	Describe telecommunications networks
Describe a local telco system	Describe an <b>ILEC</b> (incumbent local exchange carrier)	Describe external network telco providers	Describe the connection points of outside telco networks to the local telco system	Know the telecommunication owners and operators in a service area
Describe the services provided by a telecommunication owner/operator	Describe the telecommunication system model	Describe the telecommunication network model	Describe repurposed legacy infrastructure in the telecommunication system model	Describe abandoned or discontinued legacy infrastructure in the telecommunication system model
Describe rural telecommunication systems	Describe urban telecommunication systems	Describe metro telecommunication systems	Describe the composition of different types of telecommunication cables	Describe the composition of conductive cable
Describe the composition of non-conductive cable	Explain tracer wire, its application, and common configurations and locations	Describe common telco cable functions	Describe various telco cable configurations	Describe construction practices for telecommunication facilities
Describe copper-pair wires	Describe copper-pair wire cables	Describe POTS (plain old telephone service)	Describe coaxial cable	Describe fibre-optic cable
Describe various cable connections	Describe various cable splices	Describe various cable switches...	Describe various cable amplifiers	Describe signal enhancement devices
Describe above-ground (suspended / overhead) cable	Describe underground cable	Describe telco construction practices	Describe trenchless cable installation practices	Describe bell holes
Explain a central office	Explain pedestals and cabinets	Explain two party pedestals	Explain three party pedestals	Explain multi-access housing (MAH)
Describe where three party pedestals are typically found	Describe where two party pedestals are typically found	Describe where pedestals and cabinets are typically found	Describe where multi-access housing is typically found	Describe where network interface devices are typically found
Describe a punch-down block	Describe a service drop	Describe a NID (network interface device)	Explain a multi-party trench	Describe signal application access points
Describe an MDU (multi-dwelling unit) telecommunication service	Describe a primary telecommunication service	Describe a secondary (private) telecommunication service	Describe future cable	Describe dead-end cable
Describe telecommunication ancillary facilities	Describe types of telephone equipment	Explain maintaining a safe distance	Describe bonding grounding straps, bars	Describe bonding grounding cable sheaths
Describe vaults, manholes, hand holes	Describe duct banks	Describe CATV systems	Describe fibre-optic systems	Explain signal application access points for telecommunication systems
Describe telecommunication manhole access	Describe FTTC (fibre to the curb) service	Describe FTTH (fibre to the home) service	Describe fibre-optic backbone cables	Describe CATV central office
Describe "tree-and-branch" system configuration	Describe CATV bridging amp	Describe CATV splitter	Describe CATV tap	Describe unregistered telecommunication facilities
Describe privately-owned/operated telecommunication systems				

## Telecommunications & CATV

2.0

### General Locating Skills

Demonstrate the ability to recognize the users of telecommunications	Demonstrate the ability to recognize telecommunication systems	Demonstrate the ability to recognize telecommunications networks	Demonstrate the ability to recognize a local telco system	Demonstrate the ability to recognize an ILEC (incumbent local exchange carrier)
Demonstrate the ability to recognize external network telco providers	Demonstrate the ability to identify connection points of outside telco networks to the local telco system	Demonstrate the ability to identify telecommunication owners and operators in a service area	Demonstrate the ability to identify services provided by a telecommunication owner/operator	Demonstrate the ability to identify the telecommunication system model
Demonstrate the ability to identify the telecommunication network model	Demonstrate the ability to identify repurposed legacy infrastructure in the telecommunication system model	Demonstrate the ability to identify abandoned or discontinued legacy infrastructure in the telecommunication system model	Demonstrate the ability to identify rural telecommunication systems	Demonstrate the ability to identify urban telecommunication systems
Demonstrate the ability to identify metro telecommunication systems	Demonstrate the ability to identify the composition of different types of telecommunication cables	Demonstrate the ability to recognize the composition of conductive cable	Demonstrate the ability to recognize the composition of non-conductive cable	Demonstrate the ability to identify tracer wire, its application, and common configurations and locations
Demonstrate the ability to recognize common telco cable functions	Demonstrate the ability to identify various telco cable configurations	Demonstrate the ability to recognize construction practices for telecommunication facilities	Demonstrate the ability to identify copper-pair wires	Demonstrate the ability to identify copper-pair wire group cables
Demonstrate the ability to identify POTS (plain old telephone service)	Demonstrate the ability to identify coaxial cable	Demonstrate the ability to identify fibre-optic cable	Demonstrate the ability to identify various cable connections	Demonstrate the ability to identify various cable splices
Demonstrate the ability to identify various cable switches...	Demonstrate the ability to identify cable amplifiers	Demonstrate the ability to identify signal enhancement devices	Demonstrate the ability to identify above-ground (suspended / overhead) cable	Demonstrate the ability to identify underground cable
Demonstrate the ability to recognize telco construction practices	Demonstrate the ability to recognize trenchless cable installation practices	Demonstrate the ability to recognize bell holes	Demonstrate the ability to identify a central office	Demonstrate the ability to identify pedestals and cabinets
Demonstrate the ability to identify two party pedestals	Demonstrate the ability to identify three party pedestals	Demonstrate the ability to identify multi-access housing (MAH)	Demonstrate the ability to identify where three party pedestals are typically found	Demonstrate the ability to identify where two party pedestals are typically found
Demonstrate the ability to identify where pedestals and cabinets are typically found	Demonstrate the ability to identify where DLCs are typically found	Demonstrate the ability to identify where multi-access housing is typically found	Demonstrate the ability to identify where network interface devices are typically found	Demonstrate the ability to identify a service drop
Demonstrate the ability to identify a NID (network interface device)	Demonstrate the ability to identify a multi-party trench	Demonstrate the ability to identify signal application access points	Demonstrate the ability to identify an MDU (multi-dwelling unit) telecommunication service	Demonstrate the ability to identify a primary telecommunication service
Demonstrate the ability to identify a secondary (private) telecommunication service	Demonstrate the ability to identify future cable	Demonstrate the ability to identify dead-end cable	Demonstrate the ability to identify telecommunication ancillary facilities	Demonstrate the ability to identify types of telephone equipment



## Telecommunications & CATV

3.0

### Information Source Knowledge

Demonstrate the ability to maintain a safe distance from electrical hazards	Demonstrate the ability to identify bonding grounding straps, bars	Demonstrate the ability to identify bonding grounding cable sheaths	Demonstrate the ability to identify vaults, manholes, hand holes	Demonstrate the ability to identify duct banks
Demonstrate the ability to identify CATV systems	Demonstrate the ability to identify fibre-optic systems	Demonstrate the ability to identify signal application access points for telecommunication systems	Demonstrate the ability to safely access a telecommunication manhole	Demonstrate the ability to identify and utilize a punch-down block
Demonstrate the ability to identify FTTC (fibre to the curb) services	Demonstrate the ability to identify FTTH (fibre to the home) services	Demonstrate the ability to identify fibre-optic backbone cables	Demonstrate the ability to identify a CATV central office	Demonstrate the ability to identify "tree-and-branch" system configuration
Demonstrate the ability to identify a CATV bridging amp	Demonstrate the ability to identify a CATV splitter	Demonstrate the ability to identify a CATV tap	Demonstrate the ability to identify unregistered telecommunication facilities	Demonstrate the ability to identify privately-owned/operated telecommunication systems
Explain where to obtain various types of records	Explain map sources	Explain telecommunication owner / operator records	Explain ILEC records	Explain survey plans
Explain third party database	Explain as-builts drawings	Explain provincial regulatory boards / agencies / commission plans	Explain land titles records	Explain oil and gas owner / operator records
Describe the importance of obtaining information from landowners regarding facilities on their property	Explain GIS maps	Explain aerial / satellite photographs	Explain Google Maps/Google Earth	Explain importance of interviewing facility / field personnel
Explain engineer plot plans	Explain locator company drawings	Explain importance of interviewing land owners	Explain use of one call system information	Explain municipal / county maps
Explain topographical maps	Explain site photographs	Explain training in reading and utilizing information source records	Explain other utility owner / operator records	Explain internet-accessed mapping and photographs
Explain telecommunications owner / operator (ILEC) records	Explain where ILEC records can be obtained	Explain the critical importance of utilizing ILEC records	Explain how to interpret information contained in an ILEC record (e.g., legends and symbols)	Explain the formats that ILEC records are found (e.g., hardcopy, digital)
Explain the purpose and use of ILEC index records	Explain how to identify telco systems on ILEC records	Explain how to identify above ground structures (e.g., office, pedestals, cabinets, housings, overhead cables, etc.) found on ILEC records	Explain how to identify buried telco infrastructure (handholes, manholes, vaults, etc.) found on ILEC records	Explain how to identify telco system components found on ILEC records
Explain how to identify various telco infrastructure configurations found on ILEC records	Explain how to identify different functions of telco cables found on ILEC records	Explain how to identify the function and pair-count of lines found on ILEC records	Explain how to identify the status of lines found on ILEC records	Explain how to identify the approximate alignment of lines found on an ILEC record
Explain how to identify access points on ILEC records	Explain how to identify crossings (foreign, road, etc.) found on ILEC records	Explain how to identify splice points found on ILEC records	Explain how to identify a change in cable type found on ILEC records	Explain how to identify a change in cable pair-count found on ILEC records

## Telecommunications & CATV

Explain how to identify a digital/analog format change on ILEC records	Explain how to identify property owner, property line, and property descriptions found on ILEC records	Explain how to identify construction practices for telco facilities on ILEC records	Explain how to identify a multi-party trench on ILEC records	Explain how to identify trenchless cable installation on ILEC records
Explain how to identify the types of connection or services (e.g., copper/fibre, analog/digital, etc.) on ILEC records	Explain how to identify a central office (CO) on ILEC records	Explain how to identify digital loop carriers (DLC) on ILEC records	Explain how to identify duct banks on ILEC records	Explain how to identify conduits on ILEC records
Explain how to identify T1 cables on ILEC records	Explain how to identify trunk cables on ILEC records	Explain how to identify toll cables on ILEC records	Explain how to identify F1 Feeder cables on ILEC records	Explain how to identify F2 distribution cables on ILEC records
Explain how to identify a Feeder Distribution Interface on ILEC records	Explain how to identify a local loop on ILEC records	Explain how to identify service (drop) cables on ILEC records	Explain how to identify optical network units (ONU) on ILEC records	Explain how to identify optical network terminals (ONT) on ILEC records
Explain how to identify temporary surface cables on ILEC records	Explain how to identify radio transceivers on ILEC records	Explain how to identify cell phone towers on ILEC records	Explain how to identify a SONET (synchronous optical network) on ILEC records	Explain how to identify SONET multiplexers on ILEC records
Explain how to identify a cross-connect box on ILEC records	Explain how to identify repeaters on ILEC records	Explain how to identify load coils on ILEC records	Explain how to identify splice cabinets on ILEC records	Explain how to identify distribution terminals on ILEC records
Explain how to identify an NID on ILEC records	Explain how to identify multiple access housings on ILEC records	Explain how to identify two-party pedestals on ILEC records	Explain how to identify three-party pedestals on ILEC records	Explain how to identify a FOSC (fibre-optic splice enclosure) on ILEC records
Explain how to identify fibre-optic backbone cables on records	Explain how to identify a CATV central office on owner/operator records	Explain how to identify "tree-and-branch" system configuration on owner/operator records	Explain how to identify CATV bridging amps on owner/operator records	Explain how to identify CATV splitters on owner/operator records
Explain how to identify CATV taps on owner/operator records	Explain how to identify unregistered telecommunications facilities on owner/operator records	Explain how to identify gas distribution ancillary facilities (electrical, fuel gas) on telco records	Explain how to identify and utilize casings on telco records	Explain where to anticipate, based on telco records, where tracer wires may be found
Explain how to identify buried facilities in public right of way on ILEC records	Explain how to identify easements on ILEC records	Explain how to identify a right of way on ILEC records	Explain how to identify an MDU (multi-dwelling unit) service on telco records	Explain how to identify a commercial service on telco records
Explain how to identify an industrial service on telco records	Explain how to identify a primary telecommunications service on telco records	Explain how to identify a secondary (private) telecommunications service on telco records	Explain how to identify future cable on telco records	Explain how to identify dead-end pipe on telco records
Explain how to identify abbreviations and symbols on ILEC records	Explain how to identify bell hole construction on telco records	Explain map sources	Explain where to obtain various kinds of records	Explain other utility owner / operator records

## Telecommunications & CATV

4.0

### Information Source Skills

Explain schematic representation (approximate relative alignment)	Explain the importance of spatially accurate representation	Explain the importance of recorded distances between cables and from boundaries and property lines, etc.		
Demonstrate where to obtain various types of records	Demonstrate ability to utilize telecommunication owner / operator records	Demonstrate ability to utilize ILEC records	Demonstrate ability to utilize survey plans	Demonstrate ability to utilize third party database records
Demonstrate ability to utilize as-built drawings	Demonstrate ability to utilize provincial regulatory boards / agencies / commission plans	Demonstrate ability to utilize land titles records	Demonstrate ability to utilize oil and gas owner / operator records	Demonstrate ability to utilize landowner records
Demonstrate ability to utilize GIS maps	Demonstrate ability to utilize aerial / satellite photographs	Demonstrate ability to utilize Google Maps/Google Earth	Demonstrate ability to conduct interviews with facility / field personnel	Demonstrate ability to utilize engineer plot plans
Demonstrate ability to utilize locator drawings	Demonstrate ability to conduct interviews with land owners	Demonstrate use of one call system information	Demonstrate ability to utilize municipal / county maps	Demonstrate ability to utilize topographical maps
Demonstrate ability to utilize site photographs	Complete training in reading and utilizing information source records	Demonstrate the ability to utilize other utility owner / operator records	Demonstrate the ability to utilize internet-accessed mapping and photographs	Demonstrate the ability to access ILEC records
Demonstrate the ability to utilize ILEC records	Demonstrate the ability to interpret ILEC records (e.g., legends and symbols)	Demonstrate the ability to identify and utilize various formats of ILEC records (e.g., hardcopy, digital)	Demonstrate the ability to utilize ILEC index records	Demonstrate the ability to identify telco systems on ILEC records
Demonstrate ability to identify above ground structures (e.g., office, pedestals, cabinets, housings overhead cables, etc.) found on ILEC records	Demonstrate the ability to identify buried telco infrastructure (handholes, manholes, vaults, etc.) found on ILEC records	Demonstrate the ability to identify telco system components on ILEC records	Demonstrate the ability to identify various telco configurations found on ILEC records	Demonstrate the ability to identify the different functions of telco cables found on ILEC records
Demonstrate the ability to identify the function and pair-count of lines found on ILEC records	Demonstrate the ability to identify the composition and size of lines found on ILEC records	Demonstrate the ability to identify the status of lines found on ILEC records	Demonstrate the ability to identify the approximate alignment of lines found on ILEC records	Demonstrate the ability to identify access points found on ILEC records
Demonstrate the ability to identify crossings (foreign, road, etc.) found on ILEC records	Demonstrate the ability to identify splice points found on ILEC records	Demonstrate the ability to identify a change in cable type found on ILEC records	Demonstrate the ability to identify a change in cable pair-count found on ILEC records	Demonstrate the ability to identify a digital/analog format change on ILEC records
Demonstrate the ability to identify property owner, property line, and property descriptions found on ILEC records	Demonstrate the ability to identify construction practices for telco facilities on ILEC records	Demonstrate the ability to identify a multi-party trench found on ILEC records	Demonstrate the ability to identify trenchless cable installation on ILEC records	Demonstrate the ability to identify the types of connection or services (e.g., copper/fibre, analog/digital, etc.) on ILEC records
Demonstrate the ability to identify a central office (CO) on ILEC records	Demonstrate the ability to identify digital loop carriers (DLC) on ILEC records	Demonstrate the ability to identify duct banks on ILEC records	Demonstrate the ability to identify conduits on ILEC records	Demonstrate the ability to identify T1 cables on ILEC records



## Telecommunications & CATV

	Demonstrate the ability to identify trunk cables on ILEC records	Demonstrate the ability to identify toll cables on ILEC records	Demonstrate the ability to identify F1 Feeder cables on ILEC records	Demonstrate the ability to identify F2 distribution cables on ILEC records	Demonstrate the ability to identify a Feeder Distribution Interface on ILEC records
	Demonstrate the ability to identify a local loop on ILEC records	Demonstrate the ability to identify service (drop) cables on ILEC records	Demonstrate the ability to identify optical network units (ONU) on ILEC records	Demonstrate the ability to identify optical network terminals (ONT) on ILEC records	Demonstrate the ability to identify temporary surface cables on ILEC records
	Demonstrate the ability to identify radio transceivers on ILEC records	Demonstrate the ability to identify cell phone towers on ILEC records	Demonstrate the ability to identify a SONET (synchronous optical network) on ILEC records	Demonstrate the ability to identify SONET multiplexers on ILEC records	Demonstrate the ability to identify a cross-connect box on ILEC records
	Demonstrate the ability to identify repeaters on ILEC records	Demonstrate the ability to identify load coils on ILEC records	Demonstrate the ability to identify splice cabinets on ILEC records	Demonstrate the ability to identify distribution terminals on ILEC records	Demonstrate the ability to identify an NID on ILEC records
	Demonstrate the ability to identify multiple access housings on ILEC records	Demonstrate the ability to identify two-party pedestals on ILEC records	Demonstrate the ability to identify three-party pedestals on ILEC records	Demonstrate the ability to identify a FOSC (fibre-optic splice enclosure) on ILEC records	Demonstrate the ability to identify fibre-optic backbone cables on records
	Demonstrate the ability to identify a CATV central office on owner/operator records	Demonstrate the ability to identify "tree-and-branch" system configuration on owner/operator records	Demonstrate the ability to identify CATV bridging amps on owner/operator records	Demonstrate the ability to identify CATV splitters on owner/operator records	Demonstrate the ability to identify CATV taps on owner/operator records
	Demonstrate the ability to identify unregistered telecommunications facilities on owner/operator records	Demonstrate the ability to identify gas distribution ancillary facilities (electrical, fuel gas) on telco records	Demonstrate the ability to identify and utilize casings on telco records	Demonstrate the ability to anticipate, based on telco records, where tracer wires may be found	Demonstrate the ability to identify buried facilities in public right of way on ILEC records
	Demonstrate the ability to identify easements on ILEC records	Demonstrate the ability to identify a right of way on ILEC records	Demonstrate the ability to identify an MDU (multi-dwelling unit) service on telco records	Demonstrate the ability to identify a commercial service on telco records	Demonstrate the ability to identify an industrial service on telco records
	Demonstrate the ability to identify a primary telecommunications service on telco records	Demonstrate the ability to identify a secondary (private) telecommunications service on telco records	Demonstrate the ability to identify future cable on telco records	Demonstrate the ability to identify dead-end pipe on telco records	Demonstrate the ability to identify abbreviations and symbols on ILEC records
	Demonstrate the ability to identify bell hole construction on telco records	Demonstrate the ability to identify and access map sources	Demonstrate the ability to obtain various kinds of records	Demonstrate the ability to identify and obtain other utility owner / operator records	Demonstrate the ability to interpret schematic representation (approximate relative alignment)
	Demonstrate the ability to interpret spatially accurate representation	Demonstrate the ability to interpret recorded distances between pipes and from boundaries and property lines, etc.			
5.0	Telco Locating Documentation and Communication Knowledge	Describe owner/operator notification procedures	Describe procedures to contact ILEC owner/operators	Explain the locate request communication process	Describe hazard assessment, controls, and ERP records
					Describe locate sketch requirements

Telecommunications & CATV					
		Describe a stake-out report / facility location request	Describe a job completion checklist	Describe a ground disturbance package	Describe a crossing report
6.0	Telco Locating Documentation and Communication Skills	Demonstrate the ability to follow client notification procedures	Demonstrate the ability to contact ILEC owner/operators	Demonstrate the ability to follow the locate request communication process	Demonstrate the ability to document and communicate hazard assessment, controls, and ERP records
		Demonstrate the ability to utilize and complete a stake-out report / facility location request	Demonstrate the ability to utilize and complete a ground disturbance package	Demonstrate the ability to utilize and complete a job completion checklist	Demonstrate the ability to document and communicate a backfill report
7.0	Telco Locator Safety Knowledge	Describe corporate safety responsibilities	Describe employee safety responsibilities	Explain the facility owner / operator occupational health, safety, and environment (OHS&E) policy	Explain the importance of hazardous gas detection training
		Explain the importance of fire safety training	Explain the importance of electrical safety training	Explain the importance of confined space safety training	Explain the importance of emergency response training
		Explain the importance of owner-specific safety orientation	Explain the importance of site-specific safety orientation	Describe the importance and use of PPE (personal protective equipment)	Explain importance and operation of a four-way gas monitor
		Describe the purpose and content of tailgate safety meetings	Describe on-street locating safety procedures	Describe managing and channelling traffic	Describe manhole safety procedures
		Describe vault safety procedures	Describe ventilation procedures	Describe safety watch	Describe self-contained breathing apparatus (SCBA)
		Describe maintaining a safe distance from overhead electrical lines	Describe safe digging ground disturbance and damage prevention	Describe the steps of proper safe digging	Describe the job completion checklist (JCC) process
		Describe sources / types of electric power injuries	Describe causes of electrical power injuries		
8.0	Telco Locator Safety Skills	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 occupational health, safety, and environment (OHS&E) policy	Complete and demonstrate ability to apply hazardous gas detection training
		Complete and demonstrate ability to apply fire safety training	Complete and demonstrate ability to apply electrical safety training	Complete and demonstrate ability to apply confined space safety training	Demonstrate the ability to determine and follow required emergency response processes
		Demonstrate the ability to follow owner-specific safety orientation requirements	Demonstrate the ability to follow site-specific safety orientation requirements	Demonstrate the ability to determine and utilize required PPE (personal protective equipment)	Demonstrate the ability to operate a four-way gas monitor

## Underground Facility Locator Competency Profile



### Telecommunications & CATV

9.0

#### Visual Inspection Knowledge

Demonstrate the ability to conduct/attend and follow requirements of tailgate safety meetings	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 follow ventilation procedures	Demonstrate the ability to follow safety watch procedures	Demonstrate the ability to utilize self-contained breathing apparatus (SCBA)	Demonstrate the ability to follow working alone procedures
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	Demonstrate the ability to utilize, document, and communicate the job completion checklist (JCC)
Demonstrate the ability to participate in the safety / environmental incident investigation process	Demonstrate the ability to identify sources / types of electric power injuries	Demonstrate the ability to recognize and mitigate electric power hazards		
Explain the primary reason for performing a visual inspection	Describe the importance of using (ILEC) records during the visual inspection	Describe how to utilize abbreviations and symbols as found on ILEC records during the visual inspection	Describe visual signs that might indicate the presence of buried facilities	Describe how to recognize areas of previous ground disturbance
Describe how to recognize trench or excavation scars	Describe how to recognize potential hazards	Describe warning signs used for telecommunications facilities	Describe information found on warning signs	Describe where warning signs are typically located
Describe benefits of warning signs	Describe safety labels and signs used for buried telecommunications facilities	Describe information found on safety labels signs	Describe where safety labels and signs are typically located	Describe benefits of safety labels and signs
Describe identification labels and tags used for buried telecommunications facilities	Describe information found on identification labels and tags	Describe where identification labels and tags are typically located	Describe benefits of identification labels and tags	Describe how to identify signal application points as found on ILEC records
Describe how to recognize telecommunications systems as found on (ILEC) records	Describe how to identify above ground structures (e.g., office, pedestals, cabinets, housings, overhead cables, etc.) as found on ILEC records	Describe how to identify buried telco infrastructure (handholes, manholes, vaults, etc.) as found on ILEC records	Describe how to identify telco system components as found on ILEC records	Describe how to identify various telco infrastructure configurations as found on ILEC records
Describe how to identify different functions of telco cables as found on ILEC records	Know how to identify the function and pair-count of lines as found on ILEC records	Know the status of telco lines as found on ILEC records	Describe how to identify the approximate alignment of lines as found on ILEC records	Describe how to identify access points as found on ILEC records
Describe how to identify crossings (foreign, road, etc.) as found on ILEC records	Describe how to identify splice points as found on ILEC records	Describe how to identify a change in cable type as found on ILEC records	Describe how to identify a change in cable pair-count as found on ILEC records	Describe how to identify a digital/analog change as found on ILEC records

## Telecommunications & CATV

Describe how to identify property owner, property line, and property descriptions as found on ILEC records	Describe how to identify construction practices for telco facilities as found on ILEC records	Describe how to identify a multi-party trench as found on ILEC records	Describe how to identify trenchless cable installation as found on ILEC records	Describe how to identify bell hole construction as found on ILEC records
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Describe how to identify T1 cables as found on ILEC records	Describe how to identify trunk cables as found on ILEC records	Describe how to identify toll cables as found on ILEC records	Describe how to identify F1 Feeder cables as found on ILEC records	Describe how to identify F2 distribution cables as found on ILEC records
Describe how to identify a Feeder Distribution Interface as found on ILEC records	Describe how to identify a local loop as found on ILEC records	Describe how to identify service (drop) cables as found on ILEC records	Describe how to identify optical network units (ONU) as found on ILEC records	Describe how to identify optical network terminals (ONT) as found on ILEC records
Describe how to identify temporary surface cables as found on ILEC records	Describe how to identify radio transceivers as found on ILEC records	Describe how to identify cell phone towers as found on ILEC records	Describe how to identify a SONET (synchronous optical network) as found on ILEC records	Describe how to identify SONET multiplexers as found on ILEC records
Describe how to identify a cross-connect box as found on ILEC records	Describe how to identify repeaters as found on ILEC records	Describe how to identify load coils as found on ILEC records	Describe how to identify splice cabinets as found on ILEC records	Describe how to identify distribution terminals as found on ILEC records
Describe how to identify an NID as found on ILEC records	Describe how to identify multiple access housings as found on ILEC records	Describe how to identify two-party pedestals as found on ILEC records	Describe how to identify three-party pedestals as found on ILEC records	Describe how to identify a FOSC (fibre-optic splice enclosure) as found on ILEC records
Describe how to identify fibre-optic backbone cables on records	Describe how to identify a CATV central office on owner/operator records	Describe how to identify "tree-and-branch" system configuration on owner/operator records	Describe how to identify CATV bridging amps on owner/operator records	Describe how to identify CATV splitters on owner/operator records
Describe how to identify CATV taps on owner/operator records	Describe how to identify unregistered telecommunications facilities on owner/operator records	Describe how to identify gas distribution ancillary facilities (electrical, fuel gas) on telco records	Describe how to identify and utilize casings on telco records	Describe how to anticipate, based on telco records, where tracer wires may be found
Describe how to identify buried facilities in public right of way as found on ILEC records	Describe how to identify easements as found on ILEC records	Describe how to identify a right of way as found on ILEC records	Describe how to identify an MDU (multi-dwelling unit) service as found on ILEC records	Describe how to identify a commercial service as found on ILEC records
Describe how to identify an industrial service as found on ILEC records	Describe how to identify a primary telecommunications service as found on ILEC records	Describe how to identify a secondary (private) telecommunications service as found on ILEC records	Describe how to identify future cable as found on ILEC records	Describe how to identify dead-end cable as found on ILEC records
Describe how to identify bell hole sites as found on ILEC records	Describe how to identify infrastructure and features as found on various kinds of records	Describe how to identify infrastructure and features as found on other utility owner / operator records	Describe how to apply the interpretation of schematic representation during the visual inspection	Describe how to apply the interpret spatially accurate representation during the visual inspection

## Telecommunications & CATV

10.0

### Visual Inspection Skills

Describe how to visually verify recorded distances between cables and boundaries and property lines	Describe how to identify infrastructure and features as found on survey plans	Describe how to identify infrastructure and features as found on third party database records	Describe how to identify infrastructure and features as found on as-builts drawings	Describe how to identify infrastructure and features as found on provincial regulatory boards / agencies / commission plans
Describe how to identify infrastructure and features as found on land titles records	Describe how to identify infrastructure and features as found on topographical maps	Describe how to utilize landowner information during the visual inspection	Describe the importance of obtaining landowner assistance and information during the visual inspection	Describe how to identify infrastructure and features as found on GIS maps
Describe how to identify infrastructure and features as found on aerial / satellite photographs	Describe how to identify infrastructure and features as found on site photographs	Describe how to identify infrastructure and features as found on internet-accessed mapping and photographs	Describe how to perform visual inspections with facility / field personnel	Describe how to identify infrastructure and features as found on one call system information
Describe how to identify infrastructure and features as found on municipal / county maps	Describe how to identify infrastructure and features as found on engineer plot plans	Describe how to identify infrastructure and features as found on locator company drawings	Describe how to identify infrastructure and features found on previous stake-out reports	Describe how to identify infrastructure and features recorded in a ground disturbance package
Describe how to identify infrastructure as required by a current facility location request	Describe the importance of documenting the visual inspection in a job completion checklist	Describe how to identify infrastructure and features found on previous crossing report	Describe how to recognize obstacles to locating accuracy	Describe how to recognize changes in facilities
Describe how to recognize extreme environments	Describe how to recognize disruptive noises	Describe how to recognize inaccurate records	Describe how to recognize sources of unwanted coupling	Describe how to anticipate a possible location of a sharp drop in signal
Describe how to anticipate a possible location of a complete loss of signal	Describe how to anticipate a possible problem with tracer wire	Describe how to anticipate a possible location of changes in depth	Describe how to anticipate the possible location of buried cable splices	Describe how to anticipate possible areas of common-bonded facilities
Describe how to anticipate possible short facilities	Describe how to anticipate possible non-grounded facilities	Describe how to anticipate possible areas of facilities that are closer than normal	Describe how to anticipate possible areas where facilities are congested	Describe facility access obstacles and how to overcome them
Describe the importance of utilizing records during the visual inspection	Explain how to anticipate and determine unrecorded facilities	Describe the process of documenting and forwarding updated records to the facility owner/operator	Explain how to anticipate and determine abandoned or discontinued facilities	Explain how to anticipate and determine company mergers and name changes
Explain how to anticipate and determine unregistered facilities	Explain how to anticipate and determine privately-owned facilities	Explain how to anticipate and determine ancillary facilities	Explain how to identify the origin/destination points of lines as found on ILEC records	
Demonstrate ability to utilize ILEC records during the visual inspection	Demonstrate the ability to identify abbreviations and symbols as found on ILEC records	Demonstrate ability to recognize visual signs that indicate the presence of buried facilities	Demonstrate ability to match records with site facilities	Demonstrate ability to recognize types, materials and sizes of buried telecommunication facilities
Demonstrate the ability to recognize areas of previous ground disturbance	Demonstrate the ability to recognize trench or excavation scars	Demonstrate ability to identify plant features	Demonstrate the ability to recognize potential hazards	Demonstrate the ability to recognize and interpret warning signs



## Telecommunications & CATV

Demonstrate the ability to recognize and interpret safety labels and signs	Demonstrate the ability to recognize and interpret identification labels and tags	Demonstrate ability to recognize signal application access points as found on ILEC records	Demonstrate ability to recognize telco systems as found on ILEC records	Demonstrate ability to identify above ground structures (e.g., office, pedestals, cabinets, housings, overhead cables, etc.) as found on ILEC records
Demonstrate the ability to identify buried telco infrastructure as found on ILEC records	Demonstrate the ability to identify telco system components as found on ILEC records	Demonstrate the ability to identify various telco infrastructure configurations as found on ILEC records	Demonstrate the ability to identify different types of telco cables as found on ILEC records	Demonstrate the ability to identify the pair-count of lines as found on ILEC records
Demonstrate the ability to identify the origin/destination points of lines as found on ILEC records	Demonstrate the ability to identify signal application points as found on ILEC records	Demonstrate the ability to identify the status of telco lines as found on ILEC records	Demonstrate the ability to identify the approximate alignment of lines as found on ILEC records	Demonstrate the ability to identify crossings (foreign, road, etc.) as found on ILEC records
Demonstrate the ability to identify splice points as found on ILEC records	Demonstrate the ability to identify a change in cable type as found on ILEC records	Demonstrate the ability to identify a change in cable pair-count as found on ILEC records	Demonstrate the ability to identify a digital/analog change as found on ILEC records	Demonstrate the ability to identify property owner, property line, and property descriptions as found on ILEC records
Demonstrate the ability to identify construction practices for telco as found on ILEC records	Demonstrate the ability to identify a multi-party trench as found on ILEC records	Demonstrate the ability to identify trenchless cable installation as found on ILEC records	Demonstrate the ability to identify bell hole construction as found on ILEC records	Demonstrate the ability to identify the types of connection or services (e.g., copper/fibre, analog/digital etc.) as found on ILEC records
Demonstrate the ability to identify a central office (CO) as found on ILEC records	Demonstrate the ability to identify digital loop carriers (DLC) as found on ILEC records	Demonstrate the ability to identify duct banks as found on ILEC records	Demonstrate the ability to identify conduits as found on ILEC records	Demonstrate the ability to identify T1 cables as found on ILEC records
Demonstrate the ability to identify trunk cables as found on ILEC records	Demonstrate the ability to identify toll cables as found on ILEC records	Demonstrate the ability to identify F1 Feeder cables as found on ILEC records	Demonstrate the ability to identify F2 distribution cables as found on ILEC records	Demonstrate the ability to identify a Feeder Distribution Interface as found on ILEC records
Demonstrate the ability to identify a local loop as found on ILEC records	Demonstrate the ability to identify service (drop) cables as found on ILEC records	Demonstrate the ability to identify optical network units (ONU) as found on ILEC records	Demonstrate the ability to identify optical network terminals (ONT) as found on ILEC records	Demonstrate the ability to identify temporary surface cables as found on ILEC records
Demonstrate the ability to identify radio transceivers as found on ILEC records	Demonstrate the ability to identify cell phone towers as found on ILEC records	Demonstrate the ability to identify a SONET (synchronous optical network) as found on ILEC records	Demonstrate the ability to identify SONET multiplexers as found on ILEC records	Demonstrate the ability to identify a cross-connect box as found on ILEC records
Demonstrate the ability to identify repeaters as found on ILEC records	Demonstrate the ability to identify load coils as found on ILEC records	Demonstrate the ability to identify splice cabinets as found on ILEC records	Demonstrate the ability to identify distribution terminals as found on ILEC records	Demonstrate the ability to identify an NID as found on ILEC records
Demonstrate the ability to identify multiple access housings as found on ILEC records	Demonstrate the ability to identify two-party pedestals as found on ILEC records	Demonstrate the ability to identify three-party pedestals as found on ILEC records	Demonstrate the ability to identify a FOSC (fibre-optic splice enclosure) as found on ILEC records	Demonstrate the ability to identify fibre-optic backbone cables on records

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Demonstrate the ability to identify a CATV central office on owner/operator records	Demonstrate the ability to identify "tree-and-branch" system configuration on owner/operator records	Demonstrate the ability to identify CATV bridging amps on owner/operator records	Demonstrate the ability to identify CATV splitters on owner/operator records	Demonstrate the ability to identify CATV taps on owner/operator records
Demonstrate the ability to identify unregistered telecommunications facilities on owner/operator records	Demonstrate the ability to identify gas distribution ancillary facilities (electrical, fuel gas) on telco records	Demonstrate the ability to identify and utilize casings on telco records	Demonstrate the ability to anticipate, based on telco records, where tracer wires may be found	Demonstrate the ability to identify easements as found on ILEC records
Demonstrate the ability to identify a right of way as found on ILEC records	Demonstrate the ability to identify buried facilities in a public right of way as found on ILEC records	Demonstrate the ability to identify a multiple-dwelling unit (MDU) telco service as found on ILEC records	Demonstrate the ability to identify a commercial telco service as found on ILEC records	Demonstrate the ability to identify an industrial telco service as found on ILEC records
Demonstrate the ability to identify a primary telco service as found on ILEC records	Demonstrate the ability to identify a secondary (private) telco service as found on ILEC records	Demonstrate the ability to identify future cable as found on ILEC records	Demonstrate the ability to identify dead-end cable as found on ILEC records	Demonstrate ability to identify bell hole sites as found on ILEC records
Demonstrate the ability to identify infrastructure and features as found on other utility owner / operator records	Demonstrate the ability to interpret schematic representation during the visual inspection	Demonstrate the ability to interpret spatially accurate representation during the visual inspection	Demonstrate the ability to recognize distances between cables and boundaries and property lines	Demonstrate ability to identify infrastructure and features as found on survey plans
Demonstrate ability to identify infrastructure and features as found on third party database records	Demonstrate ability to identify infrastructure and features as found on as-builts drawings	Demonstrate ability to identify features as found on provincial regulatory boards / agencies / commission plans	Demonstrate ability to identify infrastructure and features as found on land titles records	Demonstrate ability to identify infrastructure and features as found on topographical maps
Demonstrate ability to obtain information from landowners regarding facilities on their property	Demonstrate ability to identify infrastructure and features as found on GIS maps	Demonstrate ability to identify infrastructure and features as found on aerial / satellite photographs	Demonstrate ability to identify infrastructure and features as found on site photographs	Demonstrate ability to identify infrastructure and features as found on internet-accessed mapping and photographs
Demonstrate ability to perform visual inspections with facility / field personnel	Demonstrate ability to identify infrastructure and features as found on one call system information	Demonstrate ability to identify infrastructure and features as found on municipal / county maps	Demonstrate ability to identify infrastructure and features found on previous backfill report	Demonstrate ability to identify infrastructure and features as found on engineer plot plans
Demonstrate ability to identify infrastructure and features as found on locator company drawings	Demonstrate ability to identify infrastructure and features found on previous stake-out reports	Demonstrate ability to identify infrastructure and features recorded in a ground disturbance package	Demonstrate ability to identify infrastructure as required by a current facility location request	Demonstrate the importance of documenting the visual inspection in a job completion checklist
Demonstrate ability to identify infrastructure and features found on previous crossing report	Demonstrate ability to recognize obstacles to locating accuracy	Demonstrate ability to recognize changes in facilities	Describe how to recognize technology limitations	Demonstrate ability to recognize extreme environments
Demonstrate ability to recognize disruptive noises	Demonstrate ability to recognize inaccurate records	Demonstrate ability to recognize sources of unwanted coupling	Demonstrate ability to recognize a possible location of a sharp drop in signal	Demonstrate ability to recognize a possible location of a complete loss of signal

## Telecommunications & CATV

11.0

### Locating Methods Knowledge

Demonstrate ability to anticipate and determine possible problems with tracer wire	Demonstrate ability to recognize a possible location of changes in depth	Demonstrate the ability to anticipate the possible location of buried cable splices	Demonstrate ability to recognize possible areas of common-bonded facilities	Demonstrate ability to recognize possible short facilities
Demonstrate ability to recognize non-grounded facilities	Demonstrate ability to recognize a possible area of facilities that are closer than normal	Demonstrate ability to recognize possible areas where facilities are congested	Demonstrate the ability to identify facility access obstacles and how to overcome them	Demonstrate ability to utilize records during the visual inspection
Demonstrate the ability to identify unrecorded facilities	Demonstrate the ability to document and forward updated records to the facility owner/operator	Demonstrate the ability to anticipate and determine abandoned or discontinued facilities	Demonstrate the ability to anticipate and determine company mergers and name changes	Demonstrate the ability to anticipate and determine unregistered facilities
Demonstrate the ability to anticipate and determine privately-owned facilities	Demonstrate the ability to anticipate and determine ancillary facilities			
Describe the procedures for locating from start to finish	Describe the procedures for the Direct Hook-up Method	Describe the procedures for the Inductive Clamp Method	Describe the procedures for the Inductive Method	Describe the procedures for the Parallel Line Check Method
Describe the procedures for the Inductive Sweeping Method	Describe the procedures for the Inducting 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) Mode	Describe the procedures for the Radio 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 electronic markers	Describe the procedures for locating remotely-applied EM signals	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	List the tools required to perform a generic direct hook-up signal application procedure	Describe safe procedures for grounding	Describe the general criteria for selecting an effective direct hook-up access point	Describe safe procedures for applying a signal using a direct hook-up
Describe the general criteria for selecting an effective direct hook-up grounding point	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 an extended or multi-point ground	Describe safe procedures for applying a direct hook-up to a conductive cable	Describe the appropriate procedures for connection at an access point	Explain proper procedure for direct hook-up method for pair cables	Describe the tools required to perform the direct hook-up method for pair cables
Describe safe procedures for applying a direct hook-up to a tracer wire	Describe safe procedures for applying a direct hook-up to a metal casing pipe	Describe safe procedures for applying a direct hook-up to a (safe) electrical cable	Describe safe procedures for applying a direct hook-up to a (safe) cathodic cable	Describe safe procedures for applying a direct hook-up to a (safe) control cable
Explain proper procedure for direct hook-up method for fibre optic cables	Describe the tools required to perform the direct hook-up method for fibre optic cables	Describe the tools required to perform the direct hook-up method for twisted-pair cables	Explain proper procedure for direct hook-up method for T1 repeater cables	Explain proper procedure for direct hook-up method for trunk cables
Explain proper procedure for direct hook-up method for toll cables	Explain proper procedure for direct hook-up method for F1 feeder cables	Explain proper procedure for direct hook-up method for F2 distribution cables	Explain proper procedure for direct hook-up method for two / three party pedestals	Describe the tools required to perform the direct hook-up method at a two / three party pedestal

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### Telecommunications & CATV

Describe the tools required to perform the direct hook-up method at handholes, manholes, and vaults	Explain proper procedure for direct hook-up method at hand holes, manholes, and vaults	Explain proper procedure for direct hook-up method at a central office	Explain proper procedure for direct hook-up method at digital loop carriers (DLC)	Explain proper procedure for direct hook-up method at a central office
Explain proper procedure for direct hook-up method at conduits	Explain proper procedure for direct hook-up method at a feeder distribution interface (FDI)	Explain proper procedure for direct hook-up method at a SONET multiplexer	Explain proper procedure for direct hook-up method at a cross-connect box	Explain proper procedure for direct hook-up method at optical network terminals or units
Explain proper procedure for direct hook-up method at repeaters	Explain proper procedure for direct hook-up method at splice cabinets	Explain proper procedure for direct hook-up method at distribution terminals	Explain proper procedure for direct hook-up method at a network interface device (NID)	Explain proper procedure for direct hook-up method at a FOSC
Describe the tools required to perform the direct hook-up method for CATV cables	Explain proper procedure for direct hook-up method for CATV cables	Explain proper procedure for direct hook-up method at CATV bridging amps	Explain proper procedure for direct hook-up method at CATV splitters	Explain proper procedure for direct hook-up method at CATV taps
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	Describe the safe procedures for applying a signal to a metal pipe with an inductive clamp	Describe the safe procedures for applying a signal to a tracer wire with an inductive clamp
Describe the safe procedures for applying a signal to a metal casing pipe with an inductive clamp	Describe the safe procedures for applying a signal to a metal conduit with an inductive clamp	Describe the safe procedures for applying a signal to a cathodic cable with an inductive clamp	Describe the safe procedures for applying a signal to an electrical cable with an inductive clamp	Describe the safe procedures for applying a signal to a communication cable with an inductive clamp
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 criteria for selecting an effective inductive signal application point for T1 cable	Describe the criteria for selecting an effective inductive signal application point for toll cable	Describe the criteria for selecting an effective inductive signal application point for trunk	Describe the criteria for selecting an effective inductive signal application point for F1 feeder cable	Describe the criteria for selecting an effective inductive signal application point for F2 distribution cable
Describe the criteria for selecting an effective inductive signal application point for service (drop) cable	Describe the criteria for selecting an effective inductive signal application point for fibre-optic 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
Explain how to verify locates of telco facilities within easements and ROWs	Describe the procedures for locating buried objects with a magnetic locator	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 procedures for locating a metal manhole cover with a magnetic locator
Describe the procedures for locating a metal hand-hole cover with a magnetic locator	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	

Telecommunications & CATV						
12.0	Locating Methods Skills	Demonstrate the procedures for locating from start to finish	Demonstrate the procedures for the Direct Hook-up Method	Demonstrate the procedures for the Inductive Clamp Method	Demonstrate the procedures for the Inductive Method	Demonstrate the procedures for the Parallel Line Check Method
		Demonstrate the procedures for the Inductive Sweeping Method	Demonstrate the procedures for the Inducting 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) Mode	Demonstrate the procedures for the Radio Mode	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 electronic markers	Demonstrate the procedures for locating remotely-applied EM signals	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 ability to select the tools required to perform a generic direct hook-up signal application procedure	Demonstrate safe procedures for grounding	Demonstrate the ability to select an effective direct hook-up access point	Demonstrate safe procedures for applying a signal using a direct hook-up
		Demonstrate the ability to select an effective direct hook-up grounding point	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 effective use of a ground rod and ground plate
		Demonstrate the effective use of an extended or multi-point ground	Demonstrate safe procedures for applying a direct hook-up to a conductive cable	Demonstrate the appropriate procedures for connection at an access point	Demonstrate proper procedure for direct hook-up method for pair cables	Demonstrate the ability to select the tools required to perform the direct hook-up method for pair cables
		Demonstrate safe procedures for applying a direct hook-up to a tracer wire	Demonstrate safe procedures for applying a direct hook-up to a metal casing pipe	Demonstrate safe procedures for applying a direct hook-up to a (safe) electrical cable	Demonstrate safe procedures for applying a direct hook-up to a (safe) cathodic cable	Demonstrate safe procedures for applying a direct hook-up to a (safe) control cable
		Demonstrate proper procedure for direct hook-up method for fibre optic cables	Demonstrate the ability to select the tools required to perform the direct hook-up method for fibre optic cables	Demonstrate the ability to select the tools required to perform the direct hook-up method for twisted-pair cables	Demonstrate proper procedure for direct hook-up method for T1 repeater cables	Demonstrate proper procedure for direct hook-up method for trunk cables
		Demonstrate proper procedure for direct hook-up method for toll cables	Demonstrate proper procedure for direct hook-up method for F1 feeder cables	Demonstrate proper procedure for direct hook-up method for F2 distribution cables	Demonstrate proper procedure for direct hook-up method for two / three party pedestals	Demonstrate the ability to select the tools required to perform the direct hook-up method at a two / three party pedestal
		Demonstrate the ability to select the tools required to perform the direct hook-up method at handholes, manholes, and vaults	Demonstrate proper procedure for direct hook-up method at hand holes, manholes, and vaults	Demonstrate proper procedure for direct hook-up method at a central office	Demonstrate proper procedure for direct hook-up method at digital loop carriers (DLC)	Demonstrate proper procedure for direct hook-up method at a central office
		Demonstrate proper procedure for direct hook-up method at conduits	Demonstrate proper procedure for direct hook-up method at a feeder distribution interface (FDI)	Demonstrate proper procedure for direct hook-up method at a SONET multiplexer	Demonstrate proper procedure for direct hook-up method at a cross-connect box	Demonstrate proper procedure for direct hook-up method at optical network terminals or units



## Telecommunications & CATV

	Demonstrate proper procedure for direct hook-up method at repeaters	Demonstrate proper procedure for direct hook-up method at splice cabinets	Demonstrate proper procedure for direct hook-up method at distribution terminals	Demonstrate proper procedure for direct hook-up method at a network interface device (NID)	Demonstrate proper procedure for direct hook-up method at a FOSC
	Demonstrate the ability to select the tools required to perform the direct hook-up method for CATV cables	Demonstrate proper procedure for direct hook-up method for CATV cables	Demonstrate proper procedure for direct hook-up method at CATV bridging amps	Demonstrate proper procedure for direct hook-up method at CATV splitters	Demonstrate proper procedure for direct hook-up method at CATV taps
	Demonstrate the ability to select the tools required to perform a generic inductive clamping signal application procedure	Demonstrate the ability to select an effective inductive clamping access point	Demonstrate safe procedures for applying a signal using an inductive clamp	Demonstrate the safe procedures for applying a signal to a metal pipe with an inductive clamp	Demonstrate the safe procedures for applying a signal to a tracer wire with an inductive clamp
	Demonstrate the safe procedures for applying a signal to a metal casing pipe with an inductive clamp	Demonstrate the safe procedures for applying a signal to a metal conduit with an inductive clamp	Demonstrate the safe procedures for applying a signal to a cathodic cable with an inductive clamp	Demonstrate the safe procedures for applying a signal to an electrical cable with an inductive clamp	Demonstrate the safe procedures for applying a signal to a communication cable with an inductive clamp
	Demonstrate the 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 ability to select an effective inductive signal application point for T1 cable	Demonstrate the ability to select an effective inductive signal application point for toll cable	Demonstrate the ability to select an effective inductive signal application point for trunk	Demonstrate the ability to select an effective inductive signal application point for F1 feeder cable	Demonstrate the ability to select an effective inductive signal application point for F2 distribution cable
	Demonstrate the ability to select an effective inductive signal application point for service (drop) cable	Demonstrate the ability to select an effective inductive signal application point for fibre-optic cable	Demonstrate the procedures for tracing an EM signal	Demonstrate procedures for verifying a previously located facility	Demonstrate the ability to properly identify a target facility
	Demonstrate the ability to verify locates of telco facilities within easements and ROWs.	Demonstrate the procedures for locating buried objects with a magnetic locator	Demonstrate the procedures for locating a metal access cover with a magnetic locator	Demonstrate the procedures for locating metal infrastructure with a magnetic locator	Demonstrate the procedures for locating a metal manhole cover with a magnetic locator
	Demonstrate the procedures for locating a metal hand-hole cover with a magnetic locator	Demonstrate the ability to measure and record distances between facilities and structures	Demonstrate the ability to record GPS information for work area and locates	Demonstrate the ability to photograph work area and locates	
13.0	Locator Marking Knowledge	Explain marking telecommunication cables using the APWA Uniform Color Code	Explain the CGA guidelines for marking practices	Describe marking telecommunication cables using CGA common abbreviations	Describe marking telecommunication infrastructure using CGA common abbreviations

Telecommunications & CATV					
14.0		Describe situations where other marking systems may be used	Explain operator's identifier marking	Explain facility detail marking	Describe different marking materials
		Explain ground and environment conditions that affect locate marks	Explain painted offset marking	Explain staked offset marking	Explain changes in direction marking
		Explain facilities installed in a vault marking	Explain structure markings (e.g., vaults)	Explain loss of signal / termination / dead ends marking	Explain no conflict marking
		Explain proper marking in navigable waterways	Explain single facility marking	Explain multiple facility marking	Explain conduit marking
		Explain markings for long distances			
	Locator Marking Skills	Demonstrate proper ground marking using the APWA Uniform Color Code	Demonstrate marking telecommunication ancillary infrastructure using the APWA Uniform Color Code	Demonstrate marking telecommunication infrastructure using CGA marking practices	Demonstrate marking telecommunications infrastructure using CGA common abbreviations
		Demonstrate marking telecommunication infrastructure using operator's identifier marking	Demonstrate facility detail marking	Demonstrate proper selection of marking materials	Demonstrate painted offset marking
		Demonstrate changes in direction marking	Demonstrate buried splice marking	Demonstrate facilities installed in a vault marking	Demonstrate structure markings (e.g., vaults)
		Demonstrate no conflict marking	Demonstrate single facility marking	Demonstrate multiple facility marking	Demonstrate conduit marking
		Demonstrate proper facility distance marking	Demonstrate proper stake / lath marking	Demonstrate proper pin flag marking	Demonstrate proper whisker (stake-chaser) marking
		Demonstrate the ability to mark facilities under adverse ground and environment conditions	Demonstrate the ability to mark facilities with site specific markings		
	Problem Solving Knowledge	Describe the effects of obstacles and problems on EM signals and locate accuracy	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 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 importance of understanding telco system configuration	Explain the effects of telco system configuration on the EM signal and locate accuracy
		Explain procedures used to locate in adverse site conditions	Explain procedures to locate in high-traffic areas	Describe how electricity carried by telco cables affects locate signals	Explain the effects of work site conditions on locate accuracy
		Explain why various facilities and compositions of cables require their own locating techniques	Describe how inaccurate records can affect locate accuracy	Explain ancillary facilities	Explain the importance of establishing survey boundaries to verify locates
					Describe the importance of utilizing records to verify locates

## Underground Facility Locator Competency Profile



### Telecommunications & CATV

16.0		Explain the effects of broken tracer wire on the EM signal	Explain the effects of cable ends on the EM signal	Explain the effects of buried splices and tees on the EM signal	Explain the effects of cathodic protection on locate accuracy	Explain the effects of telco cable type transitions on the EM signal
		Explain the effects of telco cable pair-count transitions on the EM signal	Explain the effects of rebar on locate accuracy	Explain the effects of slack loops on locate accuracy	Explain the effects of unknown laterals (buried tee splices) on locate accuracy	Describe the effects on facility identification by limited or restricted access to facilities
		Explain the effects of common-bonding on the EM signal	Explain how abandoned or discontinued facilities complicates identification and locate accuracy	Explain how company mergers and name changes complicates facility identification	Explain how unregistered facilities complicates identification and locate accuracy	Explain how privately-owned facilities complicates identification and locate accuracy
		Explain importance of third party contract locators	Describe the importance of record verification	Describe the process of documenting and forwarding updated records to the facility owner/operator		
	Problem Solving Skills	Demonstrate the ability to anticipate problem locate conditions	Demonstrate the ability to determine problem locate conditions	Demonstrate the ability to follow industry best practices to overcome problem locates	Demonstrate the ability to follow company procedures to overcome problem locates	Demonstrate the ability to utilize OJT (on-the-job training) to overcome problem locates
		Demonstrate the ability to utilize methodical troubleshooting procedures to overcome problem locates	Demonstrate the ability to overcome the effects of telco system configuration on the EM signal and locate accuracy	Demonstrate the ability to overcome the effects of telco system configuration on the EM signal and locate accuracy	Demonstrate the ability to overcome the effects of joint system/network (telco, gas, electrical, etc.) installations on locate accuracy	Demonstrate the ability to overcome the effects of locating in adverse site conditions
		Demonstrate the ability to overcome the effects of locating in high-traffic areas	Demonstrate the ability to overcome the effects of electricity carried by telco cables on the locate signal	Demonstrate the ability to overcome the effects of work site conditions on locate accuracy	Demonstrate the ability to identify and utilize the capabilities of locate equipment to overcome problems	Demonstrate the ability to utilize various locating techniques to locate different facilities and compositions of cables
		Demonstrate the ability to overcome inaccurate records	Demonstrate the ability to anticipate and locate ancillary facilities	Demonstrate the ability to utilize survey boundaries to verify locates	Demonstrate the ability to utilize records to verify locates	Demonstrate the ability to identify and overcome the effects of broken tracer wire on the EM signal
		Demonstrate the ability to identify and overcome the effects of cable ends on the EM signal	Demonstrate the ability to identify and overcome the effects of buried splices and tees on the EM signal	Demonstrate the ability to identify and overcome the effects of cathodic protection on locate accuracy	Demonstrate the ability to identify and overcome the effects of telco cable type transitions on the EM signal	Demonstrate the ability to identify and overcome the effects of telco cable pair-count transitions on the EM signal
		Demonstrate the ability to identify and overcome the effects of rebar on locate accuracy	Demonstrate the ability to identify and overcome the effects of slack loops on locate accuracy	Demonstrate the ability to identify and overcome the effects of unknown laterals (buried splice tees) on locate accuracy	Demonstrate the ability to obtain access to facilities or overcome limited or restricted access	Demonstrate the ability to identify and overcome the effects of common-bonding on the EM signal
		Demonstrate the ability to anticipate, locate, and identify abandoned or discontinued facilities	Demonstrate the ability to research ownership information and follow company mergers and name changes	Demonstrate the ability to anticipate, determine, and overcome complications from unregistered facilities	Demonstrate the ability to anticipate, determine, and overcome complications from private facilities	Demonstrate the ability to determine the need for a third-party contract locate

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		Demonstrate the ability to use records to verify locates and to verify the accuracy of the records	Demonstrate the ability to document and forward updated records to the facility owner/operator		
17.0	Locator Drawing Knowledge	Explain hand sketch locator drawings	Explain computer generated locator drawings	Explain drawing procedures	Explain drawing process
		Explain company specific drawing requirements	Explain the multiple applications of a locate drawing	Explain symbology for telecommunications facilities	Explain mapping terminology for locator drawings
		Explain the importance of measurements from telecommunication facilities to other known facilities	Explain the importance of measurements from telecommunication facilities to surface structure	Explain the importance of incorporating information from other facility records in locator drawings	Explain the importance of incorporating GIS and/or GPS information in locator drawings
		Explain the importance of accurate locate drawings	Explain the importance of documenting facility record errors on locate drawings	Explain the differences of spatially accurate locate drawings	Explain the differences of schematic representation locate drawings
18.0	Locator Drawing Skills	Demonstrate the ability to create hand sketch locator drawings	Demonstrate the ability to create computer generated locator drawings	Demonstrate the ability to identify and utilize drawing procedures	Demonstrate the ability to identify and utilize client specific drawing requirements
		Demonstrate the ability to identify and utilize company specific drawing requirements	Demonstrate the ability to identify and utilize multiple applications of a locate drawing	Demonstrate the ability to identify and utilize symbology for telecommunication facilities	Demonstrate the ability to identify and label the key elements on a drawing
		Demonstrate the ability to identify and record measurements from telecommunication facilities to other known facilities	Demonstrate the ability to identify and record measurements from telecommunication facilities to surface structure	Demonstrate the ability to incorporate information from other facility records in locator drawings	Demonstrate the ability to incorporate survey information in locator drawings
		Demonstrate the ability to identify, utilize, and create accurate locate drawings	Demonstrate the ability to document facility record errors on locate drawings	Demonstrate the ability to identify, utilize, and create spatially accurate locate drawings	Demonstrate the ability to identify, utilize, and create schematic representation locate drawings