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## **NULCA Standard**

### **Professional Competency Standards for NULCA Member Locators**



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### Disclaimer

*This standard had been prepared by the NULCA Committee of Management 2005-2006 in consultation with NULCA Members. The document does not have any legal standing but is the standard recommended to Members and widely distributed to associated stakeholders.*

**Professional Competence  
Standards for NULCA Member Locators**

**Chapter 1**

**Administration**

**1-1    General**

**Scope**

This Standard identifies the basic level of competence required of NULCA Member Locators. It specifically covers the competencies for basic level locators who are involved in buried assets locating. The Locator must demonstrate knowledge and understanding of the practices and procedures through formal closed book examination, obtaining a passing grade, together with demonstrating in actual or simulated scenarios; and demonstrating the ability to use locating equipment effectively and efficiently.

**Purpose**

The purpose of this Standard is to specify the minimum competencies for those individuals who will respond to the request for the location of utility assets which are below the surface of the ground. It is not the intent of this Standard to restrict any jurisdiction from exceeding those minimum requirements. The purpose of these competencies is assist in safer excavation practice, with the goal of minimising the possibility of causing damage to underground utility assets.

**1-2    Definitions**

**Color Code**

System of colors used for marking and recognition of various types of assets located below the ground.

**Competence**

Possessing knowledge, understanding, skill and judgement needed to perform specific tasks and/or objectives satisfactorily, with little or no supervision.

**Electromagnetic Location**

Detection of Electromagnetic fields emitted by buried metallic assets.

**Element of Competency**

What individuals have to do to demonstrate or prove the standard of Competence.

**Utility Asset**

Any structure buried below the surface of the ground.

**Locator**

For the purpose of this Standard, Locator relates to a NULCA Member Locator, and individual competent in the activity of locating buried utility assets.

**Hertz**

Unit of measuring an alternating current.

**Locating**

The practice of identifying and designating the position of a utility asset buried below the surface of the ground.

<b>Manhole</b>	Entry points to a vault and/or space below the surface of the ground.
<b>Must</b>	Indicates a mandatory requirement.
<b>NULCA</b>	National Utility Locating Contractors Association of Australia
<b>Performance Criteria</b>	Precisely describes the Element of Competence.
<b>Range Statement</b>	Describes under what circumstance the performance criteria needs to be satisfied.
<b>Receiver</b>	Equipment that receives a detectable signal for the purpose of identifying a buried utility assets.
<b>Shall</b>	Indicates a mandatory requirement.
<b>Should</b>	Indicates a recommendation or that which is advised but not required.
<b>Transmitter</b>	Equipment that transmits a detectable signal for the purpose of identifying an underground utility asset.
<b>Unit of Competence</b>	A key area, which has to be carried out if the key purpose is to be achieved.

## Chapter 2                      Competencies For Locators

<b>2            <u>General Introduction</u></b>	The Locator shall be trained to meet Federal, State and Local health occupation and safety regulatory requirements, whichever are appropriate for their jurisdiction.
<b>Definition</b>	NULCA Member Locators are those persons who, in the course of their normal duties will be required to identify and designate the appropriate horizontal position of buried utility assets. Locators are expected to identify and indicate the position of buried utility assets, protect the general public and themselves from harm, and call for support when necessary.
<b>Goal</b>	The key purpose of the NULCA Locator Competency Standard is to provide Member Locators with the skill, knowledge and understanding to complete the following tasks and activities safely and professionally.
<b>Range Statement</b>	The NULCA Member Locator shall satisfy the performance criteria of all Elements and Units of Competence outlined in this document by using locating equipment to locate a minimum of one or all of the various buried utility assets (in rural or urban settings as it pertains to a geographical area of responsibility) under actual or simulated conditions such as:

1. Electrical Systems (electric power lines, cables, conduit, & lighting cables)
2. Gas, oil, steam, petroleum, or gaseous materials
3. Communication systems (alarm or signal lines, cables, or conduit)
4. Potable water
5. Reclaimed water and irrigation
6. Sewer
7. Other underground structures

The NULCA Member Locator must demonstrate the knowledge and understanding in the outlined Competency for every type of facility that he is required to Locate.

Correctly demonstrate knowledge and understanding thorough formal and informal questioning.

## **2-2 Competencies**

### **Units of Competence**

1. Theory of Electromagnetic Locating
2. Use of the Transmitter
3. Use of the Receiver
4. Marking Procedures
5. Knowledge of Assets
6. Visual Observation Skills
7. Safe Work Practices and Regulations
8. Locate Request Procedure, Documentation and Mapping
9. Federal, State and Local Regulations
10. Customer Interaction

### ***Unit 1 Theory of Electromagnetic – NULCA Member Locator***

The Locator shall, given various simulated or actual site situations or by diagram, demonstrate competency in the knowledge of Electromagnetic Locating Theory.

#### **Elements of Competence**

- 1.1 Demonstrate thorough knowledge and understanding of circuits.
- 1.2 Demonstrate a knowledge and understanding of frequency application.

#### **Performance Criteria**

- 1.1a Correctly form a location circuit in actual or simulated setting.
- 1.1b Demonstrate ability to recognise cause and effects of signal distortion in actual or simulated setting.
- 1.2a Demonstrate knowledge and understanding of conductor types and their effects on signal and signal strength.

### ***Unit 2 Use of the Transmitter -***

The Locator shall, given various simulated or actual site situations with different buried utility assets, identify and indicate the position of those utility assets correctly using

their equipment as per the manufacturer's instructions, accessing all other reference material available and in an effective and safe manner. The Locator shall be able to:

<b>Elements of Competence</b>	2.1	Demonstrate skill in proper transmitter operation.
	2.2	Demonstrate knowledge and understanding of principles of electromagnetic theory as it applies to the transmitter.
	2.3	Demonstrate proper equipment maintenance.
<b>Performance Criteria</b>	2.1a	Correctly place transmitter and make all connections correctly including grounding if applicable.
	2.1b	Correctly use direct connect/induction or clamp methods to locate pre-selected buried assets, and correctly answer written and verbal questions.
	2.1c	Select correct power output as required.
	2.1d	Correctly select and identify the most effective frequency as required.
	2.2a	Demonstrate the ability to ensure that correct grounding has been achieved.
	2.2b	Demonstrate knowledge and understanding of proper transmitter use by accurately indicating the presence of preselected utility assets.
	2.3a	Correctly demonstrate a proper function test as per the manufacturer's instructions.
	2.3b	Demonstrate proper storage, maintenance and cleaning of the transmitter as per the manufacturer and/or company instructions.
	2.3c	Have knowledge of the power source and demonstrate proper battery test (if applicable).

### ***Unit 3 Use of the Receiver -***

The Locator shall, given various simulated or actual site situations with different utility assets, identify and designate the position of those assets correctly, use locating equipment as per the manufacturer's instructions, accessing all other reference material available in an effective and safe manner. The Locator shall be able to:

<b>Elements of Competence</b>	3.1	Demonstrate skill in proper receiver operation.
	3.2	Demonstrate knowledge and understanding of the principles of electromagnetic theory as it applies to the receiver.

- 3.3 Demonstrate proper equipment maintenance procedures.

#### **Performance Criteria**

- 3.1a Correctly use direct connect/induction or clamp methods to locate the utility asset, and correctly answer written and verbal questions.
- 3.1b Correctly use circle sweep, tracing or blind sweep methods to designate the position of utility assets.
- 3.1c Adjust frequency, sensitivity, and/or gain, to allow for best possible utility asset designation.
- 3.1d Select the appropriate antenna (peak or null) for the best possible utility asset designation..
- 3.1e Correctly operate equipment as supported by the manufacturer's instructions.
- 3.2a Answer verbal and/or written questions to confirm knowledge and understanding of electromagnetic location principles as it applies to the receiver.
- 3.2b Demonstrate the ability to place the receiver at the required distance from the transmitter to avoid air coupling when blind sweeping.
- 3.2c Demonstrate knowledge and understanding of proper receiver use by accurately designating several buried utility assets.
- 3.3a Correctly demonstrate a proper function test as per the manufacturer's instructions.
- 3.3b Demonstrate proper storage, maintenance and cleaning of the receiver as per the manufacturer and/or company instructions.
- 3.3c Have knowledge of the power source and demonstrate proper battery test (if applicable).

#### **Unit 4 Marking Procedures –**

The Locator shall, given various simulated or actual site situations with different utility assets, mark their position on the surface of the ground using the most appropriate method for the specific task after referencing any Federal, State or Local requirements or regulations concerning such activities. The Locator shall be able to:

- |                               |  |
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| <b>Elements of Competence</b> | 4.1 Correctly indicate the location of buried utility asset. |
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<b>Performance Criteria</b>	4.2	Demonstrate knowledge and understanding of different marking systems.
	4.1a	Correctly demonstrate the ability to mark the designation of buried utility assets with required Federal, State, and Local regulatory requirements.
	4.1b	Correctly demonstrate the ability to mark the designation of utility assets as per the asset owner's standards, which may exceed Federal, State and Local regulatory requirements.
	4.1c	Correctly demonstrate the placement of marks /markers within the required distances as per the regulatory requirements, or to the utility assets owner standards.
	4.2a	Demonstrate knowledge and understanding of the NULCA adopted Australian colour codes.
	4.2b	Demonstrate knowledge and understanding of the different types of marking devices and proper application methods for their use.
	4.2c	Demonstrate the ability to recognise and understand industry symbols used to denote buried and above ground utility assets.

#### ***Unit 5 Knowledge of Assets -***

The Locator shall, given various simulated or actual site situations with different buried utility assets correctly identify those assets and select the most appropriate method of locating such a utility asset.  
The Locator shall be able to:

<b>Elements of Competence</b>	5.1	Demonstrate the knowledge and understanding of differing types of above ground and or accessible utility assets.
<b>Performance Criteria</b>	5.1a	Correctly identify buried utility assets should they be exposed and visible.
	5.1b	Select the best possible method to locate buried utility assets, taking into consideration the above ground observation.
	5.1c	Correctly identify proper isolation and or bonding/unbonding procedures, taking into consideration the above ground observation.

#### ***Unit 6 Visual Observation Skills –***

The Locator shall, given various simulated or actual site situations with different buried utility assets, correctly identify visible indicators that would lead to the possibility of the existence of an underground asset.

The Locator shall be able to:

<b>Elements of Competence</b>	6.1	Correctly identify different utility asset equipment features.
	6.2	Correctly identify different visual evidence of buried utility assets being present.
<b>Performance Criteria</b>	6.1a	Recognise different utility asset features (i.e. utility poles, pedestals, gas meters, manhole covers etc.).
	6.1b	Recognise utility asset right of ways (i.e. cut lines etc.).
	6.2a	Recognise areas where previous excavations may have been taken place.
	6.2b	Recognise trench or excavation scars in paved roadways or highways.

#### ***Unit 7 Safe Work Practices and Regulations –***

The Locator shall, given various simulated or actual site situations with different buried utility assets, create safe working environments for the general public, excavators, themselves and others at the work site, following Federal, State and Local health safety and environmental regulations and practices.

The Locator shall be able to:

<b>Elements of Competence</b>	7.1	Demonstrate knowledge and understanding of safe work practices.
	7.2	Demonstrate knowledge and understanding of Federal, State and Local regulations.
	7.3	Demonstrate knowledge and understanding of the emergency response requirements.
<b>Performance Criteria</b>	7.1a	Protect themselves at the work site location, protect the general public in and around the work site location, and protect the work area.
	7.1b	Have knowledge and understanding of the right to refuse work that is unsafe to themselves or others present at the worksite.
	7.1c	Have knowledge and understanding of the obligation to stop any work that is unsafe to themselves or others present at the worksite.
	7.1d	Enter any manhole and vault safely following the required entry policies and regulatory requirements.

- 7.1e Manage and channel traffic so to minimise the disturbance and inconvenience to the general public.
- 7.1f Be able to demonstrate the ability to identify hazardous environments and practice safe work methods to ensure the safety of the Locator and others.
- 7.1g Recognise and handle the general public, with emphasis on customer relationships and conflict management.
- 7.1h Have knowledge and understanding of hazardous situations (animals, natural occurrence) and be able to demonstrate the necessary steps to protect themselves.
- 7.2a Identify and wear all personal protective equipment as required by Federal, State or Local regulatory requirements, or more stringent company standards.
- 7.2b Have knowledge and understanding of how and where to quickly access required emergency information when necessary.
- 7.2c Be able to demonstrate the ability to activate the emergency response for the geographical area they locate in.

***Unit 8 Locate Request Procedure, Documentation, and Mapping -***

The Locator shall, given various simulated or actual site situations demonstrate the ability to effectively find their way around the geographic location they are responsible for, comprehension of the procedures involved with locating requests, together with the knowledge and understanding of excavation practices and procedures, demonstrate sound knowledge and understanding for all location documentation practices by understanding the land survey systems, regulations and requirement of that geographical area.

The Locator shall be able to:

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| <b>Elements of Competence</b> | 8.1 | Demonstrate knowledge and understanding of Locating documentation. |
|                               | 8.2 | Demonstrate knowledge and understanding of map reading.            |
|                               | 8.3 | Understand Locate request terminology to allow for                 |

satisfactory locating to be undertaken.

<b>Performance Criteria</b>	8.4	Demonstrate knowledge and understanding of locate requests.
	8.1a	Demonstrate capability to create an accurate plot plan in relation to the locate performed.
	8.1b	Demonstrate knowledge and understanding of plot plan/ as built/customer maps.
	8.1c	Demonstrate knowledge and understanding of customer specific facility symbol identification.
	8.2a	Effectively read street maps.
	8.2b	Access and reference land survey systems in their geographical area of responsibility.
	8.2c	Demonstrate sound knowledge and understanding of the land survey system for a geographical area of responsibility.
	8.2d	Effectively read utility asset owner's maps and drawings to identify and recognise approximate location of buried utility assets.
	8.3a	Be able to demonstrate through written exam, the understanding of all key words on the Locate request documents, city maps and client plot plans for the geographical area of responsibility.
	8.4a	Demonstrate knowledge and understanding of "DBYD" and/or Locate request documentation in their geographical area of responsibility.
	8.4b	Fully understand the Locate request documentation process and how to complete any associated documentation (request forms, plot plans, site drawings etc.).

#### ***Unit 9 Federal, State and Local Regulations -***

The Locator shall, given various simulated or actual site situations, access the most relevant Federal, State or Local regulations pertinent to the location and site situation.

The Locator shall be able to:

<b>Elements of Competency</b>	9.1	Demonstrate knowledge and understanding of Federal, State and Local regulations.
<b>Performance Criteria</b>	9.1a	Demonstrate thorough knowledge and understanding of all regulatory requirements as it pertains to their geographical area of responsibility.

- 9.1b Reference and access regulatory specific information necessary as it pertains to the geographical area of responsibility.

***Unit 10 Customer Interaction -***

The Locator shall, given various simulated or actual site situations, interact with customers and others in a professional and effective manner.

The Locator shall be able to:

- |                               |  |
|-------------------------------|--|
| <b>Elements of Competence</b> | 10.1 Promote positive working relationships with the parties involved.   |
|                               | 10.2 Communicate effectively with the parties involved.  |
| <b>Performance Criteria</b>   | 10.1a Demonstrate and fully understand the nature and scope of work being undertaken.  |
|                               | 10.1b Complete the requirements of the request to the fullest satisfaction possible of the customer, within relevant Federal, State, Local, company or owner regulations/policies. |
|                               | 10.2a Fully understand the Locate request documentation process and how to complete any associated documentation.  |
|                               | 10.2b Recognise customer sensitivities to the work being undertaken.   |
|                               | 10.2c Communicate timely and effectively with all concerned parties.   |

**- END -**