

Topic Skills Practice Cover Sheet

Unit Name:	UEEEL0023 Terminate cables, cords and accessories for low voltage circuits
Topic Title:	Trailing Cables and Catenary Systems

Skill Practice Number:	9.1
Skill Practice Name:	Install and Terminate a Pendant Socket-Outlet

Student Name:	
Student ID:	
College/Campus:	
Group:	

Results	
Planning:	
Carryout:	
Completion:	
Overall Results:	
Comments:	

Topic Skills Practice 9.1

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

Topic 9. Trailing Cables and Catenary Systems

Skills Practice 9.1: Install and Terminate a Pendant Socket-Outlet

Task:

To install and terminate a circuit supplying a pendant socket-outlet in accordance with AS/NZS 3000 requirements.

Objectives:

At the completion of this skills practice, you should be able to:

- Install and terminate flexible cables
- Use chain to hang a pendant socket-outlet
- Test installed cables to verify earth resistance, insulation resistance and polarity in accordance with AS/NZS 3000

Topic Skills Practice 9.1

1. Planning the Skills Practice

1.1 Equipment

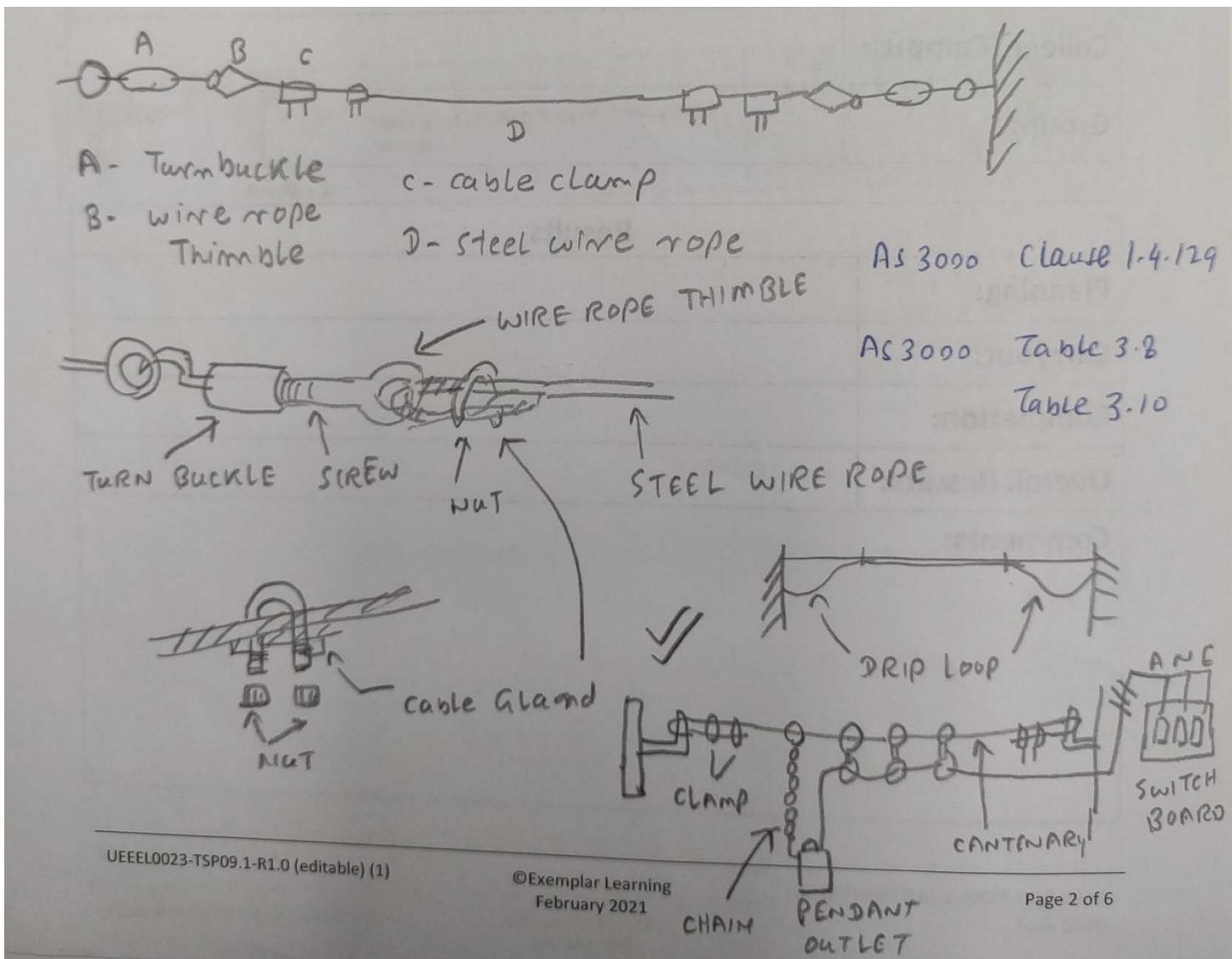
- Switchboard
- Pendant socket-outlet
- Flexible trailing cable
- Jack chain and ceiling fixing

1.2 Suggested Materials

- Cable ties
- Multimeter
- Insulation Resistance (IR) tester

1.3 Miscellaneous Items

- PPE
- Hand tools
- Pens/pencils
- AS/NZS 3000





1.4 Risk Assessment

Risk assessment procedure:

- Identify any hazards that may exist with this skills practice below
- List the supervision level you will be working under - Direct (D), General (G) or Broad (B)
- List the risk classification – High Risk (H), Medium Risk (M) or Low Risk (L)

- List the control measures required for each identified hazard that you need to implement.

Hazard/s Identified	Supervision Level (D, G or B)	Risk Classification (H, M or L)	Control Measure/s
Exposed live conductors	D	H	All exposed conductors must be enclosed.
Accidentally switching on the supply while the workmate is working on power	D	H	Appropriate test , lock and tag procedure must be followed.
In appropriate attachment causing the trailing cable to fall	B	L	Properly secure the catenary wire
Faling from height hazard	D	H	Appropriate use of ladder to hang the catenary wire.

		Have your teacher/trainer check your risk assessment	Teacher/Trainer Initials and Date	

Feedback

Topic Skills Practice 9.1

2. Carrying Out the Skills Practice

2.1 Pendant Socket-Outlet Installation




2.1.1 Install the fixing into the ceiling from which you will hang the pendant socket-outlet.

2.1.2 Prepare a suitable length of jack chain and hang the pendant socket-outlet from the fixing you have installed in the ceiling.

2.1.3 Run the flexible multicore cable from the switchboard to the socket-outlet using suitable cable supports.

2.1.4 Terminate the cable and conductors at the pendant socket-outlet, and then at the switchboard.


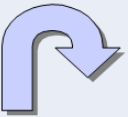

2.1.5 Cable tie the cable down the length of the jack chain.

	 Feedback Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	

2.2 Cable Specifications

2.2.1 In the spaces provided below, record details of the installation cable by interpreting and extracting specifications from the cable drum label.

Cable Specifications						
Cable Type	Size (c.s.a.)	Insulation Type	No. of Cores	Stranding	Temp. Rating	Voltage Rating
Flexible Cable	4mm ²	XLPE	3	7	105°C	500KV




	 Feedback Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	

Topic Skills Practice 9.1

2.3 Installation Testing

2.3.1 Test the installed wiring to verify continuity of the earthing system, insulation resistance, and correct polarity. Record your test results in the schedule below.

Installation Test Results						
Circuit	Earth Resistance	Insulation Resistance		Correct Polarity		Details of Circuit Defects (if applicable)
		A-E	N-E	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
1	0	Infinity	infinity	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
2	0	Infinity	infinity	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3	0	Infinity	infinity	<input type="checkbox"/> Yes	<input type="checkbox"/> No	

	 Feedback Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	
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3. Completing the Skills Practice

3.1 Skills Practice Review Questions

3.1.1 Clean your work area, return all equipment to the correct storage areas as directed by your teacher, and then complete the following review questions.

- Describe three common applications for trailing cables.

To supply pendant (suspended) socket outlets

Lift

Mobile mining machineries

2. What colour is the neutral conductor in a two-core and earth flexible cable?

Black

Topic Skills Practice 9.1

3. List two types of insulation commonly used on trailing cables.

Elastomer (PCP,EPR,CSP) insulation
Polychloroprene-PCP, Ethylene Propylene Rubber (EPR)

3. What is the primary purpose of a trailing cable trolley system?

Trailing cable is used for providing some movement of cable which is likely to occur during operation.














	 Feedback Have your teacher/trainer check your answers	Teacher/Trainer Initials and Date	

Topic Skills Practice Cover Sheet

Unit Name:	UEEEL0023 Terminate cables, cords and accessories for low voltage circuits
Topic Title:	Trailing Cables and Catenary Systems

Skill Practice Number:	9.2
Skill Practice Name:	Install and Terminate a Catenary Wiring System

Student Name:	
Student ID:	
College/Campus:	
Group:	

Results	
Planning:	
Carryout:	
Completion:	
Overall Results:	
Comments:	

Topic Skills Practice 9.2

UEEEL0023 Terminate cables, cords and accessories for low voltage circuits

Topic 9. Trailing Cables and Catenary Systems

Skills Practice 9.2: Install and Terminate a Catenary Wiring System

Task:

To install and terminate a circuit supported on a catenary in accordance with AS/NZS 3000 requirements.

Objectives:

At the completion of this skills practice, you should be able to:

- Install a catenary support system
- Secure TPS cables to a catenary system.
- Terminate TPS cables.
- Test installed cables to verify earth resistance, insulation resistance and polarity in accordance with AS/NZS 3000.

Topic Skills Practice 9.2

1. Planning the Skills Practice

1.1 Equipment

- Switchboard
- Catenary wire
- 2 x turnbuckles
- 4 x U clamps
- 2 x hook/eye-bolt anchors
- Stranded TPS cable
- Cable ties

1.2 Suggested Materials

- Junction box
- Multimeter
- Insulation Resistance (IR) tester

1.3 Miscellaneous Items

- PPE
- Hand tools
- Pens/pencils
- AS/NZS 3000

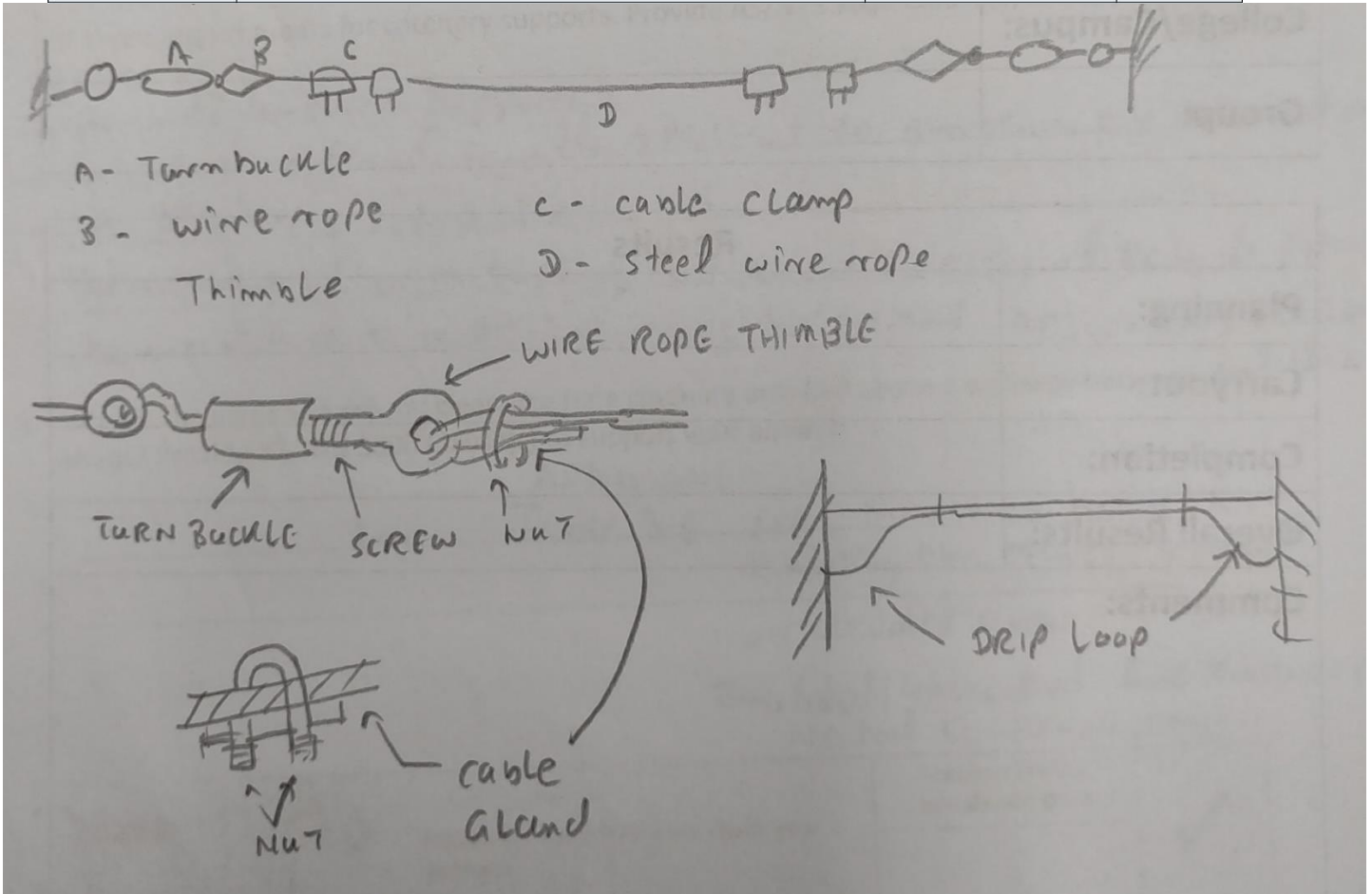
1.4 Risk Assessment

Risk assessment procedure:

- Identify any hazards that may exist with this skills practice below
- List the supervision level you will be working under - Direct (D), General (G) or Broad (B)
- List the risk classification – High Risk (H), Medium Risk (M) or Low Risk (L)
- List the control measures required for each identified hazard that you need to implement.

Hazard/s Identified	Supervision Level (D, G or B)	Risk Classification (H, M or L)	Control Measure/s
Exposed live conductors	D	H	All exposed conductors must be enclosed.
Accidentally switching on the supply while the workmate is working on power	D	H	Appropriate test , lock and tag procedure must be followed.
In appropriate attachment causing the trailing cable to fall	B	L	Properly secure the catenary wire
Faling from height hazard	D	H	Appropriate use of ladder to hang the catenary wire.

	 <p>Have your teacher/trainer check your risk assessment</p> <p>Feedback</p>	<p>Teacher/Trainer Initials and Date</p>	



Topic Skills Practice 9.2

2. Carrying Out the Skills Practice

2.1 Catenary System Installation




2.1.1 Install the two hook/eye bolt anchors at a suitable height and distance apart, as instructed by your teacher.

2.1.2 Attach a turnbuckle to each anchor.

2.1.3 Cut a suitable length of catenary wire, as instructed by your teacher, and fasten one end to one of the turnbuckles using two U clamps to secure the wire in place

2.1.4 Fasten the other end of the catenary to the other turnbuckle using the other two U clamps.

2.1.5 Tension the catenary wire by rotating the turnbuckles.

	 Feedback	Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	

2.2 Cable Installation




2.2.1 Mount the junction box on the wall at the end of the catenary that is furthest from the switchboard.

2.2.1 Run the TPS cable from the switchboard to the catenary using suitable supports.

2.2.2 Cable tie the cable along the length of the catenary, leaving a loop at each end.

2.2.3 Terminate the cable and conductors into the junction box at the far end of the catenary.

2.2.4 Terminate the cable and conductors at the switchboard.




	 Feedback	Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	

Topic Skills Practice 9.2

2.3 Cable Specifications

2.3.1 In the spaces provided below, record details of the installation cable by interpreting and extracting specifications from the cable drum label.




Cable Specifications						
Cable Type	Size (c.s.a.)	Insulation Type	No. of Cores	Stranding	Temp. Rating	Voltage Rating
Flexible Cable	4mm ²	XLPE	3	7	105°C	500KV

	 <i>Feedback</i>	Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	
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2.4 Installation Testing

2.4.1 Test the installed wiring to verify continuity of the earthing system, insulation resistance, and correct polarity. Record your test results in the schedule below.

Installation Test Results						
Circuit	Earth Resistance	Insulation Resistance		Correct Polarity		Details of Circuit Defects (if applicable)
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	 <i>Feedback</i>	Have your teacher/trainer check your work	Teacher/Trainer Initials and Date	
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Topic Skills Practice 9.2

3. Completing the Skills Practice

3.1 Skills Practice Review Questions

3.1.1 Clean your work area, return all equipment to the correct storage areas as directed by your teacher, and then complete the following review questions.

1. What are the minimum requirements for the types of cables permitted to be installed on a catenary? Provide AS/NZS 3000 Clause(s) to support your answer.

Cables supported by means of catenary shall be stranded cables affording double insulation.

Cables and catenary supports installed outdoor shall be suitable for exposure to direct

Sun light AS3000:2018 Clause 3.13.1

2. List three requirements for catenary supports. Provide AS/NZS 3000 Clause(s) to support your answer.

-Provide uniform support

-Consist of materials equally resistant to corrosion or deterioration

-Be effectively fixed at each end

-Be capable of withstanding mechanical stresses likely to occur

-Be mounted at a sufficient height above the ground



AS3000;2018 Clause 3.13.2

3. What is the minimum ground clearance for a catenary installed above a walkway between site sheds? Provide AS/NZS 3000 Clause(s) to support your answer.

3 m

AS3000:2018 See minimum height above building structures, ground or elevated area Insulated / unsheathed live conductor . Neutral screened cable.



	 Feedback Have your teacher/trainer check your answers	Teacher/Trainer Initials and Date	