

UEECD0007-NAT11297001

<b>1.1 Equipment:</b> <ul style="list-style-type: none"><li>• Selection of ladders.</li><li>• Selection of PPE.</li><li>• Electrical equipment, accessories and materials as needed.</li><li>• LV rescue kit.</li><li>• CPR mannequin.</li><li>• First Aid Kits.</li></ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"><li>• Cables.</li><li>• Fixings and supports.</li><li>• Terminals.</li><li>• Relevant WHS Acts, Regulations and/or Codes of Practice.</li></ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"><li>• Hand tools.</li><li>• Wiring booth / workshop area.</li><li>• Pens/pencils.</li></ul>
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UEECD0016-NAT11297002

<b>1.1 Equipment:</b> <ul style="list-style-type: none"><li>• Workshop and/or electrical installation facility.</li></ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"><li>• Various items set up to simulate hazards in the workplace.</li></ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"><li>• PPE.</li><li>• Pens/pencils.</li></ul>
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UEECD0019

<b>1.1 Equipment:</b> <ul style="list-style-type: none"><li>• 20 mm stock and die</li><li>• 20 mm steel conduit</li><li>• Holesaws / punches</li><li>• Nylon cable glands</li><li>• 20 mm steel lock nuts</li></ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"><li>• Metal enclosure gland plate</li><li>• PVC enclosure gland plate (400 mm x 150 mm)</li><li>• Pipe vice</li><li>• Cutting lubricant</li></ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"><li>• PPE</li><li>• Measuring tape</li><li>• Marker</li><li>• Pliers</li></ul>
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UEECD0020

<b>1.1 Equipment:</b> <ul style="list-style-type: none"><li>• Range of screw drivers</li><li>• Spanners</li><li>• Cordless power drill</li><li>• Set of twist drill bits</li><li>• Power drill with rotary/hammer setting</li><li>• Masonry drill bits</li><li>• Measuring and</li></ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"><li>• Batten holder</li><li>• Socket outlet</li><li>• Mounting block</li><li>• Plasterboard 'C' clip</li><li>• Steel conduit saddles</li><li>• Heavy duty brackets</li></ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"><li>• Plaster board</li><li>• Masonry block</li><li>• Metal plate</li><li>• Toggles</li><li>• Wall plugs and screws</li><li>• External threaded stud anchors</li></ul>
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<ul style="list-style-type: none"> <li>marking out tools</li> <li>Plasterboard saw</li> </ul>	<ul style="list-style-type: none"> <li>PVC duct</li> </ul>	<ul style="list-style-type: none"> <li>Nuts and bolts</li> <li>Adhesive tape</li> </ul>
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#### UEECD0044

<b>1.1 Equipment:</b> <ul style="list-style-type: none"> <li>d.c. power supply <b>10 V</b></li> <li>analogue voltmeter</li> <li>analogue ammeter</li> <li>fuse and switch</li> <li>connection leads</li> </ul>	<b>1.2 Suggested Materials:</b> <table border="1"> <tr> <td>R<sub>1</sub> =</td> <td><b>8.2</b></td> <td>Ω</td> </tr> <tr> <td>R<sub>2</sub> =</td> <td><b>10</b></td> <td>Ω</td> </tr> <tr> <td>R<sub>3</sub> =</td> <td><b>18</b></td> <td>Ω</td> </tr> <tr> <td>R<sub>4</sub> =</td> <td><b>47</b></td> <td>Ω</td> </tr> <tr> <td>R<sub>5</sub> =</td> <td><b>68</b></td> <td>Ω</td> </tr> </table>	R <sub>1</sub> =	<b>8.2</b>	Ω	R <sub>2</sub> =	<b>10</b>	Ω	R <sub>3</sub> =	<b>18</b>	Ω	R <sub>4</sub> =	<b>47</b>	Ω	R <sub>5</sub> =	<b>68</b>	Ω	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"> <li>AS/NZS 3000</li> </ul>
R <sub>1</sub> =	<b>8.2</b>	Ω															
R <sub>2</sub> =	<b>10</b>	Ω															
R <sub>3</sub> =	<b>18</b>	Ω															
R <sub>4</sub> =	<b>47</b>	Ω															
R <sub>5</sub> =	<b>68</b>	Ω															

#### UEECD0046

<b>1.1 Equipment:</b> <ul style="list-style-type: none"> <li>d.c. power supply</li> <li>analogue voltmeter</li> <li>analogue ammeter</li> <li>multimeter</li> <li>fuse and switch</li> <li>connection leads</li> </ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"> <li>resistors: <ul style="list-style-type: none"> <li>R<sub>1</sub> = <b>8.2</b> ohms</li> <li>R<sub>2</sub> = <b>22</b> ohms</li> <li>R<sub>3</sub> = <b>47</b> ohms</li> </ul> </li> </ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"> <li>1 x LDR</li> <li>AS/NZS 3000</li> </ul>
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#### UEECD0046

<b>1.1 Equipment:</b> <ul style="list-style-type: none"> <li>ELV a.c. power supply</li> <li>Lamp Panel</li> <li>Switch Panel</li> <li>Switches</li> <li>Test equipment</li> </ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"> <li>4 mm<sup>2</sup> connecting leads</li> <li>Multimeter</li> <li>Series test lamps</li> </ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"> <li>Fuse</li> <li>AS/NZS 3000</li> <li>Colour pens/pencils &amp; ruler</li> </ul>
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#### UEEEL0003-NAT11297004

<b>1.1 Equipment:</b> <ul style="list-style-type: none"> <li>Wiring booth</li> <li>Switchboard with neutral and earth bars</li> <li>Earth electrode</li> <li>Water pipe</li> <li>TPI earth cable</li> </ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"> <li>Socket outlets</li> <li>Light fittings</li> <li>Fixed appliances / terminal blocks</li> <li>Manufacturer's catalogues – switchgear and controlgear</li> </ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"> <li>AS/NZS 3000 (current edition)</li> <li>PPE</li> <li>Hand tools</li> <li>Pens/Pencils</li> <li>Ruler</li> <li>Calculator</li> </ul>
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Complete the equipment list/details for the circuit design in 1.1 using the ETC's catalogue provided. The components will operate at 24 V<sub>a.c.</sub> as nominated by your ETC assessor.

Relay Selection (Jogging Control)	
Manufacturer:	LS
Voltage Rating:	24 Vac
Current Rating:	9 A
N/O Contacts:	2
N/C Contacts:	

Contactors Selection (Forward and Reverse)	
Manufacturer:	LS {MC-9b}
Voltage Rating:	24 Vac
Current Rating:	9 A
AC Utilisation Category:	AC-3
N/O Contacts:	1
N/C Contacts:	1

Thermal Overload Selection	
Manufacturer:	LS {MT-32}
Voltage Rating:	up to 690 V
Current Rating:	40 A
N/O Contacts:	1
N/C Contacts:	1

Pushbutton Selection – S1, S2, S3, S4 & S6	
Manufacturer:	Tend
Voltage Rating:	24 V
Current Rating:	15 A
N/O Contacts:	1
N/C Contacts:	1

Jogging Pushbutton – S5	
Manufacturer:	Tend
Voltage Rating:	24 V
Current Rating:	15 A
N/O Contacts:	1
N/C Contacts:	0

Pilot/Indicator Lamps – L1, L2	
Manufacturer:	Tend
Voltage Rating:	24 V
Current Rating:	8~13 mA
Lamp Type:	led

Equipment List	Details of Equipment
voltmeter (multimeter) cat iii or cat iv	<details as per equipment used>
tong tester (clamp ammeter)	<details as per equipment used>
three-phase squirrel cage induction motor	<details as per equipment used>
mechanical load for the induction motor (locked rotor conditions)	<details as per equipment used>
ppe (gloves, safety glasses, suitable clothing)	<details as per equipment used>
lockout kit and relevant hand tools	<details as per equipment used>
screwdrivers	<details as per equipment used>

UEEEL0008

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Wiring booth/board</li> <li>• TPS cables</li> <li>• Isolator</li> <li>• Single phase stove / terminal block</li> <li>• Two phase stove / terminal block</li> <li>• Protection device(s)</li> <li>• Cable supports</li> <li>• Test equipment</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• Switchboard</li> <li>• RCBO</li> <li>• Cable clips</li> <li>• Screws</li> <li>• Multimeter</li> <li>• IR tester</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Hand tools</li> <li>• PPE</li> <li>• Oven thermostat</li> <li>• Thermometer</li> <li>• Measuring tape</li> </ul>
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UEEEL0009

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Wiring booth/board</li> <li>• TPS cables</li> <li>• SPDT light switches</li> <li>• Intermediate switches</li> <li>• TPS cables</li> <li>• Batten holders</li> <li>• Mounting blocks</li> <li>• Protection device(s)</li> <li>• Cable supports</li> <li>• Test equipment</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• RCBO</li> <li>• Cable clips</li> <li>• Screws</li> <li>• Multimeter</li> <li>• IR tester</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Switchboard</li> <li>• Hand tools</li> <li>• PPE</li> <li>• Measuring tape</li> </ul>
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## 1. Planning the Unit Skills Test

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Single phase socket outlets</li> <li>• Three phase five pin socket outlet</li> <li>• SPDT light switch</li> <li>• Batten holder</li> <li>• TPS cables</li> <li>• Mounting blocks</li> <li>• Protection device(s)</li> <li>• Test equipment</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• ELV three phase supply</li> <li>• RCBO</li> <li>• Cable supports – e.g. cable clips, saddles etc.</li> <li>• Screws</li> <li>• Multimeter</li> <li>• IR tester</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Wiring booth/board</li> <li>• Switchboard</li> <li>• Hand tools</li> <li>• PPE</li> <li>• Measuring tape</li> </ul>
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<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Wiring booth</li> <li>• Distribution board</li> <li>• Selection of circuit breakers and RCDs</li> <li>• Selection of isolators and switches</li> <li>• Pendant socket-outlet</li> <li>• 5-pin socket-outlet</li> <li>• Downlight and ancillary equipment</li> <li>• Smoke detector</li> <li>• Digital multimeter</li> <li>• IR tester</li> <li>• Battery drill</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• Selection of LV cables, including: <ul style="list-style-type: none"> <li>◦ TPI</li> <li>◦ Flat TPS</li> <li>◦ Circular TPS</li> <li>◦ Flexible cable</li> </ul> </li> <li>• Selection of wiring supports, including: <ul style="list-style-type: none"> <li>◦ Cable tray</li> <li>◦ Conduit</li> <li>◦ Catenary wire and supports</li> </ul> </li> <li>• Fittings and fixings for cable tray and conduit</li> <li>• Snake</li> <li>• Cable ties</li> <li>• Cable glands</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Hand tools</li> <li>• PPE</li> <li>• AS/NZS 3000 (current edition)</li> </ul>
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UEEEL0014

Equipment List	Details of Equipment
Voltmeter (multimeter)	Cat III or Cat IV
• Insulation resistance tester	hioki
• Tong tester (Clamp ammeter)	(multimeter) Cat III or Cat IV
• Single phase motor	ELV 1 PHASE
• Lockout kit and relevant hand tools	CIRLOCK
• PPE (gloves, safety glasses, and or suitable clothing)	(gloves, safety glasses, and or suitable clothing)

UEEEL0018-NAT11297005

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>AS/NZS 3000</li> <li>AS/NZS 3008.1.1</li> <li>Local Service and Installation Rules</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>Ruler</li> <li>Calculator</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>Pens/Pencils</li> </ul>
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UEEEL0019

1.1 Equipment:	1.2 Suggested Materials:	1.3 Miscellaneous Items:	
d.c. machine Prime mover 1 x analogue voltmeter 2 x analogue ammeters	Variable load Field rheostat Switch Fuse Multimeter	PPE Hand tools Connection leads	
<b>1.4 Generator Details (1 MARK)</b>			
Generator Output Power	.057W	Rated Generator Field Voltage	24V
Generator Full Load Current	8.7A	Rated Generator Speed	1600 rpm

UEEEL0020-NAT11297003

1.1 Equipment:	1.2 Suggested Materials:	1.3 Miscellaneous Items:
<ul style="list-style-type: none"> <li>• Ammeter</li> <li>• Voltmeter</li> <li>• CRO – dual trace</li> <li>• Switch</li> </ul>	<ul style="list-style-type: none"> <li>• Resistors:  <math>R_1 = 47 \_\_\Omega</math>  <math>R_2 = \_\_100 \_\_\Omega</math> </li> </ul>	<ul style="list-style-type: none"> <li>• Variable ELV single phase a.c. supply</li> <li>• Connecting leads</li> <li>• CRO leads</li> </ul>

UEEEL0021

1.1 Equipment:	1.2 Suggested Materials:	1.3 Miscellaneous Items:
1 x analogue voltmeter 2 x analogue ammeters Multimeter	d.c. relay d.c. solenoid Sensor (reed switch or inductive proximity switch) Switch Fuse	PPE Hand tools Bar magnet Manufacturers specifications Connection leads

4 Equipment Details

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Omron 24 v dc relayMK3PN-5-I

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- Solenoid:
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UEEEL0023

1.1 Equipment:	1.2 Suggested Materials:	1.3 Miscellaneous Items:
<ul style="list-style-type: none"> <li>• Flexible cords</li> <li>• Plug tops</li> <li>• Extension sockets</li> <li>• Test equipment</li> <li>• Hand tools</li> </ul>	<ul style="list-style-type: none"> <li>• Digital multimeter</li> <li>• IR tester</li> <li>• Portable appliance tester (PAT)</li> </ul>	<ul style="list-style-type: none"> <li>• Pliers</li> <li>• Side cutters</li> <li>• Screwdrivers</li> <li>• PPE</li> </ul>

UEEEL0024

Equipment List	Details of Equipment
Voltmeter (multimeter)	Cat III or Cat IV
• Insulation resistance tester	hioki
• Tong tester (Clamp ammeter)	(multimeter) Cat III or Cat IV
• Three phase squirrel cage induction motor	ELV 3 PHASE
• Lockout kit and relevant hand tools	CIRLOCK
• PPE (gloves, safety glasses, and or suitable clothing)	(gloves, safety glasses, and or suitable clothing)

<b>1.1 Equipment:</b> <ul style="list-style-type: none"> <li>• ELV power supply</li> <li>• Single phase transformer</li> <li>• Variable resistive load</li> <li>• Test equipment</li> </ul>	<b>1.2 Suggested Materials:</b> <ul style="list-style-type: none"> <li>• Multimeter</li> <li>• Insulation resistance tester</li> <li>• Tong tester</li> <li>• Variac</li> </ul>	<b>1.3 Miscellaneous Items:</b> <ul style="list-style-type: none"> <li>• PPE</li> <li>• Pens/pencils</li> <li>• Calculator</li> <li>• Connection leads</li> <li>• AS/NZ 3000</li> </ul>												
<b>1.4 Transformer Details</b> <table border="1" data-bbox="313 621 1347 961"> <tr> <td data-bbox="313 621 821 735">Primary Rated Voltage:</td> <td data-bbox="821 621 1347 735">42 V</td> </tr> <tr> <td data-bbox="313 735 821 848">Secondary Rated Voltage:</td> <td data-bbox="821 735 1347 848">24 V</td> </tr> <tr> <td data-bbox="313 848 821 961">VA Rating:</td> <td data-bbox="821 848 1347 961">100 VA</td> </tr> </table> <table border="1" data-bbox="313 1117 1347 1482"> <tr> <td data-bbox="313 1117 821 1255">Transformation Ratio (Turns):</td> <td data-bbox="821 1117 1347 1255">Primary: 125 turns Secondary: at 77 turns</td> </tr> <tr> <td data-bbox="313 1255 821 1369">Full Load Primary Current:</td> <td data-bbox="821 1255 1347 1369">2.3 A</td> </tr> <tr> <td data-bbox="313 1369 821 1482">Full Load Secondary Current:</td> <td data-bbox="821 1369 1347 1482">4.1 A</td> </tr> </table>			Primary Rated Voltage:	42 V	Secondary Rated Voltage:	24 V	VA Rating:	100 VA	Transformation Ratio (Turns):	Primary: 125 turns Secondary: at 77 turns	Full Load Primary Current:	2.3 A	Full Load Secondary Current:	4.1 A
Primary Rated Voltage:	42 V													
Secondary Rated Voltage:	24 V													
VA Rating:	100 VA													
Transformation Ratio (Turns):	Primary: 125 turns Secondary: at 77 turns													
Full Load Primary Current:	2.3 A													
Full Load Secondary Current:	4.1 A													

UEEEL0039-NAT11297006

<b>Equipment List</b>	<b>Details of Equipment</b>
Voltmeter (multimeter) Cat III or Cat IV	Cat III or Cat IV
Tong tester (Clamp ammeter)	(multimeter) Cat III or Cat IV
Phase Rotation tester	ELV 3 PHASE
Lockout kit	CIRLOCK
Hand tools	Pliers screw drivers
PPE (gloves, safety glasses, suitable clothing)	(Gloves, safety glasses, and or suitable clothing)

UEEEL0047

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Alternative supply system</li> <li>• Battery system</li> <li>• Test equipment - Cat III multimeter</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• Safety glasses</li> <li>• AS/NZS 4836 (current edition)</li> <li>• AS/NZS 5139 (current edition)</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Lock-out devices</li> <li>• Danger tags</li> <li>• PPE</li> <li>• Pens/pencils</li> </ul>
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UEERE0001

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Pens / pencils</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• Calculator</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• PPE</li> </ul>
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UETTDRRF04

<p><b>1.1 Equipment:</b></p> <ul style="list-style-type: none"> <li>• Switchboard (not connected to supply).</li> <li>• LV rescue kit.</li> <li>• Rescue mannequin.</li> </ul>	<p><b>1.2 Suggested Materials:</b></p> <ul style="list-style-type: none"> <li>• Selection of PPE.</li> <li>• First Aid Kits.</li> </ul>	<p><b>1.3 Miscellaneous Items:</b></p> <ul style="list-style-type: none"> <li>• Wiring booth / workshop area.</li> <li>• Pens/pencils.</li> </ul>
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UEEDV0005-NAT11297012

<u>Reference Text</u>	<u>Standards and Codes</u>	<u>Equipment/Material</u>
<ul style="list-style-type: none"><li>• Hampson, J., Hanssen, S., Electrical Trade Principles a Practical Approach, Pearson Education.</li><li>• Standards Australia Communications Cabling Manual HB243 Module 1 Australian Regulatory arrangements.</li><li>• Standards Australia Communications Cabling Manual HB29 Module 2 Communications cabling Manual.</li></ul>	<ul style="list-style-type: none"><li>• AS/CA S009 Installation requirements for customer cabling (Wiring Rules).</li></ul>	<ul style="list-style-type: none"><li>• Manufacturer’s catalogues – telecommunications cables.</li><li>• Lengths of various telecommunications cables (at least 5).</li><li>• Multi-pair cable.</li><li>• Disconnect modules.</li><li>• 11-way frame.</li><li>• Cable stripping tools.</li><li>• Punch down tool.</li><li>• Cable ties.</li></ul>

UEEDV0008- NAT11297013

<u>Reference Text:</u>	<u>Standards and Codes:</u>	<u>Equipment/Material:</u>
<ul style="list-style-type: none"><li>• Hampson, J., Hanssen, S., Electrical Trade Principles a Practical Approach, Pearson Education.</li></ul>	<ul style="list-style-type: none"><li>• AS/CA S009 Installation requirements for customer cabling (Wiring Rules).</li><li>• AS/NZS 3080 Telecommunications installations – Generic cabling for commercial premises.</li></ul>	<ul style="list-style-type: none"><li>• 4 RU wall mounted cabinet.</li><li>• 24 port Cat 6 patch panel.</li><li>• Cat 6 cable and sockets.</li><li>• 2 gang wall plate.</li><li>• 6 mm<sup>2</sup> green/yellow earth wire.</li><li>• Cable supports and fixings (e.g. tray, duct, trunking, Velcro ties etc.)</li><li>• Hand tools and PPE, including stripping and punch down tools..</li></ul>