

**UEENEEF102A - Install and maintain cabling for multiple access to telecommunication services**

Element/Performance criteria	MHE text	Heading reference	Test bank	Quiz	Case	Worksheets	Interactives	Animations	YouTube playlist	PPTs
<b>1. Prepare to install and maintain cabling</b>										
1.1 OHS procedures for a given work area are identified, obtained and understood through established routines and procedures.	Hand, Telecommunications	1.4 Work health and safety procedures			1.4	2, 8, 13			4	1 - Telecommunications regulations and planning
1.2 Health and safety risks are identified and established risk control measures and procedures are followed in preparation for the work.	Hand, Telecommunications	1.4 Work health and safety procedures	3, 7		3.3, 3.4					1 - Telecommunications regulations and planning
1.3 Remote power feeding is identified and established risk control measures prepared.	Hand, Telecommunications	1.4.4 Risk-control measures for remote power feeding								1 - Telecommunications regulations and planning
1.4 The nature and location of the work is determined from documentation or in discussion with appropriate person(s) to establish the scope of work to be undertaken.	Hand, Telecommunications	1.5 Planning and understanding requirements	4, 68, 69, 70, 71	15, 16		1, 5, 20				1 - Telecommunications regulations and planning
1.5 Cable routes are planned within the constraints of the building structure, significant and regulations.	Hand, Telecommunications	1.5.3 Planning cable routes	14, 35, 37, 43, 45, 55, 61			4				1 - Telecommunications regulations and planning
1.6 Earthing requirements are determined with consideration of existing earthing arrangements, where applicable and of cable system earth upper and lower resistance limitations.	Hand, Telecommunications	1.5.4 Earthing requirements	6, 18, 19, 56, 57	11, 12		6, 11				1 - Telecommunications regulations and planning
1.7 Advice is sought from appropriate persons to ensure the work is coordinated effectively with others.										
1.8 Sources of materials that may be required for the work are established in accordance with established routines and procedures.	Hand, Telecommunications	1.6 Materials, tools and equipment	8, 64	24						1 - Telecommunications regulations and planning
1.9 Tools, equipment and testing devices needed to carry out the work are obtained and checked for correct operation and safety.	Hand, Telecommunications	1.6 Materials, tools and equipment	10, 29, 30, 31, 32, 42, 43, 45, 50, 53, 54, 59, 65, 66, 67, 68, 69, 70, 71	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14		18				1 - Telecommunications regulations and planning
<b>2. Install and maintain cabling</b>										
2.1 Established OHS risk control measures and procedures for carrying out the work are followed.	Hand, Telecommunications	2.1 Work health and safety procedures	1, 13, 34, 62, 71	19, 20						2- Preparing and maintaining cabling
2.2 Installed support structure is checked to ensure cable will not be exposed to damage during installation and general operation.	Hand, Telecommunications	2.2 Pre-cabling installation	5, 70	28						2- Preparing and maintaining cabling
2.3 Catenary supports are secured to building structure and tensioned where necessary to ensure cable weight can be carried in operating conditions with interference and safety segregation maintained including adherence to AS/ACIF S009.	Hand, Telecommunications	2.3 Cabling pathways	5, 23	23		12				2- Preparing and maintaining cabling
2.4 Protective earthing of metal work is installed in accordance with requirements and to industry standards.	Hand, Telecommunications	2.4 Earthing metal	6, 56, 57							2- Preparing and maintaining cabling
2.5 Cables/wires are handled in accordance with manufacturer's application specifications including tension and bending stress requirements.	Hand, Telecommunications	2.5 Manufacturer's requirements	15, 20, 58, 70			9			1, 2	2- Preparing and maintaining cabling
2.6 Sufficient excess is allowed at cable ends to facilitate termination.	Hand, Telecommunications	2.6 Cable installation								2- Preparing and maintaining cabling
2.7 Telecommunication outlet ends of cable are uniquely labelled to match identifier at originating location.	Hand, Telecommunications	2.6 Cable installation	55							2- Preparing and maintaining cabling
2.8 Cable is placed and secured to maintain safety and interference segregation in accordance with legislative and industry standards.	Hand, Telecommunications	2.6 Cable installation	9, 18, 21, 28, 51, 52	27		4				2- Preparing and maintaining cabling
2.9 Cable ties not tightened to the point of causing cable sheath damage or transmission impairment are trimmed flush to prevent risk of personal damage.	Hand, Telecommunications	2.6 Cable installation	58							2- Preparing and maintaining cabling
2.10 Cables installed as catenaries or supported by catenaries in external environment shall meet minimum above ground clearances and clearances from hazardous electrical services as per AS/ACIF S009.	Hand, Telecommunications	2.6 Cable installation	22, 24, 25, 26		2.1					2- Preparing and maintaining cabling
2.11 Cables installed underground shall meet minimum depth of cover and segregation from hazardous electrical and other services as per AS/ACIF S009.	Hand, Telecommunications	2.7 Underground cabling								2- Preparing and maintaining cabling
2.12 Over-voltage protection devices are fitted to all cable pairs, where required, to suppress voltage surges with the devices protectively earthed in accordance with AS/ACIF S009.	Hand, Telecommunications	2.8 Earthing cable	11, 27, 48							2- Preparing and maintaining cabling
2.13 TRC/CES/Earth wire insulation is protected against damage and TRC/CES and protective earths segregated in accordance with relevant industry and legislative standards AS/ACIF S009.	Hand, Telecommunications	2.8 Earthing cable	12, 19, 56							2- Preparing and maintaining cabling
2.14 Procedures for referring non-routine events to immediate supervisor for directions are followed.										
2.15 Cabling is installed efficiently without waste of materials and energy or damage to apparatus, the surrounding environment or services.			33							

2.16 Routine quality checks are carried out to ensure cabling complies with requirements.	Hand, Telecommunications	2.9 Ensuring compliance	70, 71	17		3				2- Preparing and maintaining cabling
<b>3. Terminate and test cables and earth wires.</b>										
3.1 Established OHS risk control measures and procedures for carrying out the work are followed.	Hand, Telecommunications	3.1 Risk management	71							3 - Terminating and testing cable and earth wires
3.2 Cable sheath removed to allow for correct termination length and without damage to underlying conductors and their insulation.	Hand, Telecommunications	3.2 Cable preparation								3 - Terminating and testing cable and earth wires
3.3 Terminating modules are installed in accordance to manufacturer specifications and cable pairs neatly and sequentially fanned for termination.	Hand, Telecommunications	3.2 Cable preparation	36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47	18, 25, 26		14, 15				3 - Terminating and testing cable and earth wires
3.4 Conductors are terminated in accordance with recommended colour code sequence using appropriate termination tools in the manufacturer's specified manner.	Hand, Telecommunications	3.2 Cable preparation	20, 35, 36, 38, 39, 40, 41, 44, 46, 47, 49, 50	18	3.1	14, 16	3			3 - Terminating and testing cable and earth wires
3.5 Cable shield (if applicable) is earthed to manufacturer specifications and relevant industry codes of practice including AS/ACIF S009.	Hand, Telecommunications	3.5 Cable shielding	18, 19, 51, 52			17, 18				3 - Terminating and testing cable and earth wires
3.6 Visual inspection is undertaken to confirm termination colour code sequence has been followed prior to end-to-end testing of wire and pair termination integrity.	Hand, Telecommunications	3.4 Colour code	49							3 - Terminating and testing cable and earth wires
3.7 Cable pairs are tested and clearly labelled to provide an accurate identification in accordance with requirements.	Hand, Telecommunications	3.7 Labelling	10, 55		3.2	22			3	3 - Terminating and testing cable and earth wires
3.8 TRC/CES/Earth wires are terminated with connectors recommended by manufacturers in accordance with relevant industry codes of practice including AS/ACIF S009.	Hand, Telecommunications	3.8 Earthing requirements	6, 56, 57			7				3 - Terminating and testing cable and earth wires
3.9 TRC/CES /Earth wire continuity is maintained through out and interface requirements with electrical systems are observed.	Hand, Telecommunications	3.9 Earthing installation	6, 18, 19, 56, 57							3 - Terminating and testing cable and earth wires
3.10 TRC/CES /Earthing installation is tested for continuity, insulation resistance and conductive resistance as per relevant industry standards including AS/ACIF S009.	Hand, Telecommunications	3.10 Earthing testing	57			18				3 - Terminating and testing cable and earth wires
3.11 Earthing system is labelled in accordance with requirements.	Hand, Telecommunications	3.11 Earthing labelling	55							3 - Terminating and testing cable and earth wires
3.12 Compatibility of alterations with existing systems is confirmed and new work tested both in isolation and when integrated with existing systems.	Hand, Telecommunications	3.12 Alterations								3 - Terminating and testing cable and earth wires
3.13 Procedures for referring non-routine events to immediate supervisor for directions are followed.										
3.14 Cabling is terminated efficiently without waste of materials and energy or damage to apparatus, the surrounding environment or services.						21				
3.15 Routine quality checks are carried out and a defect rectified to ensure cabling complies with requirements.			71							
<b>4. Complete cabling work, records and reporting</b>										
4.1 OHS work completion risk control measures and procedures are followed.			7, 13, 34, 71		1.4	13				
4.2 Work site is cleaned and made safe in accordance with established procedures.	Hand, Telecommunications	4.3 Waste management	62							4 - Completing cabling work
4.3 Record sheets and plans of cable location, type and infrastructure are accurately created or updated and stored in accordance with customer requirements.	Hand, Telecommunications	4.1 Compliance	16, 17, 26, 63			23				4 - Completing cabling work
4.4 Cable pair record books are created or updated to provide an accurate record of pair locations, inter-connections and usage in accordance with industry codes of practice and AS/ACIF S009.	Hand, Telecommunications	4.1 Compliance	16, 63			10				4 - Completing cabling work
4.5 Cabling completion advice is documented and reported in accordance with requirements.	Hand, Telecommunications	4.1 Compliance	2, 60	21, 22		19, 24				4 - Completing cabling work
<b>Required skills and knowledge</b>										
KS01-EF102A Telecommunications telephony and switching										
Evidence shall show an understanding of telecommunications telephony and switching, applying safe working practices and relevant Standards, Codes and Regulations to an extent indicated by the following aspects:										
T1. Principles and characteristics of sound encompassing:	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Sound characteristics	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								

• Sound waves	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Distortion	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Attenuation	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Resonant frequency	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Sound pressure levels	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
T2. Transmission of sound encompassing:	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Compression	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Rarefaction	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Sound transmission	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Wavelength	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Inverse square rule (attenuation)	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
• Basic telephone construction	Hand, Telecommunications	2.10 Understanding telecommunications telephony and switching: Sound								
T3. Telephone transmitters encompassing:	Hand, Telecommunications	2.11 Understanding telecommunications telephony and switching: transmitters, receivers and circuits								
• Telephone transmitter functions	Hand, Telecommunications	2.11 Understanding telecommunications telephony and switching: transmitters, receivers and circuits								
• Telephone transmitter types	Hand, Telecommunications	2.11 Understanding telecommunications telephony and switching: transmitters, receivers and circuits								
• Capacitive transmitters	Hand, Telecommunications	2.11 Understanding telecommunications telephony and switching: transmitters, receivers and circuits								





• Environmental and heritage awareness purpose and regulations	Hand, Telecommunications	4.2 Environmental and heritage awareness								
T4 Cable installation encompassing:	Hand, Telecommunications	2.6 Cable installation								
• Hazards	Hand, Telecommunications	3.1 Risk management				8				
• Cable damage prevention	Hand, Telecommunications	2.5 Manufacturer's requirements								
• Cable dispensers	Hand, Telecommunications	2 - Preparing and maintaining cabling								
• Cable enclosures	Hand, Telecommunications	2 - Preparing and maintaining cabling								
• Types	Hand, Telecommunications	2.3 Cabling pathways				22				
• Fixing	Hand, Telecommunications	2.3 Cabling pathways				9				
• Regulations	Hand, Telecommunications	1.1 The telecommunications industry				10, 13, 19				
• Distribution boxes and back mounts	Hand, Telecommunications	2 - Preparing and maintaining cabling				14, 15				
• Systems	Hand, Telecommunications	2 - Preparing and maintaining cabling								
T5 Termination Boundaries and devices encompassing:	Hand, Telecommunications	3.3 Termination types								
• Electrical connections						3.1				
• Hazards						2.5				
• Regulations										
T6 Cable preparation and terminations and hauling mechanisms encompassing:										
• Indoor Methods	Hand, Telecommunications	2.2 Pre-cabling installation								
• Outdoor Methods										
T7 Earthing concepts encompassing:										
• MEN System	Hand, Telecommunications	3.8 Earthing requirements								
• Communication Earthing System	Hand, Telecommunications	3.8 Earthing requirements								
• Telecommunication Reference Conductor	Hand, Telecommunications	3.8 Earthing requirements								
• Earthing Cable Shield	Hand, Telecommunications	3.5 Cable shielding				17				
• Testing	Hand, Telecommunications	3.10 Earthing testing				18				
• Earth Barriers										
• Purpose of earth testing instruments										
• Earth Potential Rise										
• Earthing test procedures	Hand, Telecommunications	3.10 Earthing testing								
• Interpretation of results						18				
T8 Surge suppression and system encompassing:	Hand, Telecommunications	2.8 Earthing cable								
• Purpose										
• Types										
• Operation										
• Installation Techniques										
• Earthing requirements										
T9 Cable shielding and interference encompassing:	Hand, Telecommunications	3.5 Cable shielding								
• EMI/RFI Principles	Hand, Telecommunications	3.5 Cable shielding								
• Sources										
• Reduction Techniques										
• Earthing Cable Shields	Hand, Telecommunications	3.5 Cable shielding								
T10 Telecommunication earthing systems encompassing:										
• Hazards										
• Solutions										
• Installation	Hand, Telecommunications	3.9 Earthing installation								
• Termination	Hand, Telecommunications	3.3 Termination types								
• Line taps										
• Testing	Hand, Telecommunications	3.10 Earthing testing								