Learners Guide

ICTWHS201

Provide Telecommunications Services Safely on Roofs

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Unit Introduction

This resource covers the unit ICTWHS201 - Provide telecommunications services safely on roofs.

This unit describes the skills and knowledge to engage in safe work practices when installing or repairing telecommunications equipment on roof structures.

It applies to individuals employed as technicians and installers who are required to safely install or repair telecommunications equipment on roof structures. It includes planning, risk assessment and implementing control measures while undertaking telecommunications installation or repairs.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Release 1. This version first released with ICT Information and Communications Technology Training Package Version 2.0.

About This Resource

This resource brings together information to develop your knowledge about this unit. The information is designed to reflect the requirements of the unit and uses headings to makes it easier to follow. You should read through this resource to develop your knowledge in preparation for your assessment. At the back of the resource are a list of references where information has been sourced.

As a student it is important to extend your learning and to search out textbooks, internet sites, talk to people at work and read newspaper articles and journals which can provide additional learning material. Your trainer may include additional information and provide activities, PowerPoint slide presentations, and assessments in class to support your learning.

About Assessment

Throughout your training we are committed to your learning by providing a training and assessment framework that ensures the knowledge gained through training is translated into practical on the job improvements.

You are going to be assessed for:

- Your performance and knowledge using written and practical activities that apply to a workplace environment
- The foundation skills required to perform the job role
- Your ability to apply your learning to the workplace
- Your ability to recognise common principles and actively use these on the job

You will receive an overall result of Competent or Not Yet Competent for the assessment of this unit. The assessment is a competency based assessment, which has no pass or fail. You are either competent or not

yet competent. Not Yet Competent means that you still are in the process of understanding and acquiring the skills and knowledge required to be marked competent.

The assessment process is made up of a number of assessment methods. You are required to achieve a satisfactory result in each of these to be deemed competent overall.

All of your assessment and training is provided as a positive learning tool. Your trainer/assessor will guide your learning and provide feedback on your responses to the assessment. For valid and reliable assessment of this unit, a range of assessment methods will be used to assess practical skills and knowledge.

Your assessment may be conducted through a combination of the following methods:

- Written Activities
- Case Studies
- Observation of practical tasks
- Short answer questions
- Third Party Reports

The assessment tool for this unit should be completed within the specified time period following the delivery of the unit. If you feel you are not yet ready for assessment, discuss this with your trainer/assessor.

To be successful in this unit, you will need to relate your learning to your workplace. You may be required to demonstrate your skills and be observed by your assessor in your workplace environment. Some units provide for a simulated work environment, and your trainer and assessor will outline the requirements in these instances.

Elements and Performance Criteria

Elements describe the essential outcomes.	Performance criteria describe what needs to be done to demonstrate achievement of the element.
1. Follow workplace procedures for hazard identification and risk control	1.1 Notify customer and arrange site access 1.2 Recognize and report hazards in the work area to designated personnel according to workplace procedures 1.3 Follow work health and safety (WHS) legislative requirements, workplace procedures and work instructions to control risks 1.4 Comply with safe work practices for working safely on roofs and adhere to workplace environmental requirements throughout the work 1.5 Implement duty of care requirements to provide a safe working environment 1.6 Complete job safety analysis (JSA) sheets according to work requirements, including hazard identification and risk assessment 1.7 Use and maintain personal protective equipment and personal safety equipment according to work requirements and apply fall protection and personal safety requirements according to regulatory requirements
2. Prepare for work on rooftop	2.1 Assess scope of work according to workplace procedures, relevant legislation, codes, regulations and standards and relevant job information details 2.2 Inspect site to determine layout and equipment requirements according to work order 2.3 Select materials, tools and equipment, including personal protective equipment, and check for serviceability 2.4 Inspect and install fall protection and perimeter protection equipment, ensuring adequacy for work and conformance to regulatory requirements 2.5 Install roof safety system according to workplace and regulatory requirements 2.6 Select and install appropriate signage and barricades

3. Perform telecommunications work on rooftop	3.1 Inspect access from ground to work area ensuring it is safe and according to regulatory requirements
	3.2 Estimate total weight of material to be raised to rooftop to carry out the work
	3.3 Determine and use the safest lifting method to bring materials and equipment to rooftop according to regulatory requirements
	3.4 Secure test equipment, hardware and tools safely on rooftop and distribute weight to eliminate risk of damage to roof cover
	3.5 Inspect safety system periodically for compliance with regulations according to workplace procedures and report faults
	3.6 Monitor risk control measures to ensure they are effective and appropriate to the task and work environment
	3.7 Reassess risk control measures as required, according to changed work practices or site conditions and make alterations within scope of authority
4. Complete activities and documentations	4.1 Dismantle safety system according to prescribed sequence and remove from worksite
	4.2 Clear work area and dispose of materials or recycle according to state and territory legislation and workplace procedures
	4.3 Clean, check and maintain tools and equipment according to manufacturer's recommendations and workplace procedures
	4.4 Complete documentation according to workplace requirements and notify customer for sign off

Foundation skills

This section describes the language, literacy, numeracy and employment skills essential to performance in this unit but not explicit in the performance criteria:

Skill	Performance Criteria	Description
Reading	2.6	• Interprets textual information from sources to identify relevant safety signs
Writing	1.2, 1.6, 4.4	• Prepares documentation and correspondence using clear language, correct spelling and terminology in the preparation of reports, JSA, SWMS and other reports
Oral Communication	1.1, 1.2, 4.4	• Uses clear language and concepts, and tone and pace appropriate for the audience and purpose
Numeracy	3.2	• Performs mathematical calculations to estimate, interpret and confirm safe roof loading
Navigate the world of work	1.3-1.5, 1.7, 2.1, 2.4, 2.5, 3.1, 3.3, 3.6, 3.7, 4.1-4.3	• Complies with explicit policies and procedures. • Explores and implements, where identified, the implicit expectations of policies and procedures
Interact with others	1.1, 1.2, 4.4	• Identifies and takes steps to follow accepted communication practices and protocols • Uses a limited range of accepted practices for communicating in a work environment
Get the work done	1.1, 1.2, 1.4-1.7, 2.1-2.6, 3.1-3.4, 3.6, 3.7, 4.1-4.4	• Plans and implements routine tasks and workload making limited decisions on sequencing, timing and collaboration, and seeks assistance in setting priorities • Responds to predictable routine problems, implementing standard or logical solutions

Performance and knowledge evidence

Performance Evidence

Evidence of ability to:

- Locate, interpret and apply relevant information, standards and specifications for working safely on roofs
- Apply safety requirements throughout the work sequence, including the use of personal protective equipment
- Provide for erection, maintenance and dismantling of the fall and perimeter protection requirements for the site
- Carry out a risk assessment ensuring:
    - Correct identification of risks and safety requirements
    - Correct selection and use of appropriate processes, tools and equipment
    - Completion of all work to specification
    - Compliance with regulations, standards and organisational quality procedures and processes
    - Open communication and the ability to work effectively and safely with others.

Note: As a minimum, given the plans and specifications for the roof working area of a corner, extending at least 4 metres in either direction and greater than 1.8 m high, incorporating harnesses and harness fixing points for safe personal and stores access to the roof, stores and equipment locations

Knowledge Evidence

To complete the unit requirements safely and effectively, the individual must:

- Describe the purpose of job safety analysis (JSA) and safe work method statements
- Identify the various hazards associated with working on roofs
- Identify levels of responsibility when operating in a hazardous situation
- Specify workplace procedures relating to working on roofs
- Describe the hierarchy of control in a workplace health and safety environment in the context of:
    - Hazards
    - Risk
    - Control

- List and describe common workplace practices that impact health and safety
- Explain ‘duty of care’ and its relevance to workplace health and safety
- List and describe the use of safety personal protective equipment (PPE) and equipment used for working on roofs
- Describe safe lifting methods
- Explain reporting methods for safe work practices
- Explain the nature of work undertaken on roofs
- List and apply processes of providing for safe working practices
- Identify and comply with relevant statutory and regulatory authority requirements related to working safely on roofs
- Identify and use roof safety equipment and systems and considerations to facilitate working safely on roofs
- Apply SI system of measurement for measurement.

Assessment Conditions

Gather evidence to demonstrate consistent performance in conditions that are safe and replicate the workplace. Noise levels, production flow, interruptions and time variances should be typical of those experienced in the Telecommunications – Occupational Health and Safety field of work and include access to:

- Site on roof where operations may be conducted
- Induction procedure and requirements
- Relevant specifications and work instructions
- Tools and equipment appropriate to applying safe work practices
- Support materials appropriate to activity
- Workplace instructions relating to safe working practices and addressing hazards and emergencies
- Relevant regulations, standards specifications and manuals, including industry related systems information.

Assessors of this unit must satisfy the requirements for assessors in applicable vocational education and training legislation, frameworks and/or standards.

Pre-Requisites

This unit must be assessed after the following pre-requisite unit:

- There are no pre-requisites for this unit.

Unit overview

Welcome to the unit ICTWHS201 - Provide telecommunications services safely on roofs.

This unit describes the skills and knowledge to engage in safe work practices when installing or repairing telecommunications equipment on roof structures.

It applies to individuals employed as technicians and installers who are required to safely install or repair telecommunications equipment on roof structures. It includes planning, risk assessment and implementing control measures while undertaking telecommunications installation or repairs.

No licensing, legislative or certification requirements apply to this unit at the time of publication.

In this unit you will learn how to:

- Follow workplace procedures for hazard identification and risk control
- Prepare for work on rooftop
- Perform telecommunications work on rooftop
- Complete activities and documentations

Let's begin!

Topic 1 - Follow workplace procedures for hazard identification and risk control

Notify customer and arrange site access

Explain the nature of work undertaken on roofs

This Learner Guide deals with the safe installation of telecommunication services and equipment on rooftops. Such equipment may include:

- Antennas
- Dishes
- Towers
- Masts
- Associated accessories
- Wiring and cabling etc.

It has been found that rooftops provide an excellent location for equipment and services needed for the wireless network and similar communication systems. (See Fig 1 for typical rooftop installation of communication equipment.)

Rooftops are cost effective in comparison to traditional communication and/or mobile towers. In addition, rooftops can provide the desired heights necessary for efficient operation of wireless network services.

Prior to making the all-important decision, that your building's rooftop is to be given out for the installation of wireless network services, and associated equipment, it is necessary to ensure that:

- There is no negative impact on the stability of the roof.
- All regulatory compliance requirements are adhered to.
- Grounding requirements can be satisfactorily met with.
- Building Code of Australia provisions are met.
- Environmental Protection Agency (EPA) requirements are complied with.
- Provisions of National Electrical Code are satisfied.

A decision to install the rooftop equipment can be thereafter made by the relevant personnel, the stakeholders, senior management and the property owners. Once such a decision has been made, the customers (carriers who need the rooftop) may be notified about it. Thereafter access can be given to them to proceed with their installation works.

It should be noted that under the Telecommunications Act (1997-Australia), building owners, service providers and tenants have certain rights and obligations while giving/getting access to buildings to install communication equipment and services.

Access is needed to rooftops by service providers and network carriers due to the following reasons:

- To inspect the site for its suitability for installation. (Carriers and service providers have a right to inspect in order to determine the suitability of the location).
- To provide communication and broadband services to the general public and any particular agencies, societies, clubs etc. in the area. (Customers of the service providers).
- To install radio communication services if required.
- To maintain already installed facilities.

For these purposes and to ensure that all legal and regulatory provisions are complied with, the communication service providers may be notified and given access to the rooftop site.

Fig 1. Typical telecommunication equipment on rooftops.

Specify workplace procedures relating to working on roofs

There is a range of policies and procedures that relate to working on a roof. They may include, but are not limited to:

- Emergency procedures
- Fall arrest procedures
- Safe Work Method Statements
- Job safety analysis
- Reporting procedures
- Manual handling procedures
- Safe operation of equipment

Workplace procedures must be followed at all times to ensure the safety of everyone in the area.

QUESTION/ACTIVITY

1. How would you gain access to a site?

Recognise and report hazards in the work area to designated personnel according to workplace procedures

Identify the various hazards associated with working on roofs

With respect to the installation of telecommunication equipment and services, at first, you have to select the particular method out of the several methods available for hazard identification.

Hazards may include:

- Contact with electrical wiring
- Environmental hazards:
    - Air pollution
    - Dangerous gases
    - Heavy or noxious metals pollution
    - Noise
    - Petrochemical spillage
    - Prevailing weather condition
    - Release of hydrochlorofluorocarbons (HCFC)
- Fibre offcut damage to eyes and skin
- Flammable cleaning chemicals fluids and solvents
- Health hazards:
    - Dangerous or harmful substances
    - Handling of optic fibres and lasers
    - Risk of infection
    - Risk of sustained injury from repetitive tasks
- Laser damage to eyes
- Radio frequency (rf) exposure from transmitting antenna in close proximity
- Roof safety system in poor condition or non-existent
- Safety hazards
    - Biomechanical

- Lifting
- Potentially harmful procedures, such as welding
- Working at heights.

Explain reporting methods for safe work practices

Monitoring and reporting systems checklists, regular inspections, type of materials used, serviceability of tools and equipment, availability of safety manpower etc. are some of these methods. If these standard methods (which are part of the general workplace procedures) are not suitable, then any other method suitable for your rooftop (such as the method of inspecting the workplace at frequent intervals of time) may be selected. You can thereafter use it to identify the hazards observed, record them on a site register and report about them to both the safety and higher management teams on site.

At any given time, if you have recognized and/or observed a hazard on the rooftop or elsewhere in the building such as a live electric wire or a projecting steel beam which can hurt someone, you should immediately initiate action on it.

You need to record and report all hazard details in the workplace document control system. This is a standard workplace procedure. Use this record also to report the hazard and bring the attention of the site management for immediate remedial action, before any injury takes place.

People working on the hazardous surroundings and rooftops should be warned and advised to relocate to safer places, till action has been taken to remove the identified hazard.

Using the particular method which you have selected to identify hazards, you have to carry out the following: (as this is also a common practice in workplace procedures)

- Prepare a detailed list of all the hazards which you have observed in the work location and/or rooftop.
- In this list, note down items on which action is urgently required.
- Items on which action is already initiated may be indicated separately.
- Identify items on which additional resources, tools, materials, manpower are required to resolve them.
- Point out the likely risks (such as falling down from a high roof edge) which may be generated by the observed hazards.
- Report all your observations and recommendations to the management.
- All available SDS (Safety Data Sheet) should be studied to take appropriate precautions as required.
- Operation Manuals, instructions, installation procedures supplied by manufacturers shall also be studied well to install communication equipment safely and without creating hazards.
- The site management team has to enable, guide and supervise the above activities. To achieve this, a designated site safety management team should be set up for bigger jobs. For smaller jobs, one

authorized site safety engineer can carry out the functions. All hazards, as observed, should be reported to the management for further action.

- It is required to ensure that all the relevant requirements of the WHS Act's (Australia) are complied with.
- Ensure that a suitable Safety Manual has been prepared, together with a Job Safety Analysis, Safe Work Method Statement, and Material Safety Data Sheets etc.
- All local area/ city/county/territory/state regulations are all complied with in the process of hazard identification.
- Standard Codes of Practice, prevailing in the area/state/territory must be checked to ensure that hazard identification has been achieved in a professional manner.
- The design team should also be consulted during this process of hazard identification, to note the possibilities of any design or material changes which may affect the existing hazardous situation and/or which may generate new hazards on the rooftop/workplace.
- Use the checklist to make sure all possible hazards have been covered
- It is also a good step to check with the personnel working on site/rooftops about likely hazards which may have hitherto escaped attention.
- Note that the WHS Act has defined duties and responsibilities of PCBU [Persons conducting a business or undertaking] with respect to ensuring and managing all health and safety issues at the workplace. These include identifying hazards, assessing risks from hazards, removing and managing risks etc.

Identify levels of responsibility when operating in a hazardous situation

Duty to manage WHS risks

The model WHS laws require duty holders to manage WHS risks in the workplace.

Duty holders include:

- PCBUs
- designers, manufacturers, importers, suppliers and installers of plant, substances or structures, and
- officers

Workers and other persons at the workplace also have duties under the model WHS laws, such as the duty to take reasonable care for their own health and safety at the workplace.

A person can have more than one duty and more than one person can have the same duty at the same time.

List and describe common workplace practices that impact health and safety

There is a range of workplace practices that can impact on the health and safety of everyone. These include but are not limited to:

- Not following procedure – not following workplace procedures is the greatest error in safety. Procedures are there to keep everyone safe.
- Taking short cuts – trying to save time by taking shortcuts is dangerous and should be avoided.
- Ignoring instructions – ignoring instructions for supervisors and or site managers can impact the safety of those around you.
- Not following manufacturer's instructions on the safe use of equipment can cause accidents and injury.

QUESTION/ACTIVITY

2. What hazards are associated with working on a rooftop?

3. How would you identify hazards associated with the job?

4. Who would you report hazards to?

Follow work health and safety (WHS) legislative requirements, workplace procedures and work instructions to control risks

In all the works associated with the installation of communication equipment and services on selected rooftops, it is mandatory to comply with all relevant WHS regulations. This requirement has to be made an integral part of the workplace procedure, site safety manual etc.

WHS legislative requirements are provided by:

- State and Territory legislation, Regulations, Codes of practice
- Workplace policies and procedures

These must be followed by all relevant personnel to control risks when installing communication equipment and services on rooftops.

The legislation gives general guidelines and information about various business processes and the manner in which employees should conduct themselves. Failure to follow and comply with legislation may result in penalties.

Legislation relating to health and safety may change; therefore, it is better to perform regular research. Legislative requirements include areas such as:

- General duty of care requirements (see section 1.5)
- Regulations and approved codes of practice relating to risks on rooftops. (falls, fall prevention measures)
- Requirements to establish consultations with workers and health- safety representatives.
- Requirements for improved, more effective risk control and management.
- Requirements for provision of training to site personnel in safe operating procedures, risk assessment methods and control.

The WHS Act 2011 defines duties of Persons Conducting a Business or Undertaking (PCBU) and workers. PCBU's have the following WHS duties and responsibilities:

- Ensure the health and safety of workers, clients and visitors by removing risks on the rooftops.
- Provide adequate facilities, access, and exit routes for workers.
- Provide training, instruction and supervision to protect all workers from risks to their health and safety due to the work.
- Monitor regularly the health of workers.
- Maintain the work environment as safe as possible.

Workers have the following WHS duties and responsibilities:

- Always carry out safe work practices only.
- Take care of their own health and safety.
- Report to supervisor all incidents, near misses, injuries and hazards.
- Seek WHS information or advice from supervisor where necessary.
- Participate in discussions with the management on WHS risks
- Follow all WHS policies and procedures.
- Wear appropriate clothing, footwear and protective equipment.
- Familiarize with emergency procedures.

Following all WHS policies, procedures, regulations and duties stipulated therein will enable the process of achieving a safe site in which the risks of injury are a minimum.

QUESTION/ACTIVITY

5. What are your WHS duties?

Comply with safe work practices for working safely on roofs and adhere to workplace environmental requirements throughout the work

As per the regulations (WHS Act of Australia), all the work associated with roofs must be carried out in a safe environment. It follows therefore that all communication equipment installation on rooftops must also follow suit. To achieve this, the following points must be attended to, throughout the work process.

Describe the purpose of job safety analysis (JSA) and safe work method statements

The safety manual for the specific project must be available on site, together with the SWMS (Safe Work Method Statement) and JSA (Job safety Analysis). Job safety analyses (JSA), job safety and environment analyses (JSEA) and safe work method statements (SWMS) are documents which explain how you can work in a health and safety way in the specific context in which you work.

These documents should be part of the various workplace procedures and instructions to be followed on site, with respect to safety. The clauses relevant to the installation of communication equipment on rooftops must be verified to ensure that full compliance with the manual is achieved throughout the site.

As this work involves working on roof levels, at higher elevations from the ground level, there should be no hazards to the manpower working on site rooftop, such as falling from a height. It is necessary as per the WHS Act of Australia and OSH [Occupational Safety and Health] regulations that all those who are working on site are assured of their safety. Any potential dangers and hazards need to be eliminated by careful planning and regular inspection for compliance. Consideration needs to be given for work at roof edges, corners etc. with additional protection.

We need to make certain that fall prevention steps have been implemented on the worksite. Trip hazards are removed such as loose wires or cables or hangers lying on the rooftops, alongside the walls, wrongly placed pipes, structural items etc.

Other hazards of working on rooftops (other than the severe hazards of falling from heights and tripping/slipping over) may include live overhead electric lines, high noise levels, adverse weather conditions etc.

Safety gear such as hard hats, hand gloves, safety shoes etc. should be available to everyone involved in the work. All PPE i.e. Personnel Protection Equipment) should be made available on site, before the work starts.

Safe work rules for working at heights should be followed. This is especially applicable while working on rooftops. Working on rooftops for installing any equipment also needs special protection, scaffolding, proper access/exit etc.

The following safety measures should be given special consideration while installing communication equipment on rooftops while working on rooftop corners and roof edges:

- Provision of safety mesh and nets.
- Guard railing.
- Safe access to the rooftop
- Avoid excessive loads on the structure by not storing all equipment at one point

- Provide gutter boards
- Fall prevention systems and safety harnesses, static lines must be installed.
- As electric powered saws may be used for cutting sheets, tower components, mounting plates etc., safety precautions should be taken to keep workers away from power sources, the likelihood of coming into contact with live wires/cables etc.

Emergency procedures must be in place, in the case of any unsafe incidents, fire etc. taking place. First aid should be available on site, with bandages, cotton, essential medicines etc. In addition to the above, we must ensure that:

- All practically possible steps have been taken to avoid injury to workmen.
- Safety supervisors/ engineers have checked the conditions at the work site.
- Facilities for evacuation in emergency situations are available.
- Fire extinguishing systems are in place.
- All workmen have been made aware of safety regulations and requirements.
- Additional protective measures for work on roof corners, and edges.
- Entry of unauthorized personnel to work area has been stopped.
- Strict supervision for implementation of safety procedures is available on site.
- Collision of personnel is eliminated.
- Careful use of tools and equipment especially those having sharp cutting edges, injury-causing blades and similar.
- Local government regulations are complied with.

QUESTION/ACTIVITY

6. Describe three (3) safe work practices used when working on a roof.

Implement duty of care requirements to provide a safe working environment

Explain 'duty of care' and its relevance to workplace health and safety/List and apply processes of providing for safe working practices

For the purposes of this Learner Guide, we have to note that the WHS Act of Australia defines **a** PCBU as any person or entity conducting a business/construction operation.

The WHS Act stipulates that all PCBUs should ensure the health and safety of:

- Workers engaged and
- Workers whose activities are instructed and monitored by the person/PCBU

This primary duty of care requires duty holders to ensure health and safety by removing all risks to health and safety. All risks must be minimized if not removed.

Workers have the following WHS responsibilities:

- Engage in safe work practices
- Take reasonable care for own health and safety and that of others who may be affected by their acts or omissions
- Report to supervisor all incidents and injuries, and hazards or WHS issues of concern
- Seek WHS information or advice from supervisor where necessary, particularly before carrying out new or unfamiliar work
- Participate in discussions and consultation on the management of WHS risks that may affect them
- Follow policies and procedures with respect to WHS
- Wear appropriate clothing, footwear and protective equipment for the work being done and properly use relevant safety devices
- Do not wilfully place at risk the health, safety or wellbeing of others or misuse safety equipment
- Familiarise themselves with emergency procedures and cooperate with directions from emergency wardens

PCBUs owe a similar duty of care to other people who may be at risk from work carried out by the business or undertaking.

Under the primary duty of care, a PCBU must ensure:

- The availability of a safe working environment without risks to health. There must also be safe access to and exit from the jobsite.
- The safe availability of plant, structure and systems of work which do not create health risks (by providing effective guards on machines and regulating the schedules of work)

- The safe use, handling, storage and transport of plant, structure and materials (toxic chemicals, dust and fibres)
- The provision of facilities (access to washrooms, lockers and dining areas)
- The provision of instructions, training or supervision to workers to do their jobs without risk to their personal health and safety
- That the health of workers and the conditions of the workplace are regularly monitored to prevent injury or illness and
- The maintenance of safe and suitable accommodation for workers.

Duty of care also implies the additional responsibility to consult with other similar duty holders.

The WHS legislation requires duty holders with shared responsibilities to coordinate and work together as an effective team to make sure what is needed is carried out in a safe manner. This requires regular consultation, co-operation and co-ordination between the various persons holding the duty of care.

As an example, there can be a work situation where a number of different duty holders are involved in influencing how work is carried out (such as suppliers, contractors and consultants/owners).

If more than one person has a health and safety duty in relation to the same issue, they must cooperate and coordinate all the relevant activities. Each must share the relevant health and safety-related information in a timely manner to comply with their shared health and safety responsibilities.

The duty to 'consult' may not involve total agreement on all issues, though each duty holder retains responsibility for discharging their part of the health and safety duty.

Each PCBU must also consult with workers and Health Safety Representatives (if any) about matters directly affecting them.

This duty of care extends to consulting with all kinds of workers not just the PCBU's own employees, including any nominated subcontractors and their workers, employees of labour hire companies, students on work training, apprentices and others.

Proper performance of the " duty of care" by the PCBU, the workers, the health and safety representatives, owners, consultants, local authority officials etc. can go a long way in achieving a site/workplace which is free from hazards and the consequent risk of injury to the personnel working on a given rooftop installation.

QUESTION/ACTIVITY

7. What is your 'duty of care' when working?

Complete job safety analysis (JSA) sheets according to work requirements, including hazard identification and risk assessment

Along with the SWMS (Safe Work Method Statement) included in the site Safety Manual, it is also now standard practice to prepare a Job Safety Analysis (JSA) and JSEA as a part of the hazard management process.

As a minimum, for the job of installing telecommunication cabling, equipment, towers etc. on roof tops, it is necessary to include the following minimum safety requirements in the JSA:

- Identification of the existing and potentially new hazards (live wires, loose cabling, trip hazards, unprotected roof edges etc. are examples)
- An assessment of the various risks resulting from the hazards (falling from a height is a serious risk during rooftop equipment installation)
- Control measures required to remove completely or minimize, as much as practicable, the risks resulting from the hazards and
- Identification and contact information details of the authorized and competent persons who are responsible for implementing and monitoring the control measures as well as the program for managing hazards in the workplace.

Fig. 2. Job Safety Analysis definition.

The SWMS (Safe Work Method Statement, generally included as a part of the Site Safety Manual) must, as a minimum requirement:

- Identify all high-risk rooftop equipment installation works.
- Specify all the health and safety hazards and risks created by them.
- Mention the safe work methods proposed to control the risks.

- Describe risk control measures and how they will be implemented, monitored and reviewed at the workplace.
- These documents JSA and SWMS must be developed in consultation with workers and their representatives

Guidelines to identify hazards at a given workplace may be included in the above documents; JSA/SWMS.

Identifying hazards on a rooftop communication equipment installation job may involve observing keenly the work environment, installation materials and equipment used, various work procedures and assessing if they are safe and follow standards, codes, regulations etc. Examples of common hazards include but are not limited to the following:

- Overworking by workers leading to physical stresses and strains.
- Objects falling from heights falls, slipping and tripping over site obstacles.
- Live electric wires, equipment.
- Noise above permissible levels causing a disturbance, hearing hazards.
- Adverse weather conditions.

Risk assessments also need to be carried out depending upon the severity of the likely risk, the effectiveness of already included control measures (in the JSA/SWMS), activities proposed to be taken for eliminating and controlling risk etc.

Wherever practicable, the hazard should be completely eliminated, or the risk mitigated, by revising, altering and or modifying the work methods to be more safe or better construction operations or by use of a different type of equipment.

Fig. 3. Typical note of caution to use JSA

QUESTION/ACTIVITY

8. What are four (4) examples of common hazards?

Use and maintain personal protective equipment and personal safety equipment according to work requirements and apply fall protection and personal safety requirements according to regulatory requirements

The erection of telecommunication services on rooftops (such as roof-mounted towers, microwave antennas, dish antennas etc.) for wireless network services have now become a common requirement. Such installations can be risky construction operations. It is likely that several things may go wrong and injuries and accidents can occur. This is especially so when preparing the rooftop for complex / and large installations. In all the above cases, it is a legal, contractual and mandatory requirement to comply with safety regulations as per the WHS Act of Australia and various standard Codes of Practice applicable to construction projects.

The contractor carrying out the works should define a safety policy in relation to erection work on rooftops. This written safety policy for rooftop work should:

- Include a written commitment to take measures to protect all employees and others at a worksite from injuries, accidents and risks associated with falls from heights.
- Ensure that licensed persons are employed to install, maintain and dismantle equipment on and from rooftops; include a commitment to comply with relevant health and safety legislation, in Australia.

It should also be made compulsory to identify, select and use Personal Protective Equipment in all constructions that have roof systems. Some of the commonly used PPE are indicated below. This should be included in the SWMS (Safe work method statement) and JSA (job safety analysis).

- Head protection: Industrial safety helmet (hard hats).
- Safety footwear (safety boots)
- Fall arrest harness (safety harness)
- Hand protection (Safety gloves)
- Hearing protection (earmuffs or ear plugs)
- Eye protection (safety glasses, goggles).

Industrial safety helmets/ hard hats complying with Australian standards and NZS 5806 (or suitable other approved standards for head protection) must be worn at all times while on a rooftop installation site wherever there is a risk of people falling from above. Or where there is the chance of hitting against operating equipment, tools and plant. And where possibilities exist, for a worker to accidentally hit against piping or tower structural elements. In fact, hard hats are mandatory on almost all projects and work sites in Australia. An elastic/flexible chin strap is necessary to secure the helmet and prevent dislodgement by the wind or minor shocks and hits.

Safety footwear (safety boots)

Footwear should be comfortable to use, fit to the size of the workers using it, provide maximum grip and give good protection from pinching, jamming and crushing. A good range of lightweight, flexible footwear with steel or plastic protective toe caps is available (see AS/NZS 2210.1 or 2210.2). Some sites require steel toe caps to be covered to prevent the risk of creating a spark hazard should steel (read rooftop mobile towers) come in contact with the exposed steel cap.

Fall arrest harness (safety harness)

The commonly available fall arrestors comprise an assembly of mutually connected shoulder and leg straps, often with a body belt, which is to be used when there is the chance for a free fall. Workers who use these items need to be given training in their efficient usage. The lanyard attached to the harness should have a manual link, designed to attach to a standard anchorage point. The maximum lanyard length is 2.0 meters (6.5 feet). Refer to AS/NZS 1891.1. It is compulsory to use this harness when working at heights above 3m and also on rooftops, edges and corners.

Hand protection (Safety gloves)

Leather or split leather well-fitting gloves are necessary on worksites to protect the worker's hands from injury. In extreme weather conditions, the wearing of specialist gloves may be required.

Hearing protection (earmuffs or ear plugs).

Noise is a very common hazard in most worksites, which can adversely affect the health of personnel. There are a wide variety of earmuffs, pads or plugs available to protect against these effects. In Australia and New Zealand, to aid in the selection of noise prevention equipment, a system of classes is used. Some earmuffs are attachable to the safety helmet.

Eye protection (safety glasses)

Safety glasses should have clear and wide vision. They must have protection against Ultraviolet rays, harsh sunlight, be scratch proof and have side shields integrated with the frames. This gives maximum protection for workers and equipment installation staff for most site conditions (see AS/NZS 1337). All safety works and materials should comply with SWMS, JSA and MSDS (Material Safety Data Sheets).

QUESTION/ACTIVITY

9. What types of PPE might you require?

Topic 2 - Prepare for work on rooftop

Assess scope of work according to workplace procedures, relevant legislation, codes, regulations and standards and relevant job information details

At the commencement of the process of planning and designing a communication equipment installation job on a given rooftop, the designers and engineers, principal contractors and rooftop installers should include all relevant details of the recommended loads on the rooftop, safety requirements needed when working on the rooftop, in the relevant engineering drawings.

Specifications should also be included. This data needs to be communicated to the installation subcontractor. With data obtained from the project drawings, we can ensure that an accurate and appropriate design process is followed for the required rooftop and support systems on the project site. This information consisting of workplace procedures, standard work practices, specifications and engineering drawings from the designer/engineer is the main source to obtain, interpret and apply rooftop equipment installation requirements for the given building. The intended rooftop installation must also comply with all the applicable procedures, regulatory authorities' requirements, Australian standards etc.

In general, the following information regarding the nature of rooftop work should be obtained, interpreted properly, documented and applied in the erection of rooftop equipment while complying with all relevant safety regulations; while working safely on roofs.

- Site location
- Worksite instructions
- Job specifications
- Engineering drawings for the communication equipment on rooftops.
- Provision of roof openings, skylights, edge protection, corners, safety systems etc.
- Quality assurance and control requirements.
- Height and length of the proposed communication items and any other multilevel antennas required any critical dimensions which may affect the maximum safe working loads imposed on the roof including on edges, corners.
- Safe number of people who can use the rooftop at a given time (edges, corners)
- Type of access onto the rooftop area e.g., scaffolds, staircase, external ladders.
- If there is a requirement of protection sheeting, netting or guardrails etc.
- SWMS and JSA prepared for the site.

- Any specific requirement or provisions e.g., pedestrian walkway, restrictions or tie locations, fall arrestors when working on edges, corners etc.
- Operational and construction details about the communication services, wiring and cabling, towers/equipment etc. for which the rooftop is required, should all be given to the relevant personnel.
- The main construction program and timeline within which the rooftop equipment installation program should fit in.

QUESTION/ACTIVITY

10. What information regarding the nature of rooftop work should be obtained?

Inspect site to determine layout and equipment requirements according to work order

Prior to the actual commencement of installing telecommunication equipment and services on rooftops, on a given building, an actual inspection of the site must be carried by an authorized representative of the client. This inspection should be preferably carried out together with the principal contractor as well as the nominated equipment installation contractor. The purposes of the site inspection are the following.

- Checking the layout of the building's rooftop so as to determine the points at which services, equipment and materials can be installed on the supporting rooftop structure without causing overload (compared to its designed capacity), concentrated loading, deflection above permissible limits etc.
- The structural and physical condition of the support systems, (including roof corner stability), on which the communication equipment will be installed.
- The weather conditions likely to exist and prevail on site, especially when installation of communication equipment is planned. (Heavy rain, winds, snow etc. are detrimental to the work).

Site inspection is also necessary to ensure the following.

- Controls included in the Safe Work Method Statement can be implemented on the given site/rooftop area without generating any additional risks or hazards.
- Proper access systems can be provided to facilitate access of men and materials to the rooftop work areas.

- Previously established risk prevention systems can be incorporated into the work as well as rooftop area.
- When edge protection systems are installed, workers should be able to reach the work area without taking the risk of climbing over the guard rails.
- Areas can be specifically identified and demarcated for operating plant and equipment such as cranes, man lifts, hoists, elevated work platforms etc.
- Fall prevention systems, scaffolding, guard rails, safety mesh, netting etc. can be installed on site without cumbersome procedures.
- During installation of the rooftop equipment, the environmental and weather conditions should be such that there is no moisture, lichen, dust etc. on the rooftop.
- All Personnel Protection Equipment are on site.
- Safe work practices have been established on site to work adjacent to electrical equipment and services, power lines etc.; together with methods to carry and operate portable equipment.
- All equipment installation workers have been given appropriate training in technically correct installation procedures and safe work practices as well as emergency procedures in case of a serious fall or injury.

When additional work or maintenance is to be carried out on already existing rooftop equipment, a prior inspection of the site is necessary to ensure the following.

- A safety mesh already exists and it is sufficiently strong and well tied.
- Supporting structural components are free from defects and connected with stability
- The presence of skylights has been noticed.
- No hazardous materials such as asbestos are existing.

Regular inspection of the communication equipment installation on rooftops should be carried out to ascertain that all work is proceeding in a safe manner and as per regulatory compliance requirements.

QUESTION/ACTIVITY

11. Why is a site inspection necessary?

Select materials, tools and equipment, including personal protective equipment, and check for serviceability

Materials

It is important to properly identify and select the telecommunication services, equipment etc. to be used for design, construction and installation of rooftop communication equipment.

- While selecting equipment for rooftop installation, it is advisable to obtain the services of qualified engineering professionals. This will enable to make sure that the operation is safe, and the equipment functions well.
- Strength and durability of the roof are not compromised.

It is necessary to ensure that the safety and stability of the rooftop are not compromised in any way due to the installation of communication equipment.

Major communication equipment used for rooftop installation may consist of the following.

- Rooftop communication towers
- Masts
- Radio communication equipment
- Antennas at different levels
- Dish antennas of different types and sizes
- Testing equipment for communication items.
- Accessories of main communication equipment
- All associated wiring and cabling

Identify and use roof safety equipment and systems and considerations to facilitate working safely on roofs

While selecting equipment for rooftop installation, it is advisable to obtain the services of qualified engineering professionals. Such personnel should be suitably qualified, experienced and must have approved certifications and credentials.

The selection of the rooftop communication equipment, materials etc. should be such that:

- They are light in weight (to avoid excessive load transfer to the rooftop)
- Should provide radio frequency shielding.
- Should have lightning protection/proper grounding.
- Have adequate corrosion resistance.

- Have also a good past performance record.
- Must be of reasonable costs.
- Should be easy for maintenance.
- Must satisfy all codes, standards and specifications.
- Must be able to perform well under changing weather conditions, temperature, and rain.
- Should have appropriate electrical characteristics.
- The location/ state and corresponding Australian building codes must be met.
- Council requirements.
- Energy efficiency.

Tools and Equipment

These generally consist of the following.

- Ladders for rooftop access.
- Safety Equipment items.
- Cranes if required as per weight/ loading/lifting/placing requirements.
- Elevating Work Platforms to lift workers, tools, testers etc. to rooftops.

In addition, additional equipment such as a forklift and/or a crane may be needed to transport communication equipment, antennas, towers, masts, cables and wiring etc. from site storage yards to the work area, lift and place on rooftop etc.

Consultation with experienced engineers and professionals is required prior to selecting the required tools and equipment for rooftop equipment installation works. Alternatively, a principal contractor can be assigned the task of communication equipment installation, so that required quality and safety can be ensured.

List and describe the use of safety personal protective equipment (PPE) and equipment used for working on roofs

Personal Protection Equipment (PPE)

- Where PPE is to be used, it should be appropriate for the risks associated with equipment installation work on rooftops. And all PPE should conform to the relevant Australian Standards.
- PPE should be selected by a competent person and inspected and maintained according to the manufacturer's recommendations. There should be sufficient supervision and monitoring conducted to ensure PPE is used and that workers are competent in its use.
- PPE that may be required for rooftop installation work includes:

- Fall arrest equipment – fall arrest harnesses, lanyard assemblies and associated equipment should be comfortable, protect the wearer, allow freedom of movement, and permit access to all areas, especially corners, edges etc., where work is required
- Footwear – rubber-soled shoes are preferable, non-slip tread are recommended for work on roofs; footwear should have good grip, be flexible, and allow the wearer to 'feel' the roof. This footwear may not be suitable for use in other work areas
- Eye protection – dust, flying objects and severe sunlight are the most common sources causing eye damage in construction work. When someone is carrying out equipment installation, welding, cutting, grinding or chipping of concrete or metal, they should be provided with eye protection which conforms to AS/NZS 1337. Eye protection should also be provided when carrying out other works, such as carpentry or handling chemicals, where there is a risk of eye injury. Selection, use and management systems should conform to AS/NZS 1336 Recommended practices for occupational eye protection
- Protection from the sun – use a sunscreen with an SPF (sun protection factor) rating of at least 30+, and wear a hat, long-sleeve shirt and trousers. Ensure exposed parts of the body are adequately covered with sunscreen, supervise and monitor workers, so they are not exposed to extensive periods of sunlight or reflections from glazed tiles and metal roofing materials, and implement administrative control measures, such as starting and finishing work early.

- Clothing used on site by rooftop-based equipment installers should be comfortable
- Additional arrangements for protection when working on edges, at corners, etc. needed as per site conditions.

QUESTION/ACTIVITY

12. What tools and equipment might you use when working on the roof?

Inspect and install fall protection and perimeter protection equipment, ensuring adequacy for work and conformance to regulatory requirements

Identify and comply with relevant statutory and regulatory authority requirements related to working safely on roofs

As we have seen in various performance elements of this Learner Guide, rooftop installation is a risky operation for different categories of workers, who have to carry out their duties in a given/particular rooftop area work environment.

As per the WHS Act of Australia and other regulatory requirements, it is essential to mitigate the risk of fall from a height of more than 3 meters and subsequent injury to site workers and other personnel.

Various fall protection as well as perimeter protection systems are used for equipment installation work on rooftops and "guard rails" is one of the simplest such systems.

Guard rails

Wherever it is practicable for the concerned work process, the rooftop equipment installation contractor must provide guard rails as a fall/perimeter protection system to ensure that workers do not run the risk of falling from a rooftop work area or from roof edges and corners.

The particular site and work environment should be properly assessed while providing fall protection for personal safety.

- In general, guard rails are often a practical solution for protecting personnel on rooftops from sudden falls. Especially when several workmen are operating on rooftops, near edges or roofs at multiple elevations in a building on which communication equipment installation is in progress.
- When repair jobs are to be done for rooftop equipment on existing buildings, it may not be practicable to install guard rails. This is due to the much smaller number of workers required for repairs as well as the short durations required in repairing and maintaining communication equipment.
- In repairing operations on existing rooftops, instead of a guard rail, it is better to use an alternative fall arresting system. This may consist of a belt or other safety harness with a lanyard line which is integrally connected to a stable anchorage point so that the worker is automatically prevented from going beyond the unprotected edge of the already existing roof. (Fig 4)
- If there is a situation requiring a worker to be on/very near the top plate of a roof structure to facilitate the erection process, (for example, fastening joists or members of a mobile tower), fall arrest is required if the height of fall will be 3 meters (10 feet) or more. Such a condition may exist along the exterior of perimeter walls. Normally it is practicable to erect guardrails along the external side of the wall.
- Sometimes, it is necessary to remove a guardrail to accommodate work on the rooftop. If so, only a small portion required, is to be removed to proceed with the work. If there is no guard rail, workers open to a fall hazard must be protected by another fall protection system.

- If guardrails already exist, the installation contractor should not remove them and replace with another form of protection, simply because it will make the work easier. The fact that guardrails already (currently) exist shows that it is practicable to use them for fall protection.

Fig. 4. An example of a fall protection system, when working on roof edge/corner.

QUESTION/ACTIVITY

13. Why do you need fall arrest equipment in place before working on a roof?

Install roof safety system according to workplace and regulatory requirements

As we have seen already (for example in sections 2.3/2.4 above), it is mandatory to provide safety systems when the equipment installation takes place in a rooftop area work environment. Safety of everyone working on a rooftop or roof edge, at any given point of time, is of paramount importance.

Rooftop equipment installation has multiple safety system requirements. It is necessary to have the roof safety system installed in place, prior to commencing the works. Suitable planning is vital, together with the preparation of SWMS and JSA.

The following are important components of a safety system for a work area environment for rooftops roof edges etc.

- Ladders. This is simple, commonly used safety system equipment. When properly used (with firm positioning, at proper angles, without overloading etc.), ladders can help workers to access rooftop areas with safety and security.
- Scaffolds (bracketed and braced). Some rooftop installation works may require a suitably elevated platform. This can be provided by locating a bracket scaffold at an appropriate location, which depends on site-specific requirements. This location should be chosen with care as per site conditions.
- Anchor points. These are normally provided when roof sheeting is installed over structural components (such as purlins, girts etc.) and also when installation of rooftop mobile towers etc. has to be undertaken. Anchors are designed so as to safely support and carry the forces exerted on them in any given hazardous situation. Installation of rafters for roofing also needs the usage of scaffolds. Professional help should be taken for the design and installation of suitable anchors and anchorages.
- Safety Nets. Nets are essential safety systems for rooftop works, which normally can start only after the installation of the roof framing systems. There is a serious risk of injury to workers in such situations. These risks can be reduced and/or eliminated by providing strong and stable safety nets.
- When installing the safety systems for rooftop-based communication equipment installation we have to make sure that all regulatory and compliance requirements are properly adhered to.
- Well trained and experienced personnel should be employed on site.

**Relevant Australian Standards (as per BCA; Safe Work Australia, Code of Practice for Roofs etc.) should be referred to achieve the statutory compliance needs.*

As per the regulations (WHS Act of Australia), all work associated with roofs/rooftops must be carried out in a safe environment. To achieve this, the following points must be attended to, throughout the work process.

The safety manual for the specific project must be available on site, together with the SWMS (Safe Work Method Statement) and JSA (Job safety Analysis). These documents should contain the various procedures and instructions to be followed on site, with respect to safety. The clauses relevant to the installation of roof mounted communication equipment must be verified to ensure that full compliance with the manual is achieved throughout the site.

There should be no hazards to the manpower working on site, such as falling from a height, as this work involves working on roof levels, at higher elevations from the ground level. It is necessary as per the WHS Act of Australia and OSH [Occupational Safety and Health] regulations that all those who are working on site are ensured of their safety. Any potential dangers and hazards need to be eliminated by careful planning and regular inspection for compliance. Consideration needs to be given for work at roof edges, corners etc. as additional protection is necessary.

We need to make certain that fall prevention steps have been implemented on the worksite. Trip hazards are removed such as loose wires or hangers lying on the rooftops, alongside the walls, cables, wrongly placed pipes etc.)

Safety gear such as hard hats, gloves, safety shoes etc. should be available to everyone involved in the work. All PPE i.e., Personnel Protection Equipment should be made available on site before the work starts.

Safe work rules for working at heights should be followed. This is especially applicable while working on rooftops.

QUESTION/ACTIVITY

14. Why do you need to follow workplace and regulatory requirement when working on a roof?

Select and install appropriate signage and barricades

One of the important regulations in Australia with respect to safety at the workplace is the WHS Act of Australia. This act and the provisions there are compulsory to be adhered to, especially in handling installation works for communication equipment on a given rooftop.

Safety signage, barricades etc. are very important requirements for any given work location.

The most important function performed by displaying Safety Signage and Barricade is the prevention of injury to site personnel and workers. In certain circumstances, these signs can create awareness among inspecting personnel, site visitors etc. about the risks and dangers lying ahead.

If the safety signs are not available, many employees and visitors would be confused as where to go or what to do, especially in times of emergency and risk.

By making sure that a work area has a good safety signage system, we can protect the workers and other personnel who may happen to be on site at the risk of danger and injury which may have hitherto remained unnoticed.

In Australia, AS 1319 specifies the compliance requirements of safety signs/signage and barricades in the workplace. This standard gives guidelines as to which are the particular items to be complied with. The design and usage of these signs intended for:

- Regulating and controlling safety-related workplace behaviour.
- To warn of dangers and hazards lying head.
- To provide fire protection and emergency related warnings and information.

These signs can be divided into the following types.

- Prohibition signs. These signs indicate actions which are prohibited. The wording is generally in black letters with a white background.
- Mandatory signs. Instruction that is compulsory to follow.
- Fire signs. This will give information about the fire alarms and firefighting equipment such as fire hose reels.
- Other warning signs. A warning about a situation though not life threatening.
- Emergency information signs. These signs are used to provide emergency-related information such as availability of first aid, emergency exits, escape routes, action to be taken etc.
- Danger signs. Warns about serious and life-threatening situations which may occur.
- General information signs (Not mentioned in AS 1319); but are generally indicated to give information of a general nature related to vehicle routes, house-keeping etc.

Depending on the characteristics and requirements of a given site and project, we have to identify the type of signage and barricades as per AS 1319. And having identified the requirements, they should be set up in clearly visible locations around the work area. There are several recognized manufacturers of signage systems and barricades in Australia, such as Brady.

Fig. 5. Typical Barricade and danger Signs for equipment installation on rooftops.

QUESTION/ACTIVITY

15. What signage and barriers should be in place, and why?

Topic 3 - Perform telecommunications work on rooftop

Inspect access from ground to work area ensuring it is safe and according to regulatory requirements

As site accidents and injuries have been reported from construction areas, rooftop work area environment etc. due to inadequately protected access systems, it is necessary to give special attention to this problem.

As you are aware, work for installation of communication services and equipment on rooftops involve working at high elevations above ground level.

Depending upon the height of the building, appropriate access to the rooftop has to be provided.

Access is required to roof for various personnel such as the roofers, equipment installers and several other personnel who need to work, inspect, check and approve the equipment installation materials, services and procedures.

Such access is normally provided by means of appropriate stairs, ladders, scaffolding, man-lifts, elevated platforms etc.

It follows logically that such access from ground to the work area on the rooftop must be absolutely safe and comply with all regulatory and code requirements prevailing in the particular location of the work. The Building Code of Australia, the WHS Act must be referred to in this context.

The SWMS (Safe Work Method Statement), JSA (Job safety Analysis) which have been prepared prior to the actual roof installation work, as part of the approved project work program and procedures, should be used as guidelines to ensure safe access and installation of the rooftop works.

Providing a safe access to the work area as well as a safe exit route, when the work is complete, is a legal and mandatory requirement as per the WHS regulations.

Employers, contractors, PCBUs etc. engaging workers must ensure that they comply with this requirement. Noncompliance can lead to fines and penalties in addition to the inherent risk of causing danger, injury or illness to the personnel in the work area and rooftops etc.

Fig. 6. Typical Safe Roof Access

When scaffolding systems are used to provide access from ground to the rooftop work area, they should always be located on firm ground and without blocking the operating routes of heavy equipment such as cranes, EWPs on site.

Workers, inspection staff etc. should access the roof area always in a safe manner.

Only after workers have reached safely the rooftop area, small tools and equipment should be elevated to the area of work. Thereafter, materials required may be raised, lifted and/or transported to the point of usage.

Workers must make sure that they don't go too near the roof edges, openings such as skylights and multi-level roofs without taking appropriate safety measures.

Access should be restricted to the minimum required when working on rooftop areas, adjacent to electrical services, power lines etc. In a similar way, exposure to chemical pollutants should be a minimum.

QUESTION/ACTIVITY

16. How would you ensure access was safe to the roof?

Estimate total weight of material to be raised to rooftop to carry out the work

As we have seen in an earlier section (1.1), rooftops provide an excellent location for mounting/ installing telecommunication equipment and services. This is especially true in urban and suburban areas. In comparison to the traditional communication towers, rooftop installations are more cost effective. However, prior to going ahead with the rooftop installations, several factors need to be considered. These include but are not limited to the following:

- Impacts on the structural stability of the roof
- Regulatory and legislative compliance requirements
- Grounding requirements
- Weather conditions.
- Applicable codes and standards such as
- Building Code of Australia
- Environmental Protection Agency (EPA) requirements
- National Electrical Code etc.

Before utilising the rooftop for placing/installing communication services and equipment, suitable structural integrity checks must be made. This is required to establish the capability of a chosen roof to withstand the extra loads being imposed on it by the communication structure and the accessory equipment it will have to support.

All roof-mounted masts or towers must be certified as safe and that they are within permissible values of weight, by the building's structural engineer before they are installed safely on the rooftop. In general, roof mounts should be restricted to comparatively lightweight structures, having low heights. This will ensure that the roof has to support only the minimum of additional dead and dynamic loads. Non-penetrating bases are preferable for rooftop equipment.

Due to these reasons, the correct loads/weights imposed on the rooftop by all the proposed communication equipment (antennas, dishes, masts, towers, cabling and cable trays etc.) must be calculated. For this purpose, the engineering drawings provided by the designers and/or suppliers of the equipment may be utilized.

Depending upon these loads/weights, appropriate lifting equipment may be arranged so as to lift/raise and place the equipment without any impact, vibration or turning moments on the rooftop structure.

Apply SI system of measurement for measurement

Installation on rooftops can be permitted only after the structural integrity of the whole system has been checked, approved and certified. All quantity calculations must be carried out using the S.I. system of measurements.

This is the international system of measurements. The units of measurement used are the following.

- Meter for Length/height
- Kilogram for Mass
- Second for Time and Ampere for Current

QUESTION/ACTIVITY

17. Why do you need to ensure the weight of materials does not excess the weight limit for the roof?

Determine and use the safest lifting method to bring materials and equipment to rooftop according to regulatory requirements

Installation of communication services and equipment on rooftops involve lifting and raising arrays of the antenna, tower materials etc. to the roof. Subsequent to lifting, they have to be placed on the points of final use without causing any damages to the roof structure and roofing finish materials.

Describe safe lifting methods

Several lifting and raising devices are normally available for this purpose. These include but are not limited to the following:

- Hoists of different types
- Cranes
- Forklifts
- Boom lifts
- Scissor lifts
- Winches
- Elevating work platforms. (EWP)

As communication equipment, testing equipment etc. are light weight, if handled one by one (each piece of equipment by a separate lift) the safest method will be to lift them by an EWP. In this case, there is no risk of equipment getting dropped to the ground due to a loosened or improper sling as this may happen sometimes in the case of a crane.

EWP is a common term used to describe different types of Elevating Work Platforms. They can be of different types such as self-propelled, trailer mounted (can be driven or towed) or support truck mounted (driven). The term, EWP is not normally used if the elevated working platform is used as an additional attachment such as a “bucket” or “basket" or "cage” which is fitted with other types construction equipment. Given below is a picture of one of the most frequently used EWP. (Fig.7)

An Elevating Work Platform is a mobile lifting equipment which can be used on project sites to move/transport vertically, workers, tools and small quantities of materials to rooftops and other elevated working positions. Parts and components of lightweight communication equipment can be safely lifted to the rooftop. Thereafter, they can be reassembled and installed on the rooftop. Basically, an EWP comprises an elevated work platform with built-in control mechanisms, an extending arm like structure called a boom and a frame or chassis. This is one of the safest lifting mechanisms especially for personnel, expensive and lightweight communication and testing equipment, computerized systems etc. for rooftop installations within reasonable heights.

In the construction equipment market, there are different variations of EWP, but they can be classified as belonging to one of two categories: Boom type or Scissor type.

Mobile elevating work platforms (MEWPs) are useful but complicated pieces of construction machinery which are commonly used for access to heights in difficult and hazardous locations. Experience has shown that workers have been seriously injured and killed in fatal accidents which involved the operation of EWPs.

At the start of the process of planning an installation job for communication equipment, the designers and engineers should supply all relevant information to the EWP contractor to ensure that an accurate and appropriate design process is followed for an EWP or an MWEP. This information from the designers is the main source to access, interpret and apply the relevant EWP documentation.

The following information should be accessed, interpreted properly and applied in the erection and setting up of EWPs while complying with all relevant safety regulations.

- Location details of the rooftop/work area including access routes.
- The site/rooftop layout plan.
- Period of time the EWP is required to be in operation on site.
- Height and length of the structure and other critical dimensions which may affect the performance of the EWP.
- Number of lifts/operations which may be required.
- Maximum working loads to be imposed and a maximum number of people using the EWP at any given time.
- Any specific requirement or provisions e.g., restrictions, overhead power lines etc.

Fig. 7. A safe lifting method for personnel: An Elevated Work Platform.

QUESTION/ACTIVITY

18. What lifting equipment can be used to install rooftop units?

Secure test equipment, hardware and tools safely on rooftop and distribute weight to eliminate risk of damage to roof cover

We have already seen (section 3.2) some of the various considerations which need to be factored in before the actual rooftop installation of permanent communication services and equipment can take place on rooftops.

In addition to the above factors mentioned in 3.2, we have also to note that additional loads and weights can be transferred to the rooftops due to the temporary usage of testing equipment and associated hardware, tools, testing personnel etc.

Installation of communication services and equipment on rooftops require that they have to be tested for efficiency of performance.

Hence, testing equipment and tools have also to be raised and placed on the rooftop adjacent to the main communication equipment.

However, this equipment can be removed away from the rooftops, once the testing operations have been satisfactorily completed.

Some of the testing equipment (they are expensive in general) may consist of test and signal analysers, horn/dipole antennas with parabolic reflectors, D.T.H. equipment, other computerized systems etc.

Care must be taken to ensure that the additional loads caused by testing equipment, associated hardware, cabling, tools etc. do not adversely affect the rooftop structure and covering as well as finishing materials.

There should be no unbalanced loads on the roof.

All weights due to the main as well as testing equipment, accessories etc. need to be distributed uniformly on the rooftop structure.

It is also required to make sure that all testing equipment is properly secured against:

- Heavy winds
- Rainy situations
- Excessive temperature and humid conditions on the rooftops

- Theft
- Loss or damage due to other reasons such as careless handling (such as dropping them from a height), collision with other pieces of tools, equipment, men, and materials which may be present on the rooftop.
- Taking additional care about all equipment, both main and testing, both permanent and temporary, will ensure a trouble and hassle-free operation on site.

QUESTION/ACTIVITY

19. How would you secure materials to ensure they do not fall?

Inspect safety system periodically for compliance with regulations according to workplace procedures and report faults

We have seen / discussed the various safety systems, fall and edge protection systems etc., which are normally used while installation of communication equipment on rooftops is carried out for a given building. These normally consist of

- Ladders
- Scaffolding
- Anchors
- Safety nets
- Guard rails
- Fall arrestors
- PPE

As work on site proceeds, due to constant usage as well as wear and tear of materials, some of these systems may lose their efficiency in operations.

There may be also occasions when safety systems used on a construction may suffer damages due to accidents, vehicle hits, heavy material impacts and falls, loosening etc.

Safety systems may also be needed to be modified or additions incorporated due to work changes on site generated by design alterations, client instructions etc.

It becomes imperative therefore to inspect and check these systems on a regular basis on site. Such inspections will ensure that all these important systems adhere to the regulatory compliance requirement, codes of practice and relevant Australian standards.

Any defects discovered and identified during inspection should be rectified. The damaged items in the safety system should be immediately replaced and/or modified.

It is not advisable to keep damaged systems/ items in sustained operations as this may contribute to adverse effects, may result in accidents/injuries etc.

All existing and already installed systems must be inspected and checked for their suitability. This inspection must be carried out by an experienced and well-trained safety professional.

Reporting systems should be established on site to bring the immediate attention of senior site management to defective and damaged safety systems.

Frequent safety awareness meetings, toolbox discussions also must become standard practice on site to take care of detrimental situations.

An alert safety team on site can ensure that all safety systems are kept operational and efficient, to deliver the performance expected from them.

Following the above actions and taking proactive preventive maintenance of all site safety systems will enable in achieving an accident-free site. Labour man-hours lost due to safety incidents can be minimized. A safe site is an efficient site and overall productivity will be enhanced by taking logical and technically correct preventive maintenance.

Fig. 8. Working on rooftop after elevation by an EWP

QUESTION/ACTIVITY

20. Why do you need to inspect the safety systems before commencing work?

Monitor risk control measures to ensure they are effective and appropriate to the task and work environment

Any construction project involving a different type of activities including rooftop installation must be well planned and prepared to handle and/or mitigate various risks associated with the project activities.

While preparing the detailed PEP (Project Execution Program), it is necessary to incorporate therein, a logical hazard assessment and risk control system or process.

A suitable organisational structure having appropriate resources such as qualified, experienced manpower, materials and equipment also need to support and supplement the risk control process. This risk management operation should identify the probable hazards and risks which may arise when the rooftop equipment installation work is in progress. Having identified the likely risks, suitable risk control and mitigation measures have to be taken by incorporating safe work methods.

- Standard OHSA risk management systems stipulate that the following factors need to be considered when minimizing or eliminating risks on site.
- Removing completely the risk resulting from a defective plant or work operation This is achievable by stopping all work on the risky roof work/activity to be performed; instead mark out, cut and fabricate the roof panels/sheets/communication equipment etc. on site at ground level; thereafter the fabricated panel/equipment/mobile tower components etc. may be lifted by crane/EWP and placed at the point of use.
- Minimise the risk by substituting the plant or material or work by using a safer alternative.
- Isolate the hazard and remove the risk by establishing restricted access to site; if this is already there, strictly enforce the restrictions. Laxity may have led to the hazard.
- Add new, hitherto non-existing safety systems such as guardrails, bracket scaffold (the lack of these often results in hazards).
- Enforce the usage of PPE, safety footwear, eye protection etc. to reduce the risks (especially if a hazard has been generated due to non-compliance with these basic safety system requirements).

Out of all the above factors, removing completely the entire risk is possibly the best option and must be resorted wherever it is practicable.

The SWMS should also incorporate risk control measures suggested by specialist roofing and communication equipment installation subcontractors.

In order to establish the likely risks which may occur when roofing work is in progress, it is necessary to carry out hazard identification and risk assessment process.

This should be done during the initial planning and preparation stage.

Safe systems of work must then be adopted to remove, reduce and control these risks. The SWMS for the site roofing operation should contain a listing of all safety systems which can be utilised to remove the probable occurrence of hazards and risks.

Risk control measures involve:

- Identifying the hazards such as access to heights above ground level
- Evaluating the risks from the hazards (serious injury or death)
- Adopting control measures to remove the risk
- Frequent review of control measures to ensure their effectiveness

QUESTION/ACTIVITY

21. How can you monitor risk control measures whilst working?

Reassess risk control measures as required, according to changed work practices or site conditions and make alterations within scope of authority

In the section above (3.6) we have just discussed the need for various risk control measures required in a work environment involving rooftops, performing activities at heights above ground level etc. It may be noted that communication equipment installation work too near the edges, at corners, near skylights etc. need to be given special attention.

Risk control measures adopted on a work site, however, need frequent review and re-evaluation for their continued usage on site.

- This is especially so in the following situations. Changes have occurred in work procedures, materials/equipment actually utilized, changed site requirements, adverse weather conditions etc.
- The existing hazard and risk assessment evaluation has become not applicable/ invalid etc. for rooftop equipment installation.
- An injury or accident or illness has resulted from a hazard / risk with respect to the existing risk control system.
- In situations such as those listed above, it becomes necessary to re-evaluate/ reassess the existing risk control measures.
- Such re-evaluations must be carried out by experienced site safety professionals, in consultation with the principal contractors, consultants, communication equipment installation specialists and other relevant personnel.
- These re-evaluations may result in new and alternative requirements with respect to the following components of managing hazards and risks on site.
- Modified/ Improved access such as revised scaffolding, personal hoists, mobile elevating platforms or new ladders/stairs.
- New edge protection, the lack of which may have generated a hazard.
- To determine the best revised/new roof edge protection, we have to make certain that it is strong enough to resist the loads generated by a worker or any other person falling directly on it. This load depends on the momentum of the falling person, which is a function of the following.
- The type of roof surface – a person is likely to generate more momentum when falling down a slippery roof, (if the roof is wet or ice/snow exists on the surface.)
- The slope of the roof – the steeper the slope, the more speed of fall is generated
- The height from the top of the roof to the ground level as speed of fall increases with this distance.
- New or revised guard rail systems also become necessary due to the re- assessment of existing risk control measures.

Alterations required in risk control and mitigation (such as those mentioned above) should, however, be implemented on site only with the approval of senior site management. The owner of the project and other stakeholders such as local area authorities should also be involved in this decision.

Reports should be prepared giving the background and reasons for changing existing risk control measures. These need to be and included in the documentation systems of the project.

Describe the hierarchy of control in a workplace health and safety environment in the context of hazards, risk and control

If it is not possible to completely remove the threatening hazard, it becomes necessary to use the "Hierarchy of Risk Control" which enables the determination of the most efficient options available to reduce the risk as much as possible.

The six steps of the 'Hierarchy of Risk Control" are given below.

- Redesign or rearrange to completely remove the hazard from the workplace. Usage of different materials, tools and plant, working procedures, etc. may be utilised to achieve this.
- Eliminate completely or replace/substitute the hazard. As far as possible, it should be attempted to totally remove the hazard. Substitution with less harmful materials, tools, plant, equipment and less toxic substances should be resorted to.
- Separate out and/or isolate/enclose the problematic hazard. To achieve this, it is possible to use standard or customized safety barriers, signboards, warning signals, etc. The source of high level and disturbing noise etc. should be identified and isolated.
- Establish new engineering controls to reduce the hazard as much as possible. Guards/rails/ new ventilation systems are examples.
- Reduce the risk through a revised administrative control procedure. Revised job timings, reduce exposure to risk, better proactive maintenance, additional training, better work procedures and methods are examples.
- Usage of Personal Protective Equipment (PPE). Use of these is mandatory in the workplace and must be strictly enforced. Employees should be given training to effectively utilise all relevant PPE on the workplace.

In addition to the above, it also necessary to conduct a regular review of risk control measures.

Assessment should be again carried out to ensure that all risk control options are considered and the most effective one implemented in the workplace. This can be achieved by regular safety audits conducted by authorized safety inspectors.

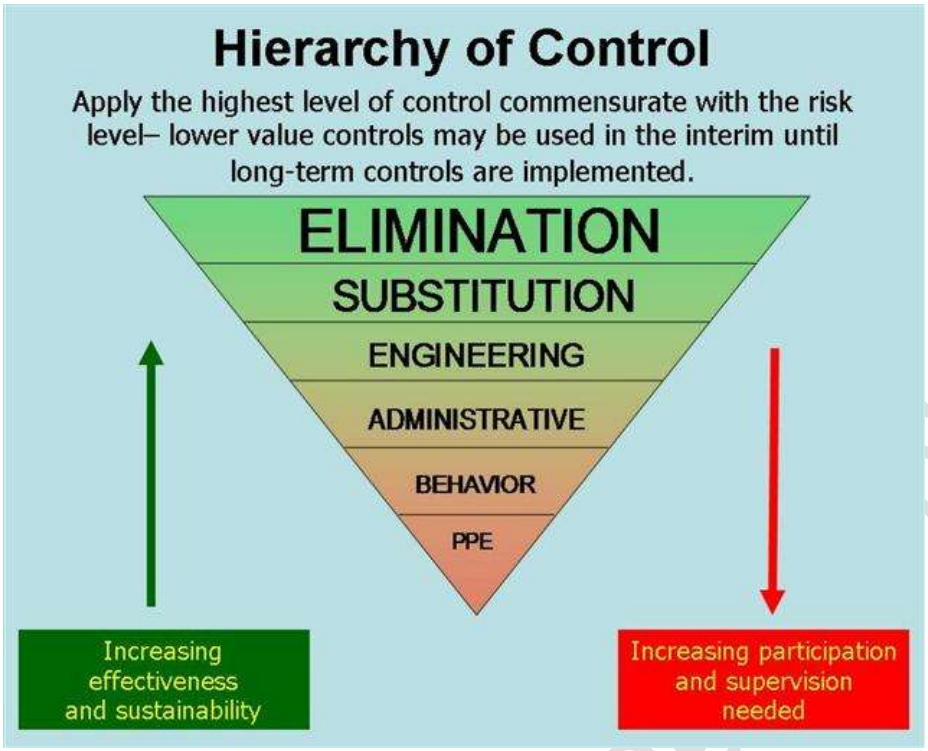

Fig 9. Hierarchy of Control (Hazard/Risk)

QUESTION/ACTIVITY

22. What is the hierarchy of control?

Topic 4 - Complete activities and documentations

Dismantle safety system according to prescribed sequence and remove from worksite

In general, the safety systems used on rooftops/installation site may consist of the following:

- Personal Protection Equipment.
- Fall Arrestors / protection devices.
- Safety harnesses.
- Perimeter protection/ guard rails / toe boards etc.
- Anchorages of lines to firm points.

At the end of the site-related installation activities and when a job or project is completed, one of the important (contractual and mandatory) requirements is to ensure that all temporary structures such as safety systems, fall protection devices and arrestors, perimeter protections etc. are dismantled and brought back to the stores.

It may be noted that safety systems and equipment used on site such as fall prevention items, their components etc. may require to be altered / modified to suit specific site requirements and therefore do not retain the same condition between the commencement of operations for installation, ultimate dismantling and removal from the site.

It is therefore required to plan how the various safety items, their accessories, equipment etc. will be cleaned, checked, maintained and stored until transported to the contactor's next site or yard. The following issues should be considered when undertaking this operation.

The site and job-specific requirements of various trades working on the rooftop, such as roofers, technicians such communication equipment installers, air conditioning workers, fitters, electricians, mechanics, television and solar panel workers etc. have to be considered. Normally they may leave the safety systems, perimeter protection rails, toe boards etc. in different modified or altered/removed conditions after use on the rooftop site. These items have to be dismantled and removed from site according to a pre-approved schedule and under proper supervision.

A competent and well-trained person with responsibility for modifying, inspecting and maintaining the various safety systems should be available on site.

A sufficient number of competent safety and equipment installation workers should be available on the site to allow checking the components and systems after using; thereafter clean and store them in a proper condition. This will facilitate subsequent and easy reuse of the safety equipment and systems.

Depending on the magnitude and complexity of the rooftop based communication equipment installation project, the number of competent safety workers required on sites to oversee these operations will vary.

QUESTION/ACTIVITY

23. How would you dismantle a safety system once work is complete?

Clear work area and dispose of materials or recycle according to state and territory legislation and workplace procedures

One of the most important requirements of construction /installation work of rooftop equipment installation and associated components (any job site, for that matter) is to leave a neat and tidy work area at the end of the job. Clients and owners expect (and will insist on) this as it is a mandatory and contractual requirement.

All personnel working on site from the Project Manager to the last worker on site should be accountable and take responsibility to tidy up the work areas when the job is completed.

This can be achieved by resorting to good housekeeping practices. These practices include but are not limited to the following.

Conduct regular clean-up of areas around/near the structural framing and rooftop based communication equipment installation work.

Carry out regular (on a daily basis is the best) clean up and removal of small items, cut debris, small objects such as fasteners, metals, bolts and nuts etc. from the areas surrounding the work site. (Fasteners used to fix the tower members, mounting platforms etc. to the roof and wall/roof framing may frequently fall down and litter the areas).

Make good use of proper signals and signage, during clean-up operations, to warn about dust, objects falling from above and other hazards.

Prevent entry to work areas where installation and cleaning of roof sheeting, structural members, equipment, accessories, and insulation works etc. are in progress. Caution signs, barricades etc. may be used to warn site staff and workers about this.

Plan and carry out routine work area clean up during the time when there is likely to be the least disturbance to the operation, by the movement of personnel, material and construction equipment, vehicles, inspection personnel etc.

Provide and locate a sufficient number of waste receptacles, trash cans etc. These should be positioned around the area of the installation works and easily visible to people working in the area.

Train cleaning staff and workers on the correct methods of cleaning and disposing of the debris generated from the work of providing and installing materials for rooftop based communication equipment, sheeting and supporting structural members.

Normal wastage and debris from the construction and provision of roof sheeting and framing works may include fasteners, cut pieces of steel sheets, small tools which might have fallen through, nails, bolts, paint, brushes, insulation material fragments, sealant tubes etc. All such debris should be removed away from the site on a daily basis. If there are items which can be reused, they should be transferred to the site storage areas and kept separately.

After the work is completed, both internal and external areas of the building site/rooftops etc. should be cleaned up before the site is handed over to the clients.

All site clean-up operations should be checked and verified by a site supervisor, whose duty it is to ensure that all applicable standards, codes, regulations and local area legislation for disposal of wastage etc. have been complied with.

QUESTION/ACTIVITY

24. Why do you need to clear and clean the work area after you have finished work?

Clean, check and maintain tools and equipment according to manufacturer's recommendations and workplace procedures

After the construction and finishing of all rooftop based installation work is completed and all areas cleaned off, it is also required to clean up all tools and equipment used in the works.

Prior to starting the final clean-up of tools, they should be arranged by type and item.

For doing this, all tools should be individually checked first for their intended future and continued serviceability.

Damaged tools should be segregated first. Items requiring major maintenance should be cleaned prior to sending them to a maintenance workshop.

Power saws, nibbling machines, shears etc. used for cutting materials associated with rooftop installation works such as tower components, mounting arrangements should be cleaned, checked, maintained and stored as per manufacturer's recommendations. So that they can be reissued for use on another job.

Fig. 10. Typical rooftop communication equipment.

The remaining tools and equipment, testing systems etc. should be cleaned one by one, according to the manufacturer's operation and instruction manuals. Standard procedures only should be used.

After cleaning up, serviceability of all tools and equipment should be once again checked.

Larger pieces of equipment such as forklifts, cranes (used to transfer the roof-mounted antennas, towers, reflectors etc. and other materials from site stores to the point of end usage) etc. need to be given special attention.

Excessive fuels, oils etc. required to operate the tools and equipment should also be separately handled and carefully transported away after completion of works.

A separate system should be put in place to take care of spare parts of the tools and equipment. Loss of spare parts should be prevented.

Each tool should be returned to a corresponding toolbox, labeled and stored.

Similarly, the PPE used on site should be cleaned, maintained and stored.

A final list of the stored tools should be made, indicating the name, type, size and the number of pieces.

After this procedure has been followed, under the supervision of a store manager or a workshop superintendent, the items can be transported back to the contractor's offices or another job site.

Follow up action should be taken for the tools sent for repair and maintenance. After the repairs are complete, they can be checked, washed and cleaned and then returned to the builder's office premises.

Substitution of permanently damaged tools, equipment and PPE, should also be initiated as part of these procedures.

QUESTION/ACTIVITY

25. How would you maintain tools and equipment?

Complete documentation according to workplace requirements and notify customer for sign off

It is a standard requirement in all technical, communication, engineering and construction/installation projects, that proper records and documentation are generated and maintained on site. Such documentation should include, at a minimum, the following.

- Original plans and drawings issued for installation and/or construction, issued by consultants and owners/clients.
- All the specific approvals given by clients for rooftop installation work must be recorded and maintained.
- Particular building and structure-wise plans and drawings for the rooftop mounted communication equipment, materials and services.
- Approved specifications for communication equipment, including material type, thickness, profile, fixing requirements, alignment for installation.
- Approved specifications for supporting structural framework, including material type, thickness, jointing, mounting details, supporting, fixing, and roof penetration if any. Non-penetrating mounts are preferable.
- Approved specifications for insulation materials, accessories, cables, wiring, testing equipment details, and electric connections.
- Submittals made for samples, grounding systems.
- Instructions given by clients and consultants.
- Local Government regulations and compliance requirements.
- Material Test certificates for towers, reflectors, lightning protection systems, obstruction lights, beacons etc. if required.
- Manufacturer's operation manuals and recommendations.
- All relevant Australian Standards, Codes of Practice etc. required for the particular project.
- Approved rooftop installation procedures for communication equipment.
- Waivers requested by the installation contractor, if any.
- Record of site incidents, inspections, visits.
- Minutes of site management meetings.
- Work progress reports.
- Minutes of safety and toolbox meetings.

- Copies of QA/QC documentation.

The following are points you should remember for documentation:

- A sufficient number of copies should be maintained. Filing system for all site and office documentation should be established as per ISO 9001.
- Electronic copies (soft copies) together with hard copies should be maintained.
- Proper labelling and tagging systems should be employed.
- Confidentiality of all site documentation should be maintained.
- Distribution of the site documents to anyone requiring them should be implemented with authorised approvals and signatures.
- Similar to the above, documentation should also be maintained for all works, for the "As Built" condition.
- As built drawings should also indicate the actual equipment and materials used in the rooftop installation.
- If there has/have been variations or deviations from the original plans, drawings, specifications etc., such data should be documented.
- All approvals for such deviations should be recorded.
- Documentation should be in recorded and filed in chronological order.

QUESTION/ACTIVITY

26. What documentation might you need to complete after finishing work?

Topic 5 - Additional information on WHS legislation and regulations

A regulation is an authorized governmental and legal document and therefore employees must implicitly meet their obligations under both the legislation and the regulations.

Regulations are formulated to support the general requirements of the legislative Act and provide more detailed information.

A particular state may be covered by either the OHS Regulations (2007) or the WHS Regulations (2007). Here are some major points covered by health and safety regulations:

- "Hierarchy of control" measures must be implemented where elimination is not reasonable or practical
- Information, training and instruction must be suitable and adequate in regard to:
    - The nature of the work carried out
    - The nature of the risks associated with the work at the time the information, training or instruction has been provided
    - The control measures proposed and implemented
- A workplace must ensure, so far as is reasonably practicable, adequate and appropriate layout; space; floors and other surfaces; lighting; ventilation; controls for work in extreme temperatures; and protection from essential services (gas, electricity etc.)
- A workplace must ensure, so far as is reasonably practicable, the provision of adequate facilities for workers, including toilets, drinking water, washing facilities and eating facilities
- A workplace must ensure:
    - The provision of first aid equipment for the workplace
    - That each worker at the workplace has access to the equipment
    - Access to facilities for the administration of first aid
- A workplace must ensure that:
    - An adequate number of workers are trained to administer first aid at the workplace
    - Workers have access to an adequate number of other persons who have been trained to administer first aid
    - PPE must be provided and follow-up conducted to ensure PPE is worn

Like other legal documents health and safety legislation can be difficult to read and interpret. To overcome this, businesses develop policies and procedures which outline the legislative areas that are applicable to the operation.

It is important that all employees take the time to learn and fully understand the WHS policies and procedures of the company and also be fully trained in any operation of equipment or in the use of hazardous substances.

Common health and safety policies include, but are not limited to:

- Risk management
- First aid
- Emergency response
- Hazard reporting
- Injury and incident reporting
- Health and safety records

Requirements to communicate

All policies and procedures relating to health and safety must be accessible to all employees. There will also be other individuals and parties that need to understand their contents including:

- Contractors and subcontractors
- Health and safety committees
- Health and safety representatives
- Managers, supervisors and persons conducting businesses or undertakings (PCBUs) or their officers
- Unions
- WHS entry permit holders
- WHS inspectors
- WHS regulators

Policies and procedures may be stored in paper or electronic format.

Electronic format - Storing policies and procedures electronically has many benefits including:

- The ability to amend policies and procedures to reflect continuous improvement or legislative changes
- Version control allows for outdated policies to be removed ensuring everyone is accessing up to date information

- Can be controlled centrally and send a consistent message to all geographical locations

Paper based - Having a copy printed can be useful if the intranet cannot be accessed at any given time. When filing in hard copy, it is imperative that someone is responsible for updating the paper copy when changes are made to the policy. Having version control on all policies will help to monitor this.

Communications on site

Methods used to communicate policies and legislation:

- Induction
- Speaking informally to each employee
- Health and safety workshops
- Regular employee briefings
- Monthly newsletters or memo
- Online learning platforms

It is important to ensure that legislation/policies and procedures are communicated regularly at team meetings, particularly whenever any changes are made. Best practice suggests each team meeting should focus on a different policy and procedure giving the team an opportunity to refresh their understanding and practice their ability to meet the policy expectations.

To ensure the information relating to policies and legislation is understood by the work team businesses can:

- Ask them to sign and date policies that they have read to say they've understood them
- Conduct assessments to check their knowledge

Benefits

The benefits that arise from well-communicated Legislation/ Policies and procedures include:

- Improved employee relations within the operation
- WHS commitment from the workforce
- Improved image through the demonstrated commitment to proactively managing WHS issues
- Improved relations with contractors, subcontractors, consultants, suppliers and unions
- Reduced worker injuries, compensation claims and WHS disputes
- Continuous improvement of WHS within the operation
- Competitive advantage
- Compliance with WHS law and regulations

Summary

Now that you have completed this unit, you should have the skills and knowledge to engage in safe work practices when installing or repairing telecommunications equipment on roof structures.

If you have any questions about this resource, please ask your trainer. They will be only too happy to assist you when required.

References

Websites and documents used in the development of this resource.

AS/NZS 1337

AS/NZS 4602

WHS Act of Australia

Building Code of Australia (BCA).

Code of practice: Safe work on Roofs: Part 1. (Australia)

Guide to the WHS Act: www.safeworkaustralia.gov.au

AS/NZS ISO 9001 for Quality

Code of Practice. Construction work.

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