

Checklist - planning the safe set-up and operation of earthmoving equipment

Earthmoving equipment covers a broad range of load-shifting or other machinery often used for site preparation, excavation, trenching, tunnelling, demolition or roadworks in the construction industry. Specific types include excavators, backhoes, loaders, graders, rollers, scrapers and dozers.

Earthmoving equipment operation can present a risk of injury to people from the following:

- People being trapped or crushed. This can occur due to plant rollover, particularly if working in the vicinity of embankments, trenches or excavations.
- Contact or collision with other plant, structures or services. This can occur if multiple plant are operating in the same area or where sufficient clearances are not maintained between the plant and structures such as bridges, buildings, concrete pumping booms, overhead powerlines or underground services (e.g. electrical, water, gas).
- People being hit by moving plant. This can result from interaction between mobile plant traffic and areas where there are people working, particularly during reversing movements, in plant blind spots or where there is poor lighting.
- Falls from height. This can occur when operators or workers perform inspections or maintenance climbs on the plant.

Why is planning important?

Planning is the first step in ensuring that work is done safely. Planning for earthmoving equipment operations should start as early as possible and involve consultation with everyone engaged in the work including the principal contractor, plant owner/supplier, designer, sub-contractors and safety personnel. Good planning involves:

- selecting the right equipment
- loading and unloading the equipment
- planning, scheduling and coordinating plant operations
- operating the plant safely, including shut down.

Effective planning will help identify ways to protect people who are:

- loading and unloading earthmoving equipment
- directly involved in operating earthmoving equipment
- performing other work activities at the workplace
- in an area adjacent to earthmoving activities, including public areas.

How to use this checklist

This checklist can be used to assist with the set up and operation of earthmoving equipment at construction workplaces. The assessment can be led by a principal contractor, Person Conducting a Business or Undertaking (PCBU), plant operator, safety advisor or health and safety representative (HSR) and should be done in consultation, coordination and cooperation with everyone involved. For example, a representative from the principal contractor might assemble a group of relevant people from the site to discuss each item and coordinate the actions required for any 'no' responses.

The *Work Health and Safety Act 2011* requires a PCBU to consult, so far as is reasonably practicable, with workers who are likely to be directly affected by a health and safety matter and with other duty-holders at the same workplace. Records of completed checklist can be kept to monitor and review items at a later date.

Part one – site details

Part one – site details	
Date of assessment:	
Assessment completed by:	
Name of PC or PCBU:	
Site location:	
Type of plant:	
Name of plant owner:	
Plant item/rego number:	
Make, model and year of manufacture:	

Section	Item	Response and comments
Part two – selecting the right plant		
Determining plant requirements	<p>1. Is the type of earthmoving equipment selected suitable for the work that needs to be performed? Consider:</p> <ul style="list-style-type: none"> • the type and extent of the work (e.g. materials, loads) • rated capacity, allowable gradient and other specifications of the plant • type of attachments required • the frequency and duration that the plant will be used • proximity of other plant and structures • workplace conditions (e.g. ground conditions, site access, , public areas, power supply). 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Inspections and maintenance	<p>2. Has the operator carried out a documented pre-operational inspection on the plant prior to starting work? This should cover, but not be limited to:</p> <ul style="list-style-type: none"> • all relevant items indicated in the operations manual • operating and emergency controls • brakes • safety devices, alarms and lights • glass and mirrored surfaces • a visual inspection of the plant (e.g. visible defects, welds, hydraulic components, attachment points) • conditions of supporting ground. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	<p>3. If the plant's log book reveals any outstanding faults or safety issues, has the plant been assessed and appropriate action carried out and recorded by a competent person prior to being put back in to service?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Comments:
	<p>4. Have inspections and maintenance been carried out according to scheduled intervals set out in the manufacturer's specifications and recorded in the log book?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Operat or manual and plant	<p>5. Is the plant operator manual written in English? Does it use metric units and is it readily available to the operator?</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:

	<p>6. Does the plant and its attachment have all required markings? This includes:</p> <ul style="list-style-type: none"> • make, model and serial number • rated capacity or safe working load (SWL) of the machine and its attachments • operator controls inside the car clearly marked • emergency controls. 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No Comments:</p>
Part three - planning, scheduling and coordinating the work		
Licencing and training	<p>7. Has the plant operator been determined to be competent to operate the plant or is there evidenced that the operator has been provided adequate information, training and instruction to operate the plant? Consider:</p> <ul style="list-style-type: none"> • statement of attainment of a nationally recognised unit of competency • on-the-job training by an experienced and competent trainer • current relevant experience verified by logbooks or previous employment references • external verification of competence by RTO or external assessor. 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No Comments:</p>
	<p>8. Has the operator received documented familiarisation training on the make and model of plant they are operating?</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No Comments:</p>
	<p>9. Did the induction training provided to workers (e.g. operator, workers in the vicinity of the plant) specifically cover what to do in the event of an emergency involving the plant? This should include information about:</p> <ul style="list-style-type: none"> • people with specific emergency roles • how to use warning systems and what to do when they sound • rescue procedures • effective communication between all workers near the device to evacuate safely • how to use firefighting and rescue equipment and where to find it. 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No Comments:</p>
Planning the work	<p>10. Has a Safe Work Method Statement (SWMS) been prepared for the high-risk construction work associated with operating the plant that:</p> <ul style="list-style-type: none"> • describes the high-risk construction work to be undertaken • sets out the steps required to perform the work • identifies hazards • describes the control measures to be used? 	<p><input type="checkbox"/> Yes <input type="checkbox"/> No Comments:</p>

	11. Does the SWMS follow the hierarchy of controls to prioritise higher-level control measures and not rely on administrative controls only?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	12. Have workers been consulted in the development of the SWMS, by: <ul style="list-style-type: none"> • providing input in to the content of the SWMS • demonstrating that they understand the content of the SWMS. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	13. Have workers involved in the operation of the plant and others in the area of the plant who may be affected by its operation signed off that they have been instructed in the SWMS?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	14. Is there a system in place to monitor compliance with the SWMS?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Traffic management	15. Has planning been done to ensure that the plant is kept a safe distance from pedestrians, other mobile plant or vehicle traffic when it's moving around the site? Note: Creating a site traffic management plan will help to separate routes for pedestrian, plant and vehicle movements and outline how different traffic situations will be managed.	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	16. Are there measures in place to manage the speed and flow of other vehicle traffic? This includes: <ul style="list-style-type: none"> • dedicated haul roads, travel routes and loading areas • signage (e.g. speed limits, directional signs) • work scheduling. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:

Part four - plant siting and setup

Unloading the plant	<p>17. If the plant is unloaded from a truck, are there measures in place to prevent people being hit or crushed by the plant during the unloading process? This includes:</p> <ul style="list-style-type: none"> • preventing access to the unloading area • ensuring the truck is on firm, level ground with no side slope • ensuring the ramp is properly secured with a suitable loading rating. 	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A Comments:
Safety devices	<p>18. Is the plant fitted with safety devices or indicators in working order? This includes:</p> <ul style="list-style-type: none"> • rollover protective structure (ROPS) • falling objects protective structure (FOPS), if performing demolition work • burst protection • emergency stops • reversing alarms • swivel lights • seat belts/operator restraints • access guardrails • fire extinguisher. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Proximity to plant, structures and public areas	<p>19. Is the plant positioned so that the risk of injury from collision with other plant or structures is minimised? This should consider:</p> <ul style="list-style-type: none"> • overhead electrical lines and towers • nearby structures • cranes, EWPs or other potential obstructions (e.g. concrete placement booms). 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	<p>20. Is the operator aware of the presence of any underground services, including electrical/telecommunications cabling, water and sewerage pipes, and gas lines?</p> <p>Note: Dial Before You Dig is a free enquiry service for information on underground assets anywhere in Australia (phone 1100 or submit an enquiry online at www.dialbeforeyoudig.com.au). Alternatively, contact relevant authorities for more information (e.g. electricity, communications, local government, water).</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:

Exclusion zones	21. Have appropriate exclusion zones been established around the plant to prevent: <ul style="list-style-type: none"> the plant nearing vicinity of overhead electrical lines people working around the plant that don't need to be there other plant and vehicle traffic from entering the area around the plant's working area. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	22. Have all relevant workers been informed and understand where exclusion zones are established?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Part five - operating the plant safely		
Communication	23. Has a reliable method of communication between the operators, spotters, pedestrian workers and site management been established? This includes the use of: <ul style="list-style-type: none"> line of sight hand signals verbal or radio communication automatic warning systems bells, buzzers or whistles. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Worker behaviour	24. Are attachments appropriately secured according to the manufacturer's or supplier's specifications (e.g. quick hitch, lifting points)?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
	25. Is the operator and all workers wearing the required personal protective equipment (PPE), such as high-visibility, reflective clothing?	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Ergonomic and housekeeping issues	26. Can the plant operator safely access and exit the plant and work area? Consider: <ul style="list-style-type: none"> condition of rails, steps and handholds slippery or unstable ground slippery plant surfaces debris and rubble piles restricted space. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:

Leaving the plant unattended	<p>27. Before leaving the plant unattended, has it been secured to prevent unauthorised use? This requires:</p> <ul style="list-style-type: none"> • bucket lowered to the ground • securely locked and keys removed • warning lamps to alert traffic if parked alongside roads overnight. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:
Site management	<p>28. Has the risk of unauthorised entry to the site been adequately controlled? Consider:</p> <ul style="list-style-type: none"> • the proximity of the site to schools, parks, shopping precincts or other populated areas • general signs indicating it is a construction site • signs warning about specific hazards • visual barriers and fencing. 	<input type="checkbox"/> Yes <input type="checkbox"/> No Comments:

What to do next

If you answered 'no' to any of the items during the assessment, further action should be taken. This should start with a discussion with the relevant people on site to gather more information and decide on a course of action. Keeping a record of the completed assessment will help to monitor and review items at a later date.