



## M&C-M Procedure



# PRO-4.5-0001-1-03

## Ground Disturbance

Document Owner:	Janelle Shackley	HSE Manager – Midstream, Network Solutions & OMS
Approved By:	Janelle Shackley	HSE Manager – Midstream, Network Solutions & OMS
Prepared By:	Adrian Connolly	HSE Specialist - Control of Work and Contractor Management
Document Status:	Active	Version 6
Approved Date:	15-Dec-23	Review By: 15-Dec-28

### Purpose

Whenever bp conducts construction, maintenance, demolition, remediation and other similar work that are typical of our industry, there is the potential for harm to people and the environment and for damage to equipment. This document provides requirements for ground disturbance in support of PRO-4.5-0001-1-01 Control of Work.

This procedure sets out a required approach to ground disturbance in accordance with the requirements of GDP 4.5-0001 Control of Work and OMS Group Essentials 3.2.1 and 4.5.1.

The document defines the requirements that apply to ground disturbances within ANZ MC&M to protect personnel from injury and property from damage during the ground disturbance or the period an excavation exists on site.

### Relevant OMS element(s)

OMS 4.5 (Control of Work)

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To review changes, refer to the [This procedure](#) was prepared with reference to relevant legislation/regulations including but not limited to, relevant Acts, Regulations, Aus/NZ Standards and industry codes and practices.

Details of current legislation/regulations can be provided by the HSSE Team on request.

Version Summary' at the end of this document.

## 1. Scope

The requirement specified in this procedure applies equally to bp employees, contractors and visitors engaged in the ANZ MC&M business.

Specific sites, areas and activities may have more detailed OMS requirements and where these exist the requirements will be specified in local procedures, safe work instructions, manuals, handbooks or specific standards.

## 2. Methodology

Within the methodology if there is a 'Shall' statement that you need to deviate from, please contact the document owner for approval.

### 2.1. Risk Assessment for Ground Disturbance work

Work that involves a man-made cut, cavity, trench or depression in the earth's (ground's) surface formed by earth (ground) removal shall not proceed unless a risk assessment has been conducted.

#### A. Hazard Identification

Identification of utility installations and other buried/hidden hazards that may be encountered during the task.

- 1) To confirm adequate controls are in place, including the identification of services to an appropriate level, a Minor Ground Disturbance Minimum Controls Checklist or Ground Disturbance Certificate is required for all Ground Disturbance as per WPCG-PRO-01 Work Authorisation (Australia) and PRO4.5-0001-1-01 Permit to Work (New Zealand).
- 2) Where site plans are available for the work site these should be reviewed for underground services, pipelines, pipework, tanks and other equipment prior to the commencement of work.
- 3) The risk assessment for the task shall consider the method for underground service investigation required prior to disturbing the ground. All available information relating to underground utilities such as Before You Dig Australia (BYDA) / beforeUdig (New Zealand), plans, site as-built plans, should be made available to the utility locator prior to the commencement of utility location activities.
- 4) If services are identified or foreseeable (e.g. due to ambiguous results) in the area then the work area should be de-energised. Specific requirements for isolation of services within a work zone may be defined by local regulations, utility providers, or within WPCG-PRO-01 Work Authorisation (Australia) and PRO4.5-0001-1-01 Permit to Work (New Zealand). All isolations, and any de-energising of electrical services, shall be carried out in accordance with PRO-4.5-0001-1-02 Energy Isolation.
- 5) In order to confirm the location of electrical services (e.g. non energised or shielded cables), where identified in the risk assessment for the task, a competent electrical worker may be required to assist the underground services locator to connect to services.
- 6) The utility locator shall review all relevant utility information gathered for the site before they proceed to inform the Permit Officer or Work Clearance Issuer (as applicable) of the

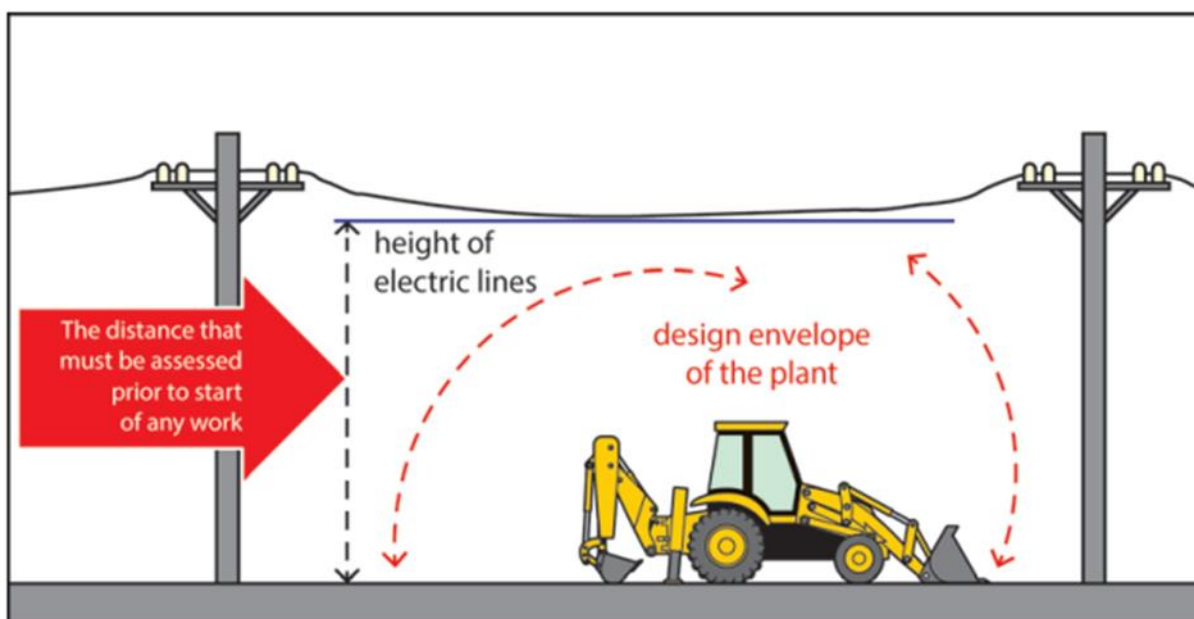
utilities in the work area. Any deviations from the plans provided should be documented on the site plan. (Note: at the completion of the ground disturbance activity, any information which demonstrates that the available plans are inaccurate or incomplete should be provided to the bp representative to update site plans).

- 7) The cable and piping locator should mark out all known services at the site on the ground surface in the work area prior to the commencement of any ground disturbance work. The following colour coding is nominated in AS1345-1995 for this purpose, and should be used.

**Table 1: Examples of standard paint colours used to mark service assets**

Utility	Colour
Communications	White (or black when on white background)
Drainage	Green
Electricity	Orange
Fire Service	Red
Gas	Yellow
Water	Blue
Recycled Water	Purple

- 8) If the location of services in the work area cannot be confirmed and the surface is not covered by concrete or bitumen then non-destructive digging should be used to provide clearance to that area. High pressure water jetting used for non-destructive digging should have a maximum pressure of 2000 psi. Pressures above this have been shown to be capable of damaging services. If water jetting is not reasonably practicable, potholing should be conducted for this purpose.
- 9) Overhead power lines near the excavation work should be considered. Specific control measures shall be implemented to prevent contact, including specification of the required separation distance depending upon the voltage, and the use of a spotter if required. Once an assessment of the worksite and the overhead electric lines has been carried out a decision on the approach distance for the proposed work can be made. The approach distances and work zones vary with the voltage of the overhead electric lines and the level of authorisation of each person carrying out the work. Approach distances can vary depending on the voltage and apply to equipment, plant and personnel. Refer to local regulations, compliance codes, codes of practice or guides for working in the vicinity of overhead and underground electric lines.



**Figure 1: Assessment of distances where overhead electrical lines are identified as a hazard.**

- 10) Review the site asbestos register and consider in the risk assessment for the task the potential for asbestos to be in the soil or adjacent buildings that may be disturbed.

#### **B. Potential for soil collapse**

Identify ground type, groundwater and environmental conditions to assess the potential for soil collapse or cave in:

- 1) Ground type and ground water

The risk assessment for the task may identify the potential for ground water, or the need for soil sample tests prior to works and assessment of the potential migration of dust / contaminated spoil.

- 2) Environmental conditions

The risk assessment for the task should consider weather conditions, both current and forecasts which may affect environmental conditions, water ingress, localized flooding, and soil condition.

#### **C. Controlling unauthorised access**

Control the risks associated with unauthorised site entry and inadvertent falling into the excavation by people or animals, by the use of physical barriers and warning signs:

- 1) In the risk assessment consideration should be given to secured fencing and additional barricading at the excavation perimeter with warning signage or physical security if required.

#### **D. Determination of the potential for a Confined Space**

Assess the potential development of hazards such as an oxygen deficient or hazardous atmosphere or engulfment within the excavation; and determine whether the excavation should be classified as a confined space, as per PRO4.5-0001-1-04 Confined Space Entry.

## **2.2. Permissions for Ground Disturbance work**

Correct 3rd party consents shall be obtained when the following may be impacted by the ground disturbance.

### ***2.2.1. Impacting Public or 3rd Party Utilities***

Public utilities such as electricity, gas, telecoms, water, stormwater, sewage, etc. may exist on work sites.

- a. Site plans, where they be available for the work site, should be reviewed prior to the commencement of work.
- b. Consult Before You Dig Australia (BYDA) / beforeUdig (New Zealand) in advance of work to identify public and 3rd party utilities and their requirements.
- c. Determine the appropriate underground site service investigation required to identify and locate 3<sup>rd</sup> party underground services that may be present prior to commencement of work.
- d. Applicable permits shall be obtained for work in Licensed Energy Corridors or Port Authorities.
- e. Traffic Management plans shall be developed, approved, and implemented where required by Road Authorities.

### ***2.2.2. Impacting Local Government Authorities***

- a. Impacts to parks or roadways may require local council approval.
- b. Consult local environmental regulations for the transportation and disposal of spoil and ground water.
- c. Local requirements to notify the respective regulatory authority of your intention to excavate shall be complied with.

### ***2.2.3. Impacting the Surrounding Community***

Consider in the risk assessment if surrounding communities may be impacted and mitigations that may be needed such as traffic management, alternative access, and communications that may be required.

## **2.3. Communication for Ground Disturbance work**

Communication and co-ordination shall be established to confirm the safety of impacted personnel as follows:

- A. WPCG-PRO-01 Work Authorisation (Australia) / PRO4.5-0001-1-01 Permit to Work (New Zealand) defines requirements for personnel to acknowledge that they have read, understand and will comply with the requirements of the risk assessment and authorisations required for the work.



- B.** The risk assessment for the task should specify the appropriate means of communication for the task and co-ordination of personnel, e.g. the agreed communication method between the operator of plant (e.g. excavator) and spotter.
- C.** Communication to impacted personnel of the effect of ground disturbance work shall be conducted by the person responsible for the works.

## **2.4. Accessing Excavations**

Personnel shall not be allowed to enter a trench or excavation unless:

- A.** The applicable Work Authorisation has been obtained as per WPCG-PRO-01 Work Authorisation (Australia) / PRO4.5-0001-1-01 Permit to Work (New Zealand), which must include authorisation to enter a confined space if the ground disturbance is deemed to be a confined space.
- B.** Trenches or excavations have been safely battered, benched, shored or protected by an engineered trench shield.
  - 1) The risk assessment for the task shall consider battering, benching, shoring or trench shields that may be required.
  - 2) Excavations greater than 1.5 metres shall receive battering, benching or shoring prior to entry. Shoring may also be required for work that requires access of personnel or placement of loads within a distance of the edge equal to the depth of the excavation, depending on the potential consequence of collapse. This should be considered in the risk assessment and is required, as a minimum, if there is a risk for harm to personnel.
- C.** A means of safe entry and exit shall be provided, e.g. benching, ladder.

## **2.5. Inspection and Documentation of Ground Disturbance work**

### **2.5.1. Inspections**

- A.** A competent employee should inspect the following items prior to the start of work each day, as applicable to the type of excavation:
  - 1) Potential for cave ins. Equipment should be positioned away from the edge of the excavation. As a rule of thumb the distance from the edge of the excavation is recommended to be at least equal to the depth of the excavation to prevent collapse. This is subject to condition of the soil; type of shoring, sloping and benching in place; and type of equipment.
  - 2) Failures of protective systems and equipment, such as shoring.
  - 3) Potential for hazardous atmospheres. The potential for occupational exposures to hazardous substances should be considered as part of the risk assessment for the task, and appropriate control measures implemented. Minimum requirements are defined within WPCG-PRO-01 Work Authorisation (Australia) / PRO4.5-0001-1-01 Permit to Work (New Zealand) and, if applicable, additionally within PRO4.5-0001-1-01 Confined Space Entry.
- B.** If the ground disturbance may be left unattended for an extended duration, the site should be regularly inspected by a Competent Person to provide assurance that the ground disturbance is

not a safety hazard to others during periods that work is not being carried out and that it is secured from unauthorised entry including inadvertent entry. This should be considered on the Work Authorisation and the frequency defined, if applicable.

- C. Inspections are required after natural or man-made events, such as heavy rainfall, which may introduce new hazards.
- 1) The risk assessment for the task shall be reviewed and the work site shall be inspected after major natural or man-made events (e.g. large earthquake in the area, site emergency on work not associated with this task or heavy rainfall that has resulted in localized flooding or impact to the soil).
  - 2) If controls have been compromised or additional measures are deemed necessary to make the task safe to continue, then work shall not proceed. The Permit Officer for the Ground Disturbance Certificate, if applicable, shall be informed.
  - 3) If an incident occurs associated with the ground disturbance works, all work shall cease and the site incident reporting and response processes shall be followed. Work authorisation requirements of WPCG-PRO-01 Work Authorisation (Australia) / PRO4.5-0001-1-01 Permit to Work (New Zealand) shall be followed prior to recommencing work.

### 3. Roles and Responsibilities

The roles and responsibilities associated with this procedure are listed in the following table.

**Table 1: Roles and Responsibilities**

<b>Planner</b>	The person responsible for planning the ground disturbance work is responsible for ensuring that the Permit Receiver is communicated the requirements of this procedure as part of the planning process prior to work. The planner role is often not a dedicated role and may be fulfilled by Project Manager, Project Engineer, Retail Field coordinator, etc.
<b>Permit Receiver</b>	The Permit Receiver is responsible for ensuring the requirements of the Work Clearance and Certificate (as applicable) are complied with, along with the risk assessment for the task and any associated Work Permits or Work Clearances as prescribed in WPCG-PRO-01 Work Authorisation (Australia) and PRO4.5-0001-1-01 Permit to Work (New Zealand).
<b>Permit Officer</b>	The Permit Officer is responsible for the issue of a Ground Disturbance Certificate in accordance with this procedure, along with the other work authorisations associated with the Ground Disturbance as prescribed in WPCG-PRO-01 Work Authorisation WPCG-PRO-01 Work Authorisation (Australia) and PRO4.5-0001-1-01 Permit to Work (New Zealand).
<b>Site Representative</b>	The Site Representative is responsible for communicating to the Permit Officer (work authorised by a Ground Disturbance Certificate) or Permit Receiver (work authorised by a Work Clearance) the operations that may affect the Ground Disturbance. They are responsible for ensuring that other parties on site that may be affected by the Ground Disturbance are informed.

## 4. Terms, Definitions and Abbreviations

**Table 2: Terms, Definitions and Abbreviations**

<b>Battering</b>	To excavate a hole or build an earth bank so that it forms a batter as a means of preventing the collapse of the sides of an excavation. A batter is formed with sides that are inclined away from the excavation. The angle of repose required to prevent collapse, varies with differences in such factors as the soil type, environmental conditions of exposure and additional loadings e.g. plant.
<b>Benching</b>	To cut an excavation in steps to provide horizontal bearing and sliding resistance as a means of preventing the collapse of the sides of an excavation. Benching is formed with one or a series of horizontal levels or steps, usually with vertical or near vertical surfaces between levels.
<b>De-energised</b>	Disconnected from all sources of supply but not necessarily isolated, earthed or out of commission.
<b>Electrical Worker</b>	Person or persons engaged in the installation, maintenance, repair and testing of electrical equipment.
<b>Ground disturbance</b>	Work that involves a manmade cut, cavity, trench or depression in the earth's surface formed by earth removal. This includes cutting into hard surfaces such as concrete, driving piles into or by breaking the earth's surface, and/or ground removal.
<b>Isolated</b>	Refer PRO4.5-0001-1-02 Energy Isolation for deflection of isolated, and isolation requirements.
<b>Potholing</b>	Using a safe means of exposure (e.g., hand-digging, using a vacuum excavator) to make a hole that confirms the exact location, depth, orientation and size of a line or other underground facility. 'Potholing' is also called 'test-pitting.'
<b>Shoring</b>	The use of timber, steel or other structural material to support an excavation in order to prevent collapse so that construction can proceed.
<b>Simultaneous operations (SIMOPS)</b>	Separate tasks or works that take place at the same time with the potential to impact each other. Also referred to as SIMOPs.

## 5. Verification Processes associate with this Procedure

The key process steps outlined in this procedure shall be included in a Self-Verification Programme.

## 6. Associated Documents

The following associated documents:

- Have been referenced in this procedure.
- Should be considered in understanding and applying the instructions provided in this procedure.

**Table 1: Required References**

Document Name	Document No
Group Defined Practice - Control of Work	GDP 4.5-0001
Asbestos Management Procedure	PRO-3.4-0000-0-02
Control of Work	PRO-4.5-0001-0-01
Permit to Work	PRO-4.5-0001-1-01
Energy Isolation	PRO-4.5-0001-1-02
Confined Space Entry	PRO-4.5-0001-1-04
WPCG Work Authorisation	WPCG-PRO-01

## 6.1. Standards & Codes of Practice

The following Standards & Codes of Practice may be used as guidance for safe and compliant ground disturbance and shall be complied with in jurisdictions in which they have legal effect with the relevant regulator for the work site.

**Table 4: Standards & Codes of Practice**

Document Name	Document No
Identification of the contents of pipes, conduits and ducts	AS1345-1995
Guidelines on earthworks for commercial and residential developments	AS 3798
Safe Work Australia Code of Practice: Excavation Work	
Worksafe NZ Good Practice Guidelines: Excavation Safety	

## 7. External References

This procedure was prepared with reference to relevant legislation/regulations including but not limited to, relevant Acts, Regulations, Aus/NZ Standards and industry codes and practices.

Details of current legislation/regulations can be provided by the HSSE Team on request.

## 8. Version Summary

The table below provides a summary of version history of this procedure.

**Table 5: Document Version Summary**

Version	Prepared by	Description of Change	Date	MoC
1	Adrian Connolly	Document created - Initial document	14 Nov 2014	
2	Adrian Connolly	Changes to formatting to improve readability and clarity. Change to requirements for underground service location (Section 5.a.3. through 5.a.6.) - Service locator is no longer mandatory for all ground disturbance work. Removal or previous table 1, inclusion of Work Instructions in new Table 1 (old Table 2) and removal of TRA requirements (refer to TRAT)	24 May 2016	
3	Adrian Connolly	Update to incorporate changes from implementation of WPCG Minimum Control Checklist	15 Oct 2017	11374
4	Adrian Connolly	Update to implement WPCG-PRO-01 Work Authorisation	22 Aug 2018	11449
5	Adrian Connolly	Update to links in document, updated BP to bp	06 Sep 2020	11733
6	Adrian Connolly	Minor update post bp reinvent, implementation of Life Saving Rules, and minor simplifications.	3 Aug 2023	11836

## 9. Disclaimer

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