

PROCEDURE

PET-HSE27-SF-PRD-00003 Ground Disturbance and Excavation



Objective

To provide a process to support the safe execution of work involving **ground disturbance** and **excavations**.

Audience

Field supervisors and other personnel involved in the planning, execution and supervision of work that comprises **ground disturbance** and **excavations**.

Note: This procedure also applies to contractors unless formally agreed to (and documented) through the Contractor Management Procedure (PET-SUP68-SU-PRD-00001).

Owner

Jason Flockton, Senior Personal Safety Adviser

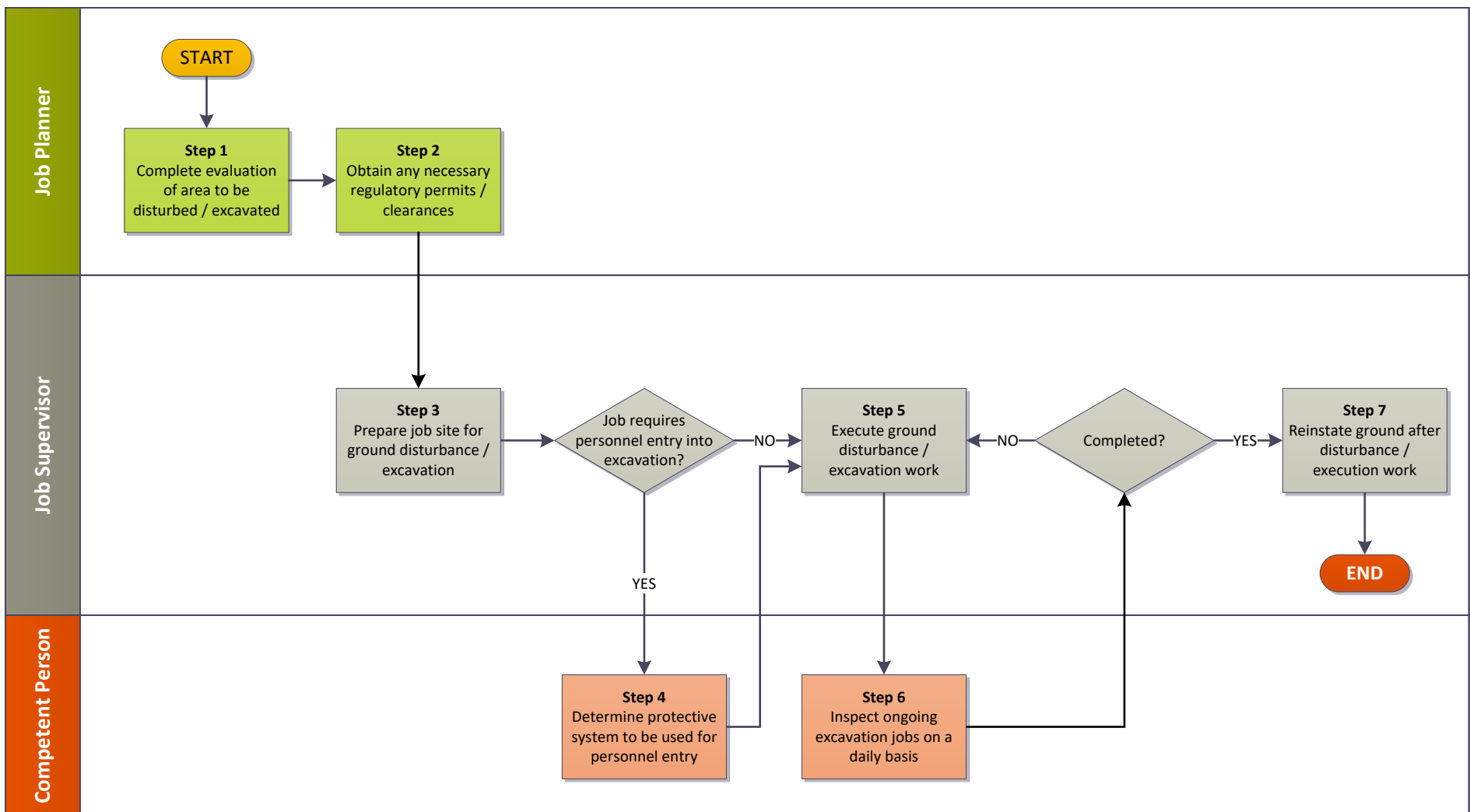
Document Signatures (e-signatures are permissible)

	Business Role	Name	Signature
Approver	VP HSEQ Projects	Karelis Holuby	<i>Signature on file – refer to Memorandum: Heritage BHP Petroleum HSE MS Post-Merger Update</i>

Disclaimer:

This document has been updated to meet post-merger requirements. Updates have been restricted to rebranding of logo, company name and revision number and date. Updates have not impacted the design or functionality, or taken away from original intent, of the document.

Process Summary



Procedure

Step 1. Complete evaluation of area to be disturbed or excavated

- *Job Planner* to complete a desktop evaluation of the proposed area to be disturbed or excavated:
 - confirm geographical footprint of planned **ground disturbance** or **excavation**
 - identify areas requiring regulatory or customary approval (e.g. areas of environmental or cultural significance, road closures, easement access authority) by discussing planned job with Environment and Regulatory team
 - locate potential underground utilities or installations
 - identify other potential hazards present within the working zone (e.g. overhead power-lines, adjacent waterways, roads) and controls needed to manage the risk of these hazards (e.g. barricades, spotters)
 - engage a **professional engineer** to design the **protective systems** (e.g., *benching, sloping, shielding, shoring*) where an excavation is planned to be greater than 20-feet (6-meters) in depth
 - excavations greater than or equal to 5 feet in depth shall be shored, laid back to a stable slope, or supported by some other means to protect personnel from cave-ins, falling dirt, or collapse of adjacent structures.

Note: Excavations less than 5 feet deep are not required to have protective systems (e.g., shoring, benching, bracing) if the excavation has been inspected by a Competent Person, if there is no indication of a potential cave-in, and if a protective system is not required at a lesser depth by state or local codes.
 - **ground disturbance** or **excavation** work conducted in the perimeter of an existing Petroleum Deepwater (WEL) controlled location (e.g. drill site, well site, Central Delivery Point) requires a Permit to Work authorized by the Ultimate Work Authority for that location in order to manage the risk associated with Simultaneous Operations
 - personnel entry to an excavation may be considered a Permit Required Confined Space (see Step 4)
 - Complete Ground Disturbance and Excavation certificate (PET-HSE27-SF-CER-00001)
- *The following activities do not require and Excavation certificate:*
 - driving a wooden survey lathe to a depth of less than 16-inches (40-centimeter)
 - pushing in wire marker flags to a depth of less than 16-inches (40-centimeter)
 - routine, minor road surface maintenance and drainage systems maintenance
 - Erosion, repairs and maintenance of tailings systems
 - agricultural cultivation to a depth of less than 16-inches (40-centimeter)
 - hand digging to a depth of no more than 16-inches (40-centimeter) so long as it does not permanently remove cover over a buried facility

Step 2. Obtain any necessary regulatory permits or clearances

- *Job Planner* to engage Environment and Regulatory team to obtain applicable regulatory permits or clearances identified from Step 1, including completion of any necessary field surveys.

Step 3. Prepare job site for ground disturbance or excavation

- *Job Supervisor* to mark-out the area to be disturbed or excavated, including the path of any underground utilities and a supporting buffer zone where a planned trench crosses another utility.
 - maintain a minimum of 24-inches (61-centimeters) separation from underground utilities at crossing points, unless approved by a Pet DW (WEL) Manager following an assessment of the risk
- *Job Supervisor* to locate and mark underground installations and utilities through one or more of the following:
 - contact utility companies or installation owners, within established or customary local response times, to advise of the proposed work (e.g. One-Call in Texas, Dial Before you Dig in Australia)

Note: Wait periods between the submission to One-Call of the intent to excavate by the excavator, and marking of the utilities by the operator may vary between States in the USA. Consult your local One-Call regulatory requirements to ensure compliance is maintained prior to commencing excavation.

- completion of an inductive sweep of the work area by a qualified person using certified locator equipment, by a person who is trained in utility locating (e.g., NULCA.org, or similar accreditation program)
- visual location of underground utilities by **potholing** using non-mechanical, non-destructive excavation process (e.g. hydro-vacing, vacuum, hand digging)
- installing suitable marking devices (e.g. stakes, tape, paint)
- *Job Supervisor* to identify special control requirements in conjunction with pipeline owners, at least two working days prior, when crossing their pipeline with heavy equipment is necessary.
- *Job Supervisor* to establish controls to minimize discharge of pollutants, including sediment, in storm-water both during and after ground disturbance.

Step 4. Determine protective systems to be used for personnel entry

- *Competent Person (excavation)* to define the **protective systems** required (e.g. *benching, sloping, shielding, shoring*) before authorizing personnel entry to an excavation:
 - conduct determination in accordance with the [Occupational Safety and Health Administration Standard CFR 1926 Subpart P](#), or equivalent
 - *competent person (excavation)* may exempt the need for **protective systems** where the excavation will be less than 4-feet (1.2-meters) deep and there is no cave-in potential, or the excavation is made entirely in stable rock
- *Competent Person (excavation)* to define:
 - the *sloping* and *benching* systems required in accordance with specifications in [Appendix 1](#)
 - controls (e.g. drainage, dikes) to prevent surface water entering the excavation
 - safe means of entry and exit for excavations 4-feet (1.2-meters) in depth or greater:
 - ladders, steps and/or ramps must be spaced no more than 25-feet (7.5-meters) apart
 - ladders must be secured with the top extending at least 3-feet (0.9-meters) above the excavation edge
- *Job Supervisor* to determine if the excavation is a Permit Required Confined Space (see *Permit to Work Procedure - PET-HSE27-SF-PRD-00006*) and if so, ensure the *Confined Space Entry Certificate* (PET-HSE27-SF-CER-00006) is completed.
- *Job Supervisor* to document the **protective systems** and safe means of entry and exit in the Job Risk Analysis (JRA).

Step 5. Execute ground disturbance or excavation work

- Place excavated soil / spoil and other materials a minimum of 24-inches (61-centimeters) from the excavation edge.
- Prevent mechanical excavation within 24-inches (61-centimeters) of an underground utility; soil removal within this buffer may only be conducted by non-mechanical means.
- No trenching machine 'cutting head' is permitted within 10-feet (3-meters) of an underground utility without Pet DW (WEL) Representative approval.
- Prohibit the extension of equipment booms over exposed pipeline without authorization from the Pet DW (WEL) Manager of the area being excavated.
- Establish an exclusion zone around the excavation using barricades to prevent unauthorized or accidental entry by personnel, vehicles, or mobile equipment.

Step 6. Inspect ongoing excavation jobs daily

- *Competent Person (excavation)* to complete an inspection of the excavation prior to commencement of work each day, or more frequently as defined in the JRA. Evidence of this inspection is to be provided by signature on the *Ground Disturbance and Excavation Certificate* (PET-HSE27-SF-CER-00001).

Step 7. Reinstate ground after disturbance or excavation work

- *Job Supervisor* to remove equipment and supports from the excavation once personnel have exited:
 - release jacks or braces slowly, lifting the jacks or braces out of the excavation from above
- *Job Supervisor* to back-fill the excavation and, if required, compact the soil.

Roles and Responsibilities

Role	Responsibilities
Competent person (excavations)	<p>Person who:</p> <ul style="list-style-type: none">▪ Is capable of identifying existing and predictable hazards in the surroundings▪ Is capable of identifying working conditions which are unsanitary, hazardous, or dangerous to employees▪ Has authorization to take prompt corrective measures to eliminate the hazards <p>For excavation activities, the person must have qualifications and experience with soil analysis and use of protective systems consistent with the type and depth of excavation being planned (e.g. trenching). The person must also have received instruction in the expectations of this Procedure</p>

Appendix 1. Sloping and Benching Protective Systems

Soil or Rock Type	Definition	Maximum Allowable Slopes
Stable Rock	Natural, solid mineral matter that can be excavated with vertical sides and will remain intact while exposed.	Vertical (90°)
Type A	Cohesive soil that has not been previously disturbed and has an unconfined compressive strength of 1.5 ton per square foot or greater. Examples include: clay, silty clay, sandy clay, and clay loam.	¾:1 (53°)
Type B	Less cohesive soil with an unconfined compressive strength greater than 0.5 ton per square foot but less than 1.5 ton per square foot. Granular soil and previously disturbed soil with an unconfined compressive strength greater than 0.5 ton per square foot are also Type B. Examples include: angular gravel or crushed rock, silt, silt loam, sandy loam, and dry rock that is not stable.	1:1 (45°)
Type C	Type C soil as an unconfined compressive strength of 0.5 ton per square foot or less. Examples include gravel, sand, loamy sand, submerged soil where water is freely seeping, or submerged unstable rock.	1 ½:1 (34°)

Table 1. Soil types and maximum allowable slopes

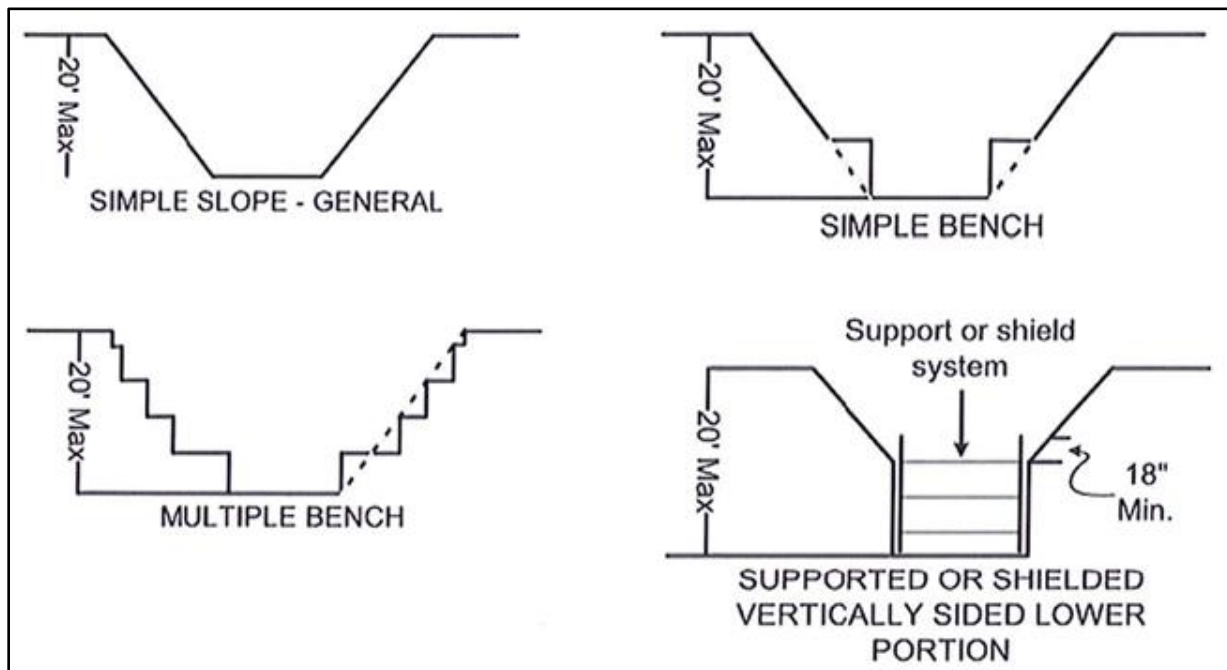


Figure 1. Examples of sloping and benching protective systems