HASLIN

Excavation Procedure

SEQ-PR-011

Document Revision Control

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Excavation Procedure

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1. Scope

The intent of this procedure is to eliminate the potential of an incident occurring that will cause the death or serious injury to a person or persons working in or in the near vicinity of an excavation or trench, any other person that may be in the vicinity of such works and for all plant and equipment working near overhead power lines and underground services.

2. Application

This procedure is applicable to All Haslin Constructions personnel and Subcontractor personnel working on Haslin Constructions Projects.

3. Definitions

Personnel:	For the purpose of this document – Employees or Subcontractors
Excavation Work:	Work to make, fill or partly fill an excavation.
Trench:	a horizontal or inclined way or opening: a) the length of which is greater than its width and greater than or equal to its depth, and b) that commences at and extends below the surface of the ground, and c) that is open to the surface along its length.
Competent Person:	A person/s who has acquired through training, qualification or experience, the knowledge and skills to carry out the task.
Cave-ins:	Cave-ins are the movement of soil into an excavation including the loss of soil from under a trench support system. This movement can be fatal to personnel if the cave-in occurs when personnel are working near or into the excavation.
Excavation:	excavation means a trench, tunnel or shaft, but does not include: a) a mine, or b) a bore to which the Water Act 1912 applies, or c) a trench for use as a place of interment.
Underground Service:	A cable, pipe or other thing laid or installed underground for the transmission, transportation or storage of electricity or a substance. Examples: • Underground Telecommunications Cable • Underground Electrical Cables • Underground Gas Pipelines • Underground Fuel Tanks or Pipes • Underground Water Pipes • Underground Sewerage Pipelines or Services • Underground Stormwater pipes or Services

Provider of underground service location plans.

4. References

- NSW WHS Act 2011
- NSW WHS Regulations 2017 Part 4.7, Division 7, Section 166. Division 3 Excavation Work. Section 304, 305 & 306
- NSW Work near Overhead Power lines - Code of Practice
- NSW Excavation Code of Practice
- Qld WHS Act 2011
- Qld WHS Regulations 2011
- Qld Electrical Safety Act 2002
- Qld Electrical Safety Regulation 2013. Part 5 Overhead and underground electric lines
- Qld Electrical Safety Code of Practice 2020 – Working near overhead and underground electric lines.
- Qld Excavation work Code Of Practice 2021
- Before you Dig Australia (BYDA)

5. Responsibilities

Supervisor

- Ensuring site specific induction training is provided to all employees and sub-contractors required to work in or around excavations.
- Assess site specific risks associated with excavations
- Establish and implement appropriate controls for identified hazards using the hierarchy of controls
- Appointing a safety observer (spotter)
- When required, ensure that a utility service provider is formally notified prior to excavation within the specified distance of a utility service and that a company representative from the utility service provider is present when excavation works are within the specified distance from the service.
- Participate in site-specific risk assessments.
- Issue approved Permit to Excavate with all relevant BYDA and other hazard identifications associated with open excavations. (Refer to permit for more detail)
- Complete regular inspections of the excavation

Employees and sub-contractors are responsible for:

- Assisting in the identification, assessment and control of excavation tasks
- Actively participating in evacuation training

6. Procedure

Where risks to health and safety are identified, steps shall be taken to eliminate or minimize so far as is reasonably practicable, using the hierarchy of controls, the risks associated with excavations.

6.1. Project Safety Risk Register

Each project must use the HIRAC process in Safety Risk Register SEQ-TP-002 to identify the potential activities on the project associated with excavations and implement controls consistent with the hierarchy of controls. The project safety risk register is a live document and updated as the project progresses.

6.2. Potholing Permit

The completion of the Haslin Permit SEQ-FM-116 Potholing Permit is a compulsory requirement before any potholing commences. The Project Manager or their delegate is responsible for approving the Potholing Permit.

The Potholing Permit details the following:

1. Asset owner contact details
2. All expected services in the immediate area are identified
3. Asset owner requirements including SAD's, permits and training requirements are met
4. Desktop and onsite investigation findings are documented in table 2 Onsite investigation findings and attached to the permit.

6.3. Excavation Permit

The completion of the Haslin Permit SEQ-FM-047 – Excavation Permit is a compulsory requirement before any excavation commences. The Project Manager or their delegate is responsible for approving the Excavation Permit. A separate Excavation Permit must be issued for each excavation area and separate permits must be issued where different methods of excavation and/or collapse prevention are implemented.

The Excavation Permit details the following:

1. Details in respect of the method of excavation
2. Protection of expected services
3. Controls to be implemented to prevent ground collapse
4. Permit conditions

The permit must be renewed every 30 calendar days or if there is a change in the scope of the excavation work. Validity of the Permit to Excavate must align with the validity of any asset owner drawings.

6.4. Safe Work Method Statements (SWMS)

A SWMS must be developed for all excavation works. The SWMS must detail the following (without limitation):

1. The requirement and method used to identify known services
2. The requirement and method used to positively locate known services
3. Asset owner requirements including Safe Approach Distances', permits and training requirements
4. The requirement to complete a permit to excavate prior to commencing excavation
5. Details in respect of the nature of the works and methods used to prevent ground collapse
6. The controls required to prevent falls into an excavation
7. The controls required to manage the risk of mobile powered plant colliding with pedestrians or other mobile plant
8. Emergency procedures for an excavation

6.5. Ground Collapse Prevention Methods

For excavations which are 1.5m or greater in depth, one or more of the following control measures must be implemented to prevent collapse.

- Shoring
- Benching to a maximum grade of 1:1 without a geotechnical report
- Battering to a maximum grade of 1:1 without a geotechnical report
- Geotechnical report.

Details of each these methods can be found in the Excavation Code of Practice. In each case, the temporary works control measures must be designed, installed and certified in accordance with Temporary Works Procedure SEQ-PR-040 and by competent persons in accordance Training and Competency Procedure SEQ-PR-069.

6.6. Additional Controls for Trenches

During the planning and execution of trenches 1.5 meters or greater in depth where shoring, benching or battering may not be required due to ground conditions, the advice of a geotechnical engineer must be sought prior to commencing excavation. This must take into consideration ground conditions, work activity and location, water table levels and the impact of any potential weather events.

Written advice from the geotechnical engineer for trench work at or greater than 1.5m deep without shoring, benching or battering must:

- State that all sides of the trench are safe from collapse; and
- State the period of time to which the advice applies; and
- State any natural occurrences that may create a risk of collapse.

For all trench work at or greater than 1.5m deep without shoring, benching or battering, written advice from a qualified and experienced geotechnical engineer on site must be obtained before proceeding any further at the following work progress points:

- Prior to commencement of excavation; and,
- At 1.5m depth; and,
- Every .5m thereafter; and,
- When conditions change from what was expected or due to an adverse weather event.

6.7. Identify and locate underground Services

Prior to excavation commencing, a desktop service investigation must be completed by requesting service location plans from Before You Dig Australia (BYDA) to identify known underground services in the vicinity of the excavation works. Other locations such as airports, defense or council facilities may have their own services location records which must also be obtained. If the scope of works changes, or the plans validity dates expire, you must submit a new BYDA or client specific service location document request. For Rail works, current revisions of the relevant Detailed Site Survey (DSS) records must be reviewed.

Each asset owner will provide information on their requirements with regards to safe excavation practices that may be required in addition to the requirements set out in this Procedure. The asset owner is to be contacted prior to commencing any works to ensure any work being carried out near their assets is undertaken in accordance with the Owner's requirements. Asset Owner contact details will be found on the confirmation sheet received from BYDA or on the information you receive from the asset owner if contacted directly.

Any services identified by the desktop investigation in the immediate area of the excavation works, must be positively located and marked on site by non-destructive excavation methods or manual hand digging (i.e. pot-holing), prior to the commencement of any mechanical excavation.

The frequency of potholing on site shall be determined based on a risk assessment for the site. Pot-holing requirements set out by asset owners must be included in work practices and the presence of the asset owner on site may be required during excavation.

6.8. Overhead Powerlines

Work involving excavation may result in plant working near exposed overhead powerlines. Prior to excavation works commencing:

- Identify Services
- Identify and maintain Safe Approach distances
- Follow the asset owners' requirements
- Where necessary, contact the asset owner to isolate the power
- Where necessary, contact the asset owner for installation of tiger tails on low voltage powerlines
- Use Overhead Powerlines Permit SEQ-FM-065 or follow client specific permit, applications and procedures where required.

6.9. Safe Approach Distances

Prior to the start of any work near overhead power lines or underground services it is essential that the height or depth and voltage of the services and the minimum safety clearance be assessed at the worksite. Potholing of services in the

immediate area of the excavation works must be used to ensure safe approach distances set out by the asset owners are adhered to during the mechanical excavation works.

When assessing the relevant approach distances for the work a number of factors must be considered including:

- The requirements of the asset owner
- Using a registered surveyor to accurately calculate Safe Approach Distances especially at higher voltages, where the safe approach distance is large. If the height or voltage of overhead power lines cannot be accurately determined consult the network operator.
- Unknown location of buried services or unidentified underground services
- Overhead power lines are made of metal and are therefore subject to expansion and contraction when heated and cooled which may vary the height
- Where more than one voltage is present
- Increased clearances must be allowed where a risk assessment identifies a reasonable possibility that a load or lifting gear (crane hook, chains, slings, etc.) moving or swinging towards overhead power lines or associated electrical apparatus when an excavator, crane or item of mobile plant is operated.

When working around overhead or underground services, or when it is likely that unknown services may be present, a spotter or safety observer must always be present and maintain direct constant communication with the operator.

Safe approach distances may vary due to Legislation and Codes of Practice in each state or territory, client requirements or the requirements of asset owners which must be reviewed and followed.

6.10. Limits of Underground Approach

The table below outlines the mechanical excavation limits for each type of underground asset. These may vary and should always be confirmed with the asset owner.

Assets	Clearances	No Go Zone For Mechanical Excavation	Controls	Typical Depths
Low and Medium Pressure services and Low-pressure mains	N/A	300 mm	Pothole to confirm location of service The position of the asset will not appear on the maps	300 – 450 mm
Medium Pressure mains	N/A	300 mm	Pothole to confirm location of asset The code of practice for shafts, tunnels and trenches, and the guide to dangers of poorly ventilated workplaces Only one individual at a time should be excavating if hand excavation is being undertaken in a confined space. Another should act as an observer and be able to operate any breathing, escape or fire equipment required The elimination of an ignition source in the event of an escape Excavation below underground assets should not be undertaken within a distance of 300 mm below the asset located at the lowest level Note: All transmission pipelines involving gas, oil and petrochemical have separate requirements and the asset owners should be contacted.	450 – 750 mm

High Pressure services, mains and pipelines	300 mm with hand tools and supervision from Network Authority	1000 mm	Powered excavation within 300 – 1000 mm is only permitted under supervision and with a Permit to Work from Asset Owner Also see Controls for medium pressure mains immediately above	750 – 1200 mm
Low Voltage Electricity cables – voltages less than or equal to 1000V (1kV)	Close proximity with use of hand tools	300 mm	Must contact asset owner for specific conditions	450 – 750 mm
High Voltage Electricity cables – voltages from 1000V (1kV) up to 11,000V (11kV)	Close proximity with use of hand tools	600 mm	Must contact asset owner for specific conditions	450 – 750 mm
Electricity conductors from 11,000V (11kV) up to 33,000V (33kV)	Close proximity with use of hand tools	Must contact asset owner	Must contact asset owner for specific conditions	600 – 1000 mm
Underground sub-transmission cables 33,000V up to 132,000V (132kV)	Must contact asset owner	Must contact asset owner	Must be carried out under the supervision of the asset owner	900 mm
Extra High Voltage Electricity Transmission cables – voltages above (132kV) and 330,000V (330kV)	Must contact asset owner	Must contact asset owner	Work must be carried out under the supervision of the asset owner	800 – 1200 mm
Telecommunications cables	Contact asset owner for specific conditions	Contact asset owner for specific conditions	Must contact the asset owner for specific conditions	Typically, 450 – 600 mm, other assets to 1200 mm
Water pipelines	N/A	300 mm (if pipeline is 200 mm or greater in diameter)	Pothole to confirm location of asset	Min 450 mm
Sewerage pipelines	N/A	300 mm (if pipeline is 200 mm or greater in diameter)	Pothole to confirm location of asset	Between 600 mm to 10 (ten) metres

6.11. Falls

The risk on falling from height may be present when performing excavations 1.5m or greater in depth. Control measures should be implemented around excavations in accordance with Working at Heights Procedure SEQ-PR-009.

6.12. Mobile plant

All mobile plant must be managed and operated in accordance with Plant Safety Management Procedure SEQ-PR-006. Materials (including spoil), vehicles, loads or equipment must not be placed, stored or piled within zone of influence of any excavation unless a suitable temporary support system has been designed, installed and certified in accordance with Temporary Works Procedure SEQ-PR-040 and by competent persons in accordance Training and Competency Procedure SEQ-PR-069.

Workers must not be in an excavation whilst excavation work is occurring unless a risk assessment and appropriate controls are in place. Workers must remain outside of the working radius of all plant.

6.13. Adjacent building/ Structures/ Materials/ Foundations

A risk assessment must be conducted prior to excavation works commencing regarding risks associated with adjacent buildings, structures, materials and foundations to identify and implement control measures. This must be recorded in the Project Risk Register. Excavation work must not start until controls are put in place to prevent the collapse or partial collapse of potentially affected buildings or structures.

Excavation below the level or within the zone of influence of the footing of a structure that could affect the stability of the structure, must not commence without the written approval of a qualified and experienced structural engineer and the design, installation and certification of appropriate temporary works controls. For all temporary works classified as either medium or high risk, a detailed excavation methodology must be developed. The temporary works control measures must be designed, installed and certified in accordance with Temporary Works Procedure SEQ-PR-040 and by competent persons in accordance Training and Competency Procedure SEQ-PR-069.

6.14. Confined Space

An excavation may be classified as a confined space. A confined space means an enclosed or partially enclosed space that:

- is not designed or intended primarily to be occupied by a person; and
- is, or is designed or intended to be, at normal atmospheric pressure while any person is in the space; and
- is or is likely to be a risk to health and safety from:
    - an atmosphere that does not have a safe oxygen level, or
    - contaminants, including airborne gases, vapours and dusts, that may cause injury
    - from fire or explosion, or
    - harmful concentrations of any airborne contaminants, or
    - engulfment.

Classification of and control measures for confined space excavations are detailed in Confined Space Procedure SEQ-PR-008.

6.15. Water Accumulation and Dewatering

Water is a major concern during excavation or trenching works. The actions of water in excavations can cause changes in ground conditions, potentially causing collapse and engulfment.

Workers must not work in an excavation when water has accumulated or is accumulating in the excavation unless adequate support and dewatering systems are in place to prevent collapse, and reduce water build up. If water is accumulating in an excavation, then adequate dewatering methods of appropriate design and capacity must be in place to ensure proper control of accumulating water.

6.16. Emergency Planning

For all excavation work an emergency plan must be developed, and an emergency response drill conducted where the difficulty of rescue is assessed as high. The emergency plan must be included in the SWMS.

6.17. Inspection

All excavations and trenches must be inspected by site supervisors or leading hands each day prior to entry to ensure safe working conditions and monitor the effectiveness of the controls in accordance with the drawings, plans or permit. The stability of the surrounding soil can change rapidly due to factors such as soil drying, fluctuations in the water table, or water saturation. Before work begins, the condition of the soil, as well as the state of any shoring, battering, or trench walls, must be carefully examined for signs of fretting, slipping, slumping, ground swelling, loose sand, rock boulders (floaters) which can loosen or move when exposed by a trench or slip planes (greasy back), vertical smooth joints in clay that can separate due to water ingress.

If any deterioration is observed, repairs or reinforcement of the shoring system must be completed from above ground before anyone enters the excavation or trench. If there are any concerns about safety or stability, the trench or excavation must not be entered until adequate controls are in place.

Additionally, inspections must be conducted after adverse weather, changes in ground conditions, impact or damage to the temporary works, unauthorised modifications, or as specified in the temporary works designer's instructions. Inspection records must be documented in the site diary within the relevant project's Procore workspace.

7. Training and Competency

All workers supervising, performing excavation work, performing inspections or acting as a spotter or safety observer must be competent to perform such work in accordance with SEQ-PR-069 Training and Competency Procedure.

8. Relevant Templates, Forms and Checklists

- SEQ-FM-116 Potholing Permit
- SEQ-FM-047 Excavation Permit
- SEQ-FM-065 Overhead Powerlines Permit
- SEQ-FM-040 Temporary Works Procedure
- SEQ-PR-069 Training and Competency Procedure
- SEQ-PR-006 Plant Safety Management Procedure
- SEQ-PR-009 Working at Heights Procedure
- SEQ-PR-008 Confined Space Procedure