



SAFE BURIALS



By Glenn French Operations Coordinator

Code of practice opening statement

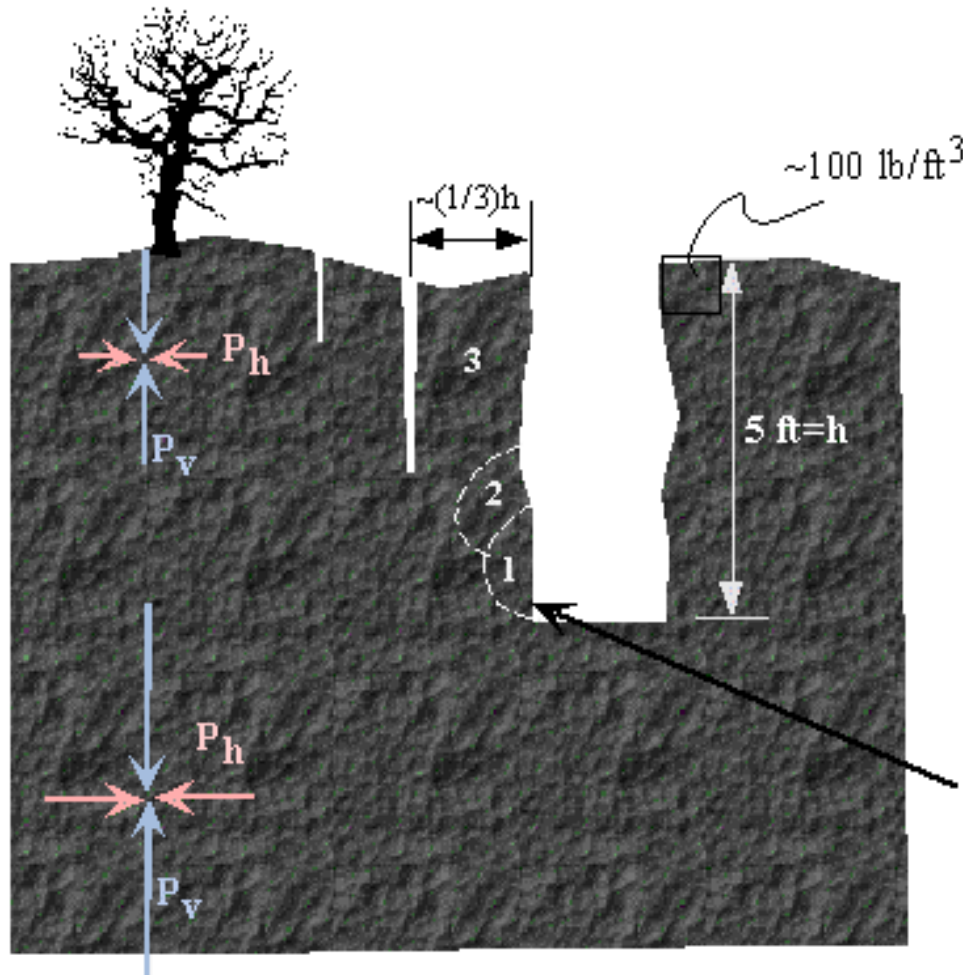
Excavation is regarded as one of the most hazardous construction operations.



Excavation failure occurs very quickly, giving a worker virtually no time to escape, especially if the collapse is extensive and the excavation is a trench. Normally, a **slab of earth collapses off the trench face under its own weight and breaks against the opposite wall** of the excavation, burying and crushing any person in its path. **This can result in death by suffocation or internal injuries.**

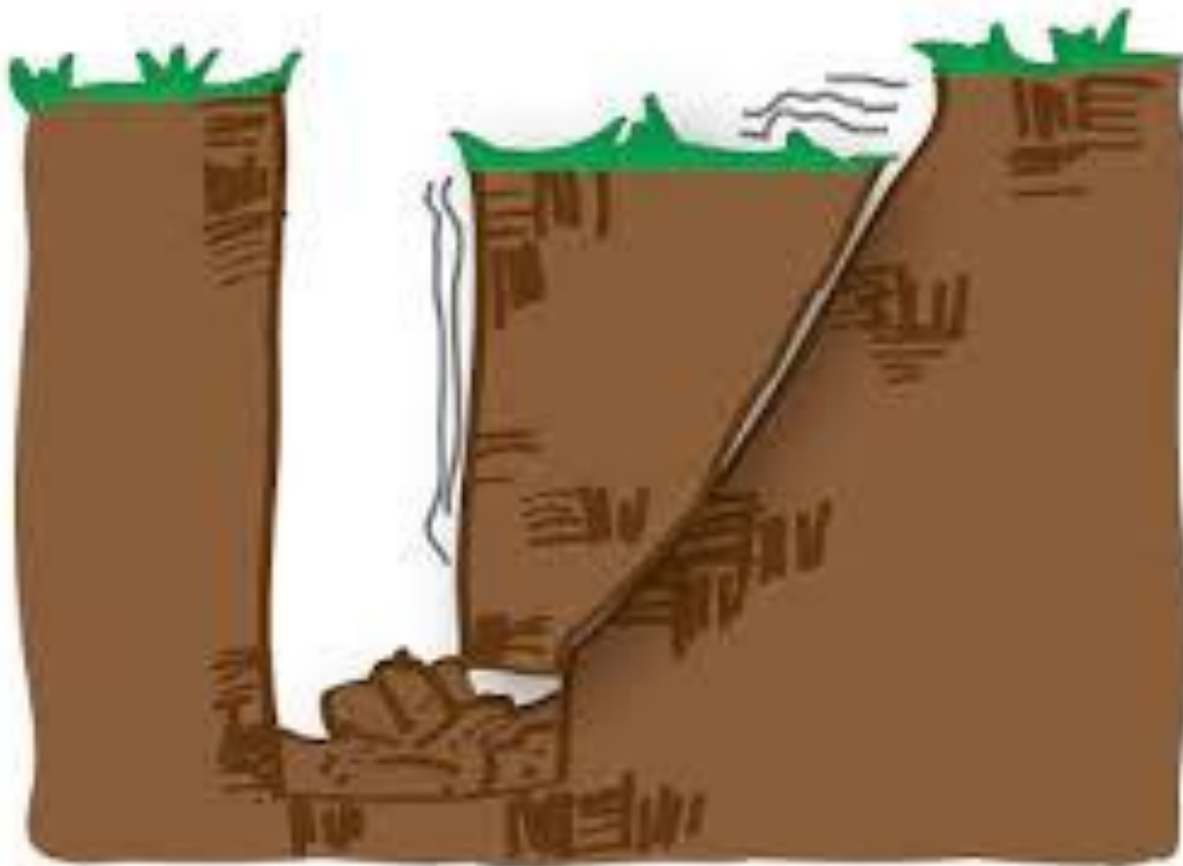


rough approximation: $P_v = \gamma h$, $P_v = 2P_h$



Vertical Soil Pressure = 500 lb/ft^2 ,
horizontal pressure $\sim 250 \text{ lb/ft}^2$ but
only on one side creating instability

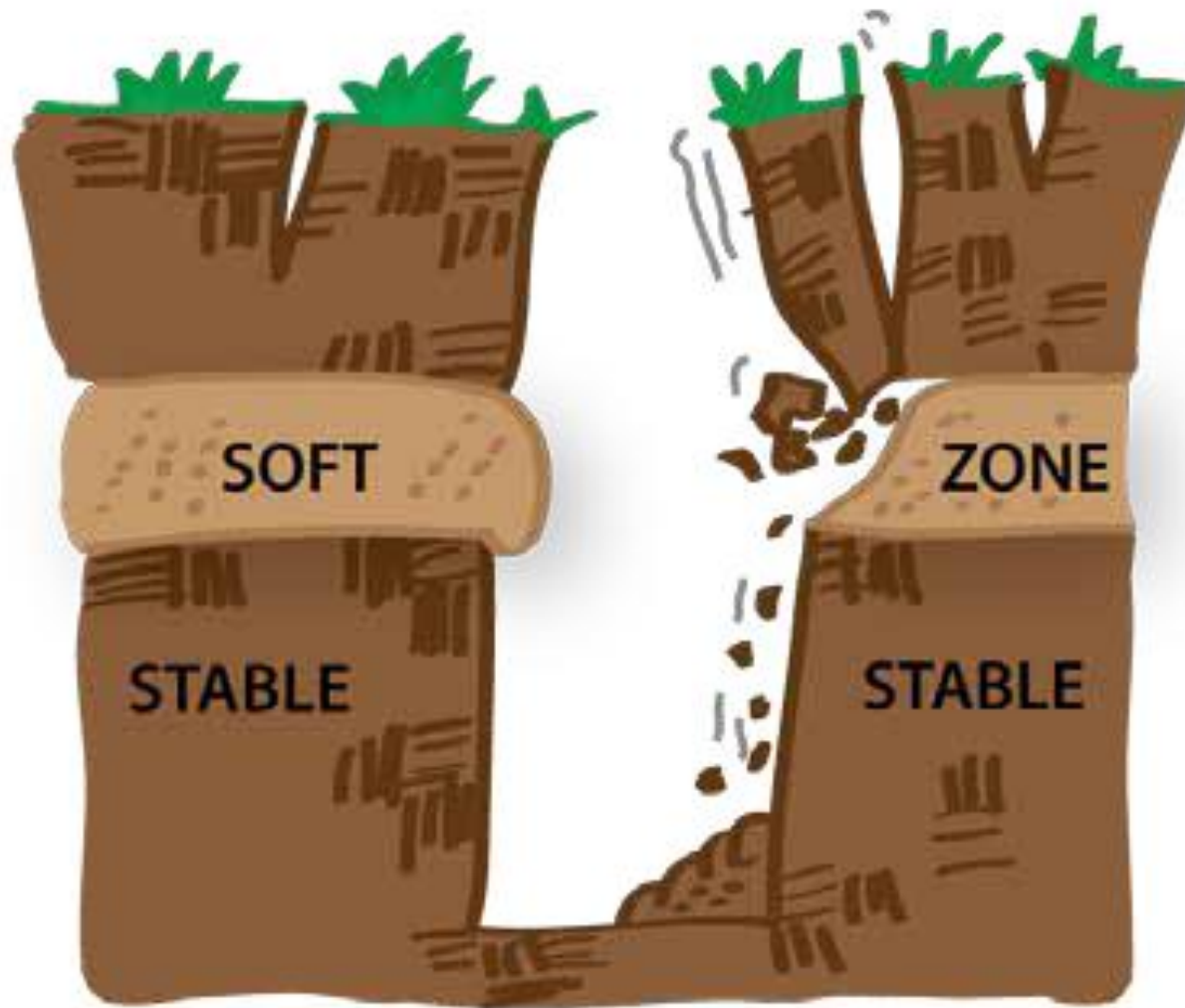
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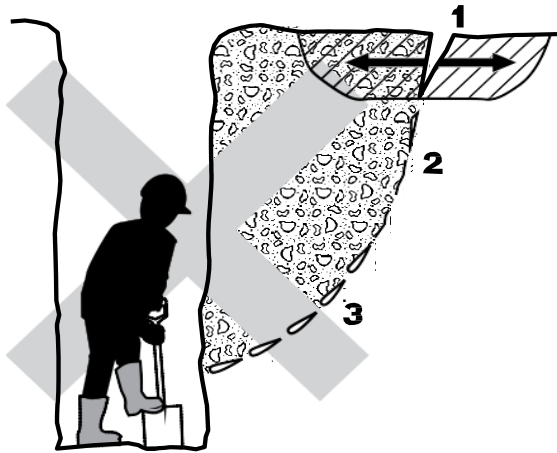
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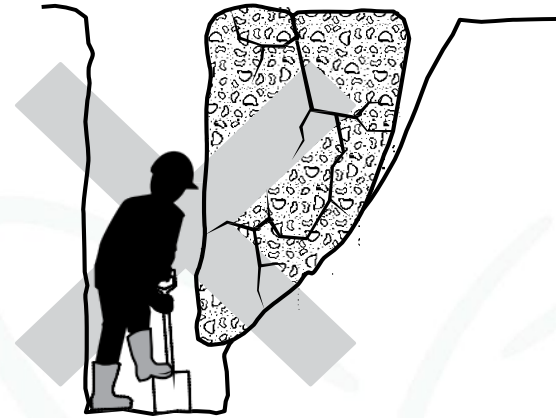




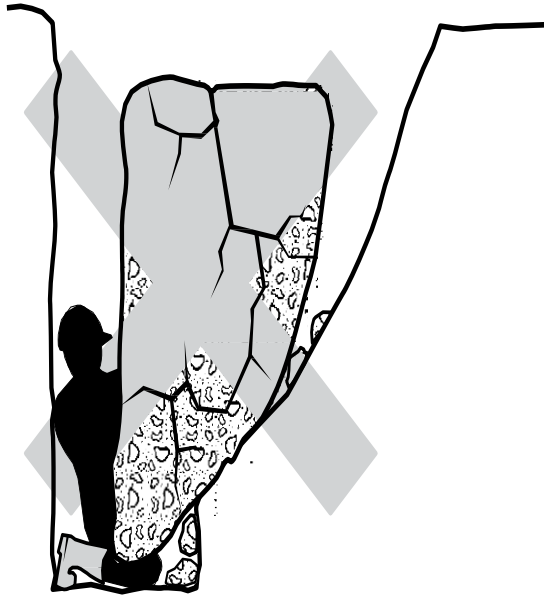


- (a) This is a very dangerous situation, requiring ground support. No worker should be in the trench unless support has been installed.
1. Area of tension, as wall starts to collapse.
 2. Slipping plane.
 3. Seepage along the slippage plane further reduces the stability of the wall. Water seeping into the excavation, tension cracks on the surface and bulging side walls are all signs of imminent collapse.

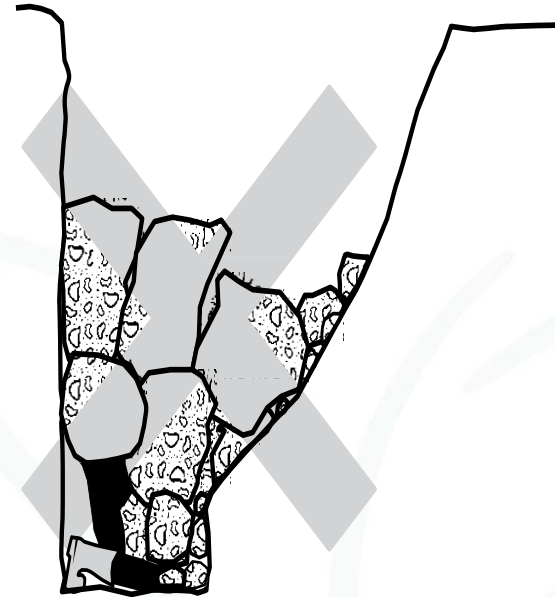
Seepage in trench bottom may not be obvious until the actual collapse.



- (b) Shear plane failure along the seepage (slippage) plane.



(a) Worker trapped and crushed against the trench wall by the quick collapse.



(b) Worker badly injured and probably smothered after being crushed against the opposite wall by the collapsing ground. The weight of a wedge of sand over a one metre length of trench two metres deep is about three tonnes; more than enough to crush a worker's chest.



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Occupational Health and Safety Act 1984

- section 19(1)(b):
- *‘an employer shall provide such information, instruction, and training to, and supervision of, the employees as is necessary to enable them to perform their work in such a manner that they are not exposed to hazards.’*



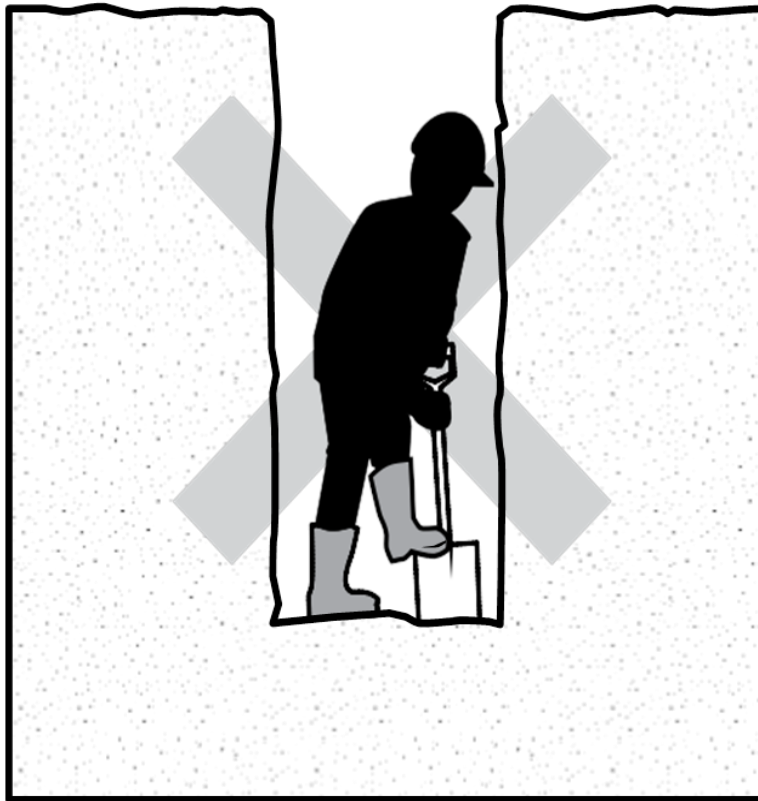


Figure 1: Worker in unsupported trench. Sides of trench need to be assessed by a competent person to be self supporting.

WHO IS A COMPETENT PERSON?

- A competent person is defined in the regulations as **'one who has acquired through training, qualification or experience, or a combination of those things, the knowledge and skills required to do that thing competently'**.
- A competent person should be capable of identifying existing and **predictable hazards or dangerous and unsafe working conditions** in and around excavations, and **be authorised to take prompt corrective action to eliminate them.**



HMAS Sydney Serviceman burial in Geraldton.



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MORE DIFFICULT THE EXCAVATION THE MORE YOU NEED TO KNOW

- The knowledge and skills required of a competent person will increase as the complexity of the excavation work increases. Size is not the only determinant of knowledge and skills needed. Many small size excavation works will be complex because of the soil conditions and stability considerations.
- Many simple and straightforward excavations will only require experience while more complex work may require training and qualifications as well. It is the complexity of the work which determines the need for training, qualification or experience, or a combination of those things, to carry out regular inspections of excavation work.



Exhumation of fourteen Nuns

Confined Graveyard, no maps



Exposed all, then exhumed



PREPLANNING

- Preplanning and co-ordination between those involved in excavation operations and activities is **essential to ensure the safety of employees and protect members of the public.**
- Safety in and around excavations should be considered as part of job planning from the commencement of a project. Identification of hazards should be part of the planning, design and estimating process.



Right method, right equipment



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Big or small, information is key

- Before excavation commences, all available information should be collected about the exact location and details of the excavation, and disposal areas for excavated material, so that suitable methods of working can be planned and the most appropriate plant for the job can be obtained.



Fencing and spoils placement





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INSPECTIONS

- Cave-ins often occur because of inadequate investigation being carried out before work commences, and the failure to use methods and install protective systems shown to be necessary by an analysis of the soil structure of the face. Poor workmanship, the use of defective materials, poor maintenance and the failure to adequately provide for temporary loads above the face and loads from nearby structures are other causes of collapse, as well as inadequate sub soil drainage and weather changes that alter the ground water level and condition of the soil.



- Inspections should be carried out:
- daily and before work commences;
- when tension cracks, sloughing, undercutting, water seepage, bulging or other similar events occur or when disturbed soil is encountered.
- when the size, location or placement of the spoil heap changes;
- when any indication of movement in an adjacent structure is noticed; and
- after every rainstorm and any earthquake or seismic event.



- Where inspections reveal hazardous situations, **workers must be removed from the excavation until precautions have been taken to ensure their safety.**
- Where inspections are carried out and reveal hazardous situations, they should be **documented.**



Burial Ticket

Cemetery

Date

Location

App. Number

Name

Director

Grave Type

Depth of Grave

Casket Type

Casket Size

Casket Weight

Other Interments at this Gravesite:

CRS Application Comments

1. Boards Placement	Name	Initial
Date/Time	[] Grave No. & Site Confirmed	

2. Grave Dug	Digger Name:	Initial
Date/Time	[] Grave No. & Site Confirmed	

3 Set-Up		DIG	TL		DIG	TL
Date/Time	Chairs	[]	[]	Cleanup	[]	[]
	Urn	[]	[]	Presentation	[]	[]
	Trowel	[]	[]	Access	[]	[]
	Carpets	[]	[]	Tapes	[]	[]
Comments -						

4. Team Leader Chk	Name:	Initial
Date/Time		

5. Attendant/s	Name:	Initial
Date/Time		

6. Backfilled	Name:	Initial
Date/Time	[] Grave No. & Site Confirmed	



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Pre Start Assessment Section (Must be Completed & Signed for each Stage)

A risk is an action or activity which has the potential to lead to a loss or an unwanted outcome. These prestart assessments are an important part of your role. It will assist you to find out what risks you will be faced with, controls that are in place, but also determining the importance of these risks, and any additional controls that may be required.

BURIAL Job S.T.A.R.T For full SOP practises - refer to BOPM, Sept 2010, pg 20-54				
1	Stop - Step back and observe Do I understand the scope of work?	Y	N	
2	Think - Through the task? How am I going to do this task? Are there any uncontrolled hazards?	Y	N	
3	Assess - Hazards, soil, paths, impact I have assessed what can go wrong. I have assessed how it can occur. I have assessed what is the most likely result.	Y	N	NA
4	Review and document findings I have listed all the hazards and controls. Refer to "What hazards have you identified" table	Y	N	NA
5	Talk it through and complete the task I have discussed the impacts with all persons impacted by this task.	Y	N	NA
6	Satisfied I am satisfied that all hazards are controlled. I have reviewed the task and I am ready to S.T.A.R.T.	Y	N	

MAUSOLEUM Job S.T.A.R.T For full SOP practises - Refer to BOPM, Sept 2010, S3, pg 69-88				
1	Stop - Step back and observe Do I understand the scope of work?	Y	N	
2	Think - Through the task? How am I going to do this task? Are there any uncontrolled hazards?	Y	N	
3	Assess - Hazards, panels, lifts, guide rods I have assessed what can go wrong. I have assessed how it can occur. I have assessed what is the most likely result.	Y	N	NA
4	Review and document findings I have listed all the hazards and controls. Refer to "What hazards have you identified" table	Y	N	NA
5	Talk it through and complete the task I have discussed the impacts with all persons impacted by this task.	Y	N	NA
6	Satisfied I am satisfied that all hazards are controlled. I have reviewed the task and I am ready to S.T.A.R.T.	Y	N	

EXHUMATION/LIFT/DEEPEN Job S.T.A.R.T For full SOP practises refer to BOPM, Sept 2010, pg 55-63				
1	Stop - Step back and observe Do I understand the scope of work?	Y	N	
2	Have I read and understand the procedures for this task? As per BOPM "Presumption that all body fluids are infectious"	Y	N	
3	Do I have the correct PPE? Disposal coversalls, face mask, rubber gloves, eyewear ETC (refer to BOPM) * Are they in good working order? * Are they the correct size for me?	Y	N	NA
4	Do I have the correct tools and equipment to perform the task? * Are they in good working order?	Y	N	NA
5	Are there any uncontrolled hazards? I have listed all the hazards and controls refer to "What hazards have you identified" table	Y	N	NA
6	Talk it through and complete the task I have discussed the impacts with all persons impacted by this task.	Y	N	
7	Satisfied I am satisfied that all hazards are controlled. I have reviewed the task and I am ready to S.T.A.R.T.	Y	N	

RISK TAKING TABLE Consequences of any Injuries or Harm to Health				
Likelihood of injury or harm	Insignificant (no injuries)	Moderate (First aid/medical treatment)	Major (extensive injuries)	Catastrophic (fatalities)
Very likely	Medium	High	Extreme	Extreme
Likely	Medium	High	High	Extreme
Moderate	Low	Medium	High	Extreme
Unlikely	Low	Medium	Medium	High
Rare	Low	Low	Medium	High

Rating	Impact of Hazard Risk	What to Do
4. Extreme	Most likely to occur / dire consequences	Do not continue (reduce risk to acceptable level)
3. High	Likely to occur / serious consequences	Do not continue (reduce risk to acceptable level)
2. Medium	Possibly could happen / moderate consequences	Continue (preferably reduce the risk)
1. Low	Unlikely to happen / minor or negligible consequences	Okay to go ahead

What hazards have you identified?	What controls have you put in place?	Risk Rating

ALL employees MUST sign below if they participate in any of the job S.T.A.R.T.s	
Board Placement / Set Up / Other Signature	
Graves Dug / Set Up / Other Signature	
Set Up & Team Leader Check / Other Signature	
Backfilled / Sealed / Other Signature	
Signature	
Signature	
Signature	
Signature	

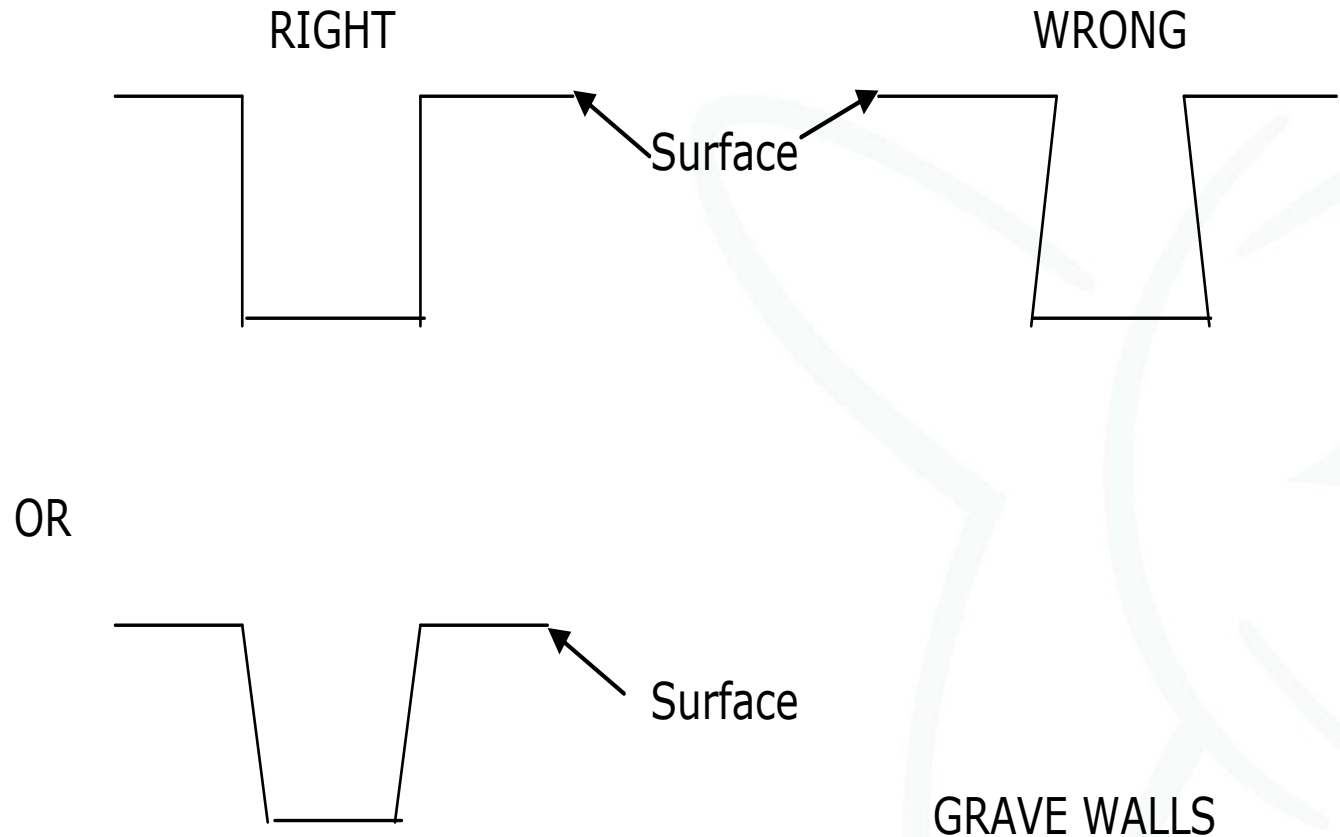


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1. Always dig grave with vertical walls – don't undercut as you dig down as this will make walls very unstable.



TEMPLATE



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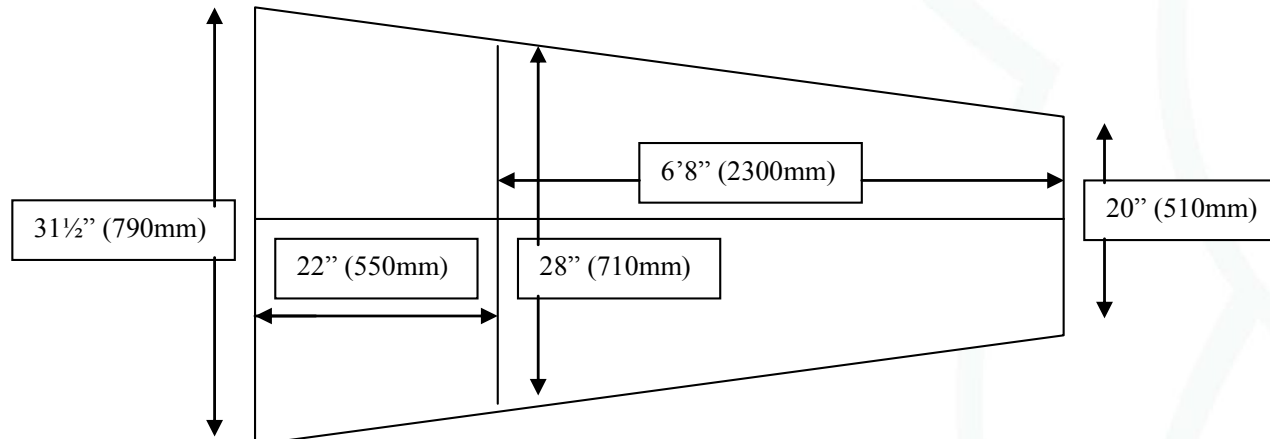
1. GRAVE SIZE: (Standard Casket)

- Width at head spreader = 31½" (790mm)
- Width at shoulders = 28" (710mm)
- Distance from head spreader to shoulder width = 20" (510mm)
- Width at feet spreaders = 20" (510mm)
- Distance between head and feet spreaders = 6'8" (2300mm)

(See diagram below.)

This is the size of the grave that will be presented for every funeral unless advised otherwise by the Funeral Director.

Where the actual size of the coffin ("an oversize coffin") is given the grave should be dug 2" (50mm) larger all round than the coffin size.



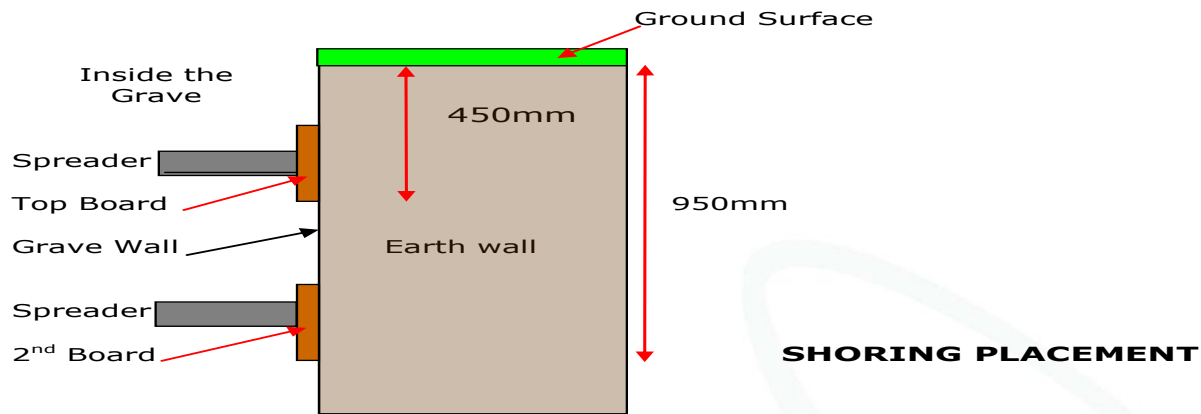


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a) Place the next set of boards on either side and continue as for (e) above.



NOTE:

This vertical gap between boards may need to be decreased where ground conditions are unstable.

a) Repeat the same process for each additional shoring set required.

See Minimum Shoring Requirements at the beginning of this section.

REMEMBER!

- **Check the grave dimensions at each level after placing each shoring set to ensure:**
- **The grave sides are vertical.**
- **The available width and length is adequate for the coffin/casket.**

1. **MINIMUM SHORING REQUIREMENTS:**

Measurements used are to the bottom of each shoring set.

2.1m (7') grave	-	4 sets	450mm from surface 900mm from surface 1350mm from surface 1800mm from surface
1.8m (6') grave	-	3 sets	450mm from surface 900mm from surface 1350mm from surface
1.4m (5') grave	-	2 sets	450mm from surface 900mm from surface

REMEMBER:

UNSTABLE GROUND CONDITIONS OR THE PRESENCE OF TREES OR MONUMENTS WILL REQUIRE ADDITIONAL SETS.

THE ABOVE REQUIREMENTS ARE MINIMUM ONLY!





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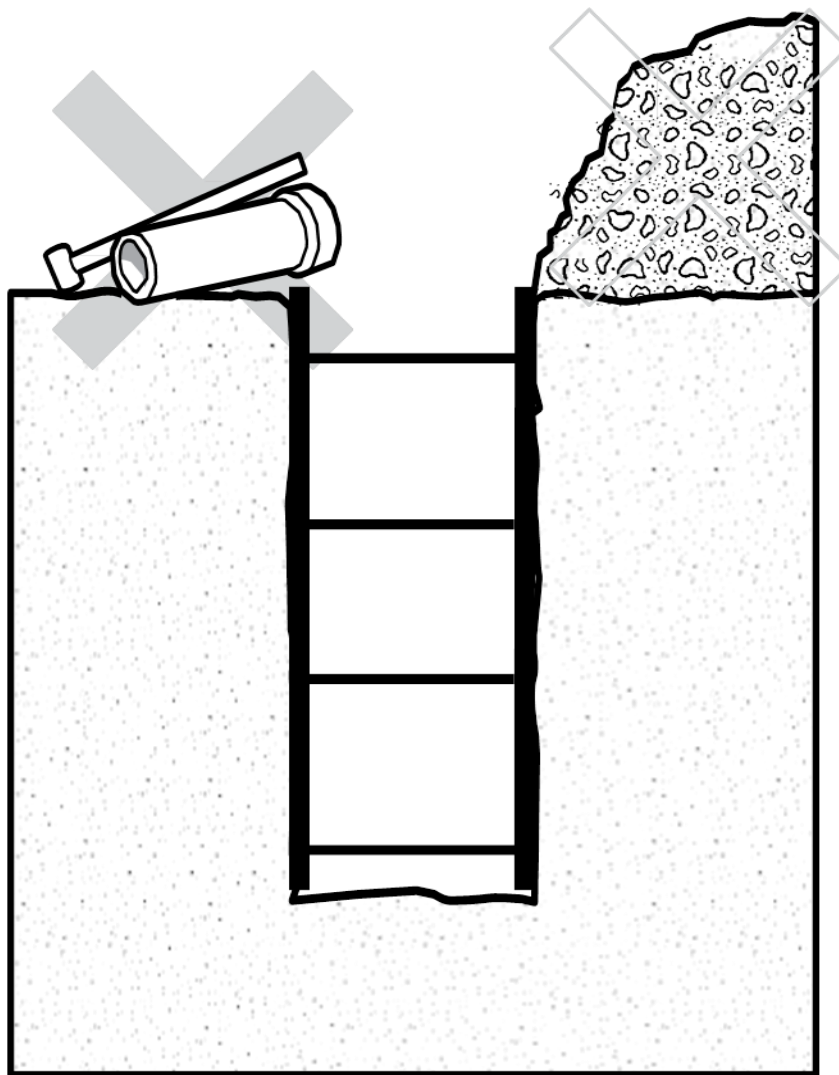


Figure 2: Excavated material, pipes and tools too close to the edge of the trench.

Headstones are a major hazard



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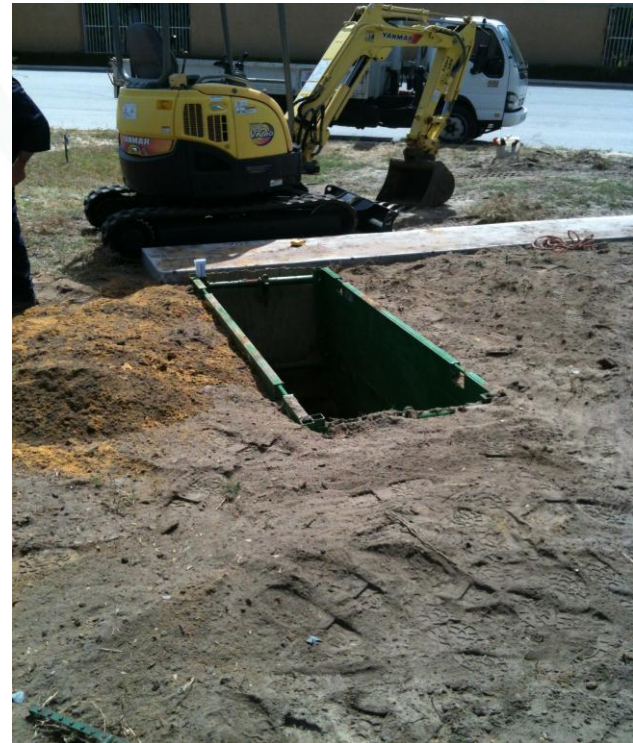
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CAR FOUND IN GRAVE

CAR OUT AND SHUTTER IN



BACKFILL AROUND SHUTTER





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BACKFILLING GRAVE WITH SHORING SETS

- BACKFILL SPOILS AROUND/OVER COFFIN UP TO THE LOWEST SET
- REMOVE SET
- BACKFILL TO NEXT
- REMOVE



COVER GRAVE WHEN UNATTENDED

Spoils away and to the corner



Leave it safe over night



RESEARCH, TRIAL AND TRAIN



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