Zero incidents
Zero harm
Zero compromise
Keeping you healthy and safe, every day at work.

ESSENTIAL STANDARD no.1

Excavations

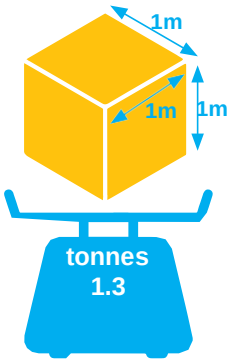
Thames Water

KEY MESSAGES

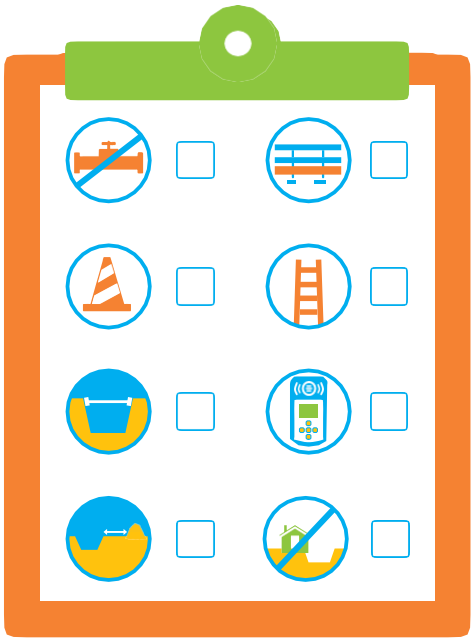
- Ensure that public safety and the safety of those doing the work is the number one priority.
- Plan to use the best/correct method. For example, where space allows, battering the sides of an excavation is the safest option.
- Plan to avoid any utility strike, and have a responsible, authorised person in charge where the activity breaks ground.
- Ensure the necessary plans, service drawings, equipment and materials are available on site.
- Anyone performing excavation work must be trained and competent and understand the risks and controls.
- Always ensure excavations are adequately protected from collapse and that the edges are protected to prevent persons from falling in.
- The mandatory PPE appropriate for the task must be worn at all times. When breaking ground, flame/ARC retardant PPE clothing must be worn.
- The use and upkeep of site safety information boards are seen as essential in visibly communicating safety information as conditions and personnel change.
- Ensure an excavation and service avoidance maturity matrix is maintained.
- Where mobile plant is used Essential Standard 6 must be followed.
- When working on live mains Essential Standard 26 must be followed.

1. Introduction

The undertaking of any activity which involves breaking ground or excavations is a high risk activity. Each year people are killed or seriously injured when utility services are struck or from collapse of the excavation. The activity must be properly planned, managed, supervised and carried out to prevent incidents. In most cases, straightforward physical protection measures can prevent incidents occurring but all too often a lack of thought and poor management control mean that protection is neglected leading to incidents and injuries.



Remember, no ground can be relied on to stand unsupported in all circumstances and one cubic metre of earth weighs approximately 1.3 tonnes.



2. Planning

Plan to do the following before performing any excavation activity or breaking ground:

- Avoid contact with underground services
- Provide safe working areas to keep highway users and members of the public away from excavations and machinery
- Protect operational staff from plant and vehicles
- Prevent trench collapse
- Keep excavated ground and other materials away from the excavation
- Provide visible and secure edge protection as necessary
- Avoid nearby structures or possible undermining
- Have appropriate access to the excavation
- Effectively control fumes or gasses

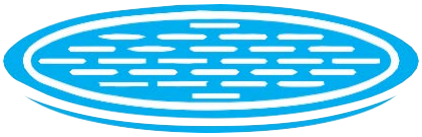
3. Avoiding Underground Services

Before you start, you must have a written permit* to dig/break ground and have a responsible, authorised and trained person present at all times.

*Refer to Appendix A for an “example of a permit to dig /break ground”.

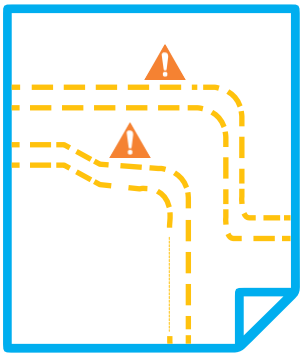
- Isolate the service where possible.

- If it is a live GRP/UPVC, isolate the mains before work starts.
- Look around for obvious signs of underground services, e.g. valve covers or patching of the road surface, covers, signage, etc.

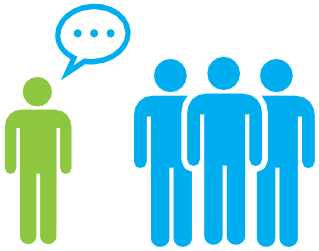


- Consult existing services drawings.
- Use locating devices to trace any services (CAT4E or equivalent standard) and mark the ground accordingly.

- Use safe digging practices, i.e. locate and dig trial holes by hand – no machines within 500mm of a service.
- The most senior person on site overseeing the excavation must be familiar with the requirements of how to avoid danger from underground services and the specific risk assessment.
- Make sure that the person supervising the excavation work has service plans and knows how to use them. Everyone carrying out the work should know about safe digging practices and emergency procedures.



- Ensure that the work gangs are briefed and fully understand the scope of works and hazards associated with the activity.



4. Protecting the Public

- Avoid exposing members of the public to the risks associated with our activities.
- Fence off all excavations and work places to prevent pedestrians and vehicles from entering.
- Inspect all works each day, ensuring that precautions are put in place, such as backfilling or covering excavations where the excavation is left open overnight or for long periods, in order to prevent collapse or unauthorised access.

5. Supporting Of Excavations

- Identify the type of ground and surrounding space before starting any excavation.

- **Use the ‘Stop and Assess’ approach on any excavations over 1.2m deep or adjacent to a live carriageway.**

- Groundwater or mains water can affect the stability of the soil, what support can be used, and, depending on the ground, what dewatering technique should be used.

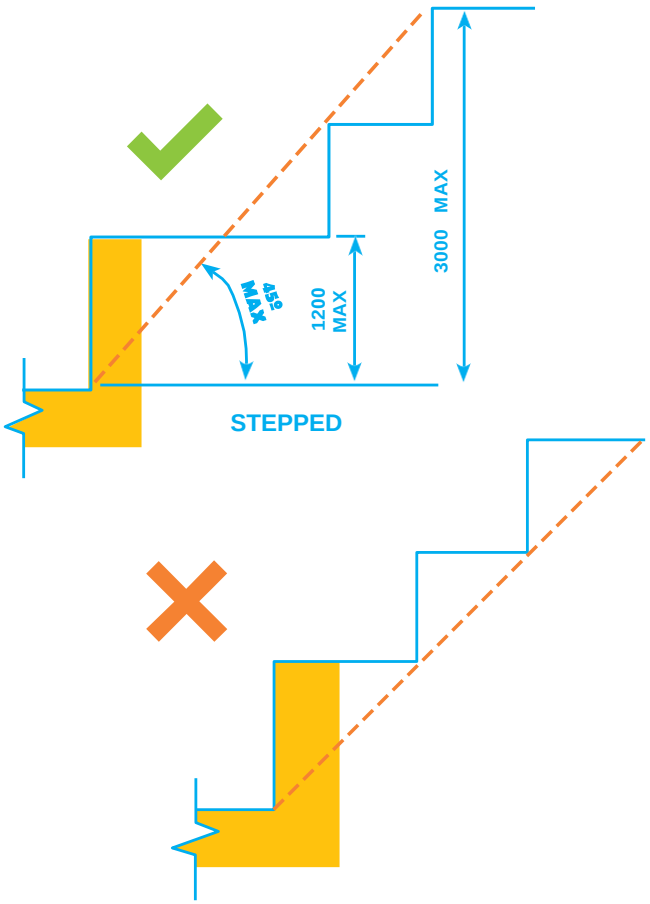
- **Consider what support is needed and get the appropriate temporary works signed off by a competent person.**

6. Battered Sides

Incidents resulting from properly designed and executed battered systems are rare. If you use battering, ensure the design allows for proper access and egress to be made. Consider the presence of ground water or mains water when selecting this method because it can affect the stability of battered slopes.

7. Stepping

An alternative to battering is cutting steps into the excavation sides. Determine the depth of the step needed using the typical slope angle as outlined in the below diagram. The vertical distance must not exceed 1.2 metres without a competent engineer's approval and sign off. The total depth must not exceed 3.0 metres without a competent engineer's approval and sign off



8. Support Systems

Involves the use of walings and horizontal struts. For example, trench box, trench sheets, frames and struts.

9. Undertaking Excavations

There are a number of risks that you must control while working on excavations. Risks and relevant control measures include:

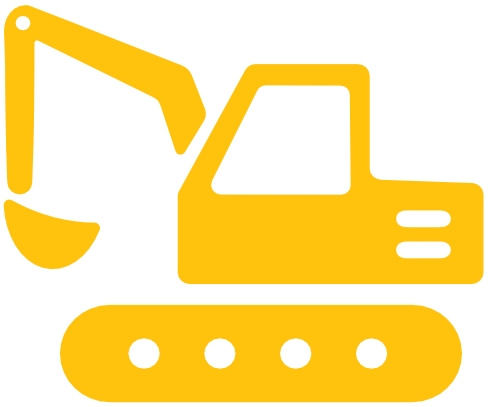
- Excavation collapse.
- Prevent the sides and the ends from collapsing by battering them to a safe angle or supporting them with timber, sheeting or proprietary support systems.
- Assess all excavations (even ones less than 1.2m deep) before entry as even work in shallow trenches can be dangerous. You may need to provide appropriate support if the work involves bending or kneeling down inside them.
- Never work ahead of the support.
- Support all exposed services and ensure they are never used for access and egress to the excavation.
- Use the appropriate engineered support for any excavation over 1.2 metres deep or adjacent to a live carriageway.
- Make, and record, proper assessments for all excavations that are 1.2 metres deep before excavating further.
- The total depth must not exceed 3.0 metres without full temporary works design and a competent engineer's approval and sign off.

10. Working In/Around Excavations

- Do not store spoil or other materials close to the sides of excavations. It may fall into the excavation and the extra loading will make the sides collapse.
- Provide substantial barriers, e.g. guard rails and toe boards, to prevent people and materials falling into excavations.
- Keep vehicles away from excavations wherever possible. Use brightly painted baulks or barriers where necessary.
- Use stop blocks to prevent vehicles that are tipping materials into excavations from over-running. The sides of the excavation may need extra support too.
- Do not straddle the excavation with any vehicle or plant; e.g. excavator.
- Wear mandatory PPE.

11. People Being Struck By Plant

Keep workers separate from moving plant such as excavators. Where this is not possible, use safe systems of work to prevent people being struck.
Where mobile plant is used Essential Standard 6 must be followed.



- Plant operators must be competent.
- Make sure excavations do not affect the footings of scaffolds or the foundations of nearby structures. Walls may have very shallow foundations which can be undermined by even small trenches.
- Decide if the structure needs temporary support before digging starts – use surveys of the foundations and the advice of a structural engineer.

12. Access

Where possible, provide a proprietary or ladder access to ensure a safe means of getting in and out of the excavation. Regularly inspect ladders to ensure they're in good order and secure.

13. Fumes

Exhaust fumes acan be dangerous. Only use petrol or diesel-engined equipment, such as generators or compressors, in or near the edge of excavations if the fumes can be ducted away or the area can be ventilated.

14. Training and Competence

A competent person must supervise the installation, alteration or removal of excavation support. People working in excavations should be given clear instructions on how to work safely.

Thames Water requires the responsible person/ supervisor to have an appropriate level of competence (training and experience) to supervise any excavation activity (e.g. formal health and safety training e.g. SSSTS/SMSTS, IOSH managing/supervising safety etc.) and where undertaking any street works NRASWA training appropriate to their level.

15. Inspecting Excavations

A competent person must inspect excavations:

- At the start, and before, each shift begins;
- After any event likely to have affected the strength or stability of the excavation; and
- After any accidental fall of rock, earth or other material.

A written report must be made after inspections. Stop work if the inspection shows the excavation to be unsafe and take action to correct it immediately.

The use and upkeep of the site safety information boards are seen as essential in visibly communicating safety information as conditions and personnel change.

Appendix A: "example of Permit to dig/break ground"

Job reference:		**Permit number Specific RAMs**	
Address:			
Scope of works:			
Permit valid from: *(date and time)*		**Permit valid to:** *(date and time)*	

Please note that the duration of this permit must not exceed 7 days

If no is answered to any of the items, escalation to the Supervisor or Manager is required to enable further planning and identify additional control measures. Monitor the works throughout the validity period of this permit to identify any change. If upon review no is answered to the questions below stop work and escalate to a supervisor or manager.

Section 1 - Documentation and Equipment	**Yes**	**No**
A site induction for all relevant personnel has been completed		
A method statement, risk assessment detailing safe digging practices has been briefed for this location		
Utility plans are available for the location, of good quality and includes symbol legend		
Equipment	**Yes**	**No**
CAT & Genny is certified and within calibration date		
CAT & Genny is in good working condition		

Section 2 - Utility services present (tick relevant boxes of known services present)

Electricity:	**Extra High Voltage**	**Gas:**	**High Pressure**	
	High Voltage		**Medium / intermediate Pressure**	
	Low Voltage		**Low Pressure**	
Water:	**Trunk main**	**Sewer:**		
	Main	**Communications:**		
	Service	**Drainage:**		
Other: please specify				

Hold point: If critical services are present, HV, EHV electric service, high/medium pressure gas, large diameter water mains (including thrust blocks, and oil and fuel pipelines), depth will exceed 1.2m, etc, work must not commence unless escalated to a Manager and section 5 of this permit completed.

Section 3 General	Yes	No	NA
A CAT and Genny scan including trace of all relevant streetlamp columns has been completed? (*Ensure CAT / Genny trace is carried out in layers throughout the excavation*)			
A check for Street furniture for example boundary boxes etc and road scarring has been completed?			
All services are marked up, including the exclusion zone of 500mm for plant? (*Never use mechanical plant or power tools within 500mm of a known service*)			
Safe digging practices - can be adopted and protection of services maintained?			
Trial holes- can be undertaken to confirm the position of services?			
Where services are encapsulated in concrete, has a request been made to the utility owner to isolate the service? If so has the service been isolated?			

Equipment	Yes	No
Are all tools suitable for the work and of the insulated type		
Personal Protective Equipment (PPE)		
Minimum standard PPE is available and worn?		
Personnel are wearing flame/ARC retardant PPE clothing?		
Training		
All personnel have relevant health and safety training? (1 day operative, 2 day team leader)		
All personnel working in proximity to underground services have Proqual Level 2 training or equivalent in service avoidance in addition to 'Streetworks' qualifications?		

Section 4 - Sign off and authorisations (where escalation has been identified section 4&5 must be completed)

Issuer: (Team leader, Supervisor or Manager with specific permit writing training and authorisation)
I confirm that works are safe to proceed in accordance with the control measures identified in this permit, and associated risk assessment and method statement.

Name:		Sign:		Date:		Time:	

Accepter: (The person in charge of the work If the issuer is not directly supervising)
I accept responsibility that work will be carried out in accordance with this permit associated risk assessment and method statement and that all persons under my control will comply

Name:		Sign:		Date:		Time:	

Excavator Operator:
I confirm that I am aware of my responsibilities in accordance with this permit and I will not operate any plant within 500mm of an identified service.

Name:		**Sign:**		**Date:**		**Time:**	
Name:		**Sign:**		**Date:**		**Time:**	
Name:		**Sign:**		**Date:**		**Time:**	

Work team sign off: (All other personnel involved in the work activity applicable to this permit)
I confirm that I have read and understood the content of this permit and will undertake my duties strictly in accordance with the control measures identified in this permit and associated risk assessment and method statement.

Name:		**Sign:**		**Date:**		**Time:**	
Name:		**Sign:**		**Date:**		**Time:**	
Name:		**Sign:**		**Date:**		**Time:**	
Name:		**Sign:**		**Date:**		**Time:**	

Section 5 – Escalation sign off (where 'no' is identified through the permit, it is the duty of the responsible Manager to attend site and verify information and consider service isolations, diversions or additional control measures to proceed safely)

Responsible Manager:

Name:		**Position:**		**Sign:**	