ST.MODWEN HOMES


# MANAGEMENT OF BURIED SERVICES HANDBOOK

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# St. Modwen Homes **Buried Services Charter**



**St. Modwen Homes have worked in partnership with our core supply chain of Contractors to ensure a safer working environment for our employees.**

The signatories to St. Modwen Homes Buried Services Charter commit to:

1. Plan all works to be carried out, ensuring those who undertake the works are aware of their responsibilities.
2. Ensure the workforce are competent and demonstrate the right attitudes to working safely around Buried Services.
3. Follow industry-recognised safe systems of work and those set out in this document.
4. Provide up-to-date accurate 'as built' drawings following service installation and ensure this information is available before digging.
5. Conduct suitable and sufficient investigation where damage to Services occurs in order to identify the cause and corrective actions required.

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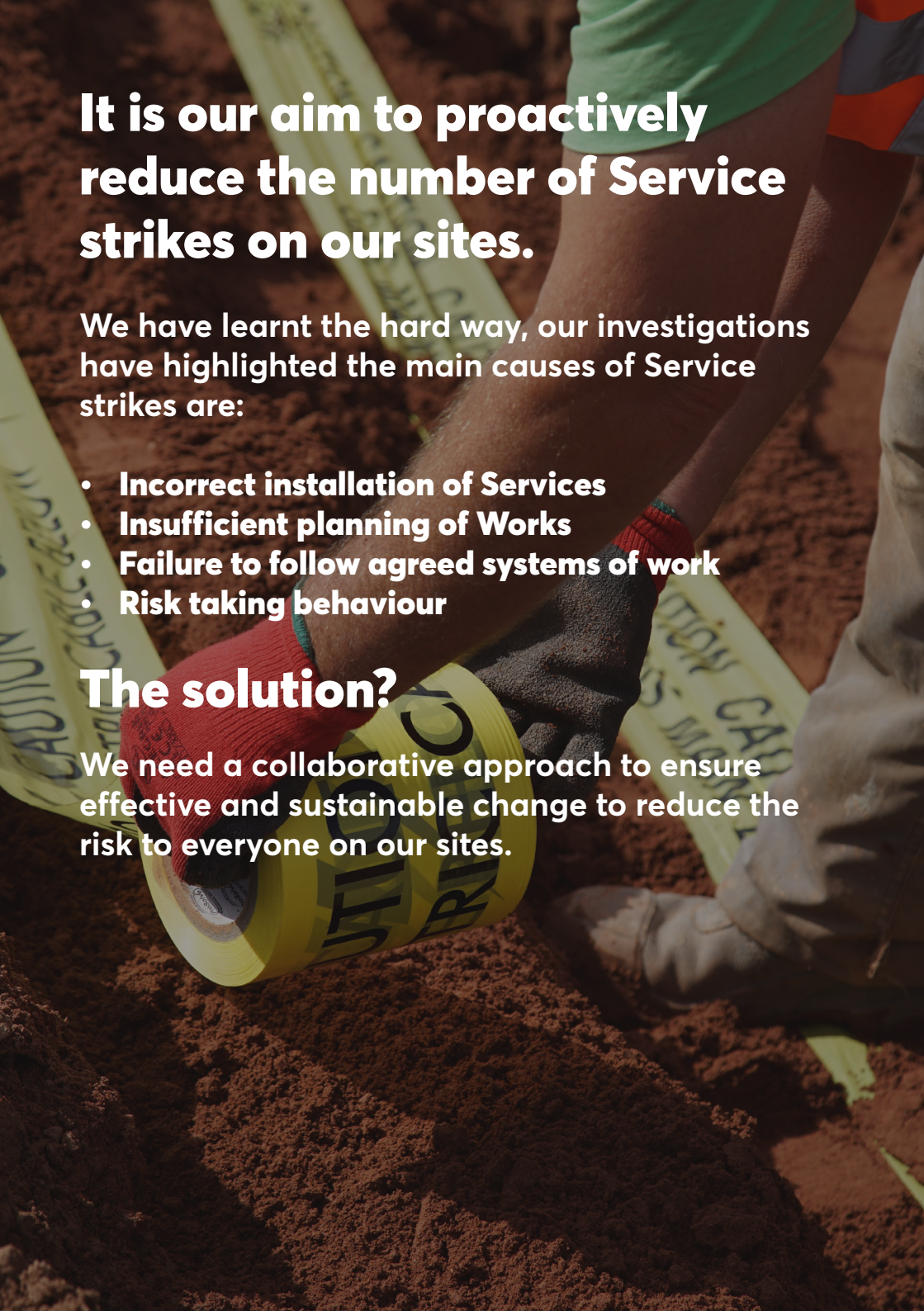


# It is our aim to proactively reduce the number of Service strikes on our sites.

We have learnt the hard way, our investigations have highlighted the main causes of Service strikes are:

- **Incorrect installation of Services**
- **Insufficient planning of Works**
- **Failure to follow agreed systems of work**
- **Risk taking behaviour**

## The solution?

We need a collaborative approach to ensure effective and sustainable change to reduce the risk to everyone on our sites.

# Our approach is clear. We have zero-tolerance for conscious risk taking behaviour.

At St. Modwen Homes we have prioritised Buried Services and Excavations as one of our Top 6 Safety Critical Hazards.

We expect our Site Teams and Subcontractors to work collaboratively to ensure safe methods of work are followed at all times.

We want you to drive our zero-tolerance approach. Failure to follow safe methods of working can have catastrophic life-threatening consequences for our teams and the communities in which we work.

Our aim is to eradicate these risks and ensure you have the knowledge and confidence to challenge bad practice and stop any works where there is deviation from agreed safe methods, whilst driving an accountable culture where short cuts are not accepted.

It is important to remember that the key to avoiding danger from Underground Services is to follow the approved process. It is a sequential system, where all elements are required to be followed. Not one step within the process is more important than the next. However, when correctly followed, Services will not be hit.

Ensuring we have sufficient information from the outset is key to preventing buried Services being hit. Where there is a lack of information available at any one step in the process you must **STOP**, **REVIEW** and **REPLAN** the works.

The purpose of this handbook is to provide a detailed look at the essential control measures required to undertake safe excavation around underground services, through provision of adequate supervision, information, safe systems of work and awareness.

We will breakdown the process for managing buried services, from obtaining land through to plot connections whilst outlining our cultural requirements to ensure all excavation work is carried out safely.

# CONTENTS

PROCESS FOR

# PLANNING & MANAGING BURIED SERVICES

Our 5-step process to planning and managing Buried Services on site is critical if we are to ensure works around live Services are undertaken safely.

The process outlines our approach to managing Buried Services, from purchasing land through to plot connections.

**1** LAND WILL COME TO HOMES FROM SL&R ALONG WITH THE H&S FILE FOR THE PROJECT. PRE-CONSTRUCTION WILL REVIEW WHETHER THE H&S FILE IS SUITABLE. IF NOT, PRE-CON WILL INSTRUCT FURTHER SURVEYS TO PAS 128 TO ATTAIN A GREATER LEVEL OF INFORMATION ON BURIED SERVICES WITHIN THE SITE.

**2** PRE-CON WILL ENGAGE WITH SERVICE PROVIDERS WHO WILL DRAW UP UTILITY PLANS FOR THE PROPOSED DEVELOPMENTS.
ONCE APPROVED 'FOR CONSTRUCTION' THE SERVICE PLANS WILL BE ADDED TO VIEWPOINT FOR PROJECTS.

**3** AHEAD OF SERVICE INSTALLATION ONSITE, GROUNDWORKERS WILL EXCAVATE THE AREAS IN WHICH THE MAINS ARE TO BE LAID. THE SERVICE PROVIDER INSTALLS SERVICES. PRIOR TO BREAKING GROUND, A PERMIT TO DIG MUST BE COMPLETED, TAKING INTO CONSIDERATION HS7 FILE INFORMATION ON EXISTING SERVICES ON SITE.

**4** THE SERVICE PROVIDER WILL THEN INSTALL THE MAINS SERVICES IN ACCORDANCE WITH THE APPROVED DRAWINGS AND IN LINE WITH NJUG VOL. 1, WHICH DICTATES LINE AND LEVEL. PRIOR TO BACKFILL, IT IS THE RESPONSIBILITY OF SMH AND A GROUND WORKERS ENGINEER TO CHECK MAINS ARE INSTALLED CORRECTLY. PHOTOGRAPHIC EVIDENCE AND RECORDS OF SERVICE INSTALLATION MUST BE TAKEN. RECORDS OF LINE AND LEVEL ARE TO BE RECORDED BY THE ENGINEER FOR THE DEVELOPMENT OF 'AS BUILT' INFORMATION TO BE ADDED TO VFP.
GROUNDWORKERS WILL THEN BACKFILL, ENSURING 250MM SAND COVERAGE IS PLACED ON THE SERVICE BEFORE LAYING TRACER DEMARCATION TAPE.

**5** AHEAD OF EXCAVATION FOR PLOT CONNECTIONS, A PERMIT TO BREAK GROUND IS REQUIRED. THE 'AS BUILT' INFORMATION HERE IS CRITICAL IN ENSURING WE PROVIDE SUITABLE INFORMATION TO UNDERTAKE THE TASK SAFELY. THE GW MUST FOLLOW THE FOUR STAGES OF THE PERMIT; LOCATE, IDENTIFY, MARK AND DIG SAFELY. ONCE THE CONNECTION IS COMPLETE, THE GW PHOTOGRAPHS, THEN MUST REINSTATE THE EXCAVATION FOLLOWING THE SAME PRINCIPLES OF BACKFILL WITH 250MM OF SAND BEFORE PLACING DEMARCATION TAPE.

For all breaking ground works, we must ensure the three basic principles of safe excavation practice are followed:

1. **PLAN THE WORK**
2. **LOCATE AND IDENTIFY BURIED SERVICES**
3. **EXCAVATE SAFELY**

# RISK ASSESSMENT.
# THE AGREED SAFE SYSTEM OF WORK

Our specialist Contractors will prepare their own risk assessments for all activities carried out which could pose a significant or foreseeable risk; excavating around buried services is no exception. The RA will highlight adequate control measures required for risks that cannot be eliminated.

## St. Modwen Homes will ensure;

- Suitable information is provided to the Contractor to assist them in developing a safe system of work, 'as built' drawings or sub scans.
- The H&S Department will assist in reviewing all high risk works in line with the RAMS Review and Authorisation Procedure.
- The Contractor Supervisor briefs their employees on the safe system of work; their role is key.

# ROLE OF THE SUPERVISOR

**A collaborative approach between our Site Management teams and on-site Supervisors is key if we are to create a culture in which corners do not get cut and works are stopped where information is missing.**
**As an extension of our Site Management team, our Ground Worker Supervisors are critical in ensuring excavation works are undertaken safely. We will work with our specialist Contractors to ensure the works undertaken are suitably planned with all required information available, works are undertaken by competent persons and, ultimately, ensure that the agreed safe system of work is followed.**

The Supervisor is responsible for ensuring all operatives are familiar and have been briefed on their risk assessments and method statements. The signed briefing sheet must be made available to the Site Management Team. Signing the risk assessments ensures the operatives have been briefed and agree to work in accordance with the outlined safe system of work.

# Further key responsibilities of Supervisors include:

- Ensure the St. Modwen Homes Permit to Break Ground system is understood by their operatives and is adhered to.
- Ensuring members of the dig team are competent to undertake excavation works with suitable equipment and PPE.
- Ensure newly installed Services are checked ahead of backfilling. They should arrange for an Engineer to take accurate line and level of Services and photograph Services outside of plots where plot connections will be made.
- Oversee excavation works; we self-regulate behaviours and are more likely to work in accordance with the agreed safe system of work where a Supervisor is overseeing the work.
- Where Services deviate from what is shown on a drawing, contact a member of Site Management. **STOP**, **REVIEW** and **REPLAN** the works.

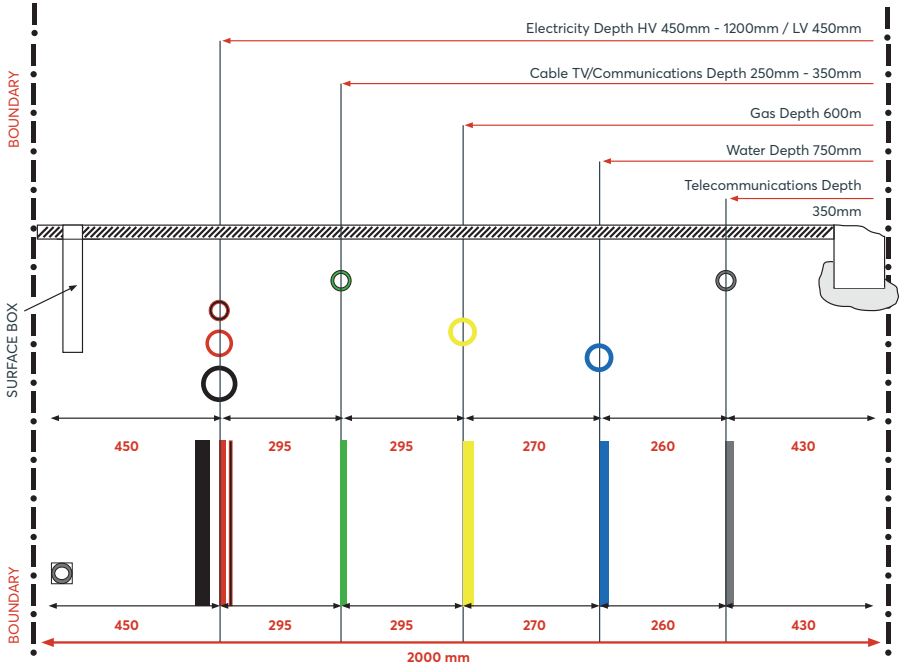
# INSTALLATION OF MAINS SERVICES

## The cause of many Service strikes initially stems from incorrect installation.

NJUG Volume 1 provides industry-wide guidance on the positioning and colour coding of Underground Utilities Apparatus.

The guidelines provide recommended positionings, line and depth of Utility Apparatus in a 2m footpath. All Utility Providers work in accordance with the NJUG. We need to ensure they are accountable for their installations and that we are confident to challenge poor installation.

**Poor installation is a regular occurrence on our sites. We need you to familiarise yourself with recommended positioning for new services.**
**Ensure you check the installation of Services prior to backfill and record your findings.**



# WHAT DOES **GOOD** LOOK LIKE?

Measure the depth of dig to ensure the minimum coverage to the crown of the Service is met.

Step the excavation in line with positioning requirements for Services within a 2m footpath.

Service apparatus installed in line with NJUG. Is barrier pipe required on your site?

Ahead of backfill, all Services are to be checked. Where there is deviation from approved positioning and/or depth, Services are not to be backfilled. Consult the utility provider.

# THE IMPORTANCE OF 'AS BUILT' INFORMATION

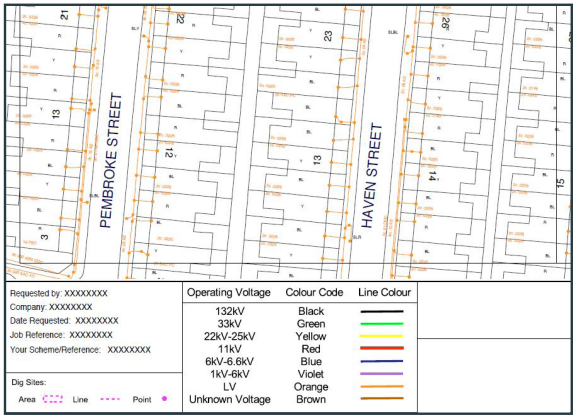
Obtaining accurate 'as built' information around Underground Services is critical when planning works.

It is critical to capture the newly laid Services ahead of backfilling to accurately record installation.
Obtaining accurate 'as built' information now will make plot connection works easier to plan and safer to undertake.

## What is accurate 'as built' information? What do we expect?

- Ahead of backfilling services, the Ground Works Engineer must attend site to take line and depth measurements of all Services which are to be plotted on a site plan.
- Engineering datum will accurately plot depth and location of newly installed Services.
- Photographs should be taken in the approximate area in which the plot connections will be carried out. Record the plot number and depth of each service.

**It is worth remembering that regrading of the surfaces may mean that initial recorded depths could differ at the time of re-excavation. They may be shallower than expected.**




The provision of this information as part of Section A of The Permit to Break Ground is a key part of the Management of Services process. However, plans alone are not sufficient.

# BACKFILLING OF SERVICES

## Poorly backfilled Services can have an impact upon Service strikes.

Backfilling of Services without adequate sand coverage can cause compaction issues around the Service. Compacted ground around Services can create difficulties when hand-digging which decrease the likelihood of it being carried out. Combine this with poorly placed demarcation tape and the likelihood of a Service strike rises. All too often, we see tape placed directly on top of the Service. This is especially true with Gas Ferrules.

## What should we expect to see?

- A minimum of 250mm of sand coverage over all Services; this will make hand digging around the service at a later date far easier (and more likely to be done).
- Mandatory Tracer Tape to be installed on the line of the Service. The wire enables a Signal Generator to be attached which more accurately traces the route of the Service at a later date.

# KEY REQUIREMENTS FOR INSTALLATION OF MAINS SERVICES

- Review proposed Service layout ahead of installation; Can we foresee any issues?
- Review existing H&S File information or GPR survey on existing Services; Are we excavating in close proximity to existing mains?
- Review and authorise GW RA/MS; Are they suitable for the works to be undertaken?
- Complete a Permit to Break Ground ahead of the works; Is a suitable level of information available to commence breaking ground?
- New mains are to be installed in line with NJUG Vol. 1.
- Consider any site-specific requirements; Does ground contamination necessitate barrier pipe?
- Newly installed mains are to be checked ahead of backfill. Any deviation from NJUG is to be challenged and the backfill of Services stopped until rectified. Once checked, ensure the service installation sign off QA is completed and retained on file.
- Ensure engineering datum to plot depth and location is taken by the Ground Workers. This must be provided electronically when overlaid onto a site plan. This is required for every new section of main installed.
- Photograph the mains and identify the depth of Service at the approximate location of plot connection. Retain a copy on site.
- A minimum of 250mm of sand coverage from the crown of the Service is required - this will make re-excavation easier at a later date.
- Install Tracer Demarcation Tape on the line of the Service.
- Consider Contractor best practice.

Double layer of Demarcation Tape over Services.

Use tonne bags of sand to protect the mains, eliminating the need for excavation.

Protect Gas Purge Valves with vertical sleeves.

*Photos credit: MV Kelly Best Practice.*

# BACKFILLING OF SERVICES

Timber strip placed in footpath from front of edging to back of kerb

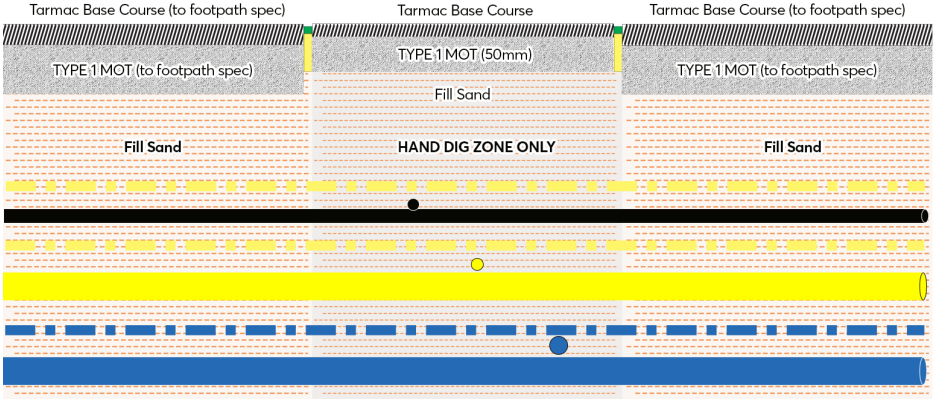
Sand Packer

Domestic House Feeds from the Finished Plot to the Service Mains

Marker Tape. (Always lay on Domestic Services also)

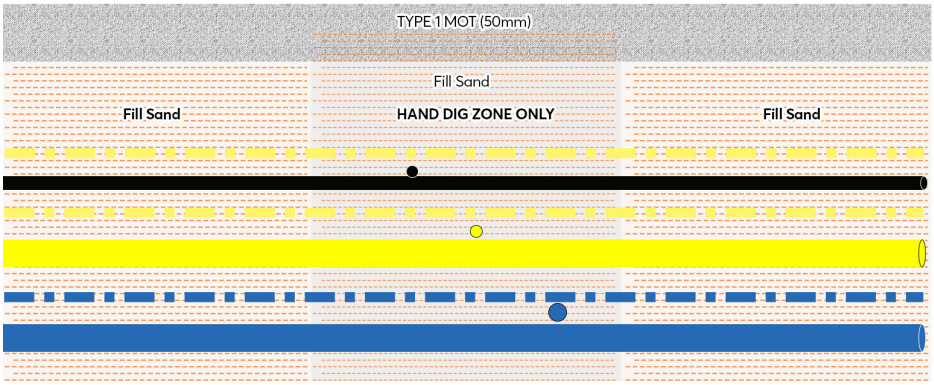
**Scenario 1**

Full Stage 1 Handover with footpaths installed.




**Scenario 2**

No Footpaths installed (No kerb lines and less cover over mains.




Identifying the point of connection ahead of backfill enables mass filling of the area with sand or the use of one tonne sandbags.
Using both methods eliminates the requirement for mechanical excavation around Services.

Mass filling with sand makes hand digging easier, whilst a one tonne sandbag can be mechanically extracted leaving a well-formed excavation.

# PLANNING FOR EXCAVATION WORKS AROUND LIVE SERVICES

Insufficient planning of works is a causal factor in service strikes. When planning to undertake excavation works it is critical that we provide sufficient time along with information to allow the works to be undertaken safely.

## To ensure excavation works are suitably planned, St. Modwen Homes must ensure sufficient notification of dig.

When notifying our ground works contractors of excavation works we must:

- St. Modwen Homes Site Management to notify the works supervisor a minimum of 7 days in advance of undertaking any excavation;
- Prior to the dig being undertaken, the Contractors H&S Advisor and/or Contracts Manager must attend site to confirm:

  Their engineer has provided as built information in a timely manner and is available at a site level for the proposed area of dig

  The Supervisor for the works has been nominated

  The method of excavation has been decided

  RAMS are in place covering the works and operatives have signed to confirm understanding of the safe system of work

  The dig team has been nominated and competencies captured
- Once it has been confirmed that all information is available to enable to safe undertaking of excavation works, both parties sign to confirm the date of the dig.

Where one element of information is lacking the dig will not be permitted to proceed. Giving 7 days notification to the ground works contractor will ensure that sufficient time has been given to plan works ensuring all the information required is available before breaking ground.

# Permit to Break Ground

On the day of the proposed excavation works, a Permit to Break Ground must be complete before commencing works. The completion must be a collaborative approach between the Site Manager and the Works Supervisor with an element taking place at the work face. The process must be followed and the contents understood, ensuring the Work Supervisor has a copy at the work face.

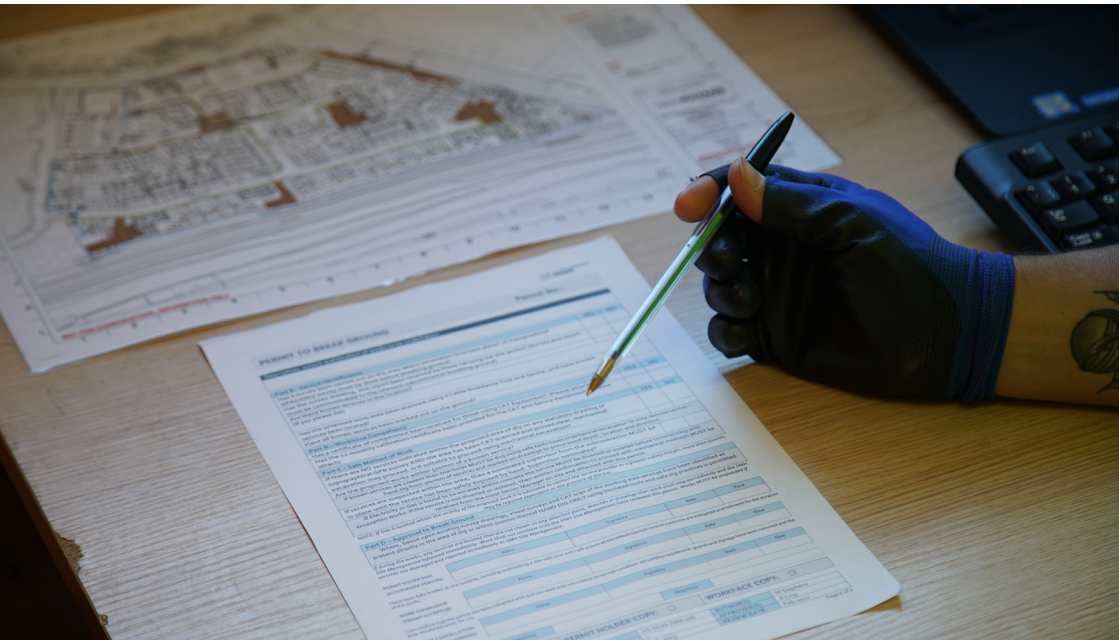
## A Permit to Break Ground is for more than exposing Services.

We must use the Permit to Break Ground for all activities as follows:

- Excavations
- Fencepost Installation
- Installations of Earthing Rods for Generators

The permit process follows a four-step plan to safe excavation. Following the permit process is critical in ensuring we have provided all relevant information to the Contractor, that Operatives are suitably trained and that the SSOW is being followed.
Each section of the permit to break ground acts as a holding point. At no time should works progress before the necessary sections are complete.

Both Site Management and the Works Supervisor must physically check each stage for compliance. Each Permit to Break Ground is only valid for 24 hours and must not be opened for a period of works.



# LOCATING SERVICES

**All operatives who break ground will be required to use a Cable Avoidance Tool (CAT) to locate identified Services or demonstrate an area is free of Services.**

Operatives must ensure that the CAT and GENNY models have the downloadable data function.

As part of the permit completion you must ensure the CAT is within its calibration date and only operated by a trained and competent user.

**Cable avoidance technology is continually developing. In some instances, consideration for the of excavator-mounted cable detection may be required where deemed necessary by risk assessment.**

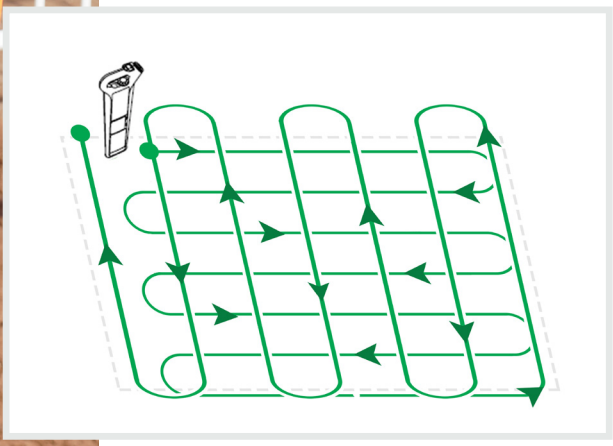
THE CAT MUST BE USED IN ALL AVAILABLE MODES.

**Genny**
Locates signals induced by a Genny. There are various ways of applying the Genny signal. Using a Genny is the most reliable way to detect a pipe or cable.

**Power**
Detects signals originating from power transmission networks. These signals may be found on any pipe or cable, not just power cables. Some power cables DO NOT radiate detectable power signals.

**Radio**
Detects radio signals originating from distant radio transmitters as they travel along underground pipes and cables. Radio signals are not always present. Always use a Genny before excavating.

**Avoidance**
Avoidance Mode speeds the process of pre-dig scanning by searching for Power, Radio and Genny signals simultaneously.

# BEWARE!

Some cables may not emit signals in power mode due to being well balanced or not under load. Always use Radio and Genny for a better chance of locating.
Note; Power signals may not be found on power cables that are switched off (e.g. a streetlight cable during daylight hours).

# IDENTIFY & MARK

## Identified Services should be carefully exposed and clearly marked.

Once a detecting device has been used to determine position and route, excavation may proceed, with trial holes dug to confirm the exact position of any detected Services.
Take special care when digging above or close to the assumed line of such a Service.

**MECHANICAL EXCAVATION IS ONLY PERMITTED IN INSTANCES TO REMOVE TARMAC. ONCE REMOVED, THE SUBCONTRATOR MUST HAND DIG THEREAFTER.**

Use trial holes to positively identify a Service and its depth. Exposing a Service safely in this way will allow its status to be further checked and may make it easier for a tracing signal to be applied.

Note the line of any identified Services and mark with paint, wooden pegs or non-conductive rods in unsurfaced areas, preferably to one side of the Service.
Steel pins, spikes or long pegs which could damage Services laid at shallow depth MUST NOT be used.

# DIG SAFELY

**Once all ground surveying has been completed and all foreseeable measures have been taken to identify the locations of Services safe digging can proceed following the below steps:**

1

ONLY INSULATED HAND TOOLS WITH CURVED EDGES ARE TO BE USED. SPADES AND SHOVELS MUST BE EASED INTO THE GROUND WITH GENTLE FOOT PRESSURE. NEVER THROW OR SPIKE INTO THE GROUND.

2

MAKE FREQUENT AND REPEATED USE OF LOCATORS DURING THE COURSE OF THE WORKS, RESCANNING EVERY 100-150MM. SERVICE LOCATION IS LIKELY TO BECOME MORE ACCURATE AS COVER IS REMOVED.

3

MECHANICAL EXCAVATION IS ONLY PERMITTED TO REMOVE TARMAC - HAND DIG THEREAFTER. HAND DIGGING CAN BE TIME CONSUMING HOWEVER, IF THE BACKFILLING PROCESS IS FOLLOWED WITH ADEQUATE SAND COVERAGE PROVIDED THIS WILL MAKE THE PROCESS EASIER DECREASING THE LIKELIHOOD OF CORNERS BEING CUT.

4

EVERY EFFORT MUST BE MADE TO EXCAVATE ALONGSIDE THE SERVICE RATHER THAN DIRECTLY ABOVE IT AS THE FORCE APPLIED TO HAND TOOLS CAN BE CONTROLLED MORE EFFECTIVELY WHEN USED HORIZONTALLY.

5

ONCE EXPOSED, SERVICES MAY NEED TO BE SUPPORTED AND SHOULD NEVER BE USED AS HANDHOLDS OR FOOTHOLDS FOR CLIMBING OUT OF EXCAVATIONS.

# PROTECTIVE EQUIPMENT

## Burns are the main injuries that result from damage to live electrical cables or from fire or explosion following a gas leak.

Where electricity cables may be encountered during excavation work, employers must consider whether, through risk assessment, the work requires the wearing of either clothing designed to protect against electric arc or flame-retardant clothing.

Specific PPE requirements must be detailed in the Subcontractors' risk assessments and method statements. Where this is not the case, Subcontractors are not permitted to break ground.

Risk assessment is key here as the level of risk will change dependent on the activity. For example, the risk of burns to a Cable Joiner are far higher than a Utility Installer. A risk-based approach must be adopted and the safe system of work amended accordingly.

**Wearing protective clothing is not a substitute for a safe system of work.**

# USE OF VACUUM EXCAVATION

Where risk assessment has identified additional risk due to the nature and complexity of Buried Services, Vacuum Excavation may be required. In these instances consult with your H&S Team and Ground Works Contractor who will assist in the development of a safe system of work.

Vacuum Excavation makes use of high velocity air jets or water jetting to loosen and remove ground to reveal a clear Service.

However, it is important to remember that Vacuum Excavation does have its limitations and will not work on all ground conditions or materials. We must also be mindful of any impact from noise and vibration; Suitable controls will need to be in place to mitigate these hazards.

It must be emphasised that excavating around live Services, in accordance with approved industry guidance, is as safe as Vacuum Excavation.

By ensuring we follow industry-recognised guidance around installation and backfilling Services, obtain detailed 'as built' information, follow the Permitting Process and ensure the works are checked and adequately supervised we will ensure that excavation around live Services is undertaken safely.

**IF YOU DON'T KNOW DONT DIG.**

# KEY REQUIREMENTS FOR EXCAVATION WORKS AROUND LIVE SERVICES

- Review 'as laid' drawings and photographs previously gathered.
- Complete the Permit to Break Ground - where sufficient information is not available **STOP WORK, REVIEW** and **REPLAN**.
- Locate services using a CAT and Genny. All modes must be used by a competent person.
- The CAT must be a suitable model that enables data usage download. Data is to be monitored periodically.
- Identify and Mark noting the line of indicated Services through paint spray or non-conductive rods in unsurfaced areas.
- Hand dig trial holes to identify Service depth. Never dig directly above the assumed line of a Service.
- Dig Safely. Mechanical excavation is only permitted to remove tarmac - hand dig thereafter.
- Fire retardant clothing must be worn where deemed necessary through risk assessment.
- Use of vacuum excavation is mandatory around HV or expensive fibre optic cables. Risk assessment may also determine vacuum excavation is required where there is additional risk, given the nature or complexity of the Services.

# EMERGENCY PROCEDURE

**In the event of hitting a Service, follow these 5 steps.**

1. Do not attempt to move, adjust or interact with the Service any further. Clear the area.
2. Ensure adequate protection and signage is applied to prevent entry and contact the Emergency Services if required.
3. The relevant Service Provider will also need to be contacted to inform them of the damage.
4. In line with the Incident Reporting Procedure, report the incident immediately to your H&S Advisor. Insurance may also need to be informed.
5. Do NOT approach the Service until advised it is safe to do so by the Service owner.

# DEALING WITH AN INCIDENT

If no persons are injured your immediate goal is to contain the incident where possible. DO NOT put yourself in danger.

Call for the necessary First Aid treatment, or an ambulance, if required.
Follow the accident procedure and notify your H&S Advisor and relevant off-site Management.

Isolate the area using tape barriers or personnel to restrict access to the area and also to preserve the scene.
Take photographs or video as required.


If any immediate danger is presented to you or others then all personnel must be kept a safe distance away.

If possible, take steps to make the area safe wherever necessary; for example, isolating any equipment. In some cases, this may need to be done first.

Note names (and contact details) of all people involved and any witnesses. Organise Drug & Alcohol Screening for everyone involved.
Contact the representatives of the Contractor involved to ensure they are included fully in all steps of the investigation.

# USEFUL CONTACTS

| | | |
|---|---|---|
| **Police, Ambulance, Fire** | **999** | |
| **BT** | 0800 023 023 | www.bt.com |
| **Virgin Media** | **0333 000 5925** | www.virginmedia.com |
| **National Grid** | **0800 111 999** | www.nationalgrid.com |
| **National Grid "Dial before you dig."** | **0800 688 588** | www.nationalgrid.com/uk/safety/dial-before-you-dig |
| **National Gas Emergency Service** | **0800 111 999** | |
| **Cadent Gas** | **0845 835 1111** | www.cadentgas.com |
| **Western Power Distribution** | **0121 623 9780** | |
| **SSE Networks** | **01256 337 294** | |

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