

24/03/23 – Esh Construction

6 Step Service Avoidance And Breaking of Ground Procedure



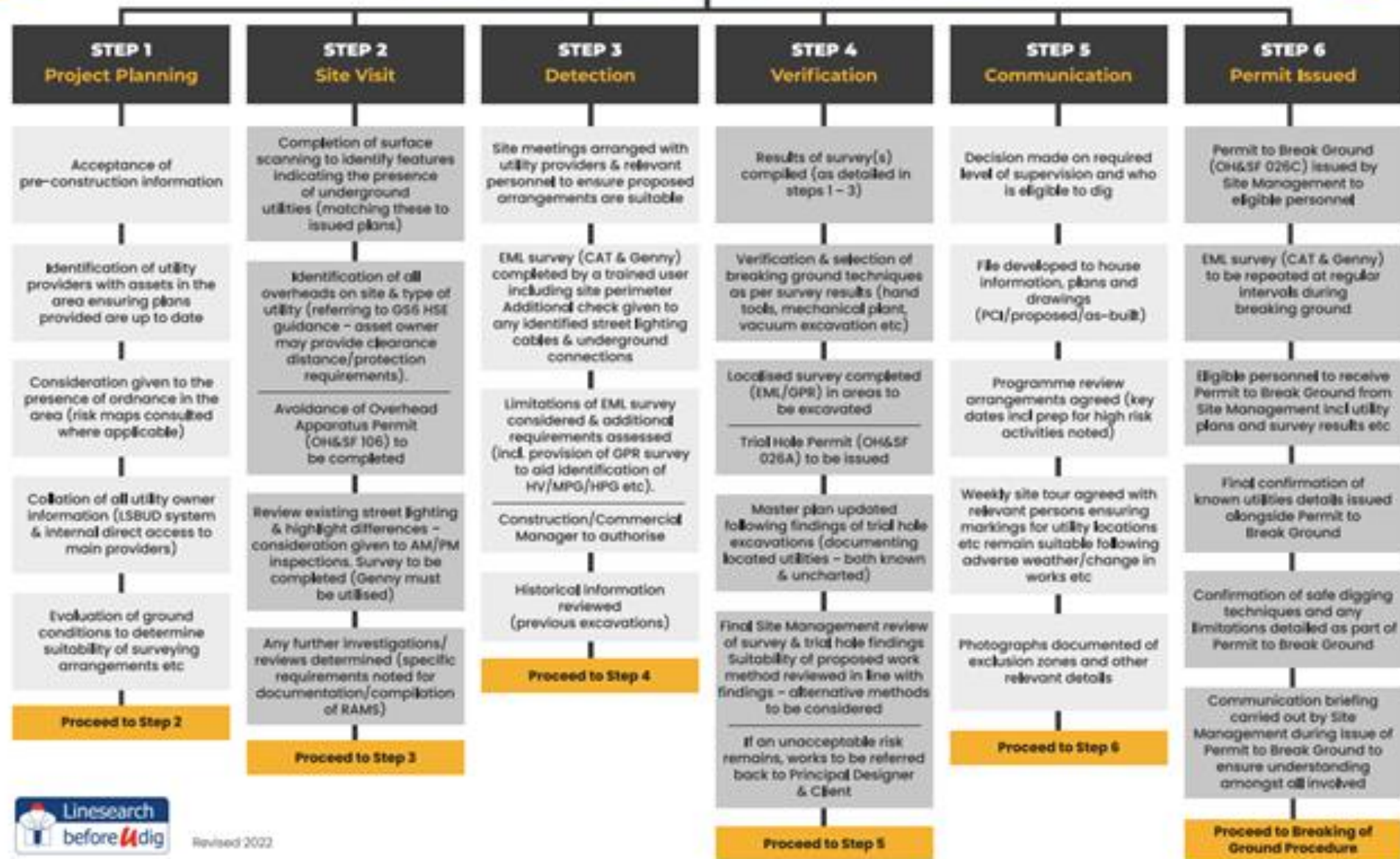
Constructing **Local**

BSI PAS 128 Underground Utility Detection, Verification and Location 2014 (updated 2022)

- Esh plan based upon principles of Pas 128.
- Sets out requirements for the detection, verification and location of undergrounds services.
- Sets out key headings for the planning of excavation works regardless of the location of the works.
- We will not be covering temporary works or shoring techniques.

ESH CONSTRUCTION

UTILITIES AVOIDANCE: 6 STEP PROCESS



Step One: Project Planning (Desktop)

Acceptance of Pre-
Construction
Information

Collation of
information

Identification of
utility Providers with
assets in the area

Evaluation of
ground conditions

Consideration of
unexploded
Ordinance

- Service drawings give an indication of what may be in the ground. They are not definitive
- Requests sent to the usual suspects BT, NGN, Water Authorities, NPG. Always consider smaller local private suppliers.
- Try to superimpose onto one drawing for sites
- Is it green field, a road, a housing estate

Step Two: Site Visit

Surface Scanning.
C.A.T and Genny.
GPR Scans

Identification of
overhead services
Request GS6 Report

Look for streetlights
or street furniture

Collation of other
specific information

- Once scans completed, match to the existing plans, try to avoid scanning to the plans!
- Overheads require a GS 6 report from National Grid, which should dictate exclusion zones and height clearances
- Consider out of hours survey for street lights when services are on. Tobies, chamber covers etc can all indicate services.
- Other information not actually linked to services, i.e. schools, places of worship etc.

Step Three: Detection

Site meetings with utility suppliers

Collation of other specific information

Furthers scans etc carried out if Required

Consider limitations of information available

- Often the representative will have better information available than that on the drawings.
- Check for domestic connections, Genny with 3 pin plug attachment is very useful.
- Look for gas / electric meter boxes, Water meters of stopcocks.
- Always double check to see if anything could have been overlooked
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Step Four: Verification

Secondary
compilation of all
information

Collation of trial hole
information



Selection of
breaking ground
Methodology

Final Management
Review.
Review of risk
assessment.
Possible referral
back to Client /
designer

Issue of trial hole
permits

- A second check of all information to ensure all available information has been considered
- Selection of excavation method, Hand dig, mechanical, Vac-ex
- Always double check to see if anything could have been overlooked
- Evaluation of works, i.e. EHV oil Filled cables, overheads etc would be passed back for consideration of diversion

Step Four: Verification – Trial Holes

	Section:	OH&S Forms	
	Reference:	OH&SF 026A	
	Page No:	Page 1 of 1	
	Issue:	Revision: B	

Trial Hole Permit

Permit No.	Dig Ref & Location:
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Method of non-mechanical excavation: (Circle)	Hand Dig	Trial Hole/ Excavation
	Vacuum Excavation	Trial Hole/ Excavation

To be completed by Contract Supervisor

Contractor supervisor. I confirm that:

- Up to date service drawings have been provided and reviewed – i.e. gas within 28 days
- Physical signs of services have been searched for prior to Cat & Genny search
- All known services have been located and marked on the ground.
- That a CAT & Genny and trained user are available to continually check as works proceed.
- That the presence of any services and details of this permit has been made known to the operatives undertaking the trials holes.
- I have provided the operatives with 'safe digging' instructions.
- That a copy of this permit will be kept by the supervisor at the site of the excavation.
- Works will immediately be stopped and Esh Construction advised should any unexpected services be uncovered.
- That **only** insulated tools will be used to carry out trial hole excavations
- Only safe hand digging techniques are to be used to/ located all service.**

Specific Control Measures for this excavation: (e.g. HV cable at new corner of site)

I confirm that all known services have been identified and that Non Mechanical excavation may proceed

Name..... Signature..... Date.....

This Permit will be invalid and all works must stop on: Date- Time

Operatives undertaking the non-mechanical excavation:
I have had the requirement of this permit and the hazards explained and understood the "SAFE DIGGING" techniques to be used.

Name (print):	Signature:	Date:
Trained and constantly present CAT & Genny Operator		
Name (print):	Signature:	Date:
Name (print):	Signature:	Date:
Name (print):	Signature:	Date:

MECHANICAL EXCAVATION IS PROHIBITED.

During the non-mechanical excavation, the following services were identified within the excavation

Service Type	Location	No. Of	Service Type	Location	No. Of
Electric cable			Foul Drainage		
Gas main			Surface water drainage		
Water main			Other:		
BT/Coms			Other:		

*Please note any comments on the reverse of this form

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Trial Hole Findings

Contract:	Date:	Ref No.:
Date of Trial Hole:	Carried Out by:	Supervisor:

Location of Trial Hole:

Purpose of Trial Hole:

Sketch/Detail of Trial Hole – Plan View:	Section:
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Co-Ordinates	Easting	Northing	Height

Photographs to be taken as a record of condition when necessary. Insert Number & Date taken in the below box.

No.	Date Taken	Details

Record of Findings

Service Type	Materials	Visual Condition	Depth (mm)	Ground Conditions
Electricity				
Gas				
Sewer				
Surface Water				
Telecom				
Water				
Other				

This log should remain on site until backfilling is complete. Details should remain with the project file & made available on Request.

Step Five: Communication

Decision on level of supervision and suitable operators

Inspection criteria by senior managers agreed

Development of CPP to ensure all information is available to site

Photographs of exclusion zones etc

Programme review for high risk activities

- Competent supervision and operatives must be appointed dependent upon experience and complexity of the task.
- All gathered information must be made available to the site
- Supervision must be appropriate to the task in hand, the more complex the operation the greater the required supervision.
- Always take photos of methods put in place for protection of workforce and others.

Step Six: Permit issue

Permit to Break Ground is completed and issued

Details of the permit and discussion of service drawings and task

All excavations require repeated use of the CAT and Genny

Confirmation of excavation techniques to be employed.

Permit to break ground is issued to the operatives by the manager

- Form OH&SF 026C Permit to break ground is issued
- All gathered information must be made available to the site
- Supervision must be appropriate to the task in hand, the ore complex the operation the greater the required supervision.
- Always take photos of methods put in place for protection of workforce and others.

Permit No.:		Location of Excavation:	
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Issued By:		Job Title:		Date:	
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- a) Excavation Supervisor. I confirm that:
- All known services have been located, marked on the ground and both visually/physically identified
 - Service drawings have been reviewed
 - Trial holes have been carried out to physically locate services and findings recorded, incl. photographs, onto OH&SF 026B (Ref:)
 - A competent CAT & Genny Operator will carry out continuous surveys of the area as works proceed to every 300mm depth
 - The presence of any services and details of this permit have been communicated to the Excavator Operator and operatives
 - I am aware of the "safe digging" procedures and have been briefed on the "six step" process
 - A copy of this permit will remain in the excavator cab or by the supervisor at the site of the excavation
 - Works will be stopped immediately and Esh Construction advised should any unexpected services be encountered
 - No mechanical excavation within 1m of known services will be undertaken
 - I will review daily and sign to confirm no changes to permit controls.

Name:		Signature:		Date:	
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List identified services in excavation location below (Identify type of supply and voltage/pressure etc). Refer to service drawings and trial hole information.

Service	Identified on drawing		Pegs	Marked on site by: Paint (coloured)	Signs
	Y	N			
<input type="checkbox"/> Elec-LV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Elec-HV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Gas-LP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Gas-MP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Gas-HP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Surface/Foul	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> BT/Openreach	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Virgin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Overhead	<input type="checkbox"/>	<input type="checkbox"/>	COMPLETE OH&SF 106 OVERHEAD SERVICES PERMIT		

Details of specialist instruction (e.g. hand dig only, expose from side of service etc):

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Details of plant and accessories to be used (toothless buckets, insulated tools, method of protecting of exposed services):

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- b) CAT & Genny Operator. I confirm that:
All known services have been identified and the necessary precautions are in place.

Name:		Signature:		Date:	
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- c) Plant Operator. I confirm that:
I have had this permit explained and understood the location of services and precautions to be taken. No mechanical excavation is to take place within 1m of services.

Name:		Signature:		Date:	
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NOTE IF ANY CIRCUMSTANCES CHANGE (e.g. CONCRETE SURROUNDING SERVICES OR DISCOVERY OF UNCHARTED SERVICES) STOP WORK AND REPORT TO THE EXCAVATION SUPERVISOR

Permit duration:
This permit is valid from the following date stated/up to the maximum of one working week or until cancellation stated at end of the document.

Date valid from:

d) Excavation Supervisor daily review (Initial below):						
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday

- e) Operative acknowledgement:

Name:		Signature:		Date:	
Name:		Signature:		Date:	
Name:		Signature:		Date:	
Name:		Signature:		Date:	
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PERMIT CANCELLATION

- f) To be completed by the person issuing this permit

Name:		Signature:		Date:	
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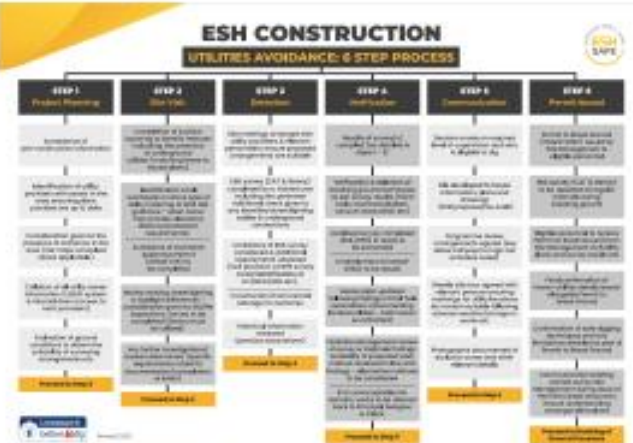
Breaking of Ground



ROAD
CLOSED



Service Avoidance including Breaking of Ground/Trial Holes

1.0	Purpose
1.1	To define the responsibilities and actions to be taken to ensure that all breaking of ground and trial holes to locate services is carried out by the company to a suitable standard which will minimise any risk. This Procedure relates to the INITIAL breaking of ground / trial holes – refer to Excavation procedure ECP013 – Excavations for further works.
2.0	Scope
2.1	These procedures apply to all Esh Construction Ltd activities, products and services
3.0	Procedure
3.1	<p>General Summary: -</p> <ul style="list-style-type: none"> Breaking of Groundwork should follow safe digging practices. HSG 47 6 Step utility service identification process to be followed Electronic scan of dig area must be completed (CAT and Genny) Check against service plans on regular basis Trial holes to confirm Issue permit to excavate Excavate alongside the service rather than directly above service. Insulated tools should be used when hand digging near electric cables. Do not assume depth, straight lines of services etc
4.0	Prior to Works Commencing
	<p>Print off A3 sized Utilities Avoidance – 6 step process</p>  <p>The flowchart 'ESh CONSTRUCTION UTILITIES AVOIDANCE - 6 STEP PROCESS' details the following steps:</p> <ol style="list-style-type: none"> STEP 1: Project Planning - Assessment of project location, identification of utility providers, and consultation with the project manager. STEP 2: Site Visit - Consideration of local knowledge, site visit to identify service locations, and marking of service locations. STEP 3: Identification - Identification of service locations, consultation with utility providers, and marking of service locations. STEP 4: Verification - Verification of service locations, consultation with utility providers, and marking of service locations. STEP 5: Communication - Communication with utility providers, marking of service locations, and obtaining permits. STEP 6: Permitting - Final verification, marking of service locations, and obtaining permits.
	<ul style="list-style-type: none"> Telephone the Service Provider and obtain service drawings. (e.g. Transco, National Powergrid etc) Contact BT "Dial Before You Dig" (Openreach) https://bbud.co.uk/ Where specialist products are transported e.g. ethylene the service provider must be consulted and the required work procedure followed. <p>DO NOT RELY ON SERVICE DRAWINGS SUPPLIED IN PRE-CONSTRUCTION INFORMATION – WE MUST REQUEST OUR OWN</p>

ECP 0028 Service Avoidance including Breaking of Ground

Covers all aspects of the Breaking of Ground

Including Use of Surveys & Electronic scans.

The downloading of scan information from CAT's

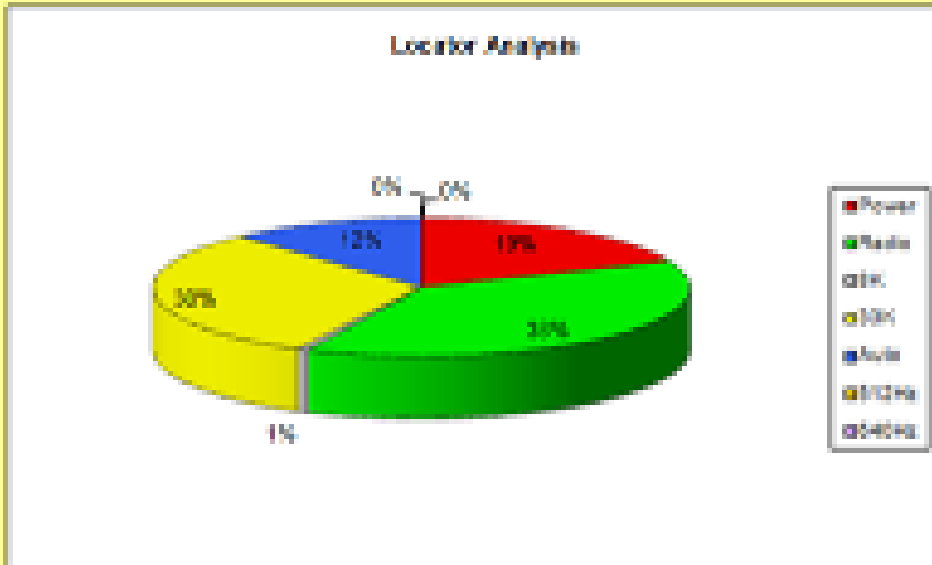
Excavation techniques and how and in what circumstances they should be employed.

Supporting of exposed services within excavations

ECP 0028 Service Avoidance including Breaking of Ground



Locator Analysis



	Power	Radio	8K	33K	Auto	512Hz	640Hz
Usage(secs)	27	55	1	44	17	0	0
Percentage	15%	31%	1%	31%	12%	0%	0%

Mode Score %	Mode	Result	Overall Mode Score
	Power Mode	Average	
keys	Radio Mode	Good	
Good	8K Mode	Poor	Good
Average	33K Mode	Good	
Poor	Auto Mode	Poor	
	512 Mode	Good	
	640 Mode	Good	

Serial No:	288892	
Week No:		
Date Range:	21/05/2013	21/06/2013
Click Here to Input Locator Information		
Save & Print		
Total Usage:	144	(Seconds)
Number of Scans:	1	(Triggered on)
Average Scan Time:	144	(Seconds)
Total ESTs Performed:	0	(Times)
File Range:	35 - 35	

ECP 0028 Service Avoidance including Breaking of Ground



Marking of services on the ground.

Make sure the marks extend beyond the working area.

The CAT used In conjunction with the Genny can give a fairly accurate depth reading on electrical and metal services.

Excavate in thin layers and continue to check with C.A.T.

ECP 0028 Service Avoidance including Breaking of Ground

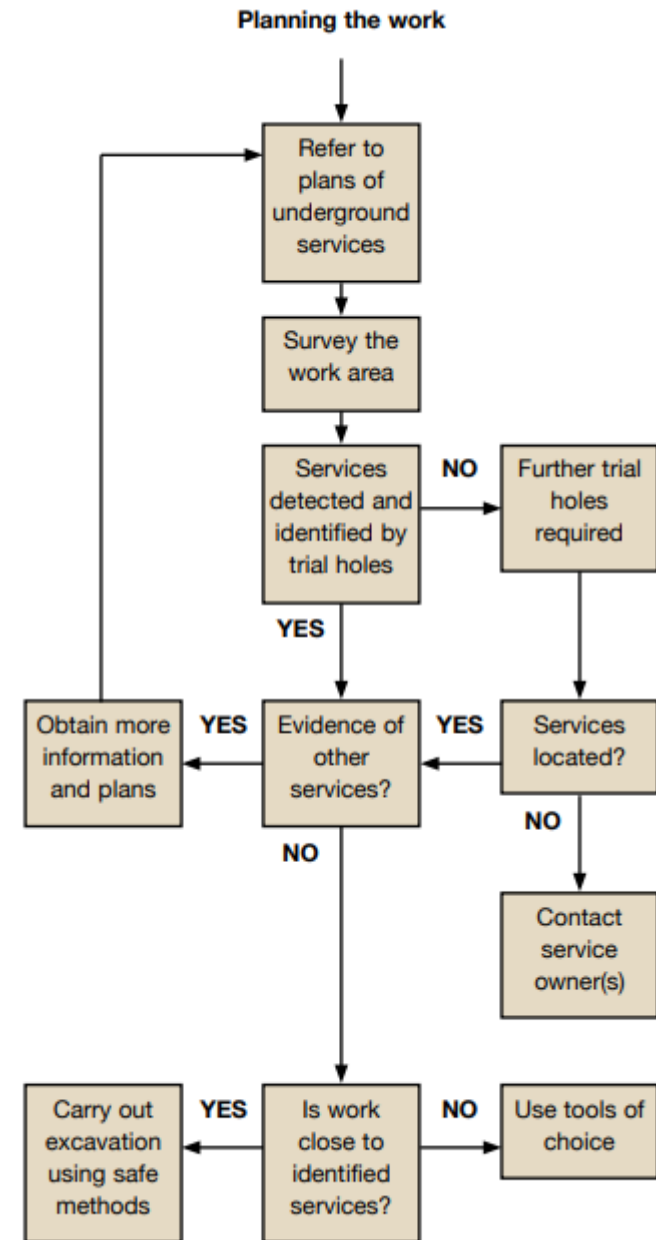
Covers all aspects of the Breaking of Ground, based upon HSG 47

Including Use of Surveys & Electronic scans.

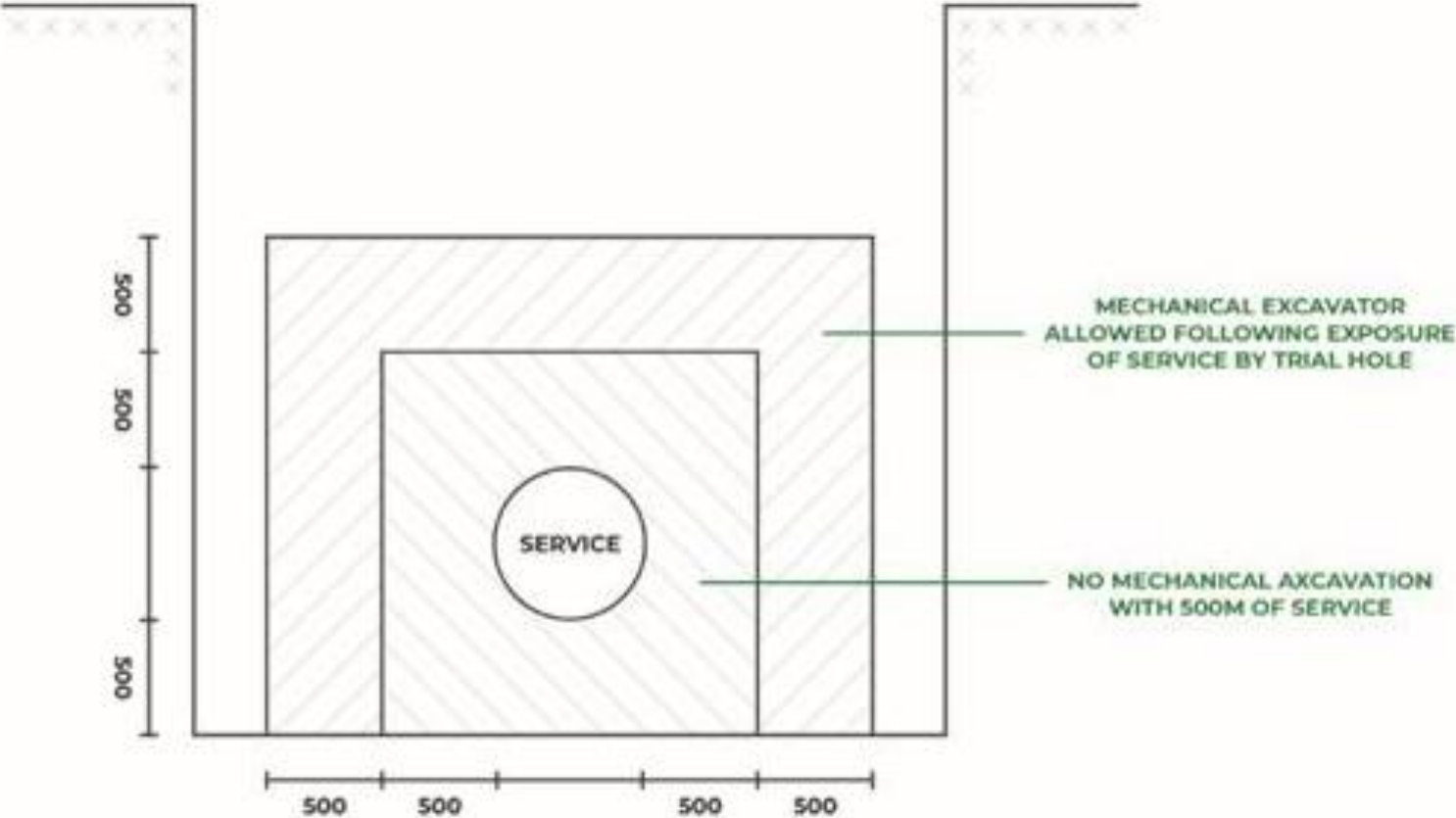
The downloading of scan information from CAT's

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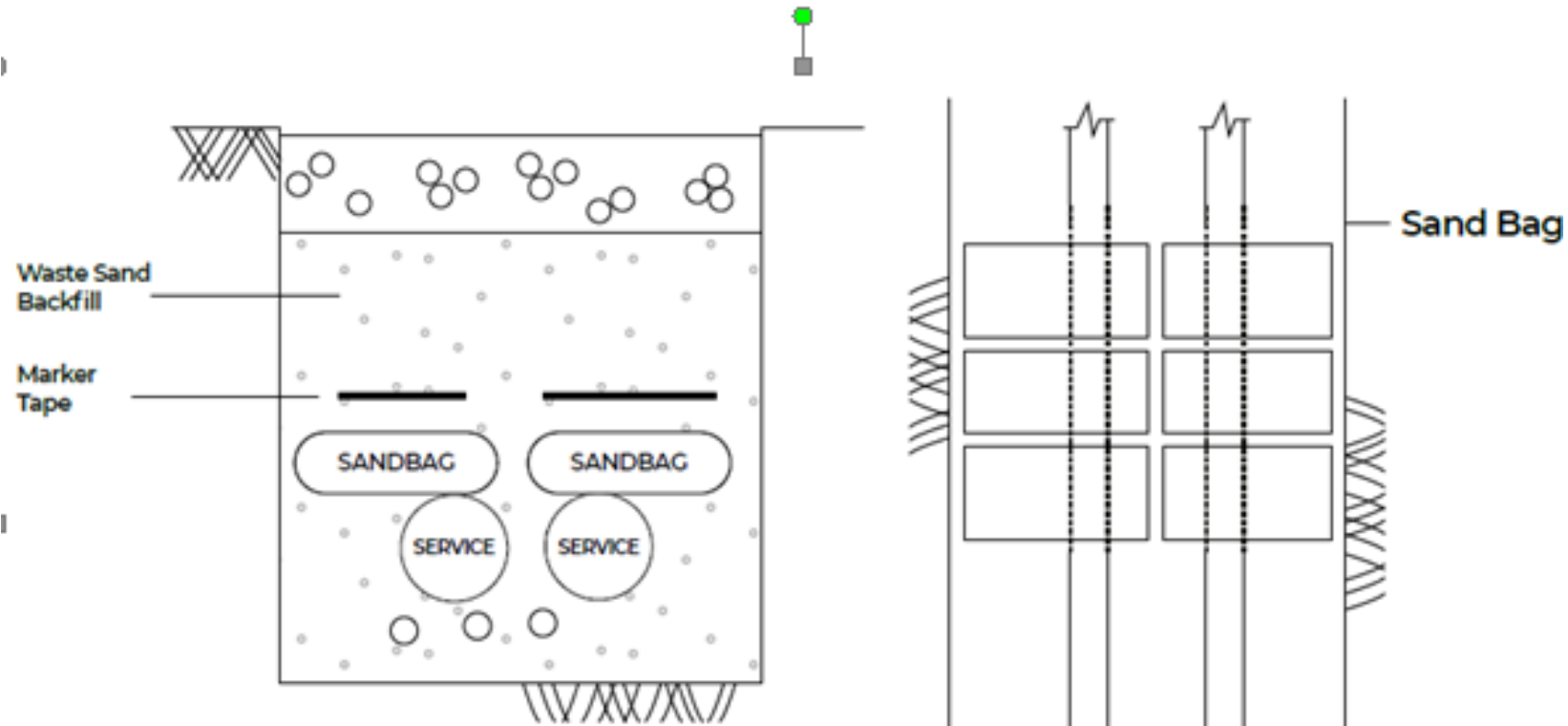


ECP 0028 Service Avoidance including Breaking of Ground



ECP 0028 Service Avoidance including Breaking of Ground

Where services are to be reburied but will later be re exposed, protect the services in this area, consider covering with sandbags or waste sand, not recycled.

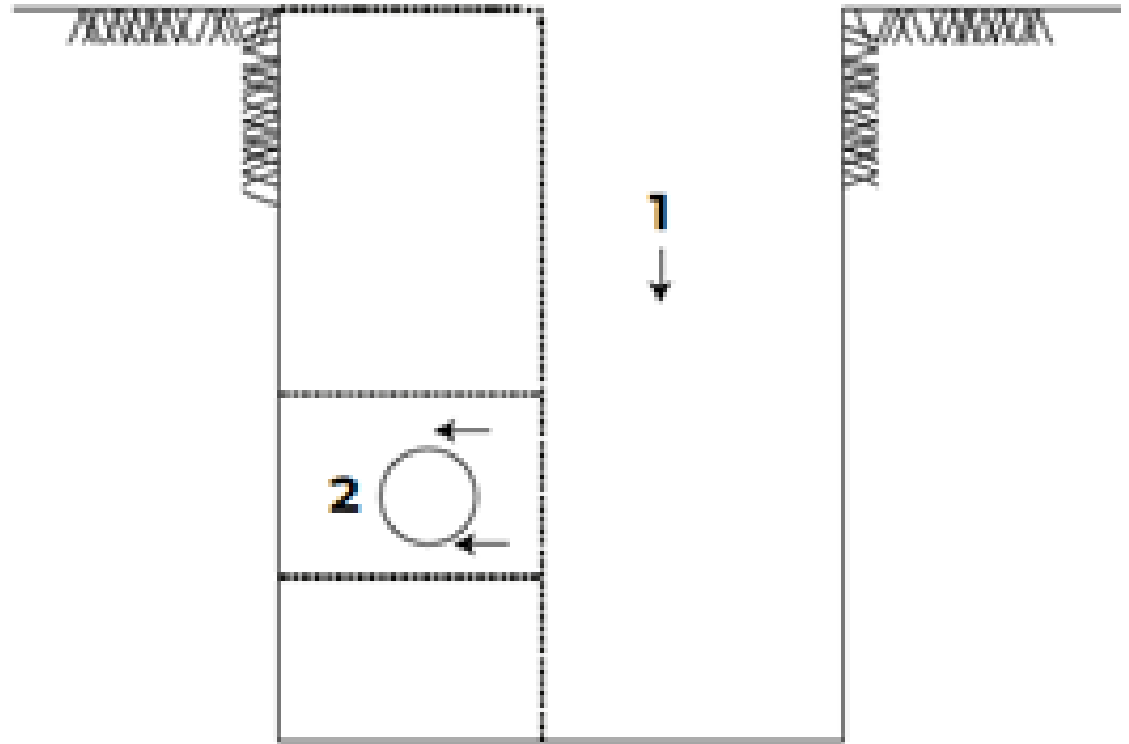


Services Protected

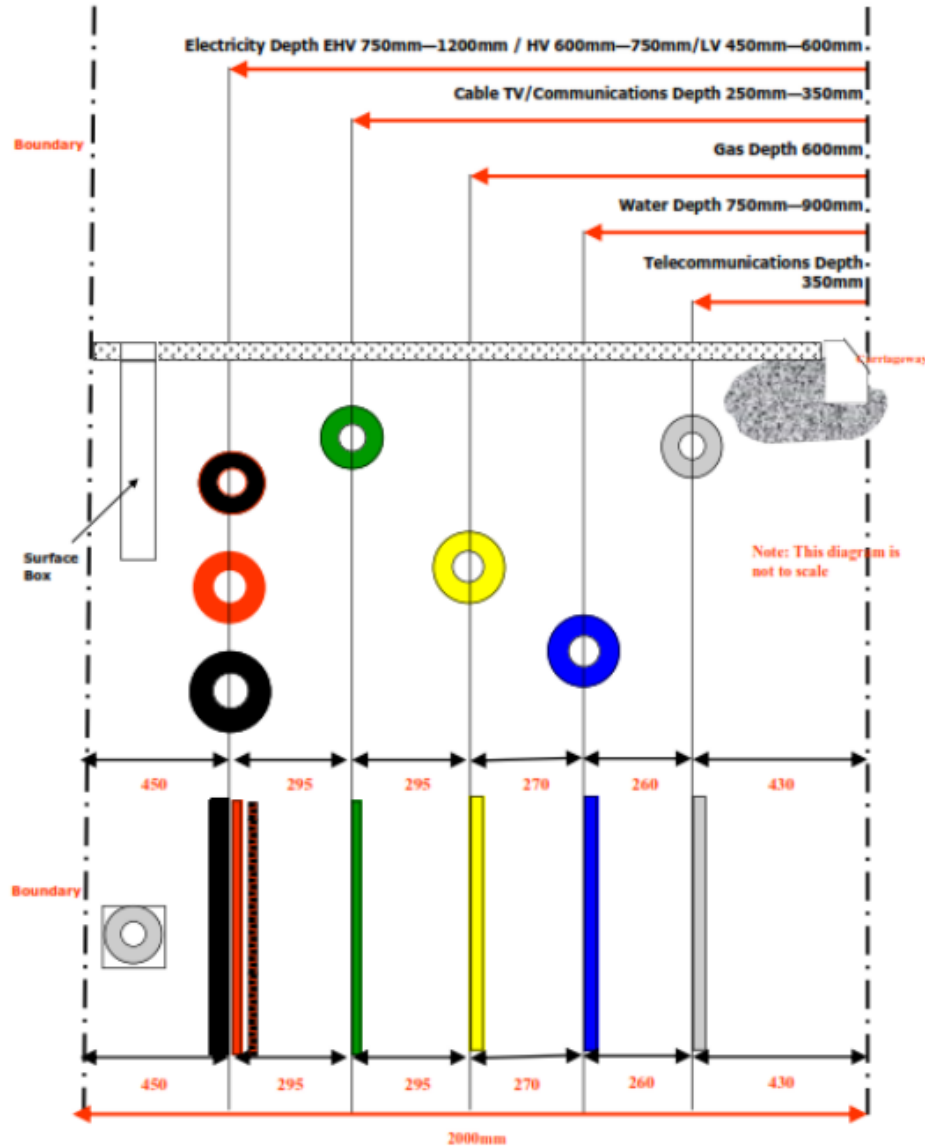
- Increased protection for individuals.
- Sand & sand bags can be recovered for reuse.
- Quicker, easier, safer re exposure of services.
- No need for mechanical excavation.

ECP 0028 Service Avoidance including Breaking of Ground

Wherever possible whilst searching for services, try to dig at least 500mm to the side of the service, and then expose the service from the side.



Service locations



This is one of many extracts showing recommended depths for services.

Anyone involved in groundworks know that this is not what we find.

Does not include street lighting.

THANK YOU

ANY QUESTIONS?



Constructing Local

