Excavations & Breaking Ground
Contents

• Breaking Ground
  – Before you start (planning)
  – Permits
  – Scanning
  – Emergency plan

• Excavations
  – Formation
  – Hazards
  – Inspection

• Summary
What is breaking ground?

• Any disturbance of the ground – this even includes driving a fence post, or drilling
Breaking Ground – before you start

• Do you have to ‘break ground’ to carry out the task – avoid it if possible!
• Consult site maps, and service drawings to help identify; power cables, phone & data cables, water & gas pipes and other obstructions.
• Consider the surrounding environment – e.g. would you want a large excavation next to an existing structure?
• Consider the possibility of contaminated ground (check site records)
  – Personal exposure & waste arising disposal
Breaking Ground – before you start

• Before carrying out any work ensure relevant staff (& other site users where applicable) are consulted and are aware of the work being carried out
  – There may be other services you are not aware of and are not shown on your plans

• Consult with service providers if you are unsure of service runs or need additional advice
Breaking Ground – permits

• No breaking ground should be carried out without a permit (or high level risk assessment) being completed

• To complete the permit various actions are required;

• Mark out, on the ground, the area of dig - include a 1 metre boundary around the perimeter so that it can be included in the scan
Permits

• Scan the ground with a service tracing tool (e.g. CAT scanner) – this must be within calibration date and used by a trained operator
  – This tool can be used for a variety of cable detection & the trained operator will know the correct mode

• Mark out on the area any known, or discovered services. Next to the line signify the type of buried service – e.g. E for electricity, G for gas, W for water or S for other service

• List any control measures for contaminated ground or suspected munitions
Permits

- Ensure the machine operator is aware of the significance, and location, of the services.
- The machine operator and site responsible person must sign the permit before excavation starts.
Carrying out the excavation

• Isolate any services crossing the area if reasonably practicable

• Where services are known or suspected a trial hole will be hand dug (using non-powered, insulated, hand tools) to expose the service, so that it can be properly identified & protected

• The remainder of the identified service will either be left in situ, or hand dug to expose it all
Emergency Plan

• Consider a banksman to inspect the area being exposed if services are suspected
• An emergency plan should be in place before the excavation starts – this will include contact details for
  – Service providers
  – Brett management
Emergency Plan

• In the event of an electricity cable being struck and exposed to the wiring - if the operator is in a rubber tyred excavator they should remain in the cab and either track away from the service or call for aid.

• In the event of striking any other service the excavation should immediately stop and local management contacted.

• You should prevent any other people coming into the area.
Excavations;

• Neither the shallowness of an excavation or the appearance of the ground should be automatically taken as indications of safety.

• Check the soil types and decide which type of support system is required in consultation with a competent person before the excavation starts.

• Erect suitable barriers to guard the excavation to prevent access by unauthorised persons.
Excavations

• Ensure that adequate and sufficient ladders are provided for safe access
• Ensure mobile plant is not parked next to an excavation; the weight of the plant could cause a collapse and the exhaust gases can enter the excavation reducing the oxygen content.
• Additionally do not store butane, propane or other gases denser than air next to an excavation
• Any haul routes or pedestrian routes are directed away from excavations
Excavations

• Material is not stockpiled adjacent to excavations.
• Vibrating compaction equipment is not used near any excavations if there is a possibility of the vibration causing collapse.
• If there is any doubt about the quality of the atmosphere within the excavation a gas detector is used prior to entry, this must have a current calibration certificate.
Excavations

• An inspection of the excavation is made prior to access each day & is recorded. As a minimum this includes;
  Ensure all support systems are secure and properly maintained.
  Check for signs of overstress in the support system or any damage that may have been caused by plant.
  Check for any water or soil that may be seeping through the support system (Re-inspect after heavy rain).
  Check for signs of earth peeling or cracking at unsupported faces
  Check that there are adequate ladders, that they are maintained, secured and used correctly.
  Check that any gas detector being used is working correctly.
Excavations

• Any faults detected are reported to the Site Manager immediately and work is stopped until deemed safe.

• Reports are to be kept available for inspection by HSE inspectors at site until work is completed & then for 3 months
Sample Excavation Checklist:

To be completed by Competent Person:

Daily and before each shift:
- After any precipitation, windstorm, thaw, vehicular movement or other activity that might increase hazards
- When fissures, tension cracks, sloughing, undercutting, water seepage, bottom bulging, or other similar circumstances occur
- When there is any change in the site, location or placement of the spoil pile
- When there is any indication of change or movement in adjacent structures

<table>
<thead>
<tr>
<th>Surface Conditions</th>
<th>Access and Egress</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cracks or Cracking</td>
<td>Trench access every 25 feet</td>
</tr>
<tr>
<td>Spoil piles set back 2 feet from edge</td>
<td>Stair ladder, and ramp at proper</td>
</tr>
<tr>
<td>No equipment or material stored near edge</td>
<td>Extend 36&quot; above excavation</td>
</tr>
<tr>
<td>Water in excavation pumped out</td>
<td>No metal ladders near electrical lines</td>
</tr>
<tr>
<td>No source of vibration</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shoring and Shielding</th>
<th>Banks and Sides of Slope or Trench</th>
</tr>
</thead>
<tbody>
<tr>
<td>In place</td>
<td>No Cracks or Cracking</td>
</tr>
<tr>
<td>Appropriate for loads expected</td>
<td>No Spalling</td>
</tr>
<tr>
<td>Hydraulic cylinders, if used are not leaking</td>
<td>Slope of 1:5 (width) to 1 (depth)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Existing Utilities</th>
<th>Sources of flammables or gases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support adequate</td>
<td>Eliminated in area of Excavation</td>
</tr>
<tr>
<td>Utilities identified and protected</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vehicular Traffic</th>
<th>Surface Crossing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eliminated in area of Excavation</td>
<td>Prohibited unless</td>
</tr>
<tr>
<td></td>
<td>Rated for 4 tons as expected load</td>
</tr>
<tr>
<td></td>
<td>Minimum 20&quot; wide</td>
</tr>
<tr>
<td></td>
<td>Fitted with Railings at base and 36&quot; height</td>
</tr>
<tr>
<td></td>
<td>Extend 24&quot; past trench walls on each side</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spoil Piles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary Pile at least 2 feet from excavation</td>
<td></td>
</tr>
<tr>
<td>Permanent Pile location and transportation means identified prior to initiating excavation</td>
<td></td>
</tr>
<tr>
<td>Any water leaking from Temporary Pile directed away from excavation</td>
<td></td>
</tr>
</tbody>
</table>

Any other potential hazards:

__________________________
Name:

__________________________
Signature:

__________________________
Date:

__________________________
Excavation Purpose:

Note: Weather conditions:

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Excavation Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Summary

• Ensure adequate planning takes place before any excavation begins
• Consider the surrounding environment
• Carry out a permit for any ‘breaking ground’
• Ensure any excavation is adequately supported
• Keep others away
• Carry out regular inspections