



WINDECO LIMITED

CONTROL OF EXCAVATIONS TRENCHING, TUNNELLING AND ROADWORKS

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1 Purpose

The purpose of this procedure is to ensure that excavation work, trenching, tunnelling, roadworks and floor opening removal / re-instatement are controlled and carried out to a high and consistently safe standard.

2 Scope

This procedure guides you on the safety aspects that should be considered in the planning, construction, inspection and examination (tagging) and working in or around floor openings, excavations, trenching, tunnelling and roadworks.

3 References

- Management of Health and Safety at Work Regulations
- HS(G) 47 - Avoiding Danger from Underground Services
- HS(G)150 - Health and Safety in Construction
- HS(G)185 - Health and Safety in Excavations
- Personal Protective Equipment

4 Precautions & Limitations

4.1 Any Site presents the hazards to personnel carrying out work involving excavation, tunnelling, trenching and road works:

- Underground services pipe work.
- Underground LIVE high and low voltage electrical cables.
- Underground high-pressure natural gas pipework.

4.2 Excavations are NOT permitted unless under the control of the person in charge of the Working Contractors.

4.3 Excavations shall be securely fenced and toe boarded, as appropriate in accordance with current legislation. Flags or tape barriers are NOT considered adequate for this purpose.

4.4 Under Health & Safety at Work Act, it is an offence to interfere with such fencing.

5 Responsibilities

Windeco Ltd. Managers are responsible for ensuring that the contracting company are aware of and will undertake to comply with the requirements of this Procedure.

6 Definitions & Terminology

6.1 Excavations

Excavations at ICHP are defined as 'Whenever the ground or its surface is broken or disturbed by hand, mechanical or hydraulic means during work activities' but excluding the

following:

- Wooden pegs driven to no more than 200mm (8") in open ground.
- Nails, anchors or bolts no longer than 100mm (4") fixed into concrete or flexible paving, (fixings etc. are forbidden in red screeded areas).

6.2 Unsupported Excavation

An excavation where Risk Assessment identifies there is no need to support the excavation sides.

6.3 Battered Excavation

An excavation where the sides of the excavation are sloped to suit the ground conditions at a safe angle of repose.

6.4 Stepped Excavation

An excavation where one or more steps are cut into the excavation side(s). The depth and width is determined by the ground type/conditions. The vertical distance of each step should not exceed 1.2m (47").

6.5 Walings, Struts and Poling Boards

Timber walings, struts and poling boards are the names given to timbers that afford support to the sides of excavations, allowing safe access for operatives.

6.6 Double Sided Support

An excavation where the forces exerted by earth on the excavation sides are transmitted from one side to the other by walings and horizontal struts.

6.7 Single Sided Support

An excavation where only one face of the excavation is supported. Transferring the load through the support material via walings to either raking shores or ground anchors resists Earth pressure from the excavated face.

6.8 Confined Space

Any place, including any chamber, tank, vat, silo, pit, trench, pipe, sewer, flue, well or other similar space in which, by virtue of its enclosed nature, there arises a reasonably foreseeable specified risk.

6.9 Competent Person (Inspection of Excavations)

A Competent Person who is suitably qualified by training (to CITB or equivalent standard) and experience and has been assessed by their employer as competent to carry out Excavation Inspections.

6.10 Competent Supervisor

Person who is suitably qualified by training (to CITB or equivalent standard) and is experienced in excavation construction.

7 Procedure - Planning and Safety Considerations for Excavations

7.1 Excavations

- 7.1.1** All requests for permission to carry out site excavations should be supported with a Method Statement and suitable and sufficient Area Risk Assessment provided by the contractor carrying out the excavation work.
- 7.1.2** It is the responsibility of the Windeco Management to review this documentation and to accept or reject the documentation.
- 7.1.3** The Risk Assessment for the excavation should identify if the excavation will be, or become, a Confined Space. If so the relevant additional risk control measures must be implemented.
- 7.1.4** Full details of the proposed excavation route must be provided with the excavation indicating width and depth of excavation, proposed method of excavation and reasons for the excavation.
- 7.1.5** It will be the responsibility of the Windeco site survey to supply the relevant information concerning the proposed excavation - including an up-to-date drawing of the services in the areas of excavation, e.g. High Voltage (HV) and Low Voltage (LV) cables, telephone cables, town main, drains and sewers, etc.
- 7.1.6** A Safety Document for the excavation work must be issued for all site excavation to the contractor carrying out the excavation work.
- 7.1.7** As part of the planning process, the Windeco Management must discuss with the approved contractor carrying out the excavation at an informal meeting, the detailed scope of work and hazards and restrictions prevailing. These may be given in a written document to be issued with any issued Safety Document if this is considered necessary.
- 7.1.8** The Windeco Management will assess the work and decide whether a Selected Survey Report is required. If this is the case then a Scan of the area to be excavated using a cable/pipe locator will be carried out. The Survey report will then give recommendations on underground services and methods of excavation i.e. mechanical, hand digging, digging trial holes or the use of Specialist Equipment. This information will be issued with the Safety Document along with any site drawings, Method Statements and Risk Assessments.
- 7.1.9** Due regard shall be given if the work is to be carried out where additional risk control measures may be required.
- 7.1.10** Excavation work in the vicinity of HV/LV electrical cables may be required to investigate / locate and repair damaged or faulty cables or to install new cable runs.
- 7.1.11** Where relevant, excavations will have properly designed shoring, suitable battering or stepping. The method used will be identified in the Risk Assessment/Method Statement submitted by the approved contractor
- 7.1.12** Any excavation deeper than 2 metres (unless battered) will require a designed support system.
- 7.1.13** Support of the excavation sides must take into account additional loadings created by buildings or other structures.
- 7.1.14** Excavations that are close to structures must be assessed to make sure the security

and stability of the structure is not reduced or affected.

- 7.1.15** Where the Excavation will affect access to doors, ladders or equipment a temporary means or access should be provided. This requirement should be included in the scope of work.
- 7.1.16** Excavations where the risk assessment has identified there is a risk of a fall should be protected with substantial barriers usually comprising guard and intermediate rails and toe boards. Additional hazards such as standing water or reinforcing bars projecting upwards should be considered and the same standard of protection should be provided.
- 7.1.17** Flammable and toxic gases could enter cable-carrying ducts, particularly if the duct has been damaged, such gases can accumulate in chambers, manholes etc and pose a risk to operatives who may need to work there. Consideration should be given to gas monitoring, (Explosive and oxygen) and especially with any excavation greater than 1.2m deep.
- 7.1.18** The risk assessment for the excavation must take into account the risk of previous ground contamination and possibility of ground contamination
- 7.1.19** Consideration should be given to the potential presence, and introduction because of wind direction within excavations, of fumes, that can cause asphyxiation and/or poisoning. Exhaust products from internal combustion engines could seep into and collect within trenches if they are sited close to the top of the excavation. (Such equipment should never be taken into an excavation). Gases such as methane or hydrogen sulphide can seep into excavations from contaminated ground or damaged services in plant areas necessitating continuous gas monitoring.
- 7.1.20** It is most important that the extent and duration of excavations and temporary obstructions are kept to a minimum. Trenches should be refilled as the work progresses and the carriageway re-opened to traffic without delay. Excavated material should not be allowed to obstruct carriageway space.
- 7.1.21** Continuously operating yellow warning lamps supplemented by traffic cones should be used to delineate the works. The lamps should be checked daily.
- 7.1.22** Lamps and cones should be kept serviceable
- 7.1.23** The area around all excavations shall be guarded and Danger Notices provided to the satisfaction of the Project Manager. The excavation contractor shall provide the guards and notices.
- 7.1.24** Where barriers are positioned they should be continuous and two feet (610mm) or more in height, and after dark they should be supplemented by yellow lamps.
- 7.1.25** Where footways are obstructed, diversions with handrails and, where necessary, toe boards should be provided
- 7.1.26** If the excavation work involves HV or LV cables the additional precautions specified in section 7.2 shall be implemented.
- 7.1.27** On completion of the excavation work and back-filling / consolidation, the Project Manager shall inspect and ensure that the area is left in a safe and satisfactory state and all barriers etc removed.

7.2 Portable Electrical Appliances

- 7.2.1** Only approved 110-volt double insulated, portable tools may be used

- 7.2.2** Portable Light Fittings are to be installed by Competent Electrical Persons.
- 7.2.3** All supplies for Portable Appliances will be from Centre Tapped Earth Transformers.
- 7.2.4** Cables for Portable Appliances shall be routed and supported as necessary to prevent them from becoming damaged or a snagging/tripping hazard.
- 7.2.5** Where cables enter excavations the outer insulation covering of the cable is to be protected by rubber matting or similar material. This is to prevent damage from sharp edges, particularly where metal trench sheets; struts and waling are used for supporting the excavation.
- 7.2.6** During the hours of darkness warning lights must be displayed. These must be certified for use in the area

8 Excavation - Commencement of Work

- 8.1** A control document must be in place for all excavations.
- 8.2** To reduce the possibility of damage to underground services and injury to those carrying out the work, the guidance in HS(G)47 HS(G)150 and HS(G)185 should be followed.
- 8.3** All excavation work will be carried out under the direction and control of a Competent Supervisor. Lists of Competent persons and Competent Supervisors are to be kept and maintained by the Contractor.
- 8.4** All materials and equipment used must be fit for purpose and in a serviceable condition. Operatives must be trained in the safe use of equipment including ground support systems
- 8.5** A precaution should be taken when using "quick couplings" on hydraulic excavators that connect attachments, these have been known to unexpectedly release. These should have a positive locking pins and / or other devices installed as recommended by the manufacturer. Manufactures installation and testing of quick couplings and attachment connections procedures should always be followed every time an attachment is made.
- 8.6** Live cables and pipes positioning will be identified from the plans and drawings, where appropriate a suitable cable and pipe locator will be used to locate cables and pipes. These where appropriate will be marked by spray paint on the ground to identify their position. Where practicable digging in these areas will be avoided as far as possible. Mechanical excavators, power tools including hand-held power tools should not be used within 500 mm of pipes and one metre of cables.
- 8.7** Where appropriate prevent the face and sides from collapsing by battering them to a safe angle or supporting them with sheeting or proprietary support systems. Install supports without delay as the excavation progresses, work should not be undertaken ahead of the supports.
- 8.8** A safe means of access/egress must be provided; this may be a ladder or ladders suitably secured. Ladders must project 1.05m (41 inches) above the excavation to provide a handhold, and the height: base ratio to be not less than 4:1.
- 8.9** Walkways or bridges with handrails shall be provided where personnel or equipment are required or permitted to cross over excavations. These should be at least 600mm (24 ins) wide and provided with edge protection.
- 8.10** Excavations must have a means of edge protection to prevent people or objects from falling in to them. The type of barrier will be identified in the Risk Assessment/Method Statement and agreed with the ConocoPhillips Contract Manager for the work.
- 8.11** Excavated materials or equipment shall not be placed or stored closer than 1.5m (59 inches) from the side of an excavation. Where the excavation depth exceeds 1.5m (59 inches), this distance needs to equal the depth of the excavation. Access to the excavation is to kept be clear at all times.
- 8.12** Because of the risk of excavation walls collapsing through overloading of the sides, vehicles, cranes and items of plant are not to be allowed near the edges of an excavation.
- 8.13** Baulks or barriers are to be used to keep vehicles at least 2m (79 inches) away from the ground disturbance and edges of excavations, were possible these should be painted or signed to make sure they can be seen by drivers.
- 8.14** Where vehicles have to tip materials into excavations properly secured stop-blocks are to

be used to prevent them from over-running into the excavation. Consideration must be given for the need for extra supports.

- 8.15** Exposed cables, pipes, drains etc. are to be suitably supported and protected to prevent damage.
- 8.16** Appropriate traffic signing on highways and ICHP roads should be used.
- 8.17** Alterations and modifications to excavations or ground support systems are to be carried out under the direction and control of a Competent Supervisor, Risk Assessments must be reviewed and full excavation process followed from the beginning.

9 Inspection and Examination

All Excavations, as identified by the risk assessment, must be inspected by defined competent Supervisor.

9.1 Inspections must be made:

- Before work at the start of every shift.
- On completion of the excavation.
- Whenever the excavation is altered or modified.
- After any event likely to have affected its strength or stability, e.g. after adverse weather conditions.
- After accidental fall of rock, earth or any other material.
- Whenever unsafe conditions are observed or suspected.
- After any significant modification to the ground support system

NB: A written report is required after each seven-day period, unless there has been a collapse/fall of material or other event likely to affect stability, in which case an inspection and report are required before work commences.

9.2 Inspection reports must be kept on site and available for auditing. The reports must include the following:

- Name of person on whose behalf inspection is carried out
- Site address
- Location and description of excavation inspected
- Date and time of inspection
- Details of any matter identified that could lead to a risk of health and safety of anyone
- Details of any action taken as a result of any matter identified in above
- Details of further action considered necessary
- Name and position of person making report

10 Working in Excavations

10.1 Operatives involved in the construction of excavations shall be competent in the work practices and techniques involved in the excavation work being carried out.

10.2 To prevent damage to underground services during excavation work the Risk Assessment and Safety Document is to be strictly adhered to. Risk assessments and method statements must be reviewed and changes approved whenever conditions change or the scope of the work is altered.

10.3 In addition to the requirements of HS (G) 185, Excavation Tags (See Fig 1) are to be displayed by the excavation contractor at the access points or another suitable position of all excavations except for the following: -

- Excavations less than 1.2m (47 ins) deep.
- All cable trenches with formed sides (concrete or brick).

10.4 Excavation Tags will show the current status of the excavation.

10.5 The following information must be entered on the excavation tag displayed at the access point of completed excavations:

- Details of the excavation / task / responsible company
- Location and description (type of excavation)
- Any special Hazards.
- Whether the work can be carried out safely, if not the tag should be removed.
- Any other H&S actions
- Name of Competent Person making report, and name of person designated as holder of the report if different.
- Date of production of tag.
- Date of last daily inspection.

EXCAVATION-TAG

EXCAVATION INSPECTION RECORD

LOCATION

DESCRIPTION

CAUTION
THE FOLLOWING HAZARDS SHOULD BE NOTED

CAN WORK BE CARRIED OUT SAFELY Y/N

IF NOT PLEASE INFORM

DETAILS OF ANY OTHER H & S ACTIONS CONSIDERED
NECESSARY

NAME OF COMPETENT PERSON MAKING REPORT

DATE

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WARNING

UNLAWFUL REMOVAL OR INTERFERENCE WITH THIS SIGN
COULD MAKE YOU LIABLE TO PROSECUTION AND FINES

DAILY INSPECTIONS		WEEKLY EXAMINATIONS	
DATE	SIGNATURE	DATE	SIGNATURE

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Fig. 1

- 10.6** Incomplete excavations and excavations not suitable for entry or occupancy must have a No Entry tag displayed at access points/barriers, additional warnings are to positioned as required.
- 10.7** Before entering an excavation the Excavation Tag is to be examined to ensure the excavation is complete and the inspections are current. Entry into the excavation is forbidden for persons other than these involved in construction of the excavation if the Excavation Tag states "**DO NOT ENTER**". If the stability or condition of the excavation is suspect, the excavation is not to be entered. The Site Supervisor responsible is to be informed and will make arrangements to have the excavation inspected and repaired as required.
- 10.8** A **Banksman** must be used to assist drivers when reversing or approaching the excavation to tip or collect excavated materials.
- 10.9** The minimum standard of Personal Protective Equipment (PPE) as defined in the Task Risk Assessment for the excavation shall used as defined in the Risk Assessment.