

# 33 Maintenance, Construction and Excavation

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## Introduction

1. This chapter provides guidance for the safe management of maintenance, construction and excavation activities (including trench building) in Defence which includes:
  - a. the construction, alteration, conversion, fitting out, commissioning, renovation, repair, upkeep, redecoration or other maintenance (including cleaning which involves the use of water or an abrasive at high pressure or the use of corrosive or toxic substances), decommissioning, demolition or dismantling of a structure;
  - b. preparation of a site or structure, including site clearance, exploration, and excavation;
  - c. the assembly on site of prefabricated elements to form a structure or the disassembly of such a structure;
  - d. the removal of a structure or of any product or waste resulting from demolition or dismantling of a structure; and
  - e. the installation, commissioning, maintenance, repair or removal of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services which are normally fixed within or to a structure.
2. The Construction (Design and Management) Regulations (CDM) applies to Defence and should therefore be followed for all construction projects. The principles of CDM are to integrate health and safety into the management of a project and to encourage everyone involved to work together to:
  - a. improve planning and management of projects from the very start;
  - b. identify risks early on so that they can be eliminated or reduced at the design or planning stage and remaining risks can be properly managed;

- c. target effort where it can do the most good in terms of health and safety; and
  - d. discourage unnecessary bureaucracy.
3. Activities governed by the CDM regulations include:
- a. any excavation (earthworks, trenches, tunnels or shafts, etc.);
  - b. the construction or maintenance of buildings or structures;
  - c. installation, commissioning, maintenance or repair of mechanical, electrical, gas, compressed air, hydraulic, telecommunications, computer or similar services normally fixed within a building or structure; and
  - d. the dismantling, alteration, disposal or demolition of the above.
4. The CDM regulations impose general management duties, these duties require all Duty Holders to make appropriate provisions for ensuring the competency of those appointed or engaged, the co-operation of all involved in a project and co-ordination of activities to ensure the health and safety of persons carrying out construction work or who can be affected by the work.
5. For most Defence personnel their involvement with CDM regulations will be limited to the communication, co-operation and co-ordination as detailed in JSP 375, Volume 1, Chapter 34 - Management of Visiting Workers and Contractors.

## **Roles and Responsibilities**

### **Client**

6. Where an activity is governed by the CDM regulations, the accountability for carrying out the Client duties rests with the individual who commissions the activity (ultimately having the authority to decide what is to be constructed, where, when and by whom). The Client shall make sure they are conversant with HSE publication L153 (Managing health and safety in construction) and with respect to:
- a. defining the expected standards of health and safety, including safe working practices, and the means by which these standards will be maintained throughout;
  - b. what is expected from the design team in terms of the steps they should reasonably take to ensure their designs help manage foreseeable risks during the construction phase; and when maintaining and using the structure once it is built and its eventual disposal or demolition;
  - c. the arrangements for commissioning the structure and a well-planned handover procedure to the new user;

- d. checking the competency and resources of all appointees;
- e. ensuring there are suitable management arrangements for the project including welfare facilities;
- f. allowing sufficient time and resources for all stages;
- g. providing pre-construction information to designers and contractors;
- h. co-ordinating the construction and / or excavation activities with the activities of others working in the same location;
- i. ensure that construction phase does not start until there is a suitable construction phase plan and welfare facilities in place; and
- j. retain and provide access to the health and safety file.

7. For CDM projects that are NOT being conducted by Defence personnel, in addition to the duties listed in paragraph above the Client also has a responsibility to:

- a. appoint a competent Principal Designer;
- b. appoint a competent Principal Contractor; and
- c. sign section 13 of the HSE Form 10 Notification (for CDM projects notifiable to the HSE).

8. If the Client does not make the appropriate appointments, they will by default become legally liable to fulfil the duties of the Principal Designer and / or Principal Contractor, as well as the liability for not making those appointments.

### **Commanding Officer / Head of Establishment (CO / HoE)**

9. The CO / HoE shall ensure that procedures are in place to enable appropriate appointments to be made where they are required for activities under their control and that suitable resources are available including the availability of all relevant documents such as risk assessments, statements of known hazards, etc. Sufficient communications between the Client, contractors and Defence personnel shall be maintained throughout the life of the project; this should be achieved in accordance with JSP 375, Volume 1, Chapter 34 - Management of Visiting Workers and Contractors and JSP 375, Volume 3 where applicable. On high-hazard sites additional licencing and certification may be required according to Statutory or Defence regulation.

### **Manager**

10. Prior to carrying out construction or excavation activities, if it has not already been provided by the Client, information shall be obtained regarding the location of the planned work (on the Defence Estate this should be available in a "statement of

known hazards” - MOD Form 5050) to establish the presence of potential hazards; these may include:

- a. buried or overhead services such as water or gas pipes, sewage pipes and power cables - damaging a power cable could result in injury, and possibly fatality. Whether or not persons are injured, the service provision to another location may also be disrupted. This in itself may prove catastrophic as the failure of the service could result in the loss of an essential function, e.g. power supply to a medical facility or an airfield ground lighting system;
- b. land contamination - it is known that the formal and informal ‘in situ’ disposal of defective or surplus equipment (including luminescent components), asbestos and unexploded devices has taken place on the Defence estate and that records of such activity have not always been completed or maintained. Any ground on the Defence estate could therefore be contaminated by materials, chemicals, radiation etc., and even very shallow excavations may expose Defence personnel to considerable risk;
- c. adjacent structures - whereby the excavation may disturb or destabilise them; and
- d. hazards likely to cause fire (see Defence Fire Regulations<sup>1</sup>).

11. Managers shall ensure that in the planning of any construction or excavation work, that all relevant information is evaluated. Relevant information may include:

- a. previous usage of the site and what buried hazards may be expected;
- b. site plans and / or drawings identifying the presence of hidden, buried and overhead services. This information is often available from the Maintenance Management Organisation (MMO);
- c. that provided by the service utilities (e.g. the local electricity board). It must be noted that the information provided will not give exact locations of the various services – the end points can be clearly identified, but it is unlikely that accurate information regarding pipe or cable runs will be available;
- d. safety distances from or below overhead services and the precautionary measures required for the safe operation of machinery;
- e. scans, or similar investigations, using various proprietary cable and / or pipe locating devices. A scan should be carried out by someone who is competent in using the equipment and in interpreting any data obtained;

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<sup>1</sup> Regulatory Reform (Fire Safety) Order 2005 Article 18 places a duty on the responsible person to appoint one or more persons to assist them in undertaking their preventative and protective measures. Notification of changes to buildings forms part of Defence Fire Regulations

- f. consultation or discussion with persons who have local knowledge; this may reveal information that has not been formally recorded;
- g. indications that buried services exist including the presence of lampposts, telephone boxes, manhole covers, or hydrant covers. There may also be small concrete indicator posts, usually on grass verges or plaques on adjacent walls; and
- h. Land Quality Assessments (LQA's) and Explosive Ordnance Disposal (EOD) clearance certificates where available.

12. Prior to commencing work, risk assessments shall be conducted and any required permits to work raised. The risk assessment and subsequent control measures are to give due consideration to all reasonably foreseeable hazards in the vicinity of the work to be undertaken as well as those inherent in the actual work activity; these may include:

- a. the height or depth from ground level that work is to be undertaken;
- b. undermining or weakening of other structures;
- c. the erection, use and inspection of scaffolding and work platforms;
- d. the use and inspection of trench supports and battening;
- e. falls and falling objects (tools and materials);
- f. the work equipment / vehicles used (particularly near excavations where the use of heavy vehicles may cause the collapse of a trench or pit wall);
- g. the materials being worked on, around or removed (e.g. asbestos roofing); and
- h. the use and selection of PPE, its storage, maintenance and inspection requirements.

13. The manager responsible for undertaking civil engineering or engineering maintenance, construction and / or excavation activities by Defence personnel shall ensure that a construction phase plan is produced and appropriately reviewed. The plan is to be updated and revised so that it continues to be sufficient to ensure that the activities are carried out, so far as is reasonably practicable, without risks to health or safety.

14. The manager shall take reasonable steps to satisfy themselves that Defence personnel under their control tasked to work on civil engineering or engineering maintenance, construction or excavation activities have the skills, knowledge and experience, necessary to fulfil the role that they are appointed to undertake. They shall assure that it will be carried out in a manner that safeguards the health and safety of any person affected by the project. If the work is to be undertaken by a

contractor, then that contractor must have the organisational capability (policies and systems) to fulfil the specified role.

## **All Personnel**

15. All Defence personnel should comply with all information, instruction, training (including Safe Systems of Work) as required by management and in accordance with the requirements of any permit to work. Personnel should report any unsafe conditions including damage to a cable, pipe or pipe coating to the relevant authority; under no circumstances are unauthorised personnel to attempt repairs, work must cease, and the area made safe.

16. Where buried services are known or expected to exist, excavations should be carried out by hand-digging to locate and confirm the existence of services with the minimum of risk of causing damage and exposing hazards. This is particularly important if there are plastic pipes, or fibre-optics, which cannot be found by a locator. Hand digging should be done using spades and shovels in preference to picks, pins or forks. Existing standards set the minimum depth at which services should be buried. However, experience has shown that this is not always the case. Services are frequently buried at a lesser depth than that required by relevant standards; also, previous works on the site may have increased or reduced surface levels.

17. As work progresses, personnel should remain vigilant for buried or hidden services and undertake repeat checks using locating devices. If a service is found, checks should be made to ensure that it is the same service that was expected, as there may be more than one cable or pipe or 'phantom' services (this is where a second cable or pipe is located above the expected service and has not been previously located or recorded) which could compromise safety causing serious injuries or deaths.

## **Retention of Records**

18. All records should be retained in accordance with JSP 375, Volume 1, Chapter 39 (Retention of Records)

## **Related Documents**

19. The following documents should be consulted in conjunction with this chapter:

- a. JSP 375, Volume 1;
  - (1) Chapter 08 - Risk Assessment;
  - (2) Chapter 15 - Personal Protective Equipment (PPE) and Respiratory Protective Equipment (RPE);
  - (3) Chapter 22 - Work Equipment;
  - (4) Chapter 27 - Preventing Falls and Falling Objects;

- (5) Chapter 28 - Confined Spaces;
  - (6) Chapter 30 - Permit to Work;
  - (7) Chapter 34 - 4C System: The Management of Visiting Workers and Contractors; and
  - (8) Chapter 39 - Retention of Records.
- b. Other MOD Publications;
- (1) DSA01.1 – Defence Policy for Health, Safety and Environmental Protection; and
  - (2) DSA01.2 Chapter 2 – Requirement for Safety and Environmental Management Systems in Defence.
- c. Legislation and Guidance;
- (1) [Management of Health and Safety at Work Regulations;](#)
  - (2) [Construction \(Design & Management\) Regulations;](#)
  - (3) [Working at Height Regulations;](#)
  - (4) [HSE L153 – Managing health and safety in construction;](#)
  - (5) [HSE HSG 33 – Health and Safety in Roof Work;](#)
  - (6) [HSE HSG 47 - Avoiding danger from underground services;](#)
  - (7) [HSE HSG 144 – Safe Use of Vehicles on Construction Sites;](#)
  - (8) [HSE Safety Topics – Structural Stability During Excavations;](#)
  - (9) [HSE CIS65 – Avoiding Concealed Services and Overhead Power Lines;](#)
  - (10) [HSE CIS64 – Excavations;](#)
  - (11) [HSE INDG 455 – Safe Use of Ladders and Step Ladders.](#)
  - (12) Regulatory Reform (Fire Safety) Order 2005