INITIAL PRE-CONSTRUCTION INFORMATION DOCUMENT

For

ALTERATIONS TO THE EXISTING MAIN ENTRANCE & FORMING OF LINK STRUCTURE TO CONNECT THE TWO SCHOOL BUILDINGS

At

Pinner Park Primary School
Melbourne Avenue
Pinner
Middlesex
HA5 5TL

by

WSP Safety Ltd
Navigation House
48 Millgate
Newark-on-Trent
Nottinghamshire
NG24 4TS

For

Harrow Borough Council
Civic Centre
Station Road
Harrow
HA1 2XY

WSP Ref No. 12087
4th June 2020 Tender issue

PRELIMINARIES

A1 Introduction

A1.1 This contract shall be carried out in full compliance with the Construction (Design & Management) Regulations 2015.

A1.2 This document has been prepared by WSP Safety Ltd, appointed as Principal Designer under the Construction (Design and Management) Regulations 2015 (Regulation 5(1) (a)).

A1.3 The successful Contractor shall be appointed as "Principal Contractor" as defined in the Construction (Design and Management) Regulations 2015 – Regulation 5(1) (b).

A1.4 This document constitutes part of the Pre-Construction Information Document as required by the Construction (Design and Management) Regulations 2015 – regulation 4(4) & 11(6)(a).

A1.5 This document should be read in conjunction with all other documents incorporated within the Tender Package.

A1.6 This document is the copyright of WSP Safety Ltd. and may not be reproduced (in whole or in part or by any means), without the prior written consent of WSP Safety Ltd. Except that this document may be used by the Principal Contractor as the basis for the Construction Phase Plan.

A2 Skills, Knowledge, Experience & Resources

A2.1 The Principal Contractor is required to satisfy themselves that any Designers they engage have the sufficient skills, knowledge and experience to undertake such works, as defined under Regulation 8(1) of the Construction (Design & Management) Regulations 2015.

A2.2 The Principal Contractor is required to satisfy themselves that any Contractors they engage are competent and adequately resourced to undertake such works, as defined under Regulation 8(1) of the Construction (Design & Management) Regulations 2015.

A3 Supporting Information to Support Tender Submission

A3.1 All Tendering Contractors are required to incorporate within their tender submission supporting information to address the following specific points: -

i) A schedule of resources identified to manage the Health & Safety aspects of this project.

ii) An outline Method Statement identifying the proposed arrangements for establishing and managing the construction site, making specific reference to the Site constraints drawings and addressing: -

- Interaction with occupants. Provide details of how works will be segregated from existing ongoing operations and public interface areas.
- Site Traffic Management.
- Site Welfare and accommodation proposals.

A4 Construction Phase Plan

A4.1 The Principal Contractor shall prepare, review and maintain a suitable Construction Phase Plan for the duration of the project in accordance with regulation 12(1) (2).

A4.2 The Construction Phase Plan shall incorporate responses to address the topics identified in schedule 3 of L153 "Managing Health and Safety in Construction" http://www.hse.gov.uk/pUbns/priced/l153.pdf.

A4.3 The Principal Contractor will be required to make available to the Principal Designer their Construction Phase Plan fourteen days prior to the proposed commencement.

A4.4 **THE WORKS CANNOT COMMENCE UNTIL THE INITIAL CONSTRUCTION PHASE PLAN HAS BEEN SUITABLY DEVELOPED**.

1.0 PROJECT INFORMATION

1.1 Purpose of this document

The document has been prepared to capture the pre-construction information made available to the Principal Designer at the time of publication.

The document will continue to be developed through the tender and pre–construction design development phase and amended accordingly.

1.2 Title Information

Location:	Pinner Park Primary School	**WSP Ref:**	12087
Address:	Melbourne Avenue, Pinner, Middlesex, HA5 5TL		
Project Title:	Alterations to the school's main entrance and the forming of link structures to connect two separate school buildings		

1.3 Key Participants

Client	Harrow Borough Council	**Contact:** **Tel:** **Email:**	Mick Wynne 020 8424 7692 Mick.Wynne@harrow.gov.uk
School Headteacher	Pinner Primary School	**Contact:** **Mob:** **Email:**	Nick Waldron 07734 966315 nwaldron@pinnerpark.harrow.sch.uk
School Site Supervisor	Pinner Primary School	**Contact:** **Mob:**	Kenny Gregori 07964 392087
Architect	Edge Property Solutions	**Contact:** **Mob:** **Email:**	Joseph Matthews 07990 039 294 joseph.matthews@edgeps.co.uk
Quantity Surveyor	Edge Property Solutions	**Contact:** **Mob:** **Email:**	Luke Gascoigne 07425 308 821 luke.gascoigne@edgeps.co.uk
Electrical Engineer	DGA Consulting Engineers	**Contact:** **Tel:** **Email:**	David Guzzetta 01530 264 166 Dguzzetta@dgace.co.uk

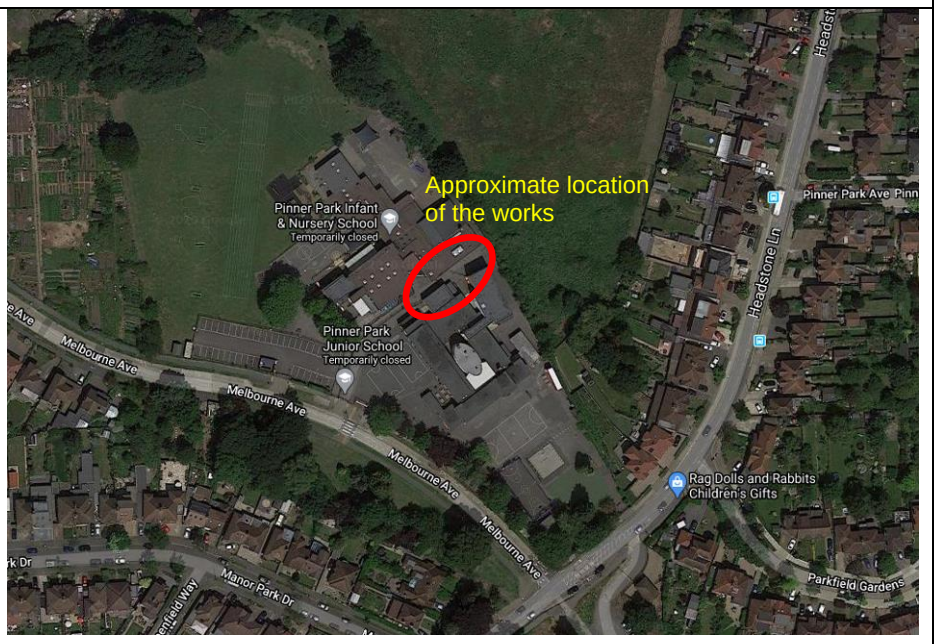
1.3 Key Participants

Mechanical Engineer	DGA Consulting Engineers	**Contact:** **Tel:** **Email:**	Jon Hall 01530 264 166 jhall@dgace.co.uk
Structural Engineer	Dice Consulting Engineers Ltd	**Contact:** **Mob:** **Email:**	Raj Somal 07714 252955 Raj.somal@diceconsult.co.uk
Principal Designer	WSP Safety Ltd	**Contact:** **Mob:** **Email:**	Jim Durney 07968 004129 Jim.durney@wsp-safety.co.uk

1.4 Project information

Project Description	Extension to the school's main entrance together with the forming of external covered link buildings between the formerly separate Junior and Infants' School buildings. There are also some internal knock on alterations.					
Description of work activities:	Reference should be made to tender documentation in conjunction with the proposed drawings and scope of works.					
Programme:	**Start Date:**	27/07/2020	**Practical Completion Date:**	18/12/2020	**Duration (Weeks):**	20 weeks
Phasing details:	The site set up, internal alteration works and sub-structural works are all proposed to occur during the school's summer holidays.					
Working Times:	Specific limitations: The site working hours are to be as per the Preliminaries document. Works carried out outside of the normal working hours should be approved in writing by the Employer prior to commencement of works.					

1.5 Site Location

Site Address	Melbourne Avenue, Pinner, Middlesex, HA5 5TL
Site Location	 The school is located on the corner of Melbourne Avenue and Headstone Lane. The main pedestrian and vehicular entrances are on Melbourne Avenue. There is a secondary access off Headstone Lane, which is the proposed Contractor access route. For the precise details of the site demise, please refer to Edge drawing package.

1.6 F10 Notification

Notification to HSE:	TBC	**Initial F10 Reference:**	TBC	**Date of Issue:**	TBC
	F10 will be submitted once the Principal Contractor is appointed.				
HSE Office:	151 Buckingham Palace Road London SW1W 9SZ				

1.7 Existing Record Information

Existing H&S File information:	The school's site supervisor was not aware of any formal Health and Safety File was known to be available for the buildings affected by these works. There was however a lever arch folder that contained information related to the reception and entrance refurbishment works undertaken by Kier Construction in 2008. This folder contained drawings prepared by Frankham Consultancy Group Ltd of Sidcup together with meeting minutes and other notes. Whilst the original junior school probably dates from the 1930s, the substantial 2 storey extension which from checking the Google Street View image history, was constructed during 2015. Under CDM 2007 and CDM 2015, there should be Health and Safety File information available for both the entrance works and the junior school extension.

1.7 Existing Record Information

Asbestos Report / Register	The school has an Asbestos Reinspection report by WYG Environment dated 25th March 2020, which is available from the site supervisor. Project-specific Refurbishment & Demolition Asbestos Survey by Survey Hub ref PMRS2440 was undertaken on 22nd May 2020. The only type of asbestos found was Chrysotile textured coating to ceilings in various locations. See section 4 of the asbestos report.
Existing Drawings	Reference should be made to tender documentation in conjunction with the proposed drawings and scope of works.

1.8 Client Commission Surveys and Investigations

The Client has commissioned the following surveys and site investigations – Cross reference to the ITT Package for schedule of documents

Title	Provided by
Underground services survey	Super Hub
Electrical Survey	David Guzzetta Associates
Mechanical Survey	David Guzzetta Associates
Site investigation report	Ivy House
Structural survey	Dice

1.9 Site Constraint Plans

The site constraints pertinent to this project have been captured on the Edge drawings issued within the tender package.

The general intention is for construction traffic to enter from Headstone Lane. The access route is to be hoarded off from the school grounds so that a fully segregated route can be maintained between the construction activities and the school site.

1.10 Project Design Proposals

This document has been prepared with reference to the following design proposals incorporated within the tender package: -

Title	Provided by	Date
Architectural	Edge Property Solutions	Refer to ITT
Structural and civil engineering	Dice Consulting	Refer to ITT
M&E Services	David Guzzetta Associates	Refer to ITT

2.0 CLIENTS CONSIDERATIONS AND ASSUMPTIONS

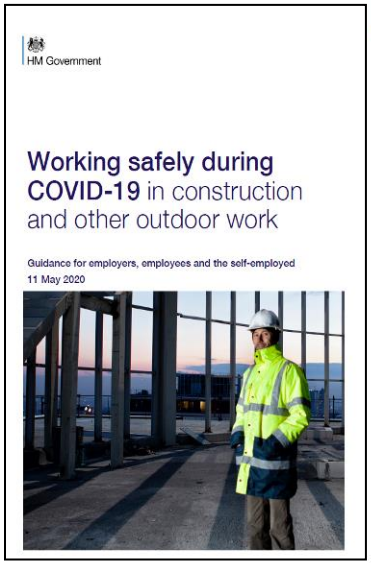
2.1 Client's Requirements

Clients Health and Safety Goals	Harrow Borough Council is committed to the provision of a safe, secure and high-quality learning, living and leisure environment that meets the needs and expectations of a diverse range of students, staff and customers and has similar expectations for Contractors working on its site.
Clients Site Rules	The Principal Contractor shall ensure that all operatives and visitors to the site are given a site-specific induction in accordance with the CDM Regulation 13(4), paying particular attention to potential risks and associated control measures pertinent to the project. The induction shall also include reference to any Client site rules and any conditions required by Harrow Borough Council. These must be crossed referenced by the Principal Contractor as documents may be required, if working outside the boundary of the site. Principal Contractor shall retain accurate records of all inductions within the Construction Phase Plan. Note – Site inductions must also be provided to site visitors working on behalf of the client who may not be familiar with hazards associated with construction sites. All such visitors must receive an induction proportionate to the nature of their visit and may require escorting whist on site.
Third Party Project Registration Schemes	The Client may require the Principal Contractor to register the Project and meet the standards defined in the following third-party project schemes such as: • Considerate Constructors' Scheme. • Constructing Better Health Scheme.

2.2 Coronavirus (Covid -19) Considerations

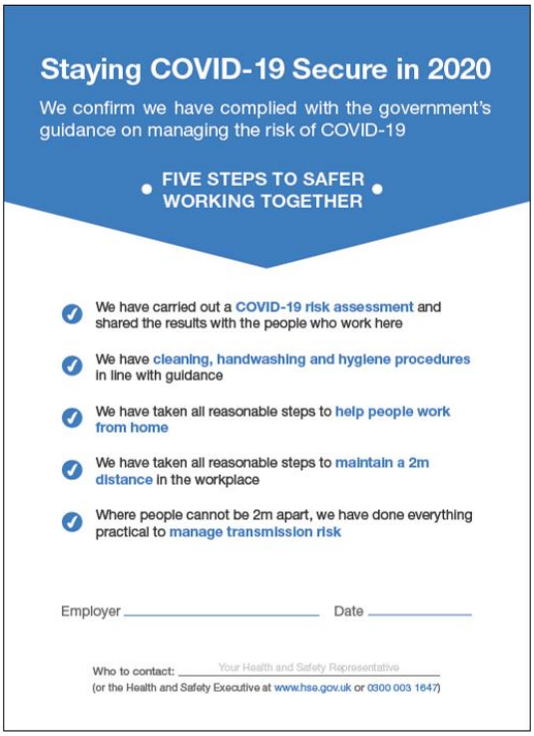
Site Precautions and Procedures

In light of the COVID-19 pandemic and the likely restrictions that will need to be maintained after lockdown measures are eased, the Client and Principal Contractor must consider how the risk of infection is to be eliminated or reduced insofar as is reasonably practicable.


HM Government

Working safely during COVID-19 in construction and other outdoor work

Guidance for employers, employees and the self-employed
11 May 2020


Staying COVID-19 Secure in 2020

We confirm we have complied with the government's guidance on managing the risk of COVID-19

FIVE STEPS TO SAFER WORKING TOGETHER

- We have carried out a COVID-19 risk assessment and shared the results with the people who work here
- We have cleaning, handwashing and hygiene procedures in line with guidance
- We have taken all reasonable steps to help people work from home
- We have taken all reasonable steps to maintain a 2m distance in the workplace
- Where people cannot be 2m apart, we have done everything practical to manage transmission risk

Employer _____ Date _____

Who to contact: Your Health and Safety Representative
(or the Health and Safety Executive at www.hse.gov.uk or 0300 003 1647)

See **Appendix I** for the HM Government's guidance **"Working safely during COVID-19 in construction and other outdoor work"** dated 11th May 2020 (this is the most up to date guidance at the time of preparing this document. The Principal Contractor must check for any updates subsequently issued).

The social distancing and increased hygiene measures will have a significant impact on the planning for this project, its programming, the work methodologies to be used, welfare facilities provision, parking, etc. These matters must be discussed between the Client and project team so that the implications and practicalities can be agreed. A written risk assessment must be prepared by the Principal Contractor and continually monitored and reviewed as the project proceeds. This risk assessment must also be discussed with the school so that they can coordinate their own risk assessment policies and procedures.

2.3 Planning & Management of Health and Safety

Planning and Management Health & Safety

The design for this project will continue to develop during the tender and construction period. The Principal Designer will be available to consult with Designers engaged by the Principal Contractor.

The Principal Contractor is required to ensure that contractors with design responsibilities under their control meet their responsibilities under the 2015 CDM Regulations and co-operate fully with the Client's established Design Team.

Communication Channels

All communications must be fed through the Contract Administrator. By agreement, the Principal Designer will develop specific channels to co-ordinate ongoing design matters relating to CDM compliance for all parties with responsibilities.

2.3 Planning & Management of Health and Safety

Ongoing Liaison between Parties	On-site co-ordination between the Principal Contractor and the Principal Designer/ Client on matters concerning Health and Safety will be agreed and confirmed at the pre-start meeting and thereafter on a regular basis. The Principal Contractor is to further develop this Pre-Construction Information Document, in discussion with the Principal Designer as the Construction Phase Plan. Any significant design or construction changes which occur during the construction phase are to be brought to the Principal Designer's attention by the Principal Contractor, and the Construction Phase Plan developed accordingly. The Principal Contractor is to establish regular liaison procedures with the Client's nominated representative on site, to ensure they are fully aware of how the construction work is likely to impact on access arrangements in the area.
Development of Construction Phase Plans	The Principal Contractor will be responsible for the continual development and monitoring of the Construction Phase Plan throughout the duration of the project. The Principal Designer and Client's Representative will require access to view and observe the development of the Construction Phase Plan.
Works Involving the Client Own Contractors	The Principal Contractor is to allow for the Client to carry out their Client Direct Works (ICT, AV, specialised equipment, etc.) to the relevant area. This is to be agreed between all parties. The Principal Contractor must manage Client directs and provide early access before Practical Completion to facilitate the direct contractors in undertaking their scope of works. While the direct contractors are employed by the Client, they must undergo a site induction given by the Principal Contractor, follow the site rules, including Covid 19 hygiene rules, the wearing of the required PPE, etc.

2.4 Surrounding Land Uses and Constraints

Location	 The school site is located on the corner of Melbourne Avenue and Headstone Lane. The main pedestrian and vehicular entrances for the school are on Melbourne Avenue.

2.4 Surrounding Land Uses and Constraints

There is a secondary access off Headstone Lane, at the south-eastern corner of the school site, which is the proposed Contractor access route.

For the precise details of the site demise refer to the Edge drawing pack

Operating Status of Site

The school will remain fully operational during the school term times. See 2.6 for school times and term dates. Note that these times and dates could be subject to review in order to regain teaching time lost due to the Covid-19 Lockdown. The Principal Contractor must liaise with the School in this regard and plan for the safe management of such eventualities.

Local Environmental Constraints:

There are residential properties on Melbourne Lane, albeit not directly opposite or adjacent to the school. There appear to horticultural allotments immediately to the west of the school playing field. The land immediately to the north and north-east of the school boundary appears to be a large expanse of fallow ground. There are a pair of detached houses next to the Headstone Lane entrance whose rear gardens extend back to almost in line with south-eastern elevation of the upper school. Where at all possible Contractor parking should be confined to the allocated location on the site. Should Contractors need to use nearby streets for parking they should do so in accordance to the Highway Code and not cause annoyance to residents or businesses.
There are double yellow lines on Headstone Lane in the vicinity of the junction with Melbourne Avenue and daytime parking restrictions further along Headstone Lane.

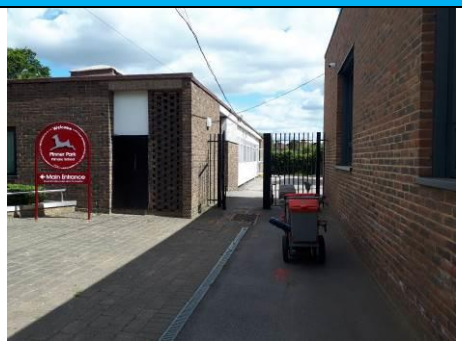
Regarding local restrictions, account must be taken of the bollards and kerbs enforcing a width restriction of 2.0m (6'-6") on Headstone Lane near the junction with Melbourne Avenue. Therefore, larger vehicles attending site must be instructed to approach site along Headstone Lane from the north, avoiding the width restriction.

2.4 Surrounding Land Uses and Constraints	
Shared occupation access required by others	Other than the pupils and the school staff, no other persons have right of way on to the school site.

2.5 Surrounding Public Roads, Footpaths and Constraints	
Location of highways / traffic levels	 Melbourne Avenue is used by parents and pupils for accessing the school site. It also gives access to the school staff car park. This road and the neighbouring streets are busy at school dropping off and collection times with cars, cyclists and pedestrians. In addition, the Contractor must consider the end and start of Nursery sessions in the middle of the day. The Principal Contractor must time his deliveries and other site vehicular movements to avoid these busy times. Where at all possible Melbourne Avenue must not be used by construction traffic. Headstone Lane is predominantly residential and is a far busier road than Melbourne Avenue. Headstone Lane runs approximately north-south between Uxbridge Road and George V Avenue (A404). The Principal Contractor will be required to submit a comprehensive traffic management plan for the works, that details any construction and non-construction related activities.
Footpaths	There are several public footpaths in the immediate vacinity of the site, which will remain in use to the public. These will be particularly busy at the start and finish of the school day with parents and children. The Principal Contractor must avoid all vehicular movements during this time.
Right of Way	There are no known rights of way on this school site.
Shared Delivery/ Access areas	Access to the construction site will be via the gateway on Headstone Lane at the south-eastern end of the school site.

2.6 Operational Activity Considerations	
School times and term dates	According to the Pinner Park Primary website, the School Day timings are as follows: **Nursery** Morning session: 8.50am – 11.50am Afternoon session: 12.20pm – 3.20pm **Reception and Key Stage 1 (Year 1 and Year 2)** School Day: 8.50am – 3.20pm Lunch: 12.00pm – 1.15pm **Key Stage 2 (Years 3 - 6)** School Day: 8.55am – 3.25pm (with a 'soft start' from 8.45am) Lunch (Years 4 and 5): 12.00pm – 1.05pm Lunch (Years 3 and 6): 12.30pm – 1.35pm According to term time information on display in the school's reception, Autumn term 2020 dates are as follows: • Friday 4th September – Thursday 22nd November • Monday 2nd November – Friday 18th December. Autumn term 2020 in-service training days for teachers: • Wednesday 2 September 2020 • Thursday 3 September 2020 • Friday 23 October 2020 Note that the school will have staff present in the hours before and after teaching times. In addition, there will likely be breakfast, after-school clubs, etc that result in children being present in the school environment outside the core teaching hours. These are the class times and term dates known at the time of preparing this document. **However, due to the impact of the Covid-19 lockdown on the children's education, these times and dates could be subject to charge in order to facilitate more classes, potentially longer school opening times to allow for socially distanced teaching of multiple reduced class sizes, catching up on lost teaching time during the summer holiday, etc. Should HM Government/ Harrow Borough Council propose to implement such changes, the implications for the safety and security of the site and programming of the work must be reviewed by the Principal Contractor and project team.**
School Security	It is essential that the school property always remains secure to protect children and staff from construction activities and to prevent any unauthorised person from entering the school grounds. Site boundaries must be robust and be continually checked for gaps or weaknesses. **The Principal Contractor must liaise with the School to ascertain the level of security/ DBS checks that are required for individuals to work in a school environment.**
Works beyond the boundaries of the site - permits	The Principal Contractor will be required to obtain and comply with the School's Permit to Work scheme for all designated high-risk activities, which are undertaken within the school site. In relation to this project it is anticipated that the following Permits to Work shall be used to control the following higher risk activities: - • Excavations • Hot works • Works on live electrical systems • Out of Hours working • Work on Water Systems

2.7 Operational Arrangements

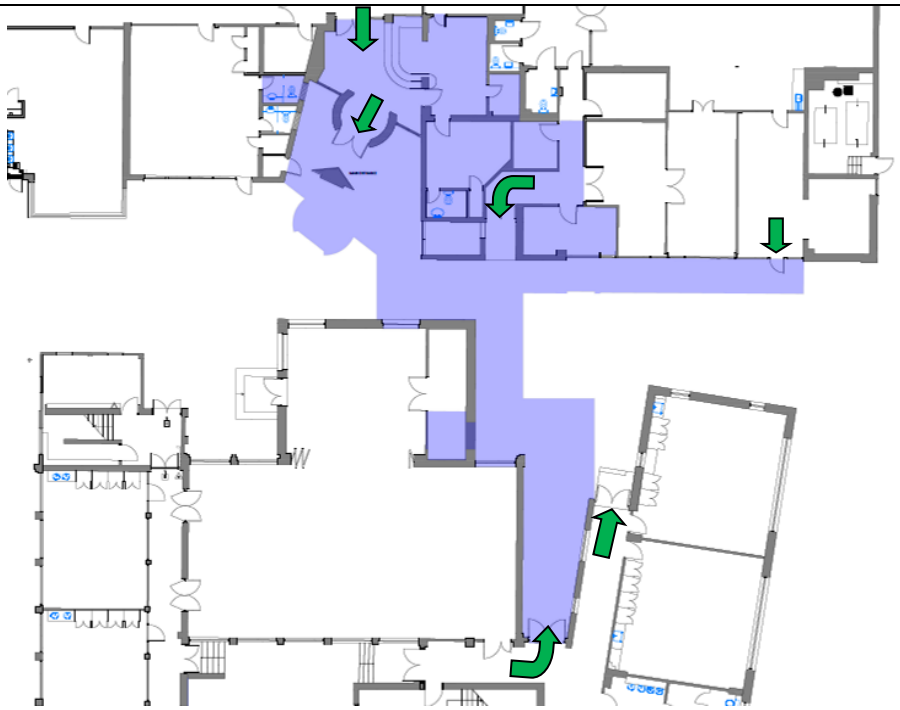
Cranage & large items of plant	 Use of large items of plant and cranes/ Hiabs must take into consideration the overhead lines in the vicinity of the school's main entrance.

2.8 Existing Services Across Site

Existing Services:	 The Principal Contractor must undertake their own investigations to fully ascertain the location and nature of all site's services. Prior to any excavations, the Principal Contractor must undertake CAT scans, trial hole investigations, etc. Refer to David Guzzetta Associates and Superhub information for survey information on existing services. The Principal Contractor should also liaise with the school's site supervisor Mr Kenny Gregori.
Electricity:	A suitable temporary electric supply will be required for the site works and the welfare facilities. All temporary electrics must only be installed be trained and competent contractors, with the appropriate skills, knowledge and experience to undertake such tasks. Commissioning certificates must be retained on site for the duration of the project.
Water	The Principal Contractor must undertake further investigation to ascertain the location and nature of any water services. Water must be provided on site for site operations and welfare arrangements.
Fire Alarm:	The Principal Contractor shall liaise with the school to coordinate any localised temporary fire alarm isolation so as not to impede the fire alarm and detection cover in the school. Consideration should be given to timing any isolations out of hours.
Gas	The Principal Contractor must undertake their own ground investigation to ascertain the location and nature of any buried services. Reference must made to the available services surveys.

2.9 Hazards Within Land	
Hazardous Items within Land	The Principal Contractor must undertake their own due diligence checks on the areas of works, to ascertain if hazardous substances are present in the ground. Reference should be made to the site investigation report prepared by Ivy House.
Asbestos	Refer to the Refurbishment & Demolition Survey prepared by Survey Hub. The Principal Contractor must remain vigilant for any asbestos containing materials. Operatives undertaking intrusive work to the existing building structure and fabric should have up to date asbestos awareness training. The Principal Contractor must have robust procedures in place for discovery asbestos containing materials.
Wood Wool slabs	It was noted from the asbestos survey that the lower school flat roof has Wood Wool slabs or similar bonded fibrous decking board material as part of its roof construction. This material is classified as a deleterious material in that bonding can deteriorate during prolonged exposure to moisture (e.g. a roof leak) resulting in weakening or failure of the slabs. Therefore, as part of the planning for safe systems of work on the roof, an assessment must be made of the integrity of the roof decking along the access routes and work areas.

2.10 Fire Precautions	
Fire Strategy for Existing Buildings	The Principal Contractor must liaise with the school's designated fire manager to review existing and proposed fire strategies for both existing premises and the construction site. Consideration for the safe location of fire assembly points. Where possible, these must be kept away from construction activities. Any agreed fire strategy for the school must not be compromised in any way by the works and access for emergency services must always be maintained.
Fire Strategy	The Principal Contractor must ensure a suitable and sufficient Construction Phase Fire Risk Assessment is undertaken for the works. This must be undertaken in conjunction with the school's own fire risk assessment so that the procedures to be implemented are coordinated. This should be updated as the project progress and reflect current site conditions.
Location of Fire Exits:	Refer to the building's fire escape strategy drawings.

Will any fire exits be affected by the work?	 Several fire exits will be affected by the works including the fire exit from the kitchen, the double door exit next to the Assistant Headteacher's office, the main entrance and the double door exit from the upper school building. See indicative green arrows above and blue shading indicating the footprint of the proposed works. The temporary loss of these of these exits during the works must be reviewed as part of the fire risk assessment process and suitable alternative measures put in place for the interim.
Assembly Point:	The Principal Contractor must agree a fire assembly point with the school prior to the start of the project so that emergency procedures can be coordinated. Details are to be given to contractors and visitors at the site induction stage.
Construction Phase Fire Risk Assessment	The Principal Contractor is to ensure that a suitable Construction Phase Fire Risk Assessment & Evacuation Strategy is undertaken and updated throughout the project, with a copy kept on site for the duration of the works. This risk assessment must be coordinated with the school's own fire risk assessment. The Principal Contractor must familiarise themselves with fire precaution and escape arrangements and ensure site operatives made aware of what to do in an emergency. A coordinated Fire Evacuation and Emergency Action Plan is to be developed, maintained and updated throughout the contract. The Principal Contractor will be required to comply with the Loss Prevention Council Joint Code of Practice for "Fire Prevention on Construction Sites" and adopt the best practice defined in HSG 168 "Fire Safety in Construction Work" The Plan should include as a minimum: - • Method of raising alarm • Temporary signage locations • Provisions of temporary fire alarm and relay to Client's system • Fire escape routes • Provision for firefighting equipment • Fire assembly points Combustible rubbish, packings, wrappings, etc. should be removed from site regularly and not allowed to build up. Skips should be kept at least 6m away from any school building.

2.11 Site Demise & Protection	
Site Security	The Principal Contractor shall take all reasonable steps to prevent unauthorised access on to the construction site, including the provision of a 2.4m high hoarding, together with appropriate warning signage and lighting. The Principal Contractor will need to pay particular attention to site security, providing appropriate monitoring and guarding for the duration of the project. The Principal Contractor shall keep accurate records of all operatives and visitors who attend site and record activities in a site logbook. Site operatives will be required to wear a clearly distinguishable identity card/ badge, displaying the individual operative's details.
Site Boundaries and Hoardings	The Principal Contractor will be responsible for the design, construction and maintenance of site hoardings for the duration of the project Consideration needs to be given to the incorporation of access gates and the segregation of pedestrians and traffic, particularly at the junction with Headstone Lane.

3.0 Environmental Restrictions	
Boundaries and Access Restrictions	Refer to the Edge tender drawings for the site constraints. The Principal Contractor will be required to liaise with the client's representatives to develop and manage arrangements to respect, protect and safely maintain access around the development, in consideration of the imposed site constraints
Site Restrictions and Protection of Existing Buildings	 The site is located adjacent to and within the school facilities and infrastructure which will continue to operate from September the remainder of the works. The Principal Contractor will need to be take all necessary measures to protect the adjacent existing building and those persons working within the building for the duration of the contract. The Principal Contractor will be required to liaise with the client's representatives to develop and manage arrangements to protect and safely maintain access around the development, in consideration of the imposed site constraints
Vehicular Access to Site	Access onto Site will be made off Headstone Lane. The Principal Contractor shall adopt best practice set out in HSE Guidance publications: - • HSG 144 – The Safe Use of Vehicles on construction site • HSG 151 – Protecting the Public, Your Move The Principal Contractor must time his deliveries and other site vehicular movements to avoid these busy times. Where at all possible Melbourne Avenue must not be used by construction traffic.
Parking for vehicles attending site	Parking for vehicles attending site will only be permitted within the defined area on the site for parking. Should some Contractors need to use nearby streets for parking they should do so in accordance to the Highway Code and not cause annoyance to residents or businesses.
Delivery and Distribution of Materials	The Principal Contractor will need to fully assess the local access restrictions imposed by the site constraints, the school's ongoing activities and the local environmental considerations in relation to the proximity of the works to occupied buildings. The Principal Contractor will be responsible for communicating access restrictions to suppliers prior to attending site and for coordinating deliveries to minimise traffic congestion.

Site Compound and welfare facilities	The Principal Contractor shall establish appropriate site welfare facilities within the site compound. The Principal Contractor will need to consider and ensure: - 1. Welfare facilities to be proportionate to cover the requirement, as set out in the latest version of the Government Guidance regarding hygiene and social distancing. 2. The compound shall be securely established with appropriate fencing to protect unauthorised access. 3. Providing adequate protection to existing hard and soft landscaping features. 4. Ensure operatives use their temporary welfare facilities and not the toilet facilities within the school. 5. Restrict smoking to specific areas agreed with the Client. 6. Ensuring operatives follow the school site rules particularly those concerning conduct.
Temporary hoardings and protection	The Principal Contractor will be responsible for the design, erection and maintenance appropriate temporary hoardings, fencing, barrier and following controlled Temporary Work Procedures. Hoardings shall meet the standards defined in HSG – 151 Protecting the Public. In addition, consideration will need to be given to ensuring the adjacent public footpaths are accessibility compliant regarding obstructions, signage and have appropriate levels of temporary lighting. Suitable arrangements will also need to be put in place to protect any works beyond the site, the Principal Contractor shall provide suitable barriers and fencing to secure the working areas.
Environmental considerations within existing buildings	The Principal Contractor will need to be considerate of the school and neighbours, taking measures to restrict, control and manage operations that generate noise, dust and vibration. Breaking out and use of heavy plant, which will generate excessive noise, dust and vibration shall be programmed to minimise disruption to the users of the building. In certain circumstances and by agreement, permission will be given for works to be undertaken out of hours and over weekends, in such circumstances the Principal Contractor will need to secure the necessary permits from the school.
Works outside the defined site demise	The Principal Contractor shall provide all necessary fencing, signage and lighting to protect any isolated works necessary that are outside of the defined site demise to accommodate installation of new service infrastructure. The Principal Contractor will be expected to comply with the requirements and best practice set out in: - • Safety on Street Works and Road Works – Code of Practice 2013 • HSG Publication HSG-151 Protecting the Public
Location of existing services	Refer to surveys and drawings contained within the Tender Package. The Principal Contractor must carry out all necessary enquiries and site investigations to verify the presence, nature and condition of all services where relevant to the works. Any alterations or temporary disconnections to existing services will be subject to advanced agreement with the school.
Existing underground services and infrastructure	Refer to the site investigation, surveys and associated drawings contained within the Tender Package. Carry out all additional site investigations to locate and mark services following HSE guidance HSG-47 -Avoiding Danger from Buried Underground Services. See **Appendix II**

4.0 SIGNIFICANT DESIGN AND CONSTRUCTION HAZARDS

4.1 Co-ordination of Design Work

It is recognised that the design will continue to be developed prior to works commencing on site. The Principal Designer will be available to consult with all duty holders undertaking the role of Designers.

Arrangements for ongoing co-ordination between the Principal Contractor and the Principal Designer/Client on matters concerning design risk management and Health and Safety, will be agreed and confirmed at the pre-start meeting and thereafter on a regular basis.

The Principal Contractor is to further develop information detailed in the Pre-Construction Information Document to produce a project specific Construction Phase Plan. The Principal Designer will be available to assist in providing relevant information.

Any significant design or construction changes which occur during the construction phase are to be brought to the Principal Designer's attention by the Principal Contractor, and the Construction Phase Plan developed accordingly.

4.2 Significant Hazards and Risks

The Principal Designer in conjunction with the design team have undertaken high level hazards and risk identification exercise and has identified the following significant hazards associated with the project. Designers' Risk Assessments have also been attached within **Appendix III.**

Ref	Significant Risk	Mitigation / Control Measure
1	Protection of the Public Security	• Provide secure 2.4m high hoarding, incorporating access gate around the perimeter of the site • Put in place arrangements to monitor out of hours site security and respond to incidents • All plant and equipment to be rendered safe, isolated and stored in a secure compound when not in use. • Any scaffold ladders to be removed out of hours and alarms fitted where applicable.
2	Traffic Routes, moving vehicles Deliveries & Removal of Rubbish	• A Traffic Management Plan to be prepared covering delivery routes, use of banksmen and risks from pedestrian areas and vehicles being manoeuvred and parked. • All deliveries / removals to be planned to avoid backlogs and peak commuting times. • Generally, be aware of vehicle movements around the site. • One-way system to be established where possible. Possible partial road / footpath closure.
3	Working at Height	• Scaffolding to only be erected, altered and dismantled by CISRS trained and authorised contractors. • Use suitable working platforms, (MEWPs, Towers Podiums). Restrict use of steps to short term, inspection type works. • Use permit to work system for high level working, including roof works where sufficient edge protection is not available. Consideration must also be given to the loadbearing qualities and integrity of the roof construction
4	Excavations	• Principal Contractor to collect all known information for the site and undertake suitable ground surveys to identify services entering the site. • Suitable sub scans to be undertaken, using a calibrated Cat and Genny. • All excavation to be battered back where possible. • Exclusion zones to be established around all excavations. • Potential confined space working during installation of sub-

		ground infrastructure and breaking into existing sewers.
5	Working around existing live services	• Principal Contractor to conduct a survey of existing ground services prior to works commencing. • Ensure that services are found and isolated prior to any excavations being undertaken. • Any installed services to be commissioned by trained and competent contractors only.
6	Fire	• Principal Contractor to undertake suitable and sufficient Construction Phase Fire Risk assessment • Operate Hot Work permit system. • Remove combustible waste on regular basis • Ensure suitable fire provisions are provided • Maintain fire escape routes. • Do not compromise the school's fire strategy
8	Noise, Dust and Vibration	• Noisy works restricted to daytime hours only. • Principal Contractor to monitor noisy activities and measures implemented where noise exceeds thresholds. • Vibration levels to be documented and monitored, with measures put into place to prevent over exposure. • Dust to be kept to a minimum. Dry sweeping to be replaced dust extraction systems. • On tool extraction systems to be fitted with M or H class filters. FFP3 dust masks to be used in conjunction with face fit certificates. • Dry cutting to be avoided where possible, water suppression to be used. Transfer of mud and debris on to the public highways to be monitored and mitigation measure put in place.
9	Encountering asbestos materials	• Undertake refurbishment and demolition asbestos survey based on the scope of works. • Communicate the findings of the report to workers as part of their site safety induction. • All operatives undertaking intrusive works must have up to date asbestos awareness training. • Intrusive work must be undertaken with caution. Should any suspicious materials be encountered, that area of work must stop and be sealed off. Contractor must follow asbestos emergency process and contact the project team and asbestos consultant to establish whether or not ACMs have been encountered and what steps are required to proceed safely.
10	Transfer of materials and waste to and from Work area- Manual handling	• Due consideration given to manual handling and types of plant that can access the site. • Mechanical means to be used where possible. • Batch sizes to be considered at the design stage. • Team handling
11	Children in the area	• All areas, including plant, storage and facilities must remain secure, especially out of working hours. • Provide appropriate warning signage
12	Coronavirus (Covid 19)	• The Principal Contractor must ensure that any works undertaken during the Coronavirus (Covid-19) pandemic, they are protecting their workforce, students, university staff and the general public and minimising the risk of spread of infection. • The Principal Contractor must comply with the latest Government advice on Coronavirus (Covid-19) at all times.

5.0	CONSTRUCTION PHASE PLAN
General	The information contained in this document is to be incorporated into the Principal Contractor's Construction Phase Plan (CPP). The document shall be propionate to the scope of works and meet the requirements out in the Construction (Design and Management) Regulations 2015.
Date required	10 working days prior to the intended start on site.
Approval to start	Works cannot commence on site until the Principal Designer has confirmed to the Client and appointed project Manager that the CPP has been adequately developed.
Responsible person on site	The CPP shall include the name and contact details for the appointed person responsible for managing the site and discharging the duties as Principal Contractor.
Monitoring of Health and Safety Arrangements	The CPP shall provide clear guidance as to the arrangements to monitor their performance in effectively managing H&S aspects of the project. Meeting the defined terms set out in the Employers Requirements Document.
Location for holding CPP	Clear guidance shall be provided as to where this document will be stored on site.

6.0	HEALTH & SAFETY FILE INFORMATION
Content	The Principal Contractor must refer to ITT Package Preliminaries for the format and content of Building Manuals and H & S File. It will be the responsibility of the Principal Contractor to obtain, collate and assemble all information to produce the H&S File and associated handover documents as identified in the project preliminaries. The exact nature and structure of the File shall be agreed between the Principal Contractor and the Principal Designer during the development of the project.
Time scales for Delivery	A draft Handover Package is to be produced by the Principal Contractor and must be completed no later than 3 weeks before Practical Completion date and submitted to the Employers Agent and Principal Designer for comment. The completed Handover Package including the H&S File and O&M manuals shall be available in electronic version at Practical Completion.
Format of the Handover Package	Two hard copies and one electronic copy of the Handover Package is required. The format and contents of the documents will follow the guidance set out in the project preliminaries.

Appendices Index

Appendix I: **HM Government's guidance "Working safely during COVID-19 in construction and other outdoor work" dated 11th May 2020**

Appendix II: **HSE guidance HSG-47 -Avoiding Danger from Buried Underground Services.**

Appendix III: **Designers' Risk Assessments**

- **Edge Property Solutions**
- **DGA Consulting Engineers**
- **Dice Consulting Engineers Ltd**

Appendix I:

HM Government's guidance
"Working safely during COVID-19 in construction and other outdoor work" dated 11th May 2020

HM Government

Working safely during COVID-19 in construction and other outdoor work

Guidance for employers, employees and the self-employed

11 May 2020

HM Government

Introduction

This document is to help employers, employees and the self-employed in the UK understand how to work safely during the COVID-19 pandemic, keeping as many people as possible 2 metres apart from those they do not live with. We hope it gives you freedom within a practical framework to think about what you need to do to continue, or restart, operations during the COVID-19 pandemic. We understand how important it is to work safely and support your workers' health and wellbeing during the COVID-19 pandemic. The government is clear that workers should not be forced into an unsafe workplace.

This document has been prepared by the Department for Business, Energy and Industrial Strategy (BEIS) with input from firms, unions, industry bodies and the devolved administrations in Wales, Scotland and Northern Ireland, and in consultation with Public Health England (PHE) and the Health and Safety Executive (HSE).

Public health is devolved in Northern Ireland, Scotland and Wales; this guidance should be considered alongside local public health and safety requirements and legislation in Northern Ireland, Scotland and Wales. For advice to businesses in other parts of the UK please see guidance set by the Northern Ireland Executive, the Scottish Government, and the Welsh Government.

We expect that this document will be updated over time. This version is up to date as of 11 May 2020. You can check for updates at www.gov.uk/workingsafely. If you have any feedback for us, please email workingsafely@beis.gov.uk.

This document is one of a set of documents about how to work safely in different types of workplace. This one is designed to be relevant for people who work in or run outdoor working environments.

How to use this guidance

This document sets out guidance on how to work safely. It gives practical considerations of how this can be applied in the workplace.

Each business will need to translate this into the specific actions it needs to take, depending on the nature of their business, including the size and type of business, how it is organised, operated, managed and regulated.

This guidance does not supersede any legal obligations relating to health and safety, employment or equalities and it is important that as a business or an employer you continue to comply with your existing obligations, including those relating to individuals with protected characteristics. It contains non-statutory guidance to take into account when complying with these existing obligations. When considering how to apply this guidance, take into account agency workers, contractors and other people, as well as your employees.

To help you decide which actions to take, you need to carry out an appropriate COVID-19 risk assessment, just as you would for other health and safety related hazards. This risk assessment must be done in consultation with unions or workers.

What do we mean by 'construction and other outdoor work'?

Working outdoors includes many people in construction, energy and utilities, farming and agriculture (including seasonal labour), forestry, waste management, other infrastructure, railway services and street and highway services.

HM Government

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HM Government

1. Thinking about risk

Objective: That all employers carry out a COVID-19 risk assessment.

Everyone needs to assess and manage the risks of COVID-19. As an employer, you also have a legal responsibility to protect workers and others from risk to their health and safety. This means you need to think about the risks they face and do everything reasonably practicable to minimise them, recognising you cannot completely eliminate the risk of COVID-19.

You must make sure that the risk assessment for your business addresses the risks of COVID-19, using this guidance to inform your decisions and control measures. A risk assessment is not about creating huge amounts of paperwork, but rather about identifying sensible measures to control the risks in your workplace. If you have fewer than five workers, or are self-employed, you don't have to write anything down as part of your risk assessment. Your risk assessment will help you decide whether you have done everything you need to. There are interactive tools available to support you from the Health and Safety Executive (HSE) at https://www.hse.gov.uk/risk/assessment.htm.

Employers have a duty to consult their people on health and safety. You can do this by listening and talking to them about the work and how you will manage risks from COVID-19. The people who do the work are often the best people to understand the risks in the workplace and will have a view on how to work safely. Involving them in making decisions shows that you take their health and safety seriously. You must consult with the health and safety representative selected by a recognised trade union or, if there isn't one, a representative chosen by workers. As an employer, you cannot decide who the representative will be.

At its most effective, full involvement of your workers creates a culture where relationships between employers and workers are based on collaboration, trust and joint problem solving. As is normal practice, workers should be involved in assessing workplace risks and the development and review of workplace health and safety policies in partnership with the employer.

Employers and workers should always come together to resolve issues. If concerns still cannot be resolved, see below for further steps you can take.

Where the enforcing authority, such as the HSE or your local authority, identifies employers who are not taking action to comply with the relevant public health legislation and guidance to control public health risks, they will consider taking a range of actions to improve control of workplace risks. For example, this would cover employers not taking appropriate action to socially distance, where possible. The actions the HSE can take include the provision of specific advice to employers through to issuing enforcement notices to help secure improvements.

How to raise a concern:

- Contact your employee representative.
- Contact your trade union if you have one.
- Use the HSE form available at https://www.hse.gov.uk/contact/concerns.htm
- Contact HSE by phone on 0300 003 1647.

HM Government

1.1 Managing risk

Objective: To reduce risk to the lowest reasonably practicable level by taking preventative measures, in order of priority.

Employers have a duty to reduce workplace risk to the lowest reasonably practicable level by taking preventative measures. Employers must work with any other employers or contractors sharing the workplace so that everybody's health and safety is protected. In the context of COVID-19 this means working through these steps in order:

- In every workplace, increasing the frequency of handwashing and surface cleaning.
- Businesses and workplaces should make every reasonable effort to enable working from home as a first option. Where working from home is not possible, workplaces should make every reasonable effort to comply with the social distancing guidelines set out by the government (keeping people 2m apart wherever possible).
- Where the social distancing guidelines cannot be followed in full, in relation to a particular activity, businesses should consider whether that activity needs to continue for the business to operate, and if so, take all the mitigating actions possible to reduce the risk of transmission between their staff.
- Further mitigating actions include:
  - Increasing the frequency of hand washing and surface cleaning.
  - Keeping the activity time involved as short as possible.
  - Using screens or barriers to separate people from each other.
  - Using back-to-back or side-to-side working (rather than face-to-face) whenever possible.
  - Reducing the number of people each person has contact with by using ‘fixed teams or partnering’ (so each person works with only a few others).
- Finally, if people must work face-to-face for a sustained period with more than a small group of fixed partners, then you will need to assess whether the activity can safely go ahead. No one is obliged to work in an unsafe work environment.
- In your assessment you should have particular regard to whether the people doing the work are especially vulnerable to COVID-19.

The recommendations in the rest of this document are ones you should consider as you go through this process. You could also consider any advice that has been produced specifically for your sector, for example by trade associations or trades unions.

If you have not already done so, you should carry out an assessment of the risks posed by COVID-19 in your workplace as soon as possible. If you are currently operating, you are likely to have gone through a lot of this thinking already. We recommend that you use this document to identify any further improvements you should make.

HM Government

1.2 Sharing the results of your risk assessment

You should share the results of your risk assessment with your workforce. If possible, you should consider publishing the results on your website (and we would expect all employers with over 50 workers to do so). Below you will find a notice you should display in your workplace to show you have followed this guidance.

Staying COVID-19 Secure in 2020

We confirm we have complied with the government's guidance on managing the risk of COVID-19

FIVE STEPS TO SAFER WORKING TOGETHER

- ✓ We have carried out a **COVID-19 risk assessment** and shared the results with the people who work here
- ✓ We have **cleaning, handwashing and hygiene procedures** in line with guidance
- ✓ We have taken all reasonable steps to **help people work from home**
- ✓ We have taken all reasonable steps to **maintain a 2m distance** in the workplace
- ✓ Where people cannot be 2m apart, we have done everything practical to **manage transmission risk**

Employer _____ Date _____

Who to contact: Your Health and Safety Representative
(or the Health and Safety Executive at www.hse.gov.uk or 0300 003 1647)

HM Government

2. Who should go to work

Objective:

That everyone should work from home, unless they cannot work from home.

Steps that will usually be needed:

- Consider who is needed on site, for example, support staff should work from home if at all possible.
- Planning for the minimum number of people needed to be on site to operate safely and effectively, for example, workers deemed necessary to carry out physical works, supervise work, or conduct work in order to operate safely.
- Monitoring the wellbeing of people who are working from home and helping them stay connected to those operating in an outdoor environment, especially if the majority of their colleagues are on-site.
- Keeping in touch with off-site workers on their working arrangements including their welfare, mental and physical health and personal security.
- Providing equipment for people to work from home safely and effectively, for example, remote access to work systems.

HM Government

2.1 Protecting people who are at higher risk

Objective: To protect clinically vulnerable and clinically extremely vulnerable individuals.

- Clinically extremely vulnerable individuals (see definition in Appendix) have been strongly advised not to work outside the home.
- Clinically vulnerable individuals, who are at higher risk of severe illness (for example, people with some pre-existing conditions, see definition in Appendix), have been asked to take extra care in observing social distancing and should be helped to work from home, either in their current role or in an alternative role.
- If clinically vulnerable (but not extremely clinically vulnerable) individuals cannot work from home, they should be offered the option of the safest available on-site roles, enabling them to stay 2m away from others. If they have to spend time within 2m of others, you should carefully assess whether this involves an acceptable level of risk. As for any workplace risk you must take into account specific duties to those with protected characteristics, including, for example, expectant mothers who are, as always, entitled to suspension on full pay if suitable roles cannot be found. Particular attention should also be paid to people who live with clinically extremely vulnerable individuals.

Steps that will usually be needed:

- [ ] Providing support for workers around mental health and wellbeing. This could include advice or telephone support.
- [ ] See current guidance for advice on who is in the clinically extremely vulnerable and clinically vulnerable groups.

2.2 People who need to self-isolate

Objective: To make sure individuals who are advised to stay at home under existing government guidance do not physically come to work. This includes individuals who have symptoms of COVID-19 as well as those who live in a household with someone who has symptoms.

Steps that will usually be needed:

- [ ] Enabling workers to work from home while self-isolating if appropriate.
- [ ] See current guidance for employees and employers relating to statutory sick pay due to COVID-19.
- [ ] See current guidance for people who have symptoms and those who live with others who have symptoms.

HM Government

2.3 Equality in the workplace

Objective: To treat everyone in your workplace equally.

- In applying this guidance, employers should be mindful of the particular needs of different groups of workers or individuals.
- It is breaking the law to discriminate, directly or indirectly, against anyone because of a protected characteristic such as age, sex or disability.
- Employers also have particular responsibilities towards disabled workers and those who are new or expectant mothers.

Steps that will usually be needed:

- [ ] Understanding and taking into account the particular circumstances of those with different protected characteristics.
- [ ] Involving and communicating appropriately with workers whose protected characteristics might either expose them to a different degree of risk, or might make any steps you are thinking about inappropriate or challenging for them.
- [ ] Considering whether you need to put in place any particular measures or adjustments to take account of your duties under the equalities legislation.
- [ ] Making reasonable adjustments to avoid disabled workers being put at a disadvantage, and assessing the health and safety risks for new or expectant mothers.
- [ ] Making sure that the steps you take do not have an unjustifiable negative impact on some groups compared to others, for example those with caring responsibilities or those with religious commitments.

HM Government

3. Social distancing at work

Objective:

To maintain 2m social distancing wherever possible, including while arriving at and departing from work, while in work and when travelling between sites.

- You must maintain social distancing in the workplace wherever possible.
- Where the social distancing guidelines cannot be followed in full in relation to a particular activity, businesses should consider whether that activity needs to continue for the business to operate, and, if so, take all the mitigating actions possible to reduce the risk of transmission between their staff. Mitigating actions include:
  - Further increasing the frequency of hand washing and surface cleaning.
  - Keeping the activity time involved as short as possible.
  - Using screens or barriers to separate people from each other.
  - Using back-to-back or side-to-side working (rather than face-to-face) whenever possible.
  - Reducing the number of people each person has contact with by using 'fixed teams or partnering' (so each person works with only a few others).
- Social distancing applies to all parts of a business, not just the place where people spend most of their time, but also entrances and exits, break rooms, canteens and similar settings. These are often the most challenging areas to maintain social distancing.

HM Government

3.1 Coming to work and leaving work

Objective: To maintain social distancing wherever possible, on arrival and departure and to ensure handwashing upon arrival.

Steps that will usually be needed:

- [ ] Staggering arrival and departure times at work to reduce crowding into and out of the workplace, taking account of the impact on those with protected characteristics.
- [ ] Providing additional parking or facilities such as bike-racks to help people walk, run, or cycle to work where possible.
- [ ] Limiting passengers in corporate vehicles, for example, work minibuses. This could include leaving seats empty.
- [ ] Reducing congestion, for example, by having more entry points to the workplace.
- [ ] Using markings and introducing one-way flow at entry and exit points.
- [ ] Providing handwashing facilities, or hand sanitiser where not possible, at entry and exit points.
- [ ] Providing alternatives to touch-based security devices such as keypads.
- [ ] Defining process alternatives for entry/exit points where appropriate, for example, deactivating pass readers at turnstiles in favour of showing a pass to security personnel at a distance.

HM Government

3.2 Moving around buildings and worksites

Objective: To maintain social distancing wherever possible, while people travel through the workplace.

Steps that will usually be needed:

- [ ] Reducing movement by discouraging non-essential trips within buildings and sites. For example, restricting access to some areas, encouraging use of telephones where permitted, and cleaning them between use.
- [ ] Reducing job rotation and equipment rotation, for example, single tasks for the day.
- [ ] Implementing one-way systems where possible on walkways around the workplace.
- [ ] Using signage such as ground markings or being creative with other objects to mark out 2m to allow controlled flows of people moving throughout the site.
- [ ] Reducing occupancy of vehicles used for onsite travel, for example, shuttle buses, and when needed, social distancing measures should be followed within the vehicles.
- [ ] Separating sites into working zones to keep different groups of workers physically separated as much as practical.
- [ ] Planning site access and ‘area of safety’ points to enable social distancing.
- [ ] Reducing the number of people in attendance at site inductions and consider holding them outdoors wherever possible with social distancing.
- [ ] Regulating use of high traffic areas including corridors, lifts, turnstiles and walkways to maintain social distancing.

HM Government

3.3 Making the main workplace safe for people who work statically

Objective: To maintain social distancing between people who work in one place.

- It is recognised that in outdoor workplaces it might be rare to have a fixed or static place of work. However, there may be some situations where this is the case.
- For people who work in one place, workstations should allow them to maintain social distancing wherever possible.
- Workstations should be assigned to an individual as much as possible. If they need to be shared, they should be shared by the smallest possible number of people.
- If it is not possible to keep workstations 2m apart then businesses should consider whether that activity needs to continue for the business to operate, and if so take all mitigating actions possible to reduce the risk of transmission.

Steps that will usually be needed:

- [ ] Changing layouts to allow people to work further apart from each other.
- [ ] Only where it is not possible to move workstations further apart, arranging people to work side by side or facing away from each other rather than face-to-face.
- [ ] Only where it is not possible to move workstations further apart, using screens to separate people from each other.
- [ ] Using a consistent pairing system if people have to work in close proximity, for example, during two-person working, lifting or maintenance activities that cannot be redesigned.

HM Government

3.4 Meetings

Social distancing during meetings outdoors

Objective: To reduce or eliminate transmission due to face-to-face meetings and maintain social distancing in meetings.

Steps that will usually be needed:

- [ ] Using remote working tools to avoid in-person meetings.
- [ ] Only absolutely necessary participants should attend meetings and should maintain 2m separation throughout.
- [ ] Avoiding transmission during meetings, for example, avoid sharing pens and or other objects.
- [ ] Providing hand sanitiser in meeting rooms.
- [ ] Holding meetings outdoors or in well-ventilated rooms whenever possible.
- [ ] For areas where regular meetings take place, use floor signage to help people maintain social distancing.

3.5 Common areas

Objective: To maintain social distancing while using common areas.

Steps that will usually be needed:

- [ ] Staggering break times to reduce pressure on break rooms or places to eat.
- [ ] Using safe outdoor areas for breaks.
- [ ] Creating additional space by using other parts of the workplace freed up by remote working.
- [ ] Reconfiguring seating and tables to maintain spacing and reduce face-to-face interactions.

HM Government

3.6 Accidents, security and other incidents

Objective: To prioritise safety during incidents.

In an emergency, for example, an accident, fire or break-in, people do not have to stay 2m apart if it would be unsafe.

People involved in the provision of assistance to others should pay particular attention to sanitation measures immediately afterwards including washing hands.

HM Government

4. Managing your customers, visitors and contractors

HM Government

4.1 Manage contacts

Objective: To minimise the number of unnecessary visits to the worksite.

Steps that will usually be needed:

- [ ] Where site visits are required, site guidance on social distancing and hygiene should be explained to visitors on or before arrival.
- [ ] Encouraging visits via remote connection/working where this is an option.
- [ ] Limiting the number of visitors at any one time.
- [ ] Determining if schedules for essential services and contractor visits can be revised to reduce interaction and overlap between people.
- [ ] Maintaining a record of all visitors, if this is practical.

Visitor signing in

HM Government

4.2 Providing and explaining available guidance

Objective: To make sure people understand what they need to do to maintain safety.

- Ensuring public notices are visible and help inform workers, customers, visitors, contractors and the public to maintain social distancing whilst near the workplace.
- There is a high likelihood in some areas that working outdoors will draw the attention of the public. Visible signage may be used to inform the public of the type of work that is being performed.

Steps that will usually be needed:

- [ ] Providing signage to inform the public on what work you are doing.
- [ ] Providing signage at entrances to the worksite to remind the public and workers to maintain social distancing.
- [ ] Providing signage on rights of way that cross your workplace to remind the public to maintain social distancing.
- [ ] Establishing host responsibilities relating to COVID-19 and providing any necessary training for people who act as hosts for visitors.

Uniform signage for workers to provide clear messaging

HM Government

5. Cleaning the workplace

5.1 Before reopening

Objective: To make sure that any site or location that has been closed or partially operated is clean and ready to restart, including:

- Conducting a risk assessment for all sites, or part of sites, that have been closed, before restarting work.
- Carrying out cleaning procedures and providing hand sanitiser, before restarting work.

HM Government

5.2 Keeping your workplace clean

Objective: To keep the workplace clean and prevent transmission by touching contaminated surfaces.

Steps that will usually be needed:

- [ ] Frequent cleaning of work areas and equipment between uses, using your usual cleaning products.
- [ ] Frequent cleaning of objects and surfaces that are touched regularly, such as buckets, site equipment and control panels, and making sure there are adequate disposal arrangements.
- [ ] Clearing workspaces and removing waste and belongings from the work area at the end of a shift.
- [ ] Sanitisation of all hand tools, controls, machinery and equipment after use.
- [ ] If you are cleaning after a known or suspected case of COVID-19 then you should refer to the specific guidance.

5.3 Hygiene – handwashing, sanitation facilities and toilets

Objective: To help everyone keep good hygiene through the working day.

Steps that will usually be needed:

- [ ] Providing additional handwashing facilities, for example, pop-ups, particularly on a large site or where there are significant numbers of personnel on site.
- [ ] Using signs and posters to build awareness of good handwashing technique, the need to increase handwashing frequency, avoid touching your face and to cough or sneeze into a tissue which is binned safely, or into your arm if a tissue is not available.
- [ ] Providing regular reminders and signage to maintain hygiene standards.
- [ ] Providing hand sanitisers in multiple locations in addition to washrooms.
- [ ] Setting clear use and cleaning guidance for toilets to ensure they are kept clean and social distancing is achieved as much as possible.
- [ ] Enhancing cleaning for busy areas.
- [ ] Special care should be taken for cleaning of portable toilets.
- [ ] Providing more waste facilities and more frequent rubbish collection.
- [ ] Where possible, providing paper towels as an alternative to hand dryers in handwashing facilities

HM Government

5.4 Changing rooms and showers

Objective: To minimise the risk of transmission in changing rooms and showers.

Steps that will usually be needed:

- [ ] Where shower and changing facilities are required, setting clear use and cleaning guidance for showers, lockers and changing rooms to ensure they are kept clean and clear of personal items and that social distancing is achieved as much as possible.
- [ ] Introducing enhanced cleaning of all facilities regularly during the day and at the end of the day.

5.5 Handling equipment, materials, waste, and onsite vehicles

Objective: To reduce transmission through contact with objects that come into the workplace and vehicles at the worksite.

Steps that will usually be needed:

- [ ] Cleaning procedures for the parts of shared equipment you touch after each use, thinking about equipment, tools and vehicles, for example, pallet trucks and forklift trucks.
- [ ] Encouraging increased handwashing and introducing more handwashing facilities for workers handling goods and merchandise or providing hand sanitiser where this is not practical.
- [ ] Regular cleaning of vehicles that workers may take home.
- [ ] Regular cleaning of reusable delivery boxes.

HM Government

6. Personal protective equipment (PPE) and face coverings

HM Government

6. Personal Protective Equipment (PPE) and face coverings

PPE protects the user against health or safety risks at work. It can include items such as safety helmets, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses. It also includes respiratory protective equipment, such as face masks.

Where you are already using PPE in your work activity to protect against non-COVID-19 risks, you should continue to do so.

At the start of this document we described the steps you need to take to manage COVID-19 risk in the workplace. This includes working from home and staying 2m away from each other in the workplace if at all possible. When managing the risk of COVID-19, additional PPE beyond what you usually wear is not beneficial. This is because COVID-19 is a different type of risk to the risks you normally face in a workplace, and needs to be managed through social distancing, hygiene and fixed teams or partnering, not through the use of PPE.

The exception is clinical settings, like a hospital, or a small handful of other roles for which Public Health England advises use of PPE. For example, first responders and immigration enforcement officers. If you are in one of these groups you should refer to the advice at:

https://www.gov.uk/government/publications/coronavirus-covid-19-personal-protective-equipment-ppe-plan/covid-19-personal-protective-equipment-ppe-plan

and

https://www.gov.uk/government/publications/covid-19-decontamination-in-non-healthcare-settings/covid-19-decontamination-in-non-healthcare-settings.

Workplaces should not encourage the precautionary use of extra PPE to protect against COVID-19 outside clinical settings or when responding to a suspected or confirmed case of COVID-19.

Unless you are in a situation where the risk of COVID-19 transmission is very high, your risk assessment should reflect the fact that the role of PPE in providing additional protection is extremely limited. However, if your risk assessment does show that PPE is required, then you must provide this PPE free of charge to workers who need it. Any PPE provided must fit properly .

HM Government

6.1 Face coverings

There are some circumstances when wearing a face covering may be marginally beneficial as a precautionary measure. The evidence suggests that wearing a face covering does not protect you, but it may protect others if you are infected but have not developed symptoms.

A face covering can be very simple and may be worn in enclosed spaces where social distancing isn't possible. It just needs to cover your mouth and nose. It is not the same as a face mask, such as the surgical masks or respirators used by health and care workers. Similarly, face coverings are not the same as the PPE used to manage risks like dust and spray in an industrial context. Supplies of PPE, including face masks, must continue to be reserved for those who need them to protect against risks in their workplace, such as health and care workers, and those in industrial settings like those exposed to dust hazards.

It is important to know that the evidence of the benefit of using a face covering to protect others is weak and the effect is likely to be small, therefore face coverings are not a replacement for the other ways of managing risk, including minimising time spent in contact, using fixed teams and partnering for close-up work, and increasing hand and surface washing. These other measures remain the best ways of managing risk in the workplace and government would therefore not expect to see employers relying on face coverings as risk management for the purpose of their health and safety assessments.

Wearing a face covering is optional and is not required by law, including in the workplace. If you choose to wear one, it is important to use face coverings properly and wash your hands before putting them on and taking them off.

Employers should support their workers in using face coverings safely if they choose to wear one. This means telling workers:

- Wash your hands thoroughly with soap and water for 20 seconds or use hand sanitiser before putting a face covering on, and after removing it.
- When wearing a face covering, avoid touching your face or face covering, as you could contaminate them with germs from your hands.
- Change your face covering if it becomes damp or if you've touched it.
- Continue to wash your hands regularly.
- Change and wash your face covering daily.
- If the material is washable, wash in line with manufacturer's instructions. If it's not washable, dispose of it carefully in your usual waste.
- Practise social distancing wherever possible.

You can make face-coverings at home and can find guidance on how to do this and use them safely on GOV.UK.

HM Government

7. Managing your workforce

HM Government

7.1 Shift patterns and working groups

Objective: To change the way work is organised to create distinct groups and reduce the number of contacts each worker has.

Steps that will usually be needed:

- As far as possible, where people are split into teams or shift groups, fixing these teams or shift groups so that where contact is unavoidable, this happens between the same people.
- Identifying areas where people have to directly pass things to each other, such as shared tools, materials or job instructions, and finding ways to remove direct contact, for example, by using drop-off points or transfer zones.
- For those workers who are required to travel and stay away from home in onsite accommodation, creating fixed groups of workers so that where contact is unavoidable, this happens between the same people.
- Minimising worker congregation at bottlenecks such as timeclocks, entrances and exits and maintaining social distancing during shift handovers.

HM Government

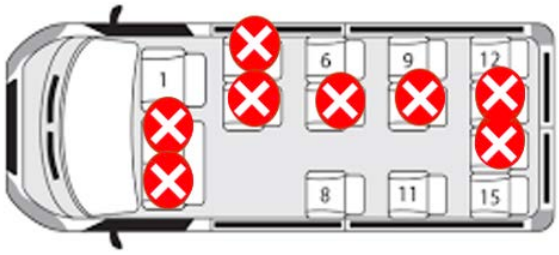
7.2 Work-related travel

7.2.1 Cars, accommodation and visits

Objective: To avoid unnecessary work travel and keep people safe when they do need to travel between locations.

Steps that will usually be needed:

- [ ] Minimising non-essential travel – consider remote options first.
- [ ] Minimising the number of people travelling together in any one vehicle, using fixed travel partners, increasing ventilation when possible and avoiding sitting face-to-face.
- [ ] Cleaning shared vehicles between shifts or on handover.
- [ ] Where workers are required to stay away from their home, centrally logging the stay and making sure any overnight accommodation meets social distancing guidelines.



Seating arrangements to maximise distance between workers

7.2 Work-related travel

7.2.2 Deliveries to other sites

Objective: To help workers delivering to other sites such as markets or customers' premises to maintain social distancing and hygiene practices.

Steps that will usually be needed:

- [ ] Putting in place procedures to minimise person-to-person contact during deliveries to other sites.
- [ ] Maintaining consistent pairing where two-person deliveries are required.
- [ ] Minimising contact during payments and exchange of documentation, for example, by using electronic payment methods and electronically signed and exchanged documents.

HM Government

7.3 Communications and training

7.3.1 Returning to work

Objective: To make sure all workers understand COVID-19 related safety procedures.

Steps that will usually be needed:

- [ ] Providing clear, consistent and regular communication to improve understanding and consistency of ways of working.
- [ ] Engaging with workers and worker representatives through existing communication routes to explain and agree any changes in working arrangements.
- [ ] Developing communication and training materials for workers prior to returning to site, especially around new procedures for arrival at work.

7.3 Communications and training

7.3.2 Ongoing communications and signage

Objective: To make sure all workers on site are kept up to date with how safety measures are being implemented or updated.

Steps that will usually be needed:

- [ ] Ongoing engagement with workers (including through trades unions or employee representative groups) to monitor and understand any unforeseen impacts of changes to working environments.
- [ ] Awareness and focus on the importance of mental health at times of uncertainty. The government has published guidance on the mental health and wellbeing aspects of coronavirus (COVID-19).
- [ ] Using simple, clear messaging to explain guidelines using images and clear language, with consideration of groups for which English may not be their first language.
- [ ] Using visual communications, for example, whiteboards or signage, to explain safe working practices around the working site to reduce the need for face-to-face communications.
- [ ] Communicating approaches and operational procedures to suppliers, customers or trade bodies to help their adoption and to share experience.

HM Government

8. Inbound and outbound goods

Objective:

To maintain social distancing and avoid surface transmission when goods enter and leave the site especially in high volume situations, for example, builders' yards or despatch areas.

Steps that will usually be needed:

- Revising pick-up and drop-off collection points, procedures, signage and markings.
- Minimising unnecessary contact at gatehouse security, yard and warehouse, for example, non-contact deliveries where the nature of the product allows for use of electronic pre-booking.
- Considering methods to reduce frequency of deliveries, for example by ordering larger quantities less often.
- Where possible and safe, having single workers load or unload vehicles.
- Where possible, using the same pairs of people for loads where more than one is needed.
- Enabling drivers to access welfare facilities when required, consistent with other guidance.
- Encouraging drivers to stay in their vehicles where this does not compromise their safety and existing safe working practice, such as preventing drive-aways.

HM Government

Where to obtain further guidance

COVID-19: what you need to do

https://www.gov.uk/coronavirus

COVID-19: guidance for employees, employers and businesses

https://www.gov.uk/government/publications/guidance-to-employers-and-businesses-about-COVID-19

COVID-19: HSE guidance on gloves

https://www.hse.gov.uk/skin/employ/gloves.htm.

COVID-19: HSE guidance on mask fittings

https://www.hse.gov.uk/news/face-mask-ppe-rpe-coronavirus.htm

COVID-19: Department of Health & Social Care guidance on masks

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879221/Coronavirus__COVID-19__-_personal_protective_equipment__PPE__plan.pdf

Appendix

Definitions

Common Areas	The term 'common area' refers to areas and amenities which are provided for the common use of more than one person including canteens, reception areas, meeting rooms, areas of worship, toilets, gardens, fire escapes, kitchens, fitness facilities, store rooms, laundry facilities.
Clinically extremely vulnerable	Clinically extremely vulnerable people will have received a letter telling them they are in this group, or will have been told by their GP. Guidance on who is in this group can be found here: https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19
Clinically vulnerable people	Clinically vulnerable people include those aged 70 or over and those with some underlying health conditions, all members of this group are listed in the 'clinically vulnerable' section here: https://www.gov.uk/government/publications/full-guidance-on-staying-at-home-and-away-from-others/full-guidance-on-staying-at-home-and-away-from-others

HM Government

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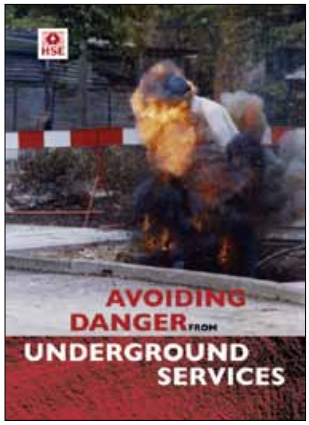
enquiries@beis.gov.uk

Appendix II:

HSE guidance
HSG-47 – "Avoiding Danger from Buried Underground Services"

Avoiding danger from underground services



This is a free-to-download, web-friendly version of HSG47 (Fourth edition, published 2000). This version has been adapted for online use from HSE's current printed version.

You can buy the book at www.hsebooks.co.uk and most good bookshops.

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This guidance outlines the dangers which can arise from work near underground services and gives advice on how to reduce the risks. It is aimed mainly at clients, designers, planning supervisors, employers, owners, operators, managers and supervisors and applies to situations where work involves penetrating the ground at or below surface level.

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This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance as illustrating good practice.

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Introduction

1 This book updates the guidance contained in the previous edition of HSG47 *Avoiding danger from underground services.* It outlines the dangers which can arise from work near underground services and gives advice on how to reduce the risk. It deals only with risks to the health and safety of people and is not concerned with damage which has no direct risks associated with it. However, precautions taken which reduce risks to the health and safety of people will generally also reduce the risk of damage to services. Remember too that damage can have a knock-on effect: consider for example the effect of the loss of a telephone service if a 999 call has to be made.

Where this guidance applies

2 This guidance applies to situations where underground services may be found and where **work involves penetrating the ground at or below surface level**. Buried services are widespread and it should be assumed they are present unless it has been shown otherwise.

3 For road resurfacing where ground penetration is contained within the wearing and base courses, the services encountered are likely to be limited to traffic sensor cables. Care will still need to be taken, in particular to avoid damage to surface boxes for valves, pressure points, test points etc. All other work will be covered by this guidance including work in footways and kerbing, regardless of depth, as underground services may be found near the surface.

Who this guidance is aimed at

4 This guidance is aimed primarily at clients, designers, planning supervisors, contractors, employers, owners and operators of underground services, managers and supervisors and others concerned with planning, organising and supervising work near such services. This includes work by or for the utilities and also roadworks, construction and demolition work. However, it is relevant to anyone who has responsibilities under relevant legislation (see Appendix 1) and contains a suggested text for use by employees who work near underground services (see Appendix 2).

How to use this guidance

5 Guidance on the general precautions to be taken to prevent damage to all types of underground services is contained in the section 'Safe systems of work'. Additional guidance for each type of buried service is given in the section 'Precautions for particular services', which should be read in conjunction with 'Safe systems of work'.

Definitions

6 The term 'service(s)' means all underground pipes, cables and equipment associated with the electricity, gas, water (including piped sewage) and telecommunications industries. It also includes other pipelines which transport a range of petrochemical and other fluids. It does not include underground structures such as railway tunnels etc.

7 The term 'service connection(s)' means pipes or cables between distribution mains and individual premises

The dangers

8 Damage to underground services can cause fatal or severe injury. The main dangers are outlined in paragraphs 9 to 18.

Electricity cables

9 Injuries are usually caused by the explosive effects of arcing current, and by any associated fire or flames which may result, when a live cable is penetrated by a sharp object such as the point of a tool (see front cover). Such effects can also occur when a cable is crushed severely enough to cause internal contact between the conductors or between metallic sheathing and one or more conductors. Injuries are typically severe, potentially fatal, burns to the hands, face and body and electric shock is less likely.

10 Incidents may also arise from cables which have been damaged but left unreported and unrepaired.

11 Other nearby services, such as plastic gas pipes, may also be at risk from damaged live electricity cables. This could result in explosions and a greater fire risk.

Gas pipes

12 Damage to gas pipes can cause leaks which may lead to fire or explosion (see Figure 1). There are two types of damage:

- that which causes an immediate leak;
- that which causes a leak some time later. The damage may occur at the time the work is carried out or subsequently: for example poor reinstatement may leave a pipe inadequately supported or subject to unequal forces.

Figure 1 Aftermath of a gas explosion, following damage to an underground gas service pipe

Water pipes and sewers

13 Although damage to water pipes is less likely to result in injury, the following may occur:

- a jet of water from a main can injure a person. It may also contain stones or other hard objects ejected from the ground around the pipe;
- leaks of water from underground pipes can affect adjacent services and reduce support for other structures, for example:
  - damage to mains can result in flooding, leading to subsequent risks from drowning or the rapid collapse of support to the sides of an excavation;
  - water can enter gas pipes if they are also damaged.

14 While some sewage is pumped at pressure, sewers are generally gravity-fed, and the main hazard from damage to a sewer is the possibility of contamination.

Other pipelines

15 The danger arising from damage to other pipelines depends on the nature of the conveyed fluid. Fluids and their associated dangers include:

- flammable liquids and gases - risk of fire and explosion;
- all fluids at elevated pressure - risk of injury from sudden release of contents;
- toxic liquids and gases - risk of poisoning; and
- gases such as nitrogen, argon etc - risk of asphyxiation.

16 Very often a fluid will present a combination of risks, for example a liquid may be both toxic and flammable.

Telecommunication cables

17 Damage to telecommunication and cable TV cables may require expensive repairs and can cause considerable disruption to those relying on the system. However, the risk of personal injury is normally very low.

18 Flammable and toxic gases can 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.

Safe systems of work

General

19 A safe system of work has four basic elements:

- planning the work;
- plans;
- cable- and pipe-locating devices;
- safe digging practices.

20 These key elements complement each other, and **all four** should be used when working near buried services. More details of each are given in the sections

that follow. A flow diagram, describing part of the process, is on page 8.

21 People responsible for planning or carrying out relevant work should liaise with the service owners/operators. It is important that owners/operators accept the need for close co-operation with those who have to excavate in the vicinity of their services. They should be prepared to help locate and identify the services when asked to do so, perhaps by sending a representative to the site. They should also consider further ways of improving and extending co-operation, particularly with other utilities, local authorities and contractors who have to perform a considerable amount of road and footway excavation.

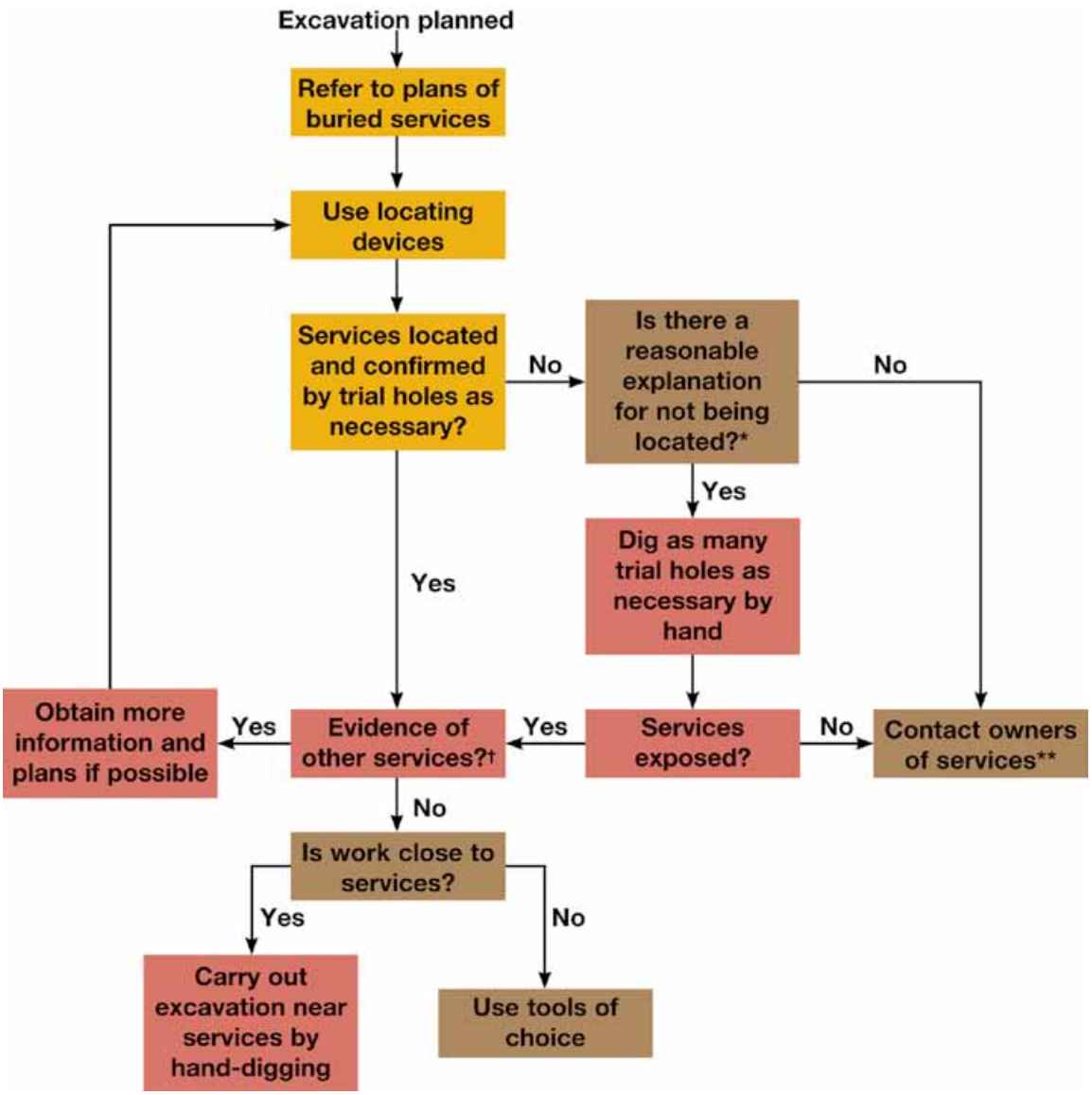
22 When carrying out excavations, it is also important to:

- use the appropriate traffic signing on highways; this is described in a Code of Practice *Safety at street works and road works;*[1]
- avoid risks from other sources. Further information can be found in HSG185 *Health and safety in excavations*.[2]

Figure 2 Flow diagram

This flow diagram is intended to help give an understanding of the process **from referring to plans on site through to the start of excavation**, for example when excavating in a road or footway. However it:

- describes *only part* of the process; it does not, for example, describe planning the work, including reference to plans at the design stage;
- is a simplified picture and not a substitute for reading the text;
- is not a substitute for a suitable and sufficient risk assessment;
- does not take account of a number of other situations, eg cables embedded in concrete or those situations where resiting services is proposed.



* For example, could services be non-metallic pipes? Please refer to text for further information.

† In particular, visual evidence. Ensure that the presence of services, which may be unmarked on plans or for which no plans are available, has been considered, for example service connections.

** If there is visual evidence of services, but owners cannot be traced, despite all reasonable attempts to do so, any excavation could proceed but using hand-dug trial holes and proceeding with great care.

Training and supervision

23 Employees should receive adequate instruction and training in correct procedures and the precautions to be taken. Appendix 2 could be used as a basis for training programmes. The Construction Industry Training Board (CITB)* can also give advice on available training. Note also that under the New Roads and Street Works Act 1991, a supervisor and at least one on-site operative at street works should have prescribed qualifications (see Appendix 1, paragraph 24).

24 Supervision should reflect the risks involved. Given the peripatetic nature of the work, the hazards involved and - as excavation proceeds - the changing nature of those hazards and conditions, supervisors should check regularly that, among other things, the work is being carried out according to instructions and that all precautions necessary are in place.

Planning the work

25 Many dangers can be avoided by careful planning before the work starts. Risk assessments should consider how the work is to be carried out, ensuring local circumstances are taken into account.

26 A permit system may be appropriate for particularly hazardous work. This would involve written authorisation by a responsible person, identifying the work to be done and the precautions to be taken. A permit system needs suitable supervision and monitoring to ensure that the conditions of a permit are complied with.

27 The Construction (Design and Management) Regulations 1994 (CDM) provide a framework for the management of risks. The Regulations apply to demolition, notifiable projects and those involving more than four people, except that the designer's duties under regulation 13 will always apply. Guidance for designers is given in the 'Design' section (see paragraphs 30 to 40). Further information on the application of the Regulations can be found in HSG224 *Managing health and safety in construction* and *A guide to managing health and safety in construction.*[3,4]

28 Even where the CDM Regulations do not apply in full, risks remain. The advice under 'Where CDM applies' (paragraphs 41 to 48) should help clients, contractors and others to comply with their duties towards employees, contractors and the public under the Health and Safety at Work etc Act 1974 (HSW Act) and under other health and safety legislation (see Appendix 1).

29 Further information on risk assessment and the management of health and safety can also be found in *Management of health and safety at work*.[5]

Design

30 The term 'design' includes drawings, design details, specifications, and bills of quantities. A designer is anyone who prepares these. For example, people planning the route of a new cable television scheme are designers. Designers will need to know if there are buried services present.

31 For building work, resiting the services away from the work is most often a reasonably practicable means of avoiding the risk. The service owner/operator should be asked to do this. Such requests will need to include a sufficient period of notice.

---

* Construction Industry Training Board, Bircham Newton, King's Lynn, Norfolk PE31 6RH Tel: 01485 577577.

32 Other options to resiting the services may include:

- repositioning structures or parts of structures to ensure that services are avoided during the work;
- arranging for the supply to be disconnected during the work;*
- if none of these are possible, choosing methods to avoid the services, for example by using ground beams.

33 Permanent structures such as buildings should generally not be built over the services, as this may introduce additional risks to construction workers and can prevent future access to the services. If it is not possible to avoid building structures over any service, arrangements should be made with the utility to relocate the services in a duct, or something similar.

34 Designers should not overlook ancillary work including the erection of perimeter fencing and walling, or the position of roadways onto the site which may affect services at the site perimeter. Early identification and planning are essential if risks are to be controlled during the construction phase of the project.

35 Where new services such as electrical or gas supplies are being installed, it may be possible sometimes to reduce risks by not installing or commissioning them until other groundworks and work on the installation have been completed.

36 The options facing designers planning a new service in a roadway may be more limited. It is important to have information about existing services to help select a route for the new service which avoids them. The risk of contact with existing services can be reduced by choosing a route with a low density of buried services. For example, a cable television duct might be routed at the side of a road if there is a reduced cable density there. Designers of pipelines should also be aware of the guidance contained in the HSE publication *A guide to the Pipelines Safety Regulations 1996*[6] which advises that the parallel running of similar pipelines in the street should be avoided. Liaison with the owners of services is important as they are in a position to provide information to the designers to enable such decisions to be made.

37 Having reduced the risks to a level as low as reasonably practicable by design, information should be provided by the designer(s) about the risks which remain. In most cases the best way of informing contractors and individuals doing the work is by providing the information on drawings, ensuring that the information is the best available. When excavations are undertaken in the vicinity of buried services it is very important that operatives have access to clear, readable and accurate plans showing the location of buried services.

38 Among their other duties to provide information, designers are specifically required to make the client aware of when project work falls within the scope of the CDM Regulations.

39 Further information for designers can be found in *Designing for health and safety in construction*.[7]

40 Designers are likely to find other information in the rest of this document useful, but note in particular the sections on 'Plans', and 'Some specific sites and situations'.

* For periods of notice required by legislation to disconnect a service to a customer, contact the relevant utility or respective regulator.

Where CDM applies

41 This section describes procedures that should be followed in addition to the designers' duties, as a result of the CDM Regulations applying in full.

42 A client is a person or organisation for whom a project is carried out. In general, where a utility company is asked to provide permanent services for a building development, the utility will be acting as a contractor, and will be required to act under the direction of the principal contractor while on site.

43 However, where the provision of services can be physically separated and demarcated from the site, then the utility will usually be acting as a client for the purposes of CDM. If the utility undertakes the work itself, then it will usually be a client and contractor. Where the work is undertaken by others, then they will be contractors in the usual way for the purposes of CDM.

44 Clients have a duty to make reasonable enquiries about buried services, and pass relevant information to the planning supervisor, who should include it in the pre-tender health and safety plan. Information on buried services may be available from the client's own health and safety file. If it is, remember that it may have been obtained for previous work and may be out of date. Up-to-date information should be included in the pre-tender health and safety plan (and ultimately transferred to the file).

45 Tenderers should outline how they intend to manage the risks from buried services, also indicating the resources to be provided.

46 Contractors arriving on site should be provided with information about the risks from buried services (see Figure 3). The principal contractor may make site rules (for example specifying acceptable types of equipment; the safe digging practices which may be used on site; working procedures; and commissioning procedures). Where services have been disconnected, this should be recorded and issued to the contractors working in that area. Contractors should co-operate with the principal contractor to ensure that any rules or agreed methods of working are adhered to.

Figure 3 Discussing the work on site

47 The planning supervisor should ensure that the health and safety file contains updated information on buried services, for the benefit of those carrying out subsequent work. Whether the project involves excavating in the roadway to install a new service or to repair or maintain an existing service, a file will still be required where CDM applies.

48 If the client is a utility, the file information should allow them to update their own records on the position of their services and should be made available to others who will need to use this information for subsequent maintenance, repair and construction work.

Plans

Obtaining information on services

49 Plans or other suitable information about all buried services in the area should be obtained before excavation work starts, when the work is being planned. Most buried services belong to one of the utilities. Those that do not are likely to be found on or near commercial, industrial, military or other sites. Wherever possible owners/operators should be consulted. It should be remembered that for a number of types of service there may be more than one owner/operator in an area.

50 The use of 'one-call' systems is recommended where available. This allows those who wish to excavate, and who give sufficient notice, to obtain plans from a range of owners and operators through one contact. In addition, because of the difficulty in detecting some telecommunication cables and the cost of damage to them, telecommunication companies may prefer to visit the site to locate the cables.

51 Where it is not possible for those undertaking the excavation work to obtain information, as may be the case when emergency* work has to be undertaken, the work should be carried out as though there are buried services in the area.

52 Account should be taken of any indications that buried services exist, such as the presence of lamp-posts, illuminated traffic signs, gas service pipes entering buildings, pit covers, pipeline marker posts, evidence of reinstated trenches etc. However, if there are no such indications, this does not mean that there are no buried services.

Provision of plans by service owners

53 Owners/operators should provide either up-to-date, readable plans, which show the recorded line and depth (where known) of all their known services buried in the proposed work area, or other suitable information which achieves the same aim. A symbol key is likely to be important to help the recipient understand the plans.

54 Owners/operators should do everything reasonably practicable to ensure that such information is made available to enquirers. They are likely to receive many routine applications for information and should consider how best to make information available at short notice. Where reasonably practicable, arrangements should also be made to deal with emergencies outside office hours so that

* The New Roads and Street Works Act 1991 defines emergency works in relation to circumstances which are likely to cause danger to people or property. If the question arises in criminal or civil proceedings whether or not works were emergency works, it is for the person alleging that they were to prove that this was the case. Clients and contractors should not use 'emergency work' as an excuse to justify a failure to plan properly when starting work without plans or other suitable information about buried services in the area.

operatives can be given plans of underground services when they receive their work instructions. Some owners/operators may have reservations, for reasons of security, about supplying copies of their underground services plans for areas such as those around important civil and military establishments. In such cases an alternative method should be used; for example a representative could be sent to the site to give information to legitimate contractors/utilities etc.

55 Utilities have made agreements to exchange records, as described in *Recommendations for the exchange of records of apparatus between utilities*.[8]

Use and limitation of plans

56 Plans vary in scale, content and style. Two examples are shown on pages 22 and 26. Adequate instruction and training in how to read and interpret plans should be given to anyone who needs to use them.

57 Plans can give an indication of the location, configuration and number of underground services at a particular site, and should help subsequent tracing by locating devices. However, they are rarely drawn accurately to scale and, even if they claim to be, they should not be relied upon to obtain distances. For example, errors may have been made during drafting, or reproduction may have changed the scale, especially if the plan was obtained from a microfiche slide or digital map. Accuracy may be further limited because:

- the position of reference points (eg the kerb line) may have changed since the plans were drawn;
- regrading of the surface may mean that the depths shown are now incorrect;
- services, particularly cables, may have been moved without the knowledge of their owners/operators;
- in many cases service connections are not marked;
- services, marked as straight lines may, in practice, snake. Excessively long cables may have been laid in horizontal loops outside substations, switch rooms etc;
- plans may show spare ducts; and
- the routes of older services in particular may not have been recorded, so the absence of records should never be taken as proof that the area in question is free of underground services.

58 These limitations make it very important that other indicators (for examples see paragraph 52) are taken into account and that suitable locating devices and safe digging methods are used. Further notes on the use and limitations of plans for electricity cables and gas pipes are given in 'Precautions for particular services'.

59 In certain cases, such as construction site work and large-scale road excavation work, it is recommended to transfer the information onto the working plans for the guidance of those carrying out the work. Information transferred should include all relevant features, such as valve pits, depths etc. Particular care should be taken where topographical changes have occurred since services were laid.

Figure 4
Using a cable locator

Cable- and pipe-locating devices

60 The position of any services in or near the proposed work area should be pinpointed as accurately as possible by means of a locating device (see Figure 4), using plans, and other information (see paragraph 52) as a guide to the possible location of services and to help interpret the signal.

Types of locating devices

61 The main types available can be classed as follows:

- *Hum detectors* are receiving instruments which detect the magnetic field radiated by electricity cables which have a current flowing through them. They do not respond to:
  - cables where there is little or no current flowing, for example service connection cables to unoccupied premises or street lighting cables in the daytime;
  - direct current cables;
  - some well-balanced high-voltage cables, where these generate relatively little field (which in turn may be further screened by the cable sheathing).
- *Radio frequency detectors* are receiving instruments which respond to low-frequency radio signals, which may be picked up and re-emitted by long metallic pipes and cables. If radio frequency detection is used, other metallic objects may re-radiate the signal and results may vary appreciably according to locality, length of the buried cable or pipe and distance from the termination and geographical orientation.
- *Transmitter-receiver instruments* - a small portable transmitter or signal generator can be connected to a cable or pipe or placed very close to it so that the signal is introduced into it. The receiver can then detect this signal. Usually the location of some part of the cable or pipe needs to be already known so that the transmitter can be properly positioned and these locators generally require more skill to operate than most other types. They can, however, provide useful information in difficult situations where the techniques using hum detectors and radio frequency detectors have not been successful.
- *Metal detectors* - conventional detectors will usually locate flat metal covers, joint boxes etc, but may well miss round cables or pipes.
- *Ground probing radar* - a method which is capable of detecting anomalies in the ground. When these anomalies can be plotted into a continuous line, this may indicate a cable, duct or pipe. However, this technique alone would not determine the precise nature of the service and it should be supported by information available about the services present, and also preferably with the use of other, more conventional, forms of locating device. **Knowledge of ground conditions is important.** For example, false readings are most likely where there are boulders and debris in the ground or where the ground has often been disturbed. Because of equipment costs, and the need for specialist training, it may be cost-effective to use firms specialising in this technique.

62 Some commercially available instruments use more than one of the techniques listed in paragraph 61 and may include a depth-measuring facility.

Use of locating devices

63 The degree of confidence with which buried services can be detected depends on a number of factors such as:

- the training, skill, hearing and experience of the operator;
- the characteristics of the device being used;
- the calibration and reliability of the locating device;
- the type, length and depth of the service;
- for cables, the magnitude of the current being carried; and
- the effects of other nearby services.

64 It is very important that anyone who uses a locator should have received thorough training in its use and limitations. Locating devices should always be used in accordance with the manufacturer's instructions and should be regularly

checked and maintained in good working order.

65 A locator may not be able to distinguish between cables or pipes running close together and may represent them as a single signal. If, for example, two are sited one above the other, the lower one may not be detected. Exposing one cable or pipe does not mean that there is not another close by. **Frequent and repeated use should be made of locators during the course of the work.** Service location is likely to become more accurate as cover is removed.

66 Locators (with the possible exception of ground-probing radar) do not detect plastic pipes or other non-metallic services unless either:

- a metallic tracer wire has been laid with the pipe. This enables a signal transmitter/receiver to be used. Plastic gas and water pipes are the non-metallic services most likely to be encountered and few have been laid with metallic tracer wires in the past, with the exception of plastic pipes on liquefied petroleum gas (LPG) metered estates; or
- a small signal transmitter is inserted into and pushed along the pipe. This is a sophisticated technique which is not likely to be appropriate for most jobs.

67 Many telecommunication and railway signalling cables also cannot be located by locating devices, unless metal components (such as a metal sheath) are connected to earth.

68 The line of any identified services should be noted and marked with waterproof crayon, chalk or paint on paved surfaces (use biodegradable paint or erase residual markings as far as possible after excavation), or with wooden pegs in grassed or unsurfaced areas. Steel pins, spikes or long pegs which could damage services laid at shallow depth should not be used.

Safe digging practice

Exposing services

69 Excavation work should be carried out carefully and follow recognised safe digging practices. Once a locating device has been used to determine position and route, excavation may proceed, with trial holes dug using suitable hand tools as necessary to confirm the position of any buried services. Special care should be taken when digging above or close to the assumed line of such a service. **Hand-held power tools and mechanical excavators are the main causes of danger and they should not be used close to underground services.** Advice on appropriate safety margins from electricity cables, gas pipes and other pipelines is given in the relevant sections of 'Precautions for particular services'.

70 Hand tools can also be a common source of accidents if incorrectly used. However, when used carefully, they can normally provide a satisfactory way of exposing buried services, once the approximate positions have been determined using plans and locators.

71 Every effort should be made to excavate alongside the service rather than directly above it. Final exposure of the service by horizontal digging is recommended, as the force applied to hand tools can be controlled more effectively. Insulated tools should be used when hand digging near electric cables. In particular:

- spades and shovels (preferably those with curved edges) should be used rather than other tools. They should not be thrown or spiked into the ground, but eased in with gentle foot pressure;

- picks, pins or forks may be used with care to free lumps of stone etc, and to break up hard layers of chalk or sandstone;
- picks should not be used in soft clay or other soft soils near to buried services.

72 Particular care is also necessary:

- when driving in fence pins or penetrating the ground with any other such object;
- when gas leak search techniques such as barholing are used.[9] (Normally the gas emergency service would undertake this technique - see paragraph 140.)

73 Safe methods of excavating around service pipes include water jetting and high-velocity air jets, which can incorporate vacuum removal of excavated material. These devices remove soil and can be used to expose buried services. They have limitations and will not work on all materials and ground conditions such as concrete. The precautions needed to prevent injury from ejected soil and other material should be assessed.

74 Once exposed, services may need to be supported and **should never be used as hand- or footholds for climbing out of excavations.**

75 All services should be assumed to be live until disconnected and proven safe at the point of work. Obtain written confirmation of disconnection from the owner/ operator before removing a redundant service.

Figure 5 Using an air digging tool

76 If a buried service suffers damage during the excavation or subsequent work, the owner/operator must be informed. In the case of electricity cables, gas pipes, other pipelines or high-pressure water mains, arrangements should be made to keep people well clear of the area until it has been repaired or otherwise made safe by the owner/operator.

77 Further advice when exposing particular types of services can be found in 'Precautions for particular services'.

Personal protective clothing

78 Burns are the main injuries that result from damage to live buried electrical cables or from fire or explosion following a gas leak. In many cases burns are made more severe by the injured person working bare-chested. Even ordinary work clothing can greatly reduce the severity of the burns and protective clothing is better (for further advice on clothing for work near electricity cables see paragraph 120). However clothing made from man-made fibres such as nylon may melt and stick to the skin, increasing the severity of the burns. The wearing of protective clothing should never be a substitute for a safe system of work.

Identifying exposed services

79 Once underground services have been uncovered, failure to identify them correctly is another common cause of accidents. A wide variety of materials and colours have been used for services over the years. Furthermore some services may be very similar in appearance and some services run in ducts made of various materials including asbestos cement, making them difficult to identify. The following approaches should be adopted until the identity of the service has been positively confirmed:

- water pipes, electricity cables and telecommunication cables may be covered in black plastic. If any black plastic service is found, it should be assumed to be a live electricity cable;
- iron and steel water pipes and gas pipelines may appear very similar. If any such pipe is uncovered, it should be treated as if it were a gas pipe;
- continuously welded steel pipes should always be treated as containing a hazardous or high-pressure fluid;
- at collieries, beware of electricity cables, some of which are yellow or blue and may be mistaken for other services;
- on some building sites beware of electricity cables being placed in yellow service pipes or blue water pipes;
- **where there is any doubt about the identity of an exposed service it should be treated as an electricity cable or gas pipe until proved otherwise.**

80 For modern installations, a national colour coding system for buried services has been agreed by most utilities, as described in the NJUG publication *The identification of small buried mains and services*.[10] In summary, the system is as follows:

Colour	Service
Black	Electricity
Red cables	Electricity - some high-voltage
Orange	Street lighting in England and Wales and traffic control cables
Purple	Road lighting in Scotland
Blue	Water
Yellow	Gas
Grey or white	Telecommunications
Green	Cable television and some telecommunications

81 It is important to remember that:

- old, non-utility services or other pipelines may not conform to this system;
- colours may look different under poor or artificial lighting; and
- ducts could include any of the services, although this is less likely to occur for telecommunication and cable television ducts.

82 This colour coding system should not be confused with the one contained in BS 1710[11] which generally applies to above-ground building and process services.

Backfilling

83 Backfilling of any excavation should be done carefully. Where possible, any warning tiles, tape etc above the services should be put back in their original position unless visual examination after exposure showed this to be incorrect, in which case they should be replaced above the service to which they refer. Warning tape should not be used for any other purpose (for example guarding an excavation) and should not be discarded in an excavation during backfilling. Backfill materials containing items likely to damage the services, such as large pieces of rock and hard core, should not be used. Further information on backfilling can be obtained from:

- utilities and owner/operators, for their particular services;
- paragraph 143 for backfilling around gas pipes (where long-term damage is a particular hazard);
- the Code of Practice (under the New Roads and Street Works Act 1991) *Specification for the reinstatement of openings in highways.*[12]

84 If the plans or other information have proved to be inaccurate (for example a service has been found well away from its recorded position), the owners/operators should be informed (preferably before the excavation is backfilled) and they should amend their records accordingly.

Some specific sites and situations

Safe systems of work for trenchless methods

85 Trenchless methods are increasingly being used for laying and renovating buried pipes and cables, particularly where there is a need to avoid surface

disruptions.[13] The most widely used techniques are directional drilling (see Figure 6), impact moling, microtunnelling, pipe bursting and auger boring.

86 Plans, locating devices and trial excavations should be used to locate existing services in the same way as for open cut excavation methods. The route of the device being used should then be planned accordingly. Care should be taken when using trenchless methods to avoid colliding with, and thereby damaging, other services. In addition, if moling or pipe bursting are undertaken too near to other services or ducts, displaced soil may damage or enter them.

87 As a general guide, to avoid damage and to allow sufficient clearance for maintenance of the services, the minimum clearance between adjacent services should be either 250 mm or one and a half times the diameter of the pipe being laid, whichever is the greater. For electricity cables, clearances for maintenance work should be approximately 300 mm.[15] However, clearances for any technique may need to be varied, taking into account such factors as the construction of adjacent plant, ground conditions, bore diameter, the accuracy and reliability of the technique/equipment being used and whether the other plant is parallel to or crosses the proposed line. Any requirements of the owners of adjacent services should be taken into account.

88 Moles are prone to deflection from their original course and if there are existing services in the vicinity a mole tracking device should be used. Where trenchless techniques are used, all equipment should be effectively earthed at all times it is in use, using an equipotential mat as required, in case it hits a power cable causing the machinery to become live.

Figure 6 Horizontal drilling being used for laying a cable under a road

89 Further information can be obtained from *Horizontal directional drilling and impact moling*.[14]

New housing developments

90 Underground services within the confines of partly completed housing developments are especially prone to damage from ongoing construction work. Each utility should keep to its agreed position as in NJUG publication Number 7.[15] A common trench may help to control the position and separation of underground services. Special arrangements may be necessary to restrict vehicle and mobile plant crossings to locations where temporary protection for the services has been provided. Advice on the installation and protection of buried electricity cables feeding plant used for construction work (eg cranes, hoists etc) is given in HSG141 *Electrical safety on construction sites*.[16]

91 Close liaison should be maintained between the developers, their contractors, and the utilities. A marked-up plan of the estate showing the up-to-date position of buried services (including any variations from planned routes) should be kept on site by the builder/developer for the information of those involved in excavation and groundwork.

Installation of new services near existing services

92 New underground services often have to be laid in ground which contains existing services. Where it is reasonably practicable to do so, the utility planning the new installation should aim to site it so that it is separated from all existing buried services by the distances specified in NJUG publication Number 7[15] (some of which are referred to in paragraph 87).

93 Where, because of buried services congestion, this standard cannot be attained, there should be as great a separation as is reasonably practicable. Where the installation of a service would obstruct access to an existing service for more than a few metres, then all reasonably practicable means should be used to avoid this. In particular, the practice of laying multiple ducts directly above other services should be avoided.

94 If the utility or its contractors laying the new service have had to reduce the separation, they should inform the utility whose service has been affected. The utility can then amend their records for future reference.

Demolition sites

95 Special problems can arise in the case of service terminations in derelict property or on demolition sites. Anyone concerned with demolition work should give adequate notice to the relevant gas, electricity and water undertakings of their intention to demolish any premises. Work should not start until either they have confirmed in writing that the supply has been disconnected, or other appropriate safeguarding action has been taken.

96 Buried services on industrial or commercial sites may be owned by the site occupier. A contractor who is to demolish buildings or plant on such a site should contact the owner or occupier, in addition to the utilities and other service operators, to ensure that all relevant services are isolated before work starts.

97 Even where supplies have been disconnected, beware of, for example:

- services that run through sites and are not part of the site supplies;
- pot-ended or bottle-ended cables (see paragraph 110); and if in doubt, treat services as ‘live’.

98 Further advice on demolition can be found in BS 6187.[17]

Precautions for particular services

99 This section gives advice on matters which relate to the main types of underground service. **It is additional information and should be read and used in conjunction with the advice contained in the 'Safe systems of work' section.**

Electricity cables

Planning the work and plans

100 Most service cables belong to the regional electricity company (look under 'Electricity' in the telephone directory). However, it is possible that some cables belong to other bodies such as the highway or roads authority, the street lighting authority, electricity generating companies, National Grid Company, Ministry of Defence, railway operator (usually Network Rail) or other companies.

101 Risk assessment should take into account the nature of local electrical hazards, such as the presence of a solid, fringe-fused cable system, as exists, for example, in London.

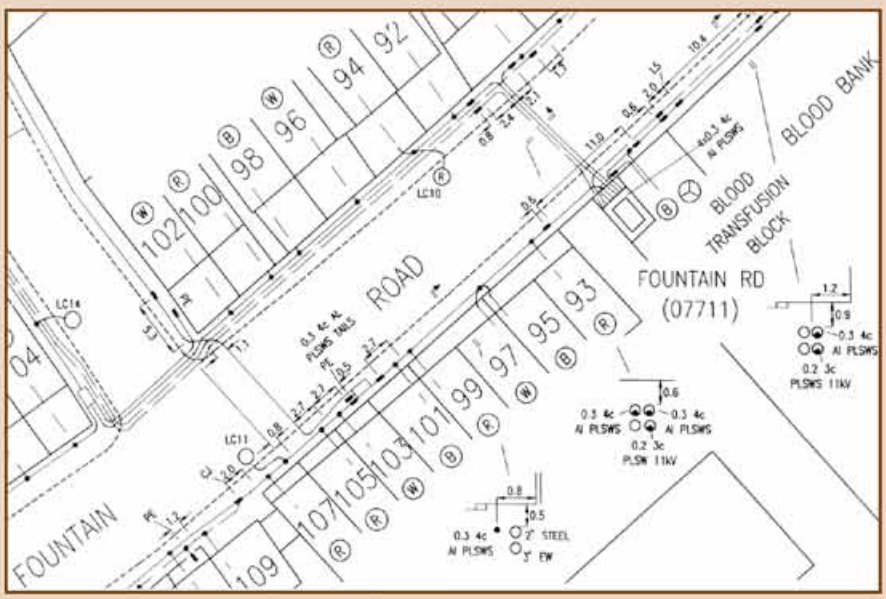
102 Figure 7 shows an example of an electricity cable plan. Note, however, that symbols vary between utilities and advice should be sought from the issuing office. Remember that high-voltage cables may be shown on separate plans from low-voltage cables.

103 For electricity cables more than other services, there may be a need to make dead for the work to proceed safely. It should be remembered that normally electricity companies have to give five days notice to customers whose supply is to be disconnected (see footnote to paragraph 32) and so, combined with other logistics of the process, making dead will normally take longer than five days.

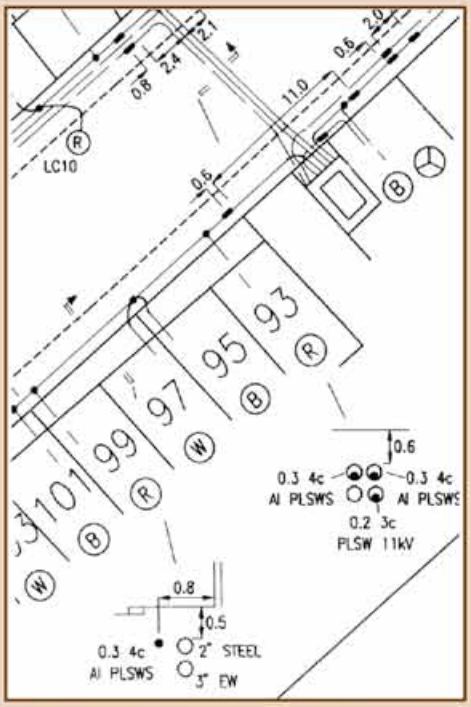
Cable locating devices

104 Hum detectors are simple to use but they do not detect all cables - see paragraph 61. A locator with a radio frequency detection mode may detect cables which a hum detector may miss and should be used as a back-up check.

105 If a cable recorded on a plan cannot be located, seek appropriate assistance or advice. If digging has to start before such assistance or advice has been obtained, extreme care should be taken.

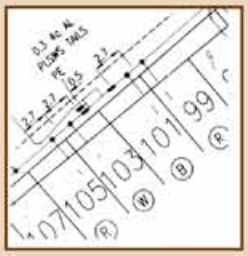


Example of an electrical cable drawing



This shows the cross-section of the cables both in the footpath and in the road crossing. Depths and position are also shown. Cables in circles are in ducts, those without are laid direct.

This box indicates a transformer chamber or substation and the rectangular or circular shapes on the cable indicate a joint or service on the main cable.



This shows a link box. This is visible on the pavement. One of the cables is pot-ended from the link box.

Note: Symbols and layout will vary

Figure 7 Example of an electricity plan

Safe digging practice

106 In most cases there will be no permanent surface marker posts or other visible indication of the presence of a buried cable. Even if no cables are shown on plans or detected by a locator, there may still be cables present, which could be live and a close watch should be kept for any signs which could indicate their presence.

107 Most underground cables are laid in trenches between 450 mm and 1 m deep. Some high-voltage (HV) cables will be deeper. However **depths should never be assumed**. Cables can be found just below the surface and even shallow excavations (for example for removal of a footpath base course) may be a source of danger. Remember this, particularly where:

- the ground has been disturbed; or
- lifting paving slabs or kerb stones; or
- there are cellars or structures such as bridges in the area which may have prevented cables being laid at standard depths.

108 Cables may have been laid directly in the ground with a bed or surround of fine soil or sand, or in cement-bound sand, or in earthenware or plastic pipes or ducts. Very occasionally they may be in steel pipes. They may have a layer of tiles, slabs or coloured plastic marker tape laid above them. On the railway infrastructure, yellow plastic mesh is often used to cover them. However, any such protection may have been disturbed and moved and should not be relied upon to give an accurate indication of a cable position. Although most HV cables would normally have tiles or marker tapes laid over them, low-voltage (LV) cables and some HV cables, where they have been installed in ducts as 'trenchless' installations, may be laid without separate protective cover.

109 A cable is positively located only when it has been safely exposed. Even then, digging should still proceed with care as there may be other cables and services adjacent or lower down. In addition, some lines of 11 kV or greater can be laid out as separate single phase cables, spread out up to 600 mm across, particularly near cable joints.

110 Occasionally, cables are terminated in the ground by means of a seal, sometimes with external mechanical protection. These 'pot-ended' or 'bottle-ended' cables should be treated as live and should not be assumed to be abandoned or disused. They can be difficult to detect with locators even when 'live'.

111 Sometimes there may also be joints in cables. These may be enclosed in earthenware pipes, filled compound, or be of cast iron or plastic epoxy-filled casings. They need proper support and should not be roughly treated. They should not be moved except in consultation with the owner.

112 Using hand-held power tools to break up hard surfaces often leads to accidents. Where practicable, such power tools should only be used 500 mm or more away from the indicated line of a cable buried in or below a hard surface. Having done so, the cable should then be positively located by careful hand digging under the hard surface. The hard surface should be gradually removed until the cable is exposed. If the cable is not so exposed then it must be assumed to be embedded within the surface. Where possible a cable locator should be used as a depth guide down the side of the excavation. The 500 mm safety margin may be reduced:

- where congestion of buried cables renders it impracticable; or
- where surface obstructions limit the space available;

but only if the line of the cable has been positively identified by plans and confirmed by a locator.

113 Because of the difficulty in confirming depth, hand-held power tools should never be used over the cable unless either:

- the cable has already been exposed by digging under the surface to be broken out and it is at a safe depth (at least 300 mm) below the bottom of the hard surface material; or
- physical precautions have been taken to prevent the tool striking the cable.

Cables in concrete

114 Excavating close to electricity cables buried in concrete is dangerous. For this reason alone electricity cables should not be buried in concrete and the owners should ensure that their own employees and contractors are aware that this practice is unacceptable.

115 Using mechanical means to break up concrete can cause damage to cables and if the cable is live, anyone present is likely to be injured.

116 Careful planning is important to find alternative routes or, failing that, to arrange for the cable to be made dead (see also paragraph 103 and the footnote to paragraph 32). Cable owners are likely to want to attend the site to verify the circumstances surrounding any request to make dead. Electricity companies should co-operate, subject to the request being reasonable, and deal with the request as soon as possible. An alternative supply or bypass arrangement could be used to help allow the cable to be made dead.

117 **Work with the cable live should only be done if it is unreasonable in all the circumstances for the cable to be dead and suitable precautions are taken to prevent injury.** If there is no alternative route, and the cable cannot be made dead, then alternative safe methods of excavation should be agreed with the cable owners. Remember that powered hand tools used close to live cables are likely to represent the greatest risk of injury.

118 When excavation can proceed safely only after a buried cable has been made dead, and where permits-to-work or other safety documents are used, the parties involved should continue to liaise to ensure that work covered by the permit is completed, and workmen are clear, before the circuit is re-energised. Where it is clear there is a risk of damage to a cable during the course of any work, the owner may wish to have a presence on site.

119 Where mechanical excavators are used in the possible vicinity of underground cables, the work should be arranged so that damage to cables is avoided so far as is reasonably practicable and so that everyone is kept well clear of the excavator bucket while it is digging. Drivers should have been instructed to stay in the cab if a cable is struck. If they have to leave the cab, they should jump clear. If drivers climb down, they may be electrocuted. When a cable is struck, a watch should be kept on the machine and no one should go down into the excavation or approach the mechanical excavator or the cable until the cable owner has made the damaged cable safe.

120 With electricity cable accidents, there may be flash burns, spatter burns from molten metal, electrical burns and direct electric shock. Direct electric shock is rare. Where electricity cables may be encountered during excavation work, employers should consider in their risk assessments whether the work justifies wearing clothing designed to protect against electric arc, or flame-retardant clothing. Advice on the suitability and performance of personal protective clothing should be

available from reputable companies specialising in its supply.

121 Where cables have been exposed:

- any damage should be reported to the cable owners immediately and work should not be undertaken in the vicinity of a damaged cable until the owner has investigated its condition;
- for more than 1 m and they cross a trench, support should be provided. Where advice and help is needed to do this, the cable owner should be contacted. If the exposed cable length is shorter than 1 m, support should still be considered if joints have been exposed or the cable appears otherwise vulnerable to damage;
- suitable precautions should be taken to prevent damage from ongoing work in the excavation. This may involve for example the use of physical means (eg timber boards, sandbags etc) to prevent mechanical damage. Materials or equipment which could damage or penetrate the outer sheath of the cable should not be used. Cables lying in the bottom of an excavation are particularly vulnerable and should be protected by nail-free wooden planks, troughing or other suitable means;
- cables should not be moved aside unless the operation is supervised by the cable owners;
- precautions should be taken to prevent access by members of the public, especially children.

Gas pipes

122 Most underground gas pipes are operated by either BG Transco or other public gas transporters (PGT) (look under 'Gas' in the telephone directory). The main exception is estates fed from bulk-stored liquefied petroleum gas (LPG) where the pipes may be owned by the estate owners or other private individuals. In the latter case, owners/managers should be able to provide information, but on certain estates (for example caravans or other rented accommodation) owners and managers may not be available round the clock. Further information may also be obtained from the LPG supplier whose name and telephone number (manned 24 hours) should be displayed at the bulk storage vessel compound, or, for buried LPG tanks, at the segregated area above the tanks. The risk from leaking LPG is greater than from a natural gas leak as it is heavier than air and does not disperse so readily. It can also travel great distances below ground level before accumulating at low level.

Planning the work

123 It is important that the location of underground gas pipelines is considered when planning building, excavation, landfill or other such work. Such activities may either cause damage to the pipelines or deny access to them for maintenance purposes. Early contact at the planning stage is very important as it will allow full discussion of proposals to ensure the safety of plant and operators.

124 Where heavy plant may have to cross the line of a gas pipe during construction work, the number of crossing points should be kept to a minimum. They should be clearly indicated and crossings not allowed at other places along the line of the pipe. Where the pipe is not adequately protected by an existing road, crossing points should be suitably reinforced with sleepers, steel plates or a specially constructed reinforced concrete raft as necessary. The pgt will advise on the type of reinforcement necessary.

Plans

125 Plans do not normally show the position of service connections and their

existence should be assumed. It may be possible to estimate the probable line of the service connection pipe from the gas meter position, or from the point of entry into the premises.

126 Gas plant may also be shown by PGT valve boxes, pits and housings. However, covers for valve boxes and pits will sometimes not show clearly whether gas is the service present; if in doubt, contact the PGT. Pits and housings may also indicate the presence of small-bore control pipes.

127 Where the presence of gas pipes which operate at pressures of 2 bar (30 psig) and above is indicated, consult the pgt before work begins.

128 An example of a plan of underground gas pipes is shown in Figure 8.

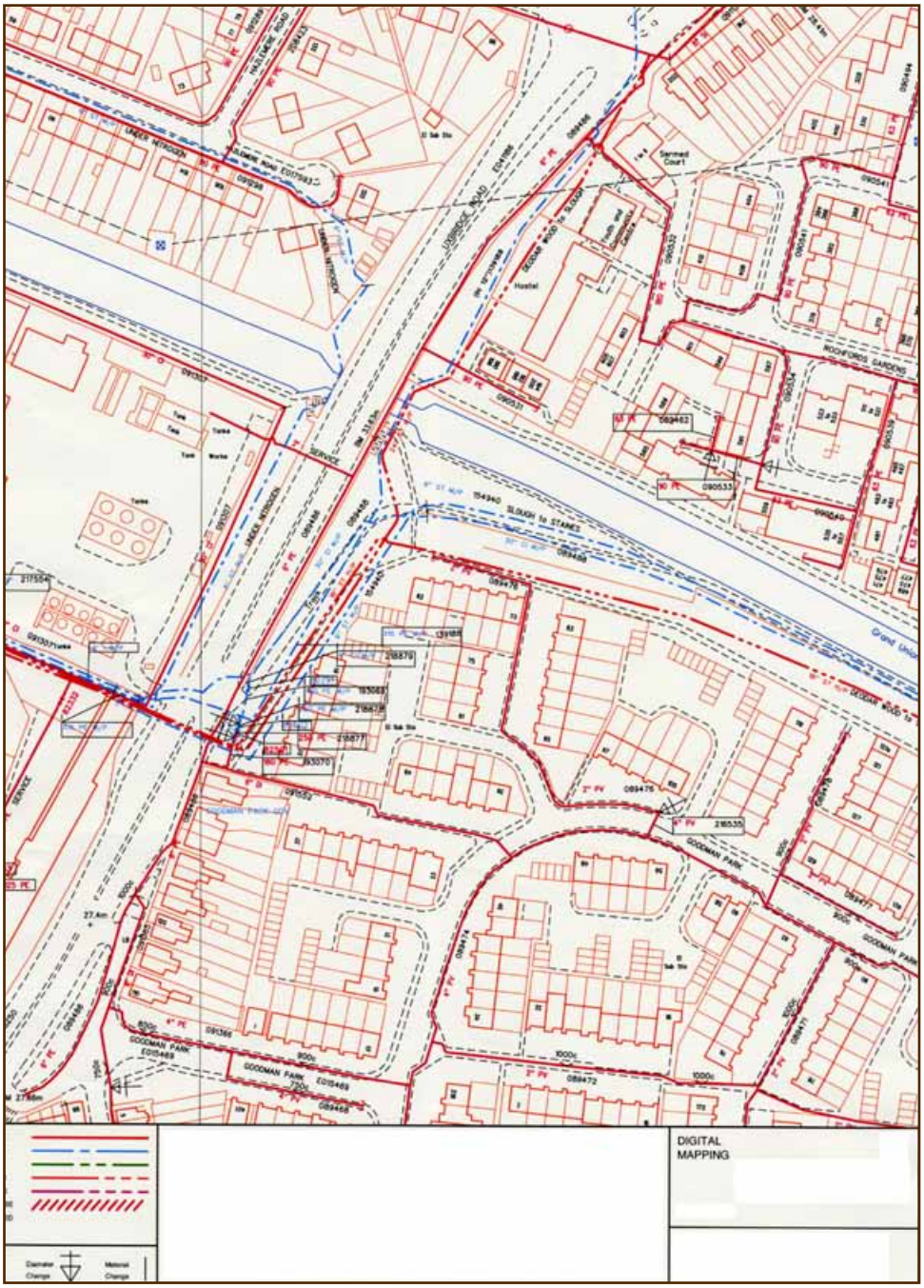


Figure 8 Example of a plan of gas pipes

Pipe-locating devices

129 Radio frequency detection or transmitter/receiver types of locating device should be used to help locate metallic gas pipes before excavation. However, many gas pipes are made of polyethylene (PE) and unless they incorporate a tracer wire, these cannot be traced by such devices. As a result it is especially important to use plans and safe digging practices.

Safe digging practice and avoidance of long-term damage

130 The depth of cover for gas mains laid in a roadway is normally about 750 mm, and for those laid in a footway about 600 mm. The depth of cover for gas service connections is normally about 450 mm in both roads and footways. However, on private property, including at entry positions to buildings, the depth of cover for the service connection may be less, about 375 mm. High-pressure gas transmission pipelines are usually buried with at least 900 mm cover. Remember that these depths **are only a guide**, and that pipes may be found at shallower depths.

131 Gas pipes are generally laid directly in the ground, although in certain soils selective backfill may have been used as a bed and pipe surround and on occasion pipes may be laid in ducts. Ductile iron pipe will sometimes be found wrapped in loose-fit polyethylene (PE) sleeving as protection against corrosion. PE mains may be inserted into redundant iron gas mains and PE service connection pipes may be inserted into yellow convoluted ducting on new housing estates.

132 Markers may also have been used to indicate gas services, namely:

- marker tiles, which may have been used above gas pipes, for example when they have been laid at shallow depths in bridges or above cellars;
- coloured plastic markers, including for PE mains (see Figure 9);
- marker posts/plates, which may show the position and size of valves or test points on gas mains.

Figure 9 Yellow plastic tape, laid above a gas pipe

However, such markers may have been disturbed and should not be relied upon as an accurate indicator of position.

133 PE gas pipes should be located by hand digging before mechanical excavation begins. This may also be necessary for metallic pipes if they have not been successfully located by a pipe-locating device. This is particularly important for service connection pipes which will not be marked on plans. A suitable hand digging method is to dig a trial trench along the road near the kerb or in the footway where the service connection pipes are likely to be at their shallowest. When the positions and depth of the pipes have been determined, work can proceed.

134 Gas pipes may have projections such as valve housings, siphons and stand pipes which are not shown on the plans. To allow for this, mechanical excavators should not be used within 500 mm of a gas pipe. Greater safety distances may be advised by the PGT or operator, depending on pressure.

135 The danger created by damaging a gas pipe with an excavator is much greater than if the damage is done with a hand-held power tool (the opposite is true for work near electricity cables and this is reflected in the different safe digging practices). It is worth remembering that the effects may not only occur at the point of impact, for example:

- damage to a service connection may result in unseen damage to the connection inside the building;
- gas from a damaged pipe may travel along the line of a service pipe into a building, causing a dangerous build-up of gas there.

136 Hand-held power tools can also damage buried gas pipes and should be used with care until the exact position of a buried pipe has been determined. They may be used to break a paved or concrete surface above a gas pipe, unless there are any indications that the pipe is particularly shallow or close to the surface to be broken up.

137 Where pipe restraints or thrust blocks are close to gas mains, these (and the ground supporting them) should never be disturbed, as this can cause sudden failure of the main.

138 Because of the risks they pose, the following should not be undertaken without consultation with the PGT:

- the use of explosives within 30 m of any gas pipe;
- piling or vertical boring within 15 m of any gas pipe;
- excavation work within 10 m of any above-ground gas installation;
- building a manhole, chamber or other structure over, around or under a gas pipe;
- work which results in a reduction of cover or protection over a pipe.

139 If welding or other hot work involving naked flames is to be carried out within 10 m of exposed gas plant, the pgt should be asked to check the atmosphere before work begins and monitoring should continue during the work. Care should be taken to ensure that no damage occurs, particularly to plastic gas pipes or to the protective coatings on other gas pipes.

140 If a gas leak is suspected, repairs should not be attempted. Instead the following action should be taken immediately:

- evacuate everyone from the immediate vicinity of the escape. If the service

connection to a building or the adjacent main has been damaged, warn the occupants to leave the building, and any adjoining building, until it is safe for them to return;
- inform BG Transco by telephoning the gas emergency number 0800 111999. BG Transco will inform other PGTs if necessary;
- prohibit smoking, and extinguish all naked flames and other sources of ignition, within **at least 5 m** of the leak; and
- help PGT staff, police or fire services as requested.

141 It is important to report any damage, however slight, to the owner. Where an excavation uncovers a gas pipe with a damaged wrapping, the owner should be told so that repairs can be made to prevent future corrosion and leakage.
142 Where gas pipes cross or run alongside excavations, changes in backfill etc may cause differential ground settlement and increased stress in the pipe. For pipes alongside excavations, the degree of risk depends upon the depth of the excavation, the distance of the pipe from the excavation and the type of soil. Wherever an excavation may affect support for a gas pipe, the owner should be consulted. In some cases it may be necessary to divert the gas pipe before work begins. Further information is contained in the *Model consultative procedure for pipeline construction involving deep excavation*.[18]

143 When backfilling an exposed gas pipe, the following should be observed:

- backfill material adjacent to gas plant should be suitable fine material or sand, containing no stones, bricks or lumps of concrete;
- the backfill should be suitably compacted. Where the excavation has exposed an existing gas pipe, compaction should give comparable support and protection to that before the excavation. In all situations, compaction beneath the pipe is particularly important to prevent any settlement which would subsequently damage the pipe;
- there should be no power compaction until 200 mm cover of selected fine fill has been suitably compacted;
- concrete backfill should not be used within 300 mm of a gas pipe.

144 If road construction is close to the top of a gas pipe, the owner/operator should be asked about necessary precautions. The road construction depth should not be reduced without permission from the local highway or roads authority.

145 Anyone who carries out work near underground gas plant should observe any specific requirements made by PGT staff, and ensure that access to the plant by those staff is available at all times. No unauthorised repairs to gas pipes should be made. **If in doubt, seek advice from BG Transco or the other appropriate PGT, if different. The addresses and telephone numbers for all emergencies and enquiries can be found in the telephone directory under 'Gas'.**

Water pipes and sewers

146 To avoid the effects of frost, water mains and sewers are generally laid at depths of 900 mm or more; water services to premises are normally at about 750 mm cover, unless local circumstances necessitate shallower depths. In general, work near underground water pipes is of low risk and most precautions are more concerned with reducing the cost of damage than with eliminating hazard. However, there are some dangers, and precautions should include:

- where work is carried out near water mains, plans should be obtained from the relevant water company and a pipe locator used. However, plastic pipes will

not be detectable by most locating devices. Safe digging practices should be followed, using hand tools as far as is practicable;
- at bends in mains, concrete thrust blocks may be used. Under no circumstances should either thrust blocks or the ground supporting them be disturbed, as this can cause sudden failure of the main;
- exposed water pipes should be supported as necessary and the correct method of backfilling used. For advice, contact the relevant water company or water authority;
- if a water pipe or its wrapping is damaged, the relevant water company or water authority and the owners of any other underground services which may be affected should be informed immediately. Unauthorised repairs should not be made.

Other pipelines

147 Other pipelines are used to convey a wide range of fluids including oils and other petrochemicals, ethylene, oxygen, nitrogen and similar industrial gases and a number of other chemicals.

148 The more hazardous of these pipelines (known as major accident hazard pipelines) will not normally be found in residential areas. They are usually in rural areas and often near chemical and petrochemical installations. Cross-country pipelines are also found in agricultural land. They usually cross roads, railways and motorways etc at right angles.

Planning the work and plans

149 It is important to consider the location of underground pipelines before carrying out building, excavation, landfill, or other such work. Such activities may not only cause damage to pipelines but could also affect access to them for maintenance purposes in the future.

150 Signs indicating the presence of buried pipelines should be looked for, for example marker posts often show where pipelines cross roads and other boundaries. Both the landowner and local authority should be contacted for further information; it is a statutory requirement for plans of pipelines to be lodged with local authorities.

151 Liaison with the pipeline operator is important, as information can be provided about not only the location but also the nature of the fluid being transported, any restrictions on excavations in the vicinity of the pipeline, the precautions to be taken during excavating and action to be taken in an emergency. Accordingly, where work is proposed near pipelines, the specific requirements of pipeline operators should be adhered to.

Pipe locators

152 The majority of these pipelines are of welded steel construction and locators of the radio frequency detection or the transmitter/receiver types can be used to locate them before excavation.

Safe digging practice

153 These pipelines may be laid directly in the ground, although sometimes selective backfill will have been used as a bed and pipe surround. They are normally buried with at least 900 mm cover and may be even deeper where they cross roads and railways. Therefore they are unlikely to be affected by shallow excavations.

154 Although marker posts/plates are sometimes used to indicate the position, size

and ownership of pipelines, such markers may have been disturbed and should not be relied upon as an accurate indicator of position.

155 Pipelines should be located by hand digging before mechanical excavators are used nearby. In any event, mechanical excavators should not be used within 500 mm of a pipeline.

156 Most pipelines will be protected against corrosion by a coating. This will normally be:

- coal tar or bitumen - coloured black sometimes with traces of white limewash;
- polyethylene cladding - usually yellow; or
- fusion-bonded epoxy powder - can be any colour - usually green or beige.

157 Some pipelines will be protected against corrosion by an alternative method known as cathodic protection, which will be linked to the pipeline by cabling. Both pipeline coatings and cathodic protection systems are susceptible to damage, even with hand tools, so great care is needed when excavating and backfilling and physical means of prevention (such as boards etc) should be used where appropriate. It is important to report to the owner/operator any damage, including to the corrosion protection, before the service is reburied.

Telecommunication cables

158 Owners of the cables should be consulted on precautions, to avoid costly damage. No special precautions are required to prevent danger.

First aid

159 Workers should know how to give emergency aid until help arrives. Competence in cardiopulmonary resuscitation and the immediate care of burns and unconsciousness would be an advantage. Help should be sought quickly if there is a serious accident and in remote locations means such as mobile phones, two-way radios etc may be the only way of doing this.

160 A casualty should not be moved unless in a position of danger. This is particularly important when the person has been thrown some distance and may have suffered injuries other than burns. People giving first aid should take care not to touch any exposed cables or tools that may be live.

161 Electric shock may cause unconsciousness, and the heart and breathing may stop; urgent action is then needed. It is essential to establish a clear airway and cardiopulmonary resuscitation should be given as soon as possible by someone competent and trained to do so.

162 Electrical burns are deceptive, with underlying damage possibly far more serious than appears on the surface. A sterile covering should be placed over the affected areas as soon as possible to reduce the risk of infection, and all burns cases should receive professional medical attention. Urgent help is essential for severe burns, which can prove fatal, and all cases of injury resulting from an electrical accident should be referred for professional treatment.

163 A first-aid container or small travelling first-aid kit should be provided with the standard contents as described in *First aid at work.*[19] There should be enough

provided for the number of employees involved. Sterile triangular bandages and sterile dressings can be used to cover burns and a sterile, individually wrapped, paper disposable sheet or similar sterile covering may be used for burns involving an extensive body area.

164 Advice on appropriate sources of first aid-training can be obtained from local offices of the Employment Medical Advisory Service.

Appendix 1 Legislation

1 The following summary outlines the main legal requirements which apply to work near buried services. The list is not exhaustive and does not give a definitive interpretation of the law. It summarises the main issues to bear in mind when carrying out such work.

The Health and Safety at Work etc Act 1974

2 The 1974 Act applies to all work activities whether or not the Construction (Health, Safety and Welfare) Regulations 1996[20] or the Construction (Design and Management) Regulations 1994[3] apply.

3 Section 2(1) imposes a duty on an employer to ensure so far as is reasonably practicable the health, safety and welfare of employees while at work. This extends to the provision and maintenance of safe systems of work as well as such information, instruction, training and supervision as is necessary.

4 Section 3(1) imposes a duty on employers to take precautions, so far as is reasonably practicable, to ensure the health and safety of people not in their employment. This duty could apply to any owner/operator of underground services, to clients, local authorities or other utilities or contractors who have the necessary records and other information required by other contractors or subcontractors. Section 3(2) imposes a similar duty on the self-employed for the health and safety of themselves and others.

5 Section 4(2) imposes a duty on people in control of non-domestic premises to ensure, so far as is reasonably practicable, the health and safety of people not in their employment who are using those premises. The definition of premises is wide-ranging and is not confined to buildings.

6 Section 7 imposes duties on each employee to take reasonable care for their own health and safety and for the health and safety of anyone else who may be affected by their acts or omissions at work, and to co-operate with their employer to enable the employer to comply with their duties.

The Management of Health and Safety at Work Regulations 1992

7 These Regulations require employers and the self-employed to assess the risks arising from work activities.[5] They should do this with a view to identifying the measures which need to be taken to comply with relevant health and safety legislation, therefore eliminating risks where possible and controlling those which remain.

The Construction (Design and Management) Regulations 1994

8 The Construction (Design and Management) Regulations 1994 apply to many construction projects (application is defined in regulation 3) and set out requirements in relation to their design and management. They place responsibilities on all those who can contribute to improving health and safety including clients, designers and contractors. Risks should be properly managed by action during the design, planning and execution phases of the project.

The Construction (Health, Safety and Welfare) Regulations 1996

9 These Regulations apply to construction work as defined by regulation 2(1) of the Regulations. They therefore cover most work in the vicinity of buried services. In particular, regulation 12(8) requires, where reasonably practicable, the identification of underground cables and services before work starts and positive action to prevent injury.

The Provision and Use of Work Equipment Regulations 1998

10 These Regulations require that equipment is maintained in good repair. Employers should ensure that employees who use work equipment or who manage or supervise its use, have received adequate training in the risks involved, methods of use and precautions to be adopted.

The Electricity at Work Regulations 1989

11 The Regulations require that those in control of part or all of an electrical system should ensure that the system is safe when provided, safe to use, and that it is maintained in a safe condition.[21] They also require that any work activity on or near an electrical system be carried out in such a manner as to prevent danger - excavation work should not be carried out unless all suitable and sufficient steps have been taken to identify and, as far as is reasonably practicable, prevent any risk from any underground cable or other underground electrical service (regulation 4(3)). Regulation 14 requires that work should not be done on or near a live conductor, where danger may arise, unless:

- it is unreasonable in all the circumstances for it to be dead; and
- it is reasonable in all the circumstances for the work to be done while it is live; and
- suitable precautions are taken to prevent injury.

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995

12 These Regulations require employers and the self-employed to report certain occupational injuries, diseases and dangerous occurrences[22,23] to the relevant enforcing authority (for incidents arising during excavation work this will almost certainly be the local office of the Health and Safety Executive).

13 Any injury which results in a worker being unable to carry out the full range of their duties for more than three days (including rest days and holidays) is reportable. There is also a range of injuries defined as major injuries. These include injuries from electric shock or electrical burns (including those from arcing), causing unconsciousness or requiring resuscitation or leading to hospitalisation for more than 24 hours.

14 Where there are no reportable injuries, underground electrical cable strikes become reportable as dangerous occurrences where the resulting fire or electrical explosion had the potential to cause death or if it puts the cable out of action for more than 24 hours.

15 Certain pipeline incidents, including gas escapes, are also reportable as dangerous occurrences by the operator of the pipeline. Schedule 2, part 1, paragraph 14 lists dangerous occurrences associated with pipelines which are

reportable. (Certain pipelines are exempted, corresponding to those to which the Pipelines Safety Regulations do NOT apply, eg water mains, drains and sewers.) The dangerous occurrences include:

- the uncontrolled or accidental escape of anything from, or inrush of anything into, a pipeline which has the potential to cause the death of, major injury or damage to the health of any person or which results in the pipeline being shut down for more than 24 hours;
- any damage to any part of a pipeline which has the potential to cause the death of, major injury or damage to the health of any person or which results in the pipeline being shut down for more than 24 hours;
- any substantial and unintentional change in the position of a pipeline requiring immediate attention to safeguard the integrity or safety of a pipeline.

The Gas Safety (Management) Regulations 1996

16 These Regulations are aimed at ensuring the natural gas distribution network is safely managed.[24] To deal with gas leaks, they require the following:

- BG Group plc (or its successors) to provide a continuously manned, national freephone telephone service, so that people can report gas escapes;
- where BG Group plc (or its successors) is notified of escapes they should straight away notify the relevant gas conveyor or emergency service provider;
- the relevant gas conveyor or emergency service provider should go to where the gas is escaping as soon as reasonably practicable;
- gas conveyors/emergency service providers should stop gas escaping within 12 hours.

17 Where a gas escape from a service pipe or main has or was likely to have resulted in a fire or explosion, then the gas conveyor has to ensure an investigation is carried out.

The Pipelines Safety Regulations 1996 (PSR)

18 These Regulations deal with the safe design, construction and operation of pipelines. The scope includes requirements that:

- no person shall cause such damage to a pipeline as may give rise to a danger; and
- pipeline operators shall take reasonable steps to inform people of the existence and whereabouts of a pipeline to prevent damage to it.

19 The Approved Code of Practice L81 *Design, construction and installation of gas service pipes*[25] gives practical guidance with the application of PSR with specific regard to gas service pipes. It requires gas service pipes to be installed in such a way that they are least likely to be affected by third party interference or subject to accidental damage.

Other legislation

*Gas Act 1995**

20 The Act updates provisions in the Gas Act 1986, including new licensing arrangements for public gas transporters, permitting competition in the domestic gas market.

New Roads and Street Works Act 1991 (NRSWA)†

21 This Act requires utilities and other undertakers (undertaker is a defined term under the Act) to give notice of their planned works under a variety of circumstances, depending upon the type of street in which the works are to be carried out and the type of works to be done. Emergency, urgent and some minor works can be started without issuing notice.

22 The Act also requires undertakers to record the location of apparatus belonging to them, to keep records up to date and to make them available for inspection at all reasonable hours, free of charge to any person having authority to carry out works in the street.

23 The terms 'emergency', 'urgent' and 'minor' works referred to above relate only to notifications for the purpose of the NRSWA and do not affect the legal obligations under the Health and Safety at Work Act (HSW Act) to give and obtain information needed to ensure safe working. While procedures under NRSWA may provide information needed under the HSW Act, owners of buried services will also need arrangements for providing such information in other cases, such as for 'emergency' works, to comply with HSW Act duties. HSW Act requirements apply to all work regardless of NRSWA classification and include work not covered by the NRSWA. There is also a specific duty on electricity companies to supply information under the Electricity Supply Regulations (see paragraph 25 below).

24 Section 67 of NRSWA requires that for any street works, work is supervised by a person qualified under the Street Works (Qualifications of Supervisors and Operatives) Regulations 1992. There also has to be an operative qualified under the same Regulations on site while work is in progress. These qualifications are certificates of competence issued by an Approved Body or an equivalent qualification issued in another EU state.

*Electricity Safety Quality and Continuity Regulations 2002***

25 A supplier of electricity has a duty under Regulation 15 of the Regulations to make and, so far as is reasonably practicable, keep up to date 'a map or series of maps indicating the position and depth below surface level of all his works'. The supplier must provide these maps free of charge to anyone who has good reason for requiring them. Regulation 14 of the Regulations imposes requirements for the protection of underground cables and also imposes requirements for the depth and manner of their installation.

Fire Services Act 1947

26 Section 16†† requires notice to be given to the fire authority of works which will affect a water supply or a fire hydrant.

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* Enforced by the DTI.
** Enforced by the DTI.
† Enforced by the highway or roads authorities.
†† Enforced by fire authorities.

Appendix 2 Suggested text for workers' information

Anyone who works near underground services should be properly trained in safe procedures. Information issued to employees can usefully supplement this training and act as a reminder of the main points. A suggested text is given below. It could be usefully adapted to meet the needs of individual organisations by adding supervisors' names, contact points etc.

Advice to site personnel when working near underground services

- Underground services, particularly electricity and gas, can be dangerous. Damage to electricity cables can cause a flash, leading to severe burns or even death. Gas leaks can cause fire or explosion.
- Damage can result from excavation or penetration of the ground, for example by a road pin.
- Underground services may be found in roads, footpaths and on sites. Always assume that they are present. Treat all services as LIVE, despite their apparent physical condition.
- Accidents have happened because people have mistaken one service for another, for example black plastic-covered electricity cables look like black plastic water pipes and cast iron gas and water mains look alike. Check before you act.

Before starting work:

- Make sure you have plans of the underground services in the area. This may not always be possible for emergency works. Remember that service connection cables and pipes from the main to a building or street light may not be shown.
- Use a cable- and pipe-locator to trace electricity cables and metal pipes. You should have been trained how to do this. If in doubt, or if you have any difficulty, ask your supervisor for advice.
- Mark the positions of the cables and pipes using paint or other waterproof marking on the ground.
- Look for signs of service connection cables or pipes, for example a gas meter or service connection entry into a house or a street light.
- Hand dig trial holes (as many as necessary) to confirm the position of services in the area of your work. This is particularly important if there are plastic pipes, which cannot be found using a locator.

When you start work:

- Wherever possible, hand dig near buried services. Spades and shovels are safer than picks, pins or forks.
- Check that any cable which is embedded in concrete and has to be broken out has been made dead before work starts, or that another safe way of working has been agreed with the cable owner (often the regional electricity company).
- Watch out for signs of services as work continues. Repeat checks with the cable- and pipe-locator as the excavation progresses.
- Backfill around services with a fine material. Do NOT use flints, bricks, mass concrete or similar material.
- Report any damage to a cable, pipe or pipe coating. Even if there is no immediate danger, damage could cause danger at a later date. Do not attempt repairs.
- Do not use hand-held power tools within 500 mm of the marked position of

an electricity cable (if the number of services present or surface obstructions makes this impossible seek further advice).

- Do not use hand-held power tools directly over the marked line of a cable unless:
  - you have already found the cable at that position by careful hand digging beneath the surface and it is at a safe depth (at least 300 mm) below the bottom of the surface to be broken; or
  - physical means have been used to prevent the tool striking it.
- Do not use a mechanical excavator within 500 mm of a gas pipe. If an excavator is used near an electricity cable keep everyone clear of the bucket while it is digging.
- Do not use exposed services as a convenient step or handhold.
- Do not handle or attempt to alter the position of an exposed service.
- Do not install plant close to an existing service. Ask your supervisor to tell you what the separation should be.
- Do not build existing services into a manhole or other structure or encase them in concrete.

If you suspect a gas leak:

- Evacuate everyone from the immediate area of the escape. Remember that if a service connection to a building has been damaged, it may cause a leak in the building. Warn the occupants of the building, and of adjoining buildings, to leave.
- Do not attempt repairs.
- Telephone BG Transco on 0800 111999 immediately.
- Ban smoking, naked flames and other sources of ignition within at least 5 m of the leak.
- Help Transco, the Police or Fire Services as requested.

REMEMBER - IF IN DOUBT, ASK.

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2 *Health and safety in excavations* HSG185 HSE Books 1999 ISBN 0 7176 1563 4

3 *Managing health and safety in construction: Construction (Design and Management) Regulations 1994. Approved Code of Practice and guidance* HSG224 HSE Books 2001 ISBN 0 7176 2139 1

4 *A guide to managing health and safety in construction* HSE Books 1995 ISBN 0 7176 0755 0

5 *Management of health and safety at work. Management of Health and Safety at Work Regulations 1999. Approved Code of Practice* L21 (Second edition) HSE Books 2000 ISBN 0 7176 2488 9

6 *A guide to the Pipelines Safety Regulations 1996. Guidance on Regulations* L82 HSE Books 1996 ISBN 0 7176 1182 5

7 *Designing for health and safety in construction* HSE Books 1995 ISBN 0 7176 0807 7

8 *Recommendations for the exchange of records of apparatus between utilities* NJUG 9 National Joint Utilities Group 1994

9 *Dealing with reported gas escapes* IGE/SR/20 Institution of Gas Engineers 1998

10 *The identification of small buried mains and services* NJUG 4 National Joint Utilities Group 1995

11 *Specification for identification of pipelines and services* British Standard BS 1710: 1984 (1991)

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13 *Trenchless construction for underground services* Technical Note 127, available from Customer Services, Construction Industry Research and Information Association (CIRIA), 6 Storeys Gate, London SW1 3AU, Tel: 0207 222 8891

14 *Horizontal directional drilling and impact moling* IGE/SR/26 Institution of Gas Engineers 1999

15 *Recommended positioning of utilities' apparatus for new works on new developments and in existing streets* NJUG 7 National Joint Utilities Group 1997

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20 *Construction (Health, Safety and Welfare) Regulations 1996* SI 1592/1996 The Stationery Office ISBN 0 11 035904 6

21 *Memorandum of Guidance on the Electricity at Work Regulations 1989. Guidance on Regulations* HSR25 HSE Books 1989 ISBN 0 7176 1602 9

22 *A Guide to the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995* L73 HSE Books 1999 (Second Edition) ISBN 0 7176 2431 5

23 *RIDDOR explained. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995* Leaflet HSE31(rev1) HSE Books 1999 (single copy free or priced packs of 10 ISBN 0 7176 2441 2)

24 *A Guide to the Gas Safety (Management) Regulations 1996. Guidance on Regulations* L80 HSE Books 1996 ISBN 0 7176 1159 0

25 *Design, construction and installation of gas service pipes. The Pipelines Safety Regulations 1996. Approved Code of Practice and guidance* L81 HSE Books 1996 ISBN 0 7176 1172 8

Further information

HSE guidance

Health and safety in construction HSG150 (Second edition) HSE Books 2001 ISBN 0 7176 2106 5

Construction Information Sheets:

Safety in excavations CIS8(rev1) HSE Books 1997

Construction (Design and Management) Regulations 1994: The role of the client CIS39 HSE Books 1995

Construction (Design and Management) Regulations 1994: The role of the planning supervisor CIS40 HSE Books 1995

Construction (Design and Management) Regulations 1994: The role of the designer CIS41 HSE Books 1995

Construction (Design and Management) Regulations 1994: The pre-tender stage health and safety plan CIS42 HSE Books 1995

Construction (Design and Management) Regulations 1994: The health and safety plan during the construction phase CIS43 HSE Books 1995

Construction (Design and Management) Regulations 1994: The health and safety file CIS44 HSE Books 1995

For information about health and safety ring HSE's Infoline Tel: 0845 345 0055 Fax: 0845 408 9566 Textphone: 0845 408 9577 e-mail: hse.infoline@natbrit.com or write to HSE Information Services, Caerphilly Business Park, Caerphilly CF83 3GG.

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NJUG publications are available from NJUG, 30 Millbank, London SW1P 4RD, Tel: 0207 963 5720. Website: www.njug.org.uk.

IGE publications are available from Institution of Gas Engineers and Managers, Charmwood Wing, Ashby Road, Loughborough, Leicestershire LE11 3GR. Tel: 01509 282728 Fax: 01509 283110. Website: www.igem.org.uk.

Appendix III:

Designers' Risk Assessments
Edge Property Solutions

Design Stage: Architectural Tender Design
Project No: 19-197 Project Title: Pinner Park Extension and Adaptation Works Date: 04.06.2020
Prepared by: Joseph Matthews Client: Harrow Borough Council

Activity/Element	Hazard/Risk	Population at Risk	Initial Risk Rating (Severity / Probability)	Action Taken at Design Stage	Residual Risk Rating (Severity / Probability)	Possible Controls for Residual Risks during	
Contractor Access/Segregation	Medium	Contractor, school staff, pupils, Site Visitors, local residents	Severity: M; Probability: M	Access Route agreed site segregation included within design	Severity: M; Probability: L	Construction Maintenance	Set delivery times Maintain Hoarding N/A
Material Delivery	Medium	Contractor, school staff, pupils, Site Visitors, local	Severity: M; Probability: M	Deliveries at agreed times.	Severity: M; Probability: L	Construction Maintenance	Set delivery times Maintain Hoarding N/A
Falling objects	Medium	Contractor, school staff, pupils, Site Visitors, local	Severity: M; Probability: M	Fencing and Hoarding used to separate areas and scaffolding erected away from the hoarding.	Severity: M; Probability: L	Construction Maintenance	Edge Protection N/A
Scaffolding Safety	Medium	Contractor, school staff, pupils, Site Visitors, local	Severity: M; Probability: M	Edge Protection provided to all scaffolding to prevent object/operatives falling	Severity: M; Probability: L	Construction Maintenance	Edge Protection Trained Operatives N/A
Roof torch on laying	Medium	Contractor, school staff, pupils, Site Visitors, local	Severity: M; Probability: M	Edge Protection provided to all scaffolding to prevent object/operatives falling	Severity: M; Probability: L	Construction Maintenance	Fire fighting equipment Fire watch at end of day N/A
COVID 19	Medium	Contractor, school staff, pupils, Site Visitors, local residents	Severity: M; Probability: M	Requesting COVID-19 practices, increased WC provision, asking for increased hygiene standards	Severity: M; Probability: H	Construction Maintenance	social distancing COVID 19 inductions N/A
Escape Routes during Works	Medium	Contractor, school staff, pupils, Site Visitors	Severity: M; Probability: M	Escape routes during works included on drawings	Severity: M; Probability: L	Construction Maintenance	Set delivery times Maintain Hoarding N/A
Asbestos containing materials on site	Low	Contractor, school staff, pupils, Site Visitors	Severity: M; Probability: M	R&D survey completed and removal of ACMs planned into works	Severity: M; Probability: L	Construction Maintenance	ACMs removed before works commence N/A
Falling from Height	Medium	Contractors, Site Visitors	Severity: M; Probability: M	Works at height only to be carried out by those with sufficient experience and training to do so. Appropriate PPE to be used	Severity: M; Probability: L	Construction Maintenance etc.	Edge Protection Triple glazed rooflight

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Damaging services/ground investigation	Severity H				Action Taken at Design Stage	Surveys completed prior to Tender for Contractor reference	Severity H					
Hazard/Risk	Medium	Severity M						Severity M				Construction	
Population at Risk	Contractors, Site Visitors	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Demolition	Severity H				Action Taken at Design Stage	Demolition works only to be carried out by those with sufficient experience and training to do so. Appropriate PPE to be used	Severity H					
Hazard/Risk	Medium	Severity M						Severity M				Construction	
Population at Risk	Contractors	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Disabled Access	Severity H				Action Taken at Design Stage	Disabled access maintained throughout the works with temporary ramps and large openings.	Severity H					
Hazard/Risk	Low	Severity M						Severity M				Construction	
Population at Risk	Contractors, site visitors, School staff, pupils	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Heavy building materials	Severity H				Action Taken at Design Stage	Contractor to adhere to risk assessments and Method statements outlining safe practices for lifting and moving materials	Severity H					
Hazard/Risk	Low	Severity M						Severity M				Construction	
Population at Risk	Contractors	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Access for maintenance	Severity H				Action Taken at Design Stage	Maintenance access designed into the proposals	Severity H					
Hazard/Risk	Low	Severity M						Severity M				Construction	
Population at Risk	School staff	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Electrical Wires	Severity H				Action Taken at Design Stage	Wires to be redirected as part of the works. Only trained competant operatives allowed to carry out works.	Severity H					
Hazard/Risk	Medium	Severity M						Severity M				Construction	
Population at Risk	Contractors	Severity L						Severity L				Maintenance etc.	

		Initial Risk Rating						Residual Risk Rating					
			Probability						Probability				
			H	M	L				H	M	L	Possible Controls for Residual Risks during	
Activity/Element	Safeguarding	Severity H				Action Taken at Design Stage	Design incorporating safeguarding measures through the construction works and into the completed works.	Severity H					
Hazard/Risk	Medium	Severity M						Severity M				Construction	Hoarding
Population at Risk	Contractors, site visitors, School staff, pupils	Severity L						Severity L				Maintenance etc.	

Appendix III:

Designers' Risk Assessments
DGA Consulting Engineers

DESIGNERS RISK ASSESSMENT

Client:	*Pinner Park School*
Project Reference / Details:	*Reception Extension Project* *Pinner Park School*
Designers:	**M & E Services Works**
	DGA Consulting Engineers Ltd *1 Mill Lane, Heather, Coalville, Leicestershire LE67 2QF*
H&S Advisor:	*WSP Safety*
Date Issued:	*02-06-2020*
Revision:	*1.*

DESIGNERS RISK ASSESSMENT (BUILDING WORKS)

Client: *Pinner Park School*

Project Reference / Details: *Reception Extension Project*
Pinner Park School

Specific Details

Sheet 1 of 3

TASK / ITEM	RISK / HAZARD	CONTROL / INSTALLATION	ADDITIONAL COMMENTS
01) Occupied Premises	*Injury to occupants and public.*	*Provide adequate hoardings and barriers to ensure safety of occupants and public.*	*Provide method statement*
	Fire escape routes.	*Maintain all fire escape routes throughout duration of works.*	
02) Access / Deliveries	*Restricted space.*	*Keep the works and site clean and tidy.*	*Provide method statement*
	Material and plant delivery vehicles.	*Ensure drivers of all vehicles are adequately trained and certified.*	
03) Existing structure	*Presence of Asbestos.*	*Confirm no asbestos other than already identified.*	*Inform employer if found and arrange removal by specialist*

TASK / ITEM	RISK / HAZARD	CONTROL MEASURES	ADDITIONAL MEASURES
04) Demolitions and Removals	*Injury from collapse of existing structure.*	*Provide adequate temporary support to existing structure, wear protective equipment, clothing and head gear and protect temporary exposed ends.*	*Provide method statement.*
	Falling objects.	*Wear protective equipment and head gear.*	
	Working at heights.	*Provide adequate scaffolding to full height, guardrails and safety harnesses.*	
	Noise and vibration.	*Wear protective equipment.*	*Obtain permit to work.*
05) Construction	*Handling.*	*Avoid manual handling where possible.*	*Provide adequate resources.*
	Falling objects.	*Wear protective equipment and headgear.*	
	Working at heights.	*Provide adequate scaffolding to full height, guard rails and safety harnesses.*	*Barrier-off area below and post suitable notices.*
	Chemical injury from concrete and sealants.	*Wear protective equipment.*	
	Dust.	*Wear protective equipment.*	*Seal off site to avoid contamination of patient areas.*
	Fixings etc.	*Wear protective equipment and use suitably qualified personnel for power tool operation.*	

TASK / ITEM	RISK / HAZARD	CONTROL MEASURES	ADDITIONAL MEASURES
	Injury from splinters and nails.	*Wear protective equipment*	
	Noise and vibration.	*Wear protective equipment.*	
06) Generally	*Injury from fire/burns.*	*No flame equipment allowed on site unless approved by Contract Administrator.*	*Provide extinguisher on site and obtain permit to work from Estates Department.*
	Noise and vibration.	*Wear protective equipment.*	*Obtain permit to work from Estates Department.*
06) Electrical	*Electrocution*	*No live working* *Distribution boards to be isolated by Client's staff or Agent, & reinstated upon the satisfactory completion & testing of the works.*	*Electrician to make arrangements with Site Manager to isolate/reinstate.*
07) Electrical Equipment	*Electric shock*	*All power tools must be P.A. Tested in accordance with the Electricity at Work Act*	
08) Hot Work/Work involving Flammable Substances	*Fire/explosion*	*Flammable substances shall be kept in flame proof stores whilst not in use. Extinguishers must be kept at hand.*	*A permit to work must be obtained from the Principle Contractor.*
09) Working with substances hazardous to health	*Risks to health of operatives*	*All materials to used in strict accordance with COSHH requirements*	
10) Working in Confined Spaces	*Risks to health of operatives*	*A minimum of two men must work together in confined spaces. Respiratory equipment must be provided.*	*A permit to work must be obtained from the Principle Contractor..*

11) Hidden Services	*Risks to health of operatives & client's Staff*	*Location of hidden services must be determined*	
12) Existing Plantroom & Voids	*Risks to occupants*	*Ensure awareness of other procedures and work taking place. Ensure safe route through operating plant.*	*A permit to work must be obtained from the Principle Contractor.*
13) Other Hazards	*Risks to health of operatives & to occupants and public*	*Constant vigilance.*	
14) Removal of existing	*Risks to health of operatives*	*Ensure isolated and cold before removal. Ensure correct service being disconnected. Safely collect refrigerant before breaking DX refrigeration systems.*	*A permit to work must be obtained from the Principle Contractor.*
15) Heavy Equipment	*Risks to health of operatives*	*Consult HSE*	*Use lifting gear. Ensure loads are secure. Provide safety barriers for personnel.*
16) Rooftop work	*Risks to health of operatives*	*Consult HSE*	*Ensure safety rail in place before commencing. Use safety harnesses if required.*
17) High level services	*Risks to health of operatives*	*Consult HSE*	*Use access platform. Ensure high-level platforms are on level ground.*

DESIGNERS RISK ASSESSMENT

Client: *Pinner Park School*

Project Reference / Details: *Reception Extension Project*
Pinner Park School

At the time of Tender, the Tenderer / Contractor shall complete the column 'Method Details' giving his method statements for each item.

ITEM	TASK / HAZARD	METHOD DETAILS
01)	***Occupied Premises***	
02)	***Access / Deliveries***	
03)	***Existing Structure***	

ITEM	TASK / HAZARD	METHOD DETAILS
04)	***Demolitions and Removals***	
05)	***Excavations and Foundations***	N/A
06)	***Steelwork Erection***	
07)	***Welding and Hot Work***	
08)	***Masonry Construction***	N/A
09)	***Timber Construction***	N/A

ITEM	TASK / HAZARD	METHOD DETAILS
10)	***Working at High Level***	
11)	***Rooftop Work***	
12)	***Overhead Work***	
13)	***Working with or near Electric Cables etc.***	
14)	***Work involving Flammable Substances***	
15)	***Working in Confined Spaces***	

ITEM	TASK / HAZARD	METHOD DETAILS
16)	***Working in Sensitive Areas***	
17)	***Working on Public Roads or Footpaths***	
18)	***Existing or Buried Services***	
19)	***Drainage Works***	
20)	***Other Hazards***	

Tenderer / Contractor:

Date:

Appendix III:

Designers' Risk Assessments
Dice Consulting Engineers Ltd

Hazard Identification and Risk Register

This risk register is referenced to Civil & Structural Engineering services only and will be updated and issued accordingly. This Register should be read in conjunction with all other Design Team Members own Risk Assessments.

This risk Register will be updated periodically throughout the life of the project and checked at key project review stages by the PM, who will approve and sign off all DRA's up to that review period.

PROJECT: Pinner Park School, Harrow
JOB NUMBER: 100428
CLIENT: Edge
SHEET NUMBER: 1
PROJECT MANAGER: RS

Dice

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Nottingham
NG1 1HS
T: +44 (0) 1159 528 752
E: info@diceconsult.co.uk

				RISK REVIEW 'RR1' - FEASIBILITY STAGE				RISK REVIEW 'RR2' - SCHEME/DETAILED DESIGN STAGE					RISK REVIEW 'RR3' - TENDER/CONSTRUCTION STAGE	RISK REVIEW 'RR4' HANDOVER STAGE
CORE ELEMENT	REF NO.	DATE	OWNER	RISKS WITH A DIRECT IMPACT ON DESIGN OR PROCESSES	INITIAL ASSESSMENT			MITIGATION STEPS	FINAL ASSESSMENT			DRAWING REF.	ON SITE ACTION REQUIRED	NOTES
					L	S	R1		L	S	R2			
GENERAL	1	20.05.20	RS	Shallow live services	1	4	4		1	4	4		Principal Contractor to ensure site operatives will be issued with existing services plans. Appropriate training and equipment to be issued to all operatives. Refer to and comply with HS (G) 47 "Recommendations on Avoiding Danger from Underground Services" and Health and Safety Executives Guidance Note GS6.	
GENERAL	2	20.05.20	RS	Deep excavations	1	3	3		1	3	3		Area marked with safety barrier and appropriate signage. Any groundworks to be supported during works to suit prevailing ground conditions in accordance with the method. The site operative is to assess the surrounding embankments whilst the work is being carried out and cease work if any earth movement/slip is observed. The opening should be back filled as soon as possible after completion.	
GENERAL	3	20.05.20	RS	Heavy lifting	1	3	3		1	3	3		Principal Contractor to ensure steelwork sub-contractor has experience of similar erection sequences and all RAMS are reviewed and approved.	
GENERAL	4	20.05.20	RS	Working at height	1	4	4		1	4	4		Works at height only to be carried out by those with sufficient experience and training to do so. Appropriate PPE to be used during works, e.g. hard hat, safety harness. Safety railings to mark boundary of works to minimise risk. On the ground below any works should be marked out as hazardous areas and only necessary personal to be working in the vicinity. Principal Contractor to establish a safe working regime.	
GENERAL	5	20.05.20	RS	Live sewer connections - gases, foul mains, surface water.	1	4	4		1	4	4		Operatives must have received adequate training, must be supplied with breathing and lifting apparatus and must be equipped with appropriate PPE, e.g. gloves.. Principal Contractor to prepare RAMS for all necessary tasks.	
GENERAL	6	20.05.20	RS	Demolition	1	4	4		1	4	4		Principal contractor to determine a safe demolition strategy.	

KEY: L= Liklihood, S=Severity (1 Low, 5 High), R* = Rating (LxS)
Refer to Risk Matrix (available on request)

PRE-CONSTRUCTION INFORMATION DOCUMENT

For

ALTERATIONS TO THE EXISTING MAIN ENTRANCE & FORMING OF LINK STRUCTURE TO CONNECT THE TWO SCHOOL BUILDINGS

At

Pinner Park Primary School
Melbourne Avenue
Pinner
Middlesex
HA5 5TL

Prepared by: WSP SAFETY LTD

Principal Designer:

James Durney

Reviewed by:

David Linnel

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