

## Designing for health - Guidance for designers

| Groundworks  |   |  |  | Ref No.<br>DfH003_18                           |
|--|---|--|--|--|
| Potential health impacts to be considered by the designer: |   | Concept Stage <input type="checkbox"/>   | Scheme Design Stage <input type="checkbox"/>   | Detailed design Stage <input type="checkbox"/> |
| Design Element   | Health Hazard   | Considerations   | Possible Solutions   | Linked to Ref No.                              |
| Site Clearance   | -   | -  | -  | DfH002_18                                      |
| Earthworks   | Chemical properties of substances in potentially contaminated ground. | In excavation or operations involving moving of material workers may come into contact with, ingest and/ or inhale substances harmful to health, for example during piling operations in:<br><br>dry conditions,<br><br>when transporting over site haul | Specific control needs should be flagged e.g. adjacent schools, residential property. Special measures may be required if site is contaminated. e.g., consider CFA piles instead of driven piles if dust would be a problem. | DfH002_18                                      |

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|  |  | <p>roads, or other excavation operations.</p> <p>When excavating in contaminated ground, e.g. derelict industrial sites, landfill sites, etc. or when excavating and/ or piling in spoil that is contaminated a range of different hazardous substances may be present.</p> | <p>A full ground contamination survey of is advisable to determine the nature and concentrations of any contamination or seepage and ensure that you alert tenderers.</p> <p>Note: Hazardous waste may no longer be disposed of with other waste. Duty of care in this respect is stringent. Further advice is available for the Environment Agency in your jurisdiction.</p>  |  |
|  | <p>Chemical properties of substances in seepage from adjacent premises or structure.</p> | <p>Tank farms, storage facilities, sites can contain hazardous substances and/ or gassing material, etc.</p>  | <p>Consider also the avoidance by anticipating use of trench-sheets which are incorporated into the permanent design, or similar cut-off measure.</p> <p>Design drainage and/ or foundations etc. to minimise need to enter excavation. e.g. specify casting against sides of excavation to avoid need for side shuttering.</p> <p>Minimise depth to founding or drainage level. (but note that most contaminants are located within the</p> |  |

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|  |   |   | top 1.5m depth)   |           |
| Soil Stabilisation                           | Lime  | Quicklime, hydrated lime or liquid lime that may be used in soil and subgrade stabilisation is an irritant to eyes, nose, throat and skin. It can cause skin burns also, while prolonged exposure has been known to lead to conditions such as ulceration/ perforation of the nasal septum, pneumonia and/ or bronchitis. | Used in road schemes with susceptible clays, you should consider designing for alternative stabilisation measures, or permit larger particle size within specification.   |           |
| Drainage                                     | Chemical properties of substances or contaminants/ pathogens in existing drains.<br><br>Leptospirosis or Weils Disease from contact with infected rats urine or contaminated water. | Exposure is likely when laying, making connections into existing drains or any other interaction with the existing drains (surveys etc.), in particular in old industrial sites, hospitals etc. where there is likely to be a range of various contaminants.  | Investigate previous use of site and whether it was of an industrial or similar nature. This will indicate whether any substances present are likely to be particularly hazardous.<br><br>Ensure that any ground investigation establishes the nature, concentration and spacial extent of contaminants in the soil and groundwater in terms of likely occupational exposure to the hazard.<br><br>See HSE guidance on Leptospirosis. | DfH002_18 |
| Constructing manholes, laying kerbs, paving, | Weight, shape and manoeuvrability of  | Handling heavy and/ or awkward shapes exposes workers to poor   | Consider the weights of components: can these be reduced (or even   |           |

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| other materials and the like. | kerbs, paving slabs etc.           | posture for prolonged periods, such as when handling, lifting and/ or laying of paving slabs etc., leading to musculoskeletal injury. | <p>increased) to avoid manual handling issues.</p> <p>Design to allow maximum use of mechanical lifting aids. Take advice from manufacturers and consider space requirements for these aids.</p> <p>There is a lot more advice and guidance on HSE's website</p> <p>Avoid need for work in one posture over long periods (e.g. kneeling) by designing to maximise opportunity for mechanical laying.</p> |                        |
|                               | NIHL<br><br>WRULD<br><br>Silicosis | Use of high-powered saws and/ or grinders expose workers to a range of hazards.   | Design to allow maximum use of standard components and minimise the number of cuts, or for cut components to be shaped off -site.  |                        |
| Concrete works                | -                                  | -   | -  | DfH004_17              |
| Piling (concrete)             | -                                  | -   | -  | DfH004_17<br>DfH005_18 |

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| Information to go to contractor:  |                              |  |
| Information to go to H&S File:  | Use <input type="checkbox"/> | Maintenance <input type="checkbox"/> Demolition <input type="checkbox"/> |
| <b>Further Information:</b><br>Handling kerbs: Reducing the risks of musculoskeletal disorders (MSDs): (HSE Guidance) - <a href="http://www.hse.gov.uk/pubns/cis57.pdf">http://www.hse.gov.uk/pubns/cis57.pdf</a><br>Harmful Micro-Organisms: Leptospirosis / Weil's Disease from rats (HSE Guidance) - <a href="http://www.hse.gov.uk/construction/healthrisks/hazardous-substances/harmful-micro-organisms/leptospirosis-weils-disease.htm">http://www.hse.gov.uk/construction/healthrisks/hazardous-substances/harmful-micro-organisms/leptospirosis-weils-disease.htm</a><br><br><b>Research</b> – None known at this time. |                              |  |

