MUSEUM OF LONDON ARCHAEOLOGY

C261 ARCHAEOLOGY EARLY EAST

Method Statement

Archaeological Targeted Watching Brief on River Lea Works

Pudding Mill Lane Portal

Document Number: C261-MLA-X-RGN-CR140-50036

Document History:

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SITE MANAGER RIVER LEA

2a. Principal Contractor review required? ☒ NO ☐
(If NO, strike out sections 2a & 2b and go to section 3)

This document has been reviewed by ROS O'FLYNN in the capacity of SECTION ENG. for coordination, compliance, integration, and acceptance as a safe system of work, output, control, sequence. This document is acceptable for transmittal to _____ for no objection to the works being executed as described.

Sign: _____ Name: ROS O'FLYNN Date: 18.01.13

2b. Review by Stakeholder (if required): YES ☐ NO ☒

Stakeholder Organisation	Job Title	Name	Signature	Date	Acceptance
					☐
					☐
					☐

3. Acceptance by *Crossrail*

	***Crossrail* Review and Acceptance Decal** This decal is to be used for submitted documents requiring acceptance by *Crossrail*.	
☑	Code 1.	Accepted. Work May Proceed
☐	Code 2.	Not Accepted. Revise and resubmit. Work may proceed subject to incorporation of changes indicated
☐	Code 3.	Not Accepted. Revise and resubmit. Work may not proceed
☐	Code 4.	Received for information only. Receipt is confirmed

Reviewed/Accepted by:(signature)	Print Name: J. CARVER	Position: ROS ABOUT	Date: 22/1/13

Acceptance by *Crossrail* does not relieve the designer/supplier from full compliance with their contractual obligations and does not constitute *Crossrail* approval of design, details, calculations, analyses, test methods or materials developed or selected by the designer/supplier.

Note for Readers

Various readers of this method statement and risk assessment are likely to be directly interested in different parts of the document. The following table is intended to help readers identify which sections cover their main interests.

Reader's main interest	Most relevant sections
Principal Contractor	2.1, 2.3 3.1 4 5 15 16 17 21 22
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1 Introduction

Archaeological investigations are to be carried out on this site by the Museum of London Archaeology (MOLA). The requirements are set out in:

- A Crossrail **Site-specific Written Scheme of Investigation** (SS-WSI): *Package C152 Pudding Mill Lane Portal, Archaeology Site-specific Written Scheme of Investigation, Doc. No. C152-SWN-C2-RSI-CR094_PT002-0001 Version 10*, 12.05.10 (Crossrail 2010a)
- An **Addendum to the WSI**: C152 – *Pudding Mill Lane Portal, Addendum to WSI: Trial Trench Evaluation, Watching Brief & Detailed Excavation* [sic] *(XSK10), Doc. No. C152-SWN-C2-RSP-CR094_PT002-50001 Revision 3.* 19.03.12. (Crossrail 2012)

The tasks which this method statement covers are Targeted Watching Briefs (TWB) on main construction works, and currently comprise:

Task	Principal Contractor	Provisional Programme
• **TWB: works within River Lea channel**	C305 Dragados Sisk jv (DSJV)	**Start:** approx. 29th or 30th January 2013 **Duration:** approx. 1 week
• **TWB: demolition and groundworks on western side of the River Lea**	C305 Dragados Sisk jv	Uncertain – will only happen if timber piles are found during investigation works on the east bank.

Table 1 Task information

This Method Statement has been developed in conjunction with the Principal Contractor, who will be responsible for ensuring that the archaeological works may be carried out as specified. The purpose of the targeted watching briefs is to mitigate the impact of the specified development works upon archaeological remains, by making an adequate record of them in during the construction ground works (a mitigation strategy of *preservation by record* in line with Crossrail requirements).

The Principal Contractor's document used in production of this method statement was:

- Dragados-Sisk Joint Venture, 2012, *C305 – Eastern Running Tunnels, Pudding Mill Lane Method Statement: River Lea – Excavate cofferdam & install framing, CRL Document Number: C305-DSJ-C-GMS-CR094_PT002-50003, v1* [DSJV method statement]

If the project design or scope/method of working are subject to changes during the works, the method statement will be updated and re-issued to the Project Archaeologist and CDM Advisor for approval, in accordance with the specified document control procedures (see 7).

1.1 Site Description

The Pudding Mill Lane Portal site is located south of the Great Eastern Main Line (GEML) railway embankment and mostly east of the River Lea, about 1km south-west of Stratford Station. The majority of the Crossrail works fall within the London Borough Newham, although a small number lie west of the Lea within the London Borough Tower Hamlets.

The River Lea worksite lies within and adjacent the river at the western end of the portal.

1.2 Geological and Topographical setting

The geological and topographical setting was covered in detail in the WSI (see section 1 above), and is summarised below.

The site lies mainly on alluvium within the floodplain of the River Lea. The gravel topography underlying the site comprises intercutting braided channels with raised gravel areas between them. The geo-archaeological assessment identified one such island in the central section of the site with a high point roughly between chainage 14500 and 14700. The assessment also identified peats and organic alluvial deposits site-wide, but concentrated in areas of lower gravel topography in the eastern and western parts of the site. The latter includes the River Lea worksite.

The targeted watching brief in the EIP/TBM chamber, some 15m to the east of the river, recorded the terrace gravels at *c* 100.4m ATD (MOLA 2012, see 1.3). However, the topographical modelling by Wessex Archaeology suggests that levels may be somewhat lower at the River Lea site than the EIP/TBM chamber to the east (Wessex Archaeology for Crossrail, *C262, Pudding Mill Lane Portal (XPM09), Geoarchaeological Assessment Report*, v1 March 2010).

Present ground levels in the Pudding Mill Lane area vary considerably due to railway and other construction, from *c* 101m to 105m ATD in the floodplain to the east of the River Lea, rising up to 104m to 110m ATD on the gravel terraces west of the Lea.

Within the modern channel of the River Lea, riverbed level is *c* 101.0m ATD (DSJV method statement, section 17). Adjacent ground level east of the river is *c* 104.6–104.8m ATD, and on the former wharf on the western bank *c* 105.1–105.25m ATD (Crossrail levels survey).

1.3 Archaeological and Historic Background

The archaeological and historic background was covered in detail in the WSI (see section 1 above), and only the archaeological potential of the site is summarised below.

1.3.1 Recent investigations

Earlier archaeological fieldwork has been conducted by C261 MOLA for Crossrail on the ‘dry land’ parts of the Pudding Mill Lane site, immediately to the east of the River Lea works. These are reported on in:

- MOLA for Crossrail, 2012a, *C261 Archaeology Early East, Interim Statement, Archaeological Evaluation, EIP/TBM Chamber, Pudding Mill Lane, XSK10*, doc no. C261-MLA-X-RGN-CR140-50057 v2 20.3.12).
- MOLA for Crossrail, 2012b, *C261 Archaeology Early East, Enhanced Interim Statement, Archaeological Excavation on EIP/TBM Chamber and Watching Briefs on Cut and Cover Section 1 and Barbers Road Utilities, Pudding Mill Lane XSK10*, Document Number: C261-MLA-X-RGN-CR140-50123 v2, 21.09.12

These revealed an alluvial sequence of historic date, from 100.4 up to *c* 103.5m ATD. Within the alluvial deposits were an extensive series of timber structures, interpreted as a fish weir or trap, which have been radiocarbon dated to the 13th to 15th centuries AD. The posts were driven up to *c* 0.5m into the terrace gravels. These horizons were overlain by 19th-century landfill dumps.

The majority of the Pudding Mill Lane site lies on alluvium (River Lea and to the east) and has:

- High potential for **post-medieval industry** including the foundations of the former buildings on site including the Soap Works, Gas Works, Tar Works, a house with formal gardens; and the remains of a timber yard;
- High potential for **geoarchaeological and palaeoenvironmental evidence** within the alluvial river/marsh sequence, located in the deeper off-island areas;
- Moderate to High potential for **late prehistoric remains**, comprising evidence for **dry land activity** such as Bronze Age and Iron Age artefacts and features (***in particular on raised gravel islands***); and **wetland activity** such as prehistoric artefacts, timbers, land surfaces and associated **palaeoenvironmental evidence**;
- Moderate potential for **medieval settlement and industry** (mainly to the west of the Lea), and for **timber structures** such as the possible fish trap/weir seen in the EIP/TBM chamber to the east;
- Low potential for **early prehistoric** (Palaeolithic, Mesolithic and Neolithic) activity;
- Low potential for **Roman activity** on both the terrace gravels and in the alluvial sequence;
- Low potential for **Saxon activity**.

1.4 Deposit Survival

The levels in 1.2 and 1.3 suggest that there is *at least* a 1.0m thickness of modern river bed and alluvial deposits, the latter forming a geoarchaeological deposit, with potential for archaeological remains of medieval or possibly earlier date (as above).

There are no data available to MOLA on how much of this thickness may be modern river bed/alluvium, and how much is of earlier date.

This material is currently sealed by *c* 3m of modern material laid down in 2012 (DSJV method statement).

2 Interfaces and Communication Plan

2.1 Interface with Project Archaeologist

The Method Statement will be submitted to the Crossrail Project Archaeologist for approval. Any comments will be incorporated. Regular progress reports will be submitted to the Project Archaeologist and will be augmented by progress meetings and site visits when required, in order to optimise communications and feedback.

2.2 Interface with C261 Contract Administrator

MOLA shall submit costings and timesheet reports in accordance with the C261 Contract to the Contract Administrator.

2.3 Interface with C305 Principal Contractor

MOLA has liaised with the C305 Principal Contractor (Dragados Sisk jv) to prepare this Method Statement. The archaeological investigations take place will be undertaken under the auspices and supervision of the Principal Contractor. This interface extends to joint Health and Safety planning under CDM requirements. MOLA will provide the Principal Contractor with all necessary information to support site start-up (eg names of staff for inductions), health and safety planning; and (if required) to support the Principal Contractor's Permits to Dig/Work. The majority of this information will be contained in this Method Statement. MOLA will liaise with the Principal Contractors regarding access, order of works, programme and commencement date. The Principal Contractor shall give MOLA 4 weeks notice of start date(s) for each work area or phase.

2.4 Interface with C152 Design Team

MOLA shall liaise with CRL Project Archaeologist, Jay Carver, to implement the correct archaeological design specification, described in the SS-WSI (Section 1 above).

2.5 Interface with External Consultees

The CRL Project Archaeologist shall liaise with GLAAS/English Heritage to inform them of the archaeological works.

3 Scope of Works

3.1 Planned Fieldwork Events

This Method Statement sets out the methodology and health and safety requirements for archaeological Targeted Watching Brief work to be carried out during construction works at the River Lea worksite of the Crossrail Pudding Mill Lane Portal. These currently comprise the two targeted watching briefs listed in Table 1 in section 1.

The mitigation strategy for the site is *preservation by record*.

3.2 Confirmation of Methods and Standards

The archaeological fieldwork and reporting will be conducted in accordance with the following guidance and standards:

- Brickley M and McKinley JI 2004. (eds.) Guidelines to the Standards for Recording Human Remains, BABAO/IFA paper no. 7
- Crossrail Environmental Minimum Requirements (Crossrail 2008)
- Crossrail Archaeology Generic Written Scheme of Investigation (draft July 2009)
- Crossrail Archaeology Specification for Evaluation & Mitigation (including Watching Brief) (CR-PN-LWS-EN-SP-00001)
- Crossrail Code of Construction Practice
- Crossrail, 2010a, *Package C152 Pudding Mill Lane Portal, Archaeology Site-specific Written Scheme of Investigation, Doc. No. C152-SWN-C2-RSI-CR094_PT002-0001 Version 10*, 12.05.10
- Crossrail, 2012, C152 – *Pudding Mill Lane Portal, Addendum to WSI: Trial Trench Evaluation, Watching Brief & Detailed Excavation* [sic] *(XSK10), Doc. No. C152-SWN-C2-RSP-CR094_PT002-50001 Revision 3.* 19.03.12
- English Heritage, 2006 Understanding Historic Buildings: A guide to good recording practice
- English Heritage, July 2009, Standards for Archaeological Work, London Region, External Consultation Draft
- English Heritage Centre for Archaeology Guidelines, Environmental archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (2002)
- English Heritage, 2004, Geoarchaeology: using earth sciences to understand the archaeological record
- Institute for Archaeologists (IFA) Standards and guidance for watching briefs and field evaluation (IFA 2001a and 2001b)
- Institute for Archaeologists (IFA), 2008 Standard and guidance for archaeological investigation of standing buildings or structures

- Mays S, Brickley M, and Dodwell N, 2002, Centre for Archaeology Guidelines. Human Bones from Archaeological Sites: guidelines for producing assessment documents and analytical reports. English Heritage
- McKinley, J and Roberts, C, 1993, Excavation and Post-Excavation treatment of cremated and inhumed human remains. IFA technical paper 13
- Museum of London Archaeological Site Manual, 3rd Edn (1994)
- Museum of London General Standards for the preparation of archaeological archives deposited with the Museum of London (1998)
- Museum of London (Powers N (ed.)), 2008, Human osteology method statement, http://www.museumoflondon.org.uk/NR/rdonlyres/2D513AFA-EB45-43C2-AEAC-30B256245FD6/0/MicrosoftWordOsteologyMethodStatementMarch2008.pdf
- Museum of London Archaeology Service (Powers N), undated, Guidelines for the assessment of inhumations and disarticulated bone, unpublished
- Royal Commission on Historical Monuments, England [RCHM(E)], 1996 Recording historic buildings: a descriptive specification
- United Kingdom Institute for Conservation's Conservation Guidelines No. 2

3.3 Aims and Objectives

3.3.1 Overall Research Aims

The original aims and objectives were listed in the WSI (Crossrail 2010) and stated that 'data collected from archaeological investigation and mitigation may contribute to the following research themes':

- Understanding London's hydrology, river systems and tributaries and the relationship between rivers and floodplains;
- Understanding the relationship between landscape, river and settlement;
- Using the understanding that comes from reconstructing London's past to contribute to wider environmental studies about contemporary concerns such as: climate change; sea level fluctuations; flood defence initiatives; links between pollution, health and quality of life;
- Understanding the reasons for evolution of the road systems, street layouts, river crossings and ferries, and their importance as engines of development and change;
- Understanding the nature and meaning of the deposition of metalwork in the Thames and at the headwaters of river tributaries;
- Understanding how water supply and drainage provision were installed and managed;
- Studying the correlation between sites associated with watercourses and meander bends, so as to understand the origin of settlements; and
- Understanding the evolving character of development in central London, in comparison to other riverine settlements.

3.3.1.1 Furthermore, the potential at Pudding Mill Lane for geo-archaeological and palaeoenvironmental deposits to be recovered will contribute to the following themes:

- The development of models for understanding the significance of geomorphology, ecology, ecosystems and climate, hydrology, vegetational and faunal development, on human lives;
- Characterising changing climatic conditions, and air and water quality and pollution, throughout the archaeological record, towards understanding its implications for how people behaved;
- The Mesolithic/Neolithic transition: understanding the significance of horticultural experimentation at this time, and the transition from hunter-gatherers into farmers; and
- Understanding what London's past environments meant to different groups and individuals.

3.3.1.2 Any evidence for Post-medieval industrial activity will contribute to the following themes:

- Charting how and why different parts of London developed as specialist producers, and understanding the implications of this for London as a world city;
- Establishing how daily work and life in London reflected and contributed to the rise of London as the commercial centre of the British Empire, and to its continued eminence as a world city thereafter; and
- Examining the success with which small towns in the London region adapted to the capital's growth.

3.3.2 Fieldwork Objectives

The objectives of the TWB are described in the Addendum to the WSI (Crossrail 2012):

- [*If required (see Table 1 in section 1)*] To record [EH Level 2] the remains of the historic wharf as they are exposed during demolition and groundworks on the western side of the River Lea: item [6] in Crossrail 2010, section 5.5.
- To observe and record the fabric and construction details of any wharves revealed during the construction of two sheet pile coffer dams.
- To observe and record, and if required take soil samples from, the deposits between ground level and the top of the river terrace gravels.

And also to:

- To inspect, record and sample profiles in the geo-archaeological sequence of deposits present within the site to understand the site topography and date its phased development.
- To analyse the palaeo-environmental evidence recovered from the works and contribute evidence to inform the Lea Valley Pleistocene and Holocene archaeological resource.

- To inspect the sequence of post Pleistocene alluvial organic deposits and clay silt units for prehistoric, Roman and medieval archaeological remains at channel edge and areas of higher ground (land and channel management, settlement and industry).
- To identify record and if appropriate recover, any archaeological artefacts (vessels, structural remains and small finds) preserved in the deeper channel areas.

In particular, the above should include any **timber structures**, as seen in earlier fieldwork east of the modern river channel (see 1.3).

3.4 Event Codes

The sitecode is **XSK10**.

4 Site Management Plan

4.1 Tools and Equipment

Tools and equipment appropriate for the archaeological works will be ordered by the Supervising Archaeologist and delivered to site by the MOLA Equipment Officer from the MOLA central store. See Section 22.8.3 for details.

4.2 Training and Certification

MOLA provides Safety Training for its staff as follows:

- Induction Training for all staff (undertaken on joining MOLA, and as appropriate on individual projects).
- General H&S Training for supervisory staff (an H&S awareness course targeted at Field and Support Staff).
- Specialist H&S Training (designed to cover specialist areas and to update professional knowledge; as appropriate to deployment)

All MOLA staff on site will be competent to carry out their archaeological work. On site all staff will be supervised by a competent person (see 4.3).

For certain specific aspects of MOLA work only those members of staff with the relevant training and certification will be allowed to undertake them. These include Cable and Pipe/Underground Service Location, Chainsaw use, Confined Spaces and Power Auger use. However, it is not anticipated that this will be required on this site.

At present the profession of Archaeologist is largely covered by the CSCS, Construction Related Organisation CRO White Card for Archaeological Technician (Code 5363); other cards are available for site visitors etc. All MOLA staff have passed a CITB Health and Safety Test to operative level and carry the card on site at all times.

All staff will have their MOLA ID cards with them (see 22.6.1).

4.3 Site Monitoring

The MOLA supervisor (Grade 4 or 5) will be monitored by the MOLA Project Manager (Elaine Eastbury, BSc) or Assistant Project Manager (Nicholas Elsden, BSc) via site visits, as and when required, in order to provide advice and support to the MOLA Supervisor. MOLA H & S Compliance Manager will also regularly monitor the site, see 16.4.

4.4 Progress Reporting

MOLA has agreed a programme of weekly written progress reports and progress meetings (If appropriate) with the Project Archaeologist. MOLA shall provide

information describing progress on-site to date, the processing of samples and artefacts and feedback from initial assessment, and a BMOS report (see 16.6).

4.5 Resource Plan

The targeted watching briefs will be conducted by a MOLA Supervisor (Grade 4 or 5) assisted by members of the MOLA field team (Grade 6) with support from MOLA Geomatics and Photographic team members (Grade 8) when required.

Other archaeological specialists (Grade 8, eg geoarchaeologists or osteologists), may be called in if necessary.

Staff will be drawn from the pool of CVs submitted to Crossrail for approval.

The named Supervisor will be confirmed to Crossrail and the Principal Contractor in advance, and added to subsequent versions of this method statement, once a firm start date for the task(s) has been notified to MOLA. Other staff to be assigned when required.

For the targeted watching briefs (to be confirmed):

- Dave Sankey, BA (Hons), Senior Archaeologist, overall responsibility for site supervision and conduct of the fieldwork. Mobile: 077 30 646 055. Office: 0207 410 2200.
- Graham Spurr, BSc (hons), MSc, Head of Geoarchaeology, responsibility for geoarchaeology and environmental recording and sampling, and specialist advice to the Senior Archaeologist via visits as required. Mobile: 07939 659057. Office: 0207 410 2232.

Other staff and specialists are to be determined when required.

All archaeological staff are direct MOLA employees, ordinarily full time. The working hours are set out in 4.7 below.

Staff conducting the targeted watching brief on the River Lea Cofferdam will be able to swim, as required by the DSJV method statement, p 21.

4.6 Programme

The programme for the various targeted watching briefs is shown in Table 1 in section 1.

4.7 Working Hours

Works on site which require the watching briefs are likely to be limited to the core Crossrail working hours, which are between 0800 to 1800 on weekdays and 0800 to 1300 on Saturdays as specified in the Environment Requirements (Section 4 of Works Information Vol 2). Operations anticipated to cause disturbance are limited to these hours (or as specified within a Section 61 consent obtained by the Principal Contractor), in order to minimise disruption to local residents and the general environment.

MOLA shall provide a site attendance when required during these specified period, so that all the relevant Principal Contractor's works defined in this MS are monitored and recorded.

5 Fieldwork Methodology

5.1 Generic Targeted Watching Brief methodology for the C305 Principal Contractor's information:

A targeted watching brief comprises the observation **and recording** of the Principal Contractor's or their sub-contractor's works with specific operations carried out under the supervision of a MOLA Senior Archaeologist. Targeted watching briefs are carried either out in areas where the density of archaeological features or deposits are not considered of sufficient significance to warrant investigation in advance of construction, or they may be carried out in areas where access prior to construction has been impossible and where, as a result, there is a possibility of unexpected discoveries (Crossrail 2009 Archaeology Specification for Evaluation & Mitigation (including Watching Brief) CR-PN-LWS-EN-SP-0001, version 3).

It should be noted that during a targeted watching brief, **the Archaeological Contractor may impose constraints on, or require changes to, the Principal Contractor's or his sub-contractor's method of working to enable the archaeological investigation to take place alongside construction works**. These constraints may include restrictions on the type of equipment used, the methodology employed, **stopping excavation works** to allow time for recording and the installation of temporary works or other attendances such as pumping out, in order that the archaeologists may enter the works excavations safely.

In addition to man-made deposits, some assessment and basic recording of any naturally deposited levels will be necessary, eg alluvial deposits. This may require the attendance of a MOLA Geoarchaeology specialist to take samples of such deposits. If timber features are revealed it may be necessary for a MOLA timber specialist to record and take samples. Normally if the remains are localised the Principal Contractor's works may continue in other areas (subject to a safe method of working and monitoring).

It is expected that the Principal Contractor will make **allowance in their work programme** to take account of the delays that a targeted watching brief may cause.

During a targeted watching brief MOLA staff will compile a basic record consisting of notes, measurements, drawings and photographs consistent with an observation role; eg depth, character, date and survival/truncation of deposit sequence, height of natural geology.

If potentially very significant (but localised) remains are exposed, such that they cannot be recorded adequately under the scope of the targeted watching brief, then subject to the Project Archaeologist's approval, additional archaeological resources and time may be required at that location (to allow for more detailed follow-up recording and perhaps limited excavation). Such work would be considered separately to the procedure for unexpected archaeological discoveries that fall outside the scope of the SS-WSI (Crossrail 2009, section 7.A2 and section 15.2 of this document).

5.2 Site specific Targeted Watching Brief methodology

This applies to:

- Construction of two sheet pile cofferdams within the River Lea
- [*If required (see Table 1 in section 1)*] Demolition and groundworks on the western side of the River Lea

5.2.1 Cofferdam

Within the cofferdam: the first approx. three metres of excavation will be removal of modern material placed in 2012, and of no archaeological interest. In the initial stages of excavation within the cofferdam (following removal of the modern material), observation will only be possible from the adjacent temporary bridge. There will be no access into the cofferdam at this stage. **This will form a significant limitation on the cofferdam watching brief.**

Where practicable, and the Principal Contractor agrees that it is safe to do so, it is intended that the targeted watching brief will be conducted in the following manner (although this may well be adapted during the course of the works as they progress, in particular with varying access conditions, water ingress, and in particular safety issues):

Site-specific methodology for Targeted Watching Brief at River Lea Works

- **Removal of modern material** by C305, down to surface of alluvial/archaeological deposits, predicted *c* 101m ATD (*c* 4.6–5.3m below the adjacent dry land). Removal of at least the lower *c* 1m of these deposits will be under archaeological monitoring, in order to identify the base of the modern material, and start of potential geoarchaeological or archaeological deposits.
- At this point, and continuing through subsequent excavation, the C261 MOLA Supervisor will **assess** the geoarchaeological or archaeological deposits present, and **their significance (which dictates the subsequent response).**
    - If **moderate or high significance archaeological remains** are present (such as the timber structures seen in earlier archaeological works to the east), these will be investigated, recorded, excavated and sampled (as necessary) by C261 MOLA (using hand tools such as trowels, shovels, mattocks, hoes, and dumpy level). MOLA may request C305 to assist with excavation/removal of any extensive deposits, as appropriate.
    - This will require C305 either to **stop work** or to **safely demarcate and barrier a temporary working area for the archaeologists, and access into the cofferdam**. Such work may continue to the base of the archaeological sequence (surface of the river terrace gravels), or if underlying horizons are assessed as being only of low significance, work may proceed under similar conditions to a General Watching Brief (as below).
    - If **low significance archaeological remains** are present, these will be recorded by C261 MOLA, and removed by C305 under similar conditions to a General Watching Brief (ie with archaeological monitoring, hand cleaning, investigation and recording, using tools as above).
- The watching brief will **cease** at the **river terrace gravels**, predicted to be at *c* 100m ATD or below (this is therefore, probably above the excavation level for the bottom frame, at 99.0m ATD).

5.2.2 Western side of the River Lea

If this work is required, it will not be possible to determine the method of work until the actual circumstances and methodology of the works have been determined.

At that point, a methodology will be determined (in collaboration with the Crossrail Project Archaeologist and DSJV) for the archaeological recording of the elements of the historic wharf as they are exposed during demolition and groundworks on the western side of the River Lea. This would be to English Heritage Level 2 (English Heritage 2006).

5.3 Survey and setting out method

MOLA will obtain from either the design archaeologist, the Principal Contractor, or Crossrail's survey department, the locations and values of the project datums in the area of the site.

When archaeological remains are found during a watching brief, MOLA surveyors will survey to LSG grid local baselines, or the features, as appropriate to the remains encountered. If this is not possible due to site conditions or short notice the MOLA Supervisor will manually record using the Principal Contractors Chainage and on site level datums.

If no archaeological remains are found, MOLA will obtain from the Principal Contractor or design archaeologist CAD plans to London Survey Grid with which to produce a plan of the areas monitored. See also 14.

5.4 Recording Methods

The archaeological remains will be recorded to best practice standards, in order to achieve archaeological objectives. The site recording will include as a minimum:

- The written record of individual context descriptions on appropriate pro-forma sheets.
- The drawn record: including, plans and section drawings of appropriate features, structures and individual contexts (1:10 1:20 or 1:50). Isolated archaeological remains (artefacts) may be spot located in plan and a height provided where possible. Deposits which are regular in plan (pits and ditches) may be located though co-ordinates, annotated with dimensions, and may be recorded digitally.
- A stratigraphic matrix of the sequence of deposits and structures encountered in each trench will be produced.
- The photographic record: photographs taken with a digital camera of resolution of 12 megapixel or greater, providing similar resolution to a conventional 35mm SLR. The photographic record will include photographs of archaeological features, appropriate groups of features, structures, and quaternary deposits. Each photograph will be recorded on site using a proforma photographic record sheet, showing image number, area/test pit, context number(s), subject/description, direction of view, and date. In addition, appropriate record photographs will be undertaken to illustrate work in progress.

- Levels on plans, sections and other fieldwork records shall be related to OS datum.
- The location of all evaluation trenches, temporary grids and baselines will be electronically surveyed by MOLA Geomatics staff. After fieldwork a digital trench location plan will be produced.
- Other appropriate drawn and written records will be produced (for environmental sampling etc).

6 Geoarchaeological investigation and methodology

Geoarchaeology examines the plant, animal and human remains associated with past human activity and the past landscape context of this activity, in order to obtain a better understanding of the economic, social and environmental setting of archaeological evidence. It involves input from a wide range of specialisms to cover the varied spectrum of environmental remains (from microscopic pollen and diatoms, to snails, seeds, insects, bird and fish bone, large mammal bone and human remains) that might be preserved in the soils and sediments excavated on an archaeological site.

In addition, in order to understand how the archaeological deposits built up and to reconstruct their depositional environment geoarchaeologists examine the archaeological deposit sequence *in situ.* Geoarchaeology is the study of soils and sediments in either a natural or anthropogenic context, that either contain human cultural material or are contemporary with human habitation within the region being studied (ie the Pleistocene/Lower Palaeolithic and later).

Within the Crossrail Pudding Mill Lane site the focus of the environmental archaeology work will be geoarchaeologically driven. It will concentrate on the examination, recording and sampling of the Lea Valley alluvial sequence, which comprises fluvial and wetland sediments with potential for past landscape reconstruction.

This work will be conducted under the environmental archaeology sampling strategy (archaeological science strategy) for Pudding Mill Lane, see below.

Where such sampling is required, it will be conducted according to the methodology and approach in section 6.1, as far as is consistent with the Principal Contractor's health and safety and environmental requirements.

If any samples are taken from designated contaminated areas they will be kept on site, in secure storage, and processed during the subsequent evaluation (trial trench/pit) stage, when on site processing facilities are expected to be required to deal with a much greater number of samples. This will be included in a subsequent method statement. The processing will be set up and conducted in conjunction and liaison with the Principal Contractor, under the requirements of their health and safety and environmental plans.

6.1 Sampling strategy

6.1.1 Overview

The geoarchaeological potential of the alluvial deposits likely to be encountered during the watching brief requires a geoarchaeologist to be on call to visit the site, advise and where necessary record and take samples from selected deposits.

The geoarchaeological strategy will focus on the recording of sediments on-site. Prior to work beginning, the geoarchaeologist will give due consideration to the previous work and sampling already undertaken in the Pudding Mill Lane area. This will make

sure that any sampling is targeted towards deposits, features and environments that need further clarification.

In order to interpret the depositional environment of alluvial deposits and hence their archaeological significance and meaning it is necessary to examine the sequence of deposits in section (cut faces). This will enable recording of the interfaces between different deposit types and lateral changes within a deposit to be seen. The geoarchaeologist will liaise with the principal contractor / sub-contractor to maximize the opportunity for such recording, without holding up the groundworks programme.

Sampling (where appropriate) will involve cutting overlapping blocks of undisturbed sediment from the section faces and digging out bulk soil samples, as continuous slabs, from the adjacent section. Spot samples for radiocarbon dating will also be taken from suitable organic layers.

6.1.2 General Methodology

Throughout the targeted watching brief the Contract Manager and MOLA Supervisor / Senior Geoarchaeologist will ensure, *as far as is safe and practicable in the working conditions of the site*:

- That a range of suitable samples and records are collected from the site for the recovery of an appropriate range of environmental evidence that will contribute to the research strategy that underpins the requirement for excavation and recording.
- That the environmental procedures outlined in the *Archaeological Site Manual* (MoL 1994) and *Environmental archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation (*English Heritage 2002) and Geoarchaeology: *using earth sciences to understand the archaeological record (*English Heritage 2007) are followed.
- The following sample types and processing methods will be employed:

Sample	Material	Processing
Column bulk (20 litre)	Freshwater and terrestrial molluscs, ostracods	Disaggregated and wet sieved
Monolith	Sediments	Laboratory cleaning
	Pollen and Diatoms	Sub-sampled for external Specialist
Kubiena	Soils/complex strata	External Specialist
Spot/Grab	Coprolites, unidentified organic materials	Specialist

- The sampling strategy will be monitored throughout the targeted watching brief and adapted in light of the preservation and the type of features encountered. Advice will be sought from the EH Regional Archaeological Science Advisor when necessary.

- Should any dateable (by palaeo-environmental materials) negative features be identified during the watching brief they will be bulk sampled and bone collected by hand. Horizontal stratigraphy if it survives will be sampled on a spatial basis where appropriate. Unstratified contexts, make-up layers and contexts thought to have a high degree of residual or intrusive material will not be sampled. Bulk samples may also be taken to recover artefacts such as evidence for metalworking and/or other industrial activity.

6.1.2.1 Sampling approach to main features anticipated

- *Lea Valley alluvial deposits:* exposures of alluvial deposits will be cleaned and recorded by a geoarchaeologist. The LSG/OS location and TD/OD level of any recorded section face will be provided by the Principal Contractor or by MOLA Geomatics team, as appropriate. Selected cleaned sections will be sampled. Sampling would typically consist of overlapping monoliths for off-site sedimentary examination and micro-fossils, with an adjacent column of continuous bulk sample slabs, respecting context interfaces, for macro-remains and grab samples for dating as appropriate.

Processing will take place at the MOLA base during the targeted watching brief so that results can feed back onto site and inform any modifications needed in the sampling strategy.

A MOLA Senior Geoarchaeologist (if necessary the MOLA Head of Human Environment) will undertake site visits to provide advice and additional advice will be sought from the EH Regional Archaeological Science Advisor when necessary. A MOLA Environmental Archaeologist/Geoarchaeologist will be on site during any visit made by the EH Regional Archaeological Science Advisor to discuss the alluvial sequence, its sampling and the results of any processing undertaken.

7 Deliverables and Submission Programme

MOLA shall provide the following reports in accordance with the C261 Contract and the Site Specific Written Scheme of Investigation (C136-SWN-C2-JLT-M123-00001) and Addendum (C136-SWN-T1-XAP-M123_WS098-00001) to the Project Archaeologist (Jay Carver) and Project Manager (Linda Muzikants), or as otherwise instructed by the Project Archaeologist:

- Organisation of site monitoring visits, as and when requested by the Principal Archaeologist and or the CRL Project Archaeologist.
- A weekly illustrated progress report containing the information required at part 5.10 of the C261 Contract.
- MOLA will produce monthly progress photographs of archaeological work on the sites in this method statement to contribute to the 30 per month required across the whole of the C261 contract (see 15.3).
- Reporting requirements for this site will be determined by the Project Archaeologists on completion of fieldwork.

8 Document Control and Record Keeping

MOLA will access the Crossrail document control system for transmitting reports and other deliverables. The primary report deliverables (as per 7) will be submitted to the Project Archaeologist (and Crossrail CDM Advisor in the case of Method Statements) in draft form (Version 1.0). Any tracked changes or comments added by the Project Archaeologist and/or Crossrail CDM Advisor will then be incorporated and future dated versions (2.0 etc) will be returned via the document control system accompanied with the appropriate Checklist with Contractor's responses.

9 Artefact Recovery and Conservation

Sampling strategies will be developed on a site specific basis to meet the objectives stated in the Crossrail Site-specific WSI (see 3.3); and the following professional standards, in consultation with appropriate specialists:

- MOL Archaeological Finds Procedure Manual (2006)
- Relevant English Heritage Centre for Archaeology Guidelines eg on Environmental Archaeology (English Heritage 2002)
- Guidelines of the Society of Museum Archaeologists for the Selection, Retention and Dispersal of Archaeological Collections (SMA 1993).
- IFA Guidelines to the standards for recording human remains (2004)
- Minimum Standards for the Processing, Recording, Analysis and Publication of Post-Roman Ceramics produced by the Medieval Pottery Research Group Occasional Paper 2, (Slowikowski, A, Nenk, B. and Pearce, J 2001)

10 Finds Collection

In general all material from stratified archaeological deposits is retained unless it is clearly residual or part of a large but routine assemblage, in which case samples of both typical and diagnostic items are retained.

Due allowance will be made for occasional specialist attendances which may be needed on and off-site to complete the investigation to the appropriate specified standard. These would only be called upon on a case-by-case basis, if significant structures or strata are revealed. Such attendances may include artefact conservation, photography, surveying, environmental sampling, finds assessment, geoarchaeology and scientific dating. MOLA has a full range of in-house specialists and can therefore deploy such resources at short notice, if needed, eg to advise on sampling strategies.

All finds and samples will be treated in a proper manner and to Museum of London standards. They will be exposed, lifted, cleaned, conserved, marked, bagged and boxed in accordance with the guidelines set out in the United Kingdom Institute for Conservation's Conservation Guidelines No. 2 and the Museum of London's Standards for the Preparation of Finds to be permanently retained by the Museum of London. Metal objects will be x-rayed and appropriate objects then selected for conservation.

11 Treasure

All finds falling within the definitions of treasure (Treasure Act 1996) shall be reported immediately to the Project Archaeologist and all subsequent works must be undertaken in accordance with the relevant legislative requirements as set out in the Environmental Requirements (archaeology) section of the relevant package Works Information.

To protect the finds from theft, MOLA shall record the finds and remove them to a safe place. Where recording and removal is not feasible or appropriate on the day of discovery, MOLA shall ensure, on liaison with the Project Archaeologist that adequate site security is provided by the Principal Contractor.

12 Archaeological Science Strategy

Where necessary, the strategy for sampling archaeological and environmental deposits and structures (which can include soils, timbers, animal bone and human burials) will be developed by MOLA in accordance with English Heritage and IFA guidelines. Advice will be sought from appropriate MOLA specialists and if additionally required from English Heritage. Subsequent on-site work and assessment of the processed samples and remains will be undertaken by MOLA Specialists.

If necessary, samples for absolute dating such as C14 or timber samples for dendrochronology will be submitted to nominated MOLA external laboratories. This will only be done with the prior approval of the Project Archaeologist where there are particular research objectives to be addressed by such dating.

See 6.1 for the site-specific sampling strategy.

12.1 Specialist Strategy

An appropriate programme of ceramic dating and study of other excavated artefactual and environmental materials will be undertaken by MOLA Specialists as their contribution to the Fieldwork Report.

12.2 Excavation and Recording of Human Remains

The required methodology for human remains is set out in detail in the SS-WSI and the MOLA Framework Method Statement (Technical Submission 2.4, section 4.6) and is not repeated here.

It is not likely that human remains will be present on this part of the Pudding Mill Lane site, however, there is some potential for Roman burials in higher areas on the terrace gravels west of the River Lea. If human remains are found, the Project Archaeologist will be contacted, and a Ministry of Justice licence obtained by MOLA (if required).

Any *in situ and disarticulated* human remains will be recorded to targeted watching brief standard (cleaned, location recorded and photographed), and lifted, in accordance with the standards in section 3.2. The advice of a MOLA Osteologist will be sought where the nature of a deposit containing human remains is ambiguous.

13 Archiving and Dissemination Method

The required methodology for off-site work including specialist method statements, assessment, analysis, publication and archive is set out in the SS-WSI and is not repeated here.

The site-specific post-excavation, publication and archive requirements will be agreed in conjunction with the Project Archaeologist in the light of the overall approach being developed for the Crossrail project (eg publication format and the extent to which individual sites may be grouped spatially or thematically; and degree to which the archive will be systematised and deposited as a single whole).

14 IT Capability – Digital Survey Recording, Data Capture and Curation

The required methodology for IT (including site survey) will be carried out in accordance with the C261 Contract and project standard survey requirements.

- For Targeted Watching Briefs it is proposed that Principal Contractor's surveys assist with the location of temporary base lines and the plotting of significant archaeological features where appropriate. Where this is not possible MOLA will provide a geomatics team to come to site to survey in features etc.
- Upon completion of the fieldwork a Site Survey Report will be compiled where MOLA has conducted the surveying.

15 Additional Details

15.1 Standards and Guidance

See Section 3.2.

15.2 Unexpected and Nationally-important remains

In cases where unexpected discoveries cannot be preserved in situ, the response plan would revert to the normal Crossrail mitigation strategy of further archaeological investigation (preservation by record). The aim would be a rapid and commensurate response, targeted to just those remains unavoidably affected by the works. Recording and sampling methods would also be proportionate to the significance of the remains. Additional archaeological resources would be deployed to achieve this, in order to minimise any delay to the Principal Contractor's works. With flexibility and good communication it is often possible for the development works to continue in other areas while localised discoveries are recorded.

15.3 Progress Photographs

In addition to the archaeological photography specified in the SS-WSI and this Method Statement MOLA will submit a monthly professional photographic record of the progress of the archaeological scope of works. The photographs from the sites in this method statement will form part of the 30 required each month across the whole of the C261 contract.

15.4 Management of Consents

MOLA will liaise with the Employer and Principal Contractor regarding supply of any necessary information in support of required consents, eg road closures, Permit to Dig.

In general separate consents for archaeological works are unlikely to be required, the possible exception being human remains. In the event of the unexpected discovery of

human remains on site, MOLA will obtain a Burial Licence from the Ministry of Justice.

16 Health and Safety

16.1 CDM Responsibilities and Reporting

- MOLA will be supporting and reporting to the Principal Contractor and to the Crossrail Project Archaeologist and CDM Co-ordinator:
- MOLA will be implementing archaeological designs in the SS-WSI prepared by the appropriate FDC consultant, therefore not acting as CDM Designer under the Construction (Design and Management) Regulations 2007.

MOLA will provide:

- A current health and safety policy, including defined operational procedures and managerial responsibilities, risk assessment/control, and measures to ensure that a safe method of working is implemented by the archaeological team on site, including appropriate advice and support from office-based managers.
- Adequate safety information in the MOLA site accommodation including the WSI, current Health and Safety Policy, Health and Safety at Law Poster, Data Protection Compliant Accident Reporting Forms, and copies of Public and Employers Liability Insurance. The Supervisory Archaeologist is responsible for ensuring that this information is made available.
- Compliance with current legislation and HSE guidance; including the Construction Design and Management Regulations (CDM) 2007 as a Designer; and the Principal Contractor's Health and Safety Policy, safety inductions and fire and emergency procedures.
- Field staff qualified to operative level (or higher) of the CITB Health and Safety test and therefore eligible to carry a Construction Related Organisation (CRO) White Card for Archaeological Technician (Code 5363).
- Services of a Contract Manager, Project Officer/Assistant Contract Manager, and Supervisory Archaeologist to manage site investigations, including liaison with the Principal Contractor's Health and Safety Co-ordinator and Principal Contractor, attendance at site meetings etc. The Supervisory Archaeologist will act as principal liaison with the Principal Contractor.
- Services of a professional health and safety consultant to attend site when required; reporting to the Supervisory Archaeologist and Project Officer, with any concerns or recommendations copied to the Principal Contractor's site manager
- A safety monitoring/reporting procedure. This should include accident reporting by the Supervisory Archaeologist to non RIDDOR and RIDDOR standard and any necessary liaison and follow-up of agreed safety actions with the Principal Contractor's site manager
- All necessary staff supervision, and training, including tool box talks and safety inductions for new staff.

- Personal protective equipment (PPE) as listed in 22.8.3, but not additional PPE required by the Principal Contractor's method of work or Health and Safety plans (see the section below).
- Review and compliance with the Principal Contractor's Construction Phase Plan under the CDM Regulations 2007.
- Trained First Aiders (as appropriate to a watching brief situation), 'Where to get First Aid' poster and a First Aid kit (to be located in the MOLA site accommodation). The Principal Contractor will also have first aid facilities on site.
- Additional PPE required in addition to that listed in the previous section, ie life jackets (and their fitting).

The Principal Contractor will provide:

- Overall control and supervision of the site and a safe working environment. The archaeological organisation will be unable to complete the specified works in any area where this is not provided.
- Technical services and attendances to the archaeologists as required. These services may include providing, site accommodation, plant for the excavation of trenches and other equipment such as handrails, shoring and ladders. These requirements are listed in detail in separate documents.
- Construction Phase Plan.

The CDM Co-ordinator will provide:

- Overall co-ordination of health and safety planning and management.
- A communications structure; including contact details for key personnel, meetings, reporting, etc.
- Supply of material information: eg services and contamination reports; any relevant requirements regarding rights of way, noise, hours of operation, etc.

16.2 Rail Sites

The watching brief areas are not a designated rail site.

16.3 Highway Sites

The targeted watching area is not a designated highway site.

16.4 Health and Safety Reporting

Adherence to health and safety procedures will be monitored by the MOLA H & S Compliance Manager, Project Manager, Project Officer and Site Supervisor. The MOLA H & S Compliance Manager will attend site for regular monitoring visits and, on each occasion, will supply a report on the archaeological work, containing any necessary health and safety recommendations. This will be forwarded to the Principal Contractor's site manager. Where appropriate to the scale of work, regular on-site progress meetings will be held between MOLA, the Project Archaeologist and

the Principal Contractor at which any safety issues may be discussed, agreed and actioned.

16.5 Liaison with Principal Contractor

The MOLA supervisory archaeologist will act as the principal point of contact with the Principal Contractor's site manager throughout the periods of site investigation. Contact details will be exchanged. The supervisory archaeologist will be supported and advised by the MOLA Fieldwork Director and project management team as needed.

16.5.1 C261 MOLA Project Management Team Contact Details

- Elaine Eastbury, Project Manager

  eeastbury@museumoflondon.org.uk
  Direct Line: 020 7410 2237
  Mobile: 07730 646063

- Nicholas Elsden, Assistant Project Manager

  nelsden@museumoflondon.org.uk
  Direct Line: 020 7410 2282
  Mobile: 07872 127296

16.6 Behavioural Safety BMOS

Mobile phones, personal CD players, i-pods and similar will not be used by MOLA staff in archaeological trenches or areas of work. Smoking and naked flames are not permitted in the trenches or areas of work. Alcohol is not permitted on site. This aspect will be monitored by the MOLA Supervisor and H and S Advisor and reported on in the progress report (see 4.3).

17 Emergency Response

17.1 Emergency Preparedness & Response Plan

MOLA staff will comply with the Principal Contractor's Emergency Plan.

An Emergency Preparedness/Continuity Plan has been prepared by MOLA and submitted to Crossrail for approval.

A General Emergency Preparedness Plan (EPP) was prepared within the MOLA Health and Safety Plan for C261 – Document Number: C261-MLA-X-XWI-CR140-50005. This should be referred to for generic emergency and accident issues. Site-specific issues are as follows:

Employers Incident Response Contact	Crossrail Incident Response Desk – 020 8197 5000
Principal Contractor Incident Response Contact	Dragados Sisk duty manager: 07 925 431 434
MOLA Incident Response Contact	• Elaine Eastbury, Project Manager eeastbury@museumoflondon.org.uk Direct Line: 020 7410 2237 Mobile: 07 730 646 063 or • Nicholas Elsden, Assistant Project Manager nelsden@museumoflondon.org.uk Direct Line: 020 7410 2282 Mobile: 07 872 127 296
Local A&E location	*Full A & E at:* The Royal London Hospital, Whitechapel Road, E1 1BB Telephone 0207 377 7781 Tube: The hospital is located opposite Whitechapel underground station. It is served by the Hammersmith and City and District lines as well as the London Overground (formerly the East London line).

17.2 Training

MOLA provides Safety Training for its staff as in Section 4.2.

The MOLA Senior Archaeologist will attend all emergency training/inductions on Preparedness/Response Plan provided by the Principal Contractor.

17.3 Emergency & Accident Equipment

- MOLA Archaeologists when working singly on the watching brief tasks will carry a single person First Aid Kit and mobile phone.
- It expected that the Principal Contractor will also provide basic first aid facilities on site.

17.4 Monitoring & Testing

MOLA staff will comply with Crossrail requirements.

17.5 Emergency & Accident Incident Reporting

All accidents and emergencies must be reported to the Principal Contractor (see **Error! Reference source not found.**), who will call the emergency services, if required. They will also be reported to the Crossrail Incident Response Desk – 020 8197 5000. In critical situations, MOLA staff will call for an ambulance immediately, and then inform the site manager.

All accidents and emergencies must be reported to the following personnel at Crossrail and MOLA:

- Liz Field, Crossrail Project Manager, Crossrail Central, Crossrail Ltd, 25 Canada Square, London E14 5LQ

  DD 0203 229 9105

- Jay Carver, Crossrail Project Archaeologist, Crossrail Central, Crossrail Ltd, 25 Canada Square, London E14 5LQ

  DD 0203 229 9258, Int 2258
  Mobile 07870 191 705

- Projectwide CDM Co-ordinator, Crossrail Central, Crossrail Ltd, 25 Canada Square, London E14 5LQ

  Mobile 07718 861941

- George Dennis, Senior Contracts Manager, Museum of London Archaeology, Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7ED

  DD 0207 410 2200, Int 2256

- Ian Grainger, H&S Compliance Manager, Museum of London Archaeology, Mortimer Wheeler House, 46 Eagle Wharf Road, London N1 7ED

  DD 0207 410 2200, Int 2255

18 Environmental Management

The archaeological works will be carried out whilst the Principal Contractor is in possession of the site. MOLA will therefore request a copy of the Principal Contractor's Environmental Management Plan prior to commencement and will supply any necessary inputs with regard to MOLA works. MOLA will comply with the Principal Contractor's Environmental Management System as documented in their Environmental Management Plan, and contribute to their EMS reporting if required.

If any remedial action is needed, eg controls for dust, water, noise or controlled waste, this will be agreed with and undertaken by the Principal Contractor as part of the required attendances (see 16). In addition an updated MOLA corporate Environmental Management Plan is currently being prepared for submission to Crossrail.

The nominated environmental person at MOLA is: Alison Telfer, atelfer@museumoflondon.org.uk, 020 7410 2276.

18.1 Contamination

MOLA will comply with the Principal Contractor's requirements in relation to any arising contamination issues. A study of the contaminated spoil in PML has deduced that PPE should provide sufficient mitigation (DSJV method statement, p 17).

MOLA staff will be vigilant for any signs of possible contamination, eg asbestos, hydrocarbon smells, etc.

Should significant contamination be found during excavation, detailed risk assessments will be completed (by the Principal Contractor and MOLA) and appropriate mitigation measures implemented (by the Principal Contractor) as necessary.

18.2 Water Disposal

The Principal Contractor is responsible for disposal of any ground water pumped from the trenches or other excavations, in accordance with their environmental management plan, with which MOLA will comply.

18.3 Site Waste Management Plan

MOLA staff will adhere to the Principal Contractor's site waste management plan.

It is anticipated that very little waste will be removed from the site from the archaeological works, but any produced will be disposed of by the Principal Contractor in accordance with their Waste Management Plan.

18.4 Vehicles/Motorised Equipment

MOLA staff will liaise with the Principal Contractor to provide safe access and parking for MOLA vehicles if required to attend site for occasional visits.

NAME	VEHICLE REG NO
M Cox	KC54 XTZ & DY59 YWB
A Chopping	KC54 XTZ & DY59 YWB
G Spurr	KC54 XTZ & DY59 YWB
H Matthews	EA55 NBJ
S Jones	KC54 XTZ & DY59 YWB
C Drew	KC54 XTZ & DY59 YWB
M Burch	KC54 XTZ & DY59 YWB
V Yendell	KC54 XTZ & DY59 YWB
CONTACT (All)	**020 7410 2200**

18.5 Other Requirements

MOLA staff will always be courteous with any members of the public they have dealings with.

19 Quality Assurance Plan

An updated Quality Assurance Plan has been prepared for submission to Crossrail in accordance with the format specified at part 5.4 of the C261 contract. Records will be kept and supplied to Crossrail in accordance with procedures set out in Crossrail Specification CR-PN-LWS-EN-SP-00001, as amplified by the SS-WSI. The MOLA responsible procurement representative is Dawn Jackson, who is a member of the Senior Management Group.

20 Community Relations

MOLA will co-operate with the Principal Archaeologist and Principal Contractor regarding any notified community relations issues in relation to the Construction Community Relations Strategy Framework as defined in the Works Information.

MOLA will in the first instance refer any media enquires or community relation issues to the Crossrail Helpdesk and the Project Archaeologist.

21 Responsible Procurement

An updated Responsible Procurement document was submitted to Alison Jackson, Crossrail on 15th January 2013.

22 Health and Safety Method Statement

22.1 Introduction and Purpose

22.1.1 Project Background

Archaeological investigations are to be carried out on this site by Museum of London Archaeology (MOLA). The requirements are set out in:

- A Crossrail **Site-specific Written Scheme of Investigation** (SS-WSI): Package C152 Pudding Mill Lane Portal, Archaeology Site-specific Written Scheme of Investigation, Doc. No. C152-SWN-C2-RSI-CR094_PT002-0001 Version 10, 12.05.10 (Crossrail 2010a)
- An **Addendum to the WSI**: C152 – Pudding Mill Lane Portal, Addendum to WSI: Trial Trench Evaluation, Watching Brief & Detailed Excavation (XSK10), Doc. No. C152-SWN-C2-RSP-CR094_PT002-50001 Revision 3.0, 19.03.12.

22.2 Scope of Document

This Method Statement sets out the specific MOLA safe methods of working to be applied to the task listed in Table 1 in section 1 of this method statement.

This method statement has been developed in conjunction with the Principal Contractors, who will be responsible for ensuring that the archaeological works may be carried out as specified.

22.3 Responsible Persons and Site Management

22.3.1 Site Management

The MOLA Senior Archaeologist/Site Supervisor will ensure that a copy of the MOLA Welfare, Health & Safety Method Statement is made available to the Principal Contractor at the site. Where further changes or additions to the WH&S Method Statement are required and agreed these should appended to the site master copy by the MOLA Senior Archaeologist/Site Supervisor.

All changes to the WH&S Method Statement will be signed off by the Project Archaeologist, Crossrail H & S Advisor, MOLA Senior Contract Manager and MOLA .

22.4 Scope of Works

22.4.1 Proposed archaeological works

The scope of archaeological works is set out in No. 21.2 above, and in section 1 of the method statement, above.

22.5 Methodology, Programme and Sequence

The programme is set out in Table 1 in section 1 of the method statement, above.

22.6 Health and Safety Control Measures

22.6.1 Site Access/Vehicle Movements

On arrival at the site, MOLA staff will sign in, establish contact with the nominated Site Manager (or equivalent) attend any inductions etc. in accordance with the required access procedure for the site (to be notified to MOLA in advance by the Principal Contractor). All MOLA staff working on site will carry identification and CSCS cards.

Safe access routes from the site gate to work Areas and any offices and/or facilities will be erected and maintained at all times throughout the course of the archaeological monitoring of the works by the Principal Contractor.

22.6.2 Services

The location and making safe of live services before or during archaeological works is the responsibility of the relevant Principal Contractor in control of the site. MOLA staff will exercise care and due diligence and report any discovery of unexpected services or other ground hazards promptly to the Principal Contractor, Project Archaeologist and MOLA H & S Officer.

22.7 Safety of Excavations

22.7.1 Entering the Trench during the Targeted Watching Briefs

- Daily inspections will be carried out by the Principal Contractor before works commence.
- MOLA staff will not enter any area of the River Lea Works as detailed in Section 5.2 until the Principal Contractor has issued a Permit to Work confirming that it is safe to do so, and that there is safe access/ingress to the archaeological investigation areas.
- MOLA Staff will not enter an area if it is declared unsafe by the Principal Contractor.
- The Principal Contractor will supply attendances as required in 22.8.1.

22.7.2 Shoring

- Where required during a Targeted Watching Brief the trench will be shored in a suitable manner by the Principal Contractor and safe access/egress arranged.

22.7.3 Confined Spaces

- At the time of writing no areas have been defined by MOLA or the Principal Contractor as Confined Spaces. This will be kept under constant review.

22.7.4 Machine Excavation

- The machining described in section 5, as specified in the Addendum to the WSI, will be monitored by MOLA Senior Archaeologist/Site Supervisor, or Geoarchaeologist, but will at all times be under the control of the Principal Contractor.

22.7.5 Hand Excavation during Evaluation or Targeted Watching Brief

- Hand excavation will be limited to selected times/areas defined by the MOLA Senior Archaeologist/ Site Supervisor, with the agreement of the Principal Contractor, and will be properly fenced, demarcated and signed.

22.7.6 Lone Working

- The monitoring MOLA Supervisor will complete the necessary signing in procedures for each site visit and will also notify the Principal Contractor's Site Manager of their presence, which works are to be monitored. The MOLA Supervisor will only be providing an attendance to observe, monitor and record the defined Principal Contractors works and therefore will not be working alone.

  In particular, the MOLA Supervisor will not attend works or enter excavations when the Principal Contractor is not present.

22.7.7 Contamination

- A study of the contaminated spoil in PML has deduced that PPE should provide sufficient mitigation (DSJV method statement, p 17).
- MOLA shall be issued with all relevant contamination test results for above and below ground hazards by the Principal Contractor prior to commencement. Any necessary remedial action will then be agreed with the Principal Contractor as part of the H & S Plan and supplied as an attendance item (22.8.1). Wherever possible such action must be undertaken by the Principal Contractor prior to MOLA commencement on site. If this is not done there may be operational constraints on the MOLA safe method of working that could restrict achievement of the archaeological scope of works set out in the SS-WSI.

22.7.8 Ordnance

CRL has undertaken UXO surveys for worksites and Works Information states "No unexploded ordinance will be encountered during construction of the works". However, in the case that operatives think that a UXO has been encountered, all works will cease and a UXO engineer will check if the obstruction is a ferrous anomaly using a magnetometer (DSJV method statement, p 17).

The MOLA Supervisor shall comply with the PC's rules. If Ordnance is unexpectedly found the MOLA Supervisor shall inform the PC immediately and withdraw to a safe place outside the area designated by the PC.

22.7.9 Site Rules

All MOLA Staff will comply with the Principal Contractor's site rules and with the MOLA single person watching brief rules (when applicable).

22.8 Planning and Resources

22.8.1 Principal Contractor's Supply of Attendances

The site specific requirements for services, facilities and attendances to be provided by the Principal Contractor, to enable MOLA to undertake the defined archaeological works are set out above. Those items in **bold (22.8.1.1) will be required** for this site – others may be required (22.8.1.2), depending on site conditions, which will be reviewed on site by the MOLA Supervisor in conjunction with the Principal Contractor's nominated Site Manager (these requirements will be communicated to the Principal Contractor in the event that they are needed):

22.8.1.1 Likely to be required

- ***site accommodation*** **and welfare facilities with electricity and water.** To include furnished main base cabin as office/work space; separate male/female changing areas, toilets and washing facilities with water; drying facilities; plus additional steel cabin for secure storage of MOLA PPE, equipment, camera and paperwork and finds. For the basic monitoring component of a small watching brief, these facilities would normally be shared with the Principal Contractor's site establishment and separate work space is not normally required. It is provisionally estimated that accommodation etc for **up to 1 to 3 people** will be required for the watching briefs.
- ***general site security*** including hoardings, gateway, warning notices, etc; to create a secure site perimeter, sufficient to prevent unauthorised access. If the Principal Contractor has retained security guards, it is recommended that the archaeological investigation areas be added to their schedule for regular patrols, particularly out of hours.
- ***providing safe access*** to the site and the specified archaeological investigation areas via separately identified pedestrian routes, signing, safety guard-rails, secure ladders etc. This includes segregating these areas from any vehicles and plant operating nearby eg via a robust physical barrier.
- ***locating and making safe any live services or hazardous substances*** **(above or below ground)**: preliminary services searches should be carried out by the Principal Contractor via the statutory undertakers etc, plus on-site inspection and testing where required. Where there is reason to believe from previous uses that the ground or adjacent buildings may be contaminated the Principal Contractor should make arrangements for advance inspection, sampling, testing and where necessary specialist remediation. The results of such surveys should be forwarded to MOLA *prior to commencement on site*. Any identified hazards will be addressed in the health and safety planning. Any unexpected hazards encountered during the investigations will also need to be made safe by the Principal Contractor before archaeological fieldwork may continue. In the event of the accidental disruption of a live service by archaeologists or sub-contractors under archaeological supervision the MOLA supervisor will inform both their

project manager and the Principal Contractor and, when appropriate, call the relevant emergency number.

- ***supply of plant and equipment***; principally a 360 degree tracked mechanical excavator of minimum 12 ton size; supplied with driver, breaker, and flat-bladed ditching bucket. Other plant such as dumpers, compressor/breakers, hoist and pumps may also be needed.
- ***accreditation and supervision of operatives, plant and equipment***, including supply of sufficient qualified banksmen/supervisors to control plant movements and adequate certification for plant and operatives.
- ***pumping-out (dewatering/drainage)***: a suitable method to keep the trenches (or area of investigation of significant deposits in a Targeted Watching Brief) dry, eg pumping into a previously investigated trench, to create a sump.
- ***transport/mounding/storage of spoil*** from archaeological investigation areas. This includes removal from site, if necessary.
- ***temporary support*****:** design, installation and maintenance of appropriate temporary support to excavations, where deeper than *c* 1.2 m (or as required in unstable ground). This will principally be via the initial concrete ring and installation of subsequent ring segments forming the shaft, but locally within the shaft area may be via benching/battering back and/or shoring, depending on a depth and ground conditions.
- ***other safety measures in deep excavations***, including monitoring of air quality and provision of rescue facilities and equipment in any areas defined by the Principal Contractor or MOLA as a Confined Space.
- **adequate *ventilation*** and protection from noise, fumes and dust where plant is in use, especially within confined spaces or standing buildings
- ***development of a safe method of working***: archaeologists will not be able to work within excavations whilst attendances (such as installing temporary support or removing spoil) are taking place, and when demolition, construction or heavy plant activity occurs adjacent or overhead.
- ***first aid***: provision of first aid facilities, and an emergency plan. On watching briefs with small numbers of staff, MOLA may not be able to supply a qualified first aider. In that case, the services of the Principal Contractor's qualified first aider(s) may be required.
- ***Secure storage*** for finds, and for tools and equipment.
- ***managerial services*** – nominated points of contact for Principal Contractor and other key members of development team.
- ***technical advice*** to be available if required (eg via client or Principal Contractor's consulting engineer) re protection of adjacent streets and buildings, removal of obstructions, depth of excavation, live services etc.

22.8.1.2 Unlikely to be required

- *specific site security:* it may be necessary to separately secure individual archaeological working areas via a physical barrier (such as Heras fencing) eg if there are public areas nearby or human remains are encountered.
- *site preparation and clearance*. Removal of structures, vegetation, rubbish, spoil heaps, demolition materials, slab, modern obstructions, infill, made ground, etc. as required, prior to and during the archaeological investigation. The majority will

be mechanical excavator, under archaeological supervision, but occasional hand work by labourers may be needed (eg clearing individual obstructions or removing spoil from investigation areas if the machine cannot re-enter).

- *temporary roofing* (*not required*) to archaeological excavations (eg clear plastic sheets on scaffolding frame). Needs to have adequate water drainage and ventilation. Local, portable frames would only be required if significant remains are present. There is no need for routine roofing of all excavation areas.
- *110v. site lighting and power supply* for access routes to excavations, plus individual task lighting within trenches (eg tripod-mounted spotlights) if required. The need for lighting depends on the depth, season and weather conditions or on ambient light level if working inside a shaft or standing building
- *filling back and reinstatement* upon completion (trenches are normally backfilled, for safety reasons, unless there are client instructions to the contrary).

22.8.2 Equipment

Equipment will be supplied by the MOLA equipment central store:

- First Aid Kit
- Hand tools, dumpy levels, stationary, grid pegs, digital camera, etc.
- Power auger if required (*not likely at the River Lea targeted watching brief*)

Any specialised equipment such as power augers will have certification of maintenance kept at MOLA headquarters.

22.8.3 PPE

All MOLA staff are supplied with and will wear or use the following PPE where required and as appropriate:

Safety Helmets (EN397)
Ear Defenders (EN 352-3)
Safety spectacles (EN166)
Dust masks plain and valved (EN149 2001).
Hi-visibility vests **and trousers** (EN471) – **orange**
Gloves Nitrile PVC, EN374
Safety footwear - steel toecap and mid-sole boots and Wellingtons EN345-47 (No riggers are allowed)
Flame retardant overalls
Disposable overalls

Additional PPE to the above will need to be supplied by the Principal Contractor, in particular **life jackets** and escape **harnesses**.

- **Life jackets: are required within 2m of the water's edge**
- **Escape harnesses: are required within the cofferdam** (but not within the hand-railed area of the viewing platform)

22.8.4 Staff

The timing and overall duration of the targeted watching brief listed earlier will be determined by the contractor's programme and the nature and extent of any surviving remains. It is envisaged that the Targeted Watching Briefs will be initially carried out by one MOLA Supervisor, with other support staff coming in to assist with any recording , sampling, surveying or photographic work if required.

It is *provisionally* estimated that up to 2 archaeologists/geoarchaeologists, and 1 or 2 other specialists, might be required on site for the targeted watching briefs. MOLA will notify the Principal Contractor if more staff will be required.

The dedicated MOLA Supervisor is currently planned to be (to be confirmed):

- Dave Sankey, BA (Hons), MA. Mobile: 077 30 646 055.

The principal geoarchaeologist is currently planned to be (to be confirmed):

- Graham Spurr Graham Spurr, BSc (Hons), MSc. Mobile: 07939659057

22.9 Briefing Arrangements

22.9.1 MOLA Staff Induction – New Starters

- All MOLA staff shall receive a full induction including Health and Safety on commencement of their first day of work with the organisation. A record of the induction is kept.
- The MOLA Supervisor will be briefed by MOLA Contracts Manager/Assistant Contracts Manager on all relevant aspects of work before work commences. This briefing will include all SS-WSI, Method Statements (PC's and including this document.
- The MOLA Supervisor will be responsible for briefing any other MOLA staff on site before they commence work on all aspects of the work and documents.

22.9.2 Site Specific Inductions, Weekly Briefings and Tool Box Talks

- Where a site is under the control of a Principal Contractor (as in this case), MOLA staff will attend all initial site inductions and subsequent toolbox talks as required and managed by the Principal Contractor.
- Irrespective of whether the site is controlled by MOLA or a Principal Contractor, on larger projects eg those with more than 2–3 staff and of a week or longer duration, regular toolbox talks will be given by the MOLA Supervisor or other suitable member of staff using the CITB: construction site safety tool box talks manual. As a minimum requirement these talks will occur 1–2 times per week and be of 10–15 minutes duration.

22.10 First Aid

22.10.1 Trained First-Aid Personnel

Where possible with the small numbers of MOLA staff during watching briefs, there will be at least one MOLA Archaeologist who is a qualified First Aider (ie 3 day FA at work course) on site. If not, the Principal Contractor's first aider(s) responsible for the watching brief task(s) will be identified by MOLA at the Principal Contractor's Induction, and their services used if required.

22.10.2 First Aid Documents

The MOLA site safety documents will be located with the first aid kit in the site office/mess hut/canteen. The safety documents will include a minimum of:

- Current Health and Safety at Law Poster for display where legislation requires
- Accident Reporting Forms compliant with the Data Protection Regulations.
- MOLA Public Liability Insurance & Employers Liability Insurance for display
- Where To Get First Aid poster – to be displayed if required.
- Current MOLA Health and Safety Policy
- A copy of the site Welfare, Health and Safety Method Statement, extracted from the Site WSI, and modified as agreed during the course of the site.

22.10.3 First Aid Equipment

A MOLA First Aid kit, of an appropriate size for the site, will be located in the site office/mess hut/canteen or in the case of this site a 'bum bag' will be carried by the MOLA Senior Archaeologist at all times.

22.11 Accident, Incident, Near Miss and Environmental Incident Reporting

22.11.1 Reporting of Accidents/Incidents and Dangerous Occurrences

The Reporting of Injuries, Diseases and Dangerous Occurrences (RIDDOR) Regulations, 1995 sets out requirements for the reporting of certain types of accidents. RIDDOR notifiable accidents will be reported immediately by the MOLA site supervisor as specified in Section 17.5 of the method statement, above.

22.11.2 Documentation

In order to identify quickly problem areas and allow corrective action to be taken all accidents, dangerous occurrences and near misses, including those that do not cause injury, will be reported immediately to:

Principal Contractor's Site Manager
MOLA supervisor

MOLA H & S Compliance Manager
MOLA Senior/Project Manager
Crossrail Project Archaeologist
Crossrail Helpdesk.

The site accident reporting documents for both the Principal Contractor and MOLA should be filled in giving details of the incident.

22.11.3 Investigation of Accidents and Dangerous Occurrences

MOLA will comply with the Principal Contractor's and Crossrail procedures.

MOLA will also initiate internal procedures as follows:

- Initial accident/incident report to MOLA Senior/ Project Manager and Assistant Project Manager and action taken as appropriate.
- Non Riddors investigated by Senior/ Project Manager/Assistant Project Manager.
- Riddors investigated and reported on to Senior Management Consultant by MOLA H & S Compliance Manager.

22.11.4 Key Project Personnel

- George Dennis, Senior Project Manager, MOLA
- Elaine Eastbury, Project Manager, MOLA
- Nicholas Elsden, Assistant Project Manager, MOLA

22.12 Emergency Procedures – Site General

All MOLA staff will comply with the Principal Contractor's procedures as outlined at the Site Specific Induction.

22.13 Emergency Services Contact Details

The Principal Contractor will confirm the hospital location:

The Royal London Hospital
Whitechapel Road
Whitechapel
London
E1 1BB

Telephone **020 7377 7000**
The hospital is off Whitechapel Road, opposite the LU Station entrance.

Note the new (2012) entrance location, from East Mount Street (off Whitechapel Road) or Raven Row (off Cavell street).

The MOLA supervisor will dial 999 for fire, ambulance and police in the case of an emergency if the Principal Contractor's Site Manager or his deputy is not present on site.

23 Route to Hospital

The Principal Contractor will advise on route to hospital at their site specific induction. The location and directions will also be displayed in the site offices and canteen.

23 Risk Assessments

23.1.1 Preliminary Site Risk Assessment Register

The MOLA Site Supervisor will be responsible during the site work for monitoring whether (and what) *additional* updates, modifications or Specific Risk Assessments are required.

MOLA Site Supervisor

MOLA RISK ASSESSMENT REGISTER

For Site/Task:		**Type**	
Persons Affected	**No**	**Classification**	**No**
Employees	1–3	Experienced	1–3
Other workers		Inexperienced	
Public		Disabled	

Known and Suspected Hazards on site with Remaining Risk (mark as appropriate and include numbered risk assessment in WSI)

	L	M	H		L	M	H		L	M	H
1 Access	Y			26 Dust				50 Glass Recording			
2 Ladders	Y			27 Noise				51 COSHH:Sthil Lubricant			
3 Plant	Y			28 Deep Excavations	Y			52 COSHH:Sthil two stroke oil			
3a Plant (loading and unloading)				29 Power Tools				53 SHARPS (hypodermics)			
4 Dumpers				30 Vibration				54 Task Lighting (laniro etc)			
5 Scaffolding (inc Towers)	Y			31 Vehicles (Driving)				55 Site Walk Over			
6 Excavations	Y			31a Vehicles (Site)				56 Processing: Finds washing			
7 Work at height	Y			31b Vehicles (loading/ unloading)				56a Processing: Environ samples			
7a Work at Height (Cherry Picker)				32 Lifting Equipment				56b Processing: Artefact marking			
8 Slips, Trips, falls	Y			33 Plant (lifting)				56c Processing: Manual handling			
9 Underground services				34 Human Remains				56d Processing: Power hose			
10 Overhead Power Lines				35 Public Safety				56e COSHH: Parafin (Processing)			
11 Electrical				36 Violence				57 Office Work			
12 Fire (inc LPG)				37 Chainsaw				58 DSE (Work Stations)			
13 Confined spaces				38 Power Auger (COBRA)				59 Young Person			
14 Breaking Out				38a Power Auger (Compressor)				60 Person Specific/Expectant Mother			
15 Hand Tools	Y			38b Power Auger (Electric)				61 Light Duties			
16 COSHH: Spray paint				39 Hand Auger				62 Individual Stress			
17 Contaminated Land				40 Foreshore/water	Y						
18 Weil's Disease	Y			41 Adverse Weather	Y						
19 Psittacosis				42 Spoil Mounding							
20 UXO				43 LPG(Butane)							
21 Asbestos				44 Waste							
22 Welfare				45 Storage							
23 Lone working				46 Animals							
23a Empty Premises				47 Non-ionising radiation							
24 Manual Handling	Y			48 COSHH: Petrol							
25 Fumes/Gas				49 Spot Dating							

General Controls

Contracts Manager in over all charge of project is: Elaine Eastbury Tel: 020 7410 2237, Mobile: 07730 646063
Supervisor(s) in daily charge of project is: Dave Sankey (TBC)
Number, training and experience of supervisors will be sufficient for the project
Supervisor(s) holds IOSH Supervising Safely Cert: Yes (TBC)
All staff will comply with the: MOLA H&S policy, Principal Contractors site rules, all WSIs, Risk assessments, safe systems of work Permits to work.
All staff will have sufficient training and experience for the tasks they undertake or be under close supervision
All staff will be CITB H&S tested and hold a CSCS card appropriate to their profession
All staff will be fit to undertake their work
All staff will be inducted on first day of work, briefed on the WSI and the specific hazards and control measures attendant on their work on site.
The full site induction will be undertaken by the Principal Contractor.
All staff will sign the induction and WSI register to confirm that they have received, understood and will comply with both.
Tool box talks/staff briefing will be conducted on the hazards and control measures on a regular basis (at least weekly or more frequently if circumstances dictate)
Appropriate PPE to be worn for each task.
Minimum site PPE (unless otherwise stated by supervisor): Steel Toe-cap/midsole boots, Safety helmet, high visibility vest or jacket, and trousers (life jackets and harnesses as section 22.8.3).
First Aid kit on site, First aider/appointed person on site. Nearest accident and emergency unit located and contact numbers obtained

Competent Person(s) appointed to take action:	**All Risk Assessments seen by (initials)**	
H&S Manager	**PM**	**Archaeologists**
Contract Manager	**SA(s)**	
Senior Archaeologist	**Client**	
Senior Geoarchaeologist/matician	**Contractor**	
Principal Contractor's site manager	**Other**	

23.1.2 Specific Risk Assessments

MOLA RISK ASSESSMENTS		**SITE: Crossrail, Pudding Mill Lane, River Lea works**	
APPROVAL (Name and Title)		**SIGNATURE**	**DATE**
Prepared by:	**Nicholas Elsden**		**16.01.13**
Approved by:	**Ian Grainger HSCM**		18.01.13

RA N^{O}	**ACTIVITY**	**Hazards**	**RISK**	**Risk Class L/M/H**	**N^{o} at Risk**	**Control Measures**	**Final Risk L/M/H**	**Action by**
0001	SITE ACCESS	Fall of persons from height, Fall of objects from height, Vehicle/plant collisions, Slips Trips falls	**Personal Injury, Equipment Damage**	**M**	**1–3**	Obey warning signs, verbal and written PC and traffic marshal instructions. Use pedestrian access gate. Keep to designated pedestrian routes. Be aware of plant and vehicle routes and movements. Do not obstruct pedestrian routes – be tidy. Report unsafe routes.	**L**	Supervisor and staff

0002	LADDERS (Access into cofferdam by secured ladders in early phases of work; subsequently by scaffolding access towers – se RA 5)	Fall of person from ladder, Fall of material from ladder, Collapse of ladder	**Personal Injury, Equipment Damage**	M	**1–3**	Use correct length and type, not painted. Daily inspection when in use, do not use if damaged. Must project at least 1.50m above stepping off point. Check/Fix securely at top and base. Check/Install at an angle of 75 degree (1:4 ratio over length). Three points of contact: make sure any load can be carried comfortably with one hand free for ladder.	L	Supervisor and staff
0003	PLANT 16t excavator	Persons Struck by Machine Shovel or load dropping Hydraulic fluid spray Overturning of machine Fire/explosion	**Personal Injury, Equipment Damage**	M	**1–3**	**MOLA staff will not operate plant**. No work with or near plant operator under influence of drugs/alcohol or behaving erratically. *Where applicable:* operations to be under supervision of MOLA supervisor or deputy and trained banks person also Staff working near machine to ensure that the operator has seen them and that they are at a safe distance. Staff briefed on plant operations and changes to them. High visibility clothing.	L	Supervisor and staff
0005	Scaffolding (Towers and Access) Access via temporary bridge over river (See also RA 7) Access into cofferdam by scaffolding access towers in later phases of work	Fall of persons Fall of materiel Collapse of scaffolding	**Personal Injury, Equipment damage**	H	**1–3**	**MOLA staff will not erect scaffolding.** Only use scaffolding (inc stairs) that displays green scaffold tag with current weekly inspection record. Do not use if obviously damaged. Do not use in high winds and/or heavy rain. Maintain three points of contact, always have one hand free for guard rail when carrying load.	L	Supervisor and staff
0006	EXCAVATION	Collapse of sides Fall of persons Falls of Plant, equipment, material Flooding	**Personal Injury, Equipment damage**	H	**1–3**	Inspect all excavations before each day/shift and record results. Supervisor will report unsafe excavations to principal contractor. Staff will not enter any excavation they consider unsafe until it is made safe. Staff will report unsafe excavation to	L	Supervisor and staff

						supervisor. Shoring installed by contractor under direction of the principal contractor. Edge protection installed by contractor under direction of the principal contractor. Warning and information signs in MOLA excavations. Pumps if required inspected and certified.		
0007	WORK AT HEIGHT Monitoring excavations from hand-railed viewing platform over river See also RA 40	Falls of Persons Falls of materials and equipment	**Personal injury, Equipment damage.**	H	**1–3**	Competent person to determine if work at height. Robust edge protection and warning signs. Safe access (se RA 5). Safety harnesses and lanyards secured to fixed point **NOT** required in hand-railed area. All equipment will be checked daily/before each shift by competent person Staff screening for task suitability – fear of heights etc.	L	Supervisor and staff
0008	SLIPS/TRIPS/ FALLS	Falls of persons Dropping of equipment/material	**Personal injury, Equipment damage**	M	**1–3**	Assess work in adverse weather and suspend if appropriate. Keep all surfaces level and dry where practicable. Keep all areas free of unnecessary obstruction and debris. Keep all areas well lit. All safe pedestrian routes to be sign posted. Staff to be physically fit for the conditions on site. No running or horseplay. Be cautious moving about site.	L	Supervisor and staff
0015	HAND TOOLS Covers use of: Mattock, Shovel, spade, pick axe, trowel, draw hoe, garden fork, hand shovel, brush, lump hammer, sledge hammer, chisel, bolster and similar simple non mechanical tools	Manual handling Impact from tool Impact from flying debris	**Personal injury, property damage**	M	**1–3**	All hand tools to be to industry safety standard. Inspect tools on delivery. Discard tool if not fit for purpose. Assess staff fitness to use tools. Task briefing where applicable. Training and supervision for inexperienced staff. Adequate breaks/rest periods	L	Supervisor and staff

0018	WEILS DISEASE (Leptospirosis) RATS	Rat (and Cattle) faeces and urine	**Personal injury Illness**	H	**1–3**	Brief staff on hazard. Carry HSE G 406 instruction card Wear gloves. Clean and cover any cuts or abrasions promptly with a waterproof plaster. Wash hands before eating, drinking, smoking. No eating drinking and smoking outside designated areas. Keep Welfare facilities dry, tidy and secure. Keep food covered and secure. Basic surveillance of staff for flu like symptoms. Report ill health.	L	Supervisor and staff
0024	MANUAL HANDLING	Too heavy, big, awkward load, Too prolonged Dropping load	Personal injury, Equipment damage	M	1–3	**General** Remove the need for manual handling where possible. Use mechanical aids where possible. Reduce horizontal and vertical distances. Reduce size and weight of individual load. Ensure team sufficient and fit for task. Ensure that route planned, well lit, obstruction free, and as dry as possible. Liaise with others to keep route safe, use lookouts. Brief and train staff. Rotate staff and/or sufficient breaks for prolonged tasks Use gloves **Personal** Assess weight before lifting, stay comfortably within personal lifting capacity. When picking up load: stand close with feet slightly apart, crouch do not bend at waist, keep head up and maintain natural curvature of spine, thrust/lift through hips, keep object close to body, maintain clear field of vision and do not run. **Use MOLA Manual handling check lists for all significant manual handling tasks 0024a-e :** Planks, ladders and boards	L	Supervisor and staff

						Drums/round containers Bags and sacks Finds/irregular shaped objects on site Office work – boxes etc		
0028	DEEP EXCAVATIONS Excavation will be within a sheet-piled cofferdam Slopes required along the base of cofferdam will be at 1:3 (DSJV method statement, p 59)	Collapse of sides Fall of persons Falls of Plant, equipment, material Flooding Hazardous atmosphere	Personal Injury, death	H	**1–3**	**Cofferdam-specific:** Staff to wear escape harnesses, and davit arm to be installed and maintained by competent operatives by PC. Gas/Air quality monitoring before and during work by PC. **Generic:** Determine the depth for the installation of shoring/ battering back as outlined in WSI. Shoring installed and maintained by competent sub-contactor. Shoring inspected by competent sub – contractor or MOLA supervisor instructed by them. Access ladders/scaffolding installed and inspected by competent contractor. Edge protection – fixed scaffolding barrier –installed around trench by a competent person 'Danger Deep Excavation' Warning signs displayed ie on site boundary/entrance, trench edge protection Where appropriate a fixed hoist to remove spoil rather than a crane or mechanical excavator. Hoist and plant operators will be briefed on MOLA works and operating procedures for deep trenches. The size and shape of the bucket or skip used for spoil disposal will be suitable for the size of trench, shoring, and other obstructions. Task specific briefing before commencement. Only staff physically fit and suitable. Basic visual health	L	Supervisor and staff

						surveillance. report all unwell, symptom immediately. A mechanical pump(s) where necessary.		
0040	WORKING OVER/ON/NEAR WATER	Falling into water trip hazards, (Weil's disease – see RA 18, tetanus)	Personal Injury or illness, equipment damage or loss.	H	**1–3**	Life jackets to be worn within 2m of waters edge. Staff must be able to swim. Rescue boat present at all times. Life buoys in conspicuous positions adjacent to water's edge. At least 3 persons present at all times. Frequent checks to be carried out on numbers of personnel on site. Briefing on Emergency Procedure. Fluorescent Hi-Vis PPE. First aider on site. No lone working. No eating, drinking or smoking Wear impermeable gloves. Provide hand-cleansing materials Avoid hand to face contact and wash hands. Ensure any wounds or broken skin is covered with water proof dressing Electrical equipment must not be over 65 volts if water is present	L	Supervisor and staff
0041	ADVERSE WEATHER Risk from slip/trip/fall etc increased by location over/near water	Slips trips and falls Snow, sleet, hail, rain, - Frozen ground Ice covered ponds holes freezing temperatures, high winds	Personal Injury, equipment damage, lost time	H	**1–3**	Keep walk ways, pedestrian route, and observation/working areas clear of ice and snow, mud. Monitor weather forecasts. Ensure staff can get to and from work safely in reasonable time – send home early if necessary. Cancel work in advance if necessary consider remote sites/ poor transport links. Ensure drying and heating in welfare facilities. Assess site conditions before commencement. Check barriers/warning	L	Supervisor and Staff

						signs in place around all deep holes. Rotate staff tasks. Do not use hand tools on heavily frozen ground or in heavy rain. Report unwell symptoms. Wear warm clothing.		
All persons affected by these hazards must be made aware of the contents of this Risk Assessment								

HEALTH & SAFETY METHOD STATEMENT REGISTER			
Date	Name of Inductee	Signature of inductee To: confirm that you have read this Method Statement and understood its contents and you will work in accordance with the method statement.	Confirmation Signature of Supervisor/Manager
INDUCTION REGISTER (by Principal Contractor for this task)			
Date of Induction	Name of Inductee	Signature of inductee To confirm that you have attended the induction and understood its contents and that you will work in accordance with the induction content, MS, Risk assessments and resulting safe systems of work and all legal and reasonable safety requirements and instructions	Confirmation Signature of MOLA inductor

For further names append more pages

Fig 1 PML site drawing 16.11.12 (DSJV)