C422 – Tottenham Court Road

Method Statement for Urban Realm Drainage Installation (J. Murphy & Sons)

CRL Document Number: C422-LAO-A-GMS-N105_WS089_1-50001

Supplier Document Number: N/A

Contract MDL reference C12.005

1. Contractor Document Submittal History:

Version	Date:	Prepared by:	Checked by:	Approved by:	Reason for Issue:
1.0	27/10/2017	[redacted]	[redacted]	[redacted]	For Crossrail Acceptance
		[redacted]			

2a. Stakeholder Review Required? YES ☐ NO ☐

Stakeholder submission required: LU ☐ RfL ☐ NR ☐ LO ☐ DLR ☐ Other: _____

Purpose of submission: For no objection ☐ For information ☐

This document has been reviewed by the following individual for coordination, compliance, integration and acceptance and is acceptable for transmission to the above stakeholder for the above stated purpose.

Sign: _____ Role: _____ Name: _____ Date: _____

Sign: _____ Role: _____ Name: _____ Date: _____

2b. Review by Stakeholder (if required):

Stakeholder Organisation	Job Title	Name	Signature	Date	Acceptance
					☐
					☐
					☐

3. Acceptance by *Crossrail*:

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	Reviewed / Accepted by: [redacted]
☐	[redacted]	Not Accepted. Revise and resubmit. Work may [redacted] indicated	[redacted]
☐	Code 3.	Not Accepted. Revise and resubmit. Work may not proceed	Position: PCa
☐	Code 4.	Received for information only. Receipt is confirmed	Date: 31/10/17
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.			Signature: [redacted]

RISK ASSESSMENT / METHOD STATEMENT / TASK SHEET APPROVAL or ACCEPTANCE

Project:	**C422 - Tottenham Court Road**		
Section:	**Urban Realm**		
Work Element:	**Drainage Installation**		
Reference:		**Date:**	**17/10/2017**
Originator:	**Subcontractor**		
Company:	**J. Murphy & Sons**	**Name:**	[redacted]

Rev.	Date:	Reviewed by:	Comments:	Date of Return:	Returned To:

'I am reasonably satisfied, to the best of my knowledge, the proposals in the above method statement are adequate'

1.METHOD STATEMENT APPROVED (LOR MS) or ACCEPTED (SUBCONTRACTOR MS) FOR USE:	
Signed:	**On Behalf of:**
Name:	**Date:**
2.ACCEPTED BY TEMPORARY WORKS COORDINATOR: AS PRINCIPAL CONTRACTOR	
Signed:	**As PC:**
Name:	**Date:**
3. ACCEPTED BY APPOINTED PERSON FOR LIFTING: AS PRINCIPAL CONTRACTOR	
Signed:	**As PC:**
Name:	**Date:**
4. METHOD STATEMENT ACCEPTED BY LAING O'ROURKE PACKAGE / RESPONSIBLE MANAGER:	
Signed:	**As PC:**
Name:	**Date:**
5.FINAL REVIEW AND APPROVAL WITHIN A WEEK PRIOR TO WORK COMMENCING:	
Signed:	**On Behalf of:**
Name:	**Date:**

IMPLEMENTATION OF METHOD STATEMENT:

I have witnessed the work within 24 hrs of its commencement and am reasonably satisfied, to the best of my knowledge, that the proposals in the above method statement are being implemented.

Signed:	**On Behalf of:**
Name:	**Date:**

Table of Contents

1.0 INTRODUCTION

Murphy have been employed to carry out the urban realm works at Tottenham Court Road Station adjacent to both the Western Ticket Hall and Goslett Yard Box sites.

This document outlines the methodology that will be used to carry out drainage installation within the carriageways surrounding both sections of the site. This Method Statement includes a general sequence and methodology of works, specific points relating to the Quality Assurance and Health, Safety and Environmental controls. It will identify the risks associated with the works and the subsequent control measures therefore ensuring that the works are carried out in a manner that reduces the risk to operatives, public, adjacent work forces, CRL and other third party assets.

All operatives and supervisors will be briefed on this Method Statement prior to works commencing.

All operations are to be reviewed during the construction process by appropriate Murphy personnel (Supervisor, Construction Manager, Project Manager, HSE Advisor, etc.) to ensure that the works are being carried out in a safe manner.

The following is to be read in conjunction with the following documents:

ITEM	DOCUMENT NUMBER	DOCUMENT DESCRIPTION
1	C422-1000-DES-PLA-0012	Drainage Drawing – WTH North
2	C422-1000-DES-PLA-0012	Drainage Drawing – WTH South & GYB
3	C422-LAO-C-RSP-N105_WS089-50002	Highway and Urban Realm Specification
4	C422-LAO-O1-STP-N105_WS089-50001	Construction Phase Plan
5	CRL-XRL-V3-XWI-CR001-50035	Works Information: Volume 2B - General Requirements
6	C422-LAO-O4-STP-N105_WS089-50001	Project Quality Assurance Plan
7	C422-LAO-A-ITP-N105_WS089_1-50002	ITP for Drainage Installation
8	N/A	C422 Site Information
9	C422-XRL-C2-RGN-N105-50001	Geotechnical Baseline Report
10	C422-LAO-05-STP-N105_WS089-50001	Project Security Plan
11	C422-LAO-R5-STP-N105_WS089-50001	Logistic Plan
12	N/A	CLOCS Standard for Construction Logistics
13	C422-LAO-T1-STP-N105_WS089-50001	Environmental Management Plan
14	C422-LAO-T1-STP-N105_WS089-50013	Site Waste Management Plan

2.0 SCOPE OF THE WORKS

This Method Statement covers drainage installation at the Western Ticket Hall and Goslett Yard Box sites. The works include:

- Carrier drain installation
- Manhole construction
- Gully installation
- Removal of redundant gullies

Figures 2-1, 2-2 & 2-3 show the general arrangement of the drainage installation (although are subject to revision). The Site Engineer will keep a register of up to date drawings and documents issued to Murphy by Laing O'Rourke as the project progresses.

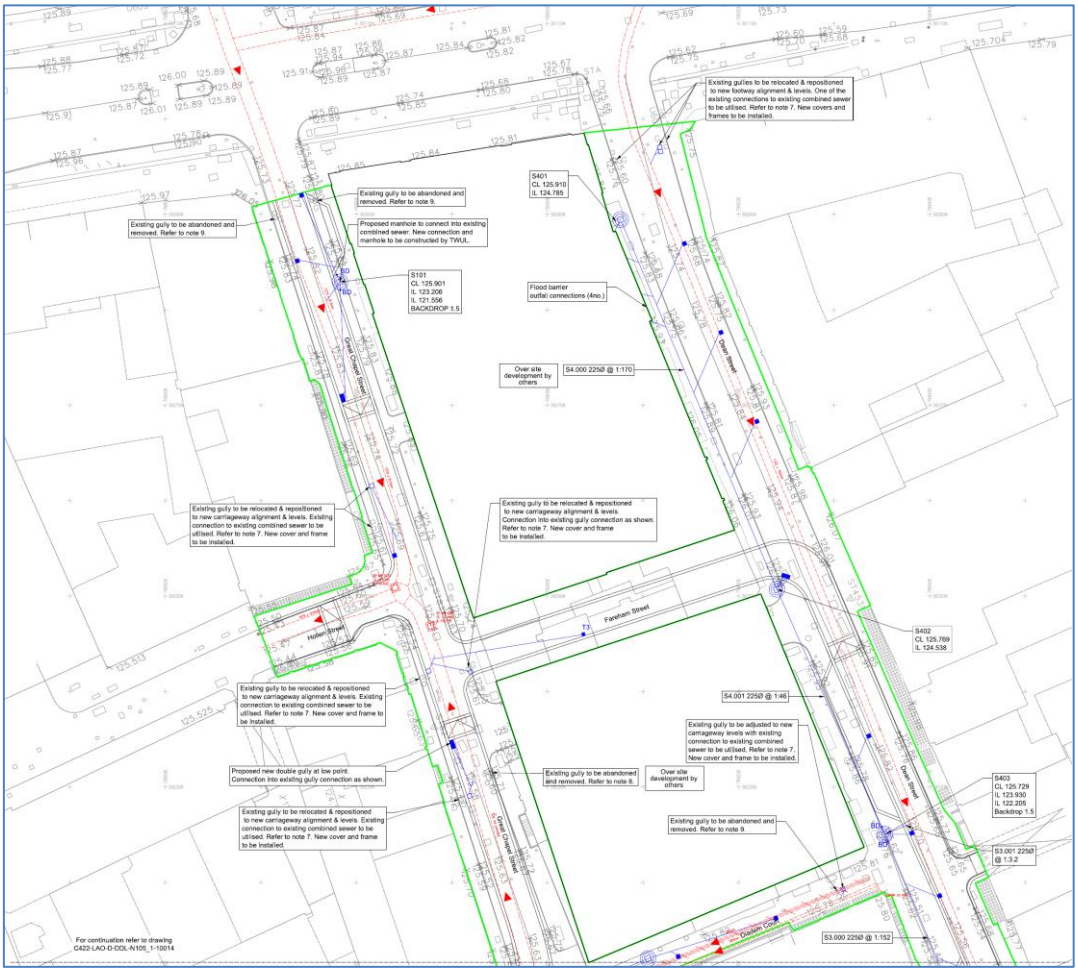


Figure 2-1: Drainage General Arrangement – Western Ticket Hall Northwest

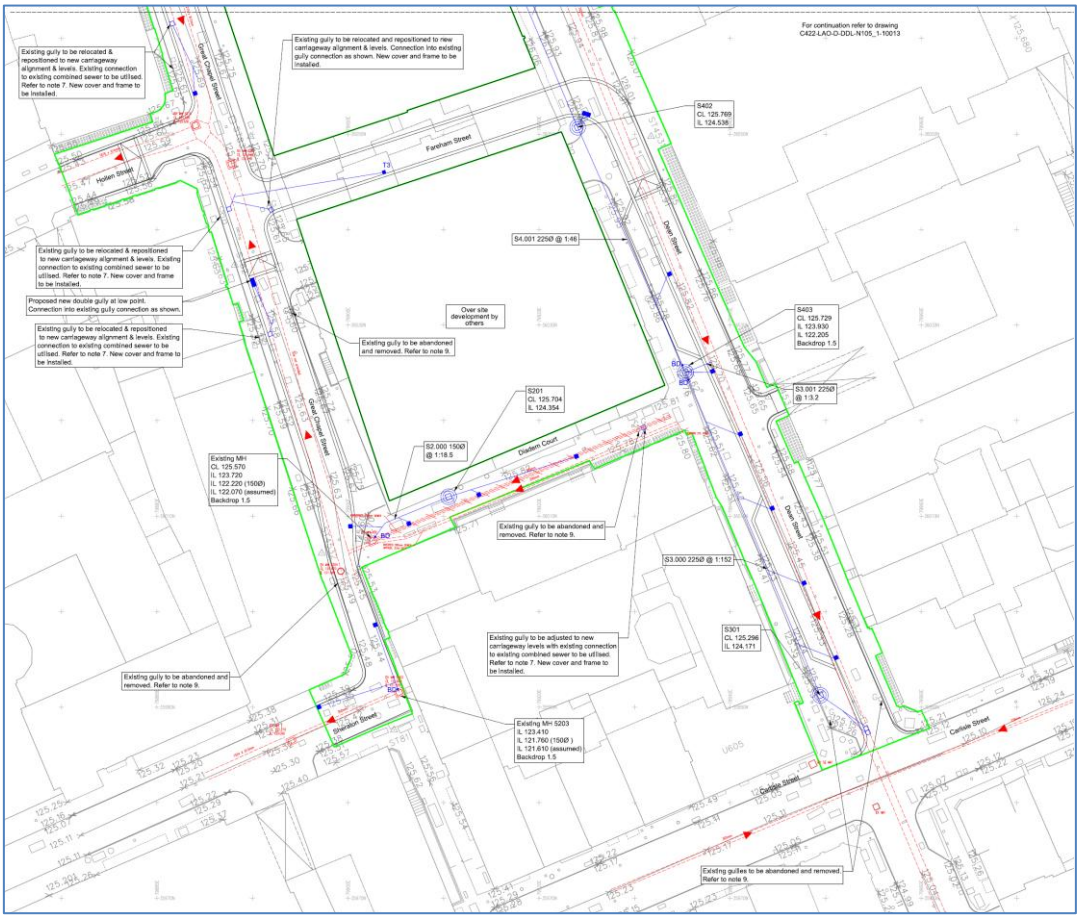


Figure 2-2: Drainage General Arrangement – Western Ticket Hall Southwest

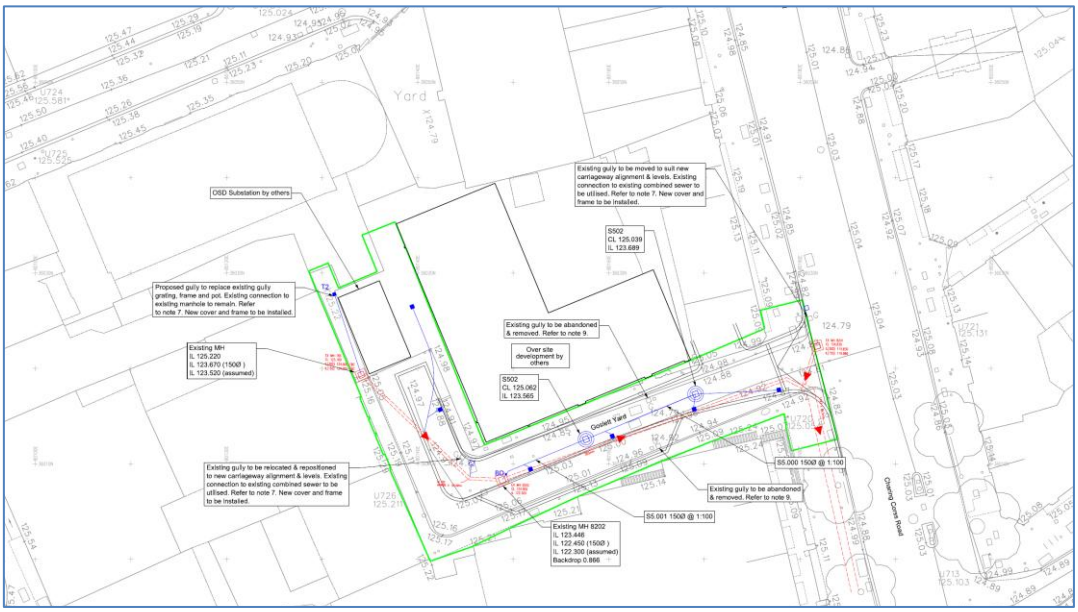


Figure 2-1: Drainage General Arrangement – Goslett Yard Box

3.0 SEQUENCE & METHOD

3.1 Preparation

All personnel are required to attend an LOR site induction prior to entry to site. PPE and competency requirements are described in sections 4 and 6 of this Method Statement. This Method Statement and relevant associated document such as Inspection and Test Plans will be reviewed and accepted by Laing O'Rourke and Crossrail prior to works starting on site and then briefed to the workforce.

All drainage components used on the scheme have been approved by Crossrail and the site team are to be aware of approved material / suppliers and the required documentation, for example CE marking, to be presented with deliveries.

Copies of drainage drawings, the specification, and other relevant documents are to be kept on site and accessible to the site team. Copies of all health, safety, environmental and quality documents are also to be kept on site and be available for audit if requested by either Murphy, Laing O'Rourke, or Crossrail personnel.

3.2 Access/Egress and Material Storage

The works areas are divided into sections within the existing site hoardings and outside the site hoardings.

Access to areas within site hoardings will be via the existing site access gates with routes as detailed in the project Logistics Plan and shown in Figure 3-3 below. Areas for material storage will be agreed with Lang O'Rourke to enable Murphy to hold a level of stock on site, but without interfering with adjacent activities. This will be reviewed on a weekly basis as works progress or at more regular intervals if required.

Traffic management will be installed to the carriageways and footways in areas outside of the hoardings with access routes and material storage areas shown. Materials, waste and equipment stored outside of the existing site hoardings will be kept to a minimum outside of site working hours. The traffic management drawing for Dean Street South is shown in Figure 3-1. Working areas outside of the hoardings will be securely fenced using Strongwall Barrier, as pictured in Figure 3-2, which is to be clipped together to prevent unauthorised access.

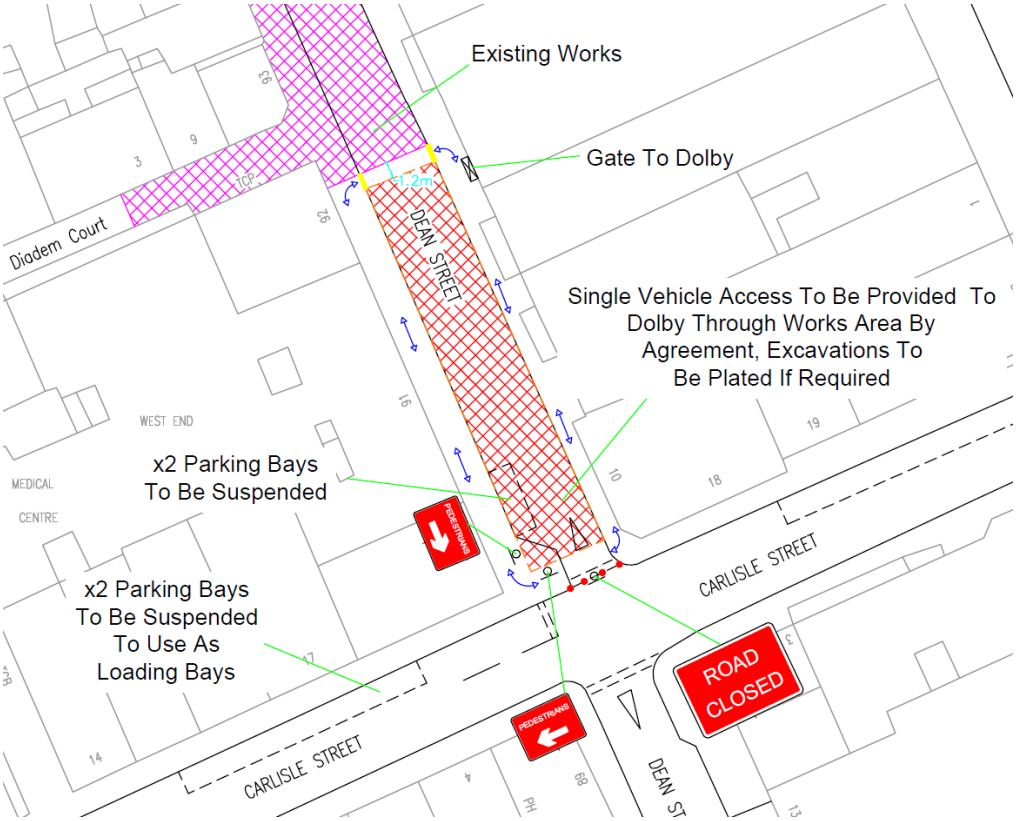


Figure 3-1: Traffic Management Drawing for Dean Street South Works

Figure 3-2: Photo of Strongwall Barrier in use to secure a works area

3.3 Buried Services

A key risk associated with the drainage installation is buried services. A full set of utility drawings, dated within the past 12 months, are to be kept on site and reviewed regularly, particularly in advance of moving to a new area of the site. These will be provided by Laing O'Rourke. Chamber and manhole covers will also be lifted and the site checked for lighting columns, distribution boxes, etc. which will indicate that services are present.

The location of the proposed excavation is to be CAT scanned and any services detected clearly marked on the ground. Laing O'Rourke will issue a Permit to Dig for each section of the site which is to be briefed to all personnel involved in the excavation activity. Trial trenches are to be excavated to confirm the location and depth of services on Dean Street South, the results of which are to be logged and included on future permits. Such excavations may also reveal potential clashes with the proposed drainage with Laing O'Rourke notified as soon as possible if this is suspected. The aim is to keep drainage alignment clear of both services and adjacent properties.

Breaking operations are to be carried out by the site excavator with hydraulic breaker attached. No jackhammers or hand held breakers, picks or points are to be used. Mechanical excavation is not to be carried out within 500mm of an identified or suspected service. Flame retardant PPE is to be work by all personnel involved in excavation activities.

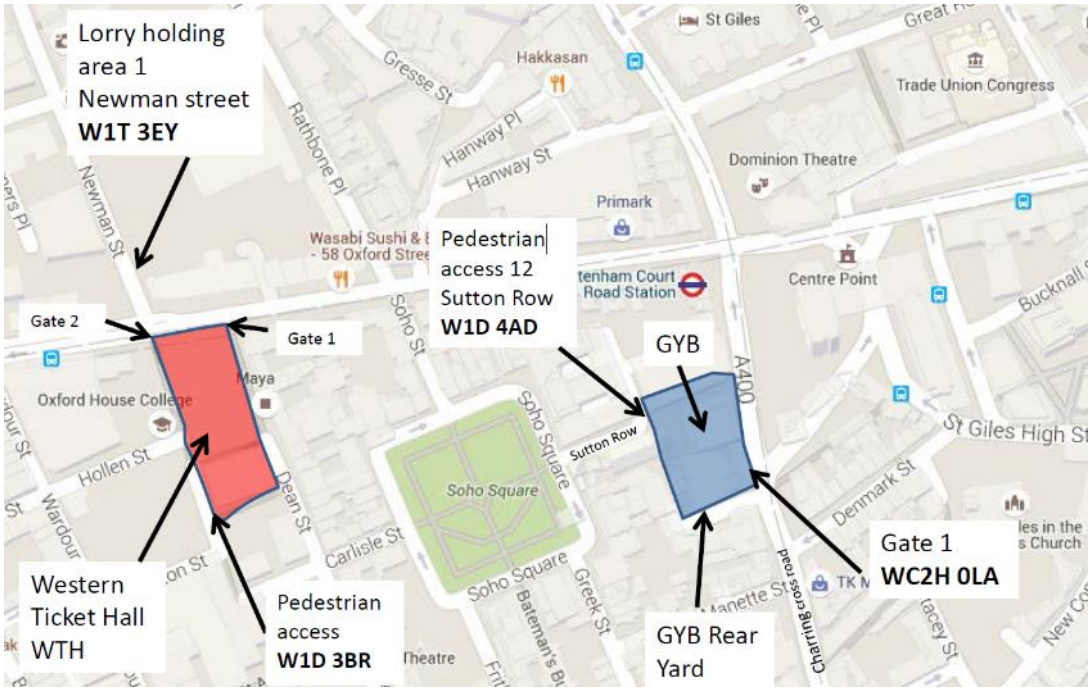
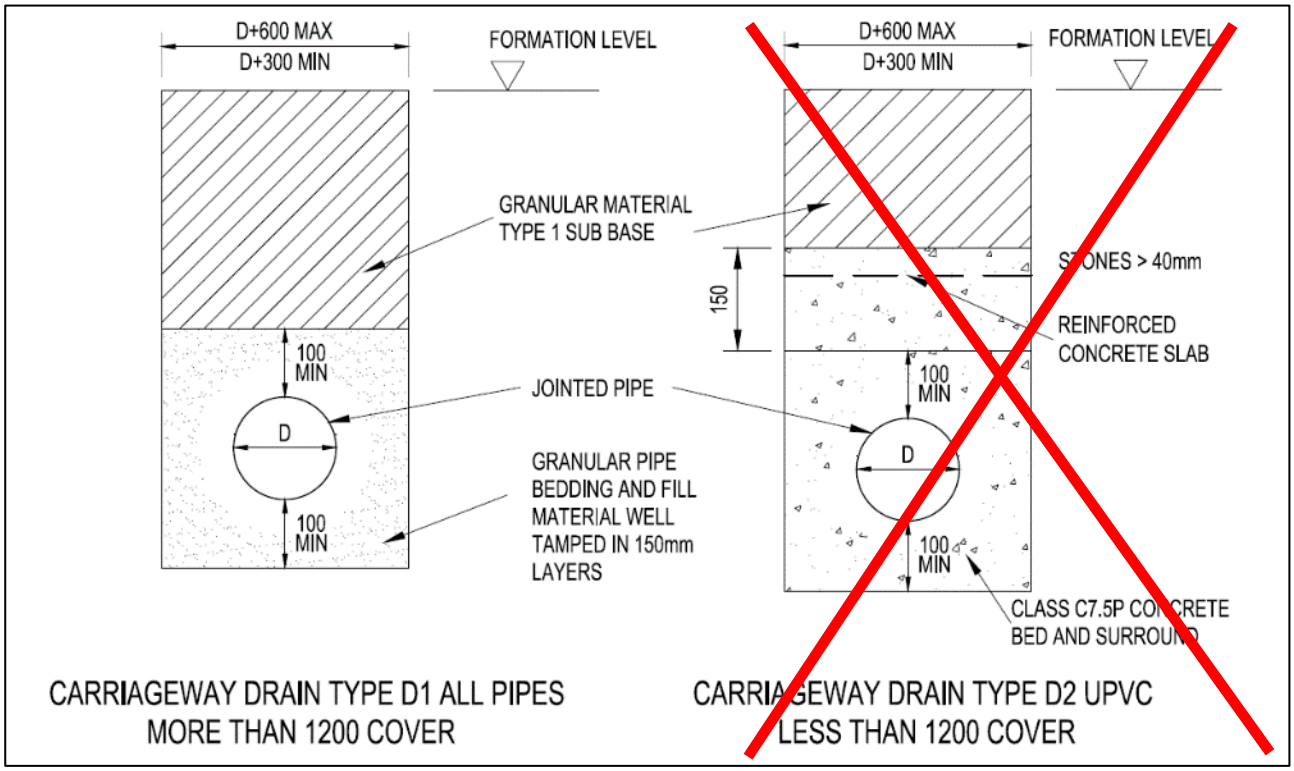


Figure 3-3: Site layout showing existing access gates through hoardings

3.4 Sequence and Method: Pipe Installation

1. The site engineer will set out the line of the drainage run, which ordinarily will run between manholes or from gully to Manhole / junction with carrier drain. Depths will be given from existing ground level and the temporary works requirement identified. They will also identify the pipe diameter, which will govern the width of the trench.
2. Utility drawings are to be checked, areas CAT scanned and a Permit to Break Ground issued. The excavation will then proceed as outlined in section 3.3. Long lengths of open trench should be avoided in order to reduce the risk of working from height and ensure stability.
3. Should trench shoring be required due to the excavation depth, this is to be installed as per the approved temporary work design and checked by a temporary works coordinator prior to operatives accessing the trench and commencing pipe installation. Open excavations are to be kept fenced off and inspected daily or after an event which may affect stability such as heavy rain. Inspections are to be logged on site.
4. Road plates are to be provided to temporarily cover the trenches in order to maintain access to Dolby Europe. Dolby Europe will request access in advance.
5. The excavation depth and formation is to be checked with any soft spots removed to a depth of 300mm and backfilled with compacted type 1. Laing O'Rourke are to be informed if any significant areas of poor ground are encountered. Excavation depth is to extend 100mm below the underside of the pipe to account for bedding material. Excavation width is to be 450mm to 750mm width for a 150mm diameter pipe / 525mm to 825mm width for a 225mm diameter pipe.
6. Bedding material is then to be placed, which will depend on the cover to the pipe. Pipes greater than 1.2m depth are to be laid on a 20mm gravel bed with shingle surround, pipes with less than 1.2m cover are to be laid and surrounded with C16/20 concrete.
7. The pipe will then be laid in lengths with invert level checked and fittings connected to manufacturers guidelines. Results of surveys are to be recorded on as built records. The pipe will then be air tested.
8. Once a sufficient length has been placed and tested the pipe will be surrounded in the appropriate material, which will extend 100mm above the top of pipe if shingle, 150mm above if C16/20 concrete.
9. The trench is then to be backfilled and compacted in layers of 300mm. Care should be taken not to compact the fill until a height of at least 300mm above the pipe has been reached. The top of the backfill is to be checked and left at a level suitable for pavement construction.
10. CBR testing is to be carried out on Type 1 sub base in order to check compaction. This is to be witnessed by a WCC clerk of works in at least one location. Details of CBR testing are included within the Paving RAMS and ITP.
11. A construction record for each pipe run is to be completed and signed off by the relevant parties.



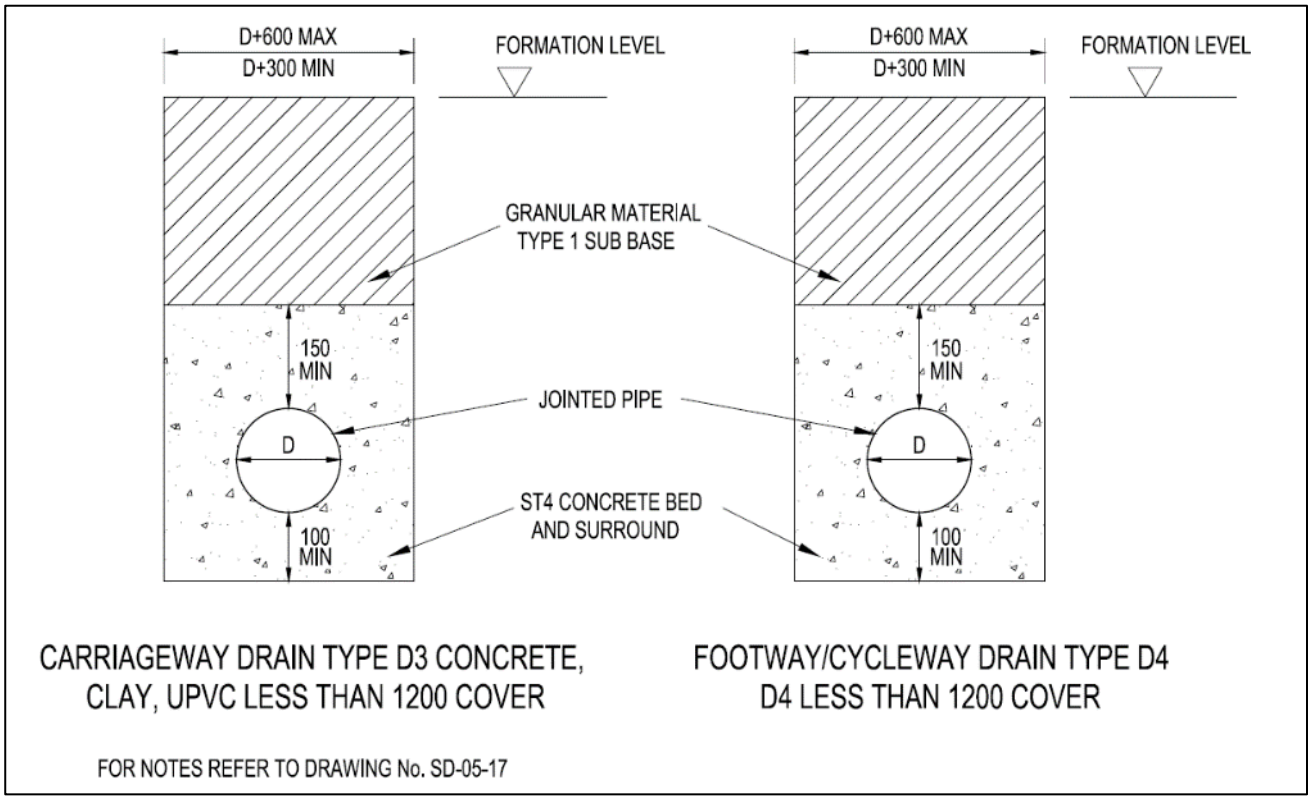


Figure 3-4: Standard Details for Pipe Installation

3.5 Sequence and Method: Gully Installation

1. Gully coordinates and cover level to be set out by the Site Engineer along with excavation depth from existing ground level, which will be governed by the gully type – either type 1 (pre-cast) or Type 3 (brick).
2. Utility drawings are to be checked, areas CAT scanned and a Permit to Break Ground issued. The excavation will then proceed as outlined in section 3.3.
3. The gratings on any redundant gullies are to be removed to storage, brickwork broken out to a level to suit pavement construction and the pot filled with foamed concrete. Outlet pipes are to be protected in case they are to be reused and to prevent material entering the carrier drain.
4. The excavation depth will extend 150mm below the base of the gully to account for concrete bed. Excavation depth for a Type 1 gully will be calculated by the site engineer accounting for external depth of gully pot, depth of slab, two or three courses of brick and grating. Once excavated the formation will be checked and soft spots removed.
5. Road plates are to be provided to temporarily cover excavation in order to maintain access to Dolby Europe. Dolby Europe will request access in advance.
6. The gully will then be installed / constructed on the concrete bed. Type 1 gullies are pre-cast concrete pots of size 450mm diameter x 900mm depth (internal). These will be lifted into position using the site excavator. A generic lift plan will be produced for the excavator and submitted to Laing O'Rourke / Crossrail for review. Type 3 gullies are to be brick built with internal size 300mm x 350mm. The longer side is to be aligned perpendicular to the outlet pipe run / parallel with kerb line. Depth is to suit the invert level of the outlet pipe with the bottom of the gully pot 200mm below pipe invert.
7. The 150mm diameter outlet pipe will be connected to the manhole with connection around brickwork made good with sand and cement mortar.
8. Once installed, the gully and outlet pipe is to be surrounded by a minimum of 150mm C16/20 concrete.
9. The cover slab will then be positioned onto the Type 1 gully pot and brickwork brought up to a level to suit the finish paving level and depth of grating.
10. Once complete, the gully is to be cleaned with any detritus from the sump removed and gratings washed. The overseeing organisation will be invited to inspect the work and sign off the completed construction records.

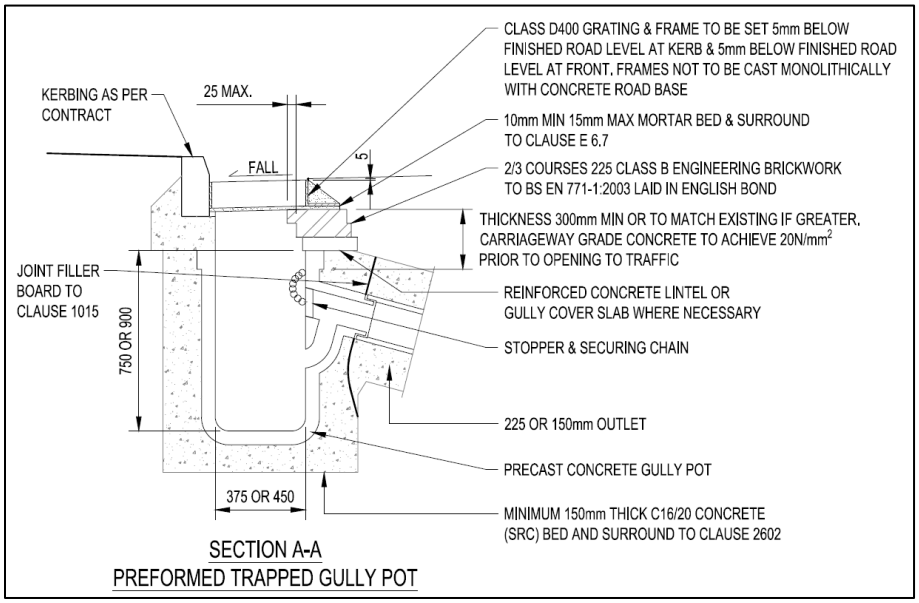


Figure 3-5: Type 1 Gully Standard Detail

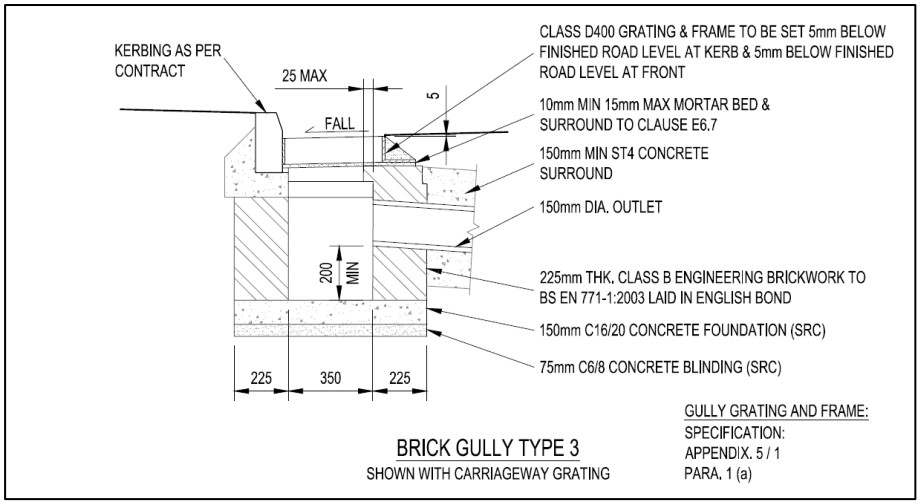


Figure 3-6: Type 3 Gully Standard Detail

3.6 Sequence and Method: Manhole / Chamber Construction

1. Manhole coordinates and cover level to be set out by the Site Engineer along with excavation depth from existing ground level. Manhole type will be governed by its proposed depth – either Type A: depth 1.35m to 3m (1.2m diameter precast rings) or Type B: depth <1.35m (rectangular brick or precast sections).
2. Utility drawings are to be checked, areas CAT scanned and a Permit to Break Ground issued. The excavation will then proceed as outlined in section 3.3.
3. The excavation depth will extend 225mm below lowest pipe invert to account for concrete bed. Excavation depth for a Type A gully will be calculated by the site engineer accounting for depth of precast rings, depth of slab, two to four courses of

brick and cover. Once excavated the formation will be checked and soft spots removed.

4. Should shoring be required due to the excavation depth, this is to be installed as per the approved temporary work design and checked by a temporary works coordinator prior to operatives accessing the trench and commencing pipe installation. Open excavations are to be kept fenced off and inspected daily or after an event which may affect stability such as heavy rain. Inspections are to be logged on site.
5. Place and level concrete to manhole bed.
6. Precast sections are to be lifted into position by the site excavator. A generic lift plan will be produced for the excavator and submitted to Laing O'Rourke / Crossrail for review.
7. Construct brick chamber to 1200mm x 675mm internal dimension. Brick to be class B engineering as approved. Brick to be taken to underside of cover level, accounting for depth of mortar bed.
8. The pipework will then be brought into the manhole by cutting a suitable sized opening into the wall of the manhole, positioning the pipe to design invert level and making good with sand and cement mortar. A flexible joint in the pipework is to be installed 600mm from the external face of the chamber.
9. Once installed, the base of the manhole is to be benched to give an internal fall of 1 in 12 and prevent the build-up of detritus or ponding water.
10. A 150mm thick concrete surround will then be installed to the manhole. The remaining excavation will be backfilled and compacted in 300mm layers to a level to suit either the paving or top of precast section.
11. The cover slab will then be positioned onto the Type A gully pot and brickwork (two to four courses) brought up to a level to suit the finish paving level and depth of cover.
12. Within trafficked areas the cover is to be solid grade D400 ductile iron. Covers within paving in non-trafficked areas are to be galvanised recessed covers of FACTA class D.
13. Once complete, the manhole is to be cleaned with any detritus, an as built survey carried out and a construction record completed. The overseeing organisation will be invited to inspect the work and sign off the completed construction records.

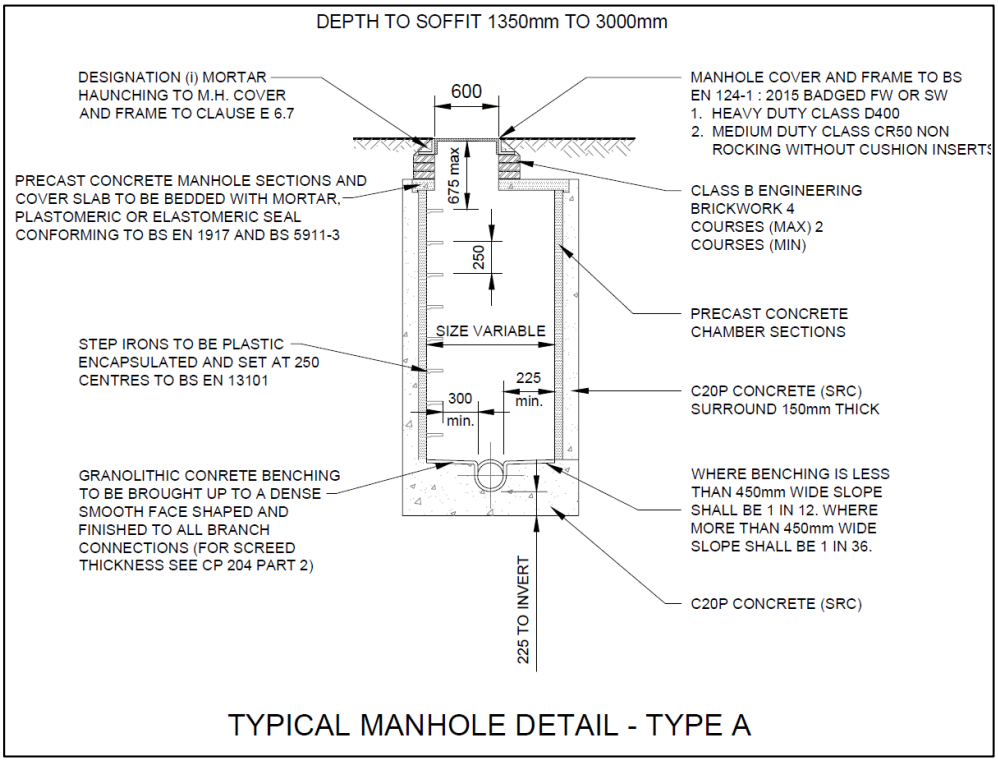


Figure 3-7: Standard Detail of Type A Manhole

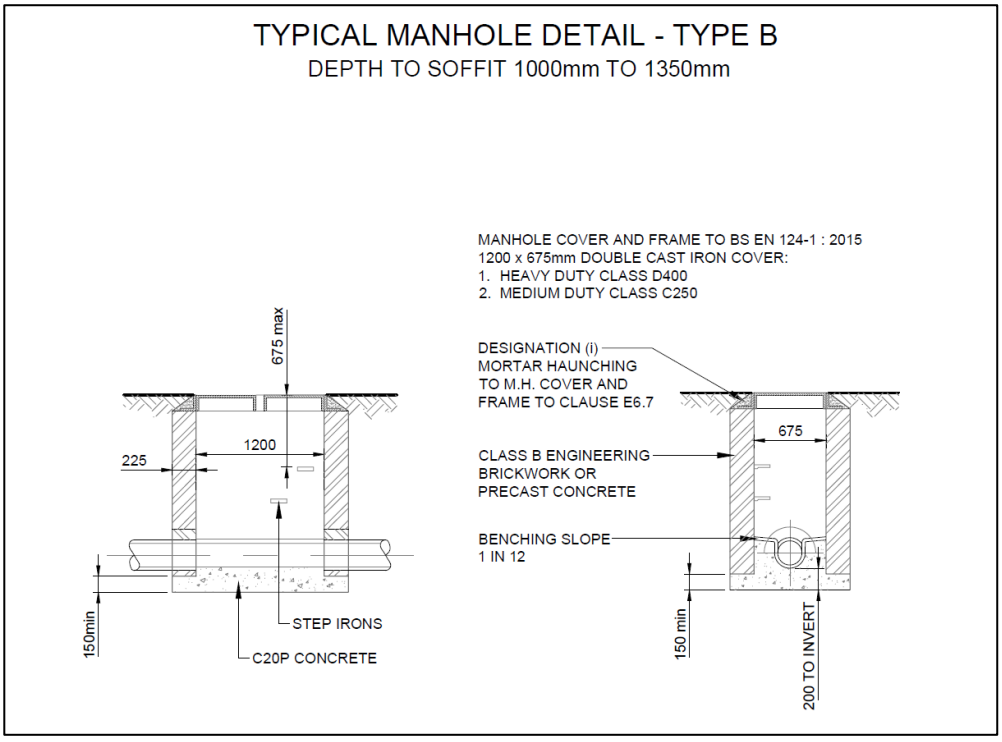


Figure 3-8: Standard Detail of Type B Manhole

4.0 PPE

Mandatory personal protective equipment (PPE) for all persons entering the TCR work site is in line with the C422 works information and Murphy procedures. Mandatory PPE includes: steel toe and midsole boots, Hi-Viz jacket / tabard, glasses, gloves, hard hat.

All operatives involved in cutting or breaking operations should wear the following:

- Dust Masks (to EN149 FFP3)
- High impact Goggles
- Hearing Protection (Ear muffs to EN 352-1) or ear plugs where applicable.

Operatives involved in excavations should wear Hi-Viz flame retardant trousers and long sleeve top.

5.0 PROGRAMME

All works will be carried out in the hours agreed within the section 61 application. Hours are envisaged to be Monday to Friday 8:00-18:00 and Saturday 8:00-13:00.

The works are phased in line with constraints and access dates and several visits will be required to complete. Drainage install will commence on Dean Street South with the section outside of the hoarding to be completed before the Christmas embargo in early December. It will then move onto Diadem Court before commencing Great Chapel Street in early 2018. The

final section to be completed will be the Goslett Yard Box, which is programmed to commence in early April.

6.0 COMPETENCY OF THOSE INVOLVED

All those entering the WTH, GYB and tunnels are to have received a LOR site induction prior to entry, and attended a one-to-one interview with a member of the LOR Project leadership team to determine behaviours with regards to safety.

Daily activity briefings (DAB's) / Point of Works Risk Assessments will be carried out by all trade supervisors with their particular team at the start of each shift, briefing all personnel on what is to be carried out that particular day and highlighting any interfaces which may cause risk.

All persons shall have attended and passed a construction skills health, safety and environment touch screen test and hold an in date CSCS competency card suitable for their role on site. Any operatives installing or altering traffic management are to be NRSWA Streetworks qualified. The site supervisor is also hold a Streetworks card to Supervisor level.

Excavator operators, banksmen, slinger-signallers will hold a relevant CPCS card.

Personnel should have also completed relevant training to suit their role such as manual handling, and abrasive wheels. At least one qualified first aider will be on site at all times.

7.0 TECHNICAL COMPLIANCE

Works are to be carried out in accordance with this Method Statement and the Inspection and Test Plan for drainage as well as construction drawings, the specification and works information.

Inspections are to be carried out in line with hold and witness points by Murphy and also, where indicated, by Laing O'Rourke / WCC / Crossrail.

A construction record will be completed for each manhole, gull and drainage dun. In addition, as build records will be kept and drawings marked up for handover upon completion of the works.

8.0 RESOURCES

Site staff and labour will be supplied by J. Murphy & Sons and arranged by the site's Construction Manager. Those positioned to carry out tasks specified within this Method Statement are to meet the competencies required to carry out the specific trade/task, as defined in Section 6 above.

The following trades/personnel will be required to carry out task in this MS:

- Construction Manager
- Supervisor
- Excavator Operator
- Slinger/Signaller
- Vehicle Banksman

- Ground Workers
- Appointed Person
- Temporary Works Coordinator

8.1 Plant

All the below will be fully inspected in line with the manufacturer's requirements and testing procedures before use. Certificates will be checked by the relevant person dependent on plant and kept on site for review when required:

- Wheeled Excavator
- Hydraulic Breaker

8.2 Tools/Equipment

All of the items listed below will be visually inspected before use by the user. Site supervisor and Murphy's plant department will ensure tools and equipment are inspected and in date prior to being used on site. In addition to daily checks, a weekly recorded PUWER inspection will be carried out by a competent person. Should it be anticipated that cutting works will generate sparks, a hot works permit is to be issued for the activity prior to commencement. The permit is to include controls to be in place such as screens, fire extinguishers, fire watch, etc. as appropriate.

- Hydraulic breaker
- Sthil Saw
- Whacker Plate
- Total Station and Handset (for setting out)
- Calibrated air testing equipment

9.0 EMERGENCY PROCEDURES

Emergency procedures will be briefed to personnel during the site induction, for example, access and emergency routes, the location of the muster points and nearest hospital.

Should an incident occur the first concern is to ensure no one else is at risk and to help the injured party.

All near misses and incidents are to be reported to Laing O'Rourke as well as though Murphy's 2-1-2 system. This requires sites to report the event within 2 hours of it occurring, complete and interim investigation within 1 day and a through SHEQ Adviser investigation (depending on severity) within 2 weeks.

10.0 ENVIRONMENTAL

10.1 Water

Any wastewater / runoff that is generated, for example from required from damping down, must be captured and prevented from entering the drainage network unfiltered. This can be done by positioning sheeting / hessian over existing gullies during the works.

Plant it to be refuelled in designated areas and all tools with petrol generator, petrol cans, etc., to be placed in drip trays.

10.2 Air Quality & Dust

Cutting and breaking operations are to be screened and dampened down to reduce dust. It may be possible to segregate such activities for example by creating a designated cutting area.

10.3 Traffic Management

Traffic management plans will be submitted for approval for each phase of the works. Only competent personnel holding valid Streetworks tickets are to install, alter, or remove TM. Works are phased to minimise disruption to pedestrians.

11.0 APPENDICES

11.1 Risk Assessment

Contract			**C422 - Tottenham Court Road**				**Client**		**Laing O'Rourke**				
Contract No.							**Risk Assessment No.**		**C422-LAO-A-GMS-N105_WS089_1-50001**				
Activity			**Excavation of Trial Hole to Locate Existing Outfall**										
Activity affecting ***(Tick Appropriate Box)***			**Employee**	**x**	**Third Party**	**x**	**Vehicle**	**x**	**Plant**	**x**	**Environment**	**x**	**Likelihood X Consequences**
No.	**Hazard**	**Possible Consequences**	**Pre- Control**			**Control Measures**						**Post-Control**	
			L	**C**	**RR**							**L**	**C**	**RR**
1	Pedestrian and Traffic Management	Injury or death to member of the public Unacceptable disruption to community Damage to parked vehicles Injury to driver or site operative Slips, trips and falls	4	3	12	1. Area to be securely fenced at all times using Strongwall Barrier. This is to be fully clipped when unattended, but at all times closed while work proceeds. 2. Access through the Mews to be maintained, but parked cars moved to a safe distance from the works area to allow a large enough area of site for access for plant and safe pedestrian routes as well as private vehicles to pass. 2. Operatives to wear Hi-Viz clothing. 3. Site to be kept tidy with all loose items and waste removed as soon as possible or stacked neatly. Site and pedestrian walkways to be kept clear at all times.						1	3	3

2	Breaking Operations	Harm from dust and flying debris Excessive noise Bollard instability Damage to buried Services	4	4	16	1. Area to be securely fenced with sheeting / acoustic barrier attached to fencing to contain dust and debris and reduce noise exposure to the public. 2. All operatives in the working area to wear ear defenders to protect against noise exceeding 80dB. 3. All operatives to wear safety glasses in case of flying debris. 4. Damp down working area during breaking to reduce dust as required. 5. FFP3 dust masks to be work by operatives should any cutting works be involved. 5. Ensure the area is regularly CAT scanned and a permit to break down is in place. All operatives to be briefed on services identified on both utility drawings and from CAT scans. Regularly CAT scan the area during breaking and personnel to carry out breaking in a steady and controlled manner, regularly checking for services, ducts, or any other cast in items which may indicate the presence of a service. 6. Care is to be taken around adjacent properties with sheeting in place in site fencing as above to prevent flying debris causing damage to buildings or other property. 7. The site will be inspected prior to commencing breaking and excavation to check for underground structures such as basements. One indicator is the presence of Coal Holes, which have been noted within the Dean Street South footway. Should basement structures be suspected, breaking and excavation operations are to proceed with care in order to avoid damage to the structure and waterproofing, with operatives regularly checking via hand dig to establish the depth of the structure. If damage is to occur, Laing O'Rourke are to be notified and remedial works carried out prior to continuing works in the area.	1	4	4

3	Abrasive Wheels	Electric shock Laceration Eye Injury Hearing Loss Respiratory Disease	3	4	12	1. Only operatives who have received abrasive wheels training are to inspect, adjust or operate the tool. 2. Equipment to be inspected before each use and to have a weekly inspection, which is recorded on the PUWER inspection register. 3. Wheel guard to be fitted, in correct position, and in good condition. 4. Spindle speed, ID number and power rating tag to be marked on all grinding tools. 5. Ensure blade is correct for the tools and appropriate for the material being cut. 6. Cutting to be screened where possible and any dust / sparks / debris / directed away from the public, adjacent workers and property. 7. Water bottle to be attached to saw and water used to damp down cutting area and supress dust. 8. Ear defenders, dust mask (with operative face fit tested), and high impact glasses to be worn in addition to mandatory site PPE.	1	4	4
4	Underground Services	Damage to services Gas explosion Injury or death by electric shock Other injuries to ground worker	4	5	20	1. Utility drawings to be available and checked. 2. CAT and Genny to be used to clearly mark the location of any services. 3. Ground disturbance permit to be issued and briefed to all personnel involved with the excavation. 4. Breaker mounted on excavator to be used. No hand held breakers. This will reduce the risk of injury should a service be damaged as well as the risk of hand arm vibration. 5. No mechanical excavation within 500mm either side of a marked / known service. Trial holes to be excavated by hand where appropriate to confirm location and depth.	1	5	5

5	Temporary Works / Deep Excavations	Ground Instability Trench collapse leading to crushing Falls from height	4	5	20	1. All temporary works (trench shoring) to be installed as per the temporary works design. Timber grade and cross section, spacing of frames, etc., to be checked periodically both during and after installation. 2. The assumed ground condition is mixed soil / made ground. Should the ground be of poor quality, stop and inform the temporary works coordinator who will ensure the temporary works design is appropriate before works continue further. 2. The excavation is to be inspected at least daily and the inspection recorded. Additional inspections are to take place following event which may affect stability, for example, accidental surcharging, heavy rain, unauthorised access. 3. An exclusion zone of 1m is to be in place around the perimeter of the excavation. No items of plant are to enter this area, no materials or waste are to be stacked. The perimeter of the excavation is to be barriered off at all times. A second line of barrier is to be positioned within the site perimeter to protect against falling. Pedestrian barriers are to be positioned at least 1m from the edge of the excavation. 4. The ladder for access into the excavation will be tied off at the top to secure and be positioned at a comfortable angle which allows personnel to position feet comfortably on the rungs. The ladder is to extent at least 1m above ground level.	1	5	5
6	Wet Concrete	Injury to skin including dermatitis and concrete burns Eye injuries	2	3	6	1. COSHH assessment to be in place for concrete and cement and briefed to workforce. 2. Additional PPE to work including Wellington type safety boots, water proof gloves, mandatory eye protection. 3. Barrier cream to be provided in the site welfare facilities along with a means of washing should concrete make contact with the skin. Report any event of concrete entering the eye to a first aider.	1	3	3

7	Noise	Hearing damage Tinnitus Unacceptable environmental disturbance to the surrounding area	3	3	9	1. Assess if a less noisy method or item of equipment can be practicably used instead. 2. Turn off plant when not in use. 3. Keep plant well maintained. If sound insulated doors / accesses are provided to muffle the noise, ensure these are kept closed. 4. Keep noisy works area barriered off. If possible segregate this from the rest of the workforce. Fencing facing public areas to be sheeted. 6. Provide ear defender to all personnel exposed to noise above 80db. Ensure all personnel are wearing ear defenders should noise levels rise above 85db. Ear defenders should always be worn during breaking and cutting operations. 7. Work activities to be varied in order to prevent noise exposure for long continuous durations.	1	3	3
8	Hot Works	Injury by sparks / embers Fire risk to site plant and equipment and surrounding buildings	3	3	9	1. Hot works are to be controlled by a permitting system detailing the controls to ensure the fire risk is controlled. 2. Hot works to be screened to prevent the escape of sparks and to prevent eye injury. 3. Sparks to be directed away from people, plant and property. 4. Fire extinguishers are to be close to the works area and easily deployable in required. Fire extinguishers to be checked weekly. 5. A fire watch system is to be in place with the works area monitored for one hour following completion of the works.	1	2	2

9	Plant & Machinery	Severe injury or fatality by entanglement, crushing, entrapment, overturning Injury resulting from unauthorised person operating plant Damage to plant / surrounding property	4	5	20	1. Check machines have been thoroughly examined and the certificate within date on arrival to site. Check the machine does not have a semi-automatic hitch, which are banned on Murphy sites. 2. Inspect plant before use and record a weekly inspection on PUWER sheet on site. Inspections to be carried out by suitably qualified personnel such as the operator. Should a fault be found, stop using and inform the hire company. 3. Only trained and competent personnel to operate plant and machinery. Check CPCS card is appropriate and keep copies on site. 4. Plant to be switched off and keys removed when not in use. Plant and machinery secured against unauthorised access / use when unattended. 5. Ensure plant operators have all round visibility, for example, 360 excavators to be fitted with mirrors / cameras. 6. A 600mm clear distance is to be maintained between static items such as walls and fencing and rotating plant to prevent crushing. 7. A banksman is to be used to coordinate signalling instructions to operators. Plant movements to be coordinated between Murphy and other contractors if there is an interface. 8. Work areas for plant to be segregated from pedestrians and other site operations through designated safe walkways. At all times the machine is to only work within the site area, which is surrounded by barriers and within approved TM. 9. Ground conditions to be checked to ensure stability of the machine, cabs to be fitted with roll bars in case of overturning. 10. Site speed limit of 5mph to be adhered to. 11. Should the machine be required for lifting a lift plan will produced and approved by the appointed person. The operator must be trained for lifting operations. 12. All personnel to wear mandatory PPE, which includes Hi-Viz clothing, hard hat and safety boots.	1	5	5

10	Grab Lorry	Injury in reversing operations Crushing, entrapment or impact resulting in injury Mechanical failure resulting in a dropped load Slips, trips and falls when accessing the cap or operation platform Overturning due to unstable ground Damage to buildings or surrounding property from the grab arm Injury to pedestrians	4	5	20	1. Ensure machines have been thoroughly examined and the certificate within date on arrival to site. Operator to inspect vehicle daily to ensure it is in good working order. And faults to be reported to Murphy Plant. 2. Vehicle to be fitted with reversing aids including CCTV camera and mirrors. 3. Operator to hold valid competency card and license for both the vehicle and grab operation. Operative to be medically screened to ensure fitness for work. 4. Check stability of the ground. Park vehicle on firm, level ground with the brakes and stabilisers applied. Keys should be removed from the ignition. 5. Loads spread evenly within the wagon to ensure stability and safety of the load. 6. Banksman to be present to ensure no one is within the loading / unloading zone. 7. Interlocking system and alarm to be present to prevent driver accidentally driving away with grab extended. 8. Driver to operate grab from safe operating position with full view of load and traffic. 9. Mandatory site PPE including Hi-Viz, hard hat and safety boots to be worn by operators when outside the cab of the vehicle. 10. Operators to take care when exiting the vehicle and accessing the operating position. 3 points of contact when using fixed access steps.	1	5	5

11	Loading & Unloading	Injury by slips, trips and falls Crushing, entrapment or impact injuries Mechanical failure resulting in dropped loads Damage to building or property	4	3	12	1. Keep routes clear to enable safe loading and unloading. 2. Material to be stacked neatly and site and pedestrian walkways kept clear. No material to be stored outside of the site boundary. 3. Drivers to check security of the load before driving. 4. Banksman used to help manoeuvre vehicles around site. 5. When travelling with load, avoid sharp cornering and braking and acceleration to prevent load destabilising. 6. Delivery vehicles to have mirrors to aid visibility. *It is not anticipated that any material will require crane off load either by a site excavator or a Hiab.*	1	3	3
12	Fuel Spillage	Pollution to watercourse / drainage system Injury as a result of exposure of skin / eyes to fuel Damage to carriageway or other property	3	3	9	1. Ensure vehicles are re-fuelled in designated areas. 2. All fuel cans, generators or tools powered by a petrol motor to be stored within a drip tray when not in use. Care to be taken to ensure drip trays do not fill with rainwater, which will reduce their capacity. 3. Spill kits to be kept adjacent to the site and operatives given on site training in how to adequately clean a spill. Used spill kits to be disposed of in a COSHH bin.	1	3	3

Likelihood of Occurrence	Score	Consequence of Occurrence	Risk Rating		Action
Very Unlikely	1	Insignificant / E.g. Non- Lost Time Incident (212 – Cat. 1)	Low	1 - 5	Works may proceed
Unlikely	2	Minor / E.g. Non-Reportable Incident (212 – Cat. 2)			
Possible	3	Moderate / E.g. Reportable Lost Time Incident (212 – Cat. 3)	Medium	6 - 12	All reasonable practicable measures in place and the point of work risk assessment captures further controls as required. Works may proceed with caution.
Likely	4	Major / E.g. Reportable Incident– Permanent Disability (212 – Cat. 4)	High	13-25	Unacceptable. Do not proceed until further controls are in place and

Almost Certain	5	Catastrophic / E.g. Fatality (212 – Cat. 5)			risk has been reduced with all controls in place.
Compiled By					
Name:	[redacted]	Signature:		Date:	**30.08.2017**
Approved by					
Name:	[redacted]	Signature:		Date:	**01/09/2017**

Risk Assessment Review required (*Approver to decide review period)*	**Date:**		**Rev:**	