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BP FILLING STATION,GOODS
WAY,LONDON,N1C 4UR

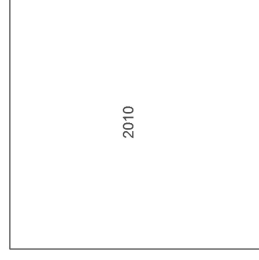
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Report Ref: GS-1777898
Grid Ref: 530305, 183477

Map Name: National Grid

Map date: 2010

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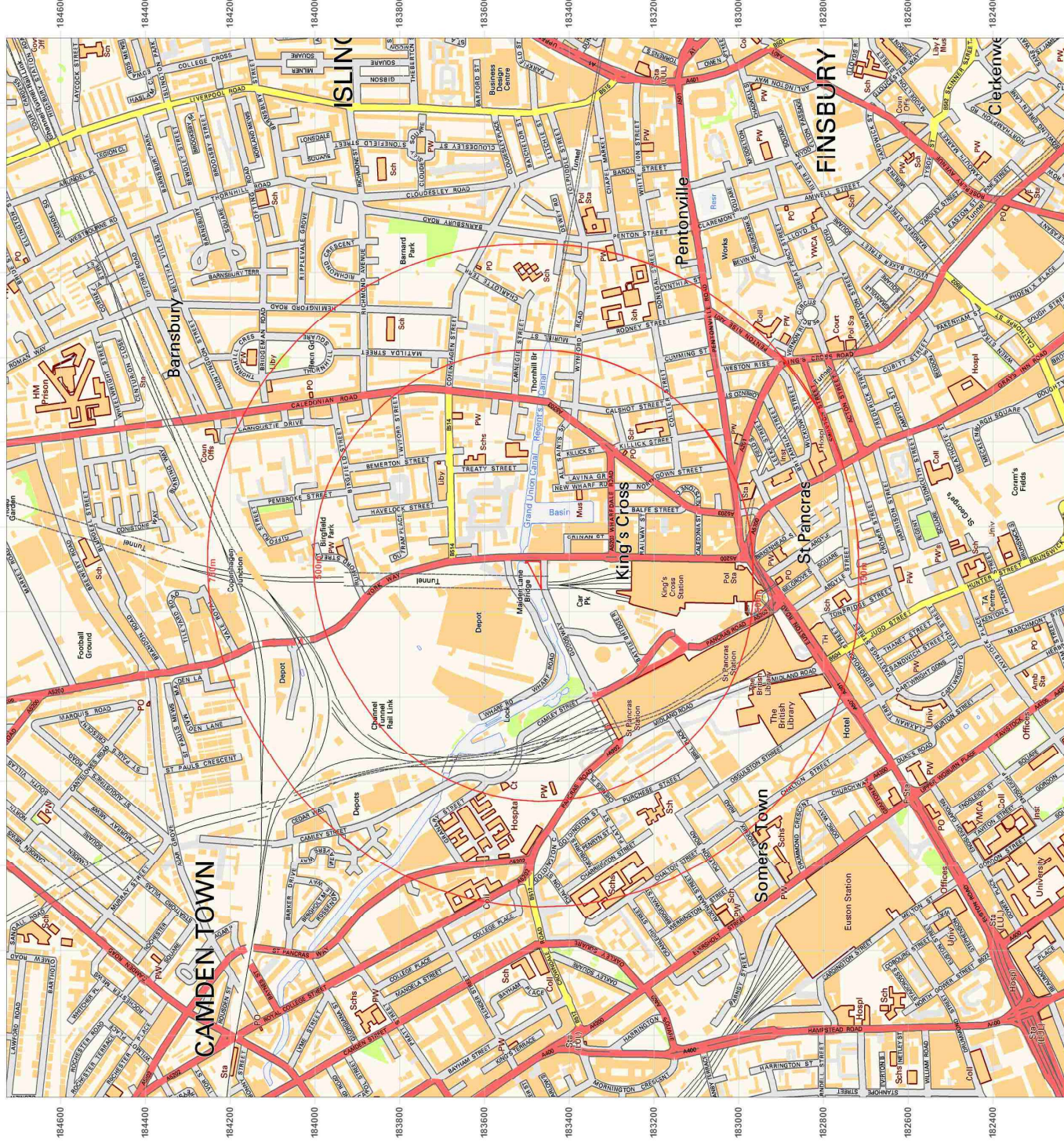
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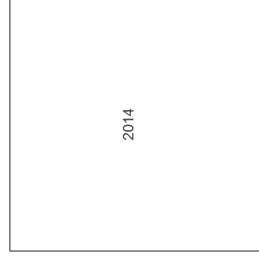
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Appendix C

RPS unexploded ordnance desk study



**DESK STUDY FOR POTENTIAL HISTORIC ORDNANCE
CONTAMINATION**

VOLUME 2 – 3 of 11

Kings Cross Central – UXO Assessment Zone 3

Goods Way, Development Zones V & F

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020 7928 0999 JER3699-Z3R
020 7928 0708 Revision: 0
30.04.2007

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Drawings

JER3699-Z3-001	Site Plan
JER3699-Z3-003	Summary of UXO and Explosives Risk
JER3699-Z3-004	UXO Risk Map

Executive Summary

This report has assessed the UXO risk across *UXO Assessment Zone 3*, which includes the area of Goods Way and extends north, to the boundary of Regents Canal (as outlined on *Drawing JER3699-Z3-001*). This assessment has taken into account any bomb strikes within the zone and / or the damage received. It has also taken into consideration the pre and post war land uses that may have altered the risk level.

The risk levels identified are outlined on the associated risk map (*Drawing JER3699-Z3-004*); following are the appropriate mitigation requirements for each level of risk:

Degree of Risk Intrusive Activity	Low Risk Areas	Low/ Moderate Risk Area	Moderate Risk Areas
Events prior to intrusive works	Ensure all site personnel attend an Explosives Ordnance Site Safety & Awareness Briefing	Ensure all site personnel attend an Explosives Ordnance Site Safety & Awareness Briefing	Ensure all site personnel attend an Explosives Ordnance Site Safety & Awareness Briefing
Shallow Excavations (within Made Ground)	No Further Mitigation	Explosives Safety Engineer on Call	Explosives Safety Engineer on site to supervise excavations
Deep Excavations (into natural)	No Further Mitigation	Explosives Safety Engineer on Call	Explosives Safety Engineer on site to supervise excavations
Boreholes & Piled Foundation	No Further Mitigation	Explosives Safety Engineer on Call	Intrusive magnetometer survey ahead of boreholes and/or piling

1 Introduction

1.1 Instruction

RPS Explosives Engineering Team (EET) has been commissioned to conduct a desktop study for potential historic Unexploded Ordnance (UXO) contamination at the Kings Cross Central (KXC) regeneration site, London, N1.

This particular report covers the area of Goods Way, north up to the boundary of Regents Canal and includes KXC Development Zones V and F. This area has been designated *UXO Assessment Zone 3*, the boundary of which is outlined on the site plan (*Drawing JER3699-Z3_001*).

1.2 Scope of Work

The KXC - Historical Review presented in Volume 1 (*JER3699-V1*) identified a moderate risk of encountering UXO across the wider KXC development area. The purpose of this report is to use information from the historical desk study to refine the risk level across *UXO Assessment Zone 3*.

Volume 1 outlines, amongst other subjects, the bombing and history of the KXC regeneration area. It should be noted that only relevant information has been transferred to this report to provide a clarification of the levels of risk assigned and identify the requirement for risk mitigation within the boundary of *UXO Assessment Zone 3*.

The definition of the risk levels and appropriate mitigation required at each level is defined in Volume 3 (*JER3699-V3*) alongside information regarding UXO Safety & Awareness.

2 Site Details and Description

2.1 Site Location & Description

UXO Assessment Zone 3 lies immediately south of Regents Canal in the KXC development area. The site encompasses the entire length of Goods Way, from York Way in the east to St Pancras Station in the west. There is currently a petrol station in the eastern corner immediately north of Goods Way in the area Designated Development Zone F. The zone also includes a small area of waste ground to the west, which bounds Regents Canal, known as Development Zone V.

2.2 Proposed Site Plans – Zone 3

RPS EET understands that the following proposals have been put forward for the assessment zone.

2.2.1 Development Zone F

This is located towards the eastern of Goods Way immediately south of the canal. The petrol station that currently occupies this area is to be demolished and replaced by a mixed-use development, which will have a lower ground level. It will include residential uses situated above business/employment uses.

2.2.2 Development Zone V

This is located towards the western end of Goods Way immediately south of the canal. Zone V is to be the new site for the District Gas Governor, which is currently located within Development Zone B. Within this area will be a number of major utilities.

2.2.3 Goods Way

Goods Way is to be retained; however it will be modified/realigned. It is to be split into Goods Way (east) and Goods Way (west) with a new area of Public Realm designated Central Square in the centre of this.

2.2.4 Utilities

The gas main extension will run from the location of the new Gas Governor westwards along Goods Way. In addition further services and infrastructure along the alignment of Goods Way will be realigned.

2.3 Site Work – Intrusive Engineering

It is anticipated that the following ground engineering activities will occur in Zone 3:

- **Site Investigation** – It is considered likely that a site investigation will be undertaken in Zone 3 to assess the geology and environmental setting. This is likely to involve Trail Pits, Boreholes and / or Window Samples.
- **Construction** – RPS EET are not aware at this stage of the proposed construction methodology; however it is known that this is to include the diversion of services (telecoms, electric, water) and a gas main in the area of Goods Way. It is understood that the services will be laid in trenches no deeper than 1.5m and the gas main, which is due to be diverted in 2008, will be laid no deeper than 2m. The remaining works are presumed to involve bulk excavations, trenching and some piling.

3 Site Geology

3.1 Site Geological Information

Historical geotechnical information in the region of this assessment zone indicates that the following ground conditions are likely to be encountered:

- Made Ground - Concrete and tarmacadam - to 0.20m,
- Made Ground - Mixed fill - concrete rubble and sand - to 0.70m,
- London Clay - firm to stiff - to 4.70m,
- London Clay - Stiff - to 5.10m,
- London Clay - Very stiff - to 16.20m.

3.2 Site Specific Ordnance Penetration Assessment

When assessing the potential for ordnance ground penetration it is essential not to rely solely on either an empirical, statistical and arithmetical formula. Experience has shown that a realistic depth is gained by considering the above approaches supplemented by accounts of historical Bomb Disposal Tasks in the area.

Taking into consideration the above factors RPS EET has calculated the maximum bomb penetration to be **9.8 metres** below ground level. It is considered unlikely that the ground levels in Zone 3 have altered significantly post war and therefore the penetration depth is likely to remain at around 9.8m below current ground levels.

It should be noted that this may be reviewed if additional site investigation or intrusive magnetometer data becomes available.

4 Historical and Bombing Review

4.1 General

The purpose of this section is to develop a profile of the assessment zone to consider the risk of encountering UXO, to achieve this the following issues were addressed:

- Pre-war site use.
- Bomb strikes on site.
- WWII bomb damage.
- Immediate post-war site use.
- Post-war development.

4.2 Bombing and Bomb Damage Records

4.2.1 General

A number of sources of information have been reviewed regarding the bombing history and possible sources of UXO contamination of KXC. Following is a summary of this information relating to *UXO Assessment Zone 3*, the key features of which have been mapped on *Drawing JER3699-Z3-003*.

4.2.2 Bomb Census Maps

The mapping indicates that no bombs were recorded landing within the footprint of Zone 3; however 1 bomb landed immediately adjacent to the western end.

4.2.3 ARP Bombing Records

No ARP bombing records have been identified stating that bombs landed within the footprint of Zone 3.

4.2.4 London County Council (LCC) War Damage Map

The war damage map indicates that the site itself sustained no damage; however buildings immediately south were deemed '*Seriously Damaged, but Repairable at Cost*'.

It should be noted that the War Damage Maps did not record damage sustained by road or rail infrastructure and therefore do not indicate whether Goods Way sustained any damage from bombing.

4.2.5 RAF Reconnaissance Photograph

Although the photograph is not entirely clear there is no evidence of bomb/blast damage within this zone.

4.2.6 MoD Archive Information

There are no records of abandoned bombs or Explosive Ordnance Disposal Clearance Tasks being undertaken within the site footprint.

4.3 Map Review

4.3.1 Pre WWII

Goods Way occupies the majority of the site, to the west Goods Way bears south outside the boundary of the zone. In this area are a number of buildings and the southern end of Bridge Street. At the eastern end of the site, the parcel of land between Goods Way and Regents Canal is vacant.

4.3.2 Post WWII

The zone appears to remain unchanged until c. 2005 when the western end of Goods Way has been realigned and now occupies the site, replacing buildings that were previously located there. In addition there is now a building on the parcel of land at the eastern end of the zone between Goods Way and the canal and a further building on the western side of the bridge.

4.3.3 Significant Post WWII Change

There does not appear to be any evidence of wartime damage shown in the mapping.

5 Explosive Ordnance Contamination Risk Assessment

5.1 General

The risk assessment completed in report *JER3699-V1* has identified that there is a potential risk on the development area from encountering UXB and a lower risk of other UXO such as AAA shells. However due to the detailed records kept of bombing incidents and the level of post war development it is possible to refine the risk across *UXO Assessment Zone 3*.

5.2 UXO Assessment Zone 3 - Risk Map

The risk levels assigned to Zone 3 are outlined on Drawing *JER3699-Z3-004* and have been assessed as:

- **Low,**
- **Low / Moderate,**
- **Moderate.**

Volume 3 (*JER3699-V1*) outlines the definitions of each risk level and the recommended mitigation required.

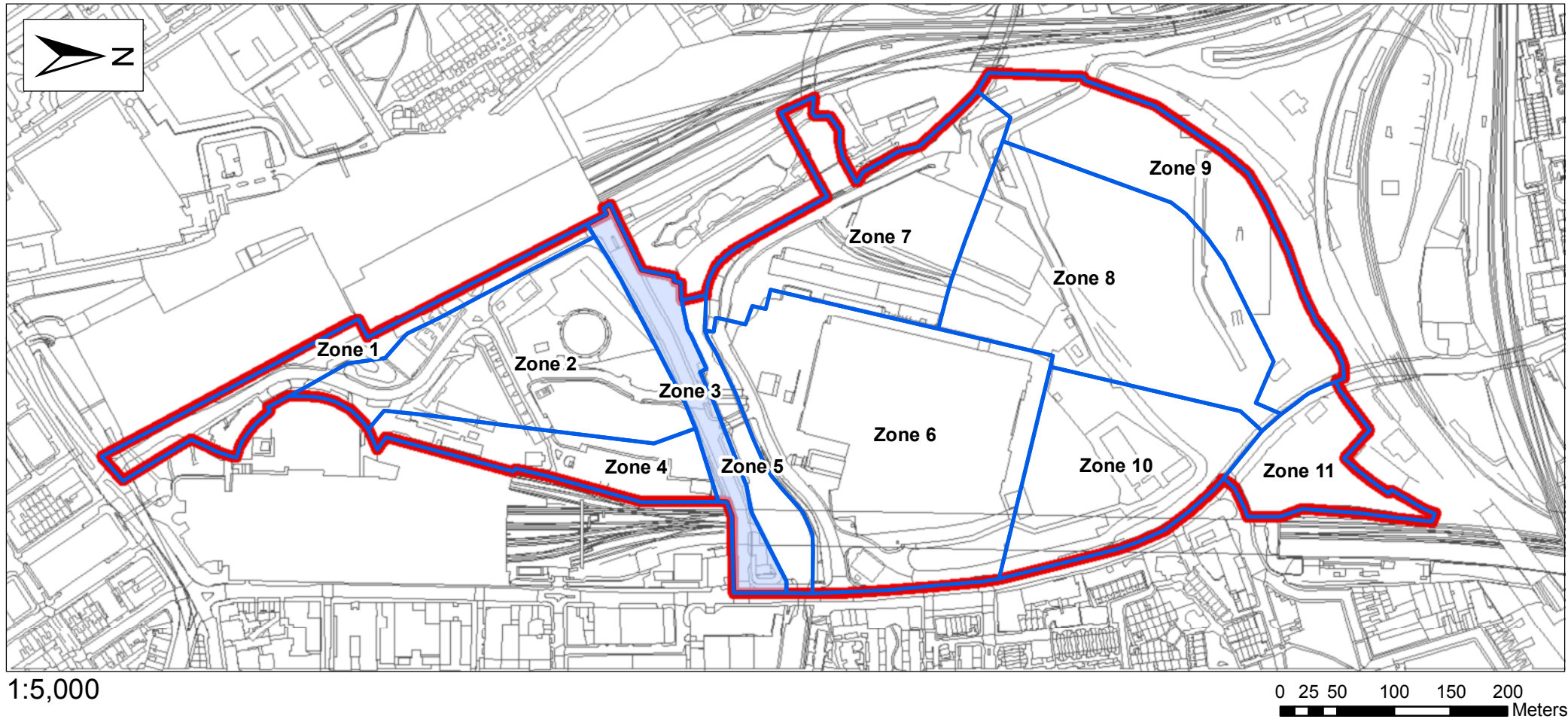
Generally the site has been assigned a Low to Low/Moderate risk level. Goods Way occupied much of the zone way during WWII and as the road was utilised during this time there is only a Low/Moderate chance of an UXB remaining here that may have gone unnoticed during WWII.

The land around Development Zones V and F have been given a Low risk level as they was either contained building cover during WWII that remained post war or post war development has taken place. The exception to this is a small parcel of land southwest of Development Zone V, which has remained undeveloped since WWII and has been given a Moderate risk level.

Drawings

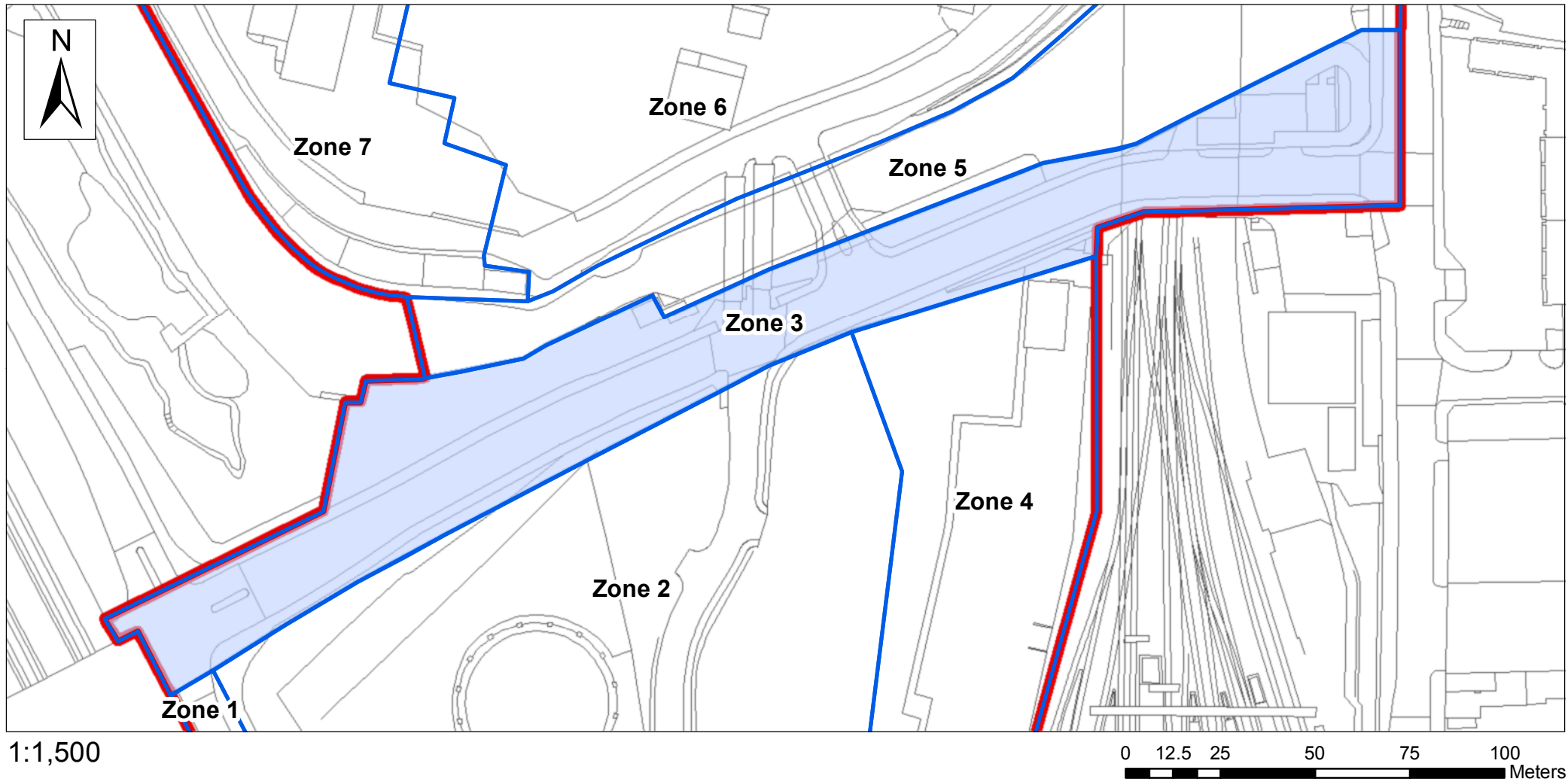
Drawing JER3699-Z3_001

Site Plan



Legend

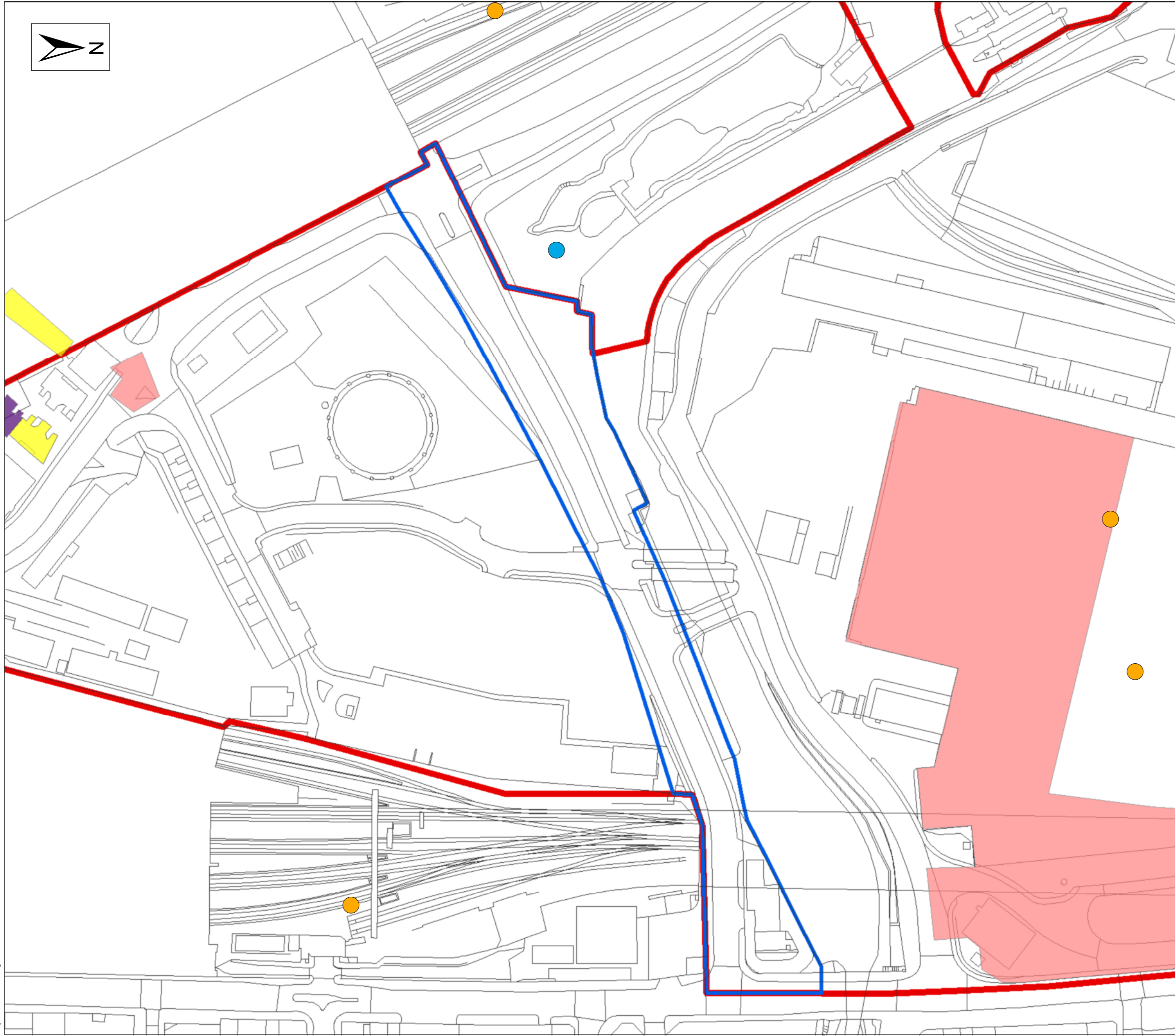
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- Zone Boundary
- Zone 3



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Status: PRELIMINARY				
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■ Client: Argent				
Project: Kings Cross Central				
Title: Site Plan UXO Assessment - Zone 3				
Scale: As Shown @ A3				
Date: 27/04/2007 Datum: OSGB36 Projection: BNG				
Drawn: SRM Checked: - Job Ref: JER3699				
■ Drawing No: JER3699-Z3-001 Revision: -				

Drawing JER3699-Z3_003

Summary of UXO and Explosives Risk



Legend

- Kings Cross Central Site Boundary
- Zone 3

Notes

- Bomb strikes recorded between 7th October 1940 - 28th July 1941
- Night Bomb strikes recorded up to 7th October 1940

War Damage Locations

- Blast Damage, Minor in Nature
- Seriously Damaged, But Repairable at Cost
- Damage Beyond Repair

NOTE: Bomb strike, war damage & historical locations are approximate.

Rev:	Date:	Amendment:	Name:	Checked:
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■ Data Source: RPS 2007

Status: PRELIMINARY



Explosives Engineering Team 185 Park Street London SE1 9DY
T 020 7928 0999 F 020 7928 0708 E eetco-ord@rpsgroup.com W www.rpsuxo.com

■ Client: Argent

Project: Kings Cross Central

Title: Summary of UXO and Explosives Risk
UXO Assessment - Zone 3

Scale: A3 @ 1:1,500

0 0.025 0.05km



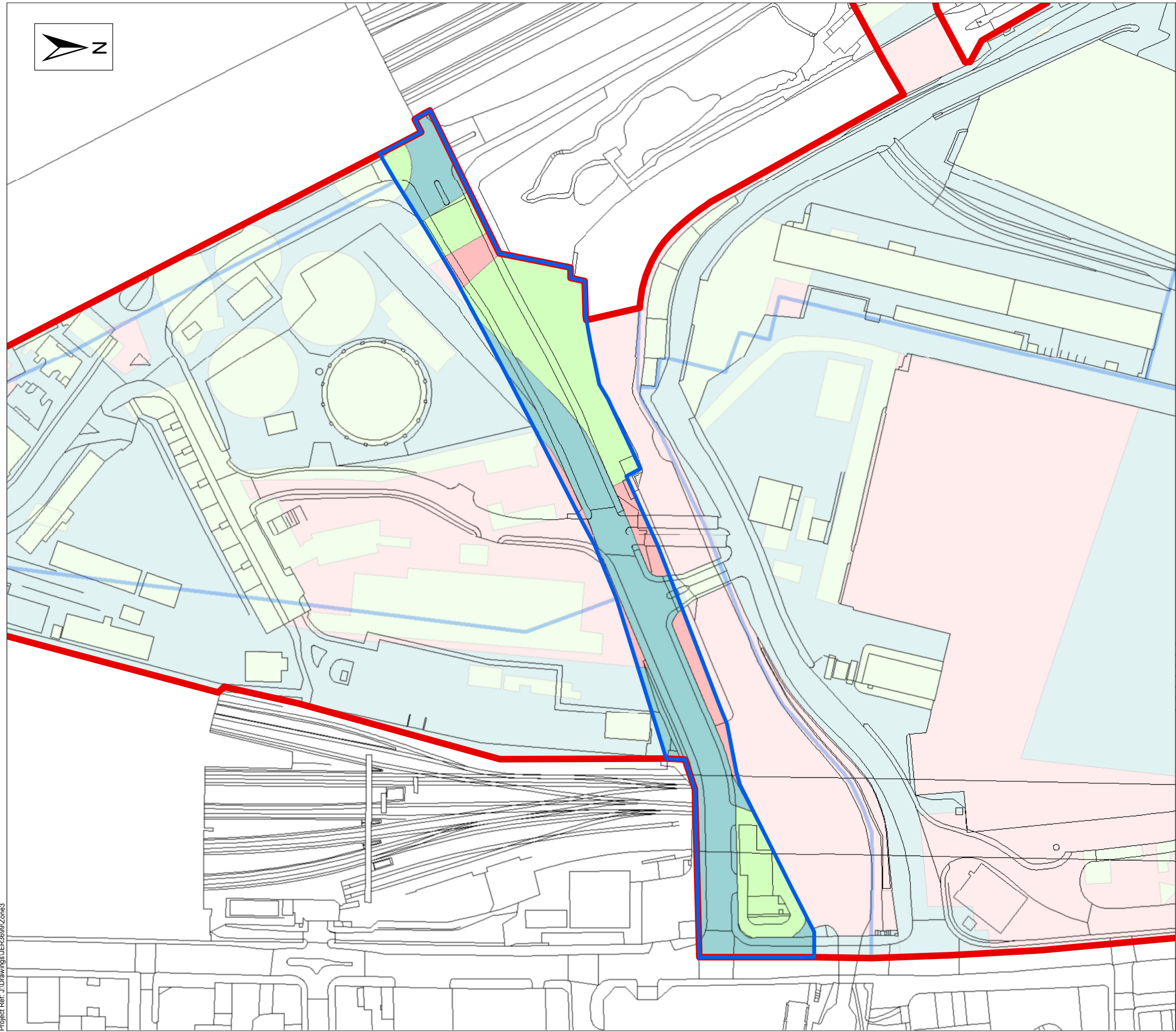
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■ Drawing No: **JER3699-Z3-003** Revision: -

Drawing JER3699-Z3_004




UXO Risk Map





Legend

-  Kings Cross Central Site Boundary
-  Zone Boundary

Unexploded Ordnance Risk

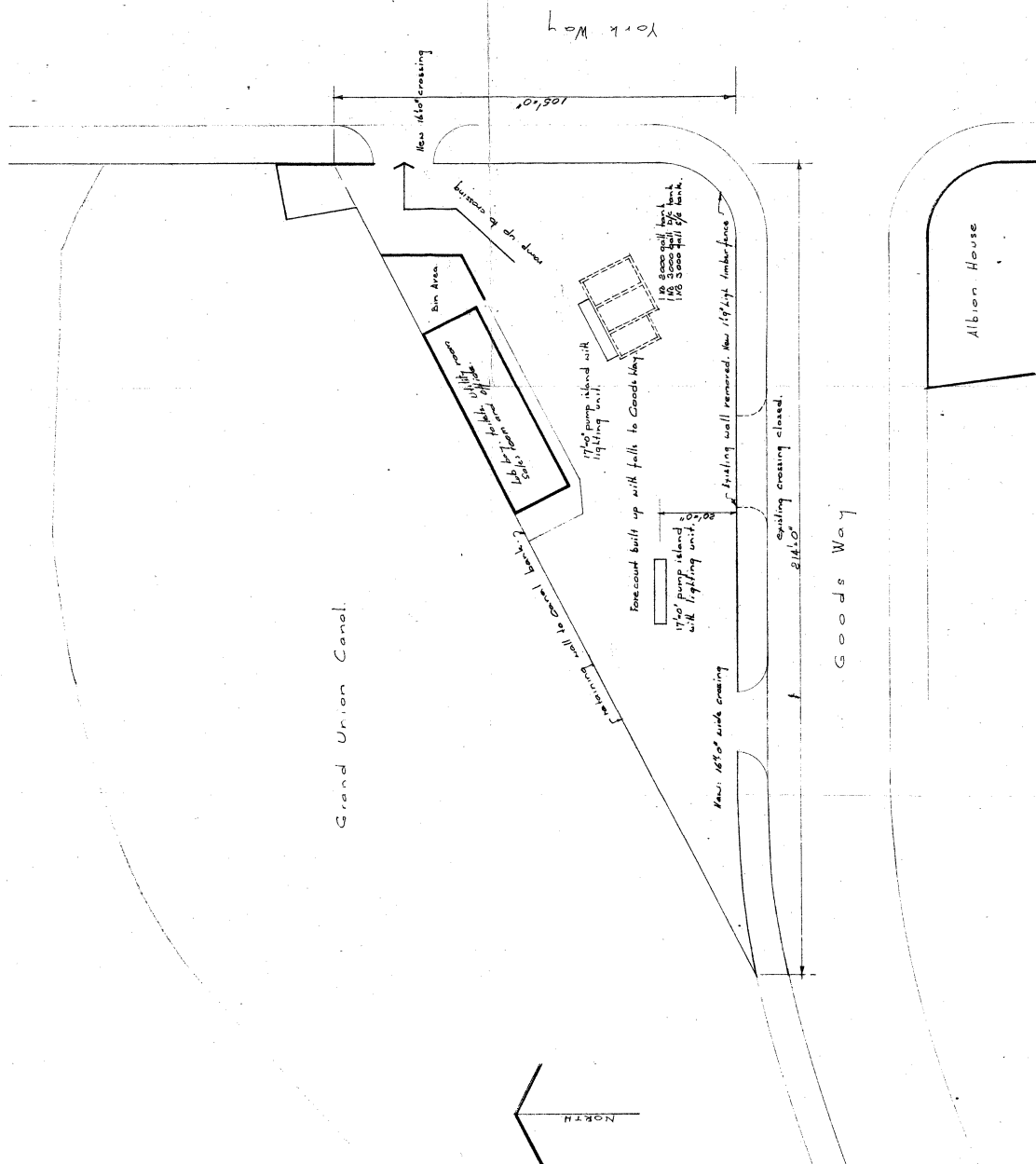
-  Low Risk
-  Low / Moderate Risk
-  Moderate Risk

Rev:	Date:	Amendment:	Name:	Checked:
■ Data Source: RPS 2007				
Status: PRELIMINARY				
				
Explosives Engineering Team 185 Park Street London SE1 9DY T 020 7928 0999 F 020 7928 0708 E eetco-ord@rpsgroup.com W www.rpsuxo.com				
■ Client: Argent				
Project: Kings Cross Central				
Title: Unexploded Ordnance Risk Map UXO Assessment - Zone 3				
Scale: A3 @ 1:1,500 0 0.025 0.05km 				
Date: 27/04/2007 Datum: OSGB36 Projection: BNG				
Drawn: SRM Checked: VP Job Ref: JER3699				
■ Drawing No: JER3699-Z3-004 Revision: -				

Appendix D

Fuel Storage tank records

D.1 Historical plans



MOBIL OIL CO. LTD.
R. O. D. SECTION,
SOUTHERN RETAIL DIVISION,
NEWCOMBE HOUSE,

Proposed Service Station
at 41 Satter by
junction of Goods Way
and York Way LONDON N1.

SAVIN	CHECKED DATE	APPROVED DATE

DRAWING NO.
0307/663/1.

LONDON COUNTY COUNCIL
 7114 19364
 19364