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Phase 1 Land Contamination Risk Assessment

for

Conversion of offices to mixed use offices and residential flats above.

on the site of

61, 63 and 65 Charlotte Street, London, W1T 4PQ

Date: March 2015

Status:	Final Report
Reference:	61, 63 and 65 Charlotte Street
Date:	11/03/2015

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1.0 QUALITY ASSURANCE

Castledine & Co. confirm that all reasonable efforts have been made to ensure that the information outlined within this report is accurate.

Castledine & Co. would further confirm that due care, attention and technical skill were used in the creation of this report.

For and on behalf of Castledine & Co.

Kevin Castledine

(Proprietor)

2.0 INTRODUCTION

Castledine & Co. have been appointed by Merchant Land Investments Ltd of 66 Leman Street London E1 8EU to undertake a Phase 1 Desk Study 61, 63 and 65 Charlotte Street London, W1T 4PQ

3.0 SCOPE

Castledine & Co. have prepared this report for the sole use and reliance of Merchant Land Investments Ltd and their appointees for the purpose of ensuring compliance with:

- paragraphs 120 and 121 of the NPPF,
- part C1 of the building regulations.

This report may not be used or relied upon by any unauthorised third party, or for any other proposed use than that specified above, without the explicit written agreement of Castledine & Co.

The report consists of a preliminary risk assessment in accordance with BS10175:2011+A1:2013 and CLR11 “Model Procedures for the Management of Land Contamination”.

The objectives of the report are:-

- To assess historical activities at the site with respect to their potential impact on the site environment.
- To characterise the environmental setting of the site, identify migration pathways and vulnerable receptors for contamination originating at the site, focusing on potential soil and groundwater liabilities.
- To assess historical and current surrounding land use in relation to known or potential off site contamination issues that may impact on the subject site and
- To develop a preliminary conceptual site model (CSM).

4.0 LIMITATIONS

The conclusions and recommendations made in this report are limited to those based on the findings of the investigation. Where comments are made based on information obtained from third parties, Castledine & Co. assumes that all third party information is true and correct. No independent action has been undertaken to validate the findings of third parties.

The assessments and interpretation have been made in line with legislation and guidelines in force at the time of writing, representing best practice at the time.

This survey has not included asbestos within existing structures, invasive plant species or any elements unconnected with potential ground contamination at the site. If required, such surveys should be undertaken by suitably accredited organisations.

There may be other conditions prevailing at the site which have not been disclosed by this investigation and which have not been taken into account by this report. Responsibility cannot be accepted for conditions not revealed by the investigation.

5.0 SITE DESCRIPTION

The site is situated in central London at National Grid Ref 529390 181740 and is approximately 519 m² in area.

No site inspection has been undertaken as part of this report

The site consists of 3 units currently occupied by offices .

It is worth noting that the lower ground floor uses are offices, with residential / retail / office accommodation above.

Current and proposed site plans and elevations are presented in APPENDIX B.

6.0 REGULATORY AUTHORITY AND OTHER ENVIRONMENTAL DATA

A Landmark Sitecheck Report listing historical and environmental factors likely to affect the property has been reviewed. The most pertinent information is summarised in the following sections. A copy is presented in APPENDIX A. Additional geological and hydrological data was obtained from the British Geological Survey.

6.1 HYDROLOGICAL

6.1.1 GROUND WATER

Minor Aquifer (Variably permeable) - These can be fractured or potentially fractured rocks, which do not have a high primary permeability, or other formations of variable permeability including unconsolidated deposits. Although not producing large quantities of water for abstraction, they are important for local supplies and in supplying base flow to rivers, Soil Classification: Soils of High Leaching Potential (U) - Soil information for restored mineral workings and urban areas is based on fewer observations than elsewhere. A worst case vulnerability classification (H) assumed, until proved otherwise, Map Scale: 1:100,000, Map Name: Sheet 39 West London

6.1.2 SURFACE WATER

None within 250m

6.2 POLLUTION INCIDENTS

There is 1 pollution incident located 125m to the south west.

- Authority: Environment Agency - Thames Region, North East Area,
  Incident Date: 2nd August 2002,
  Incident Reference: 96824,
  Water Impact: Category 4 - No Impact,
  Air Impact: Category 2 - Significant Incident,
  Land Impact: Category 4 - No Impact,
  Pollutant: Inorganic Chemicals : Acids

6.3 PERMITTED PROCESSES.

No sites hold an environmental permit within 250m

6.4 RADIOACTIVE SUBSTANCES REGISTRATIONS

There are several radioactive substance register entries. All relate to the nearby Hospital

6.5 WASTE

6.5.1 LICENSED WASTE MANAGEMENT FACILITIES (LOCATIONS)

None within 250m

6.5.2 REGISTERED LANDFILL SITES

None within 250m

6.5.3 REGISTERED WASTE TREATMENT OR DISPOSAL SITES

None within 250m

6.6 HAZARDOUS SUBSTANCES.

None within 250m

6.7 SOILS AND GEOLOGY

"Contains British Geological Survey materials © NERC 2015" obtained from http://www.bgs.ac.uk/data/mapViewers/home.html under the Open Government Licence

6.7.1 SUPERFICIAL DEPOSITS

Lynch Hill Gravel Member - Sand And Gravel. Superficial Deposits formed up to 2 million years ago in the Quaternary Period. Local environment previously dominated by rivers.

6.7.2 BEDROCK

London Clay Formation - Clay, Silt And Sand. Sedimentary Bedrock formed approximately 34 to 56 million years ago in the Palaeogene Period. Local environment previously dominated by deep seas.

6.7.3 COAL MINING

No Coal mining in the area

6.7.4 RADON

Property is in a lower probability radon area (Less Than 1% homes above the action level) no protection is required

6.8 PLANNING HISTORY

This information is taken from London Borough of Camden website (http://www.camden.gov.uk). Drawings attached to application 12958 have parts of numbers 61 and 63 labelled as Sawmill, and Print works.

Application Number	Site Address	Development Description	Date Registered	Decision
CA/1194	61 Charlotte Street, Camden,	at 61 Charlotte Street, Camden, an internally illuminated double sided projecting box sign having red letters to read PRINTERS on a white ground. Overall projection 4'0", Depth 1'4", Overall height 10'4".	20-12-1968	Permission
N12/31/11/8309	65 Charlotte Street, W1.	Use for a limited period of basement front room for storage of electrical and other goods at 65 Charlotte Street, W1.	23-01-1970	Limited Period
9627	65 Charlotte Street, Camden	The use of the basement of 65 Charlotte Street, Camden for storage purposes.	05-09-1970	Permission
12958	61-63 Charlotte Street and 33 Tottenham Street W1	Change of use of parts of 61-63 Charlotte Street and 33 Tottenham Street W1 **from light industrial use** to office and residential use and the erection of a first floors extension at the rear of 61-63 Charlotte Street, W1	18-02-1972	Refusal
22421R	61 Charlotte Street, W1	The installation of a new shopfront.	12-03-1976	Permission
AD307	61 Charlotte Street, W1	The installation of a static, internally illuminated fascia sign to measure 16' x 1'6" (4.9m x 0.5m) approximately opal panel, recessed, with dark blue letters to read "AZAT (LONDON) LTD"	30-03-1976	Permission
CA4506/AD381	65 Charlotte Street, W1	The installation of external neon, static illuminated fascia letters measuring 1 ft (0.3m approx.) maximum height and 14 ft 2 ins (4.3m approx.) in length.	30-06-1976	Permission

Application Number	Site Address	Development Description	Date Registered	Decision
22966	65 Charlotte Street, London W1	The change of use of the ground floor from retail shop to snack bar and the installation of a new shopfront.	30-06-1976	Refusal
23386	65 Charlotte Street, W1	The installation of a new shopfront.	16-09-1976	Permission
AD579	61 Charlotte Street, London, W.1	The display of an internally illuminated double-sided projecting box sign measuring 2'0" (.61m) by 1'3 3/4"(.4m) fixed approximately 8'0" (2.43m) above ground level on the northern pilaster.	22-03-1977	Permission
9180138	65 Charlotte Street W1	Approval for Advertisement - Display of one internally illuminated projecting box sign measuring 3ft x 2ft in line with the shop fascia sign as shown on 1 x unnumbered plan.	11-09-1991	Granted
9401075	63 Charlotte Street W1	Change of use of ground floor from retail use within Class A1 to a betting office within Class A2 of the Town and Country Planning Use Classes Order 1987 as shown on 1 (A4 size) unnumbered plan.	18-07-1994	Grant Full or Outline
9401972	61 Charlotte Street W1	The erection of a glazed pitched roof on the existing single storey rear extension together with a new rooflight on an adjoining roof to rear of 59 Charlotte Street as shown on drawing number 274 SK 6D (existing) and two A3 sized drawings numbered sheet 1 of 2 and 2 of 2.	23-12-1994	Grant Full or Outline
9500323	61 Charlotte Street W1	The installation of a new shopfront as shown on drawings SK03A; AL10 and sketch A1.	03-03-1995	Grant Full or Outline
P9601127	65 Charlotte Street, W1	Removal of roof to single storey building at rear of site and replacement of new amdega type at higher level to match that recently erected at No 63. (plans submitted).	15-04-1996	Withdrawn
C9601128	65 Charlotte Street, W1	Removal of roof to single storey building at rear of site and replacement of new amdega type at higher level to match that recently erected at No 63. (plans submitted).	15-04-1996	Withdrawn

Application Number	Site Address	Development Description	Date Registered	Decision
P9601371	61 Charlotte Street, W1	Retention of access gantry and walk way to service air conditioning plant and roof's. (plans submitted).	03-05-1996	Withdrawn
P9601127R1	65 Charlotte Street, W1	The erection of a new pitched, glazed roof on the building at the rear, as shown on drawing number 273 and letter dated 2nd July 1996.	03-07-1996	Grant Full (conds)
C9601128R1	65 Charlotte Street, W1	Conservation Area consent- Demolition of roof on building at rear, as shown on drawing number 273 and letter dated 2nd July 1996.	03-07-1996	Grant
P9601371R1	61 Charlotte Street, W1	The retention and part-alteration of metal access gantries at the rear servicing plant, as shown on drawing W/1957 and one unnumbered drawing.	13-09-1996	Grant Full (conds)
2005/4772/P	61-65 Charlotte Street London W1T 4PF	Certificate of Lawfulness of existing development for 24no air conditioning units.	16-12-2005	Granted
2005/4770/P	61-65 Charlotte Street London W1T 4PF	The retention of 2 air conditioning units within a rear courtyard.	23-03-2006	Refused
2006/4856/P	61-65 Charlotte Street London W1T 4PF	The retention of 2x air conditioning units within a rear courtyard to the office (Class B1) building.	15-12-2006	Withdrawn
2013/0014/P	61-65 Charlotte Street London W1T 4PF	Creation of retail unit for composite A1/A3 use (Sui Generis) at ground floor level of Nos 61 and 63 and basement level of Nos 61,63 and 65 Charlotte Street; three residential units (2 x 2bed and 1 x 3bed) on the upper floors of Nos 61 and 63; new residential entrance at 61. External alterations including new shopfronts to Nos 61-65; flat roof to existing patio area, gangway platform and handrail, exhaust duct, and plant to rear.	07-01-2013	Refused

6.9 INFORMATION RECEIVED FROM THE CLIENT

The Lower ground floor is to be re-tanked

6.10 POTENTIALLY CONTAMINATED LAND

6.10.1 ONSITE

Use of the site as a

- print works may have contaminated the site with solvents and lubricants related to the use of printing presses and printed surface treatments
- sawmill may have contaminated the site with lubricants and wood preservatives.

A contemporary trade directory for the site list Rentokil pest control as occupying number 65. This may have contaminated the site with pesticides.

6.10.2 OFFSITE

There are several radioactive substances registrations within 250m relating to the nearby hospital given the level of regulation in this field it is felt they are unlikely to have an effect on the subject site.

There are several contemporary trade directory entries which may have caused contamination to the surrounding area which may affect the site. The closest of each type of industry are as follows

TABLE 1 INDUSTRY MINIMUM DISTANCE FROM SITE.

Potentially Contaminative Uses	**Distance (m)**	**Direction**
Telecommunications Equipment & Systems	45	W
Motor Cycle Repairs	56	S
Builders' Merchants	56	S
Print works	65	SW
Textile Manufacturing,	70	NW
Photographic Processors,	88	SE
Dry Cleaners	88	E

Potentially Contaminative Uses	Distance (m)	Direction
Garage Services,	97	NW
Tool Design, Manufacturers & Makers,	106	N
Dry Cleaners	133	SW
Furniture Manufacturers	133	E
Hospitals	80	SW
Brass & Copper Manufacturers & Suppliers,	196	SE

These industries all have related DOE industry profiles. Potential contaminants that could affect a nearby site include metals and metalloids, hydrocarbons, and Polycyclic Aromatic Hydrocarbons (PAH's)

7.0 POLLUTANT LINKAGE ASSESSMENT

The risk posed by any contaminants in soil or groundwater will depend on the nature of the hazard, the probability of exposure, the pathway by which exposure occurs, and the likely effects on the receptors. A contaminant is defined as a substance that has the potential to cause harm, while a risk is considered to exist if such a substance is present in sufficient concentration to cause harm and a pathway exists for a receptor to be exposed to the substance.

The following sections discuss all the identified potential on and off site sources, pathways and receptors in the context of the proposed development and plausible pollutant linkages which may represent a risk to identified receptors from the data gained from the desk study.

At this stage the assessment is qualitative and aimed to determine all pollutant linkages, irrespective of significance or allowing for uncertainty.

Three impact potentials exist for any given site, these are:

- The site impacting upon itself;
- The site impacting on its surroundings; and
- The surroundings impacting on the site.

All three impacts need to be considered in a risk assessment.

7.1 SOURCES

The following potential sources of contamination have been identified.

7.1.1 ONSITE

Fuel oils and lubricants
Asbestos
Metal and metalloids
Pesticides

7.1.2 OFFSITE

Fuel oils and lubricants

Metal and metalloids

7.2 PATHWAYS

A pathway is defined as a mechanism or route by which a contaminant comes into contact with, or otherwise affects a receptor. Pathways by which the identified receptors may be impacted upon in the context of the proposed development are identified as follows:

Ingestion;
Skin contact;
Inhalation;
Plant uptake,
Direct contact by buried structures;
Leaching of soluble contamination into groundwater

7.3 RECEPTORS

Receptors are defined as people, living organisms, ecological systems, controlled waters, atmosphere, structures and utilities that could be adversely affected by contaminant(s).

Human Health
Current users of the site;
Future users of the site;

Users of neighbouring sites;

Construction workers; and

Services personnel working in trenches.

Construction Materials

Buried concrete, which may be affected by high concentrations of sulphate and/or low pH, in the soils and groundwater underlying the site; and

Buried water pipes.

Controlled Waters

Ecological Receptors

Flora and fauna using the proposed development

8.0 PRELIMINARY CONCEPTUAL SITE MODEL

The preliminary Conceptual Site Model (CSM) is a hypothesis of the nature and sources of contamination, potential receptors that may be the recipient of contamination arising from those sources and any pathways that may exist. It creates a plausible source-pathway-receptor pollutant linkage (hazard), set within the context of the ground and proposed end use of the site.

8.1 PRELIMINARY CONCEPTUAL SITE MODEL

There are potential sources of contamination relating to the current and historical use of the site and neighbouring sites.

Several stages of re-development have occurred since the print works and the sawmill have occupied the site. The building of extensions (see section 6.8) would likely have removed substantial volumes of surface material that would could have been effected by these activities.

The nature of the development includes no soft landscaping as the entire site is occupied by buildings. This removes the pathway for non-volatile contaminants such as metals and metalloids

Several of the surrounding land uses have the potential to contaminate the ground with volatile and semi-volatile compounds (Fuels, lubricants and combustion products),

The preliminary CSM is presented is outlined in Table 2 below.

TABLE 2 SUMMARY OF SIGNIFICANT POLLUTION LINKAGES

Contaminant	Pathway	Receptor	Comments	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Contaminated Soils	Direct Ingestion & Direct Contact	Site Workers		Li	Mi	M/L	Site workers to wear appropriate PPE for health and safety reasons.
Contaminated Soils	Inhalation of Dust	Site Workers		Li	Mi	M/L	Site workers to wear appropriate PPE for health and safety reasons.
Contaminated Soils	Direct Ingestion & Direct Contact	End Users		Ul	Md/Mi	L	.
Contaminated Soils	Inhalation of Dust	End Users		Ul	Md/Mi	L	
Contaminated Soils	Direct Ingestion	Flora and Fauna		Ul	Mi	L	
Contaminated Soils	Vertical and lateral migration	Controlled Waters		Lw	Mi	L	
Contaminated Soils	Direct contact	Services		Li	Mi	M	Consult water supply company on use of appropriate pipes

Contaminant	Pathway	Receptor	Comments	Probability of Pollutant Linkage	Consequence	Risk	Possible Mitigation
Ground Gases (Methane and CO_2)	Vertical and lateral migration	End Users & Building Envelope	No Identifiable sources in the vicinity	Ul	Sv	L	
Volatile and Semi-volatile Organic Compounds	Vertical and lateral migration	End Users & Building Envelope		Li	Md	M	Install appropriate Tanking to lower ground floor to prevent ingress of vapours
Radon	Vertical and lateral migration	End Users & Building Envelope	Not in a Radon protection area	Ul	Md	Vl	

KEY:

Probability of pollutant linkage	Hi = Highly likely, Li = Likely, Lw = Low Likelihood, Ul = Unlikely
Consequence	Sv = Severe, Md = Medium, Mi = Mild, Mr = Minor,
Overall Risk	VH = Very High, H = High, M = Moderate, M/L = Moderate/Low, L = Low, VL = Very Low

Based on the preliminary CSM for the site, an environmental risk assessment has been undertaken. A simple matrix can provide a consistent basis for decision making. It should be used with caution, recognising the over-simplification that it will normally represent. The probability and consequences are defined according to parameters relevant to the situation; the boundaries of risk acceptability (and tolerability, where relevant) indicated on the matrix provided in Table 3, can be tailored to the factors influencing the significance of the risk. Individual situations are mapped onto the matrix to provide a ready and consistent indication of their acceptability or tolerability.

Classifications of probability and consequence are included as Table 4.

TABLE 3 RISK CLASSIFICATION MATRIX

		Consequence			
		Severe (Sv)	**Medium (Md)**	**Mild (Mi)**	**Minor (Mr)**
Probability	**High (Hi)**	Very high risk Very High Risk	High risk	Moderate Risk	Moderate/ Low Risk
	Likely (Li)	High risk	Moderate Risk	Moderate/Low Risk	Low Risk
	Low Likelihood (Lw)	Moderate Risk	Moderate/ Low Risk	Low Risk	Very Low Risk
	Unlikely (Ul)	Moderate/ Low Risk	Low Risk	Very Low Risk	Very Low Risk

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

These attributes are evaluated qualitatively against individual hazard assessments to determine the likelihood of a given hazard occurring. The risk evaluations for each plausible pollutant linkage are given in the last three columns of Table 1. Based on the previous activities that have taken place adjacent to the site, the pollution linkage assessment combined with the historical and topographical knowledge of the site has indicated that these activities represent a low risk to human health set in the context of the proposed development.

TABLE 4 CLASSIFICATION OF RISK

Very high risk (Vh)	There is a high probability that severe harm could arise to a designated receptor from an identified hazard, OR, there is evidence that severe harm to a designated receptor is currently happening. This risk, if realised, is likely to result in a substantial liability. Urgent investigation (if not undertaken already) and remediation are likely to be required.
High risk (Hi)	Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation (if not undertaken already) is required and remedial works may be necessary in the short-term and are likely over the longer term.
Moderate risk (Md)	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild. Investigation (if not already undertaken) is normally required to clarify the risk and to determine the potential liability. Some remedial works may be required in the longer-term.
Low risk (Lw)	It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very low risk (Vl)	There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

Source: CIRIA Report C552, Contaminated Land Risk Assessment. A Guide to Good Practice, 2001

9.0 PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT

Based on the information contained in this report, it is the opinion of Castledine & Co that the site represents a moderate risk with respect to the proposed use of the site.

Though the potential of contamination of on site soils exists the nature of the development encapsulates all onsite soils.

The remaining risks can be militated against by

1. the appropriate use of Personal Protective Equipment (PPE) by site workers during construction.
2. The installation of an appropriate VOC/SVOC resistant tanking system in the lower ground floor. If a sump is required this will require sealing in such a manner that vapours cannot escape into the building.

The risks are based on the hazards presented by potential land contamination only. For example, the risks to surface waters do not reflect the potential for chemical spills to reach the surface water drains while the risks to site users do not consider direct exposure to chemicals

10.0 FURTHER ENVIRONMENTAL INVESTIGATION

It is not anticipated that further investigation will be required

10.1 PROPOSED REMEDIAL ACTIONS AND VERIFICATION

The installation of an appropriate VOC/SVOC resistant tanking system in the lower ground floor. If a sump is required this will require sealing in such a manner that vapours cannot escape into the building.

11.0 REFERENCES

11.1 LEGISLATION AND REGULATIONS

11.1.1 ACTS

[1]. Environmental Protection Act 1990, Part IIA: inserted by Environment Act 1995, Section 57. See Environment Act 1995 for text of Part IIA.

11.1.2 PLANNING REGULATIONS

[2]. The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 SI1999/No.293

[3]. The Town and Country Planning (Environmental Impact Assessment) (England and Wales) (Amendment) Regulations 2000 SI2000/No.2867

11.1.3 CONTAMINATED LAND REGULATIONS

[4]. The Contaminated Land (England) Regulations 2000. SI2000/No.227

[5]. The Contaminated Land (England) (Amendment) Regulations 2001 SI2001/No.663

[6]. The Radioactive Contaminated Land (Enabling Powers) (England) Regulations 2005 SI2005/No.3467

[7]. The Radioactive Contaminated Land (Modification of Enactments)(England) Regulations 2006 SI2006/No.1379

[8]. The Contaminated Land (England) Regulations 2006 SI2006/No.1380

[9]. The Radioactive Contaminated Land (Modification of Enactments) (England) (Amendment) Regulations 2007 SI2007/No.3245

[10]. The Radioactive Contaminated Land (Modification of Enactments) (England) (Amendment) Regulations 2008 SI2008/No.520

11.2 STATUTORY GUIDANCE

[11]. Department of Environment, Food and Rural Affairs. 2012. *Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance.* Department of Environment, Food and Rural Affairs

[12]. Communities and local Government, 2012: National Planning Policy Framework.

11.3 BRITISH STANDARDS

[13]. BS 5930:1999 Code of practice for site investigations

[14]. BS 10175:2011+A1:2013 Investigation of potentially contaminated sites - Code of practice

[15]. BS 8485:2007 Code of practice for the characterization and remediation from ground gas in affected developments

[16]. BS 8576:2013 Guidance on investigations for ground gas. Permanent gases and Volatile Organic Compounds (VOCs)

11.4 NON STATUTORY TECHNICAL GUIDANCE

11.4.1 ENVIRONMENT AGENCY

[17]. Cassella Stranger, 2002. Model Procedures for the Management of Contaminated Land, Contaminated Land Report (CLR) 11, Department for Environment, Food, and Rural Affairs.

11.4.2 CIRIA PUBLICATIONS

[18]. Wilson, S., Oliver, S., Mallett, H., Hutchings, H., and Card, G.. 2007, *C 665 Assessing risks posed by hazardous ground gases to buildings* London: Construction Industry Research and Information Association

11.4.3 CL:AIRE

[19]. Card G, Wilson S, Mortimer S. 2012. *A Pragmatic Approach to Ground Gas Risk Assessment. CL:AIRE Research Bulletin RB17*. CL:AIRE, London, UK. ISSN 2047- 6450 (Online)

12.0 APPENDICES

APPENDIX A. SITECHECK REPORT

APPENDIX B. PROPOSED AND CURRENT SITE PLANS