

APPENDIX 8.2
REMEDIATION STRATEGY

Former Nestle Factory, Hayes - Proposed Commercial Development

Remediation Strategy

11 July 2016

Quality Management

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1. Introduction

1.1 Report Purpose

- 1.1.1 This report describes the proposals for environmental remediation of the part of the former Nestle factory in Hayes, which is intended to be redeveloped for new commercial premises. It draws on information obtained from several preceding phases of ground investigation and geo-environmental risk assessment, and is intended to support the planning application for the proposed development.

1.2 Background

- 1.2.1 The Nestle site comprises a former coffee (and previously chocolate) manufacturing plant which ceased production and closed at the end of 2014. SEGRO subsequently acquired part of the site and intends to bring forwards a new commercial development comprising light industrial / warehouse units (see architect's drawing in Appendix A). The remainder of the former Nestle property is expected to be redeveloped separately by others for residential use.

1.3 Previous Reports

- 1.3.1 Capita has previously produced the following reports covering the site:

- Further Geo-environmental Assessment, ref. CS-075666-PE-16-113-R dated 6 June 2016.
- Geo-environmental Investigation and Assessment, ref. CS075666-PE-14-211-R Revision A dated 24 November 2014.

- 1.3.2 Reports were also produced for Nestlé UK Ltd by Geosyntec Consultants Ltd prior to the acquisition by SEGRO:

- Letter report titled *Update on Groundwater Monitoring Results post September-14 round* dated 23 October 2014.
- Subsurface Asbestos Investigation: Main Building Undercroft & South-Eastern Surrounding Area. Project ref. GCU0124025 dated July 2014.
- Phase 2 Environmental Assessment of the Nestlé UK Ltd Facility in Hayes, Middlesex. Project ref. GCU0124024 dated June 2014.
- Phase 1 Environmental Assessment of the Nestlé UK Ltd Facility in Hayes, Middlesex. Project ref. GCU0124020 dated September 2013.

2. Site Setting

2.1 Location

2.1.1 The site is located off North Hyde Gardens in Hayes, approximately centred on post code UB3 4RF and at Ordnance Survey National Grid Reference 510100, 179190. A location plan is provided in Appendix B.

2.2 Site Description

2.2.1 The area covered by this assessment covers approximately 5.15 hectares in the eastern and northern part of the former Nestle premises, which extends to over 12 hectares in total. It is occupied by several buildings and areas of hardstanding (both macadam and concrete) and the main features are:

- The Green Bean Warehouse, previously used for the storage of coffee beans.
- The Eden Building, used for packing and loading of finished products.
- The Lodge, a former residential property in the south-eastern corner of the site.
- The Main Building, of varying construction types and modified / added to on a number of occasions. The building occupies land to be developed by both SEGRO and the residential developer.
- The Gatehouse, located in the central eastern part of the site.
- A macadam surfaced car park covering much of the southern end of the site.

2.2.2 The site is relatively flat with levels ranging between about 31.4 and 30.5 mAOD, with a slight fall towards the west.

2.3 Previous Development History

2.3.1 The site comprised agricultural land from at least the 1860s until the 1910s, and the earliest part of the Main Building was completed circa 1914 for a cocoa factory. During the First World War much of the site was used for a munitions factory comprising numerous wooden huts for shell manufacturing. The munitions factory closed in 1919 and the site reverted to cocoa, and later coffee, production. The Main Building was extended in the 1930s and further modified and added to in the 1960s. The factory complex continued to expand throughout the second half of the twentieth century and many of the larger warehouse-type buildings were constructed in the 1970s. Coffee production ceased at the end of 2014 since when the site has remained disused.

3. Ground Conditions

3.1 Stratigraphy

3.1.1 The table below summarises conditions encountered in exploratory holes situated within the proposed SEGRO commercial development area:

Stratum	Thickness range (m)	Depth range to top of stratum (mbgl)	Depth range base depth (mbgl)
Concrete / Macadam	0.07 to 0.80	GL	0.06 to 0.80
Made Ground	0.15 to 2.3 Average: 0.85	0.07 to 0.8 Average: 0.25	0.45 to 2.45 Average: 1.1
Langley Silt / Brickearth	0.2 to 1.6 Average: 0.7	0.35 to 2.5 Average: 1.0	0.85 to 3.0 Average: 1.7
Lynch Hill Gravel	0.9 to 3.3 Average: 2.3	0.85 to 3.0 Average: 1.5	2.6 to 5.3 Average: 4.0
London Clay	Not proven	2.6 to 5.3 m Average: 3.2	Not proven

3.2 Groundwater / NAPL

3.2.1 Groundwater typically lies between about 0.7 and 1.7m below current ground level, within the Lynch Hill Gravel lithology. This corresponds to levels of between about 27.9 and 29.6 mAOD. Flow is towards the southeast at an approximate gradient of 1:150 (0.66%).

3.2.2 Free phase hydrocarbons (LNAPL and DNAPL) were not detected on or below groundwater in any of the monitoring wells.

3.3 Ground Gases

3.3.1 Monitoring of gas concentrations in borehole wells has recorded very low methane concentrations across the proposed development area, typically <0.1% and a maximum of 0.5% by volume. The carbon dioxide concentration ranged between 0.1 and 0.5%.

3.3.2 The site has been categorised in accordance with BS 8485:2015 and CIRIA publication C665 and concluded to fall under Characteristic Situation 1, corresponding to a very low hazard potential. No special ground gas protection measures are considered necessary.

3.4 Chemical Contamination

3.4.1 Laboratory analysis of soil and groundwater samples did not detect significant chemical contamination. However asbestos was detected in numerous shallow soil samples (generally <1.0m deep) comprising either fragments of insulation lagging or loose asbestos fibres, predominantly chrysotile but also small amounts of amosite and crocidolite. Concentrations were relatively low, ranging between <0.001% and 0.22% by mass.

4. Remediation Strategy

4.1 Asbestos

- 4.1.1 It has been recommended that asbestos should, as far as is reasonably practical, be removed from shallow soils below the site.
- 4.1.2 In this regard it is proposed that a watching brief be maintained during the demolition contract, such that regular inspections of the ground formation are undertaken during removal of existing floor slabs. Where possible the asbestos should be hand-picked by suitably qualified and experienced personnel, and removed from site to a licenced facility.
- 4.1.3 If there is evidence of abundant fragments of asbestos containing materials that cannot reasonably be removed by handpicking, it may be necessary to remove, on a localised basis, the entire soil mass affected. Again this will require off-site disposal.
- 4.1.4 Validation testing should be undertaken on completion to demonstrate adequate removal has been achieved. This will comprise collection and analysis of soil samples from the resultant 'cleared' formation.
- 4.1.5 All relevant site records and, if applicable, laboratory test results, should be collated and presented in a remediation validation report.

4.2 Landscaping Cover Layer

- 4.2.1 In order to mitigate any (slight) residual risk of direct contact with potentially hazardous soils, or inhalation of dust, it is proposed that a 600mm thick cover layer of imported topsoil be placed in areas of soft landscaping. This should conform to the landscape architect's specification and applicable industry standards.

4.3 Discovery Strategy

- 4.3.1 It is recommended that a reactive programme of visual screening be employed during the main development groundworks to assess soil conditions in any previously un-investigated areas.
- 4.3.2 In the event that observations suggest possible chemical contamination of the ground, the following measures are proposed:
- Sampling and laboratory analysis of suspected soils (or groundwater).
 - If applicable assessment criteria are exceeded (i.e. the screening values adopted in the geo-environmental reports), further selective excavation of the ground may need to be undertaken. Subject to further risk assessment such areas may require removal.
 - Validation samples should be obtained from the sides and the base of the excavations (where possible).
 - The excavations should be backfilled with suitable material as determined by appropriate certification or chemical analysis.

- Throughout these operations, due regard will be given to potential detrimental effects on the surroundings including noise and dust.

4.3.3 The contractor will be responsible for the appropriate management of waste generated through this process, to include waste characterisation and where necessary waste acceptance criteria (WAC) testing prior to disposal.

4.3.4 All laboratory testing should be undertaken to a method detection limit appropriate to the screening criteria, by a reputable accredited laboratory.

4.4 Backfill

4.4.1 Materials used to backfill excavations must be sorted and graded according to the engineer's earthworks specification.

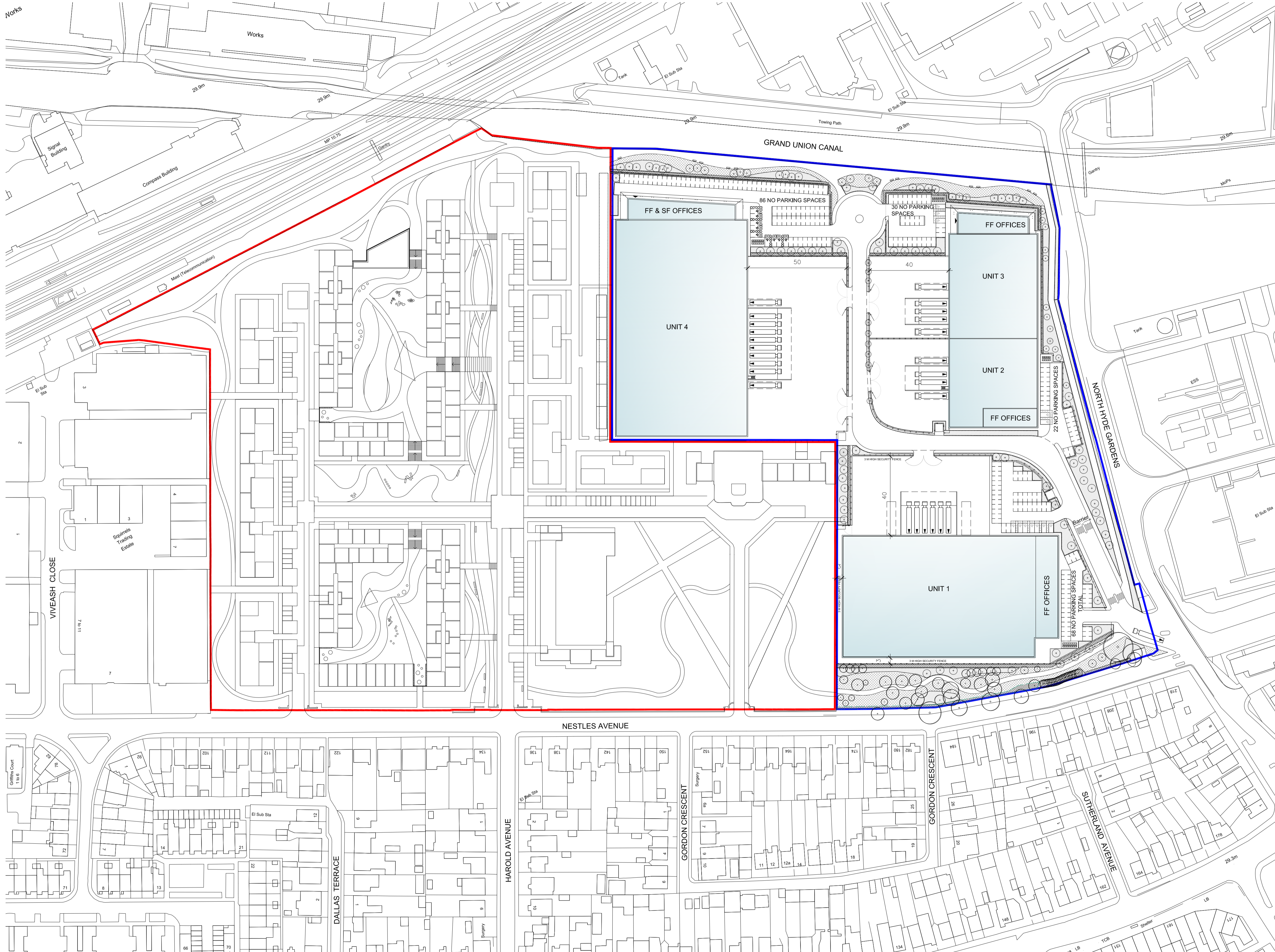
4.4.2 The quality of any materials brought to site should be ascertained at source and certification/testing should be provided before placement.

4.5 Validation

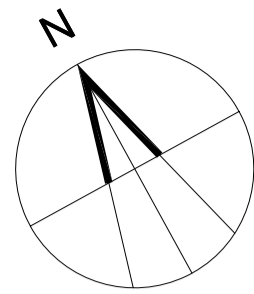
4.5.1 An 'Environmental Close Out Report' should be produced on completion of the development to present the final status of the site with respect to ground contamination. The following elements may need to be included:

- A description of any additional remediation undertaken (including vapour membrane installation) and the methodology adopted.
- Site notes/logs and photographs.
- Excavation validation testing results and imported fill testing results.
- Copies of all waste management documentation, and records of the volumes of soils removed and imported.

Appendix A – Architect’s Proposed Development Layout



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 SUBJECT TO SURVEY
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AREA SCHEDULE
GEA

	sqm	sqft
1		
Unit	6,647	71,545
FF Offices	612	6,590
Sub total	7,259	78,135

	Ha	acres
PLOT 1 AREA	1.232	3.04

	sqm	sqft
2		
Unit	2,034	21,895
FF Offices	272	2,930
Sub total	2,306	24,825

	sqm	sqft
3		
Unit	2,742	29,515
FF Offices	361	3,885
Sub total	3,103	33,400

	sqm	sqft
4		
Unit	7,826	84,240
FF&SF Offices	1,039	11,185
Sub total	8,865	95,425

TOTAL	21,533	231,785
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	Ha	acres
PLOT AREA (Approx.)	5.157	12.74

DENSITY 41.8 %

REV	DATE	NOTE	DRAW	CHK
I	01/04/2016	Landscape updated	AT	AC
H	23/03/2016	Unit 1 updated layout	AT	AC
G	21/03/2016	Unit 1 updated layout	AT	AC
F	09/03/2016	Unit 4 updated parking	AT	AC
E	23/02/2016	Area schedule & plot 1 boundary omitted	GZ	AC
D	19/02/2016	Updated area schedule	AT	AC
C	15/02/2016	Area schedule for unit 2, 3 & 4 added	GZ	AC
B	08/02/2016	Unit 1 updated	GZ	AC
A	13/12/2015	Unit 1 and residential layout updated	GZ	AC
-	10/12/2015	First issue	GZ	AC



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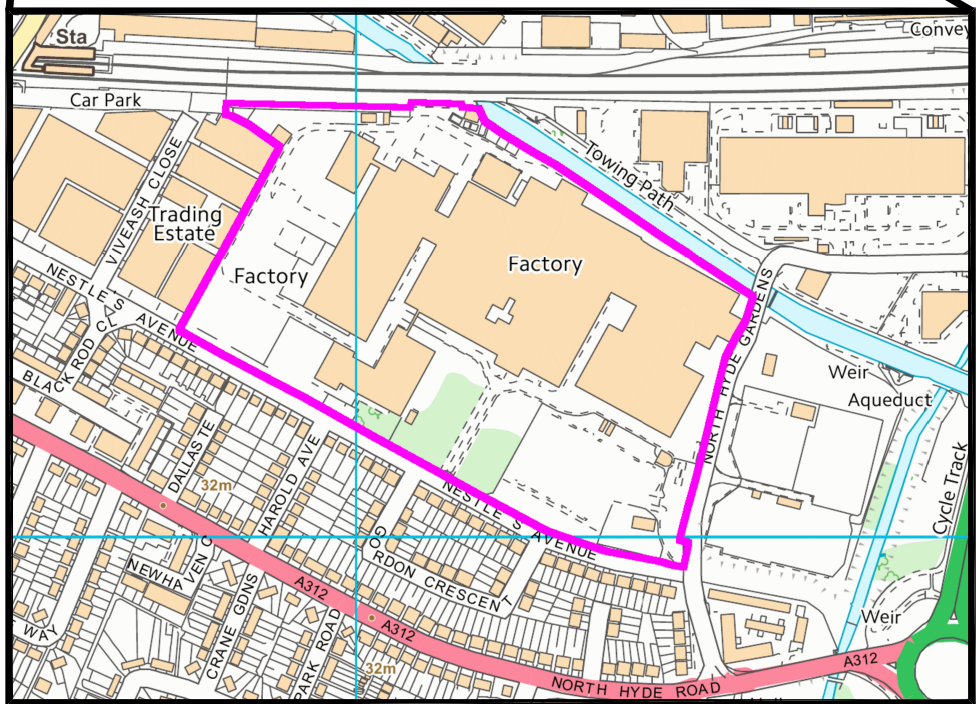
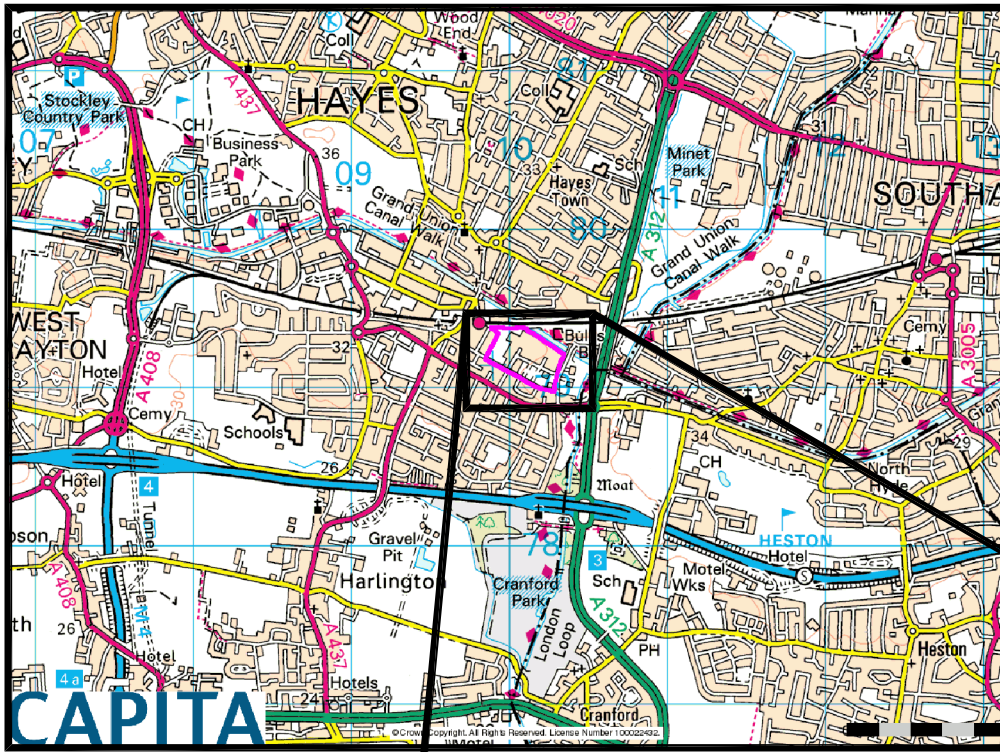
TITLE
NESTLES AVENUE, HAYES
 DRAWING
SITE MASTER PLAN

CLIENT
SEGRO

DATE	SCALE	DRAWN
DECEMBER 2015	1:1000 @ A1	GZ
STATUS	FEASIBILITY	CHECKED
		AC

DRAWING NUMBER
30680-FE-441

Appendix B – Site Location Plan



Drawing status

PRELIMINARY

Client



Project

FORMER NESTLE SITE, HAYES

Drawing

SITE LOCATION PLAN

Scale @ A4

N.T.S.

Project No.

CS/075666

Drawing Identifier

075666 - CA- 0 - G00- DSP- SE- 502 - P00

Drawn

WFJ

Date

21/11/14

Checked

PWE

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BS1192:2007 / Avanti Compliant
project origin zone level file type role number revision

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