

HARRISON & COMPANY

(Soils and Foundation Engineers) Limited

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F.O.S.

Registered in England No. 1306165, Registered Office: 50 Unthank Road, Norwich.

REPORT No. : C604A

DATE : July 1993.

LOCATION : British Gas Site, Ford Road, Arundel, West Sussex.

CLIENT : British Gas plc (South-eastern)

DESK STUDY
ON A
DISUSED GAS WORKS
AT
FORD ROAD, ARUNDEL, WEST SUSSEX
FOR
BRITISH GAS (South Eastern) plc

1 INTRODUCTION

The desk study covered by this report was carried out by Harrison & Company (Soils and Foundation Engineers) Limited, to the instructions of the Client, British Gas (South Eastern) plc., under their Order No. Wo13664, dated 6th July 1993.

The site under consideration was located between Ford Road and the River Arun, Arundel, West Sussex. The investigation was undertaken to ascertain past and recent land use purposes. In addition, former site boundaries and whether the site had contained other buildings or structures together with their approximate locations, have been investigated. Details of buildings and processes within the current British Gas works have not been investigated at this time. Harrison and Company have previously carried out a site investigation of this site in 1988. Full details of this investigation are given in our report, No. C604, and are discussed in section 3.7 below. The scope of the investigation was limited to the information available at the West Sussex County Records office. It should be noted that additional information concerning the site may be available from other sources, and that this study should not be considered to be exhaustive.

2 GEOLOGY

Reference to the British Geological Survey 1:50,000 sheet No. 217, Chichester, shows the site to be underlain by Alluvium overlying Upper Chalk in the north-eastern half of the site and Reading Beds in the south-western half of the site.

3 DESK STUDY

The desk study involved the collection and review of the historical information concerning the site available from the map room of the West Sussex Record Office. In addition a brief visit was made to site to assess its current condition.

Included in the appendix to this report are copies of one Tithe Map and four Ordnance Survey County Series Sheets together with a recent plan obtained from the archives at British Gas of the site. The outline of the current site is shown on all the plans with a dashed line. For the period between 1841 and the present day, the maps revealed the following information :

3.1 Tortington Tithe Map (Published 1841), TD/W128 MS84. (Scale 1:2500)

This shows that by 1841 the northern corner of the site, adjacent to Ford Road, was already occupied by a small gas works consisting of a single circular holder, a medium sized works building and a small cottage. To the north-east of the gas works were a lane and drainage ditch, running between Ford Road and a sluice gate on the River Arun. Beyond the lane and ditch was pasture land. Beyond Ford Road, to the north-west of the gas works, was more pasture land, and to the south and south-east between the gas works and the river embankment was an area of water meadow. The river bank was marked by a flood defence embankment, behind which was a drainage ditch which ran parallel to the river. When this ditch reached the lane and sluice gate it turned north-westwards and ran along the south-western edge of the lane as far as the corner of the gas works. To the south-west of the original gas works, and running parallel to Ford Road was a garden nursery which was bounded to the south-east by a drainage ditch connected to the River Arun. According to the county records the gas works was owned by an unnamed gas company and there was no information available as to when the gas works was first constructed. However, given that in 1840 Arundel was a relatively small city and that coal gas distilling was a relatively new process, then it seems likely that the 1841 gas works was the first to occupy the site and was probably less than twenty years old when surveyed. Prior to its construction the site was probably occupied by pasture land. (Drawing No. C604A/1)

3.2 O.S. County Series Map, West Sussex Sheet LXIII \I (Published 1877), 1st. Edition. (Scale 1:2500)

This map indicates that between 1841 and 1877 the gas works expanded slightly towards the south-west into the area once occupied by the nursery garden. This expansion consisted of two more holders and a rectangular building adjacent to the main works. The drainage ditch along the south-eastern boundary of the nursery gardens was extended and marked the south-eastern boundary of the gas works. The drainage ditch along the north-eastern side of the lane adjacent to the north-eastern boundary of the gas works was extended to run from the river sluice gate to Ford Road. To the south of the gas works within the water meadows between the river and Ford Road a public baths was constructed, consisting of an unspecified building and two rectangular ponds. The baths were bounded on three sides by drainage ditches, and lay along the south-western boundary of the current site. The river embankment was armoured against erosion using stone blocks.(Drawing No. C604A/2).

3.3 O.S. County Series Map, West Sussex Sheet LXIII/I (Published 1910), (Scale 1:2500)

This shows that by 1910 the gas works had doubled in size by expanding south-westwards into the area once occupied by the nursery garden. The expanded gas works now contained two large circular holders and an expanded works building. In addition an unspecified building was built in the northern corner of the gas works. The rest of the nursery garden was replaced by two rows of terrace houses and their adjacent gardens. The south-eastern boundary of both the gas works and the gardens was still marked by a drainage ditch although this no longer appeared to be connected to the river. To the north-west of the site the pasture land across Ford Road was converted into a cemetery containing a mortuary chapel and a lodge house. To the south-west of the cemetery Kirdford Road was constructed along with some terrace housing. (Drawing No. C604A/3).

3.4 O.S. County Series Map, West Sussex Sheet LXIII/I (1937 Revision), (Scale 1:2500)

Between 1910 and 1937 the area around the gas works remained much the same, with some additional housing present along Kirdford Rd. However the gas works expanded south-eastwards into the water meadows adjacent to the river. By 1937 the drainage ditch that originally marked the south-eastern boundaries of the gas works and Ford Road houses was gone, presumably having been infilled. Within the new area occupied by the gas works was a large circular tank or holder and a small building. (Drawing No. C604A/4).

3.50 O.S. National Grid. Sheet No. TQ0006-01066 (Revision of 1971) (Scale 1:2500)

This shows that between 1937 and 1971, the area around the gas works appeared to have remained much the same, with the exception of the public baths which were demolished and backfilled. The area occupied by the gas works is the same as in 1937, but by 1971 contained only a large circular holder or tank, an electricity sub station, a square tank and a buried pressure reducing station. The north-western half of the site appeared to be empty. (Drawing No. C604A/5).

3.6 British Gas Corporation (South-eastern Region) Plan, Drawing No. DE/Sx/4/200. Published 1976 (Scale 1:250)

This shows the site to be much the same as in 1971, except that the large circular holder in the south-eastern corner of the site had been removed. This plan shows that the services to the site consisted of several 8" and 12" gas mains connecting the pressure reduction plant to the mains running along Ford Road. These mains went on to supply both Arundel town and Slindon. (Drawing No. C406A/6)

3.7 Harrison and Co. Site Investigation No. C604, 1988.

In 1988 a limited site investigation of the site was carried out, consisting of 22 trial pits. The trial pits were logged and samples taken for contamination testing. The findings of this investigation are given in full in report C604, but are summarised below.

Natural ground was encountered within all the trial pits and generally consisted of clay Alluvium, gravelly clay from the Reading Beds and weathered Upper Chalk.

Within the British Gas compound, buried structures, consisting of concrete, pipes and metal, were encountered. Generally the depth of fill across this part of the site was about 1.3 m, but ranged up to depths of 3.0 m below ground level.

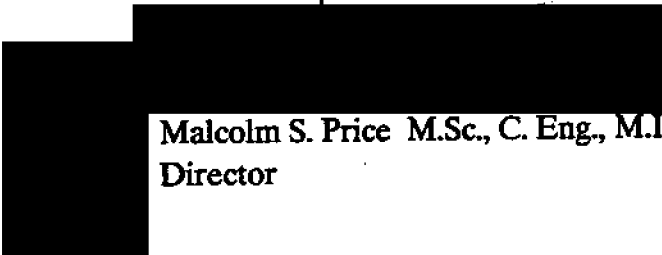
Within the south-western part of the site, which was occupied by pasture land, the top soil was generally underlain by natural materials, although in places limited quantities of chalk and brick fill were found. This material may originate from the demolition of the public baths, which were sited close to this end of the site.

3.8 Site Visit, May 1993.

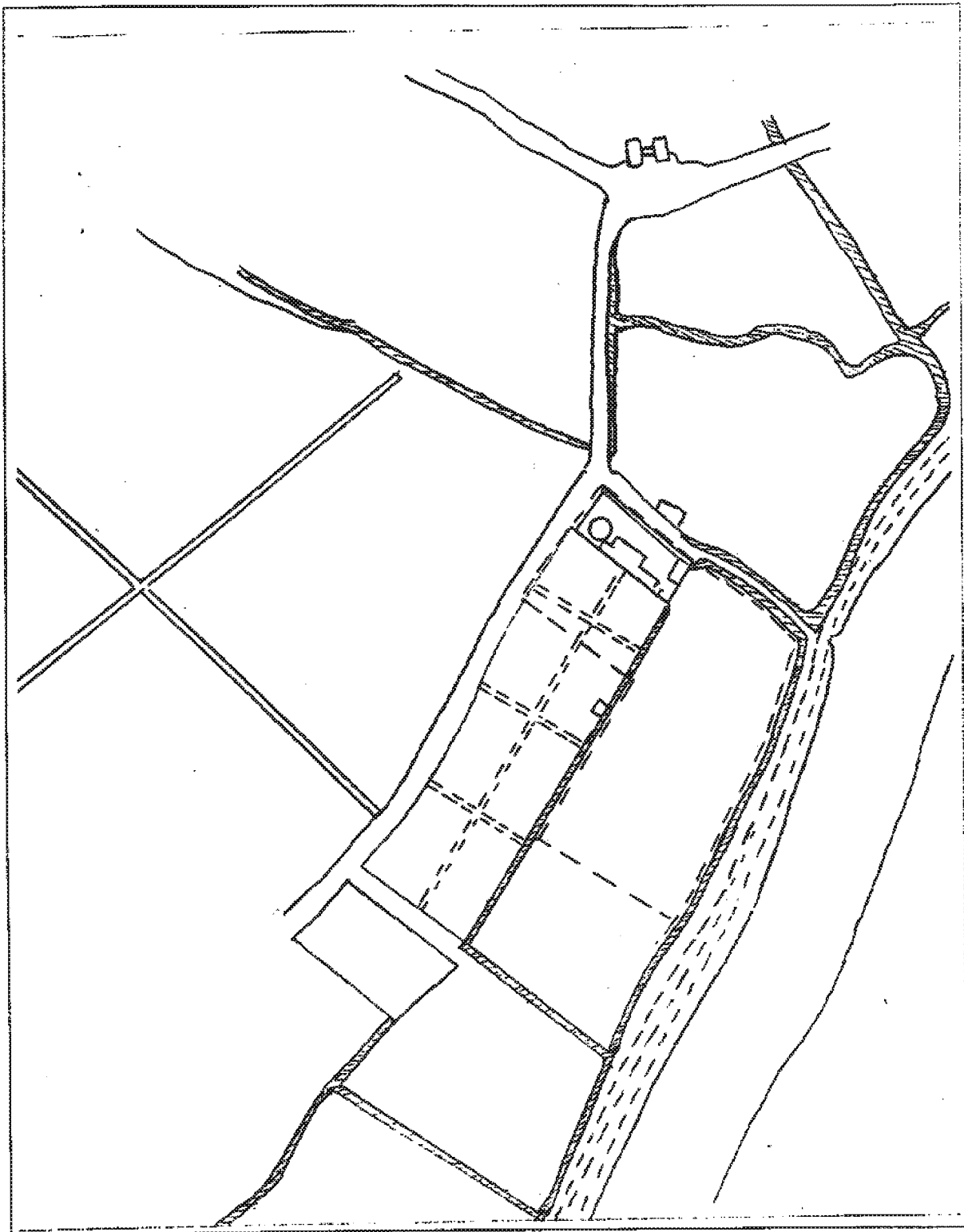
The site was visited by an engineer from Harrisons and Company on the 2nd July 1993 and since access to the gas works compound was not possible, a partial walk-over survey was carried out. The area under consideration included the British Gas compound and the area between the Ford Road houses and the drainage ditch adjacent to the river Arun. The site visit showed that the compound was no longer in use, and that the pressure reduction station appeared to be in some state of disrepair. The compound still was surrounded and divided by security fencing as shown on the 1976 British Gas plan. The north-western half of the compound was covered with gravel and looked as if it had been used as a vehicle park. The south-eastern half of the compound was as shown on the 1976 British Gas Plan, although in a general state of disrepair and abandonment. The rest of the site consisted of large pasture bounded by gardens to the north-west, the gas works security fence to the north-east, a tree lined drainage ditch to the south-east and open land to the south-west. Within the south-eastern drainage ditch water flowed quite rapidly south-westwards from a concrete culvert at the northern end of the ditch. It seems likely that this culvert connects with the concrete sluice gate at the end of the site access lane. Between the ditch and the River Arun was a river levee or embankment, 2 - 3 m high. The face of the embankment was armoured against erosion with concrete blocks.



Matthew Naylor B.Sc. (Hons).
Project Engineer



Malcolm S. Price M.Sc., C. Eng., M.I.C.E., F.G.S.
Director



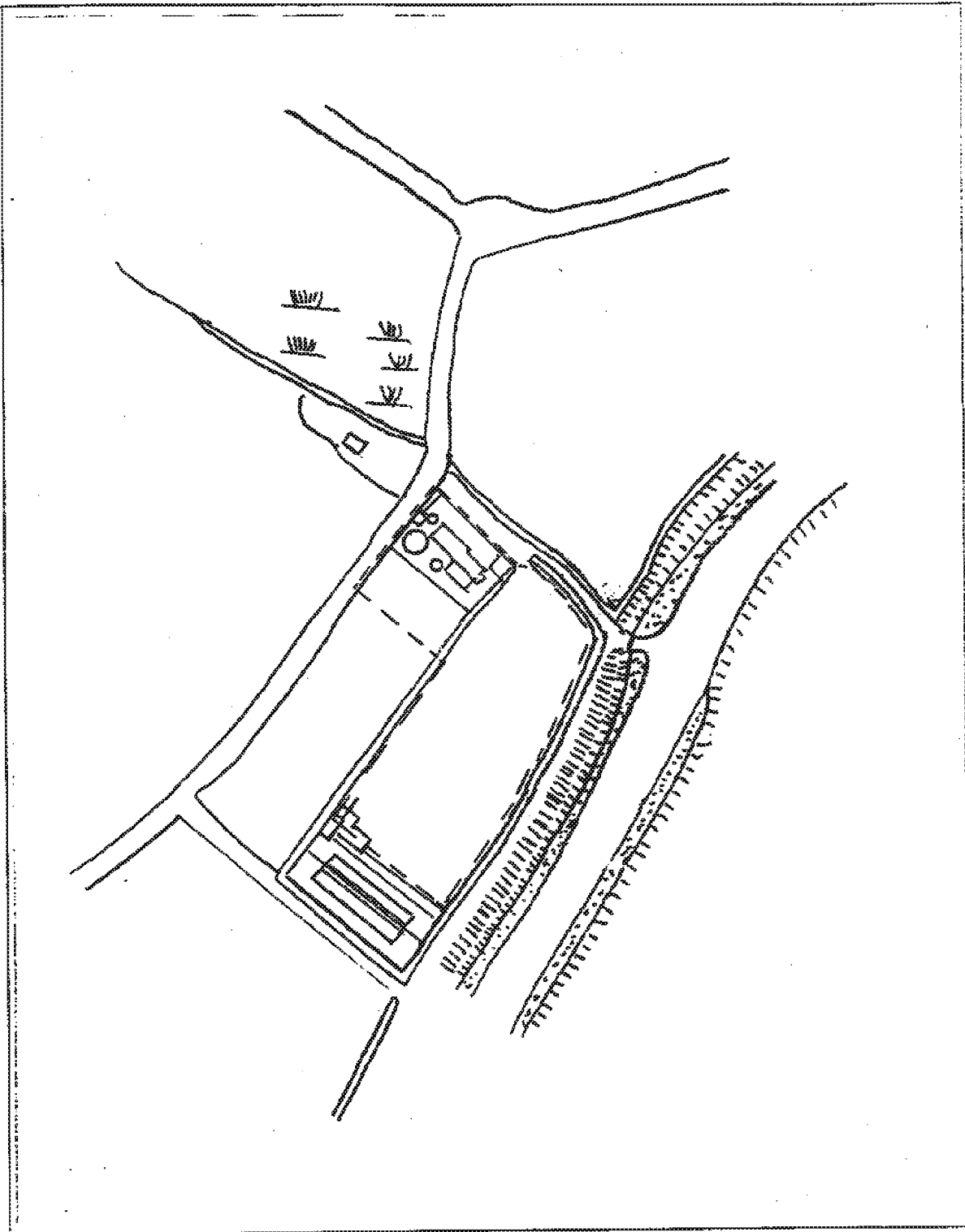
Ford Road, Arundel, West Sussex.

Tortington Tithe Map : Drawing No. C604A/1

Library No. TD/W128-MS84 (Published 1840), 1st. Edition

Scale : 1 : 2500

July 1993

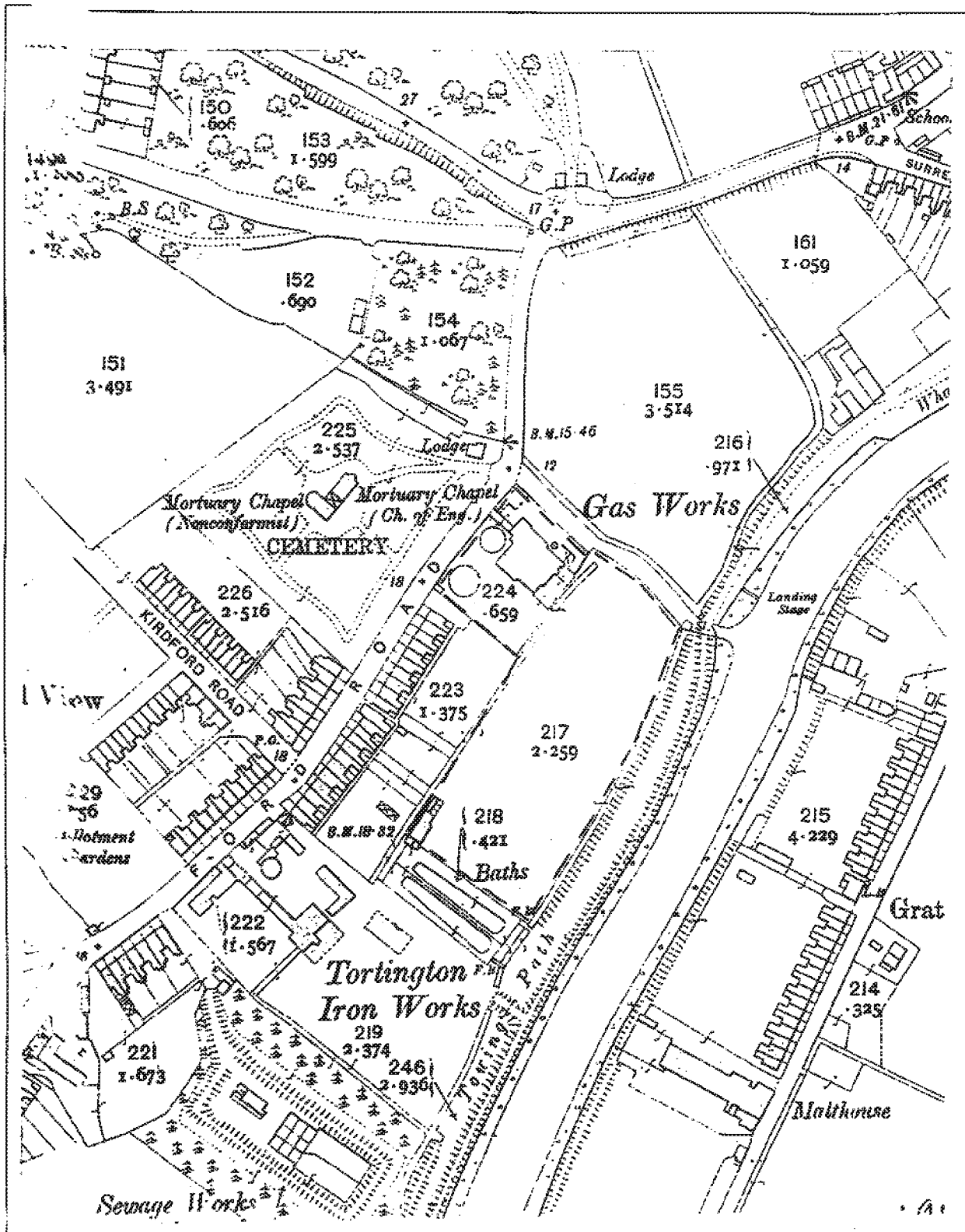


Ford Road, Arundel, West Sussex.

O.S. County Series Map : Drawing No. C604A/2
O.S. West Sussex Sheet LXIII/1 (Published 1877), 1st. Edition

Scale : 1 : 2500

July 1993



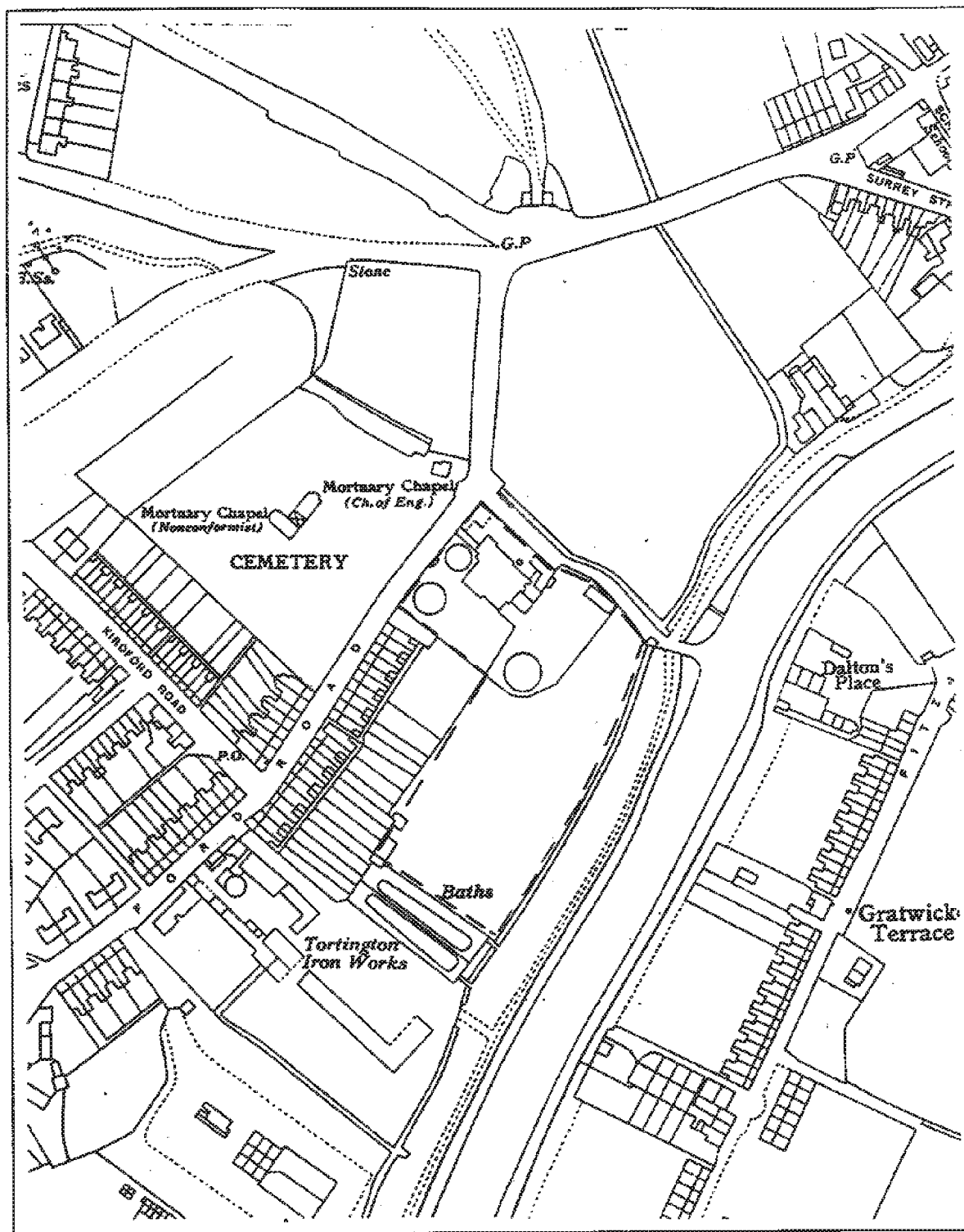
Ford Road, Arundel, West Sussex.

O.S. County Series Map : Drawing No. C604A/3

O.S. West Sussex Sheet LXIII/I (Published 1910)

Scale : 1 : 2500

July 1993



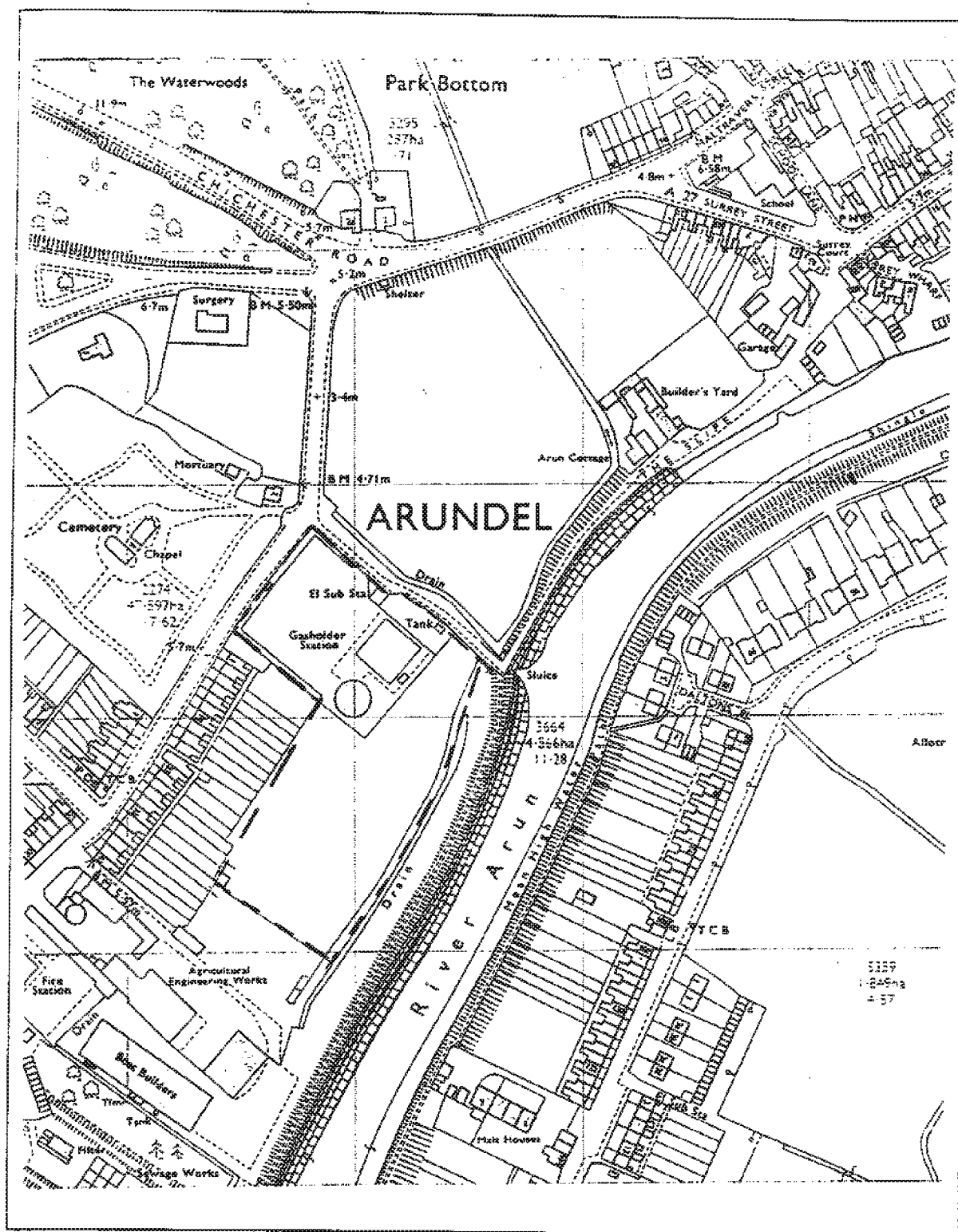
Ford Road, Arundel, West Sussex.

O.S. County Series Map : Drawing No. C604A/4

O.S. West Sussex Sheet LXIII/1 (Published 1937)

Scale : 1 : 2500

July 1993



Ford Road, Arundel, West Sussex.

O.S. National Grid Map : Drawing No. C604A/5

O.S. Sheet TO0006-0106 (Published 1971)

Scale : 1 : 2500

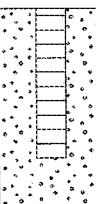
July 1993

Appendix B
Trial Pit and Borehole Logs, Site Photographs
and Site Works Log

BOREHOLE LOG

Boring Contractor : ESL					Job No : A71430/ 015162		Borehole No : BH1	
Boring method : CFA					Client : Lattice Property		Sheet 1 of 2	
Boring diameter : 100			Casing diameter : 50		Site : Arundel		Ground level : 3.67 (Relative to Ordnance datum)	
Boring equipment :					Project : Arundel Site Investigation		Date commenced : 07/06/2000	Date completed : 07/06/2000
Easting : 501285.29			Northing : 106775.30					
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		3.67		
01	S	1.00			0.80	2.87		Soft to firm brown sandy clay with much gravel and cobble of builders rubble fill. MADE GROUND
02	S	2.00						Firm light brown very gravelly CLAY. Gravel of flint. NATURAL GROUND.
03	S	3.00						Red brown silty sandy with only occasional gravel at 1.8m.
04	S	5.00						Brown without sand/ silt, very gravelly at 2.5m.
								Soft to firm wet light brown with occasional fine chalk gravel (not flint) at 2.5m.
05	S	7.00			6.50	-2.83		Soft light grey decomposed CHALK with occasional dark grey staining, slight odour. NATURAL GROUND.
								With occasional hard core stones at 7.4m.
								Continued Next Sheet
Groundwater  Depth to water strike					Remarks :			
Struck (m): 3.30					Flow Remarks :			
					Logged By : ESL			

BOREHOLE LOG

Boring Contractor : ESL					Job No : A71430/ 015162		Borehole No : BH1	
Boring method : CFA					Client : Lattice Property		Sheet 2 of 2	
Boring diameter : 100			Casing diameter : 50			Site : Arundel		Ground level : 3.67 (Relative to Ordnance datum)
Boring equipment :					Project : Arundel Site Investigation		Date commenced : 07/06/2000	Date completed : 07/06/2000
Easting : 501285.29			Northing : 106775.30					
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		3.67		
06	S	9.00			10.00	-6.33		Soft light grey decomposed CHALK with occasional dark grey staining, slight odour. NATURAL GROUND.
								End of Borehole at 10.00 m
Groundwater					Remarks :			
Struck (m):		Flow Remarks :			Logged By : ESL			
3.30								

WS Atkins Environment

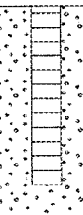
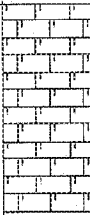
Woodcote Grove, Ashley Road
Epsom, Surrey, KT18 5BW



BOREHOLE LOG

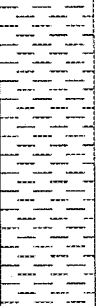
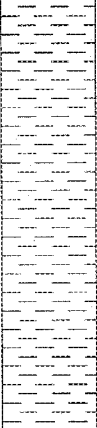
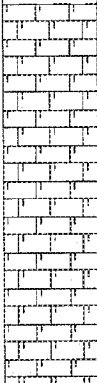
Boring Contractor : ESL					Job No : A71430/ 015162		Borehole No : BH2	
Boring method : CFA					Client : Lattice Property		Sheet 1 of 2	
Boring diameter : 100			Casing diameter : 50		Site : Arundel		Ground level : 3.40 (Relative to Ordnance datum)	
Boring equipment :					Project : Arundel Site Investigation		Date commenced : 08/06/2000	Date completed : 08/06/2000
Easting : 501272.21			Northing : 106727.31					
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		3.40		
01	S	1.00			0.20	3.20		Loose light brown coarse gravel fill. MADE GROUND
02	S	2.00						Soft to firm red/brown very silty CLAY. NATURAL GROUND. Much flint gravel at 0.7m.
03	S	3.00						Soft sandy with only very occasional gravel at 1.8m.
04	S	5.00						Light brown without sand at 4.0m.
05	S	7.00			6.50	-3.10		Soft wet white to light brown completely decomposed CHALK with very occasional flint gravel. NATURAL GROUND. With occasional hard core stones at 7.2m.
								Continued Next Sheet
Groundwater Depth to water strike					Remarks :			
Struck (m) : 2.68					Flow Remarks :			
					Logged By : ESL			

BOREHOLE LOG

Boring Contractor : ESL				Job No A71430/ 015162		Borehole No : BH2		
Boring method : CFA				Client : Lattice Property		Sheet 2 of 2		
Boring diameter : 100		Casing diameter : 50		Site : Arundel		Ground level : 3.40 (Relative to Ordnance datum)		
Boring equipment :				Project :		Date commenced :	Date completed :	
Easting : 501272.21		Northing : 106727.31		Arundel Site Investigation		08/06/2000	08/06/2000	
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		3.40		
06	S	9.00			10.00	-6.60		Soft wet white to light brown completely decomposed CHALK with very occasional flint gravel. NATURAL GROUND.
								End of Borehole at 10.00 m
Groundwater							Remarks :	
Struck (m)	Flow Remarks :						Logged By : ESL	
2.68								

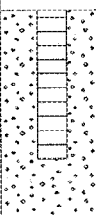
BOREHOLE LOG

Boring Contractor : ESL				Job No : A71430/ 015162		Borehole No : BH3	
Boring method : CFA				Client : Lattice Property		Sheet 1 of 2	
Boring diameter : 100		Casing diameter : 50		Site : Arundel		Ground level : 3.22 (Relative to Ordnance datum)	
Boring equipment :				Project : Arundel Site Investigation		Date commenced : 07/06/2000	Date completed : 07/06/2000
Easting : 501295.70		Northing : 106741.54					

Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well				
						3.22		
01	S	1.00			0.60	2.62		Soft to firm black /brown sandy CLAY fill, with much gravel and builders rubble. With odour. MADE GROUND
02	S	2.00						Soft to firm light brown CLAY. No odour. NATURAL GROUND Red /brown with flint gravel at 0.8m. Very gravelly at 1.3m.
03	S	3.00						With gravel at 2.8m. Soft light brown light grey with fine chalk gravel (no flint) at 3.0m. Light grey with odour at 3.2m.
04	S	5.00						Light brown with flint gravel (no chalk) and slight odour at 4.3m.
05	S	7.00			5.80	-2.58		White very light brown completely decomposed CHALK with occasional hard core stones. NATURAL GROUND.
								Continued Next Sheet

Groundwater  Depth to water strike		Remarks :	Logged By : ESL
Struck (m) 3.20	Flow Remarks :		

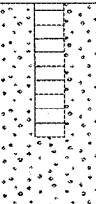
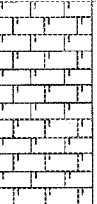
BOREHOLE LOG

Boring Contractor : ESL					Job No : A71430/ 015162		Borehole No : BI13	
Boring method : CFA					Client : Lattice Property		Sheet 2 of 2	
Boring diameter : 100			Casing diameter : 50		Site : Arundel		Ground level : 3.22 (Relative to Ordnance datum)	
Boring equipment :					Project : Arundel Site Investigation		Date commenced : 07/06/2000	Date completed : 07/06/2000
Easting : 501295.70			Northing : 106741.54					
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		3.22		
06	S	9.00			10.00	-6.78		White very light brown completely decomposed CHALK with occasional hard core stones. NATURAL GROUND.
								End of Borehole at 10.00 m
Groundwater						Remarks :		
Struck (m): 3.20 Flow Remarks :						Logged By : ESL		

BOREHOLE LOG

Boring Contractor : ESL				Job No : A71430/ 015162		Borehole No : BH4			
Boring method : CFA				Client : Lattice Property		Sheet 1 of 2			
Boring diameter : 100		Casing diameter : 50		Site : Arundel		Ground level : 2.51 (Relative to Ordnance datum)			
Boring equipment :				Project : Arundel Site Investigation		Date commenced : 06/06/2000	Date completed : 06/06/2000		
Easting : 501304.21		Northing : 106696.39							
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata	
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		2.51			
01	S	1.00	▽		0.50	2.01		Firm brown silty gravelly clay fill. MADE GROUND	
02	S	2.00							Soft to firm light brown CLAY. NATURAL GROUND With gravel at 1.0m.
03	S	3.00							Very gravelly at 2.5m.
04	S	5.00							Red / brown stiff silty with very occasional gravel at 3.5m. Firm light brown and gravelly at 4.2m.
05	S	7.00			5.90	-3.39		Soft wet white decomposed CHALK with occasional hard core stones and occasional flinty gravel. No odour. NATURAL GROUND.	
								Continued Next Sheet	
Groundwater Depth to water strike				Remarks :				Logged By : ESL	
Struck (m): 2.28				Flow Remarks :					

BOREHOLE LOG

Boring Contractor : ESL					Job No : A71430/ 015162		Borehole No : BH4	
Boring method : CFA					Client : Lattice Property		Sheet 2 of 2	
Boring diameter : 100			Casing diameter : 50		Site : Arundel		Ground level : 2.51 (Relative to Ordnance datum)	
Boring equipment :					Project : Arundel Site Investigation		Date commenced : 06/06/2000	Date completed : 06/06/2000
Easting : 501304.21			Northing : 106696.39					
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well		2.51		
06	S	9.00			10.00	-7.49		Soft wet white decomposed CHALK with occasional hard core stones and occasional flinty gravel. No odour. NATURAL GROUND.
								End of Borehole at 10.00 m
Groundwater						Remarks :		
Struck (m) Flow Remarks : 2.28						Logged By : ESL		

BOREHOLE LOG

Boring Contractor : ESL				Job No : A71430/ 015162		Borehole No : BH5	
Boring method : CFA				Client : Lattice Property		Sheet 1 of 2	
Boring diameter : 100		Casing diameter : 50		Site : Arundel		Ground level : 2.55 (Relative to Ordnance datum)	
Boring equipment :				Project : Arundel Site Investigation		Date commenced : 06/06/2000	Date completed : 06/06/2000
Easting : 501341.00		Northing : 106735.55					

Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well				
					0.10 0.30	2.45 2.25		Asphalt. MADE GROUND Loose red, grey, brown builders rubble. MADE GROUND Soft to firm light brown CLAY. NATURAL GROUND. Band of gravel at 1.1m.
01	S	1.00						
02	S	2.00						With much gravel at 2.5m.
03	S	3.00						Band of gravel at 3.7m.
04	S	5.00						Band of gravel at 4.5m. Damp at 5.0m.
05	S	7.00			6.00	-3.45		Soft white light grey decomposed CHALK with occasional hard core stones and occasional flint gravel. Wet with hydrocarbon odour. NATURAL GROUND.
								Continued Next Sheet

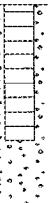
Groundwater		Remarks :	Logged By : ESL
Struck (m):	Flow Remarks :		

WS Atkins Environment

Woodcote Grove, Ashley Road
Ennosc, Surrey, KT18 5RW

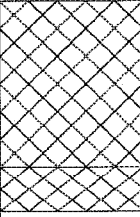


BOREHOLE LOG

Boring Contractor : ESL					Job No A71430/ 015162		Borehole No : BH5	
Boring method : CFA					Client : Lattice Property		Sheet 2 of 2	
Boring diameter : 100			Casing diameter : 50		Site : Arundel		Ground level : 2.55 (Relative to Ordnance datum)	
Boring equipment :					Project :		Date commenced :	Date completed :
Easting : 501341.00			Northing : 106735.55		Arundel Site Investigation		06/06/2000	06/06/2000
Sample Details			Groundwater Details		Depth (mBGL)	Level (mAOD)	Key	Description of Strata
Reference	Type (Soil/Water)	Depth (mBGL)	Strike	Well				
06	S	9.00			10.00	-7.45		Soft white light grey decomposed CHALK with occasional hard core stones and occasional flint gravel. Wet with hydrocarbon odour. NATURAL GROUND.
								End of Borehole at 10.00 m
Groundwater						Remarks :		
Struck (m) Flow Remarks :						Logged By : ESL		

TRIAL PIT LOG

Client : Lattice Property				Job No : A71430/ 015162		Trial Pit No : TP1	
Project : Arundel Site Investigation				Easting : 501281.30		Sheet 1 of 1	
Site : Arundel				Northing : 106763.75		Date commenced :	Date completed :
Excavated By : JCB				Ground Level (mAOD) : 3.60		07/06/2000	07/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.05	3.55		Loose light brown gravel. MADE GROUND
					Loose white to yellow chalk fill with chalk boulders. MADE GROUND
02		1.20	2.40		Becoming dirty, light brown to yellow, patches of some broken brick and metal, patches of orange to brown clay (reworked natural ground). MADE GROUND
03		1.50	2.10		End of Trial Pit at 1.60 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.80	CHALK, MADE GROUND
02	W	1.40	Slight organic odour, water looking clean
03	S	1.60	Clay on western side of the trial pit.

Remarks :			
Logged By : GMA			

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**TRIAL PIT LOG**

		Job No : A71430/ 015162		Trial Pit No : TP2	
		Easting : 501274.54		Sheet 1 of 1	
		Northing : 106751.85		Date commenced :	Date completed :
		Ground Level (mAOD) : 3.71		07/06/2000	07/06/2000
Project : Arundel Site Investigation					
Site : Arundel					
Excavated By : JCB					

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	3.61		Loose light brown gravel. MADE GROUND
					Loose dark brown silty sand with patches of soft orange brown clay (reworked) and brick, roots, scrap metal, concrete blocks (up to 30cm x 100cm x 60cm), coal, cast iron railway line/track at 1m, 250mm circular wall (broken holder base). MADE GROUND
		1.50	2.21		Soft white to grey foul lime or chalk with patches of black staining, pockets of tar or phenol odour with timber and scrap metal. MADE GROUND
		2.20	1.51		Tar stained gravel at 1.8m.
					End of Trial Pit at 2.30 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	1.00	MADE GROUND
02	W	1.80	Dark brown water with a brown foam, tar odour.
03	S	1.80	MADE GROUND. Gas works waste.
04	S	2.20	Clay

Remarks :

Logged By : GMA

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TRIAL PIT LOG

Project : Arundel Site Investigation					Job No : A71430/ 015162	Trial Pit No : TP2A	
Site : Arundel					Easting : 501274.54	Sheet 1 of 1	
Excavated By : JCB					Northing : 106751.85	Date commenced : 07/06/2000	Date completed : 07/06/2000
Ground Level (mAOD) : 3.71							

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	3.61		Loose light brown gravel. MADE GROUND
		0.40	3.31		Loose dark brown silty sand. MADE GROUND
02					Soft orange brown CLAY with gravels with red to orange clay patches. No visual or olfactory signs of contamination. NATURAL GROUND. No sign of contamination below base or adjacent.
					Turning to a soft yellow to orange clay at 1.8m.
		2.40	1.31		End of Trial Pit at 2.40 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	1.00	Gravelly CLAY
02	S	2.40	CLAY

Remarks :
Logged By : GMA

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TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP3	
Project : Arundel Site Investigation		Easting : 501267.52		Sheet 1 of 1	
Site : Arundel		Northing : 106743.94		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.76		07/06/2000	07/06/2000

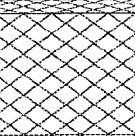
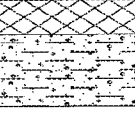
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	3.66		Gravel fill. MADE GROUND
		1.20	2.56		Loose dark brown to black sandy silt. MADE GROUND Concrete base at 1.2m, no visual or olfactory signs of contamination. End of Trial Pit at 1.20 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	1.00	MADE GROUND

Remarks :
Logged By : GMA

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Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP3A	
Project : Arundel Site Investigation		Easting : 501267.52		Sheet 1 of 1	
Site : Arundel		Northing : 106743.94		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.76		07/06/2000	07/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	3.66		Gravel fill. MADE GROUND Loose dark brown to black sandy silt. MADE GROUND
		0.95	2.81		Soft orange to brown clay with gravels. Reworked natural ground.
02		1.20	2.56		Soft orange to brown sandy CLAY with gravel, no visual or olfactory contamination. NATURAL GROUND .
		1.70	2.06		Concrete base at 1.2m, 200mm thick. TP moved 0.5m away from the site side, outside the slab. End of Trial Pit at 1.70 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01		1.20	Sludge contaminated soil. MADE GROUND
02		1.70	CLAY

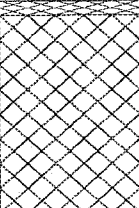
Remarks :

Logged By : **GMA**

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**TRIAL PIT LOG**

					Job No : A71430/015162		Trial Pit No : TP4	
					Easting : 501254.14		Sheet 1 of 1	
					Northing : 106737.88		Date commenced :	Date completed :
					Ground Level (mAOD) : 4.01		07/06/2000	07/06/2000
Project : Arundel Site Investigation								
Site : Arundel								
Excavated By : JCB								
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata			
01		0.10	3.91		Loose light brown gravel. MADE GROUND			
		1.50	2.51		Loose light brown orange sandy SILT with brick, scrap metal, blue 1960-70's glass bottle, old barrel, steel pipes, coal and cast iron scrap, no odour or visual sign of contamination. MADE GROUND Quantity of hard core increases at 0.8m. Mass concrete at 1.5m. End of Trial Pit at 1.50 m			
Sample Details								
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description					
01	S	1.00	MADE GROUND					
Remarks :								
Logged By : GMA								

TRIAL PIT LOG

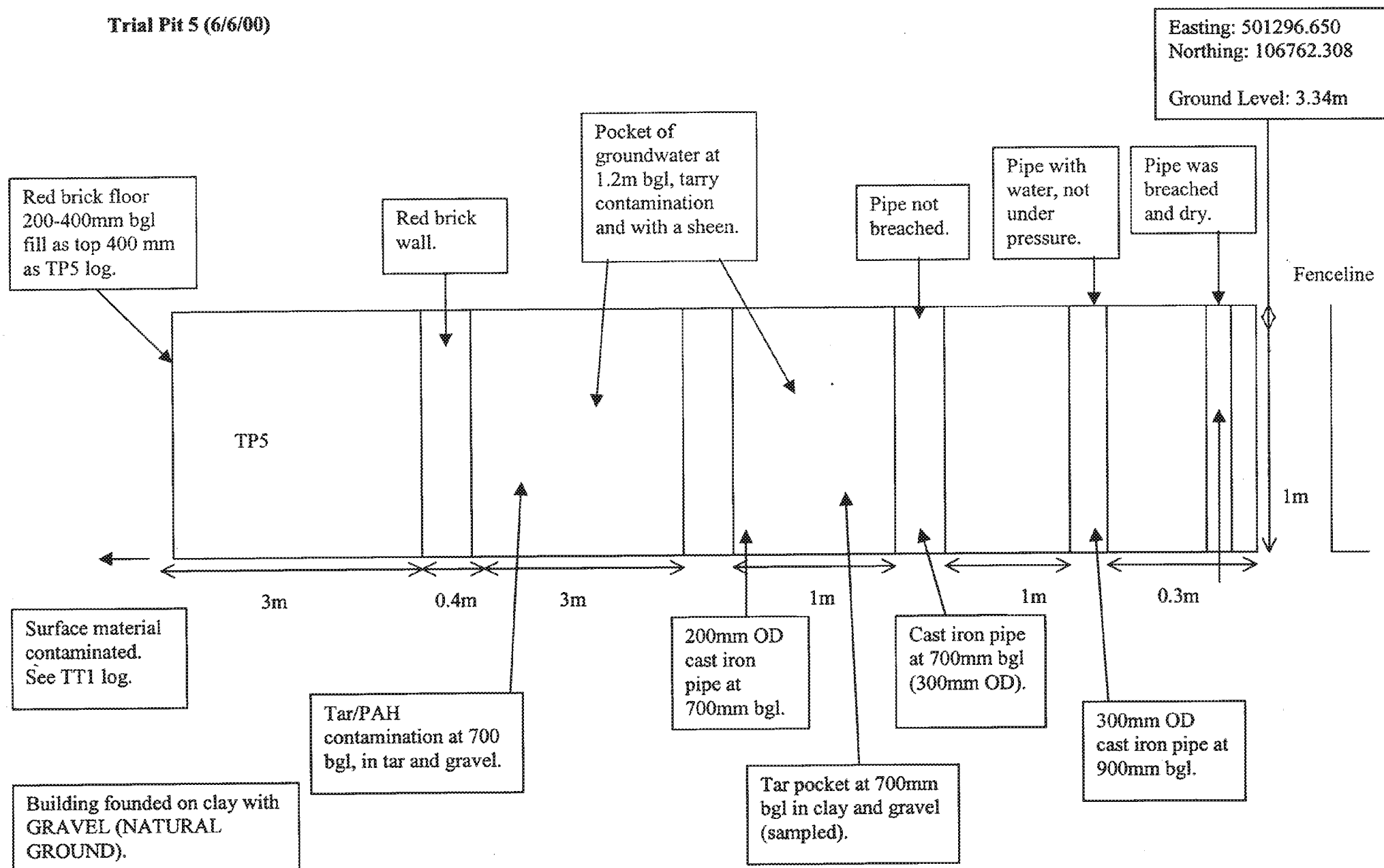
Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP5	
Project : Arundel Site Investigation		Easting : 501297.40		Sheet 1 of 1	
Site : Arundel		Northing : 106763.41		Date commenced : 06/06/2000	Date completed : 06/06/2000
Excavated By : JCB		Ground Level (mAOD) : 3.35			

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	3.25		Loose light brown gravel. MADE GROUND
02					Loose dark brown to black sandy silt with ash, coal, broken bricks, some clay, soft light brown-orange with grey clay patches with gravel and small pockets of reworked natural ground. MADE GROUND
05		1.00	2.35		At 0.7m no service road side a third 300mm cast iron pipe and a pocket of tar with contaminated soil (sampled).
03		1.40	1.95		At 0.9m two 300mm cast iron pipes full of water, two were broken but the water was not under pressure i.e. it was contained in the pipe.
		1.70	1.65		Soft black silty clay with heavy tar contamination and brick. MADE GROUND
04		2.50	0.85		Loose black medium gravel with heavy tar contamination and soft light-brown-orange with grey patched clay with gravel. MADE GROUND
					Soft orange brown CLAY with gravel. NATURAL GROUND Tar contamination absent by 2.0m. End of Trial Pit at 2.50 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.70	Tar contaminated soil. MADE GROUND
02	S	0.90	Tar contaminated soil. MADE GROUND
05	W	1.20	Tar contaminated water.
03	S	1.30	Tar contaminated soil. MADE GROUND
04	S	2.40	Gravelly CLAY

Remarks :

Logged By : **GMA**



TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP6	
Project : Arundel Site Investigation		Easting : 501279.84		Sheet 1 of 1	
Site : Arundel		Northing : 106717.93		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.13		08/06/2000	08/06/2000

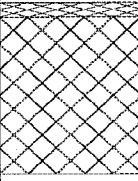
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.80	2.33		Loose soft dark brown gravelly clayey SILT, rich in organic matter with roots (topsoil). NATURAL GROUND.
02		1.50	1.63		Soft orange brown CLAY. Becoming gravelly clay from 1.0m. No visual or olfactory contamination. NATURAL GROUND.
					End of Trial Pit at 1.50 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	Gravelly clayey SILT
02	S	1.40	Gravelly CLAY

Remarks :
Logged By : GMA

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP7	
Project : Arundel Site Investigation		Easting : 501308.47		Sheet 1 of 1	
Site : Arundel		Northing : 106747.02		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.00		06/06/2000	06/06/2000

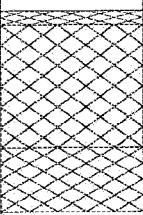
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	2.90		Loose light brown gravel. MADE GROUND
02		1.20	1.80		Loose dark brown to black sandy silt fill with white ash, brick and coal. MADE GROUND. Pockets of soft light brown to orange with grey chalk, reworked natural ground. TP ended at 1.2m due to two 300mm cast iron pipes. End of Trial Pit at 1.20 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	MADE GROUND
02	S	1.05	NATURAL GROUND on service road side of trial pit.

Remarks :
Logged By : GMA

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP8	
Project : Arundel Site Investigation		Easting : 501306.50		Sheet 1 of 1	
Site : Arundel		Northing : 106740.26		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 2.94		06/06/2000	06/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	2.84		Loose coarse gravel fill. MADE GROUND
02		0.95	1.99		Loose dark brown black silty sandy clay fill with ash, coal, brick (red, orange, and yellow in colour). Some clinker and patches of soft orange - brown silty clay (no odour), chalk boulders and patches of spent oxide. MADE GROUND
03		1.40	1.54		MADE GROUND Cast iron pipe at 1.2m, broken accidentally during excavation. Trial pit ended at 1.4m as broken pipe filled trial pit with water. End of Trial Pit at 1.40 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	MADE GROUND
02	W	1.20	Cast iron pipe, dark brown to green water, phenol/oil odour, sheen on the water.
03	S	1.20	MADE GROUND

Remarks :

 Logged By : **GMA**

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Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP9	
Project : Arundel Site Investigation		Easting : 501301.54		Sheet 1 of 1	
Site : Arundel		Northing : 106725.33		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 2.95		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	2.85		Tarmac road. MADE GROUND
		0.60	2.35		Loose black, dark brown silty clay fill with coal, gravel, sand, chalk, brick work on the northern, eastern and southern sides however on the western side at 0.9m natural ground was encountered. MADE GROUND
02		1.50	1.45		Soft orange to brown CLAY with gravel. NATURAL GROUND Becoming more gravelly at 1.4m End of Trial Pit at 1.50 m

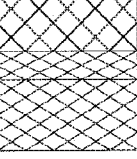
Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	MADE GROUND
02	S	1.50	NATURAL GROUND

Remarks :

Logged By : **GMA**

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP10	
Project : Arundel Site Investigation		Easting : 501292.61		Sheet 1 of 1	
Site : Arundel		Northing : 106716.39		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.01		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
02		0.40	2.61		Loose light brown clayey silt with roots. MADE GROUND
		0.60	2.41		Mass concrete holder base. MADE GROUND - brick wall at edge.
		1.10	1.91		Loose light brown clayey silt and bricks as above. MADE GROUND. Looks clean and no odour.
					End of Trial Pit at 1.10 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
02	S	0.40	Holder side. MADE GROUND

Remarks :

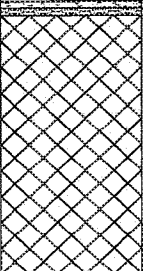
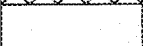
Logged By : **GMA**

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**TRIAL PIT LOG**

Client : Lattice Property				Job No : A7143W 015162		Trial Pit No : TP 10A	
Project : Arundel Site Investigation				Easting : 501292.61		Sheet 1 of 1	
Site : Arundel				Northing : 106716.39		Date commenced :	Date completed :
Excavated By : JCB				Ground Level (mAOD) : 3.01		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.05	2.96		Loose light brown gravel.
		0.10	2.91		Black top/ tarmac. MADE GROUND
02					Soft dark brown, black silty clay fill with ash, gravel, coal, brick and timber. No odour.
		1.90	1.11		At 1.2m, 200mm diameter clay drainage pipe breached (pipe clay). At 1.6m clay pocket on roadside of pit reworked NATURAL GROUND. (Soft orange-brown CLAY). Slow groundwater seepage at 1.7m Wet at 1.8m
					End of Trial Pit at 2.30 m

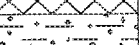
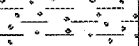
Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	1.00	Non holder side. MADE GROUND
02	S	2.00	Non holder side clay. MADE GROUND

Remarks : Not enough water in the pit to sample.

Logged By : GMA

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP11	
Project : Arundel Site Investigation		Easting : 501309.20		Sheet 1 of 1	
Site : Arundel		Northing : 106707.93		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 2.59		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.05	2.54		Loose light brown gravel. MADE GROUND
		0.40	2.19		Loose dark brown sands with organic matter and some gravel. MADE GROUND
02					Soft orange to brown clay with gravel at 1.5m. No sign of visual or olfactory contamination. NATURAL GROUND.
03		1.50	1.09		End of Trial Pit at 1.50 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.20	MADE GROUND
02	S	1.20	NATURAL GROUND
03	S	1.40	NATURAL GROUND

Remarks :

Logged By : GMA

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP 11A	
Project : Arundel Site Investigation		Easting : 501309.20		Sheet 1 of 1	
Site : Arundel		Northing : 106707.93		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 2.59		08/06/2000	08/06/2000

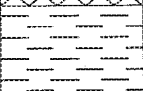
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.20	2.39		Loose light brown clayey fill. Top soil
		0.40	2.19		Pink, light red broken concrete slab 200mm thick. MADE GROUND.
		0.60	1.99		Sand and tarmac. MADE GROUND
		0.90	1.69		Mass concrete base intact 300mm thick.
02		1.40	1.19		Soft orange to brown CLAY with gravel. NATURAL GROUND.
				End of Trial Pit at 1.40 m	

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.20	Non holder side
02	S	1.20	Non holder side
03	S	1.40	Below footing slab. Holder side.

Remarks :	
Logged By : GMA Depth to water strike	

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP12	
Project : Arundel Site Investigation		Easting : 501319.24		Sheet 1 of 1	
Site : Arundel		Northing : 106709.73		Date commenced :	Date completed :
Excavated By: JCB		Ground Level (mAOD) : 2.43		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01	▽	0.05	2.38		Loose light brown gravel. MADE GROUND
02		0.70	1.73		Soft dark brown silty clay (organic rich). MADE GROUND
03		1.60	0.83		Soft orange light brown CLAY. NATURAL GROUND At 0.7m five 10mm dead electric cables. With some gravel at 1.2m.
					End of Trial Pit at 1.60 m

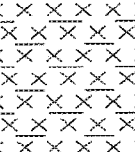
Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	MADE GROUND
02	W	1.30	looks clean, no odour, orange to brown coloration.
03	S	1.50	CLAY

Remarks :

Logged By : GMA ▽ Depth to water strike

TRIAL PIT LOG

Client : Lattice Property				Job No : A71430/ 015162		Trial Pit No : TP13	
Project : Arundel Site Investigation				Easting : 501327.97		Sheet 1 of 1	
Site : Arundel				Northing : 106719.91		Date commenced :	Date completed :
Excavated By :				Ground Level (mAOD) : 2.48		08/06/2000	08/06/2000

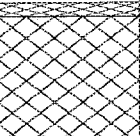
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	2.38		Wood chippings and moss. MADE GROUND
02		1.40	1.08		Loose dark brown clayey SILT with sand and roots, no odours or sign of contamination. NATURAL GROUND. 20 mm dead steel water pipe and 5 dead electric cables at 0.8m.
					End of Trial Pit at 1.40 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.60	Clayey SILT
02	S	1.20	Clayey SILT

Remarks :
Logged By : GMA

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TP14	
Project : Arundel Site Investigation		Easting : 501336.52		Sheet 1 of 1	
Site : Arundel		Northing : 106740.64		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 2.63		08/06/2000	08/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01		0.10	2.53		Tarmac / black top. Loose, black to brown with white specks, sandy silt with ash, chalk, glass, scrap metal, brick, clay pipe, clinker and slight gasworks odour. MADE GROUND
02		1.00 1.15	1.63 1.48		Soft orange to light brown CLAY with gravel, reworked natural ground. MADE GROUND Concrete slab at base (1.15m). End of Trial Pit at 1.15 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.80	MADE GROUND
02	S	1.10	MADE GROUND. Clay.

Remarks :

 Logged By : **GMA**

TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TT1	
Project : Arundel Site Investigation		Easting : 501277.60		Sheet 1 of 1	
Site : Arundel		Northing : 106732.08		Date commenced : 06/06/2000	Date completed : 06/06/2000
Excavated By : JCB		Ground Level (mAOD) : 3.52			

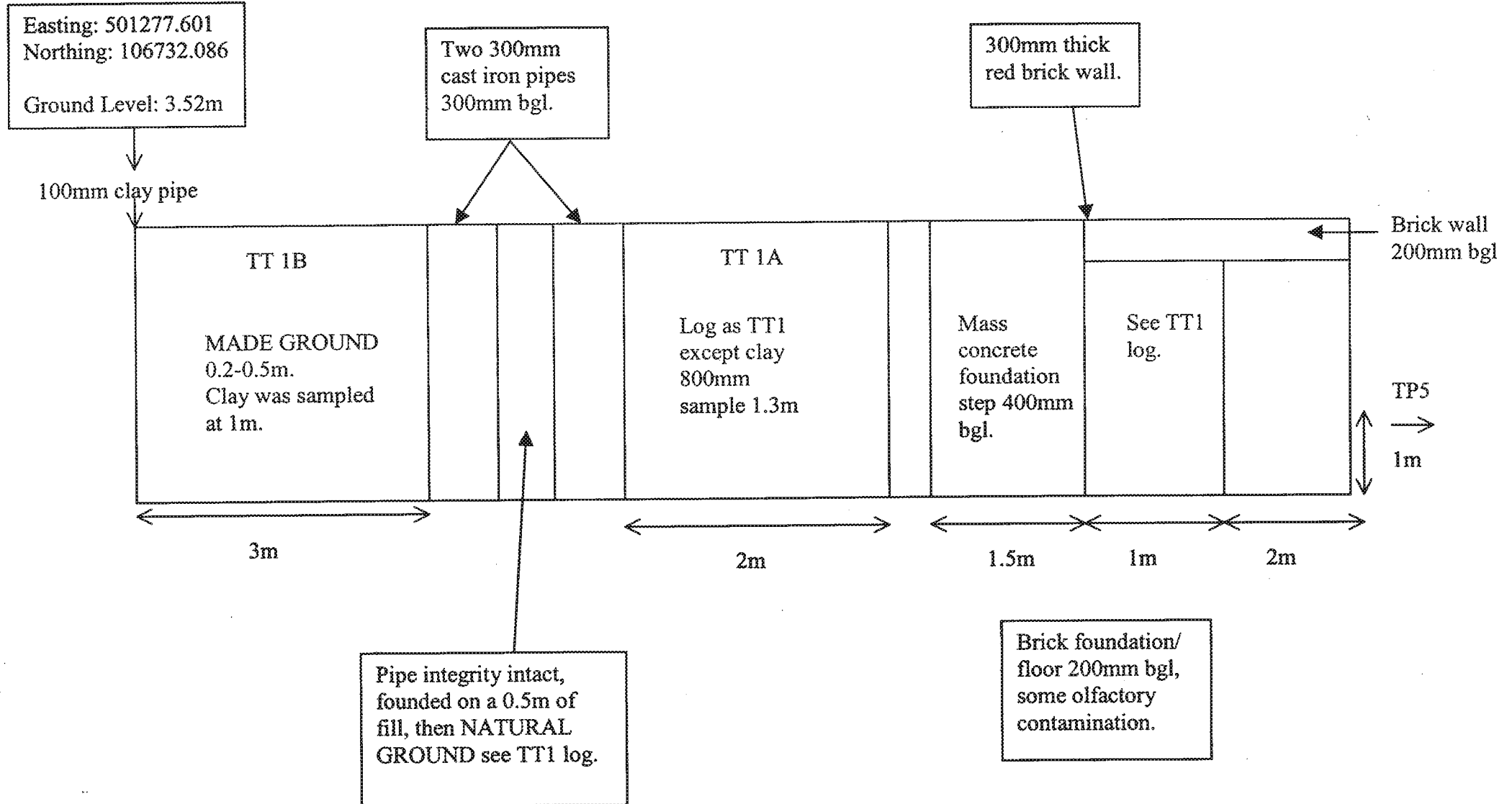
Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
03		0.10	3.42		Loose light brown gravel. MADE GROUND
01		0.70	2.82		Loose dark brown sandy SILT with clay and roots. NATURAL GROUND
03					Soft orange to brown CLAY with gravel. NATURAL GROUND.
04		1.40	2.12		
05					End of Trial Pit at 1.60 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
03	S	0.20	Clayey sandy SILT at TTB.
01	S	0.80	Gravelly CLAY at TTA
03	S	1.00	Gravelly CLAY at TTB
04	S	1.30	Gravelly CLAY at TTA
05	S	1.60	CLAY at TTA

Remarks :
Logged By : GMA

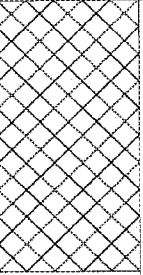
BG Arundel

Trial Trench 1 (6/6/00)



TRIAL PIT LOG

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TT2A	
Project : Arundel Site Investigation		Easting : 501306.15		Sheet 1 of 1	
Site : Arundel		Northing : 106783.68		Date commenced : 09/06/2000	Date completed : 09/06/2000
Excavated By : JCB		Ground Level (mAOD) : 2.93			

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01					Loose light brown sandy silt with ash, bricks and concrete. MADE GROUND
02		1.90	1.03		Brick foundation from 0.7 to 1.9m. Soft orange to brown on the western side at 1.0m to base of pit. At 1.0m material became more clayey i. e. sandy silt with clay and reworked natural ground soft orange to brown. Anaerobic odour and black staining at 1.8m. Concrete at base 1.9m. End of Trial Pit at 1.90 m

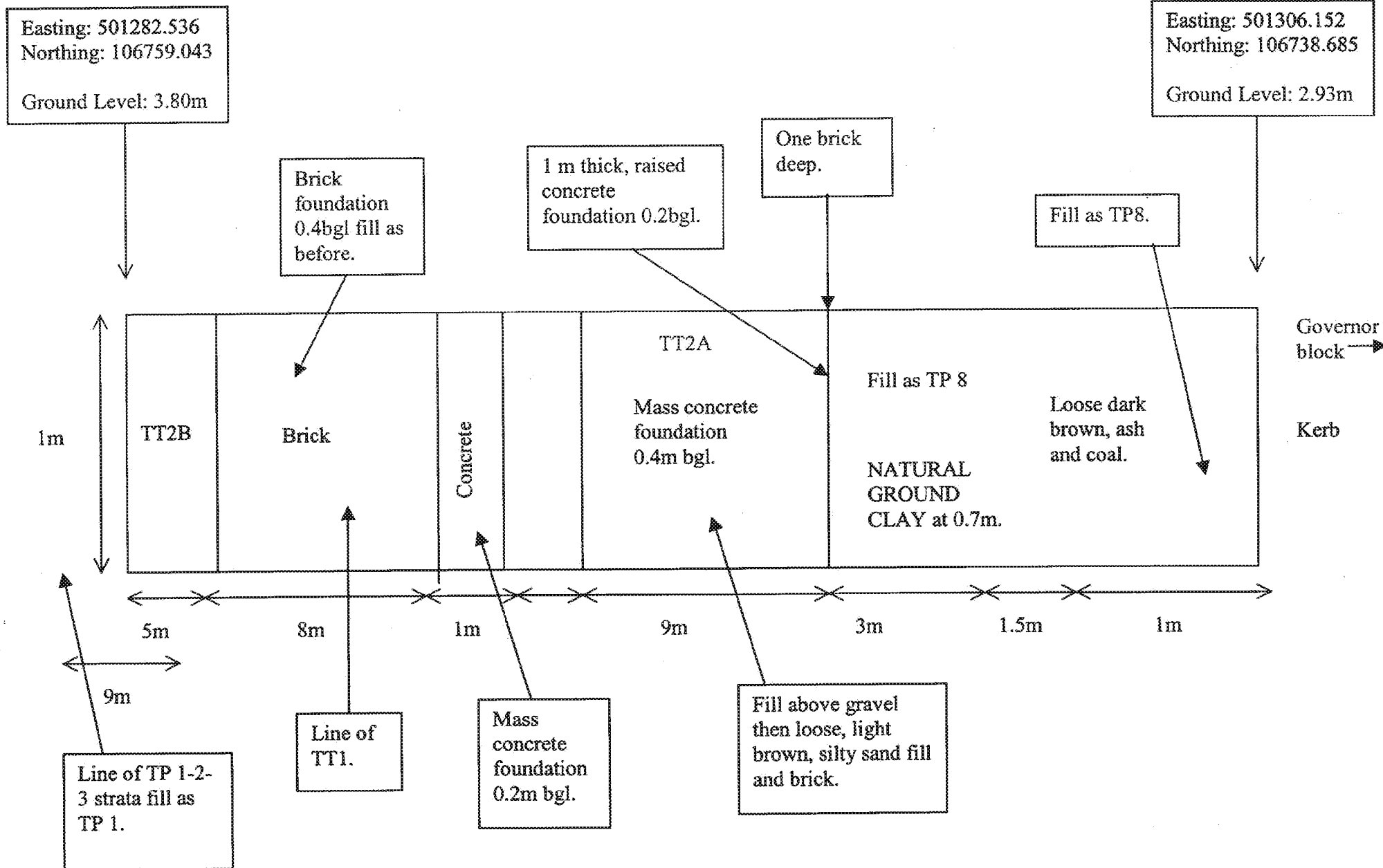
Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.60	MADE GROUND. Black stained material.
02	S	1.80	MADE GROUND

Remarks :

Logged By : **GMA**

BG Arundel

Trial Trench 2 (9/6/00)



WS Atkins Consultants Ltd.

Woodcote Grove, Ashley Road
Epsom, Surrey, KT18 5BW

**TRIAL PIT LOG**

Client : Lattice Property		Job No : A71430/ 015162		Trial Pit No : TT2B	
Project : Arundel Site Investigation		Easting : 501282.53		Sheet 1 of 1	
Site : Arundel		Northing : 106759.04		Date commenced :	Date completed :
Excavated By : JCB		Ground Level (mAOD) : 3.80		09/06/2000	09/06/2000

Sample Location	Groundwater Strike	Depth (mBGL)	Level (mAOD)	Key	Description of Strata
01					Loose light brown silty sand with gravel and broken brick. MADE GROUND
		1.50	2.30		At 1.0m anaerobic odour and black staining 10cm band as in TT2A.
02		2.00	1.80		Soft orange to light brown CLAY with gravel. NATURAL GROUND
					End of Trial Pit at 2.00 m

Sample Details			
Sample Reference	Type (Soil or Water)	Depth (mBGL)	Description
01	S	0.50	MADE GROUND
02	S	2.00	CLAY

Remarks :
Logged By : GMA

Arundel Site Log (5 to 9 June 2000)

Date	Plant and Labour	Progress	Notes
5 June	Myself and SubScan Engineer	Identification of underground services	Services marked on the ground and recorded on site sketch
6 June	Myself, One RST rig with two crew, One JCB and Driver.	Construction of TP5, TP7, TP8, TT1, BH4 and BH5. First set of samples sent to Lab	Skip arrived on site.
7 June	Myself, One RST rig with two crew, One JCB and Driver.	Construction of TP1, TP2, TP3, TP4, BH1 and BH3. Borehole 4 and 5 developed. Second set of samples sent to Lab	-
8 June	Myself, One RST rig with two crew, One JCB and Driver.	Construction of TP6, TP9, TP10, TP11, TP12, TP13, TP14, and BH2. Borehole 1, 2 and 3 developed. Third set of samples sent to Lab	-
9 June	Myself, one addition WSA Scientist, One JCB and Driver, Two surveyors on site carry out full survey, Tim Greaves from Reading University on site.	Construction of TT1, groundwater of BH1 to 5. Forth set of samples sent to Lab	Skip collected from site empty. pH, Temp, conductivity, meter failure on site after purging third BH. However, all borehole are purged dry and allowed to recover. Very wet day. Site levelled and tided up.

Appendix C

Results of Chemical Analysis

Site : ARUNDEL
 Laboratory : TES Bretby
 Report Number : EXR/002777
 Leachates

TES ID Number	13714	13715	13513	13514	13511	13512	14446	14447	14452	13716	13515	14453	13516	13717	13517	13718	14454
BH/TP	T/P	T/P	T/P	T/P	T/P	T/P	T/P	T/P				QC Blank	QC Blank	QC Blank	QC Blank	QC Blank	QC Blank
Sample Number	0003A	4	5	5	7	8	9	14									
Depth	1.2	1	0.9	1.3	0.5	0.5	0.5	0.8									
pH units	7.4	7.5	8	8.4	6.6	6.9	7.4	8	6	8.1	7.6	6.96	7	6.9	7.9	7.9	7.9
Total Organic Carbon	16	3.1	20	43	1.1	4.2	3.1	1.9	0.1	0.2	0.3	<0.1	<0.1	<0.1	100	98	96
Conductivity uS/cm @ 25C	346	317	406	395	345	349	419	212	<100	<100	<100	<100	<100	<100	2750	2760	2820
Cresols	<0.1	<0.1	<0.1	11.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	97	93	93
Xylenols	<0.1	<0.1	<0.1	11.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	101	96	100
Phenol	<0.1	<0.1	<0.1	6.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	92	88	85
Trimethylphenols	<0.1	<0.1	0.4	4.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	100	100	103
Total Phenols	<0.4	<0.4	<0.7	33.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	390	377	381
Naphthalene	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	88	88	93
Acenaphthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	87	87	89
Acenaphthylene	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	86	86	89
Fluorene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	90	90	91
Phenanthrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	92	92	92
Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	77	77	67
Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	90	90	92
Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	90	90	91
Benzo(a)Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	83	83	83
Chrysene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	85	85	87
Benzo(b)Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	82	82	84
Benzo(k)Fluoranthene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	82	82	83
Benzo(a)Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	81	81	80
Dibenzo(ah)Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	79	79	80
Indeno(123-cd)Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	76	76	78
Benzo(ghi)Perylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	78	78	80
Total PAH	<0.17	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	<0.16	1346	1346	1359
Arsenic as As (Dissolved)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	98	99	96
Cadmium as Cd (Dissolved)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	98	98	97
Chromium as Cr (Dissolved)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	99	101	98
Lead as Pb (Dissolved)	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	98	98	99
Copper as Cu (Dissolved)	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	99	99	97
Nickel as Ni (Dissolved)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	98	99	100
Zinc as Zn (Dissolved)	0.04	0.02	0.02	0.01	0.02	0.02	0.04	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	99	99	98
Mercury as Hg (Dissolved)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0014	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	88	92	92
Selenium as Se (Dissolved)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	96	96	98
Chloride as Cl	2	2	<2	4	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	99	100	97
Total Sulphur as SO4 (Dissolved)	79.1	110	78	103	145	140	159	49.3	<0.06	0.13	<0.06	<0.06	<0.06	<0.06	99	98	98
Iron as Fe (Dissolved)	0.17	0.58	0.05	0.49	0.01	0.21	0.16	0.29	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	99	100	98
Ammoniacal Nitrogen as N	2.2	0.2	35	46	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	96	96	96
Nitrate as N	<1.0	<1.0	<1.0	102	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	102	103	105
Cyanide (Free) as CN	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	104	104	105
Cyanide (Total) as CN	0.3	1.1	<0.1	0.2	0.2	0.5	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	80	85	84
Complex Cyanide as CN	0.3	1.1	<0.1	0.2	0.2	0.5	<0.1	0.2	<0.1	<0.1	<0.1	N.D	N.D	N.D	N.D	N.D	N.D
Sulphide (Free) as S	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	107	107	91
TPH GC	0.28	<0.1	1	1.9	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	75	75	72
Benzene (µg/l)	36	<5	<5	4550	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	100	100	99
Toluene (µg/l)	40	<5	8	7400	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	102	102	102
Ethyl Benzene (µg/l)	270	<5	<5	330	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	100	100	101
Xylenes (µg/l)	280	<5	540	5530	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	103	103	104

Results expressed as mg/l unless stated

Site : ARUNDEL
 Laboratory : TES Bretby
 Report Number : W/EXR/002745
 Table 2

TES ID Number	13373	13374	13375	13376	13377	13378	13379	13380	13381	13382	13383	13384	13385
Description	TP 01 @ 1	TP 08 @ 1	TP 02 @ 1	TP 12 @ 1	BH 01 @ 3	BH 02 @ 2	BH 03 @ 3	BH 04 @ 2	BH 05 @ 2	Stream	TP 05 @ 1	QC Blank	QC Blank Spike (% Re
Sample Date	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
pH units	6.9	7.6	7	6.6	7.2	7.2	7.1	7.2	7	7.2	7.6	7	7.9
Total Organic Carbon	28	22	60	22	15	3	4.2	3.6	9.8	22	88 <0.1		96
Conductivity uS/cm @ 25C	1400	815	429	1080	1730	752	776	769	2190	354	1470 <100		2710
Cresols	0.4 <0.1		0.7 <0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		18.8 <0.1		97
Xylenols	1.2 <0.1		0.4 <0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		15.5 <0.1		101
Phenol	0.2 <0.1		0.5 <0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		11.6 <0.1		92
Trimethylphenols	0.6 <0.1		0.3 <0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		4.4 <0.1		100
Total Phenols	2.4 <0.4		1.9 <0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4		50.3 <0.4		390
Naphthalene	0.26 <0.01		2.8 <0.01		0.06 <0.01	<0.01	<0.01	<0.01	<0.01		11 <0.01		82
Acenaphthene	0.01 <0.01		0.05 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		96
Acenaphthylene	0.02	0.01	0.13 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.14 <0.01		70
Fluorene	<0.01	<0.01	0.11 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.1 <0.01		91
Phenanthrene	0.05 <0.01		0.28 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.62 <0.01		97
Anthracene	<0.01	0.02	0.04 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.24 <0.01		82
Fluoranthene	0.01	0.02	0.06 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.07 <0.01		98
Pyrene	0.01 <0.01		0.06 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.05 <0.01		97
Benzo(a)Anthracene	<0.01	0.01	0.02 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.02 <0.01		95
Chrysene	<0.01	0.01	0.03 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		96
Benzo(b)Fluoranthene	<0.01	<0.01	0.01 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		0.02 <0.01		95
Benzo(k)Fluoranthene	<0.01	<0.01	0.01 <0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		94
Benzo(a)Pyrene	0.01	0.02	0.02 <0.01	<0.01		0.01	0.02 <0.01		0.01 <0.01		0.02 <0.01		91
Dibenzo(ah)Anthracene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		89
Indeno(123-cd)Pyrene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		89
Benzo(ghi)Perylene	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		95
Total PAH	<0.46	<0.19	<3.65	<0.16	<0.21	<0.16	<0.17	<0.16	<0.16	<0.16	<12.34	<0.16	1457
Cyanide (Free) as CN	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		103
Cyanide (Total) as CN	1.5	0.2 <0.1		3.3	1 <0.1		0.1 <0.1		0.9 <0.1	<0.1	<0.1		99
Complex Cyanide as CN	1.5	0.2 <0.1		3.3	1 <0.1		0.1 <0.1		0.9 <0.1	<0.1	N.D	N.D	
Arsenic as As (Dissolved)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		98
Cadmium as Cd (Dissolved)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		98
Chromium as Cr (Dissolved)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		100
Lead as Pb (Dissolved)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03		96
Copper as Cu (Dissolved)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		99
Nickel as Ni (Dissolved)	0.02 <0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		97
Zinc as Zn (Dissolved)	0.01 <0.01		0.01	0.03	0.01	0.02	0.01	0.01	0.01	0.02	0.03 <0.01		99
Mercury as Hg (Dissolved)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		80
Selenium as Se (Dissolved)	0.003 <0.001		0.001	0.002	0.002	0.002	0.001	0.002	0.003 <0.001		0.002 <0.001		100
Ammoniacal Nitrogen as N	23.4	0.5	7.8 <0.1		68.2 <0.1		12.3 <0.1		75.5	0.5	86	0.11	100
Nitrate as N	<0.5	<0.5	<0.5	10.8	5	4.1	0.7	5.1 <0.5	<0.5		0.7 <0.5		100
Suspended Solids	29800	545	730	6220	1930	1640	6400	2280	2210	184	6440 <5		97
Chloride as Cl	52	27	22	36	111	58	42	62	43	30	55 <2		99
Total Sulphur as SO4 (Dissolved)	300	24.1	49.5	406	498	44	68.1	45.7	952	27.3	253 <0.06		98
Iron as Fe (Dissolved)	3.02	1.54	8.58	1.23	0.13	0.07	0.01	0.01	0.38	0.13	2.58 <0.01		99
Sulphide (Free) as S	<0.2	<0.2	4.4 <0.2		1.1 <0.2		0.4 <0.2	<0.2	<0.2	<0.2	<0.2		104
TPH GC	5.3	12	37	0.43	1.9	0.46	0.74	0.36	0.77	0.56	83 <0.1		94
Benzene (µg/l)	1480 <5		8080 <5	<5	<5	<5	<5	<5	<5		11600 <5		100
Toluene (µg/l)	74 <5		4380 <5	<5	<5	<5	<5	<5	<5		8140 <5		103
Ethyl Benzene (µg/l)	<5	<5	539 <5		15 <5	<5	<5	<5	<5		176 <5		102
Xylenes (µg/l)	159 <5		2090 <5		81 <5	<5	<5	<5	<5		4650 <5		105

Results expressed as mg/l unless stated

Appendix D

Groundwater Levels

Groundwater Levels

	Date:	Friday 9th June 2000		Wednesday 19th July 2000		
Borehole ID	Elevation mAOD to top of cover	Depth to water	Water Level mAOD	Depth to water	Water Level mAOD	Aquifer
BH1	3.97	3.30	0.67	3.900	0.070	Chalk
BH2	3.71	2.68	1.03	3.465	0.245	Chalk
BH3	3.59	3.20	0.39	3.115	0.475	Chalk
BH4	2.87	2.28	0.59	2.435	0.435	Chalk
BH5	2.90	2.02	0.88	2.855	0.045	Chalk