CLEARVIEW SURVEYS LTD
HORTON, WIMBORNE
DORSET, BH21 7JL
Tel: 01202 828281, Fax: 01202 824777

Project-information

Project name:	Contract number:	Contact:	Date:
FITZROY PARK	5110		04/07/2011

Client	SUBSCAN TECHNOLOGY
Contact:	WILL REEVES
Position:	
Road	9 SOMERS ROAD
Town	RUGBY
County	WARWICKSHIRE CV22 7DB
Telephone:	01788 550017
Fax:	
Mobile:	
E-Mail:	

Site	
Contact:	
Position:	
Road	FITZROY PARK
Town	CAMDEN
County	LONDON
Telephone:	
Fax:	
Mobile:	
E-Mail:	

Contractor	CLEARVIEW SURVEYS LTD
Contact:	ANDY GUARE
Position:	
Road	SLOUGH HOUSE, SLOUGH LANE
Town	HORTON, WIMBORNE
County	DORSET, BH21 7JL
Telephone:	01202 828281
Fax:	01202 824777
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Defect Grade Description

Project name:	Contract number:	Contact:	Date:
FITZROY PARK	5110		04/07/2011

1: Occurances without damage: for example, laterals, joints etc.

NO DEFECTS WERE DETECTED.

2: Constructional deficiencies or occurances with insignificant influence to tightness, hydraulic or static pressure of pipe: f.e. wide joints, badly torched intakes, minor deformation of plastic pipes, minor erosions etc.

REHABILITATION CAN BE SCHEDULED LONG-TERM.

3: Constructional deficiencies diminishing static, hydraulic and tightness: f.e. open joints, untorched intakes, cracks, minor drainage obstructions such as calcide build ups, protruding laterals, minor damages to pipe wall, individual root penetrations, corroded pipe walls etc.

REHABILITATION IS NECESSARY MEDIUM-TERM WITHIN 3 TO 5 YEARS.

4: Constructional damages with nonsufficient static safety, hydraulic or tightness: f.e. axial/radial pipebursts, pipe deformations, visually noticeable infiltration/exfiltration, cavities in pipe-wall, severe protruding, laterals severe root penetrations, severe corrosion of pipe wall etc.

REHABILITATION PROCEDURE IS URGENT AND HAS TO BE COMPLETED WITHIN 1 TO 2 YEARS. NECESSITY FOR EMERCENCY OPERATIONS HAS TO BE EXAMINED.

5: Pipe is already or will shortly be impermeable: f.e. collapsed pipe, deeply rooted pipe or other drainage obstructions. Pipe loses water or danger of backwater in basements etc.

REHABILITATION IS URGENT AND SHORT-TERM. IN ORDER TO PREVENT FURTHER DAMAGE, NECESSARY TEMPORARY SPOT REPAIR HAS TO BE CONDUCTED ON EMERGENCY LEVEL.

SUBSCAN TECHNOLOGY

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Project name:	Contract number:	Contact:	Date:
FITZROY PARK	5110		04/07/2011

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
3	MH.2	MAIN RUN	04/07/2011	FITZROY PARK		Vitrified clay (i.e. all clayware)	34.5	34.5

Profile: CIRCULAR 100 = 34.5 m (34.5 m)

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
1	MH.1	MAIN RUN	04/07/2011	FITZROY PARK		Vitrified clay (i.e. all clayware)	25.2	25.2
2	MH.1	MAIN RUN	04/07/2011	FITZROY PARK		Vitrified clay (i.e. all clayware)	38.9	38.9

Profile: CIRCULAR 150 = 64.1 m (64.1 m)

No.	start MH	end MH	Date	Road	Tape No.	Material	m	(m)
4	MH.3	MAIN RUN	04/07/2011	FITZROY PARK		Vitrified clay (i.e. all clayware)	24.7	24.7
5	MH.3	MAIN RUN	04/07/2011	FITZROY PARK		Vitrified clay (i.e. all clayware)	20.3	20.3

Profile: CIRCULAR 225 = 45 m (45 m)

all sections = 143.6 m (143.6 m)

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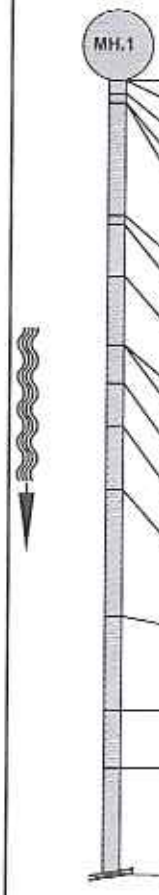
Inspection report

Date:	Job N°:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	1	MH.1 X
Video Volume No.:	**Flow Ctrl:**	**Temperature:**	**Year laid:**	**Cleaned:**	**Strat. Drain:**
5110	No flow control	above freezing	Z	No	

Road:	FITZROY PARK	Div/Dist:		start MH:	MH.1
Place:	HAMPSTEAD HEATH	Drain. Area:		end MH:	MAIN RUN
Location:	Gardens	Standard:	BS EN 13508-2:2003	Total length:	25.2 m

Purpose:	Sample survey (asset condition)	Shape/Size:	Circular 150
Type:	Gravity drain/sewer	Material:	Vitrified clay (i.e. all clayware) Pipe length:
Use:	Combined	Lining:	
		Lining Type:	

Comment:



1:225 position	code	observation	MPEG	photo	grade
Depth: 0.45FINE ROOTS IN MANHOLE					
0.00	MH	Start node type, manhole, reference number: MH.1			(Misc) 0
0.00	WL	Water level 5 % height/diameter			(Serv) 0
0.40	RF	Fine Roots	00:00:13		(Serv) 1
0.70	LL	Line of drain/sewer deviates left, Remark: SLIGHTLY	00:00:35		
0.70	FCJ	Circumferential Fracture at joint from 08 to 09 o'clock	00:00:42	1_5a	(Struct) 3
4.30	CCJ	Crack Circumferential at joint from 09 to 01 o'clock	00:01:28	1_6a	(Struct) 2
4.60	WL	Water level 10 % height/diameter	00:01:57		(Serv) 0
6.20	FCJ	Circumferential Fracture at joint from 10 to 03 o'clock	00:02:14	1_8a	(Struct) 3
8.40	FCJ	Circumferential Fracture at joint from 08 to 03 o'clock	00:03:00		(Struct) 3
8.40	BJ	Broken Pipe at joint from 11 to 01 o'clock	00:03:07	1_10a	(Struct) 4
9.60	WL	Water level 5 % height/diameter	00:03:27		(Serv) 0
11.00	CCJ	Crack Circumferential at joint from 10 to 03 o'clock	00:03:47	1_12a	(Struct) 2
13.00	WL	Water level 10 % height/diameter	00:04:24		(Serv) 0
17.00	WL	Water level 15 % height/diameter	00:05:05		(Serv) 0
20.00	DES	Settled deposits fine 10 % cross-sectional area loss	00:05:50		(Serv) 1
21.80	CCJ	Crack Circumferential at joint from 10 to 02 o'clock	00:05:59		(Struct) 2
25.20	SA	Survey abandoned, Remark: DUE TO SLURRY ETC	00:07:20		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	1	MH.1 X

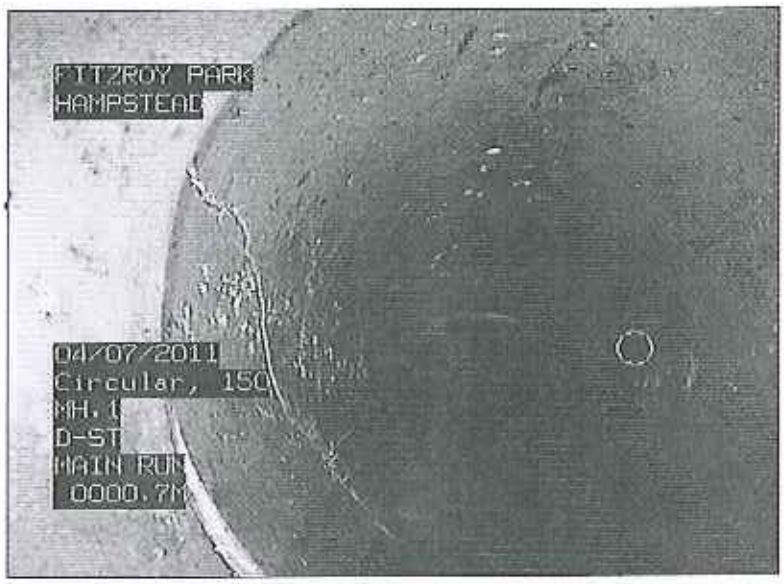

Photo: 1_5a, Tape No.: 5110, 00:00:42
0.7m, Circumferential Fracture at joint from 06 to 09 o´clock

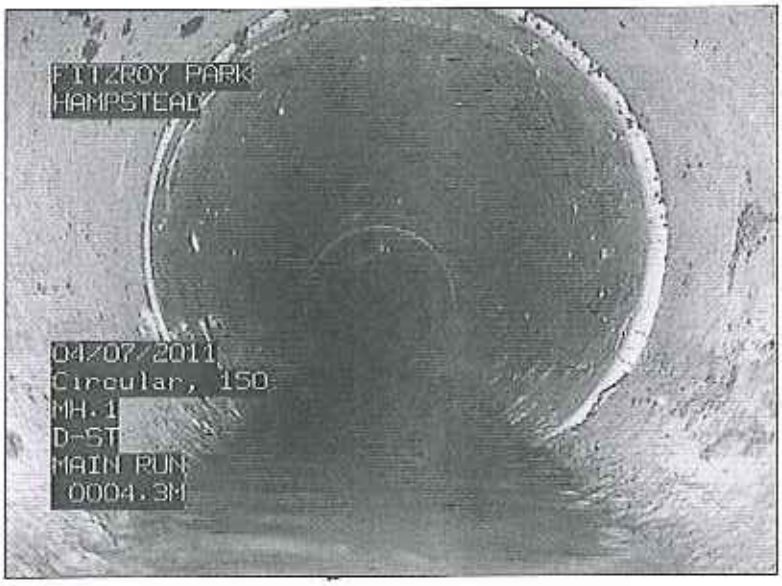

Photo: 1_6a, Tape No.: 5110, 00:01:28
4.3m, Crack Circumferential at joint from 09 to 01 o´clock

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	1	MH.1 X

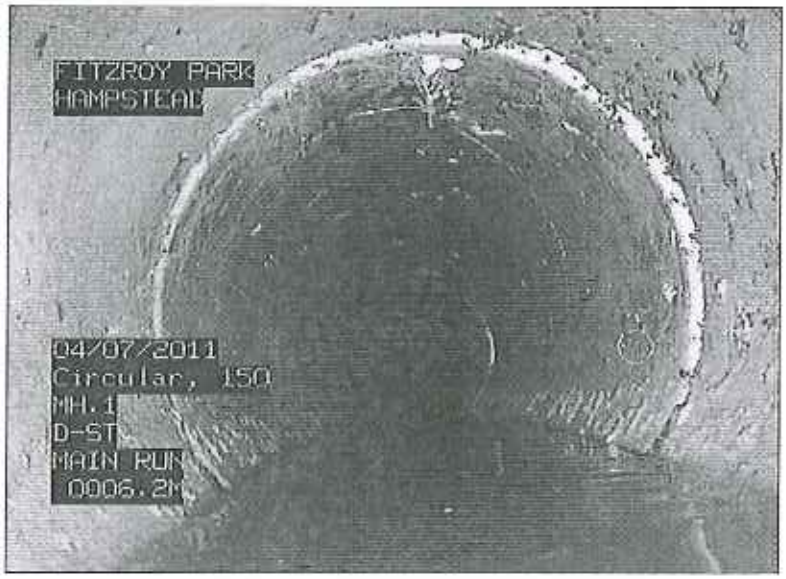

Photo: 1_8a, Tape No.: 5110, 00:02:14
6.2m, Circumferential Fracture at joint from 10 to 03 o´clock

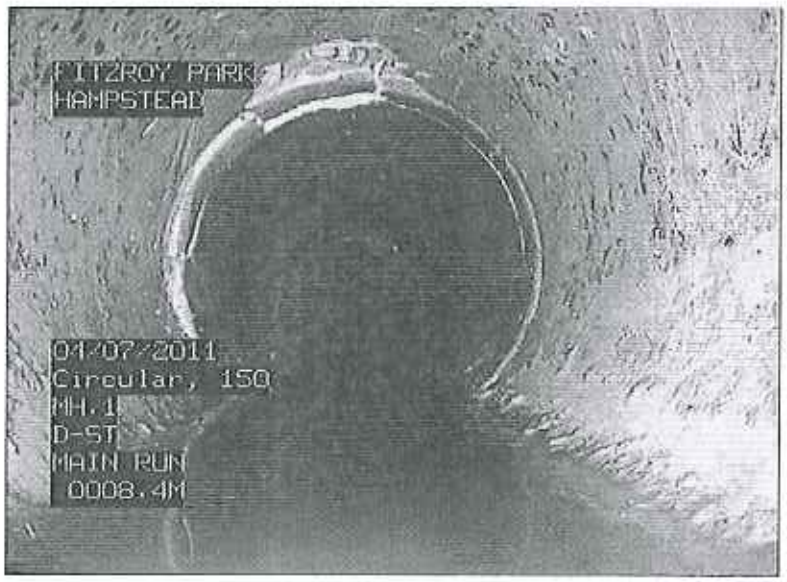

Photo: 1_10a, Tape No.: 5110, 00:03:07
8.4m, Broken Pipe at joint from 11 to 01 o´clock

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	1	MH.1 X

Photo: 1_12a, Tape No.: 5110, 00:03:47
11m, Crack Circumferential at joint from 10 to 03 o´clock

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Inspection report

Date:	Job N°:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	2	MH.1 X
Video Volume No.:	**Flow Ctrl:**	**Temperature:**	**Year laid:**	**Cleaned:**	**Strat. Drain:**
5110	No flow control	above freezing	Z	Yes	

Road:	FITZROY PARK	Div/Dist:		start MH:	MH.1
Place:	HAMPSTEAD HEATH	Drain. Area:		end MH:	MAIN RUN
Location:	Gardens	Standard:	BS EN 13508-2:2003	Total length:	38.9 m

Purpose:	Sample survey (asset condition)	Shape/Size:	Circular 150
Type:	Gravity drain/sewer	Material:	Vitrified clay (i.e. all clayware) Pipe length:
Use:	Combined	Lining:	
		Lining Type:	

Comment: BACK JETTED

1:325 position	code	observation	MPEG	photo	grade
0.00	MH	Start node type, manhole, reference number: MH.1			(Misc) 0
0.00	WL	Water level 5 % height/diameter			(Serv) 0
0.40	RF	Fine Roots	00:00:03		(Serv) 1
0.70	LL	Line of drain/sewer deviates left, Remark: SLIGHTLY	00:00:15		
4.00	WL	Water level 10 % height/diameter	00:00:46		(Serv) 0
4.30	FCJ	Circumferential Fracture at joint from 09 to 02 o'clock	00:01:00		(Struct) 3
6.20	WL	Water level 15 % height/diameter	00:01:31		(Serv) 0
8.40	FCJ	Circumferential Fracture at joint from 09 to 03 o'clock	00:02:04		(Struct) 3
8.40	BJ	Broken Pipe at joint from 11 to 01 o'clock	00:02:12		(Struct) 4
11.90	REM	General remark, Remark: ASSUME LOOSE ROOT ETC	00:05:02		
12.00	DES	Settled deposits fine 15 % cross-sectional area loss	00:07:45		(Serv) 1
14.00	REM	General remark, Remark: CAMERA LENS SMEARED DUE TO SILT ETC	00:13:39		
38.90	SA	Survey abandoned, Remark: SILT / RUBBLE ETC PLUS REVERSE SURVEY	00:17:35		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection report

Date:	Job N°:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	3	MH.2 X
Video Volume No.:	Flow Ctrl:	Temperature:	Year laid:	Cleaned:	Strat. Drain:
5110	No flow control	above freezing	Z	No	

Road:	FITZROY PARK	Div/Dist:		start MH:	MH.2
Place:	HAMPSTEAD HEATH	Drain. Area:		end MH:	MAIN RUN
Location:	Gardens	Standard:	BS EN 13508-2:2003	Total length:	34.5 m

Purpose:	Sample survey (asset condition)	Shape/Size:	Circular 100
Type:	Gravity drain/sewer	Material:	Vitrified clay (i.e. all clayware) Pipe length:
Use:	Combined	Lining:	
		Lining Type:	

Comment:

1:186 Depth: 0.92

position	code	observation	MPEG	photo	grade
0.00	MH	Start node type, manhole, reference number: MH.2			(Misc) 0
0.00	WL	Water level 5 % height/diameter			(Serv) 0
0.40	REM	General remark, Remark: VIEW OF REAR OF INTECEPTOR TRAP			
1.00	LL	Line of drain/sewer deviates left	00:00:23		
1.00	JDM	Joint displaced medium	00:00:29		(Struct) 1
4.90	FCJ	Circumferential Fracture at joint from 12 to 12 o'clock	00:01:27		(Struct) 3
5.20	FC	Fracture Circumferential from 12 to 12 o'clock	00:02:11	37_7a	(Struct) 3
9.60	REM	General remark, Remark: JUNCTION IN MH	00:03:25		
9.90	REM	General remark, Remark: EXIT MH	00:03:39		
9.90	CCJ	Crack Circumferential at joint from 09 to 12 o'clock	00:03:45		(Struct) 2
16.70	FS	Fracture spiral from 06 to 12 o'clock	00:05:16	41_11a	(Struct) 4
23.20	REM	General remark, Remark: MANHOLE	00:06:54		

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Inspection report

Date:	Job nr.:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	3	MH.2 X
Present:	Vehicle:	Camera:	Preset:	Cleaned:	Grade:
	P40 CVS	FLEXIPROBE		No	

1:186	position	code	observation	MPEG	photo	grade
	23.60	LL	Line of drain/sewer deviates left	00:07:19		
	23.60	REM	General remark, Remark: EXIT MH	00:07:31		
	23.60	SCC	Shape of drain/sewer changes to Circular dia 150 mm	00:07:42		
	24.10	FCJ	Circumferential Fracture at joint from 01 to 06 o'clock	00:08:07		(Struct) 3
	24.70	FCJ	Circumferential Fracture at joint from 03 to 09 o'clock	00:08:28		(Struct) 3
	25.10	FL	Fracture longitudinal at 09 o'clock	00:08:52		(Struct) 3
	25.10	FCJ	Circumferential Fracture at joint from 12 to 12 o'clock	00:08:59	49_19a	(Struct) 3
	28.30	CC	Crack Circumferential from 12 to 12 o'clock	00:10:31		(Struct) 2
	28.30	RF	Fine Roots	00:10:38	51_21a	(Serv) 1
	29.90	CLJ	Crack Longitudinal at joint at 02 o'clock	00:11:08	52_22a	(Struct) 2
	29.90	CLJ	Crack Longitudinal at joint at 10 o'clock	00:11:18		(Struct) 2
	29.90	DEE	Attached deposits encrustation from 02 to 05 o'clock 5 % cross-sectional area loss	00:11:29		
	29.90	DEE	Attached deposits encrustation from 07 to 10 o'clock 5 % cross-sectional area loss	00:11:39		
	30.50	WL	Water level 10 % height/diameter	00:12:00		(Serv) 0
	32.40	WL	Water level 30 % height/diameter	00:12:19		(Serv) 0
	33.00	REM	General remark, Remark: SOIL WASTE ETC	00:12:31		
	34.50	SA	Survey abandoned, Remark: DUE TO SILT ETC	00:13:11		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	3	MH.2 X

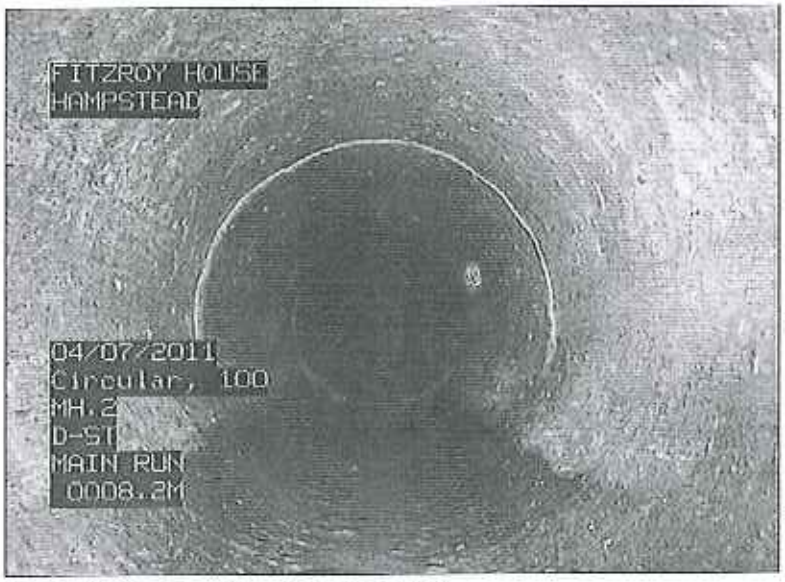

Photo: 37_7a, Tape No.: 5110, 00:02:11
5.2m, Fracture Circumferential from 12 to 12 o´clock

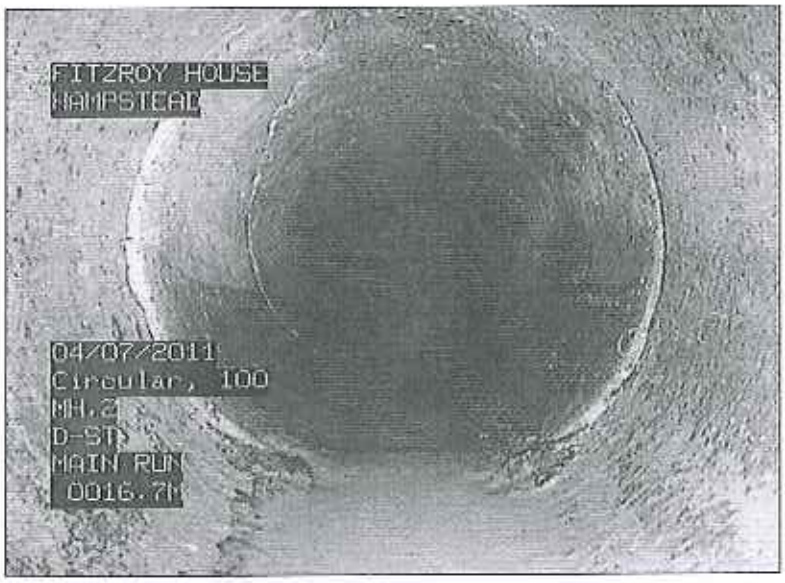

Photo: 41_11a, Tape No.: 5110, 00:05:16
16.7m, Fracture spiral from 06 to 12 o´clock

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	3	MH.2 X

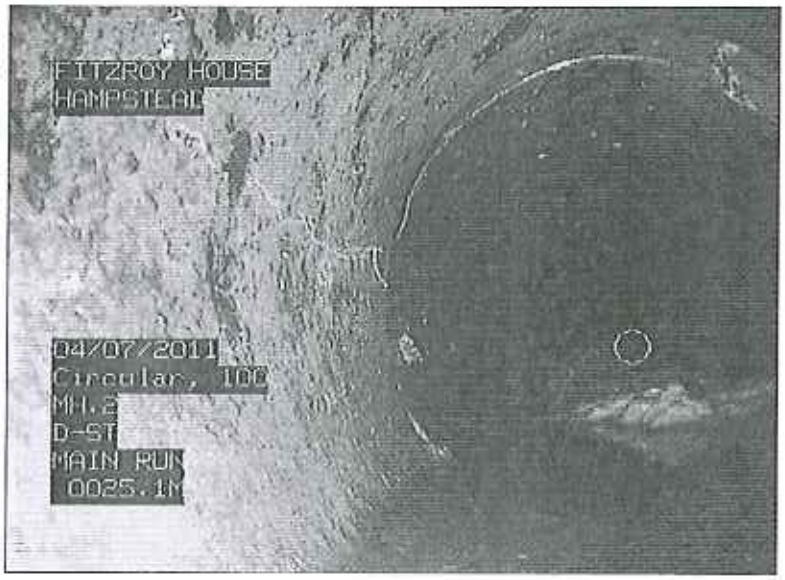

Photo: 49_19a, Tape No.: 5110, 00:08:59
25.1m, Circumferential Fracture at joint from 12 to 12 o´clock

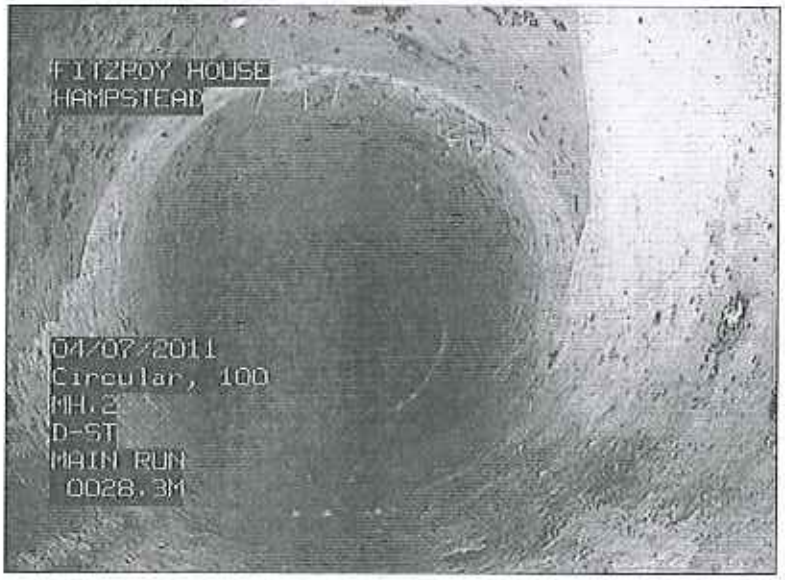

Photo: 51_21a, Tape No.: 5110, 00:10:38
28.3m, Fine Roots

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	**FITZROY PARK**	**04/07/2011**	**3**	**MH.2 X**

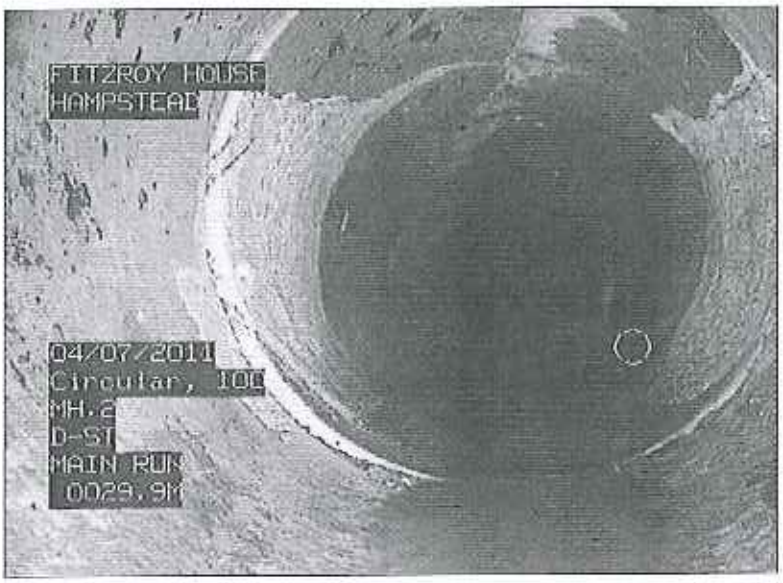

Photo: 52_22a, Tape No.: 5110, 00:11:08
29.9m, Crack Longitudinal at joint at 02 o´clock

1.0 INTRODUCTION

This report summarises the assessment of the energy target and renewables proposals to support the planning application for the re-development of the Waterhouse dwelling.

The existing dwelling is proposed to be demolished and replaced with a more contemporary dwelling arranged over three floors from basement to first floor and incorporating an internal swimming pool.

This report makes an assessment of the predicted energy requirements of the proposed development and analyses the various options for generating renewable energy from on-site technologies.

2.0 POLICY GUIDANCE AND CONSTRAINTS

The Proposed Development has been influenced by the following guidance:

- London Borough of Camden Unitary Development Plan (UDP)
  Policy B1 General Design Principles and SD9 Resources and Energy.

- London Borough of Camden Planning Guidance 2006 – Energy and On Site Renewable Facilities.

Regionally these policies and guidance are supported by the Mayor of London's London Plan (including alterations from 2004) and Energy Strategy. In maximising the sustainability aspects of the development, the Client is committed to delivering appropriate items. In particular:

- Code for Sustainable Homes Level 4 standard "at least 68 credits".
- Maximising water conversation and recycling.
- Designing the building and services for minimum energy use.
- Offset on-site generated renewable energy sources where feasible "at least 25% of predicted energy requirements".

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Inspection report

Date:	Job N°:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	4	MAIN RUN X
Video Volume No.:	Flow Ctrl:	Temperature:	Year laid:	Cleaned:	Strat. Drain:
5110	No flow control	above freezing	Z	No	

Road:	FITZROY PARK	Div/Dist:		start MH:	MH.3
Place:	HAMPSTEAD HEATH	Drain. Area:		end MH:	MAIN RUN
Location:	Road	Standard:	BS EN 13508-2:2003	Total length:	24.7 m

Purpose:	Sample survey (asset condition)	Shape/Size:	Circular 225
Type:	Gravity drain/sewer	Material:	Vitrified clay (i.e. all clayware) Pipe length:
Use:	Combined	Lining:	
		Lining Type:	

Comment:

1:200 position		code	observation	MPEG	photo	grade
0.00		MH	Start node type, manhole, reference number: MH.3			(Misc) 0
0.00		WL	Water level 10 % height/diameter			(Serv) 0
0.00		FLJ	Fracture longitudinal at joint at 03 o'clock	00:02:19		(Struct) 3
0.90	S1	DES	Settled deposits fine 10 % cross-sectional area loss, Start			(Serv) 1
6.00		WL	Water level 5 % height/diameter	00:00:42		(Serv) 0
6.00	F1	DES	Settled deposits fine 10 % cross-sectional area loss, Finish	00:00:48		(Serv) 1
8.00		WL	Water level 10 % height/diameter	00:01:22		(Serv) 0
9.40		FL	Fracture longitudinal at 03 o'clock	00:01:29		(Struct) 3
9.40		FL	Fracture longitudinal at 09 o'clock	00:01:37		(Struct) 3
9.40		FL	Fracture longitudinal at 12 o'clock	00:01:42		(Struct) 3
9.40		D	Deformed drain/sewer 10 %	00:01:48	4_11a	(Struct) 5
10.50	S2	FL	Fracture longitudinal at 03 o'clock, Start	00:02:28		(Struct) 3
10.50	S3	FL	Fracture longitudinal at 09 o'clock, Start	00:02:42		(Struct) 3
10.90	S4	D	Deformed drain/sewer 5 %, Start	00:02:50		(Struct) 5
13.50		FL	Fracture longitudinal at 02 o'clock	00:03:20		(Struct) 3
13.50		WL	Water level 20 % height/diameter	00:03:25		(Serv) 0
17.10	F2	FL	Fracture longitudinal at 03 o'clock, Finish	00:04:16		(Struct) 3
17.10	F3	FL	Fracture longitudinal at 09 o'clock, Finish	00:04:26		(Struct) 3
17.10	F4	D	Deformed drain/sewer 5 %, Finish	00:04:32		(Struct) 5
17.10		WL	Water level 15 % height/diameter	00:04:48		(Serv) 0
21.00		WL	Water level 25 % height/diameter	00:05:21		(Serv) 0
21.20	S5	DES	Settled deposits fine 15 % cross-sectional area loss, Start	00:05:13		(Serv) 1
24.70	F5	DES	Settled deposits fine 15 % cross-sectional area loss, Finish	00:05:59		(Serv) 1
24.70		SA	Survey abandoned, Remark: SILT AND DEBRIS	00:06:19		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

CLEARVIEW SURVEYS LTD
HORTON, WIMBORNE
DORSET, BH21 7JL
Tel: 01202 826261, Fax: 01202 824777

Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	4	MAIN RUN X

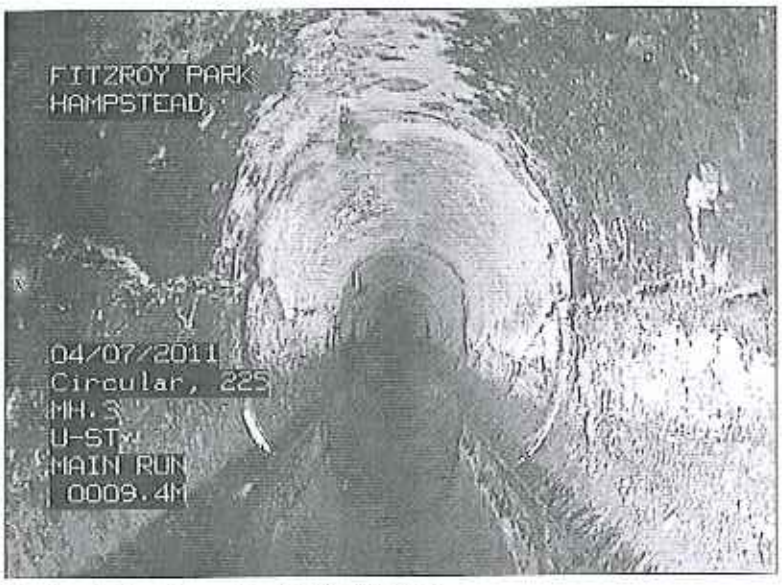

Photo: 4_11a, Tape No.: 5110, 00:01:48
9.4m, Deformed drain/sewer 10 %

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Inspection report

Date:	Job N°:	Weather:	Operator:	section number:	PLR:
04/07/2011	5110	No rain or snow	M. RICHARDS	6	MH.3 X
Video Volume No.:	Flow Ctrl:	Temperature:	Year laid:	Cleaned:	Strat. Drain:
5110	No flow control	above freezing	Z	No	

Road:	FITZROY PARK	Div/Dist:		start MH:	MH.3
Place:	HAMPSTEAD HEATH	Drain. Area:		end MH:	MAIN RUN
Location:	Road	Standard:	BS EN 13508-2:2003	Total length:	20.3 m

Purpose:	Sample survey (asset condition)	Shape/Size:	Circular 225
Type:	Gravity drain/sewer	Material:	Vitrified clay (i.e. all clayware) Pipe length:
Use:	Combined	Lining:	
		Lining Type:	

Comment:

1:175

position		code	observation	MPEG	photo	grade
0.00		MH	Start node type, manhole, reference number: MH.3			(Misc) 0
0.90		WL	Water level 10 % height/diameter			(Serv) 0
0.90	S1	DES	Settled deposits fine 5 % cross-sectional area loss, Start	00:00:04		(Serv) 1
5.60		FLJ	Fracture longitudinal at joint at 12 o'clock	00:00:51		(Struct) 3
5.60		FLJ	Fracture longitudinal at joint at 03 o'clock	00:00:56		(Struct) 3
5.60		FLJ	Fracture longitudinal at joint at 09 o'clock	00:01:02		(Struct) 3
5.60		D	Deformed drain/sewer 5 %	00:01:07	90_7a	(Struct) 5
8.20	S2	FLJ	Fracture longitudinal at joint at 03 o'clock, Start	00:01:46		(Struct) 3
8.20	S3	FL	Fracture longitudinal at 09 o'clock, Start	00:01:56		(Struct) 3
8.20	S4	FL	Fracture longitudinal at 12 o'clock, Start	00:02:09		(Struct) 3
8.20	S5	D	Deformed drain/sewer 5 %, Start	00:02:16		(Struct) 5
10.30	F2	FLJ	Fracture longitudinal at joint at 03 o'clock, Finish	00:02:49		(Struct) 3
10.30	F3	FL	Fracture longitudinal at 09 o'clock, Finish	00:03:01		(Struct) 3
10.30	F4	FL	Fracture longitudinal at 12 o'clock, Finish	00:03:13		(Struct) 3
10.30	F5	D	Deformed drain/sewer 5 %, Finish	00:03:19		(Struct) 5
13.20		WL	Water level 15 % height/diameter	00:03:45		(Serv) 0
16.80		WL	Water level 25 % height/diameter	00:04:16		(Serv) 0
18.60		CCJ	Crack Circumferential at joint from 12 to 12 o'clock	00:04:35		(Struct) 2
20.20	F1	DES	Settled deposits fine 5 % cross-sectional area loss, Finish	00:05:26		(Serv) 1
20.30		SA	Survey abandoned, Remark: DUE TO SILT ETC	00:05:36		(Misc) 0

Structural Defects	Constructional Features
Service Defects	Miscellaneous Features

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Inspection photos

Place:	Road:	Date:	section number:	PLR:
HAMPSTEAD HEATH	FITZROY PARK	04/07/2011	5	MH.3 X

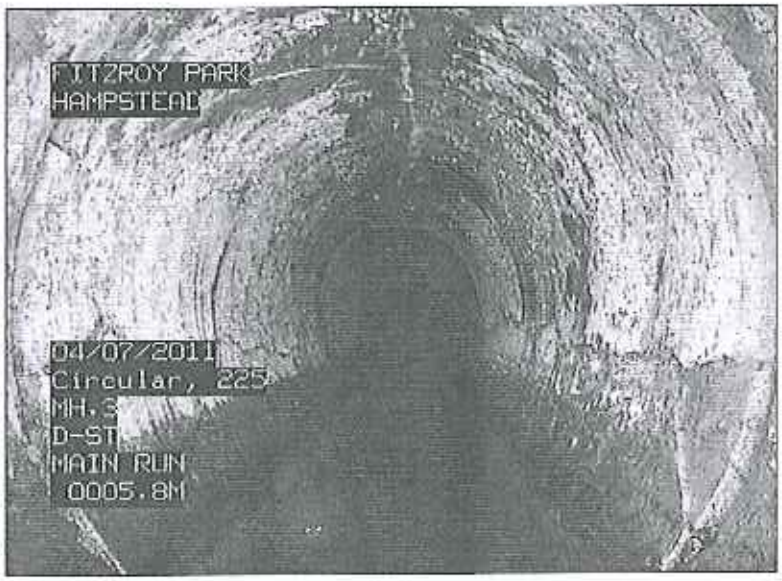

Photo: 90_7a, Tape No.: 5110, 00:01:07
5.8m, Deformed drain/sewer 5 %

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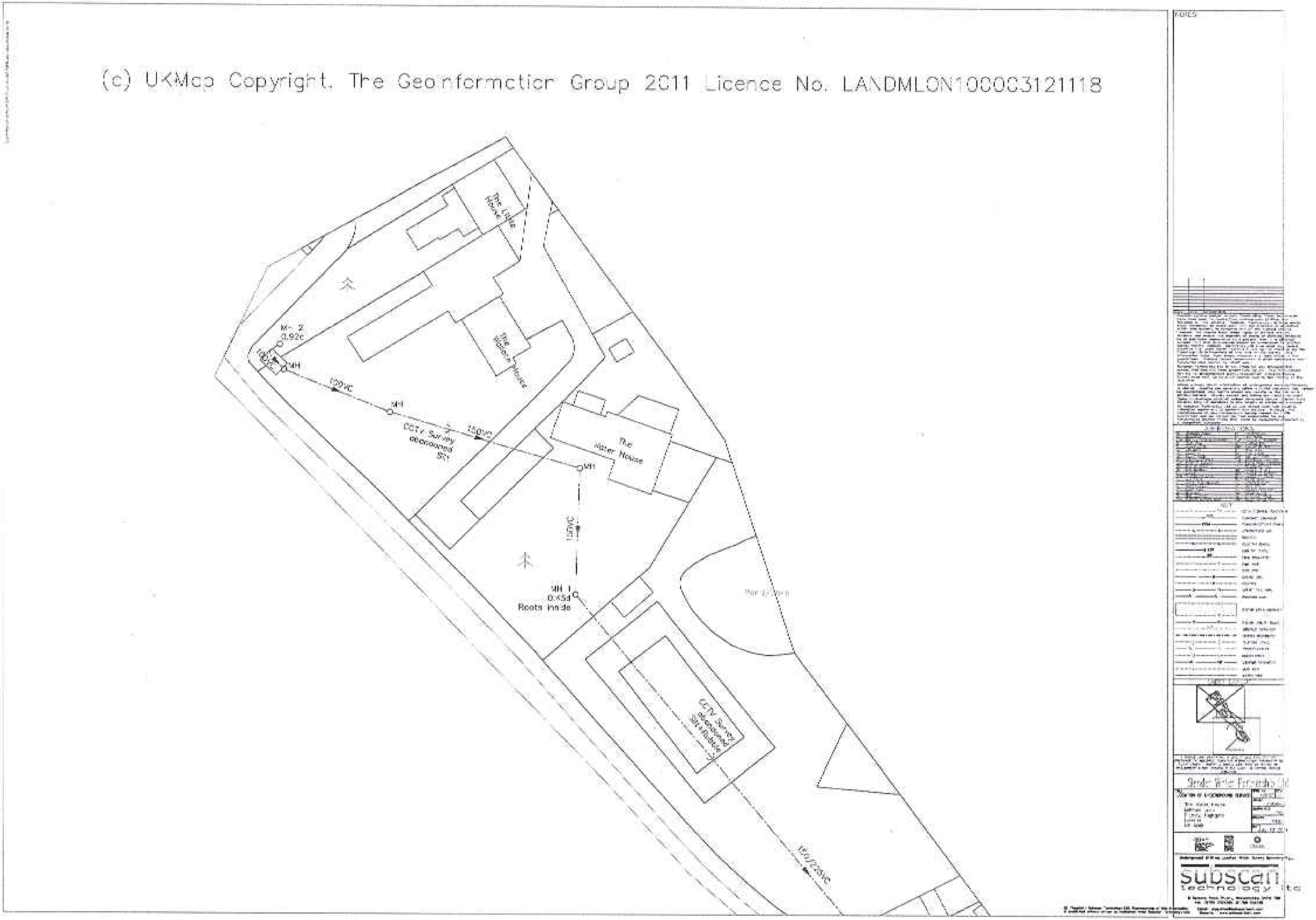
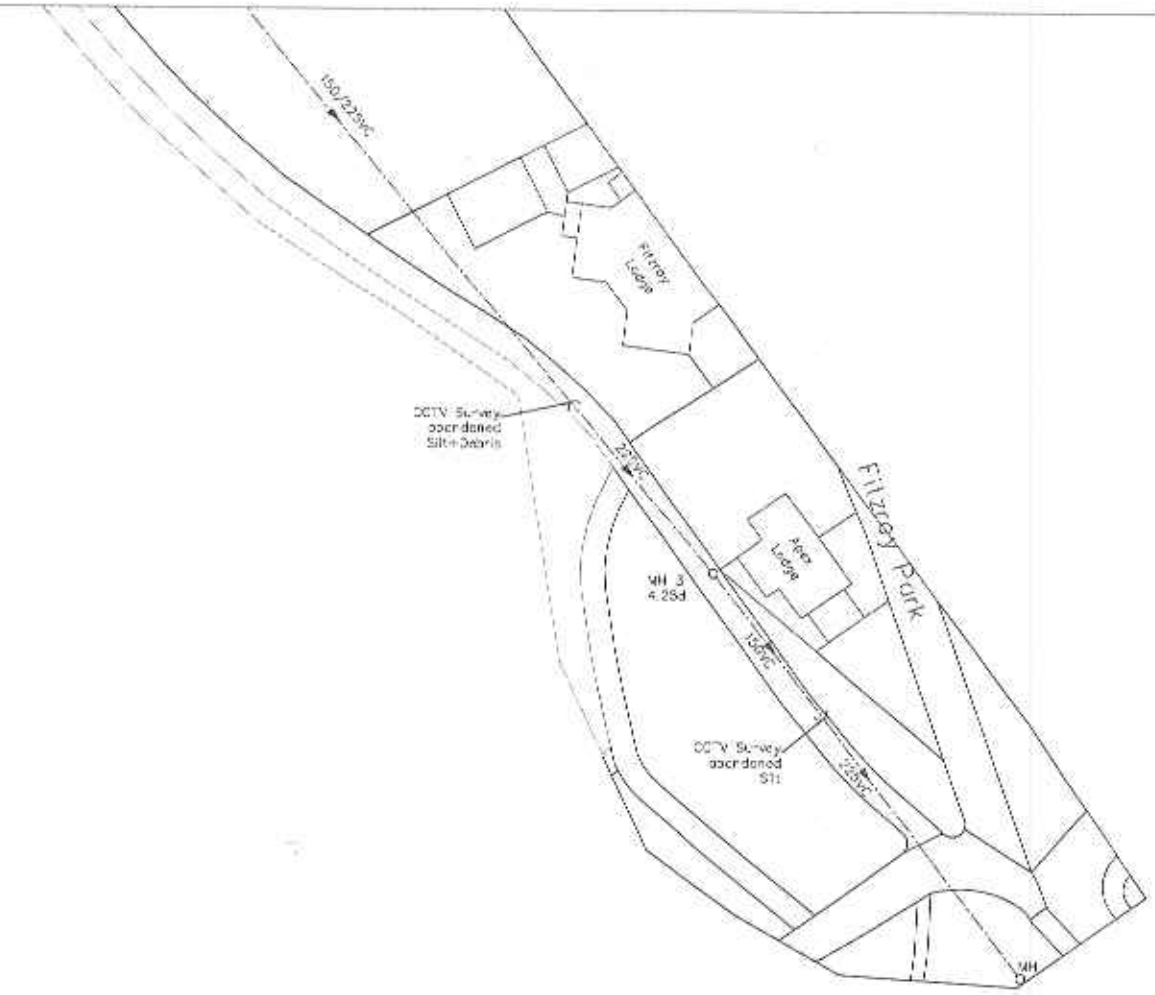
RECOMMENDATIONS

	start MH	end MH	insp. (m)	Recommendation
1	MH.1	MAIN RUN	25.20	REMEDIAL WORKS REQUIRED
2	MH.1	MAIN RUN	38.90	LORRY JETTING REQUIRED AND REMEDIALS
3	MH.2	MAIN RUN	34.50	REMEDIAL WORKS REQUIRED
4	MH.3	MAIN RUN	24.70	LORRY JETTING REQUIRED AND REMEDIAL WORK
5	MH.3	MAIN RUN	20.30	LORRY JETTING REQUIRED AND REMEDIAL WORKS
			143.60 m	


(c) UKMap Copyright. The Geoinformation Group 2011 Licence No. LANDMLON100003121118
The Little House
The Wallace House
The Water House
MH 2
0.92c
MH
150VC
CCTV Survey
abandoned
Silt
MH 1
0.45d
Roots inside
CCTV Survey
abandoned
Silt+Rubble
NOTES
subscan
technology ltd



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3.0 SUSTAINABILITY AND ENERGY APPROACH

The outline approach by the Proposed Development in addressing sustainability, environmental impact and conserving its energy use, whilst seeking to provide a large family-sized detached house built in a contemporary architectural style and design as a minimum to comply with the Building Regulations Part L1A (2010).

The Code for Sustainable Homes is a good single national standard in the design and construction of domestic properties. It provides for 6 levels of 'Sustainability', covering construction, design and procurement.

As previously stated this development will be aimed at achieving level 4. This requires the following:

1) 25% minimum reduction in Dwelling Emission Rate (DER).
2) Maximum potable water consumption of 105 litres per day.
3) Total credit score (>) 68.

4.0 BASELINE ENERGY CONSUMPTION AND CO_2 FOOTPRINT

At this early stage in the project's life, the Notional building CO_2 emission rate for this type building shall be used for assessing baseline CO_2 consumption. This will of course be refined throughout the detailed design process to derive a more accurate figure and the scale of renewables adjusted accordingly.

The total habitable heated area of the proposed dwelling is approximately 767m^2, not including plantrooms. A baseline benchmark CO_2 total consumption of 21kg/m^2.annum shall be applied to cover the CO_2 utilsation for heating, cooling, lighting, small power, cooking and domestic hot water.

To this, an additional CO_2 input of 3,960kg/annum shall be allowed for heating internal pool, this equates to 2.5 kW standing losses for the pool water, which is a reasonable allowance at this stage for an insulated pool box, or an external pool, with cover, operating in the summer.

The following table shows the estimated baseline kg of CO_2 requirement for the Proposed Development when related to current Building Regulation minimum standards:

Overall Development Class	Building Type	Baseline Energy Requirement (kg CO_2/annum) X Area	Energy Requirement deriving from Renewable energy source (20%) (kg CO_2/annum)
Single Residential	Main House	16,107	3,221
	Int Pool	2,770	554
	Total	**18,877**	**3,775 kg of CO_2/annum**

5.0 ENERGY EFFICIENT MEASURES ON BASELINE DESIGN

The following measures are intended to be incorporated to provide an acceptable energy level usage building.

5.1 Thermal elements

It is proposed that the building's thermal elements be specified to exceed the minimum AD Part L standards by at least 20%.

5.2 Heating

The house will have high efficiency gas condensing boilers (A rated, 92% efficient) located in the basement catering for top-up of space heating and domestic hot water demand. Subject to how the space heating will be provided this will be sized to cover load, and will be in the region of 65kW.

The areas within the building shall be suitably zoned for space heating provision.

In terms of pollution, the boiler will be a minimum Class 5 with a maximum NOx rating of 40mg/kWh.

5.3 Pool Ventilation Plant

The pool hall ventilation unit shall be a purpose built unit and shall incorporate heat recovery technology utilising external air for heating/cooling and dehumidification wherever possible.

5.4 Mechanical Ventilation and Heat Recovery serving the main House

It is proposed to utilise ventilation units with heat recovery to serve areas that do not have access to natural ventilation.

5.5 Air Permeability

The building will be designed to achieve an air permeability of 4-5$m^3/hr/m^2$. This, along with the high thermal mass of the external walls, will significantly reduce the energy demand for space heating.

In order to achieve this low air permeability rate the use of a central ventilation system with heat recovery is proposed for the basement accommodation.

5.6 Artificial Lighting

The provision of natural daylight is considered an important factor in the design in order to minimise the use of artificial light within the building. All habitable rooms have access to natural light with high specification glazing being used to maximise day lighting levels and minimise associated heat loss.

High efficiency lamps will be considered in conjunction with the client's preferences and facilities for automatic switching and dimming via the AV system shall also be incorporated where possible. This will however be subject to the client's and interior designer's agreement.

6.0 RENEWABLE TECHNOLOGY ASSESSMENT FOR 25% ON SITE ENERGY REDUCTION REQUIREMENT

6.1 Photovoltaics

These systems convert energy from the sun's photon energy into electricity through semi-conducting cells. Arrays of semi-conductors connected together are mounted into modules connected via inverter and control mechanisms to the building energy network can provide (not necessarily in direct sunlight conditions) a proportion of the electrical consumption of a house and/or commercial property.

They are particularly suited to buildings that use electricity during the day i.e. offices, retail and schools. It is arguable therefore that any real benefit will be gained to this residential property, however due to the systems employed within the house and the fact that staff will be in occupation a considerable amount of the time, it has been considered further.

Firstly we need to discuss the likely location of solar arrays of this type. Investigating the Architect's drawings we find that PV panels would need to be located on the central area of the flat roof area in the centre. However this is subject to the agreement of the planners.
When considering photovoltaics it is possible to achieve up to 100kWh/annum/m2 of panel and when relating this to the flat area of south facing roof available, which equates to approximately 14m2 of panel, this may provide **739kg CO_2/annum.** This would result in achieving about 3.9% of the buildings energy reduction needs.

6.2 Solar Water Heating

Solar collectors, which are at the heart of most solar systems, absorb the sun's energy and provide heat for hot water, heating and other applications.

There is space at roof level as indicated on the Architect's drawings to provide solar water heating panels that will serve the hot water service demand particularly during the summer months of the property. It may also be used to feed the swimming pool heating system.

It is anticipated that evacuated tube units can be employed because of their high efficiency and their ability to be laid flat and having their tubes rotated to gain optimum sun absorption. Typically these would be arranged in an array that will feed a hot water storage buffer vessel within the lower ground plantroom. These collectors could be fitted to mounting frames located within the flat central roof area.

It is important not to oversize solar heating panels otherwise the system will overheat in peak summer conditions leading to degradation of the system. With this in mind and with estimates of hot water usage annually, it is considered sensible to limit the area of solar panels to 8 sq.m for a property of this size, which would be expected to provide up to 930kg CO_2/annum of solar water heating in an unshaded location. However this figure will be reduced for this application to 860kg CO_2/annum account for the shading effects upon the roof due to the surrounding trees. This would result in achieving around 4.9% of the annual buildings energy needs.