DRAINAGE INVESTIGATION REPORT

CLIENT	HUSBAND AND BROWN LIMITED
SITE	KINGS ROAD, WOMBWELL
DATE	14/12/2011
JOB No.	4340

- **Comprehensive Site Surveys**
- **Drainage Rehabilitation**
- **Pipeline and Ancillary Installation**
- **Maintenance Programme Appraisal & implementation**

CORUS MILLS, SHEFFIELD RD, S60 IBN
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environmental drainage solutions ltd

CCTV REPORT HEADER CODE EXPLANATION

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Detailed below are explanations for the standard Water Research Council (WRC) CCTV report header codes. Whilst WRC defect codes are also included within the body of the report, they are accompanied by an explanation in the "Observation" column. Please contact Environmental Drainage Solutions on the number below if you wish to discuss any aspect of this report.

CODE	LOCATION DESCRIPTION
A	Main road - urban (town or city centre with heavy goods vehicles)
B	Main road - suburban/rural (all other roads with heavy goods vehicles)
C	Light road (rural roads with light traffic, town and city back streets, estate roads and parking areas)
D	Footpath or verge (within the highway boundary)
E	Fields (farmland and public open space)
F	Gardens (within private property)
G	Woodland
X	Difficult access (Motorway, railway, watercourse, inside building).

CODE	PIPE MATERIAL DESCRIPTION
AC	Asbestos cement
AK	Alkathene
BR	Brick
CC	Concrete box culvert
CI	Cast Iron
CO	Concrete
CSB	Concrete segments (bolted)
CSU	Concrete segments (unbolted)
DI	Ductile iron
GRC	Glass reinforced cement
GRP	Glass reinforced plastic
MAC	Masonry - in regular courses
MAR	Masonry - randomly coursed
PE	Polyethylene
PF	Pitch fibre
PP	Polypropylene
PSC	Plastic/steel composite
PVC	Polyvinyl chloride
RPM	Reinforced plastic matrix
SI	Spun (grey) iron
ST	Steel
VC	Vitrified clay (ie all clayware)
XXX	Other (state in comments)
ZZZ	Not known

CODE	PIPE SHAPE DESCRIPTION
A	Arched (with flat bottom)
B	Barrel (e.g. beer barrel shape)
C	Circular
E	Egg shaped
H	Horshoe (i.e. inverted U)
O	Oval
R	Rectangular
S	Square
T	Trapezoidal
U	U-shaped with flat top
X	Other (state in comments)

CODE	WEATHER DESCRIPTION
1	Dry
2	Heavy rain
3	Light rain
4	Showers
5	Snow

CODE	PIPE LINING DESCRIPTION
BL	Bitumen
CL	Cement
IS	Soft inversion type liner
PL	Plastic
RL	Resin
XXX	Other (state in comments)
ZZZ	Not known

CODE	PIPE USE DESCRIPTION
C	Combined
F	Foul
S	Surface Water
T	Trade Effluent
W	Watercourse
X	Other
Z	Not known

CODE	SURVEY DIRECTION DESCRIPTION
D	Downstream
U	Upstream

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STRUCTURAL PERFORMANCE ASSESSMENT CRITERIA

CLAYWARE AND CONCRETE DRAINAGE

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Detailed below are the criteria used for the assessment of severity of defects in accordance with the Water Research Council (WRC). Proposed remedial works are based upon these assessments in conjunction with many other issues such as nature of original problem (if any), implications of collapse (depth, location etc), frequency of surcharging, and many more. Most drainage systems exhibit structural defects of some sort and the WRC assessments can only be a guideline. In the right ground conditions, quite serious defects can be stable for many years. We aim to provide a reasonable, balanced recommendation for remedial works, based upon our experience and following consultation with the client. Please contact Environmental Drainage Solutions if you wish to discuss any aspect of this report.

DEFECT	STRUCTURAL IMPLICATION
CIRCUMFERENTIAL CRACK	MINIMAL COLLAPSE RISK IN SHORT TERM, BUT POTENTIAL FOR FURTHER DETERIORATION
MEDIUM JOINT DISPLACEMENT	MINIMAL COLLAPSE RISK IN SHORT TERM, BUT POTENTIAL FOR FURTHER DETERIORATION
MEDIUM OPEN JOINT	MINIMAL COLLAPSE RISK IN SHORT TERM, BUT POTENTIAL FOR FURTHER DETERIORATION
SLIGHT SPALLING OR WEAR	MINIMAL COLLAPSE RISK IN SHORT TERM, BUT POTENTIAL FOR FURTHER DETERIORATION
FRACTURE WITH DEFORMATION <5%	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
LONGITUDINAL OR MULTIPLE CRACKING	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
MINOR LOSS OF LEVEL (i.e. DIP IN PIPE)	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
LARGE DISPLACED JOINT	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
LARGE OPEN JOINT	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
SLIGHT SPALLING OR WEAR	COLLAPSE UNLIKELY IN NEAR FUTURE BUT FURTHER DETERIORATION LIKELY
BROKEN PIPEWORK	COLLAPSE LIKELY IN FORESEEABLE FUTURE
BROKEN PIPEWORK WITH DEFORMATION <10%	COLLAPSE LIKELY IN FORESEEABLE FUTURE
FRACTURE WITH DEFORMATION <10%	COLLAPSE LIKELY IN FORESEEABLE FUTURE
MULTIPLE FRACTURE	COLLAPSE LIKELY IN FORESEEABLE FUTURE
SERIOUS LOSS OF LEVEL	COLLAPSE LIKELY IN FORESEEABLE FUTURE
LARGE SPALLING OR WEAR	COLLAPSE LIKELY IN FORESEEABLE FUTURE
ALREADY COLLAPSED	COLLAPSED OR COLLAPSE IMMINENT
BROKEN PIPEWORK WITH DEFORMATION >10%	COLLAPSED OR COLLAPSE IMMINENT
EXTENSIVE AREAS OF FABRIC MISSING	COLLAPSED OR COLLAPSE IMMINENT
FRACTURE WITH DEFORMATION >10%	COLLAPSED OR COLLAPSE IMMINENT

CCTV REPORT SUMMARY

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SITE ADDRESS: KINGS ROAD, WOMBWELL **DATE:** 29/12/2011

No.	FROM	TO	DIR	DIA(MM)	JET	COMMENTS
1	EDS1	BRANCH B	U	225		
2	EDS3	BRANCH X	D	225		
	EDS3	BRANCH X	D	225		SURVEY No.2 CONTINUED
	EDS3	BRANCH X	D	225		SURVEY No.2 CONTINUED
3	EDS3	BRANCH X	D	225		CONTINUATION FROM END OF SURVEY No.2
	EDS3	BRANCH X	D	225		SURVEY No.3 CONTINUED

CCTV REPORT SHEET

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Client:	HUSBAND AND BROWN LIMITED	Sheet No:	1
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS1	1.37	BRANCH B		U	225	0	VC	Z	

General comments	

Count	Code	Observation	Remarks
0.9	ST	Start of survey	
0.9	MH	Manhole or node	EDS1
0.9	WL	Water Level	5%
0.9	GO	General observation	TOP OF PIPE MISSING - SLAB OVER
3.1	LR	Line of pipe deviates right	MEDIUM
3.9	JN	Junction	150MM @ 9 o'clock
5.8	CC	Circumferential crack from	7 o'clock to 11 o'clock
6.9	JN	Junction	225MM @ 6 o'clock - BACK END OF WINSER TRAP - MANHOLE NOT VISIBLE. MUST BE INSIDE KIER COMPOUND. (NO ACCESS).
6.9	SA	Survey abandoned	DUE TO WINSER TRAP

CCTV REPORT SHEET

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Client:	HUSBAND AND BROWN LIMITED	Sheet No:	2
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS3	1.94	BRANCH X		D	225	0	VC	Z	

General comments	

Count	Code	Observation	Remarks
0.9	ST	Start of survey	
0.9	MH	Manhole or node	EDS3
0.9	WL	Water Level	5%
7.7	JN	Junction	150MM @ 9 o'clock
8.4	CC	Circumferential crack from	8 o'clock to 9 o'clock
8.4	CC	Circumferential crack from	3 o'clock to 5 o'clock
9.2	JN	Junction	150MM @ 3 o'clock
13.6	FC	Circumferential fracture	12 o'clock to 9 o'clock
13.6	H	Hole in pipe at	6 o'clock to 8 o'clock
13.6	B	Broken pipe at	8 o'clock
29.7	CL	Longitudinal crack at	2 o'clock
29.7	CL	Longitudinal crack at	3 o'clock
29.7	CC	Circumferential crack from	6 o'clock to 9 o'clock
30.5	FL	Longitudinal fracture	9 o'clock
30.5	FC	Circumferential fracture	3 o'clock to 5 o'clock
30.5	FC	Circumferential fracture	7 o'clock to 9 o'clock
31.4	CL	Longitudinal crack at	3 o'clock
32.1	CC	Circumferential crack from	1 o'clock to 3 o'clock
33.7	JN	Junction	150MM @ 10 o'clock
35.1	CC	Circumferential crack from	1 o'clock to 6 o'clock

CCTV REPORT SHEET

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Client:	HUSBAND AND BROWN LIMITED	Sheet No:	2
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS3	1.94	BRANCH X		D	225	0	VC	S	

General comments	SURVEY No.2 CONTINUED

Count	Code	Observation	Remarks
35.2	JN	Junction	150MM @ 2 o'clock
38.5	CC	Circumferential crack from	7 o'clock to 9 o'clock
38.5	JN	Junction	150MM @ 9 o'clock
42.2	CC	Circumferential crack from	1 o'clock to 3 o'clock
42.3	JN	Junction	150MM @ 3 o'clock
42.8	CC	Circumferential crack from	7 o'clock to 12 o'clock
44.4	CL	Longitudinal crack at	8 o'clock
46.0	CC	Circumferential crack from	9 o'clock to 11 o'clock
46.9	CC	Circumferential crack from	3 o'clock
47.6	CL	Longitudinal crack at	3 o'clock
49.1	CL	Longitudinal crack at	3 o'clock
49.7	CC	Circumferential crack from	10 o'clock to 1 o'clock
51.4	FC	Circumferential fracture	3 o'clock to 5 o'clock
51.4	FC	Circumferential fracture	7 o'clock to 8 o'clock
53.2	CL	Longitudinal crack at	7 o'clock
53.2	CC	Circumferential crack from	7 o'clock to 8 o'clock
54.0	MH	Manhole or node	EDS5
54.0	LL	Line of pipe deviates left	SLIGHT
56.2	FL	Longitudinal fracture	5 o'clock
56.6	CL	Longitudinal crack at	1 o'clock

CCTV REPORT SHEET

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Client:	HUSBAND AND BROWN LIMITED	Sheet No:	2
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS3	1.94	BRANCH X		D	225	0	VC	S	

General comments	SURVEY No.2 CONTINUED

Count	Code	Observation	Remarks
56.6	CC	Circumferential crack from	9 o'clock to 10 o'clock
61.6	CC	Circumferential crack from	12 o'clock to 2 o'clock
61.6	CC	Circumferential crack from	3 o'clock to 5 o'clock
62.6	CC	Circumferential crack from	7 o'clock to 8 o'clock
62.6	JN	Junction	150MM @ 9 o'clock
63.4	CC	Circumferential crack from	8 o'clock to 9 o'clock
63.4	CC	Circumferential crack from	10 o'clock to 11 o'clock
63.7	DE	Debris	10% - GROUT
63.8	CL	Longitudinal crack at	4 o'clock
63.9	JN	Junction	150MM @ 3 o'clock
67.0	CC	Circumferential crack from	8 o'clock to 10 o'clock
71.9	CC	Circumferential crack from	4 o'clock to 5 o'clock
71.9	CL	Longitudinal crack at	9 o'clock
73.0	CL	Longitudinal crack at	3 o'clock
74.6	CL	Longitudinal crack at	9 o'clock
74.6	SA	Survey abandoned	DUE TO LOSS OF TRACTION

CCTV REPORT SHEET

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Client:	HUSBAND AND BROWN LIMITED	Sheet No:	3
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS3	1.94	BRANCH X		D	225	0	VC	S	

General comments	CONTINUATION FROM END OF SURVEY No.2

Count	Code	Observation	Remarks
77.6	JN	Junction	150MM @ 9 o'clock
79.6	CL	Longitudinal crack at	3 o'clock
80.1	CL	Longitudinal crack at	10 o'clock
80.1	CL	Longitudinal crack at	11 o'clock
80.1	CL	Longitudinal crack at	2 o'clock
81.1	CL	Longitudinal crack at	9 o'clock
84.3	CC	Circumferential crack from	1 o'clock to 3 o'clock
85.1	JN	Junction	150MM @ 9 o'clock
86.6	JN	Junction	150MM @ 3 o'clock - UNIDENTIFIED, POSSIBLEY FROM SITE. FLOW TESTED GULLY A - NEGATIVE
88.1	CC	Circumferential crack from	8 o'clock to 9 o'clock
88.5	CL	Longitudinal crack at	12 o'clock
90.1	JN	Junction	150MM @ 9 o'clock
91.8	JN	Junction	150MM @ 3 o'clock - FLOW TEST FROM GULLY A - POSITIVE
94.9	CL	Longitudinal crack at	1 o'clock
97.3	CC	Circumferential crack from	8 o'clock to 10 o'clock
97.3	JN	Junction	150MM @ 3 o'clock - UNIDENTIFIED, POSSIBLEY FROM SITE.

CCTV REPORT SHEET

environmental drainage solutions ltd

Client:	HUSBAND AND BROWN LIMITED	Sheet No:	3
Site:	KINGS STREET - WOMBWELL	Date:	29/12/2011

Job No.	Operator	Location code	Weather	Pre clean	Shape	Lining	Tape No.
4340	IW	C	2		C		1

Start MH	Depth(m)	Finish MH	Depth(m)	Direction	Dia(mm)	Dim(mm)	Material	Use	Length(M)
EDS3	1.94	BRANCH X		D	225	0	VC	S	

General comments	SURVEY No.3 CONTINUED

Count	Code	Observation	Remarks
98.3	CL	Longitudinal crack at	11 o'clock
101.4	CC	Circumferential crack from	8 o'clock to 10 o'clock
105.7	CL	Longitudinal crack at	2 o'clock
108.1	JN	Junction	150MM @ 9 o'clock
108.5	SA	Survey abandoned	DUE TO LOSS OF TRACTION

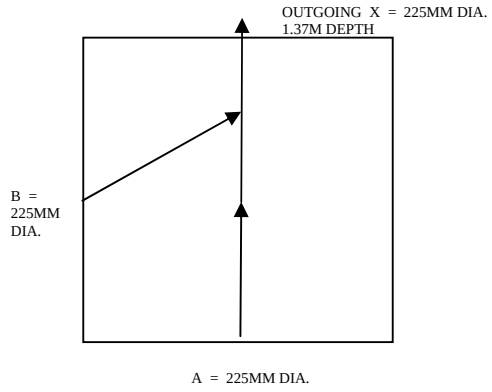
MANHOLE RECORD CARD

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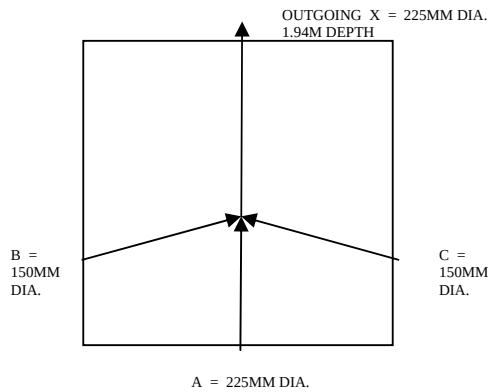
JOB No. 4340 SHEET 1 OF 1

CLIENT:- **Husband and Brown Ltd.** SITE:- **Kings Rd - Wombwell**

NODE REF	EDS1
SURVEY DATE	29/12/11
NODE TYPE	MH/IC/GULLY/OTHER
STATUS	PU/PR
FUNCTION	F/SW/C UNKNOWN
INVERT DEPTH(M)	1.37M
CONSTRUCTION	BR/PCC/OTHER
REMARKS (Photos etc)	BRANCH A - 50% SILTED



NODE REF	EDS3
SURVEY DATE	29/12/11
NODE TYPE	MH/IC/GULLY/OTHER
STATUS	PU/PR
FUNCTION	F/SW/C
INVERT DEPTH(M)	1.94M
CONSTRUCTION	BR/PCC/OTHER
REMARKS (Photos etc)	LOCATED OUTSIDE 9 COLLINRIDGE RD. - APPROX 70M UPSTREAM OF SITE BOUNDARY



MH – MANHOLE, IC – INSPECTION CHAMBER, PU – PUBLIC, PR – PRIVATE
F – FOUL, SW – SURFACE WATER, C – COMBINED, BR – BRICK, PCC – PRE-CAST CONCRETE

KINGS ROAD



Title: GP1
Date: 14/12/11
Description: EDS1 - MANHOLE COVER



Title: GP2
Date: 14/12/11
Description: EDS1



Title: GP3
Date: 14/12/11
Description: EDS1



Title: GP4
Date: 14/12/11
Description: EDS2 - MAHOLE COVER (UNABLE TO RAISE)

GENERAL PHOTOS

KINGS ROAD



Title: GP5
Date: 14/12/11
Description: EDS1 & EDS2 - LOCATION



Title: GP6
Date: 14/12/11
Description: SITE ENTRANCE



Title: GP7
Date: 14/12/11
Description: SITE ENTRANCE



Title: GP8
Date: 14/12/11
Description: SITE VIEW

GENERAL PHOTOS

KINGS ROAD



Title: GP9
Date: 14/12/11
Description: SITE VIEW



Title: GP10
Date: 14/12/11
Description: SITE VIEW



Title: GP11
Date: 14/12/11
Description: SITE VIEW



Title: GP12
Date: 14/12/11
Description: SITE VIEW

GENERAL PHOTOS

KINGS ROAD



Title: GP13
Date: 14/12/11
Description: SITE VIEW



Title: GP14
Date: 14/12/11
Description: SITE VIEW



Title: GP15
Date: 14/12/11
Description: PUBLIC MANHOLES - UNABLE TO RAISE IN JUNCTION



Title: GP16
Date: 14/12/11
Description: KIER COMPOUND

GENERAL PHOTOS

KINGS ROAD



Title: GP17
Date: 14/12/11
Description: SITE VIEW



Title: GP18
Date: 14/12/11
Description: SITE VIEW



Title: GP19
Date: 29/12/11
Description: EDS1



Title: GP20
Date: 29/12/11
Description: EDS1 - LOCATION

GENERAL PHOTOS

KINGS ROAD



Title: GP21

Date: 29/12/11

Description: LINE OF BRANCH B - UPSTREAM OF EDS1



Title: GP22

Date: 29/12/11

Description: RUBBLE ON TOP OF NORMAL LEVEL - BRANCH B PASSES UNDER THIS



Title: GP23

Date: 29/12/11

Description: KIER COMPOUND



Title: GP24

Date: 29/12/11

Description: ENTRANCES - FENCED OFF

GENERAL PHOTOS

KINGS ROAD



Title: GP25

Date: 29/12/11

Description: ENTRANCES - FENCED OFF



Title: GP26

Date: 29/12/11

Description: ACCESS GAINED DUE TO BROKEN FENCE



Title: GP27

Date: 29/12/11

Description: ENTRANCES - FENCED OFF



Title: GP28

Date: 29/12/11

Description: ENTRANCES - FENCED OFF

GENERAL PHOTOS

KINGS ROAD



Title: GP29

Date: 29/12/11

Description: MANHOLE RAISED - NOT PUBLIC SEWER



Title: GP30

Date: 29/12/11

Description: RAISED MANHOLE - LOCATION



Title: GP31

Date: 29/12/11

Description: MANHOLE RAISED - NOT PUBLIC SEWER



Title: GP32

Date: 29/12/11

Description: MANHOLE RAISED - LOCATION

GENERAL PHOTOS

KINGS ROAD



Title: GP33
Date: 29/12/11
Description: EDS3



Title: GP34
Date: 29/12/11
Description: EDS3 - LOCATION



Title: GP35
Date: 29/12/11
Description: EDS3 - LOCATION



Title: GP36
Date: 29/12/11
Description: EDS4 - UNABLE TO RAISE

GENERAL PHOTOS

KINGS ROAD



Title: GP37
Date: 29/12/11
Description: EDS4 - LOCATION



Title: GP38
Date: 29/12/11
Description: EDS5 - UNABLE TO RAISE



Title: GP39
Date: 29/12/11
Description: EDS5 - LOCATION



Title: GP40
Date: 29/12/11
Description: GULLY A

GENERAL PHOTOS

KINGS ROAD



Title: GP41

Date: 29/12/11

Description: GULLY A - LOCATION



Title: GP42

Date: 29/12/11

Description: LARGE CHAMBER - UNIDENTIFED USE



Title: GP43

Date: 29/12/11

Description: LARGE CHAMBER - LOCATION



Title: GP44

Date: 29/12/11

Description: INSPECTION CHAMBER - SURCHARGED

GENERAL PHOTOS

KINGS ROAD



Title: GP45

Date: 29/12/11

Description: INSPECTION CHAMBER - LOCATION



Title: GP46

Date: 29/12/11

Description: GENERAL SITE VIEW



Title: GP47

Date: 29/12/11

Description: GENERAL SITE VIEW



Title: GP48

Date: 29/12/11

Description: GENERAL SITE VIEW

GENERAL PHOTOS

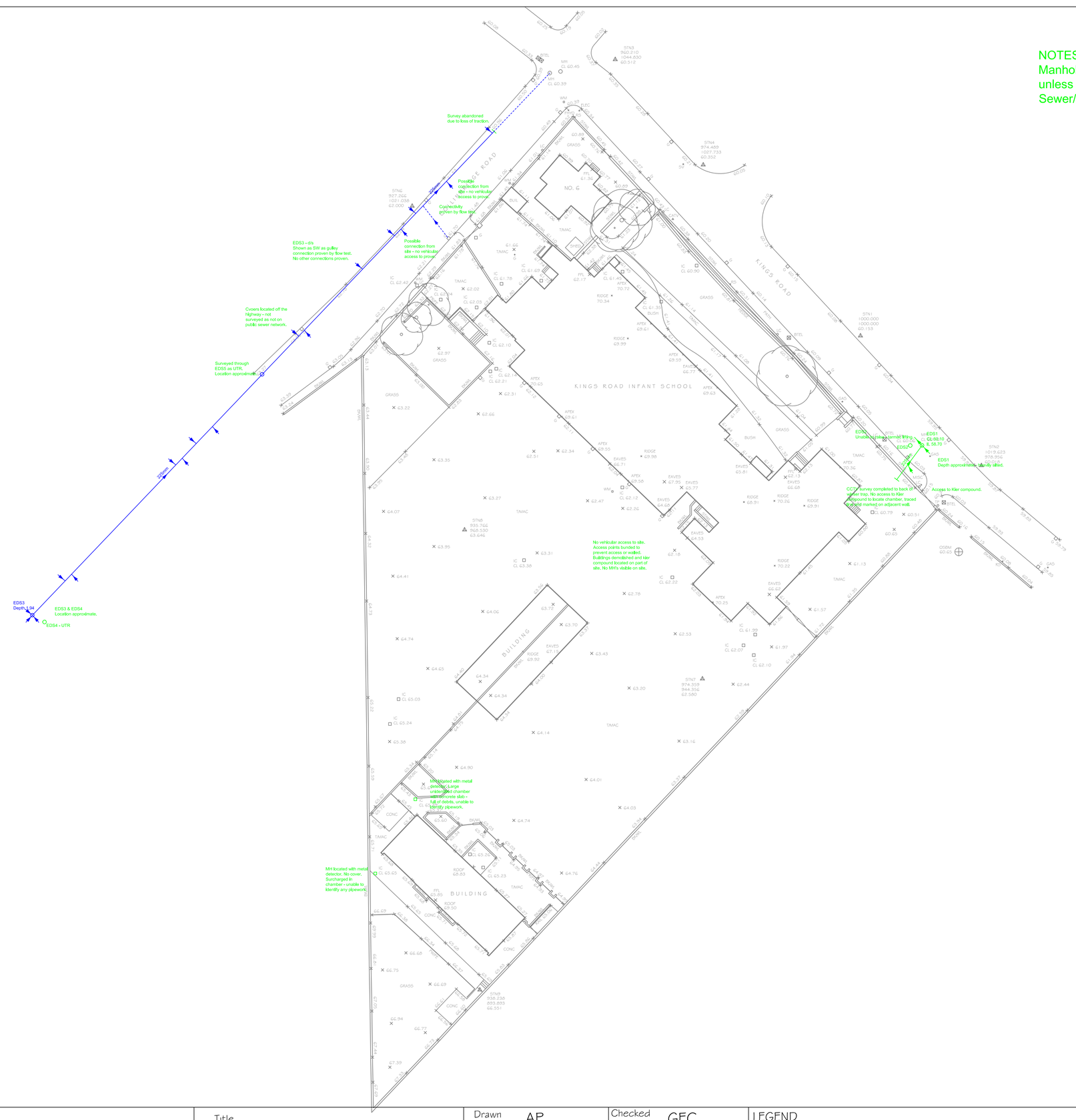
KINGS ROAD



Title: GP49
Date: 29/12/11
Description: GENERAL SITE VIEW

GENERAL PHOTOS

NOTES:
Manhole locations from topographical survey supplied unless stated otherwise.
Sewer/drain lines shown dashed not surveyed.



Corus Mills Sheffield Rd Rotherham S60 1BN Tel 0845 2300 939 Fax 0845 2300 949 email ops@eds.uk.net Web www.eds.uk.net	Client HUSBAND AND BROWN	Title KINGS ROAD WOMBWELL	Drawn AP / Checked GEC Date 15/12/11 / Scale NTS Drawing No. EDS/EAC/4340/01

LEGEND

Foul Drain/Sewer
Surface Water Drain/Sewer
Watercourse/culvert
Combined Drain/Sewer

Manhole (Colour denotes use)
Gully (Colour denotes use)
Rainwater Pipe / Gully
Soil Vent Pipe

EDS1
G
RWP RWG
SVP