

Site & Location	Highgate School - Richards Music Centre Bishopswood Road, London N6 4PR	Report No:	9933 / JRCB
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SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	w _L (%)	w _p (%)	Pass 425 (%)	I _p (%)	Mod I _p (%)	I _L (%)	LOI (%)	Description
BH1	1.20	U	23	48	19	>95	29		0.14		MADE GROUND: orange/brown, light grey/brown and brown mottled clay with occasional flint gravel and brick
BH1	3.20	U	33	57	25	>95	32		0.25		Brown/orange and light grey mottled silty CLAY, locally very silty
BH1	5.70	U	24	39	22	>95	17		0.12		Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH1	8.70	U	28	48	23	>95	25		0.20		Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH1	9.70	D	29	62	22	>95	40		0.18		Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH1	14.20	D	23								Dark grey slightly sandy CLAY with frequent partings of fine light grey sand. Locally silty
BH1	15.70	D	29								Dark grey slightly sandy CLAY with frequent partings of fine light grey sand. Locally silty
BH1	18.70	D	25	66	25	>95	41		0.00		Dark grey slightly sandy CLAY with frequent partings of fine light grey sand. Locally silty
BH2	3.00	U	29	60	26	>95	34		0.09		Brown and brown/orange mottled slightly silty CLAY with frequent veins of light grey clay and occasional silt partings. Locally silty
BH2	5.00	U	25	40	23	>95	17		0.12		Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty and sandy
BH2	6.50	D	28								Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty and sandy
BH2	8.00	D	23								Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty and sandy
BH2	11.00	D	25								Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	13.50	D	24								Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	14.00	U	26	48	24	>95	24		0.09		Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	15.50	D	23								Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	17.00	U	21	46	20	>95	26		0.04		Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	18.50	D	24								Dark grey silty slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally very silty
BH2	20.00	U	22	55	23	>95	32		-0.04		Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally very silty with occasional shell fragments

Testing in accordance with BS EN ISO 17892 unless specified otherwise

Date: 04 Mar 16

Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)

Percent passing 425µm: by estimation, by hand* or by sieving**

(Classification Sheet 1 of 2)

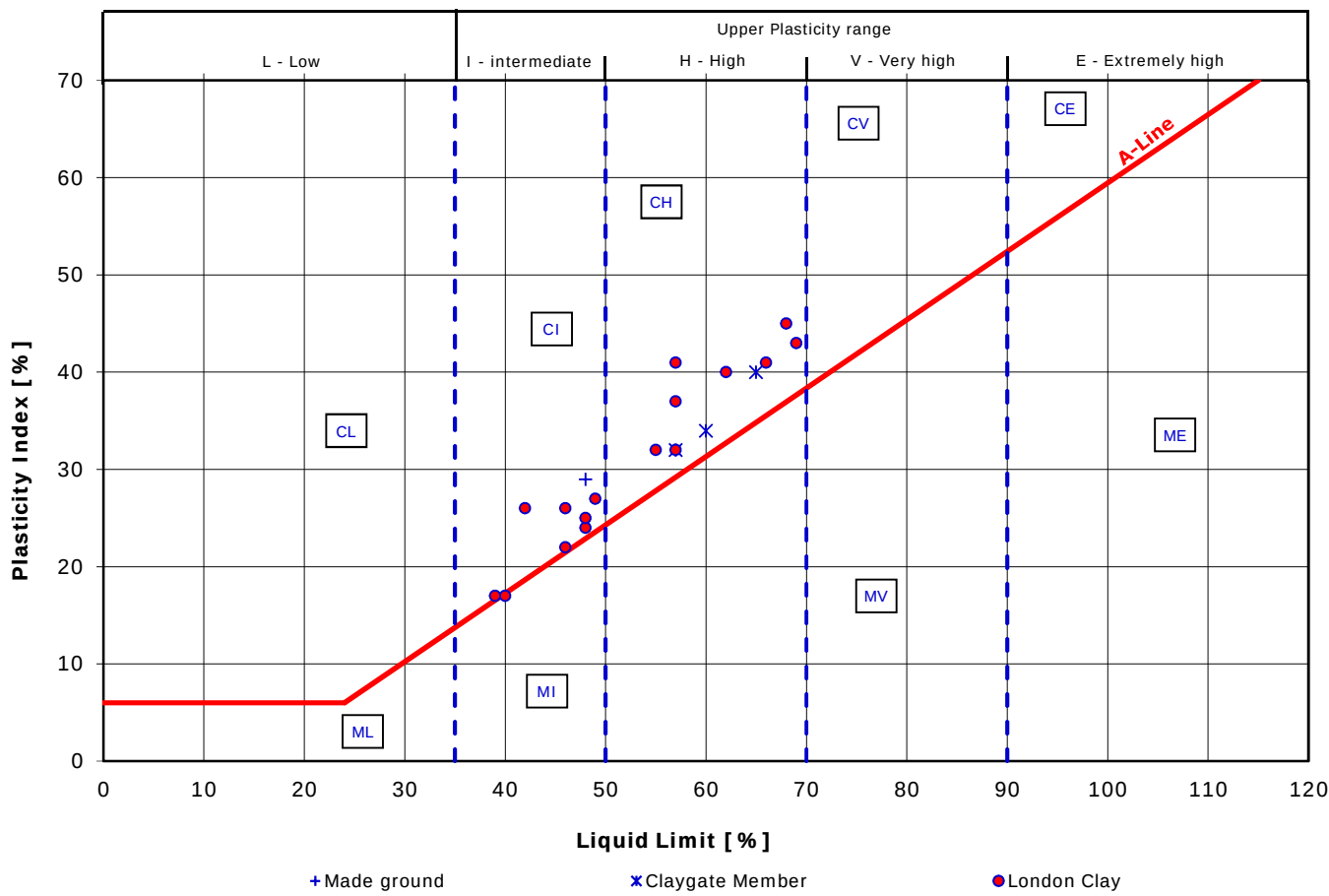
Site & Location	Highgate School - Richards Music Centre Bishopswood Road, London N6 4PR	Report No:	9933 / JRCB
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SUMMARY OF CLASSIFICATION TEST RESULTS

BH ID	Depth (m)	Type	w (%)	w _L (%)	w _p (%)	Pass 425 (%)	I _p (%)	Mod I _p (%)	I _L (%)	LOI (%)	Description
BH2	21.50	D	26								Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH2	23.00	U	24	57	25	>95	32		-0.04		Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH2	24.00	D	28								Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH2	26.00	U	25	69	26	>95	43		-0.03		Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH2	27.00	D	29								Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH2	29.00	U	24	68	23	>95	45		0.03		Dark greyish brown fissured CLAY, locally slightly silty. Occasional shell fragments
BH3	2.00	D	33	65	25	>95	40		0.20		Brown, brown/orange and light grey mottled slightly silty CLAY. Occasional silt partings
BH3	4.00	D	30								Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH3	6.00	D	24								Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH3	8.00	U	25	42	16	>95	26		0.35		Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH3	9.00	D	25								Dark grey slightly sandy CLAY with frequent pockets and partings of fine light grey sand. Locally silty
BH3	11.00	U	26	49	22	>95	27		0.15		Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally very silty
BH3	12.00	D	26								Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally very silty
BH3	14.00	U	26	57	20	>95	37		0.17		Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally very silty
BH3	15.00	D	23								Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally sandy
BH3	17.00	U	23	57	16	>95	41		0.18		Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally sandy
BH3	18.00	D	24								Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally sandy
BH3	19.50	U	22	46	24	>95	22		-0.10		Dark grey silty slightly sandy CLAY with frequent partings of fine light grey sand. Locally sandy

Testing in accordance with BS EN ISO 17892 unless specified otherwise	Date:	04 Mar 16
Modified Plasticity Index calculated in accordance with NHBC Standards Chapter 4.2 (reported if %passing 425mm <95%)		
Percent passing 425µm: by estimation, by hand* or by sieving**		(Classification Sheet 2 of 2)

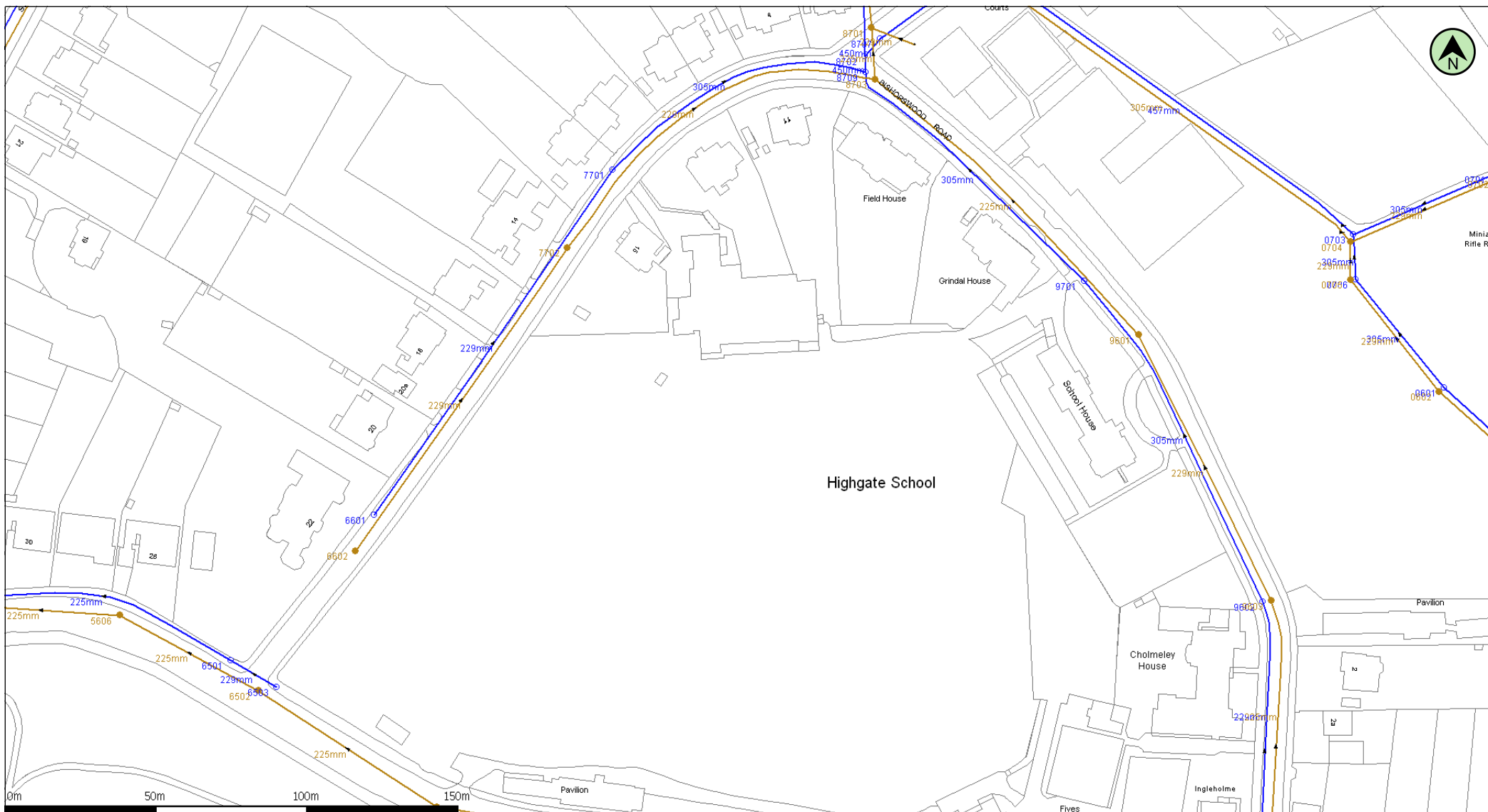
Plasticity Chart



M - SILT [plots below the A-Line]
C - CLAY [plots above the A-Line]

Classification in accordance with BS5930:1999+A2:2010 "Code of practice for site investigations"

Appendix D – TW Asset Information



Ordnance Survey Mapping © Crown Copyright 1000019345 Date: 08/11/12 Scale: 1:1787 Map Centre: 527806.5,187669.9 Data updated: 01/09/12 Wastewater Plan A4

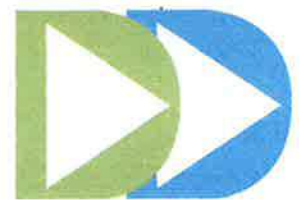
Based on the Ordnance Survey Map with the sanction of the Controller of H.M. Stationary Office License Number:- 100019345. This map is to be used for the purposes of viewing the location of Thames Water plant only. Any other uses of the map data or further copies are not permitted. The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. This information is valid for the date printed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified on site before any works are undertaken.

Foul Sewer	—	Foul Manhole	●
Surface Sewer	—	Surface Manhole	○
Combined Sewer	—	Combined Manhole	●
Abandoned Sewer	—	Abandoned Manhole	○
Pressure Main	—	Other Manhole	●
Private Asset (Colour denotes effluent type)	—	End Item	●
Proposed Asset (Colour denotes effluent type)	—	S104 Boundary	—

marco.maserati@haringey.gov.uk



Appendix E – CCTV Survey



**Direct Drain
Services**

☎ 01992 765444

✉ info@directdrain.co.uk

🌐 www.directdrain.co.uk

Our Ref: CPR/CCTV SR No: 1867

4 August 2014

Estates Department
Highgate School
North Road
London
N6 4AY

Attention: Jeni Parkins

Dear Jeni

Re: CCTV drainage survey @ Highgate School (rear of Richard's Music Centre & Sports Hall Bishopswood Road Highgate London N6

I can now confirm the CCTV drainage survey at this property has been completed and enclose the DVD & written report that refers.

The survey was completed via a foul and separate surface water manhole chamber's located within an adjacent property. The surveys were completed on both outfall drains of the foul and surface water systems. Similarly surveys were also completed within upstream drainage of both chambers. All surveys could not be completed due to the distances involved but structural faults to include root intrusion have been observed.

We recommend the next step is to confirm who owns the drainage. It is possible that both the foul and surface water drainage systems (to also include manhole chambers) are the responsibility of Thames Water Utilities. For a small fee, Thames Water will provide maps of their sewers and surface water drainage that will confirm if they have any interest within these manhole chambers.

If Thames Water does not own the apparatus, we will need to extend the survey reports to confirm the locations of all up and downstream manhole chambers. Repair options and costs can then be provided to also include moving both manhole chambers and re-routing drainage contained within.

I hope the enclosed is of interest but should you require any further assistance then please do not hesitate to contact me.

Yours sincerely

**Chris Reeve OS20X (W.R.C. Qualified)
Director**



Direct Drain Services
Unit 9 Waterways Business Centre
Navigation Drive, Off South Ordinance Road
Tel: 01992 765 444
Fax:
Email: info@directdrain.co.uk

Project-information

Project name : HIGHGATE SCHOOLREAR RICHARD	Project Number : 1867	Contact : Chris Reeve	Date : 22/07/2014
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Client: Highgate School
Contact Name:
Department:
Road: North Road
Town:
County: London N6 4AY
Telephone:
Fax:
Mobile:
E-mail:

Site: Richards Music Centre & Sports Area
Contact Name:
Department:
Road: Highgate School, Bishopswood Road
Town: Highgate
County: London N6
Telephone:
Fax:
Mobile:
E-mail:

Contractor Direct Drain Services
Contact Name: Chris Reeve
Department:
Road: Unit 9 Waterways Business Centre
Town: Navigation Drive, Off South Ordinance Road
County: Enfield Lock, Middlesex EN3 6JJ
Telephone: 01992 765 444
Fax:
Mobile:
E-mail: info@directdrain.co.uk

Highgate School - Survey of Richards Music Centre and Sports Area - List of all drains surveyed

No.	Upstream MH	Upstream Depth [m]	Downstream MH	Downstream Depth [m]	Inspection dir.	Inspected Length
1	MHCW01	2360	UNKNOWN		MHCW01 (D/S) UNKNOWN	57.69
2	MHSW01	2400	UNKNOWN		MHSW01 (D/S) UNKNOWN	57.08
3	UNKNOWN		MHSW01	2340	MHSW01 (U/S) UNKNOWN	17.25
4	UNKNOWN		MHCW01	2340	MHCW01 (U/S) UNKNOWN	49.83
						181.85 m

Summary Recommendations of Inspection Reports

Client: Highgate School	Site: Rear of Richards Music Centre and Sports Area
Survey Start Date: 22 July 2014	Survey Ref: 1867

Structural Defect

Service Defect

Constructional defect

General Observation

Section/Run Number	Summary Recommendation
1	This survey refers to the downstream sewer and discharges under the tennis courts. The length of the sewer prevented the survey from being completed. To move the manhole chamber (MHCW01) will require confirmation that this chamber and all drainage contained within is not the ownership or responsibility of Thames Water Utilities Limited. Assuming Thames Water have no interest, costs can be provided to move the existing manhole chamber and re-route all drainage and pipe work contained within. The survey has also confirmed numerous structural faults exist including root intrusion. If this sewer is not the responsibility of Thames Water then we recommend further investigations are completed to confirm the downstream access (manhole chamber) and provide repair options thereafter.
2	This survey refers to the downstream surface water drain and discharges under the tennis courts. The length of the surface water drain prevented the survey from being completed. To move the manhole chamber (MHSW01) will require confirmation that this chamber and all drainage contained within is not the ownership or responsibility of Thames Water Utilities Limited. Assuming Thames Water have no interest, costs can be provided to move the existing manhole chamber and re-route all drainage and pipe work contained within. The survey has also confirmed numerous structural faults exist including root intrusion. If this surface water drain is not the responsibility of Thames Water then we recommend further investigations are completed to confirm the downstream access (manhole chamber) and provide repair options thereafter.
3	This survey refers to the upstream surface water drain and discharges under the neighbouring property.. The length of the surface water drain prevented the survey from being completed. To move the manhole chamber (MHSW01) will require confirmation that this chamber and all drainage contained within is not the ownership or responsibility of Thames Water Utilities Limited. Assuming Thames Water have no interest, costs can be provided to move the existing manhole chamber and re-route all drainage and pipe work contained within. The survey has also confirmed numerous structural faults exist including some lateral junctions. If this surface water drain is not the responsibility of Thames Water then we recommend further investigations are completed to confirm the upstream access (manhole chamber) and provide repair options thereafter.
4	This survey refers to the upstream sewer and discharges under the neighbouring property. The length of the sewer prevented the survey from being completed. To move the manhole chamber (MHCW01) will require confirmation that this

Section/Run Number	Summary Recommendation
	chamber and all drainage contained within is not the ownership or responsibility of Thames Water Utilities Limited. Assuming Thames Water have no interest, costs can be provided to move the existing manhole chamber and re-route all drainage and pipe work contained within. The survey has also confirmed numerous structural faults exist including root intrusion. If this sewer is not the responsibility of Thames Water then we recommend further investigations are completed to confirm the upstream access (manhole chamber) and provide repair options thereafter.



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Service / Operational Defects (SRM 4)

Project name :
HIGHGATE SCHOOLREAR RICHARD

Project Number :
1867

Contact :
Chris Reeve

Date :
22/07/2014

No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	MHCW01X	D	C	C 225	22/07/2014	VC	57.69	57.69	1	2	3	1.96	112.8
2	MHSW01X	D	S	C 300	24/07/2014	VC	57.08	57.08	1	0	1	0	0
3	UNKNOWNX	U	C	C 300	22/07/2014	VC	17.25	17.25	-	0	1	0	0
4	UNKNOWNX	U	C	C 225	24/07/2014	VC	49.83	49.83	1	4	3	2	99.6



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Structural Defects (SRM 4)

Project name : HIGHGATE SCHOOLREAR RICHARD	Project Number : 1867	Contact : Chris Reeve	Date : 22/07/2014
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No.	PLR	Dir.	Use	Shape / Size	Date	Mat.	Total Length	Insp. Length	Peak HWG	Peak Score	Grade	Mean Score	Total Score
1	MHCW01X	D	C	C 225	22/07/2014	VC	57.69	57.69	4	205	5	4.94	285
2	MHSW01X	D	S	C 300	24/07/2014	VC	57.08	57.08	3	80	4	2.98	150
3	UNKNOWNX	U	C	C 300	22/07/2014	VC	17.25	17.25	4	80	4	16.81	290
4	UNKNOWNX	U	C	C 225	24/07/2014	VC	49.83	49.83	3	40	3	1	50



Direct Drain Services
Unit 9 Waterways Business Centre
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Inspection report

Date : 22/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 1	PLR SUFFIX: X
Weather : no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Operator : E SCOTT

Place : Road : Location Inspection	HIGHGATE SPORTS AREA HIGHGATE SNAP (state in comments) MHCW01 (D/S) UNKNOWN	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	MHCW01 2360 UNKNOWN
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Use: Year laid : Purpose : Total length :	Combined Z Routine inspection of condition 57.69 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay
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Comment :	LOCATION BETWEEN SPORTS AREA AND RICHARDS MUSIC CE
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1:270	Position	Code	Observation	Photo	Grade
Depth: 2360					
	0.00	MH	Start node type, manhole, reference number : MHCW01		(Constr) 0
	0.00	WL	Water level, 5% of the vertical dimension		(Serv) 0
	0.95	RFJ	Roots, fine at joint		(Serv) 2
	0.95	JDM	Joint displaced, medium		(Struct) 1
	1.26	S01 DEG	Attached deposits, grease, from 7 to 5 o'clock, 5% cross-sectional area loss, Start Remarks: IN PATCHES		(Serv) 3
	1.78	RFJ	Roots, fine at joint		(Serv) 2
	2.53	JDM	Joint displaced, medium		(Struct) 1
	3.24	RFJ	Roots, fine at joint		(Serv) 2
	4.92	JDM	Joint displaced, medium		(Struct) 1
	5.71	RFJ	Roots, fine at joint		(Serv) 2
	8.88	JDM	Joint displaced, medium		(Struct) 1
	9.64	S02 CLJ	Crack, longitudinal at joint, at 12 o'clock, Start		(Struct) 2
	11.22	RFJ	Roots, fine at joint		(Serv) 2
	11.22	JDM	Joint displaced, medium		(Struct) 1
	11.30	JDM	Joint displaced, medium		(Struct) 1



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Inspection Report

Date : 22/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 1	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Grade:

1:270	Position	Code	Observation	Photo	Grade
	12.04	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	12.24	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	12.84	F02 CLJ	Crack, longitudinal at joint, at 12 o'clock, End		(Struct) 2
	13.86	CLJ	Crack, longitudinal at joint, at 12 o'clock		(Struct) 2
	15.89	JDM	Joint displaced, medium		(Struct) 1
	17.46	JN	Junction, at 9 o'clock, diameter 150mm		(Constr) 0
	18.00	FL	Fracture, longitudinal, at 2 o'clock		(Struct) 3
	18.16	B	Broken pipe, from 2 to 5 o'clock		(Struct) 4
	18.28	H	Hole in drain/sewer, from 3 to 6 o'clock		(Struct) 5
	18.28	FCJ	Fracture, circumferential at joint, from 12 to 2 o'clock		(Struct) 3
	22.27	JDM	Joint displaced, medium		(Struct) 1
	26.04	JDM	Joint displaced, medium		(Struct) 1
	30.70	JDM	Joint displaced, medium		(Struct) 1
	35.51	JDM	Joint displaced, medium		(Struct) 1
	37.82	JDM	Joint displaced, medium		(Struct) 1
	46.91	JDM	Joint displaced, medium		(Struct) 1
	55.22	JDM	Joint displaced, medium		(Struct) 1



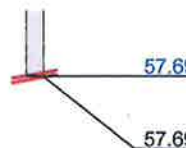
Direct Drain Services
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 Email: info@directdrain.co.uk

Inspection Report

Date : 22/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 1	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Grade:

1:270 Position Code Observation Photo Grade



	57.69 F01	DEG	Attached deposits, grease, from 7 to 5 o'clock, 5% cross-sectional area loss, End Remarks: IN PATCHES		(Serv) 3
	57.69	SA	Survey abandoned Remarks: END OF PUSH ROD		(Misc) 0

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	206	4.94	285	5	1	2	1.96	112.8	3

HIGHGATE SCHOOLREAR RICHARDS MUSIC CENTRE AND SPORTS AREA



Direct Drain Services
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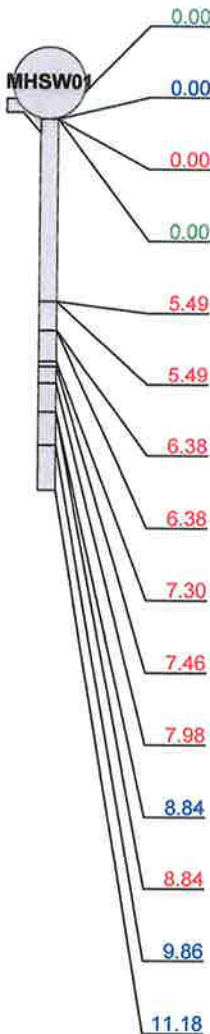
Inspection report

Date : 24/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 2	PLR SUFFIX: X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Operator : E SCOTT

Place : Road : Location Inspection	HIGHGATE SPORTS AREA HIGHGATE SNAP (state in comments) MHSW01 (D/S) UNKNOWN	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	MHSW01 2400 UNKNOWN
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Use: Year laid : Purpose : Total length :	Surface water Z Routine inspection of condition 57.08 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay
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Comment :

1:216 Position Depth: 2400	Code	Observation	Photo	Grade
	MH	Start node type, manhole, reference number : MHSW01		(Constr) 0
	WL	Water level, 5% of the vertical dimension		(Serv) 0
	JDM	Joint displaced, medium		(Struct) 1
	JN	Junction, at 1 o'clock, diameter 150mm		(Constr) 0
	FLJ	Fracture, longitudinal at joint, at 12 o'clock		(Struct) 3
	FLJ	Fracture, longitudinal at joint, at 5 o'clock		(Struct) 3
	S01 FLJ	Fracture, longitudinal at joint, at 12 o'clock, Start		(Struct) 3
	FLJ	Fracture, longitudinal at joint, at 5 o'clock		(Struct) 3
	CC	Crack, circumferential, from 12 to 4 o'clock		(Struct) 2
	FLJ	Fracture, longitudinal at joint, at 3 o'clock		(Struct) 3
	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	RFJ	Roots, fine at joint		(Serv) 2
	F01 FLJ	Fracture, longitudinal at joint, at 12 o'clock, End		(Struct) 3
	RFJ	Roots, fine at joint		(Serv) 2
	RFJ	Roots, fine at joint		(Serv) 2



Direct Drain Services
Unit 9 Waterways Business Centre
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Inspection Report

Date : 24/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 2	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Grade:

1:216	Position	Code	Observation	Photo	Grade
	11.33	JN	Junction, at 10 o'clock, diameter 150mm		(Constr) 0
	12.20	JN	Junction, at 2 o'clock, diameter 150mm		(Constr) 0
	12.78	RFJ	Roots, fine at joint		(Serv) 2
	12.78	S02 CLJ	Crack, longitudinal at joint, at 12 o'clock, Start		(Struct) 2
	15.87	F02 CLJ	Crack, longitudinal at joint, at 12 o'clock, End		(Struct) 2
	15.87	S03 FLJ	Fracture, longitudinal at joint, at 12 o'clock, Start		(Struct) 3
	17.42	FLJ	Fracture, longitudinal at joint, at 3 o'clock		(Struct) 3
	17.61	CC	Crack, circumferential, from 7 to 2 o'clock		(Struct) 2
	18.32	JDM	Joint displaced, medium		(Struct) 1
	19.10	FCJ	Fracture, circumferential at joint, from 12 to 4 o'clock		(Struct) 3
	19.10	FLJ	Fracture, longitudinal at joint, at 2 o'clock		(Struct) 3
	19.71	FLJ	Fracture, longitudinal at joint, at 3 o'clock		(Struct) 3
	20.61	FLJ	Fracture, longitudinal at joint, at 9 o'clock		(Struct) 3
	20.61	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	21.45	FLJ	Fracture, longitudinal at joint, at 3 o'clock		(Struct) 3
	21.83	FC	Fracture, circumferential, from 7 to 9 o'clock		(Struct) 3
	21.83	FL	Fracture, longitudinal, at 9 o'clock		(Struct) 3

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
6	80	2.98	150	4	0	0	0	0	1

HIGHGATE SCHOOLREAR RICHARDS MUSIC CENTRE AND SPORTS AREA



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Email: info@directdrain.co.uk

Inspection report

Date : 22/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 3	PLR SUFFIX: X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Operator : E SCOTT

Place : Road : Location Inspection	HIGHGATE SPORTS AREA HIGHGATE ROAD (state in comments) MHSW01 (U/S) UNKNOWN	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	UNKNOWN MHSW01 2340
---	---	---	--	-------------------------------

Use: Year laid : Purpose : Total length :	Combined Z Routine inspection of condition 17.25 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 300 mm Vitrified clay
--	---	--	--------------------------------------

Comment :

1:72	Position	Code	Observation	Photo	Grade
Depth: 2340					
	0.00	MH	Start node type, manhole, reference number : MHSW01		(Constr) 0
	0.00	WL	Water level, 5% of the vertical dimension		(Serv) 0
	0.00	S01 FLJ	Fracture, longitudinal at joint, at 12 o'clock, Start		(Struct) 3
	0.57	CC	Crack, circumferential, from 8 to 12 o'clock		(Struct) 2
	1.29	FL	Fracture, longitudinal, at 5 o'clock		(Struct) 3
	2.93	FM	Fracture, multiple, from 11 to 7 o'clock		(Struct) 4
	3.81	FLJ	Fracture, longitudinal at joint, at 3 o'clock		(Struct) 3
	4.27	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	4.60	FC	Fracture, circumferential, from 1 to 4 o'clock		(Struct) 3
	5.57	FC	Fracture, circumferential, from 1 to 5 o'clock		(Struct) 3
	6.01	JDM	Joint displaced, medium		(Struct) 1
	6.88	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	6.88	JN	Junction, at 1 o'clock, diameter 150mm		(Constr) 0
	6.88	FC	Fracture, circumferential, from 3 to 6 o'clock		(Struct) 3
	7.34	FC	Fracture, circumferential, from 3 to 6 o'clock		(Struct) 3



Direct Drain Services
 Unit 9 Waterways Business Centre
 Navigation Drive, Off South Ordinance Road
 Tel: 01992 765 444
 Fax:
 Email: info@directdrain.co.uk

Inspection Report

Date : 22/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 3	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Grade:

1:72 Position Code Observation Photo Grade

	15.81	FLJ	Fracture, longitudinal at joint, at 4 o'clock		(Struct) 3
	17.25 F01	FLJ	Fracture, longitudinal at joint, at 12 o'clock, End		(Struct) 3
	17.25	SA	Survey abandoned Remarks: UNABLE TO PUSH ROD ANY FURTHER		(Misc) 0

Structural Defects

Service Defects

Constructional Features

Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
7	80	16.61	290	4	0	0	0	0	1

HIGHGATE SCHOOLREAR RICHARDS MUSIC CENTRE AND SPORTS AREA



Direct Drain Services
Unit 9 Waterways Business Centre
Street : Navigation Drive, Off South Ordinance Road
Tel: 01992 765 444
Fax:
Email: info@directdrain.co.uk

Inspection report

Date : 24/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 4	PLR SUFFIX: X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Operator : E SCOTT

Place : Road : Location Inspection	HIGHGATE SPORTS AREA HIGHGATE SNAP (state in comments) MHCW01 (U/S) UNKNOWN	Location details: Catchment: Tape number : Pipe Length	U/S MH : U/S Depth : D/S MH : D/S Depth :	UNKNOWN MHCW01 2340
---	---	---	--	-------------------------------

Use: Year laid : Purpose : Total length :	Combined Z Routine inspection of condition 49.83 m	Pipe shape : Pipe size : Pipe material : Lining :	Circular 225 mm Vitrified clay
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Comment :

1:288 Position Code Observation Photo Grade
Depth: 2340

	MHCW01	MH	Start node type, manhole, reference number : MHCW01		(Constr) 0
	0.00	WL	Water level, 5% of the vertical dimension		(Serv) 0
	0.00	FLJ	Fracture, longitudinal at joint, at 12 o'clock		(Struct) 3
	0.00	JDM	Joint displaced, medium Remarks: 6.80		(Struct) 1
	0.00	DEG	Attached deposits, grease, from 7 to 5 o'clock, 5% cross-sectional area loss Remarks: IN PATCHES		(Serv) 3
	0.53	CN	Connection other than junction, at 12 o'clock, diameter 150mm		(Constr) 0
	0.73	FLJ	Fracture, longitudinal at joint, at 12 o'clock		(Struct) 3
	1.00	S05 DEG	Attached deposits, grease, from 7 to 5 o'clock, 5% cross-sectional area loss, Start Remarks: IN PATCHES		(Serv) 3
	1.09	FLJ	Fracture, longitudinal at joint, at 12 o'clock		(Struct) 3
	1.92	FLJ	Fracture, longitudinal at joint, at 2 o'clock		(Struct) 3
	1.92	FLJ	Fracture, longitudinal at joint, at 8 o'clock		(Struct) 3
	1.92	FLJ	Fracture, longitudinal at joint, at 11 o'clock		(Struct) 3



Direct Drain Services
Unit 9 Waterways Business Centre
Navigation Drive, Off South Orcombe Road
Tel: 01992 765 444
Fax:
Email: info@directdrain.co.uk

Inspection Report

Date : 24/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 4	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Preset :	Cleaned : no	Grade:

1:288	Position	Code	Observation	Photo	Grade
	2.81	S01	FLJ	Fracture, longitudinal at joint, at 12 o'clock, Start	(Struct) 3
	2.81		FLJ	Fracture, longitudinal at joint, at 8 o'clock	(Struct) 3
	2.81	S02	FLJ	Fracture, longitudinal at joint, at 3 o'clock, Start	(Struct) 3
	3.46		FLJ	Fracture, longitudinal at joint, at 8 o'clock	(Struct) 3
	5.06		FC	Fracture, circumferential, from 12 to 4 o'clock	(Struct) 3
	6.80		JDM	Joint displaced, medium	(Struct) 1
	6.80	F02	FLJ	Fracture, longitudinal at joint, at 3 o'clock, End	(Struct) 3
	6.80	F01	FLJ	Fracture, longitudinal at joint, at 12 o'clock, End	(Struct) 3
	8.90		CLJ	Crack, longitudinal at joint, at 12 o'clock	(Struct) 2
	8.98		CC	Crack, circumferential, from 12 to 3 o'clock	(Struct) 2
	9.89	S03	CLJ	Crack, longitudinal at joint, at 12 o'clock, Start	(Struct) 2
	10.77	S04	FLJ	Fracture, longitudinal at joint, at 3 o'clock, Start	(Struct) 3
	13.66		FCJ	Fracture, circumferential at joint, from 3 to 6 o'clock	(Struct) 3
	13.66		CLJ	Crack, longitudinal at joint, at 10 o'clock	(Struct) 2
	16.05	F03	CLJ	Crack, longitudinal at joint, at 12 o'clock, End	(Struct) 2
	16.05	F04	FLJ	Fracture, longitudinal at joint, at 3 o'clock, End	(Struct) 3
	19.95		RFJ	Roots, fine at joint	(Serv) 2
	25.48		JN	Junction, at 9 o'clock, diameter 150mm	(Constr) 0



Direct Drain Services
Unit 9 Waterways Business Centre
Navigation Drive, Off South Ordinance Road
Tel: 01992 765 444
Fax:
Email: info@directdrain.co.uk

Inspection Report

Date : 24/07/2014	Job number : HIGHGATE S	Weather : no rain or snow	Operator : E SCOTT	Section number : 4	PLR : X
Weather no rain or snow	Vehicle : VEHICLE 1	Camera : PUSHROD	Presel :	Cleaned : no	Grade:

1:288 Position Code Observation Photo Grade

	26.81	RFJ	Roots, fine at joint		(Serv) 2
	48.97	JN	Junction, at 10 o'clock, diameter 150mm		(Constr) 0
	49.58	JN	Junction, at 1 o'clock, diameter 150mm		(Constr) 0
	49.83	F05 DEG	Attached deposits, grease, from 7 to 5 o'clock, 5% cross-sectional area loss, End Remarks: IN PATCHES		(Serv) 3
	49.83	SA	Survey abandoned Remarks: END OF PUSH ROD		(Misc) 0

Structural Defects

Service Defects

Constructional Features

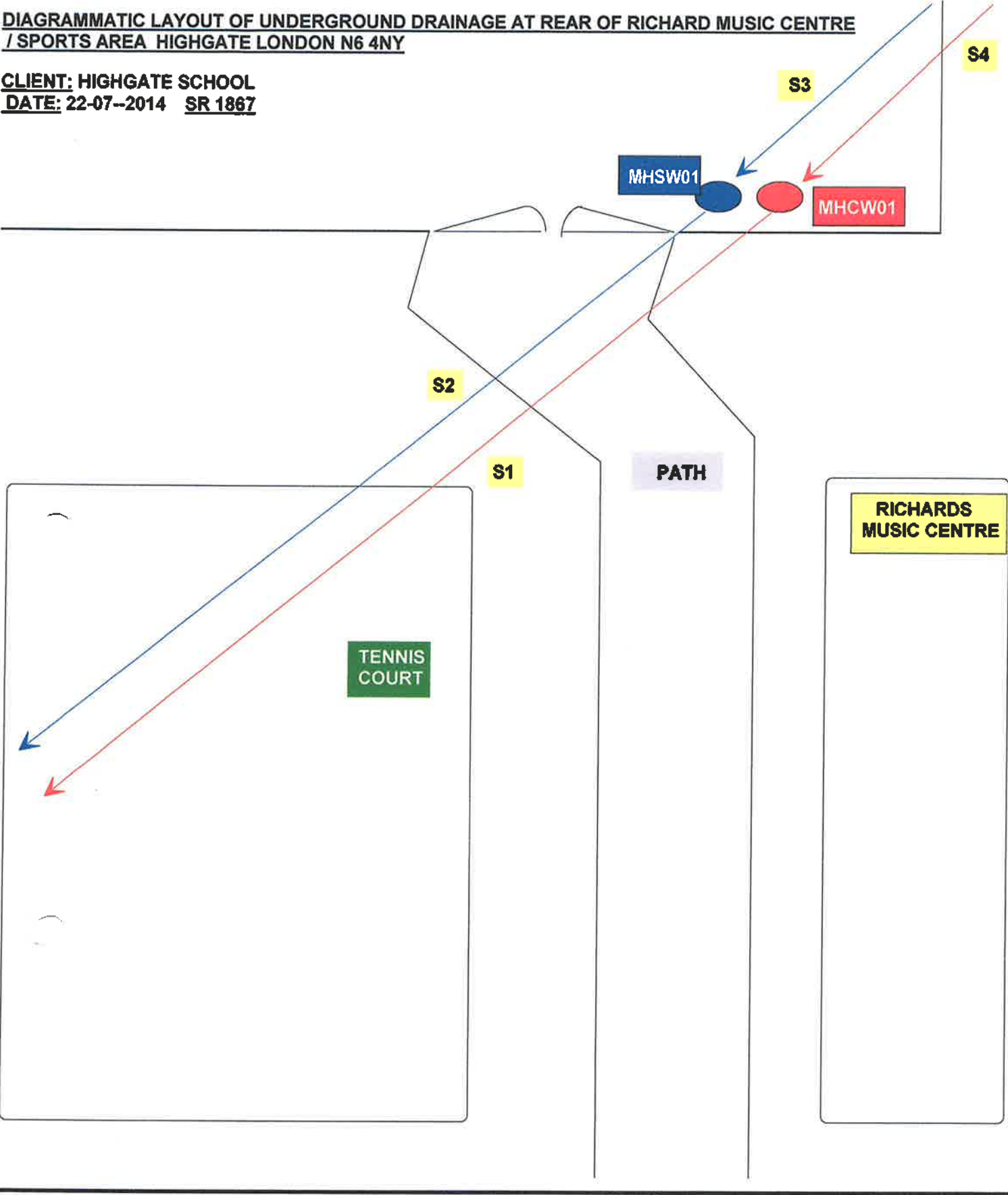
Miscellaneous Features

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	40	1	60	3	2	4	2	99.6	3

HIGHGATE SCHOOLREAR RICHARDS MUSIC CENTRE AND SPORTS AREA

**DIAGRAMMATIC LAYOUT OF UNDERGROUND DRAINAGE AT REAR OF RICHARD MUSIC CENTRE
/ SPORTS AREA HIGHGATE LONDON N6 4NY**

CLIENT: HIGHGATE SCHOOL
DATE: 22-07-2014 SR 1867



DRAWING IS DIAGRAMMATIC & NOT TO SCALE



DRAINS LIMITED t/a DIRECT DRAIN SERVICES

UNIT 9 WATERWAYS BUSINESS CENTRE SOUTH ORDNANCE ROAD ENFIELD MIDDLESEX EN3 6JJ

TELEPHONE: 01992 765444 FAX: 01992 765777 E-MAIL: directdds@directdds.co.uk

MANHOLE CHAMBER RECORD CARD

CUSTOMER: HIGHGATE SCHOOL

SITE ADDRESS: REAR RICHARDS MUSIC CENTRE / SPORTS AREA BISHOPSWOOD ROAD HIGHGATE N6 4NY

DATE OF SURVEY: 22-07-2014 SURVEY No: S/R 1867 MANHOLE CHAMBER No: MHCW01

CONTACT: INSPECTION CHAMBER DUTY: COMBINED FOUL & SURFACE WATER

MANHOLE COVER

COVER SIZE: 600x600mm ROUND

CONSTRUCTION: CAST IRON

DUTY: HEAVY DUTY

MANHOLE ACCESS: GOOD ON GRASS NEXT TO PATH

MANHOLE OPENING SIZE: 600x600mm ROUND

REMARKS: UNSURE IF THIS MANHOLE CHAMBER & SEWER CONTAINED WITHIN IS THE RESPONSIBILITY OF THAMES WATER UTILITIES LIMITED.

MANHOLE COVER CONDITION

- ☒ SATISFACTORY
☐ ROCKING
☐ WORN
☐ BROKEN COVER/FRAME
☐ REPAIR
☐ REPLACE

MANHOLE CHAMBER

520x1500mm

BENCHING & CHANNEL CONDITION

- ☐ SATISFACTORY
☐ DEBRIS / GREASE / SCALE
☐ BROKEN / CRACKED CHANNEL
☒ EVIDENCE OF RODENT ACTIVITY
☐ BENCHING REPAIRS REQUIRED
☐ ROOT INTRUSION
☐ RODENT ACTIVITY

STEP IRONS

- ☒ SATISFACTORY
 HOW MANY? 2
☐ MISSING
☐ CORRODED
☐ UNSECURE
☐ NONE

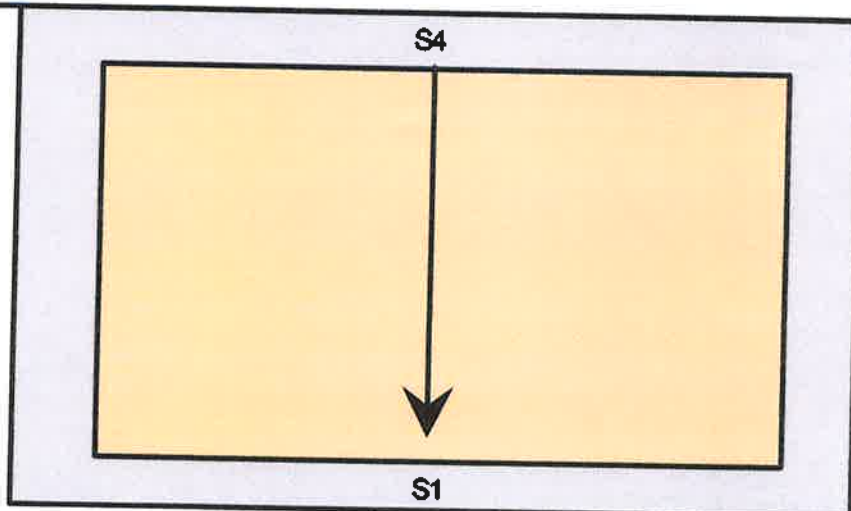
MANHOLE CONSTRUCTION

- ☒ BRICK
☐ CONCRETE RINGS
☐ CONCRETE RECTANGULAR SEGMENTS
☐ POLYVINYL CHLORIDE CHANNEL/CHAMBER
☐ BRICK RENDERED WITH CEMENT

INTERNAL MANHOLE PLAN

MANHOLE WALL CONDITION

- ☒ SATISFACTORY
☐ BROKEN
☐ ERODED
☐ CRACKED & MISSING RENDERING
☐ WATER INFILTRATION
☐ ROOT INTRUSION
☐ CHAMBER WALLS 'BLOWN'
☐ MANHOLE CHAMBER WALL REPAIRS REQUIRED
☐ OTHER



CONNECTIONS	DEPTH (M)	DIA. (mm)	MATERIAL	FROM	TO
S1	2360mm	225mm	VITRIFIED CLAY	MHCW01	UNKNOWN
S4	2340mm	225mm	VITRIFIED CLAY	UNKNOWN	MHCW01



DRAINS LIMITED t/a DIRECT DRAIN SERVICES

UNIT 9 WATERWAYS BUSINESS CENTRE SOUTH ORDNANCE ROAD ENFIELD MIDDLESEX EN3 6JJ

TELEPHONE: 01992 765444 FAX: 01992 765777 E-MAIL: directdds@directdds.co.uk

MANHOLE CHAMBER RECORD CARD

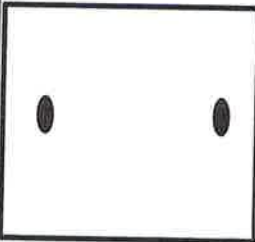
CUSTOMER: HIGHGATE SCHOOL

SITE ADDRESS: REAR RICHARDS MUSIC CENTRE / SPORTS AREA BISHOPSWOOD ROAD HIGHGATE N6 4NY

DATE OF SURVEY: 22-07-2014 SURVEY No: S/R 1867 MANHOLE CHAMBER No: MHSW01

CONTACT: INSPECTION CHAMBER DUTY: SURFACE WATER

MANHOLE COVER



COVER SIZE: 600x600mm ROUND

CONSTRUCTION: CAST IRON

DUTY: HEAVY DUTY

MANHOLE ACCESS: GOOD ON GRASS NEXT TO PATH

MANHOLE OPENING SIZE: 600x600mm ROUND

REMARKS: UNSURE IF THIS MANHOLE CHAMBER & SURFACE WATER DRAIN CONTAINED WITHIN IS THE RESPONSIBILITY OF THAMES WATER UTILITIES LIMITED

MANHOLE COVER CONDITION

- ☒ SATISFACTORY
☐ ROCKING
☐ WORN
☐ BROKEN COVER/FRAME
☐ REPAIR
☐ REPLACE

MANHOLE CHAMBER

520 x 1500mm

MANHOLE CONSTRUCTION

- ☒ BRICK
☐ CONCRETE RINGS
☐ CONCRETE RECTANGULAR SEGMENTS
☐ POLYVINYL CHLORIDE CHANNEL/CHAMBER
☐ BRICK RENDERED WITH CEMENT

BENCHING & CHANNEL CONDITION

- ☒ SATISFACTORY
☐ DEBRIS / GREASE / SCALE
☐ BROKEN / CRACKED CHANNEL
☐ EVIDENCE OF RODENT ACTIVITY
☐ BENCHING REPAIRS REQUIRED
☐ ROOT INTRUSION
☐ RODENT ACTIVITY

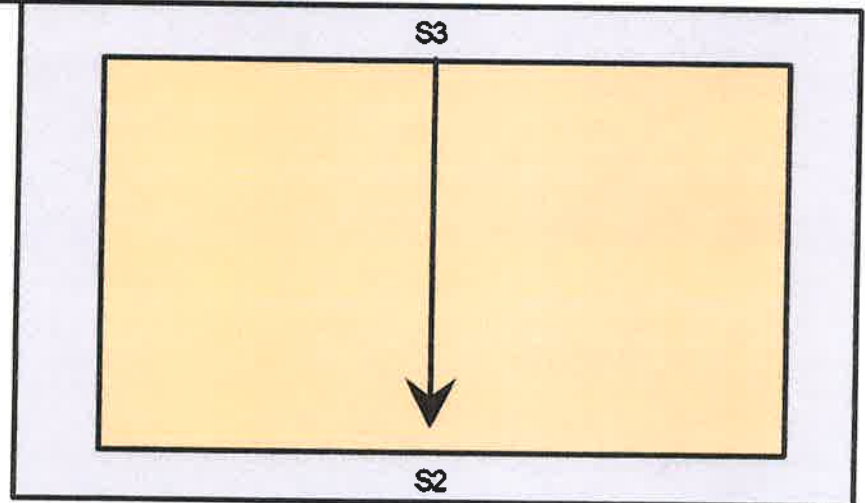
STEP IRONS

- ☒ SATISFACTORY
 HOW MANY? 3
☐ MISSING
☐ CORRODED
☐ UNSECURE
☐ NONE

INTERNAL MANHOLE PLAN

MANHOLE WALL CONDITION

- ☒ SATISFACTORY
☐ BROKEN
☐ ERODED
☐ CRACKED & MISSING RENDERING
☐ WATER INFILTRATION
☐ ROOT INTRUSION
☐ CHAMBER WALLS "BLOWN"
☐ MANHOLE CHAMBER WALL REPAIRS REQUIRED
☐ OTHER



CONNECTIONS	DEPTH (M)	DIA. (mm)	MATERIAL	FROM	TO
S2	2360mm	300mm	VITRIFIED CLAY	MHSW01	UNKNOWN
S3	2400mm	300mm	VITRIFIED CLAY	UNKNOWN	MHSW01



Project-information

Project name:

Contract number:

Contact:

Date:
21/04/2009

Client
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

SMITH CONSTRUCTION SPORTS & CIVILS
C O/ D.GWYN JONES FRICS
SENIOR CAPITAL PROJECTS MANAGER
NORTH ROAD
LONDON, N6 4AY

020 8340 7674

Site
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

HIGHGATE SCHOOL

NORTH ROAD ,
LONDON ,N6 4AY

020 8340 1524

Contractor
Contact:
Position:
Road
Town
County
Telephone:
Fax:
Mobile:
E-Mail:

LANES GROUP PLC . RAIL DIVISION
JOHN WRIGHT
C.C..T.V OPERATIONS MANAGER
16 LAMSON ROAD
RAINHAM
ESSEX RM13 9YY
01708 553555
01708 630523
07725782240
wright.john@lanesgroup.co.uk



Defect Grade Description

Project name:

Contract number:

Contact:

Date:
21/04/2009**1:**

Occurrences without damage: for example, laterals, joints etc.

NO DEFECTS WERE DETECTED.

2:

Constructional deficiencies or occurrences 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 EMERGENCY 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.

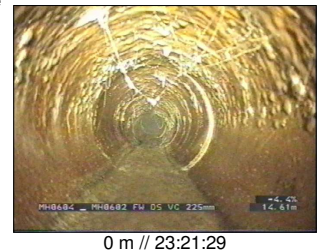
Inspection report

Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 1	PLR: 0604 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0604
Place: High Gate School	Drain. Area: Sports Field	end MH: 0602
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 74.13 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 225	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Foul	Lining: Lining Type:	

Comment:

1:550	position	code	observation	grade
	0.00	MH	Start node type, manhole, reference number: 0604	0
	0.00	WL	Water level 05 % height/diameter	0
	0.00	S1 DEF	Attached deposits, fouling from 09 to 03 o'clock 05 % cross-sectional area loss, Start	
	16.89	JN	Junction at 10 o'clock dia 150 mm	0
	17.36	BJ	Broken Pipe at joint from 04 to 06 o'clock	4
	74.12	F1 DEF	Attached deposits, fouling from 09 to 03 o'clock 05 % cross-sectional area loss, Finish	
	74.13	MHF	Finish node type, manhole, reference number: 0602	





Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 1	PLR: 0604 X
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Photo: 3_3a, Tape No.: 002, 23:21:29
0m, Attached deposits, fouling from 09 to 03 o'clock 05 %
cross-sectional area loss, Start



Photo: 5_5a, Tape No.: 002, 23:23:36
17.36m, Broken Pipe at joint from 04 to 06 o'clock

Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 1	PLR: 0604 X
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Photo: 5_5b, Tape No.: 002, 23:23:36
 17.36m, Broken Pipe at joint from 04 to 06 o'clock



Photo: 7_7a, Tape No.: 002, 23:30:15
 74.13m, Finish node type, manhole, reference number: 0602



Inspection report

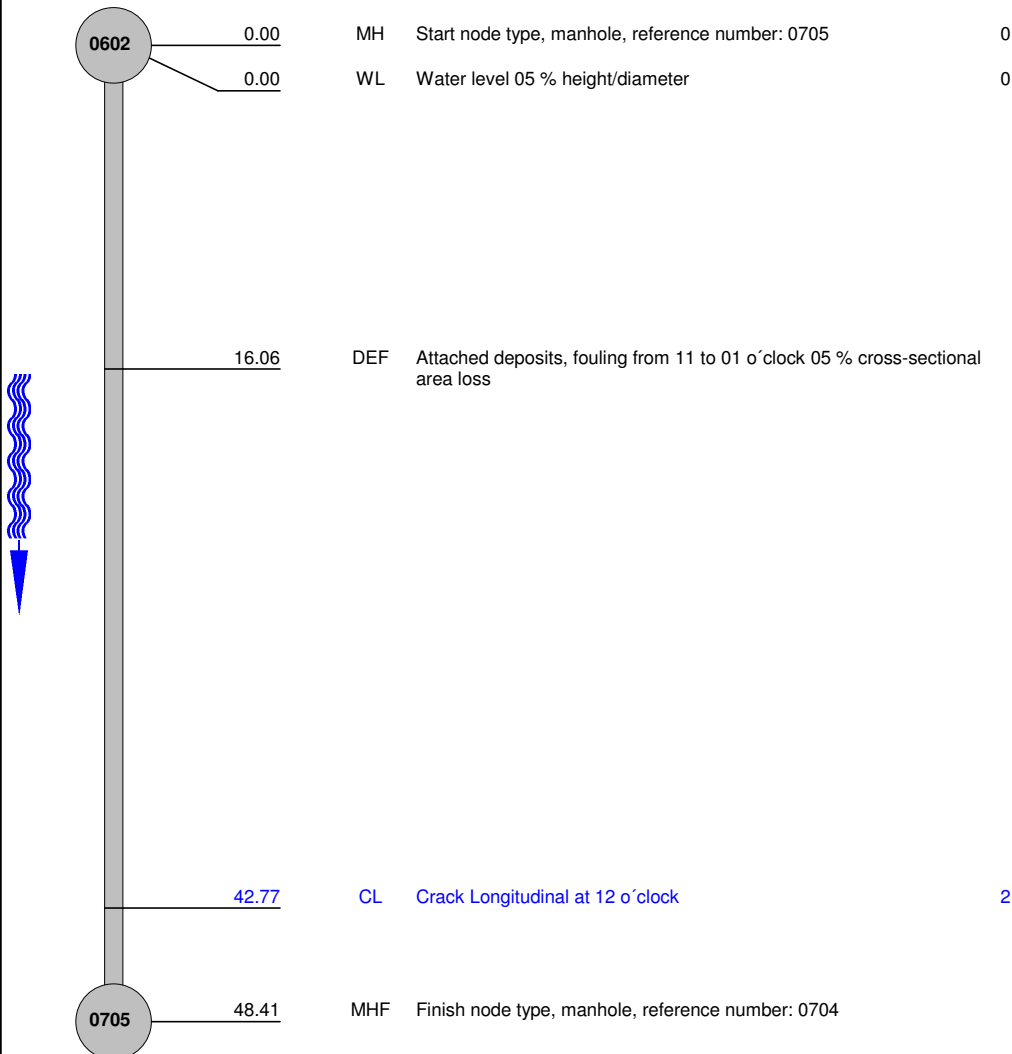
Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 2	PLR: 0602 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0602
Place: High Gate School	Drain. Area: Sports Field	end MH: 0705
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 48.41 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 225	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Foul	Lining: 	
	Lining Type:	

Comment:

1:375 position code observation

grade





Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 2	PLR: 0602 X
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Photo: 12_5a, Tape No.: 002, 23:35:39

48.41m, Finish node type, manhole, reference number: 0704

Inspection report

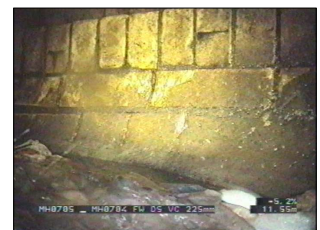
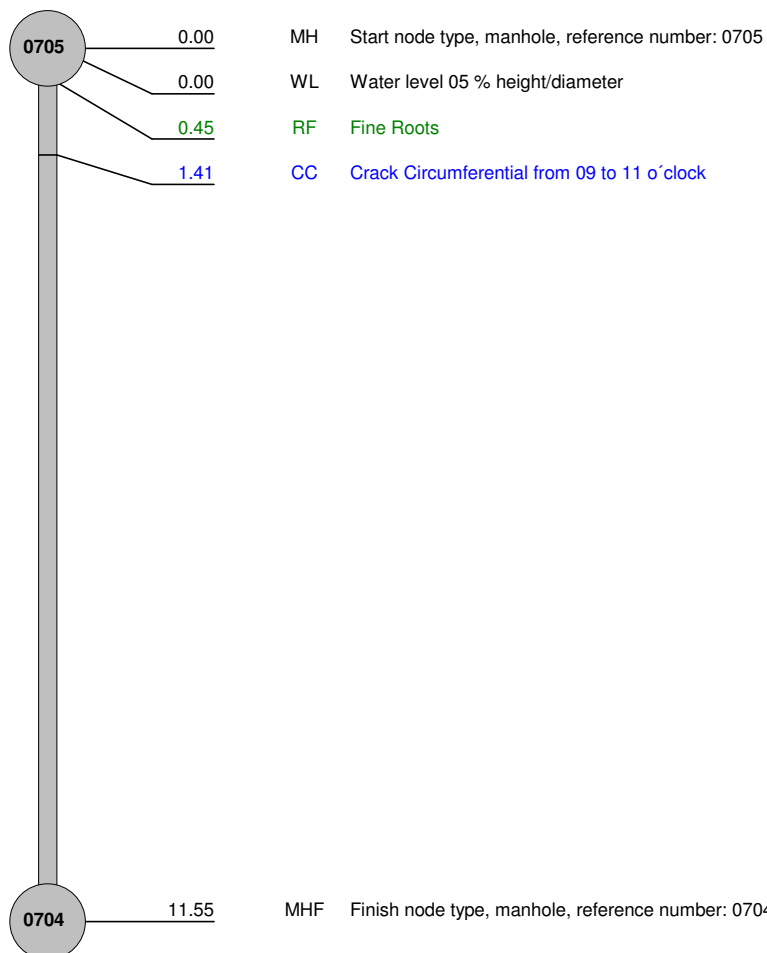
Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 3	PLR: 0705 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0705
Place: High Gate School	Drain. Area: Sports Field	end MH: 0704
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 11.55 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 225	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Foul	Lining: Lining Type:	

Comment:

1:100 position code observation

grade





Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 3	PLR: 0705 X
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Photo: 15_3a, Tape No.: 002, 23:36:20
0.45m, Fine Roots



Photo: 17_5a, Tape No.: 002, 23:38:14
11.55m, Finish node type, manhole, reference number: 0704



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 3	PLR: 0705 X
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Photo: 17_5b, Tape No.: 002, 23:38:14
11.55m, Finish node type, manhole, reference number: 0704

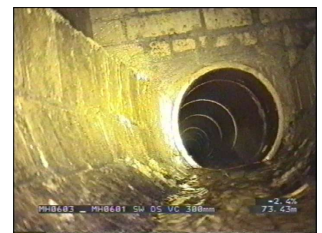
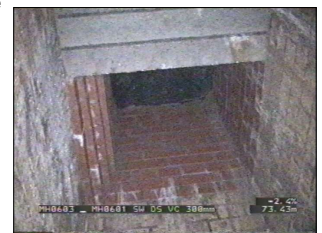
Inspection report

Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 4	PLR: 0603 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0603
Place: High Gate School	Drain. Area: Sports Field	end MH: 0601
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 73.43 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 300	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Surface water	Lining: 	
	Lining Type:	

Comment:

1:403	position	code	observation	grade
	0.00	MH	Start node type, manhole, reference number: 0603	0
	0.00	WL	Water level 05 % height/diameter	0
	4.56	FL	Fracture longitudinal at 12 o'clock	3
	5.40	FC	Fracture Circumferential from 12 to 03 o'clock	3
	6.39	FL	Fracture longitudinal at 09 o'clock	3
	6.66	CL	Crack Longitudinal at 11 o'clock	2
	9.76	RFJ	Fine Roots at joint	1
	10.45	JN	Junction at 11 o'clock dia 100 mm	0
	11.22	JN	Junction at 01 o'clock dia 100 mm	0
	11.70	RFJ	Fine Roots at joint	1
	15.44	CLJ	Crack Longitudinal at joint at 12 o'clock	2
	17.85	JN	Junction at 11 o'clock dia 100 mm	0
	18.21	CL	Crack Longitudinal at 02 o'clock	2
	18.87	FL	Fracture longitudinal at 12 o'clock	3
	19.66	FL	Fracture longitudinal at 03 o'clock	3
	19.93	CLJ	Crack Longitudinal at joint at 09 o'clock	2
	21.32	FL	Fracture longitudinal at 12 o'clock	3
	21.92	CC	Crack Circumferential from 09 to 12 o'clock	2
	23.24	FL	Fracture longitudinal at 12 o'clock	3
	24.10	CL	Crack Longitudinal at 01 o'clock	2
	25.74	CL	Crack Longitudinal at 12 o'clock	2
	45.97	JN	Junction at 11 o'clock dia 100 mm	0
	47.05	JN	Junction at 02 o'clock dia 100 mm	0

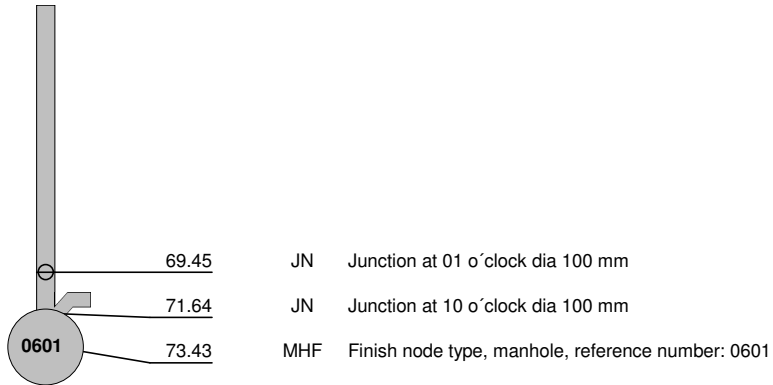




Inspection report

Date: 21/04/2009	Job nr.: 17877	Weather: Rain	Operator: John Wright	section number: 4	PLR: 0603 X
Present:	Vehicle: PF07EWE	Camera: Small Crawler	Preset:	Cleaned: No	Grade:

1:403 position code observation grade



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 4	PLR: 0603 X
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Photo: 43_26a, Tape No.: 002, 23:43:43
73.43m, Finish node type, manhole, reference number: 0601



Photo: 43_26b, Tape No.: 002, 23:43:43
73.43m, Finish node type, manhole, reference number: 0601



Inspection report

Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 5	PLR: 0601 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0601
Place: High Gate School	Drain. Area: Sports Field	end MH: 0706
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 47.73 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 300	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Surface water	Lining: 	
Lining Type: 		
Comment:		

1:350	position	code	observation	grade
	0.00	MH	Start node type, manhole, reference number: 0601	0
	0.00	WL	Water level 05 % height/diameter	0
	6.88	JN	Junction at 11 o'clock dia 100 mm	0
	7.78	JN	Junction at 02 o'clock dia 100 mm	0
	35.36	JN	Junction at 11 o'clock dia 100 mm	0
	39.84	JN	Junction at 02 o'clock dia 100 mm	0
	47.73	MHF	Finish node type, manhole, reference number: 0706	



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 5	PLR: 0601 X
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Photo: 50_7a, Tape No.: 002, 23:48:01
 47.73m, Finish node type, manhole, reference number: 0706



Photo: 50_7b, Tape No.: 002, 23:48:01
 47.73m, Finish node type, manhole, reference number: 0706



Inspection report

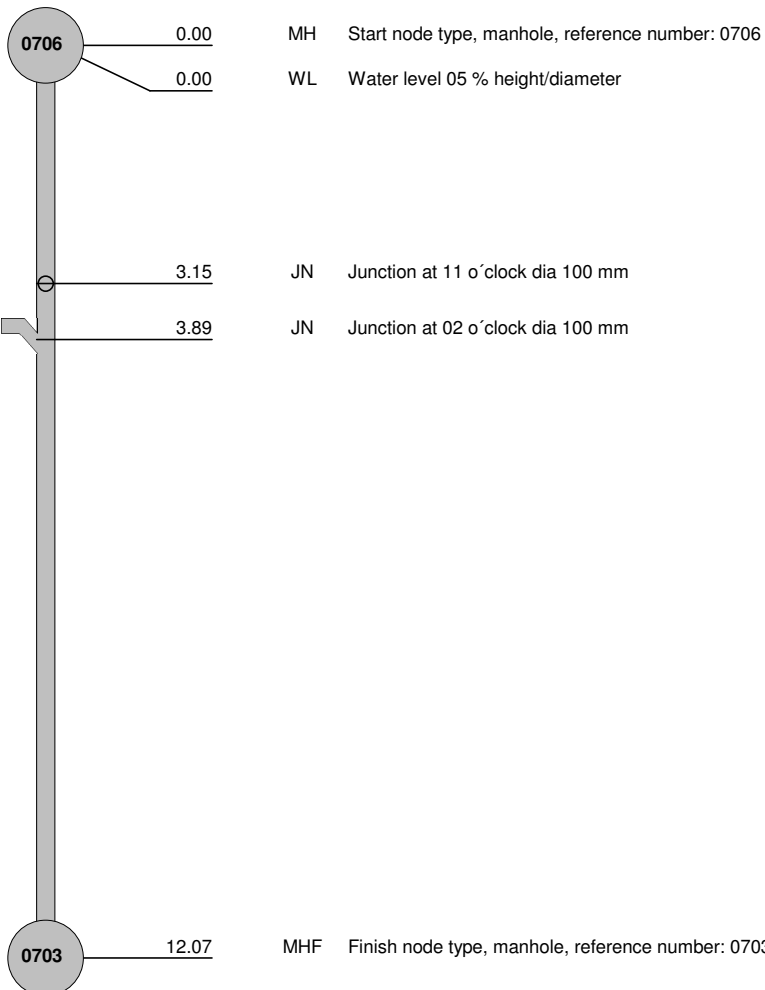
Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 6	PLR: 0706 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0706
Place: High Gate School	Drain. Area: Sports Field	end MH: 0703
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 12.07 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 300	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Surface water	Lining: Lining Type:	

Comment:

1:100 position code observation

grade



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 6	PLR: 0706 X
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Photo: 55_5a, Tape No.: 002, 23:50:11
 12.07m, Finish node type, manhole, reference number: 0703



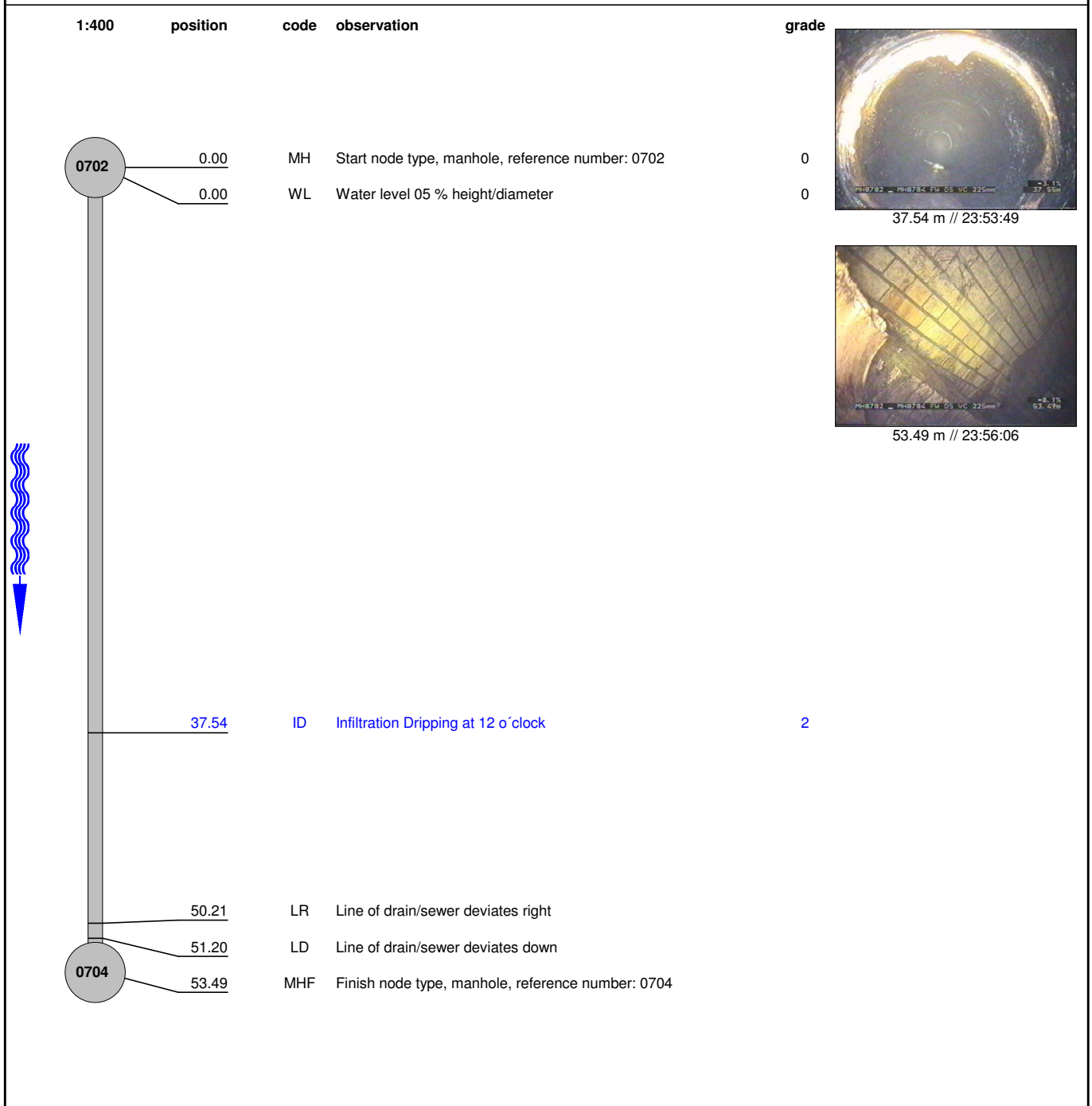
Photo: 55_5b, Tape No.: 002, 23:50:11
 12.07m, Finish node type, manhole, reference number: 0703



Inspection report

Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 7	PLR: 0702 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist:	start MH: 0702
Place: High Gate School	Drain. Area: Sports Field	end MH: 0704
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 53.49 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 225	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Foul	Lining: 	
Lining Type: 		
Comment:		



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 7	PLR: 0702 X
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Photo: 58_3a, Tape No.: 002, 23:53:49
37.54m, Infiltration Dripping at 12 o'clock



Photo: 61_6a, Tape No.: 002, 23:56:06
53.49m, Finish node type, manhole, reference number: 0704

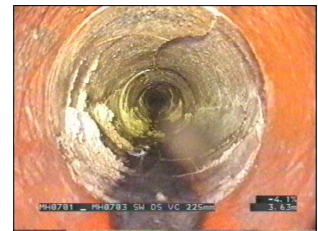
Inspection report

Date: 21/04/2009	Job N°: 17877	Weather: Rain	Operator: John Wright	section number: 8	PLR: 0701 X
Video Volume No.: 002	Flow Ctrl: No flow control	Temperature: above freezing	Year laid:	Cleaned: No	Strat. Drain:

Road: Bishopswood Road	Div/Dist: Sports Field	start MH: 0701
Place: High Gate School	Drain. Area: Sports Field	end MH: 0703
Location: Fields	Standard: BS EN 13508-2:2003	Total length: 15.96 m
Purpose: Post inspection of repairs or renovations	Shape/Size: Circular 300	
Type: Gravity drain/sewer	Material: Vitrified clay (i.e. all clayware)	Pipe length:
Use: Surface water	Lining: 	
	Lining Type:	

Comment:

1:93	position	code	observation	grade
Possibly disused				
	0.00	MH	Start node type, manhole, reference number: 0701	0
	0.00	WL	Water level 0 % height/diameter	0
	0.00	S1 RF	Fine Roots, Start	1
	1.56	CL	Crack Longitudinal at 09 o'clock	2
	3.57	F1 RF	Fine Roots, Finish	1
	3.71	FL	Fracture longitudinal at 01 o'clock	3
	3.76	FM	Fractures multiple from 10 to 06 o'clock	4
	4.74	FL	Fracture longitudinal at 08 o'clock	3
	4.74	FL	Fracture longitudinal at 12 o'clock	3
	4.74	FL	Fracture longitudinal at 05 o'clock	3
	5.44	B	Broken pipe from 11 to 01 o'clock Remark: Missing pipe	4
	6.36	FL	Fracture longitudinal at 08 o'clock	3
	6.36	FL	Fracture longitudinal at 12 o'clock	3
	6.36	FL	Fracture longitudinal at 04 o'clock	3
	6.90	B	Broken pipe from 11 to 02 o'clock Remark: Missing pipe	4
	6.90	FM	Fractures multiple from 12 to 12 o'clock	4
	8.42	BJ	Broken Pipe at joint from 09 to 03 o'clock	4
	8.68	FL	Fracture longitudinal at 09 o'clock	3
	8.68	FL	Fracture longitudinal at 12 o'clock	3
	8.68	FL	Fracture longitudinal at 05 o'clock	3
	9.33	FC	Fracture Circumferential from 09 to 12 o'clock	3
	10.76	B	Broken pipe from 09 to 12 o'clock	4
	10.76	B	Broken pipe from 04 to 07 o'clock	4
	11.72	S2 D	Deformed drain/sewer 05 %, Start	5
	12.46	B	Broken pipe from 11 to 04 o'clock	4





Inspection report

Date: 21/04/2009	Job nr.: 17877	Weather: Rain	Operator: John Wright	section number: 8	PLR: 0701 X
Present:	Vehicle: PF07EWE	Camera: Small Crawler	Preset:	Cleaned: No	Grade:

1:93	position	code	observation	grade
	13.65	FM	Fractures multiple from 12 to 12 o'clock	4
	14.63	FL	Fracture longitudinal at 12 o'clock	3
	14.63	FL	Fracture longitudinal at 04 o'clock	3
	15.51	B	Broken pipe from 08 to 12 o'clock	4
	15.96	H	Hole in sewer from 09 to 03 o'clock Remark: obstruction broken pipe	4
	15.96	F2 D	Deformed drain/sewer 05 %, Finish	5
	15.96	SA	Survey abandoned, Remark: Unable to pass obstruction	0





Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 8	PLR: 0701 X
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Photo: 8_29555a, Tape No.: 002, 23:56:33
0m, Fine Roots, Start



Photo: 8_29559a, Tape No.: 002, 23:57:43
3.76m, Fractures multiple from 10 to 06 o'clock



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 8	PLR: 0701 X
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Photo: 8_29563a, Tape No.: 002, 23:57:57

5.44m, Broken pipe from 11 to 01 o'clock Remark: Missing pipe



Photo: 8_29567a, Tape No.: 002, 23:58:16

6.9m, Broken pipe from 11 to 02 o'clock Remark: Missing pipe

Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 8	PLR: 0701 X
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Photo: 8_29569a, Tape No.: 002, 23:58:36
8.42m, Broken Pipe at joint from 09 to 03 o'clock



Photo: 8_29569b, Tape No.: 002, 23:58:36
8.42m, Broken Pipe at joint from 09 to 03 o'clock



Inspection photos

Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 8	PLR: 0701 X
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Photo: 8_29574a, Tape No.: 002, 23:58:57
10.76m, Broken pipe from 09 to 12 o'clock



Photo: 8_29582a, Tape No.: 002, 23:59:42
15.96m, Hole in sewer from 09 to 03 o'clock Remark: obstruction
broken pipe



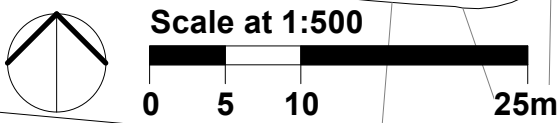
Inspection photos

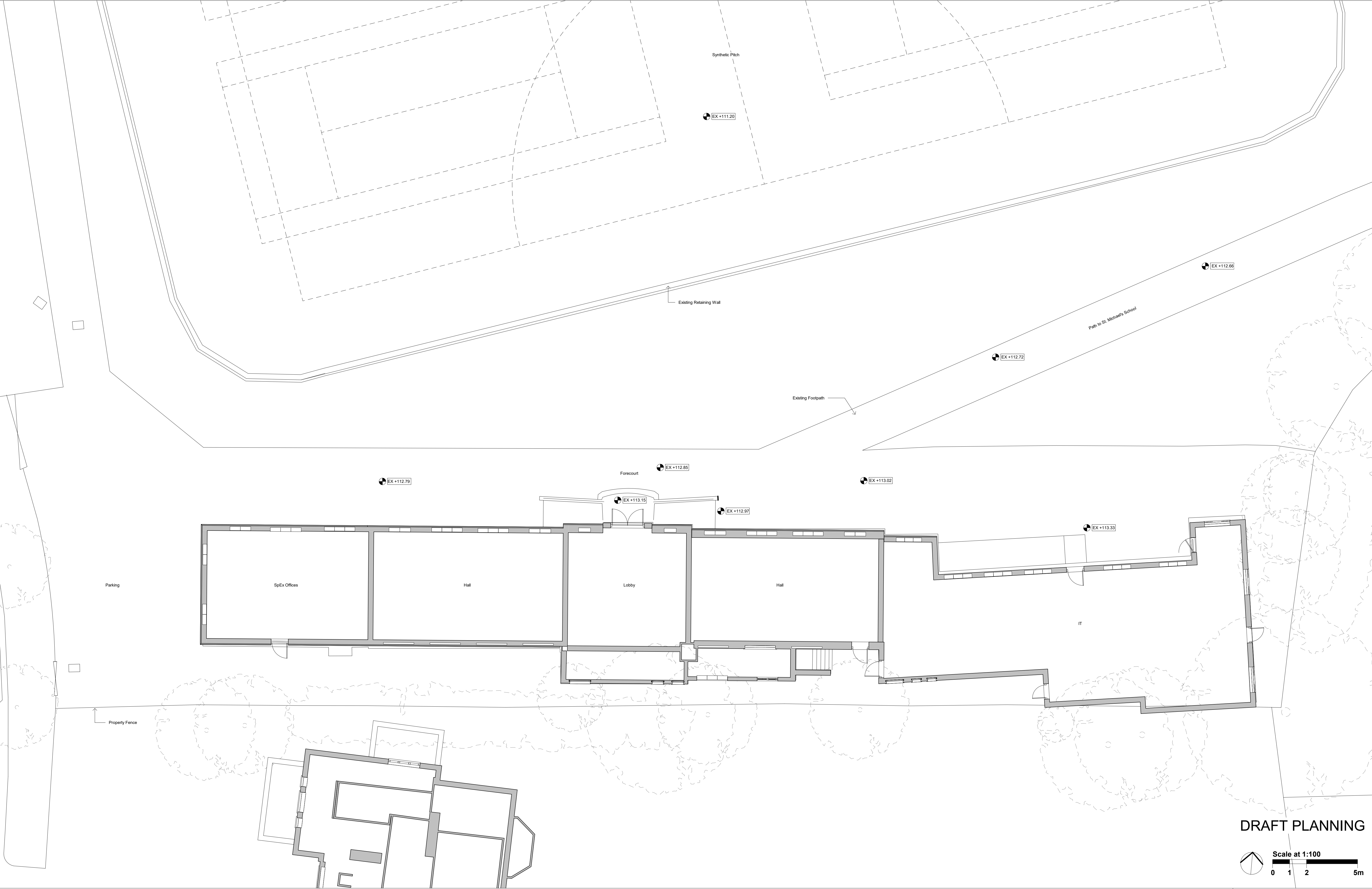
Place: High Gate School	Road: Bishopswood Road	Date: 21/04/2009	section number: 8	PLR: 0701 X
-----------------------------------	----------------------------------	----------------------------	-----------------------------	-----------------------



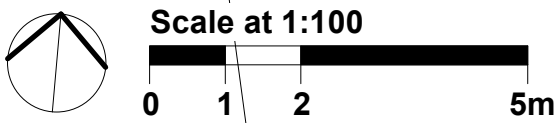
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15.96m, Hole in sewer from 09 to 03 o'clock Remark: obstruction
broken pipe

Appendix F – Project Drawings

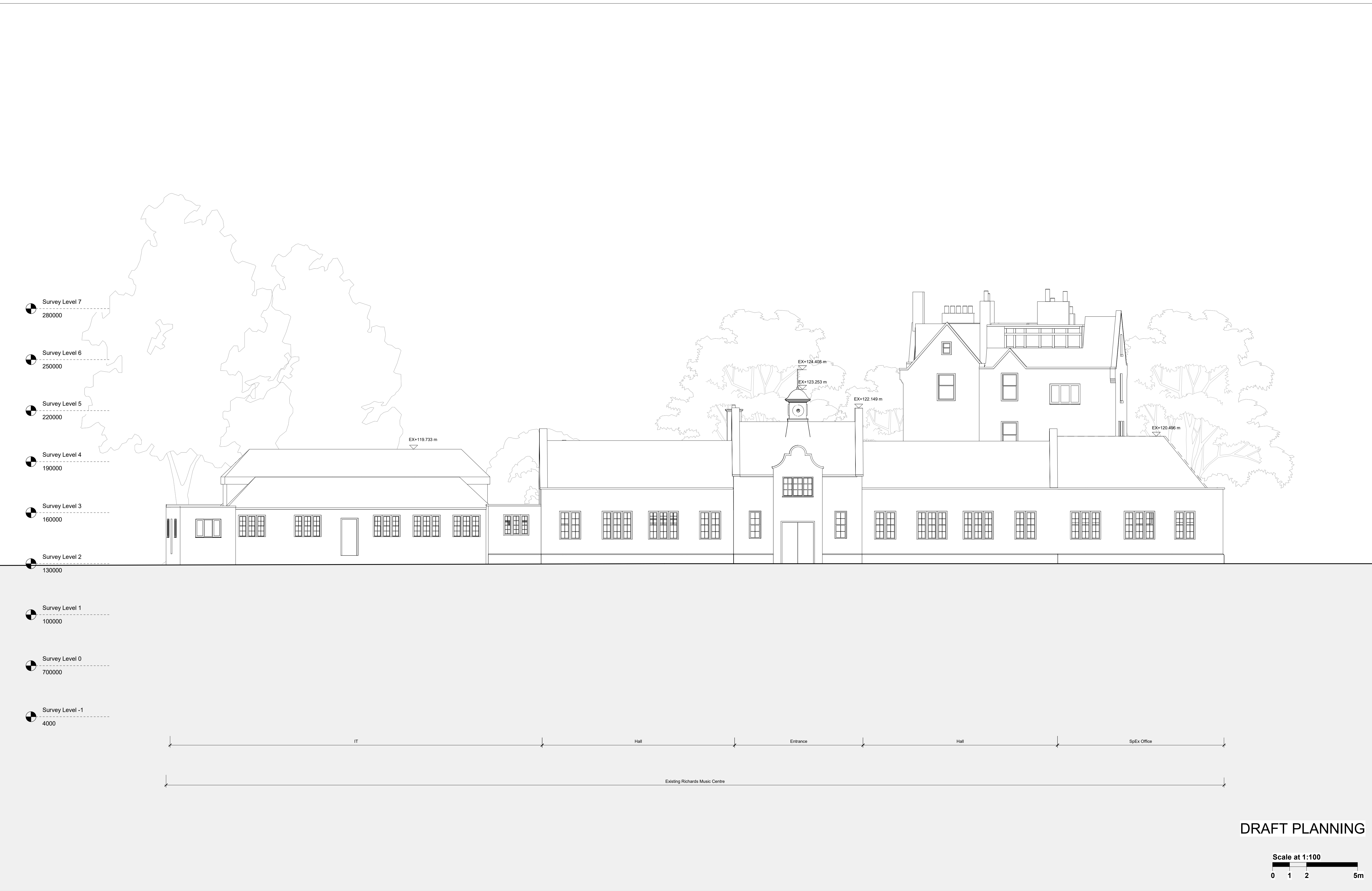
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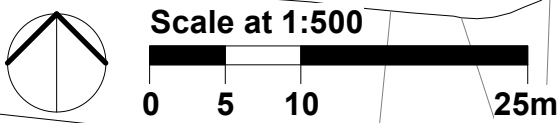
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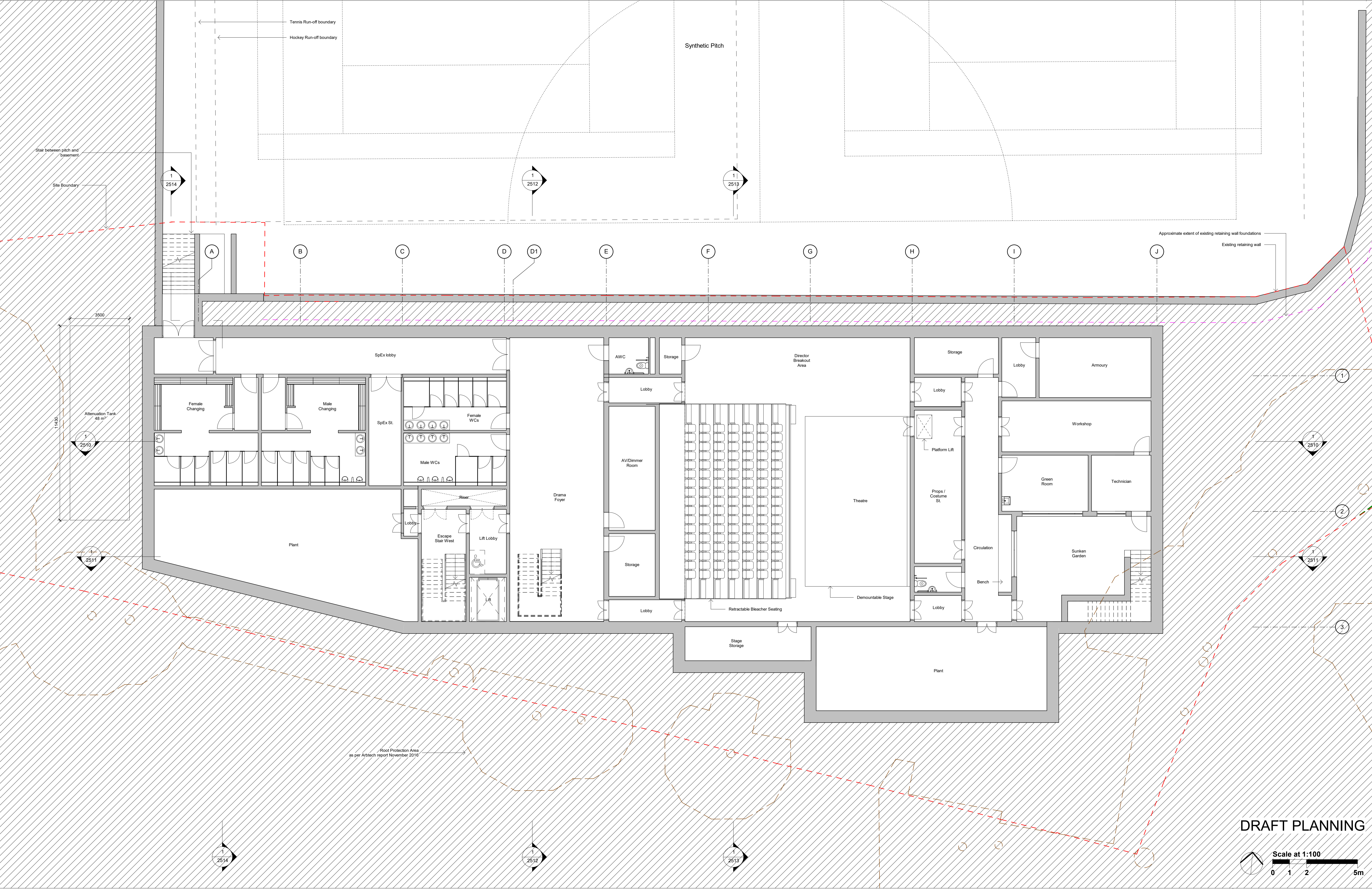
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						27.07.2018	A	Memo_0006_Stage 2 Background & Costing Issue	JG					Subject	Existing Ground Floor Plan	A/HS-RMC2	2200	C
						28.09.2018	B	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	C	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/25/18	Scale: 1 : 100	at A1



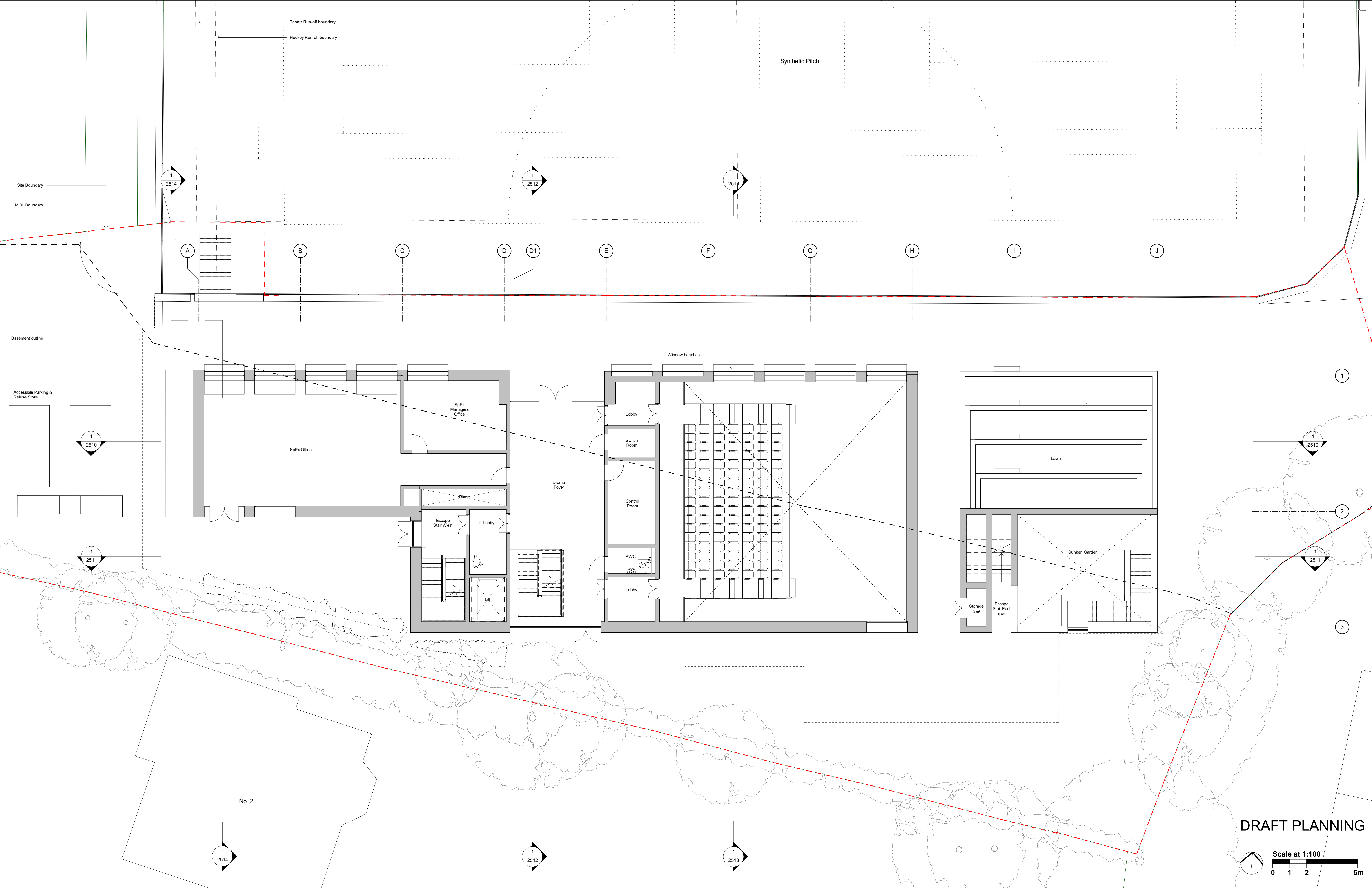
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						27.07.2018	A	Memo_0006_Stage 2 Background & Costing Issue	JG					Subject	Existing Site Elevations - North	A/HS-RMC2	2250	C
						28.09.2018	B	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	C	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/24/18	Scale: 1 : 100	at A1



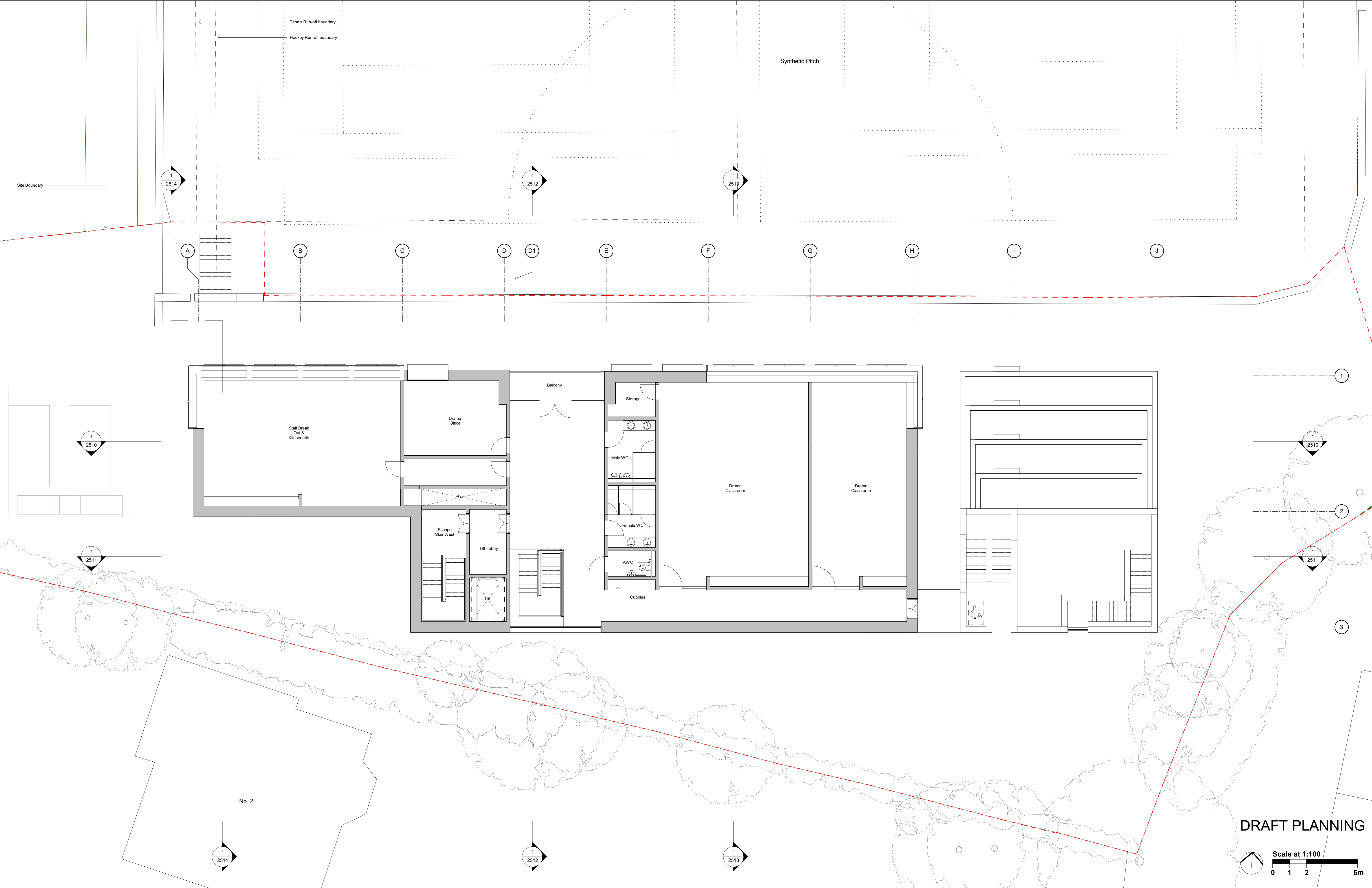
© Copyright Hopkins Architects Limited. Registered in England number: 11779559 Registered address: 27 Broadley Terrace London NW1 6LG Do Not Scale. Use Figured Dimensions Only. All Dimensions to be checked on site. Original Drawing Size A1 (L)



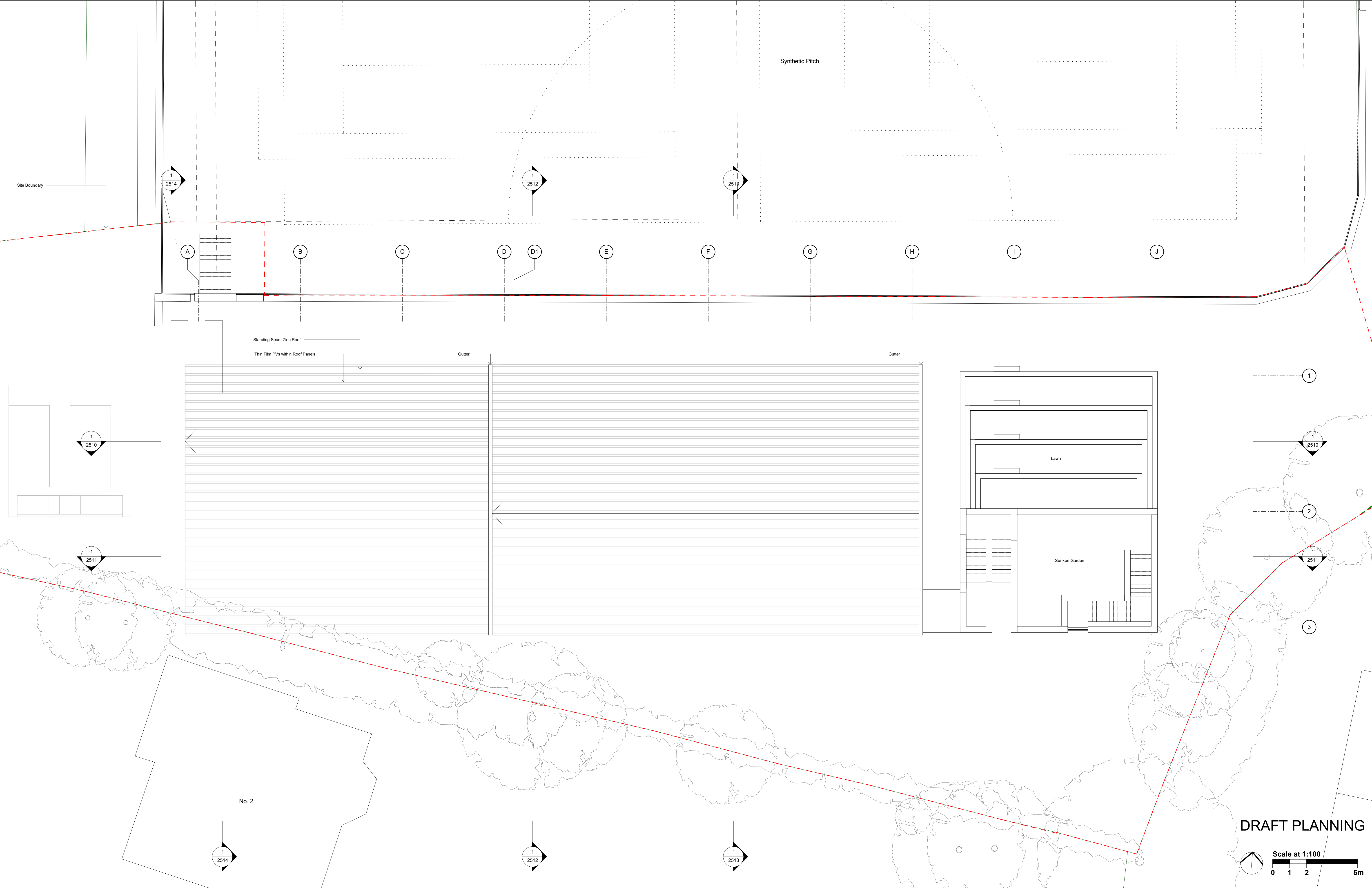
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						31.05.2018	A	Memo_0002_Draft GA Issue for Interim Cost Check	JG					Subject	Proposed GA Basement Plan	A/HS-RMC2	2310	H	
						07.06.2018	B	Memo_0003_Updated basement and east stair layout. Draft GA Issue for Interim Cost Check	JG										
						29.06.2018	C	Memo_0004_Update GA progress issue	JG										
						16.07.2018	D	Draft Issue to Fire Consultant	JG										
						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG										
						27.07.2018	F	Memo_0006_Stage 2 Background & Costing Issue	JG										
						29.09.2018	G	Memo_0008_Stage 2 Issue	JG										
						11.07.2019	H	Draft Planning Issue to Client	JW										
															Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 11/04/2018	Scale: 1 : 100	at A1



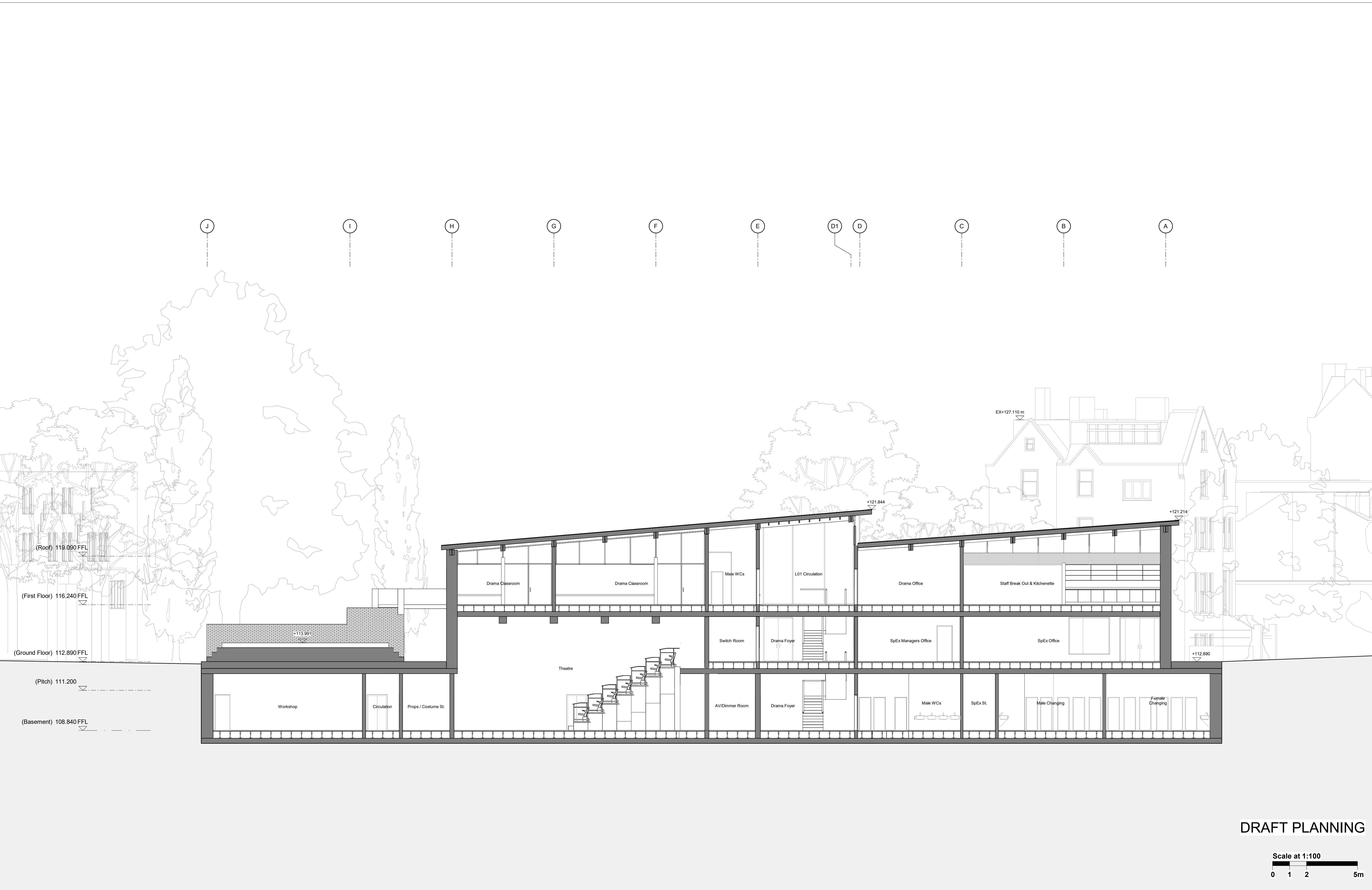
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						07.06.2018	B	Memo_0003_Updated basement and east stair layout. Draft GA Issue for Interim Cost Check	JG									
						29.06.2018	C	Memo_0004_Update GA progress issue	JG									
						16.07.2018	D	Draft Issue to Fire Consultant	JG									
						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG									
						27.07.2018	F	Memo_0006_Stage 2 Background & Costing Issue	JG									
						29.09.2018	G	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	H	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadway Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 11/04/2018	Scale: 1 : 100	at A1



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						31.05.2018	A	Memo_0002_Draft GA Issue for Interim Cost Check	JG					Highgate School Richards Music Centre 2	Proposed GA First Floor Plan	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	A/HS-RMC2	2312	H
						07.06.2018	B	Memo_0003_Updated basement and east stair layout. Draft GA Issue for Interim Cost Check	JG										
						29.06.2018	C	Memo_0004_Update GA progress issue	JG										
						16.07.2018	D	Draft Issue to Fire Consultant	JG										
						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG										
						27.07.2018	F	Memo_0006_Stage 2 Background & Costing Issue	JG										
						29.09.2018	G	Memo_0008_Stage 2 Issue	JG										
						11.07.2019	H	Draft Planning Issue to Client	JW										
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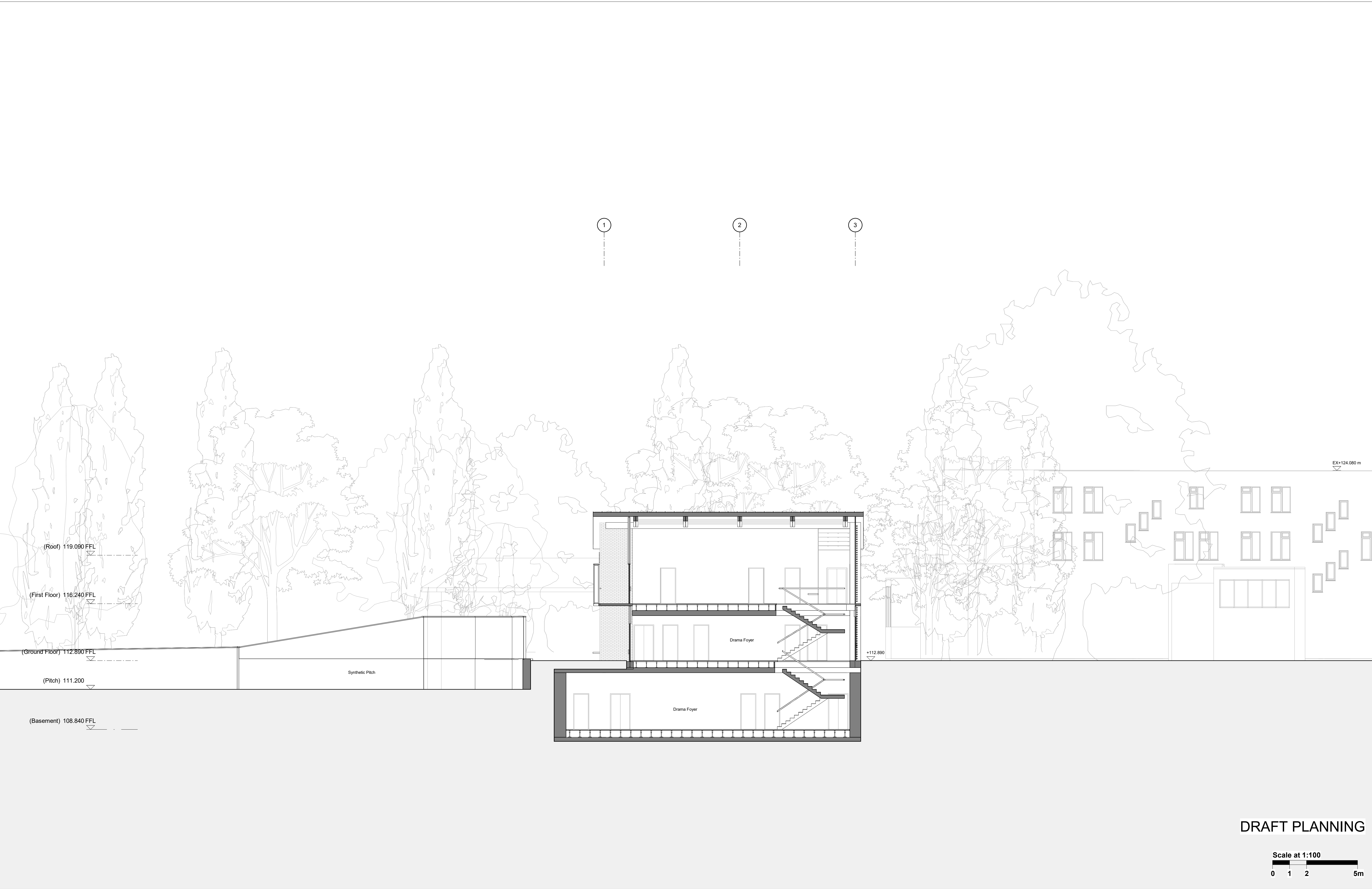
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						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG										
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						29.09.2018	G	Memo_0008_Stage 2 Issue	JG										
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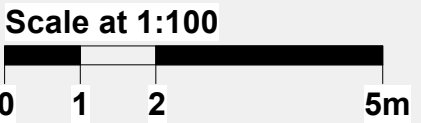
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						31.05.2018	A	Memo_0002_Draft GA Issue for Interim Cost Check	JG					Subject	Proposed GA Long Section Through Foyer	A/HS-RMC2	2510	H
						27.06.2018	B	Draft additional WCs layout	JG									
						29.06.2018	C	Memo_0004_Update GA progress issue	JG									
						16.07.2018	D	Draft Issue to Fire Consultant	JG									
						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG									
						27.07.2018	F	Memo_0006_Stage 2 Background & Costing Issue	JG									
						29.09.2018	G	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	H	Draft Planning Issue to Client	JW									
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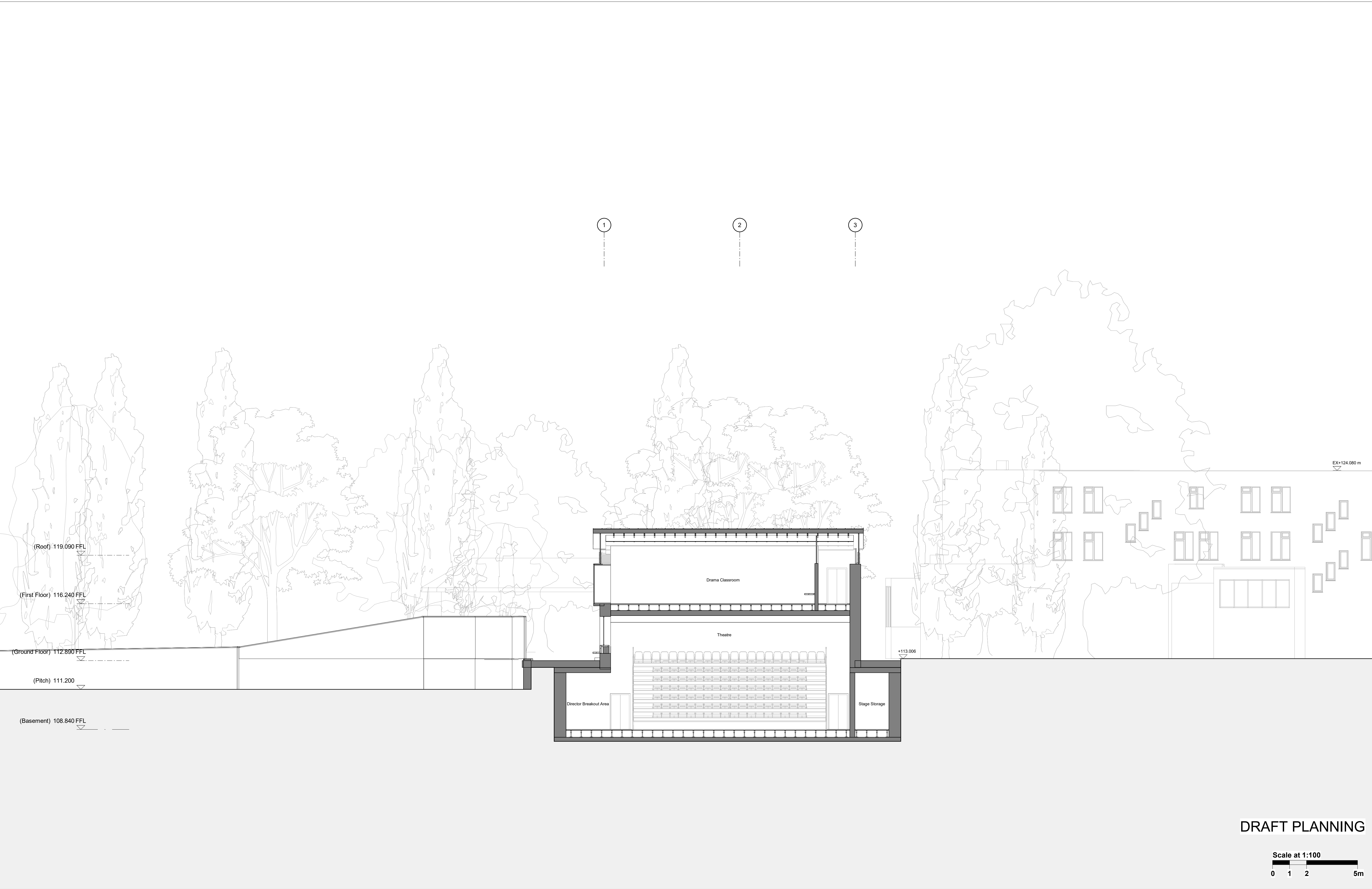
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						28.09.2018	B	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	C	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/24/18	Scale: 1 : 100	at A1



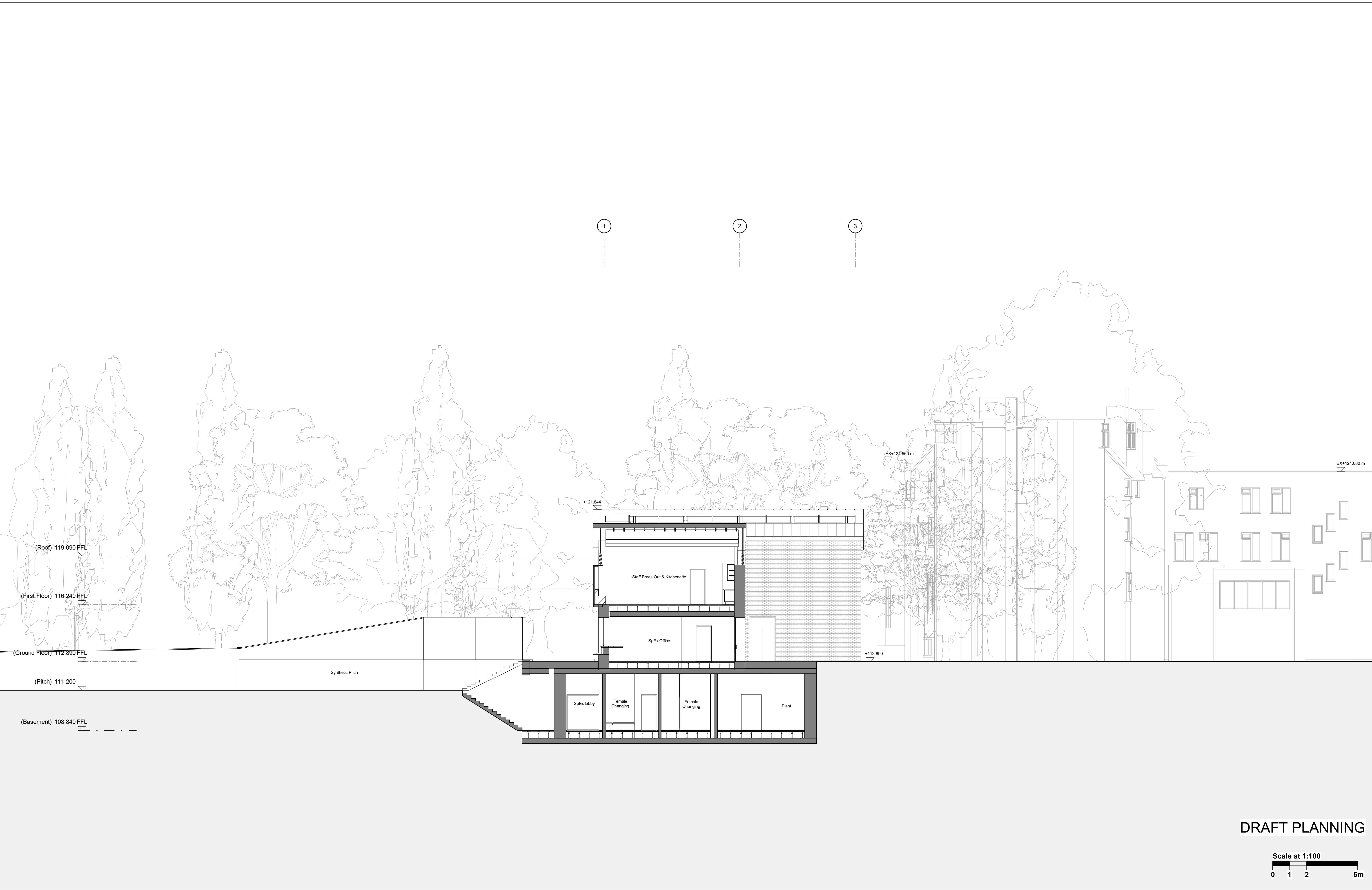
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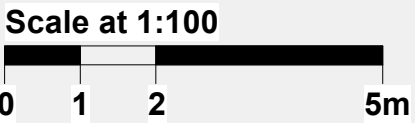
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						27.06.2018	B	Draft additional WCs layout	JG									
						29.06.2018	C	Memo_0004_Update GA progress issue	JG					Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/24/18	Scale: 1 : 100	at A1
						16.07.2018	D	Draft Issue to Fire Consultant	JG									
						20.07.2018	E	Memo_0005_Draft Stage 2 backgrounds issue	JG									
						27.07.2018	F	Memo_0006_Stage 2 Background & Costing Issue	JG									
						29.09.2018	G	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	H	Draft Planning Issue to Client	JW									



Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Highgate School Richards Music Centre 2	Sort Code	Drawing Number	Rev.
						27.07.2018	A	Memo_0006_Stage 2 Background & Costing Issue	JG					Subject	Proposed GA Cross Section Through Theatre	A/HS-RMC2	2513	C
						28.09.2018	B	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	C	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/24/18	Scale: 1 : 100	at A1

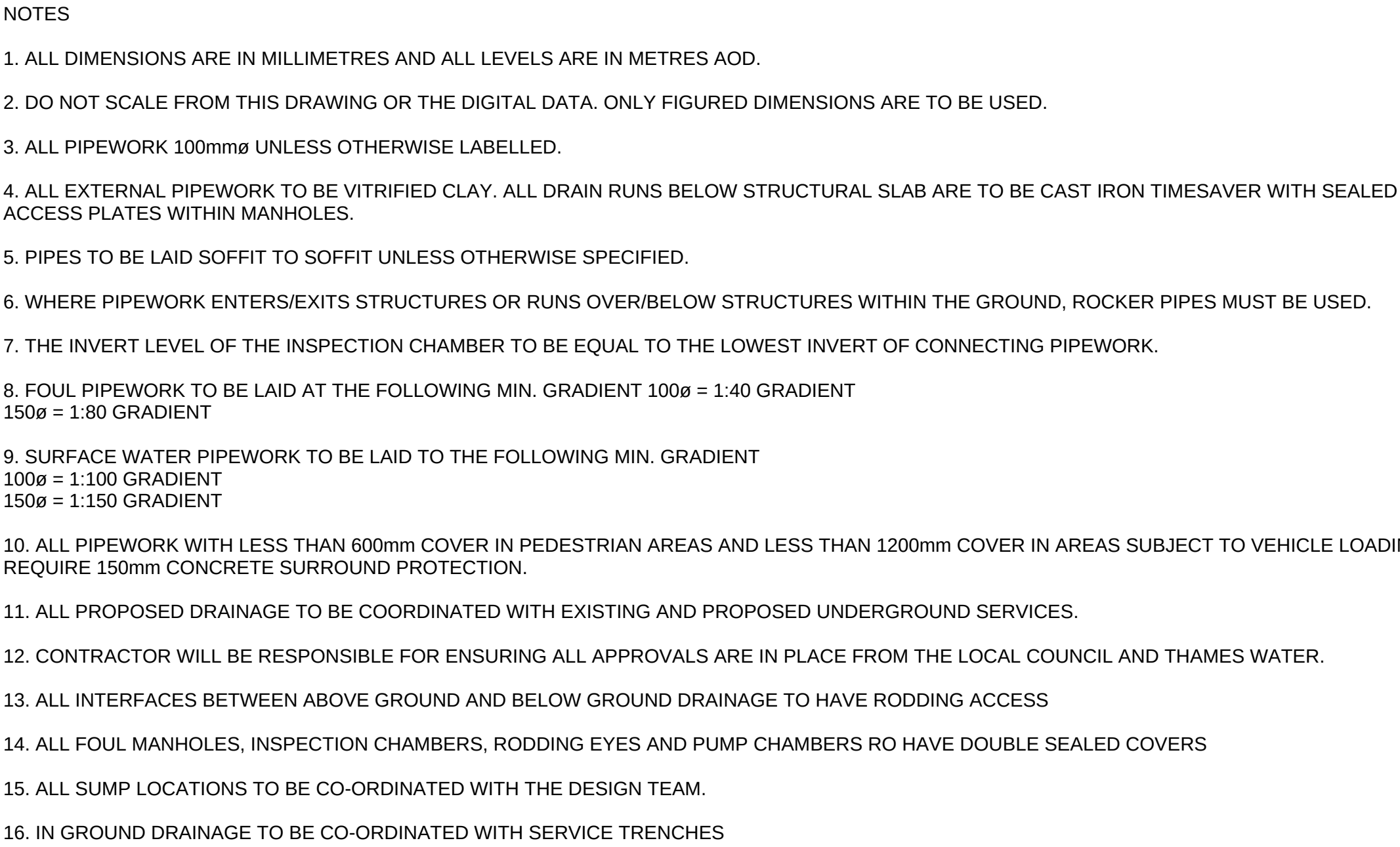


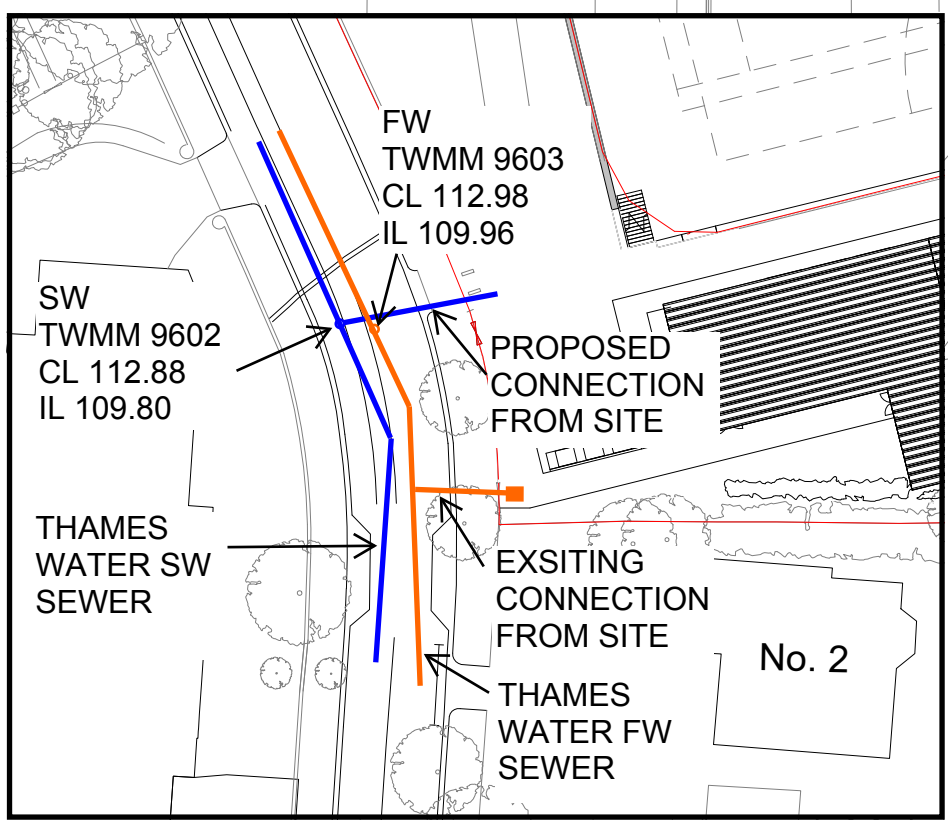
DRAFT PLANNING



Work Package	Cost Check	Info/Briefing	Tender	Contract	Construction	Date	Rev.	Description	Approved By	Date	Rev.	Description	Approved By	Project	Highgate School Richards Music Centre 2	Sort Code	Drawing Number	Rev.
						27.07.2018	A	Memo_0006_Stage 2 Background & Costing Issue	JG					Subject	Proposed GA Cross Section through offices/pitch connection stair	A/HS-RMC2	2514	C
						28.09.2018	B	Memo_0008_Stage 2 Issue	JG									
						11.07.2019	C	Draft Planning Issue to Client	JW									
														Architects	Hopkins Architects Limited 27 Broadley Terrace, London, NW1 6LG T: 020 7724 1751 E: mail@hopkins.co.uk	Date: 07/24/18	Scale: 1 : 100	at A1

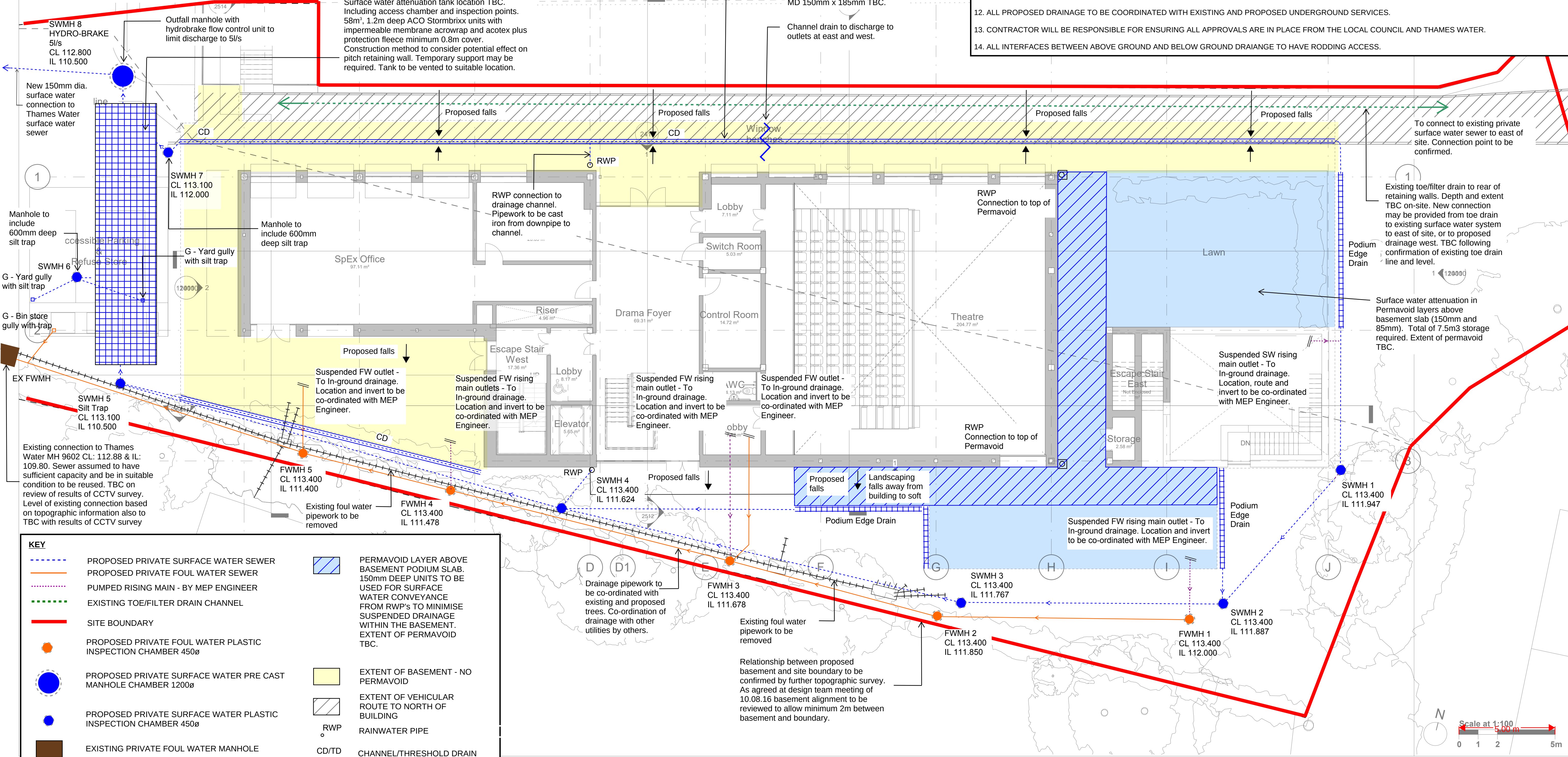
Appendix G – Drainage Drawings





PLAN VIEW OF PROPOSED SEWER CONNECTION WITHIN BISHOPSWOOD ROAD

- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES AOD.
 2. DO NOT SCALE FROM THIS DRAWING OR THE DIGITAL DATA. ONLY FIGURED DIMENSIONS ARE TO BE USED.
 3. A SURVEY OF THE EXISTING DRAINAGE IS REQUIRED TO CONFIRM ARRANGEMENT AND CAPACITY INCLUDING LOCATION, LEVELS AND SIZE OF ALL PIPEWORK AND CHAMBERS.
 4. ALL PIPEWORK 100mmØ UNLESS OTHERWISE LABELLED.
 5. ALL EXTERNAL PIPEWORK TO BE VITRIFIED CLAY. ALL DRAIN RUNS BELOW STRUCTURAL SLAB ARE TO BE CAST IRON.
 6. PIPES TO BE LAID SOFFIT TO SOFFIT UNLESS OTHERWISE SPECIFIED.
 7. WHERE PIPEWORK ENTERS/EXITS STRUCTURES OR RUNS OVER/BELOW STRUCTURES WITHIN THE GROUND, ROCKER PIPES MUST BE USED.
 8. THE INVERT LEVEL OF THE INSPECTION CHAMBER TO BE EQUAL TO THE LOWEST INVERT OF CONNECTING PIPEWORK.
 9. FOUL PIPEWORK TO BE LAID AT THE FOLLOWING MIN. GRADIENT 100Ø = 1:40 GRADIENT 150Ø = 1:80 GRADIENT
 10. SURFACE WATER PIPEWORK TO BE LAID TO THE FOLLOWING MIN. GRADIENT 100Ø = 1:100 GRADIENT 150Ø = 1:150 GRADIENT
 11. ALL PIPEWORK WITH LESS THAN 600mm COVER IN PEDESTRIAN AREAS AND LESS THAN 1200mm COVER IN AREAS SUBJECT TO VEHICLE LOADING REQUIRE 150mm CONCRETE SURROUND PROTECTION.
 12. ALL PROPOSED DRAINAGE TO BE COORDINATED WITH EXISTING AND PROPOSED UNDERGROUND SERVICES.
 13. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING ALL APPROVALS ARE IN PLACE FROM THE LOCAL COUNCIL AND THAMES WATER.
 14. ALL INTERFACES BETWEEN ABOVE GROUND AND BELOW GROUND DRAINAGE TO HAVE RODDING ACCESS.



KEY

---	PROPOSED PRIVATE SURFACE WATER SEWER	■	PERMAVOID LAYER ABOVE BASEMENT PODIUM SLAB. 150mm DEEP UNITS TO BE USED FOR SURFACE WATER CONVEYANCE FROM RWP'S TO MINIMISE SUSPENDED DRAINAGE WITHIN THE BASEMENT. EXTENT OF PERMAVOID TBC.
---	PROPOSED PRIVATE FOUL WATER SEWER	■	EXTENT OF BASEMENT - NO PERMAVOID
---	PUMPED RISING MAIN - BY MEP ENGINEER	■	EXTENT OF VEHICULAR ROUTE TO NORTH OF BUILDING
---	EXISTING TOE/FILTER DRAIN CHANNEL	○	RWP
---	SITE BOUNDARY	○	CD/TD
○	PROPOSED PRIVATE FOUL WATER PLASTIC INSPECTION CHAMBER 450Ø	---	CHANNEL/THRESHOLD DRAIN
●	PROPOSED PRIVATE SURFACE WATER PRE CAST MANHOLE CHAMBER 1200Ø	---	PODIUM EDGE DRAIN
●	PROPOSED PRIVATE SURFACE WATER PLASTIC INSPECTION CHAMBER 450Ø		
■	EXISTING PRIVATE FOUL WATER MANHOLE		
■	PERMAVOID LAYER ABOVE BASEMENT PODIUM SLAB. 85mm DEEP UNITS TO BE USED FOR SURFACE WATER CONVEYANCE GREEN ROOF TO MINIMISE SUSPENDED DRAINAGE WITHIN THE BASEMENT. EXTENT OF PERMAVOID TBC.		

Appendix H – LB Haringey Proforma

1. Project & Site Details	Project / Site Name (including sub-catchment / stage / phase where appropriate)	Richard Music Centre - Highgate Schools Project Pre-planning Drainage Statement
	Address & post code	Bishopswood Road, Highgate, London, N6 4PR
	OS Grid ref. (Easting, Northing)	E 528014 N 187601
	LPA reference (if applicable)	
	Brief description of proposed work	Proposed demolition of existing school building and construction of new building to include a basement that will take up a large area of the post development site.
	Total site Area	1893 m ²
	Total existing impervious area	1233 m ²
	Total proposed impervious area	1440 m ²
	Is the site in a surface water flood risk catchment (ref. local Surface Water Management Plan)?	No. Site is within Flood Zone 1
	Existing drainage connection type and location	Thames Water 225mm dia. foul sewer on Bishopswood Road (MH9603)
	Designer Name	Fred Labbe
	Designer Position	Associate Director
Designer Company	Expedition Engineering	

2. Proposed Discharge Arrangements	2a. Infiltration Feasibility		
	Superficial geology classification	Made Ground of varying thickness overlaying the Claygate formation.	
	Bedrock geology classification	London Clay	
	Site infiltration rate	0	m/s
	Depth to groundwater level	0.6-2.4	m below ground level
	Is infiltration feasible?	No	
	2b. Drainage Hierarchy		
		Feasible (Y/N)	Proposed (Y/N)
	1 store rainwater for later use	N	N
	2 use infiltration techniques, such as porous surfaces in non-clay areas	N	N
	3 attenuate rainwater in ponds or open water features for gradual release	N	N
	4 attenuate rainwater by storing in tanks or sealed water features for gradual release	Y	Y
	5 discharge rainwater direct to a watercourse	N	N
	6 discharge rainwater to a surface water sewer/drain	Y	Y
	7 discharge rainwater to the combined sewer.	Y	N
2c. Proposed Discharge Details			
Proposed discharge location	TW SW sewer on Bishopswood Road via new connection.		
Has the owner/regulator of the discharge location been consulted?	Yes		

3. Drainage Strategy	3a. Discharge Rates & Required Storage				
		Greenfield (GF) runoff rate (l/s)	Existing discharge rate (l/s)	Required storage for GF rate (m ³)	Proposed discharge rate (l/s)
	Q _{bar}	0.87			
	1 in 1	0.74	10.8	66	5
	1 in 30	2.01	27	66	5
	1 in 100	2.78	27	66	5
	1 in 100 + CC			66	5
	Climate change allowance used		40%		
	3b. Principal Method of Flow Control		Hydrobrake		
	3c. Proposed SuDS Measures				
		Catchment area (m ²)	Plan area (m ²)	Storage vol. (m ³)	
	Rainwater harvesting	0		0	
	Infiltration systems	0		0	
	Green roofs	0	0	0	
	Blue roofs	0	0	0	
Filter strips	0	0	0		
Filter drains	0	0	0		
Bioretention / tree pits	0	0	0		
Pervious pavements	0	0	0		
Swales	0	0	0		
Basins/ponds	0	0	0		
Attenuation tanks	1440		66		
Total	1440	0	66		

4. Supporting Information	4a. Discharge & Drainage Strategy	Page/section of drainage report
	Infiltration feasibility (2a) – geotechnical factual and interpretive reports, including infiltration results	Section 2.2 (Page 1) and Section 5.2 (Page 3) (Ground Investigation report included in Appendix C)
	Drainage hierarchy (2b)	Section 5.2 (Page 3)
	Proposed discharge details (2c) – utility plans, correspondence / approval from owner/regulator of discharge location	Section 5.4 (Page 4)
	Discharge rates & storage (3a) – detailed hydrologic and hydraulic calculations	Section 5.4 and 5.5 (Page 4) Appendix
	Proposed SuDS measures & specifications (3b)	Section 5.4 and 5.5 (Page 4) Appendix
	4b. Other Supporting Details	Page/section of drainage report
	Detailed Development Layout	SK C810 & SKC811 (Appendix F)
	Detailed drainage design drawings, including exceedance flow routes	SK C810 & SKC811 (Appendix F)
	Detailed landscaping plans	Appendix F
	Maintenance strategy	Section 7 (page 6)
	Demonstration of how the proposed SuDS measures improve:	
	a) water quality of the runoff?	Section 5.6 (page 5)
	b) biodiversity?	Section 5.7 (Page 5)
	c) amenity?	Section 5.7 (Page 5)

Appendix I – Drainage Calculations

Surface Water Calculations: Catchment Areas and Peak Flow Rates

Catchment Area

BS EN 752:2008
EN 752:2008 (E)

Typical Run off coefficients

Surface type	Runoff coefficient
Flat Roof	0.9
Paved / Hard Landscape	0.85
Soft Landscape	0.25
Gravel	0.85
Podium	0.85
Sedum roof	0.75

For calculating effective catchment areas of sloping roof and vertical surfaces refer to BSEN 12056-3:2000, 4.3 and NC.3 & NC.4

Table E.3 — Runoff coefficients for calculating runoff from small development schemes

Nature of connected area	Runoff Coefficient C	Comments
Impermeable areas and steeply sloping roofs ^a	0.9 to 1.0	Depending on depression storage
Large flat roofs	0.5	Over 10 000 m ²
Small flat roofs	1.0	Less than 100 m ²
Permeable areas	0.0 to 0.3	Depending on ground slope and cover

^a Impermeable areas may be increased by 30 % of large vertical surfaces.

Using Modified Rational Method - using all units in l, s & m² therefore it is not necessary to multiply by 2.78

Usage	Area (m2)	Runoff coefficient	Effective Catchment Area (m2)
Roof area	492	0.9	443
Hardstandings	741	0.85	630
Permeable	660	0.2	132
	Total effective catchment		1205
			0
	Total effective catchment		1205

Q			
10 yr (l/s)	30 yr (l/s)	100 yr (l/s)	2 Yr (l/s)
0.019422	0.026811	0.0355	0.0085
8.60	11.87	15.72	3.76
12.23	16.89	22.36	5.35
2.56	3.54	4.69	1.12
23.40	32.30	42.77	10.24

Peak Flow Rates, Q (l/s)

$$Q = C \times I \times A$$

Q is peak flow rate

C is runoff coefficient

i is rainfall intensity (l/s/m²)

A is area receiving rainfall

Rainfall intensities

Durations for roof surfaces is usually 15mins

Durations for external surfaces is usually 5min

Flow rates

1 in 5 (15min)	0.014777778 l/s/m2	
1 in 10 (15min)	0.019422222 l/s/m2	
1 in 30 (15 min)	0.026811111 l/s/m2	
1 in 100 (15 min)	0.0355 l/s/m2	l/s/m ²
1 in 2 (15 min)	0.0085 l/s/m2	l/s/m2
1 in X year return period 5/15 minute storm duration		
i =	0.014777778 l/s/m2	
Q =	2.832604444 l/s	

Calculated by:

Site name:

Site location:

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:

Longitude:

Reference:

Date:

Runoff estimation approach**Site characteristics**

Total site area (ha):

Methodology

Q_{BAR} estimation method:

SPR estimation method:

Soil characteristics

	Default	Edited
SOIL type:	4	4
HOST class:	N/A	N/A
SPR/SPRHOST:	0.47	0.47

Hydrological characteristics

	Default	Edited
SAAR (mm):	661	661
Hydrological region:	6	6
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes**(1) Is $Q_{BAR} < 2.0$ l/s/ha?**

When Q_{BAR} is < 2.0 l/s/ha then limiting discharge rates are set at 2.0 l/s/ha.

(2) Are flow rates < 5.0 l/s?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $SPR/SPRHOST \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q_{BAR} (l/s):	0.87	0.87
1 in 1 year (l/s):	0.74	0.74
1 in 30 years (l/s):	2	2
1 in 100 year (l/s):	2.78	2.78
1 in 200 years (l/s):	3.26	3.26

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

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STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FEH Rainfall Model

Return Period (years)	2
FEH Rainfall Version	2013
Site Location GB 528373 187529 TQ 28373 87529	
Data Type	Point
Maximum Rainfall (mm/hr)	150
Maximum Time of Concentration (mins)	30
Foul Sewage (l/s/ha)	0.000
Volumetric Runoff Coeff.	0.750
PIMP (%)	100
Add Flow / Climate Change (%)	0
Minimum Backdrop Height (m)	0.200
Maximum Backdrop Height (m)	1.500
Min Design Depth for Optimisation (m)	1.200
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	9.269	0.062	149.5	0.018	5.00	0.0	0.600	o	150	Pipe/Conduit	
1.001	13.670	0.137	99.8	0.005	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.002	21.398	0.214	99.8	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.003	23.904	0.905	26.4	0.059	0.00	0.0	0.600	o	150	Pipe/Conduit	
1.004	15.949	0.120	132.4	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit	
2.000	4.619	0.300	15.4	0.048	5.00	0.0	0.600	o	150	Pipe/Conduit	
3.000	10.726	1.292	8.3	0.014	5.00	0.0	0.600	o	150	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	66.25	5.19	111.947	0.018	0.0	0.0	0.0	0.82	14.5	3.2
1.001	64.89	5.42	111.885	0.023	0.0	0.0	0.0	1.01	17.8	4.0
1.002	62.92	5.77	111.748	0.023	0.0	0.0	0.0	1.01	17.8	4.0
1.003	61.86	5.97	111.534	0.082	0.0	0.0	0.0	1.97	34.8	13.7
1.004	60.34	6.28	110.628	0.082	0.0	0.0	0.0	0.87	15.4	13.7
2.000	67.27	5.03	111.800	0.048	0.0	0.0	0.0	2.58	45.6	8.7
3.000	67.13	5.05	111.800	0.014	0.0	0.0	0.0	3.52	62.2	2.5

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Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.005	16.106	0.247	65.2	0.000	0.00	0.0	0.600	o	225	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.005	59.55	6.44	110.433	0.144	0.0	0.0	0.0	1.62	64.5	23.2

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Manhole Schedules for Storm

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Diameter (mm)	PN	Pipes In Invert Level (m)	Diameter (mm)	Backdrop (mm)
SWMH1	113.400	1.453	Open Manhole	1200	1.000	111.947	150				
SWMH2	113.400	1.515	Open Manhole	1200	1.001	111.885	150	1.000	111.885	150	
SWMH3	113.400	1.652	Open Manhole	1200	1.002	111.748	150	1.001	111.748	150	
SWMH4	113.400	1.866	Open Manhole	1200	1.003	111.534	150	1.002	111.534	150	
SWMH5	113.100	2.472	Open Manhole	1200	1.004	110.628	150	1.003	110.628	150	
SWMH6	113.100	1.300	Open Manhole	1200	2.000	111.800	150				
SWMH7	113.100	1.300	Open Manhole	1200	3.000	111.800	150				
SWMH8	112.800	2.367	Open Manhole	1200	1.005	110.433	225	1.004	110.508	150	
								2.000	111.500	150	992
								3.000	110.508	150	
	112.880	2.694	Open Manhole	0		OUTFALL		1.005	110.186	225	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
SWMH1	528058.301	187605.759	528058.301	187605.759	Required	
SWMH2	528054.158	187597.468	528054.158	187597.468	Required	
SWMH3	528040.928	187594.029	528040.928	187594.029	Required	
SWMH4	528019.536	187593.505	528019.536	187593.505	Required	
SWMH5	527995.637	187593.991	527995.637	187593.991	Required	
SWMH6	527995.008	187606.212	527995.008	187606.212	Required	
SWMH7	527992.058	187598.730	527992.058	187598.730	Required	
SWMH8	527991.715	187609.451	527991.715	187609.451	Required	
	527975.875	187606.534			No Entry	

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PIPELINE SCHEDULES for Storm

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	150	SWMH1	113.400	111.947	1.303	Open Manhole	1200
1.001	o	150	SWMH2	113.400	111.885	1.365	Open Manhole	1200
1.002	o	150	SWMH3	113.400	111.748	1.502	Open Manhole	1200
1.003	o	150	SWMH4	113.400	111.534	1.716	Open Manhole	1200
1.004	o	150	SWMH5	113.100	110.628	2.322	Open Manhole	1200
2.000	o	150	SWMH6	113.100	111.800	1.150	Open Manhole	1200
3.000	o	150	SWMH7	113.100	111.800	1.150	Open Manhole	1200
1.005	o	225	SWMH8	112.800	110.433	2.142	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	9.269	149.5	SWMH2	113.400	111.885	1.365	Open Manhole	1200
1.001	13.670	99.8	SWMH3	113.400	111.748	1.502	Open Manhole	1200
1.002	21.398	99.8	SWMH4	113.400	111.534	1.716	Open Manhole	1200
1.003	23.904	26.4	SWMH5	113.100	110.628	2.322	Open Manhole	1200
1.004	15.949	132.4	SWMH8	112.800	110.508	2.142	Open Manhole	1200
2.000	4.619	15.4	SWMH8	112.800	111.500	1.150	Open Manhole	1200
3.000	10.726	8.3	SWMH8	112.800	110.508	2.142	Open Manhole	1200
1.005	16.106	65.2		112.880	110.186	2.469	Open Manhole	0

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Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	-	-	100	0.018	0.018	0.018
1.001	-	-	100	0.005	0.005	0.005
1.002	-	-	100	0.000	0.000	0.000
1.003	-	-	100	0.059	0.059	0.059
1.004	-	-	100	0.000	0.000	0.000
2.000	-	-	100	0.048	0.048	0.048
3.000	-	-	100	0.014	0.014	0.014
1.005	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.144	0.144	0.144

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
---------------------	--------------	--------------	--------------	------------------	----------	--------

1.005		112.880	110.186	109.800	0	0
-------	--	---------	---------	---------	---	---

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH
Return Period (years)	2
FEH Rainfall Version	2013
Site Location	GB 528373 187529 TQ 28373 87529
Data Type	Point
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

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Online Controls for Storm

Hydro-Brake® Optimum Manhole: SWMH8, DS/PN: 1.005, Volume (m³): 3.2

Unit Reference	MD-SHE-0097-5000-1600-5000
Design Head (m)	1.600
Design Flow (l/s)	5.0
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	97
Invert Level (m)	110.500
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	5.0
Flush-Flo™	0.425	4.7
Kick-Flo®	0.865	3.8
Mean Flow over Head Range	-	4.2

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	3.1	1.200	4.4	3.000	6.7	7.000	10.0
0.200	4.3	1.400	4.7	3.500	7.2	7.500	10.3
0.300	4.6	1.600	5.0	4.000	7.7	8.000	10.7
0.400	4.7	1.800	5.3	4.500	8.1	8.500	11.0
0.500	4.7	2.000	5.5	5.000	8.5	9.000	11.3
0.600	4.6	2.200	5.8	5.500	8.9	9.500	11.6
0.800	4.1	2.400	6.0	6.000	9.3		
1.000	4.0	2.600	6.3	6.500	9.7		

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Storage Structures for Storm

Tank or Pond Manhole: SWMH2, DS/PN: 1.001

Invert Level (m) 111.885

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	18.5	0.400	18.5	0.410	0.1

Tank or Pond Manhole: SWMH8, DS/PN: 1.005

Invert Level (m) 110.500

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	72.0	0.800	72.0	0.810	0.0	1.100	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	1	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Rainfall Model	FEH
FEH Rainfall Version	2013
Site Location	GB 528373 187529 TQ 28373 87529
Data Type	Point
Cv (Summer)	0.750
Cv (Winter)	0.840

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 180, 240, 360, 480, 600, 720, 960, 1440
Return Period(s) (years)	2, 30, 100
Climate Change (%)	0, 35, 40

PN	US/MH Name	Surcharged		Flooded		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.000	SWMH1	-0.101	0.000	0.23			3.0	OK	
1.001	SWMH2	-0.110	0.000	0.16			2.6	OK	
1.002	SWMH3	-0.111	0.000	0.15			2.6	OK	

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	Time (mins)	Flow (l/s)		
1.003	SWMH4	-0.094	0.000	0.29			9.6	OK	
1.004	SWMH5	-0.059	0.000	0.68			9.7	OK	
2.000	SWMH6	-0.101	0.000	0.23			7.9	OK	
3.000	SWMH7	-0.130	0.000	0.04			2.3	OK	
1.005	SWMH8	0.001	0.000	0.07			4.0	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1)
for Storm

PN	US/MH Name	Surcharged Flooded		Flow / Overflow		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Cap.	(l/s)	Time (mins)	Flow (l/s)		
1.003	SWMH4	0.415	0.000	0.96			31.8	SURCHARGED	
1.004	SWMH5	0.536	0.000	1.92			27.5	SURCHARGED	
2.000	SWMH6	-0.045	0.000	0.82			28.1	OK	
3.000	SWMH7	-0.112	0.000	0.15			8.2	OK	
1.005	SWMH8	0.568	0.000	0.08			4.7	SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged		Flooded		Half Drain	Pipe	Status	Level Exceeded
		Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Time (mins)	Flow (l/s)		
1.003	SWMH4	1.113	0.000	0.49			16.3	SURCHARGED	
1.004	SWMH5	2.001	0.000	1.10			15.8	SURCHARGED	
2.000	SWMH6	0.819	0.000	0.28			9.6	SURCHARGED	
3.000	SWMH7	0.817	0.000	0.05			2.8	SURCHARGED	
1.005	SWMH8	2.107	0.000	0.10			5.9	FLOOD RISK	

Appendix J – Maintenance schedule

Attenuation Tanks

Maintenance schedule	Required action	Typical frequency
Regular maintenance	Inspect and identify any areas that are not operating correctly. If required, take remedial action	Monthly for 3 months, then annually
	Remove debris from the catchment surface (where it may cause risks to performance)	Monthly
	For systems where rainfall infiltrates into the tank from above, check surface of filter for blockage by sediment, algae or other matter; remove and replace surface infiltration medium as necessary.	Annually
	Remove sediment from pre-treatment structures and/or internal forebays	Annually, or as required
Remedial actions	Repair/rehabilitate inlets, outlet, overflows and vents	As required
Monitoring	Inspect/check all inlets, outlets, vents and overflows to ensure that they are in good condition and operating as designed	Annually
	Survey inside of tank for sediment build-up and remove if necessary	Every 5 years or as required

Drainage Pipes

Maintenance schedule	Required action	Typical frequency
Regular Maintenance	Remove sediment and debris from inspection chambers	Annually
	Cleaning of gutters and any filters on downpipes	Annually
	Remove any root ingress	As required
Occasional Maintenance	CCTV survey of drains to check alignment, cracking and joint displacement	10 year intervals

Podium system/Green roofs

Maintenance schedule	Required action	Typical frequency
Regular inspections	Inspect all components including soil substrate, vegetation, drains, irrigation systems (if applicable), membranes and roof structure for proper operation, integrity of waterproofing and structural stability.	Annually and after severe storms
	Inspect soil substrate for evidence of erosion channels and identify any sediment sources	Annually and after severe storms
	Inspect drain inlets to ensure unrestricted runoff from the drainage layer to the conveyance or roof drain system	Annually and after severe storms
	Inspect underside of roof for evidence of leakage	Annually and after severe storms
Regular maintenance	Remove debris and litter to prevent clogging of inlet drains and interference with plant growth	Six monthly and annually or as required
	During establishment, replace dead plants as required	Monthly
	Post establishment, replace dead plants as required	Annually
	Remove fallen leaves and debris from deciduous plant foliage	Six monthly or as required
	Remove nuisance and invasive vegetation, including weeds	Six monthly or as required
	Mow grasses, prune shrubs and manage other planting as required	Six monthly or as required
Remedial actions	If erosion channels are evident, these should be stabilised with extra soil substrate similar to the original material, and sources of erosion damage should be identified and controlled	As required
	If drain inlet has settled, cracked or moved, investigate and repair as appropriate	As required

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