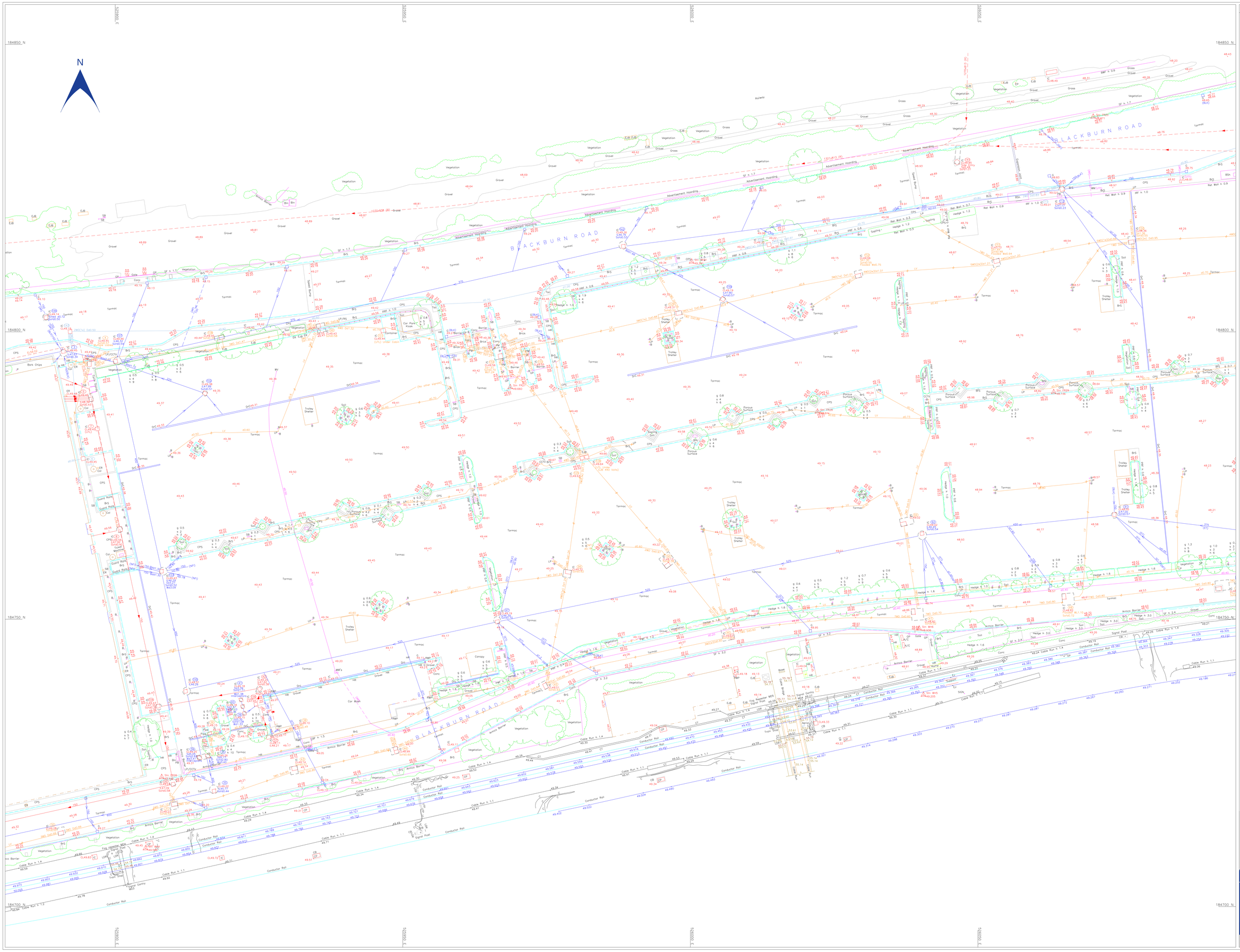

STANDARD ABBREVIATIONS

A/C	Air Conditioner	LB	Litter Bin
ATM	Automated Tolling Machine	LP	Lamp Post
B	Bollard	Max	Maximum
BB	Beltéma Beacon	Mh	Multiduct
Bh	Borehole	MH	Manhole
BL	Beam Level	Min	Minimum
Br	Brick	Mk	Marker
BrS	Brick Sets	NB	Name Board
BRW	Brick Retaining Wall	NP	Name Plate
BS	Bus Stop	OBF	Open Boarded Fence
BT	British Telecom	OH	Overhead
BW	Brick Wall	OSBM	Ordnance Survey Bench Mark
BWF	Barbed Wire Fence	P	Post
CBF	Close Boarded Fence	PB	Pillar Box
CCTV	Closed Circuit Television	PGM	Protection Board Ground Marker
CI	Corrugated Iron Fence	PLL	Pushbutton Light
CL	Cross Level	PM	Parking Meter
CLF	Chain Link Fence	PRF	Post and Rail Fence
Col	Column	PS	Paving Stones
Conc	Concrete	PWF	Post and Wire Fence
CoW	Cable on Wall	RE	Rodding Eye
CPS	Concrete Paving Slabs	RG	Road Gully
CTV	Cable Television IC	RS	Road Sign
Ct	Cattle	RTJ	Rail Expansion Joint
DC	Duct Cover	RWP	Rain Water Pipe
DH	Duct Height	s	spread
DP	Down Pipe	SB	Sign Board
DrC	Drainage Channel	SBM	Site Bench Mark
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ESG	Electrical Switchgear	SO	Smoke Outlet
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Fl	Floodlight	Tac	Tactile Paving
GV	Gas Valve	TBM	Temporary Bench Mark
h	Height	TCB	Telephone Call Box
GC	Gas Cock	TCP	Traffic Control Post
GM	Gas Meter	TIC	Telephone Inspection Cover
GP	Gate Post	TJB	Telephone Junction Box
GV	Gas Valve	TL	Traffic Light
h	Height	TLCB	Traffic Light Control Box
IC	Inspection Cover	TLIC	Traffic Light Inspection Cover
IL	Invert Level	TP	Trolley Line Pole
IRF	Iron Railing Fence	Typ	Typical
IRS	Illuminated Road Sign	V	Vent
JB	Junction Box	VM	Vent Pipe
KO	Kerb Outlet	WV	Window
L	Light	WW	Water Meter
		WV	Water Valve

SERVICE ABBREVIATIONS

(AR)	Assumed Route	PE	Depth to top of pipe
BdB	Back Drop Depth	PE	Polyethylene
BdL	Back Drop Level	(R)	From Records
(BLK)	Blocked	RWP	Rain water Pipe
CCTV	Closed Circuit TV	(S)	Service Cable
(COG)	Cable on Ground	SdM	Soffit Depth
CR	Cable Riser	Sd	Sump Depth
d	Depth of service (approx)	SL	Sump Level
(M)	Depth of duct	SPH	Sprinkler Head
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CT	Cable Trough/ring	P	Point
DEP	Designated Earthing Point	PB	Protection Board
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ER	Earthing Rod	S	Signal
FM	Fish Rail Weld	SH	Switch Heater
g	Girth	SM	Switch Motor
G	Gully	SPT	Signal Post Telephone
GG	Grease Gun	SR	Speed Restriction
GP	Grease Pit	SRE	Side Ramp End
h	Height	STB	Stretcher Bar
HABD	Hot Axle Box Detector	TBM	Temporary Marking
HR	Hand Rail	TF	Telegraph Pole
IB	Impedance Bond	TPMS	Train Protection Warning System
IBJ4	Insulated Block Joint 4	TR	Transition Rail
IBJ6	Insulated Block Joint 6	TW	Thermite Weld
		UTP	Under Track Pipe

SERVICE LEGEND

FOUL DRAINAGE
SURFACE WATER DRAINAGE
WATER
GAS
ELECTRICITY
TELEPHONE
CABLE TV
TRAFFIC CONTROL
UNKNOWN SERVICE
UNDERGROUND CHAMBER

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CLIENT

Landsec

100 Victoria Street
London
SW1E 5JE

PROJECT TITLE

O2 Centre

255 Finchley Road NW3 6LU

Topographic Survey and UGS

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY August 2018

PC PROJECT No. 40070 CHECKED DGR

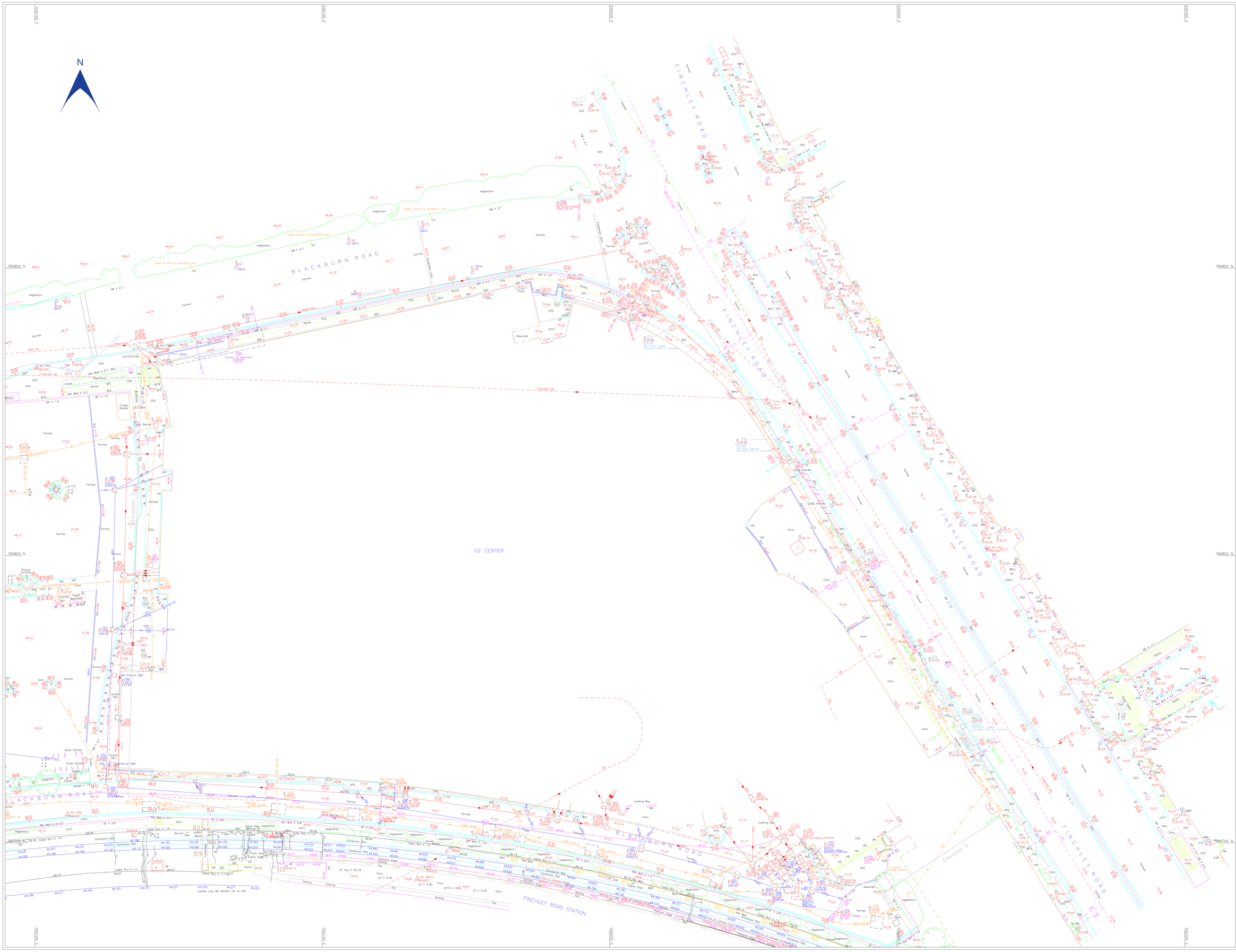
DRAWING No. ISSUE

40070T-01-3 E

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
Hertfordshire
AL5 5EQ
Tel: +44 (0)1582 765566
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

115 Southwark Bridge Road
London
SE1 0AX
Tel: +44 (0)207 490 7700



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IC	Inspection Cover	Typ	Typical
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B&L	Back Drop Level	(R)	From Records
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d	Depth of service (approx)	SL	Sump Level
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SERVICE LEGEND

- FOUL DRAINAGE
- SURFACE WATER DRAINAGE
- WATER
- GAS
- ELECTRICITY
- TELEPHONE
- CABLE TV
- TRAFFIC CONTROL
- UNKNOWN SERVICE
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CLIENT

Landsec

100 Victoria Street
London
SW1E 5JE

PROJECT TITLE

O2 Centre

255 Finchley Road NW3 6LU

Topographic Survey and UGS

PRESENTATION SCALE: 1:200 @ A0

DATE OF ORIGINAL SURVEY: August 2018

PC PROJECT No.: 40070 CHECKED: DGR

DRAWING No.: 40070T-01-4 ISSUE: E

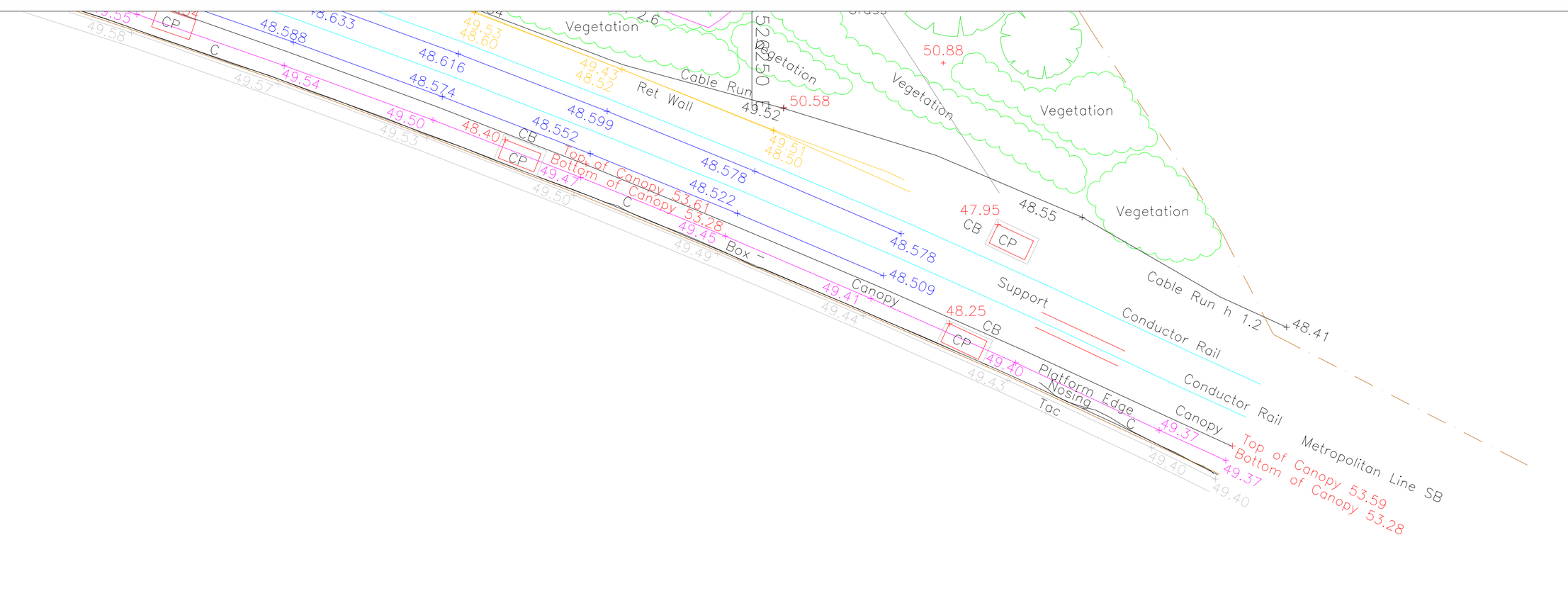
Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
Hertfordshire
AL5 5EQ
Tel: +44 (0)1582 765566
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

115 Southwark Bridge Road
London
SE1 0AX
Tel: +44 (0)207 490 7700

526100 E | 526150 E | 526200 E | 526250 E | 526300 E

N



184700 N

184650 N

184600 N

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40070T-01-1 | 40070T-01-2 | 40070T-01-3 | 40070T-01-4 | 40070T-01-5

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SW1E 5JE

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O2 Centre

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Topographic Survey and UGS

PRESENTATION SCALE 1:200 @ A0

DATE OF ORIGINAL SURVEY August 2018

PC PROJECT No. 40070 CHECKED DGR

DRAWING No. 40070T-01-5 ISSUE E

Plowman Craven

Plowman Craven House
2 Lea Business Park
Lower Luton Road
Harpenden
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AL5 5EQ

115 Southwark Bridge Road
London
SE1 0AX

Tel: +44 (0)1582 765566
Tel: +44 (0)207 490 7700
Email: post@plowmancraven.co.uk
Web: www.plowmancraven.co.uk

526100 E | 526150 E | 526200 E | 526250 E | 526300 E

Appendix B Development Proposals

KEY

- SITE BOUNDARY
- LANDSEC OWNERSHIP BOUNDARY
- RESIDENTIAL UNITS
- RESIDENTIAL AMENITY
- COMMERCIAL
- COMMUNITY SPACES
- WORK SPACES
- PLANT
- BIKE STORES
- REFUSE STORES

REV	DATE
01	06.08.21 - ISSUED FOR INFORMATION
02	16.08.21 - STAGE 2 ISSUE
03	24.09.21 - ISSUED FOR INFORMATION
04	28.09.21 - ISSUED FOR INFORMATION
04	28.09.21 - ISSUED FOR INFORMATION
05	29.09.21 - ISSUED FOR INFORMATION
06	13.10.21 - ISSUED FOR INFORMATION
07	06.12.21 - ISSUED FOR EIA

SCALE

0 20 50 100

NOTE

When this drawing is issued in uncontrolled CAD format it will be accompanied by a PDF version and is issued to enable the recipient to prepare their own documents / models / drawings for which they are solely responsible.
The recipient should report all drawing errors, omissions and discrepancies to the architect, All dimensions should be checked on site by the contractor and such dimensions shall be the contractor's responsibility.

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- any loss or degradation of the information held in this drawing resulting from the translation from the original file format to any other file format or from the recipients reading of it in any other programme or any version of the programme other than that which was used to prepare it
- the accuracy of survey information provided by others or for any costs, claims, proceedings and expenses arising out of reliance on such information
- any scaling from this drawing other than by the local planning authority solely for the purposes of the planning application to which it relates

LOCATION

N

ALLFORD HALL MONAGHAN MORRIS
ARCHITECTS Ltd
MORELANDS, 5-23 OLD STREET LONDON EC1V 9HL
TEL 020 7251 5261 FAX 020 7251 5123 WEB WWW.AHMM.CO.UK

job title
FINCHLEY ROAD

drawing title / location
PROPOSED LOWER GROUND FLOOR PLAN

drawn by	checked	scale	status
CJ	TC	1:1000@A1; 1:2000@A3	INFORMATION

project	zone	source	classification	drawing no.	revision
19066	X	A	(00)_100		07

Appendix C Micro Drainage Simulation Results

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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Maximum Rainfall (mm/hr)	0
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)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	0.000
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.877	4-8	2.198	8-12	0.063

Total Area Contributing (ha) = 5.138

Total Pipe Volume (m³) = 114.498

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

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)

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
S1.000	32.000	0.547	58.5	0.420	5.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	74.000	0.060	1233.3	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.002	54.000	0.130	415.4	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	88.000	0.440	200.0	0.420	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	36.000	0.030	1200.0	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.002	20.000	0.030	666.7	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	15.000	0.490	30.6	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	38.000	0.200	190.0	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	3.000	0.490	6.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	30.000	0.310	96.8	0.254	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	79.000	0.420	188.1	0.254	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	14.000	0.380	36.8	0.254	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	45.000	0.920	48.9	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	45.000	0.760	59.2	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	23.000	0.070	328.6	0.254	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.004	5.000	1.500	3.3	0.254	0.00	0.0	0.600	o	375	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)
S1.000	0.00	5.20	47.000	0.420	0.0	0.0	0.0	2.66	423.4	0.0
S1.001	0.00	7.16	46.450	0.840	0.0	0.0	0.0	0.63	136.2	0.0
S1.002	0.00	7.98	46.390	1.260	0.0	0.0	0.0	1.09	236.5	0.0
S2.000	0.00	6.15	46.760	0.420	0.0	0.0	0.0	1.28	141.1	0.0
S2.001	0.00	7.19	46.320	0.840	0.0	0.0	0.0	0.58	92.0	0.0
S2.002	0.00	7.61	46.290	1.260	0.0	0.0	0.0	0.78	124.0	0.0
S1.003	0.00	8.04	46.260	2.940	0.0	0.0	0.0	4.41	1247.5	0.0
S1.004	0.00	8.40	45.770	3.360	0.0	0.0	0.0	1.76	498.6	0.0
S1.005	0.00	8.41	45.570	3.360	0.0	0.0	0.0	9.88	2794.1	0.0
S3.000	0.00	5.49	48.070	0.254	0.0	0.0	0.0	1.02	18.1	0.0
S3.001	0.00	6.88	47.760	0.508	0.0	0.0	0.0	0.95	37.8	0.0
S3.002	0.00	6.97	47.340	0.762	0.0	0.0	0.0	2.60	183.7	0.0
S4.000	0.00	5.40	47.880	0.254	0.0	0.0	0.0	1.87	74.5	0.0
S5.000	0.00	5.44	47.720	0.254	0.0	0.0	0.0	1.70	67.7	0.0
S3.003	0.00	7.35	46.960	1.524	0.0	0.0	0.0	0.99	109.8	0.0
S3.004	0.00	7.36	46.890	1.778	0.0	0.0	0.0	9.98	1102.5	0.0

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
S1.006	2.000	0.004	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	20.000	0.080	250.0	0.000	0.00	0.0	0.600	o	1500	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)
S1.006	0.00	8.44	45.080	5.138	0.0	0.0	0.0	1.08	306.0	0.0
S1.007	0.00	8.56	44.670	5.138	0.0	0.0	0.0	2.71	4786.2	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 * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	1
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	1	+0%					47.121
S1.001	S2	15 Winter	1	+0%					46.807
S1.002	S3	15 Winter	1	+0%					46.700
S2.000	S4	15 Winter	1	+0%					46.935
S2.001	S5	15 Winter	1	+0%	1/15 Summer				46.796
S2.002	S6	15 Winter	1	+0%	1/15 Winter				46.748
S1.003	S4	15 Winter	1	+0%					46.541
S1.004	S5	15 Winter	1	+0%					46.191
S1.005	S6	15 Winter	1	+0%					45.974
S3.000	S10	15 Winter	1	+0%	1/15 Summer				48.776
S3.001	S11	15 Winter	1	+0%	1/15 Summer				48.233
S3.002	S12	15 Winter	1	+0%					47.540
S4.000	S13	15 Winter	1	+0%					47.994
S5.000	S14	15 Winter	1	+0%					47.841

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.329	0.000	0.16			58.9	OK	
S1.001	S2	-0.168	0.000	0.70			97.3	OK	
S1.002	S3	-0.215	0.000	0.63			134.4	OK	
S2.000	S4	-0.200	0.000	0.41			55.6	OK	
S2.001	S5	0.026	0.000	1.29			97.4	SURCHARGED	
S2.002	S6	0.008	0.000	1.79			139.5	SURCHARGED	
S1.003	S4	-0.319	0.000	0.45			313.6	OK	
S1.004	S5	-0.179	0.000	0.83			348.8	OK	
S1.005	S6	-0.196	0.000	0.49			347.1	OK	
S3.000	S10	0.556	0.000	1.32			22.8	SURCHARGED	
S3.001	S11	0.248	0.000	1.24			45.6	SURCHARGED	
S3.002	S12	-0.100	0.000	0.48			73.0	OK	
S4.000	S13	-0.111	0.000	0.49			35.2	OK	
S5.000	S14	-0.104	0.000	0.55			35.2	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S3.003	S13	15 Winter	1	+0%	1/15 Summer				47.462
S3.004	S14	15 Winter	1	+0%					47.055
S1.006	S7	15 Winter	1	+0%	1/15 Summer				45.920
S1.007	S8	15 Winter	1	+0%					45.125

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.003	S13	0.127	0.000	1.74			163.5	SURCHARGED	
S3.004	S14	-0.210	0.000	0.40			191.3	OK	
S1.006	S7	0.240	0.000	2.22			518.1	SURCHARGED	
S1.007	S8	-1.045	0.000	0.20			520.3	OK	

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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Maximum Rainfall (mm/hr)	0
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)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	0.000
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.877	4-8	2.198	8-12	0.063

Total Area Contributing (ha) = 5.138

Total Pipe Volume (m³) = 114.498

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

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)

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
S1.000	32.000	0.547	58.5	0.420	5.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	74.000	0.060	1233.3	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.002	54.000	0.130	415.4	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	88.000	0.440	200.0	0.420	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	36.000	0.030	1200.0	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.002	20.000	0.030	666.7	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	15.000	0.490	30.6	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	38.000	0.200	190.0	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	3.000	0.490	6.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	30.000	0.310	96.8	0.254	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	79.000	0.420	188.1	0.254	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	14.000	0.380	36.8	0.254	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	45.000	0.920	48.9	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	45.000	0.760	59.2	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	23.000	0.070	328.6	0.254	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.004	5.000	1.500	3.3	0.254	0.00	0.0	0.600	o	375	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)
S1.000	0.00	5.20	47.000	0.420	0.0	0.0	0.0	2.66	423.4	0.0
S1.001	0.00	7.16	46.450	0.840	0.0	0.0	0.0	0.63	136.2	0.0
S1.002	0.00	7.98	46.390	1.260	0.0	0.0	0.0	1.09	236.5	0.0
S2.000	0.00	6.15	46.760	0.420	0.0	0.0	0.0	1.28	141.1	0.0
S2.001	0.00	7.19	46.320	0.840	0.0	0.0	0.0	0.58	92.0	0.0
S2.002	0.00	7.61	46.290	1.260	0.0	0.0	0.0	0.78	124.0	0.0
S1.003	0.00	8.04	46.260	2.940	0.0	0.0	0.0	4.41	1247.5	0.0
S1.004	0.00	8.40	45.770	3.360	0.0	0.0	0.0	1.76	498.6	0.0
S1.005	0.00	8.41	45.570	3.360	0.0	0.0	0.0	9.88	2794.1	0.0
S3.000	0.00	5.49	48.070	0.254	0.0	0.0	0.0	1.02	18.1	0.0
S3.001	0.00	6.88	47.760	0.508	0.0	0.0	0.0	0.95	37.8	0.0
S3.002	0.00	6.97	47.340	0.762	0.0	0.0	0.0	2.60	183.7	0.0
S4.000	0.00	5.40	47.880	0.254	0.0	0.0	0.0	1.87	74.5	0.0
S5.000	0.00	5.44	47.720	0.254	0.0	0.0	0.0	1.70	67.7	0.0
S3.003	0.00	7.35	46.960	1.524	0.0	0.0	0.0	0.99	109.8	0.0
S3.004	0.00	7.36	46.890	1.778	0.0	0.0	0.0	9.98	1102.5	0.0

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
S1.006	2.000	0.004	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	20.000	0.080	250.0	0.000	0.00	0.0	0.600	o	1500	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)
S1.006	0.00	8.44	45.080	5.138	0.0	0.0	0.0	1.08	306.0	0.0
S1.007	0.00	8.56	44.670	5.138	0.0	0.0	0.0	2.71	4786.2	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 * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

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

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	2	+0%					47.140
S1.001	S2	15 Winter	2	+0%					46.871
S1.002	S3	15 Winter	2	+0%					46.760
S2.000	S4	15 Winter	2	+0%					46.987
S2.001	S5	15 Winter	2	+0%	2/15 Summer				46.866
S2.002	S6	15 Winter	2	+0%	2/15 Summer				46.792
S1.003	S4	15 Winter	2	+0%					46.608
S1.004	S5	15 Winter	2	+0%	2/15 Winter				46.461
S1.005	S6	15 Winter	2	+0%	2/15 Winter				46.253
S3.000	S10	15 Winter	2	+0%	2/15 Summer				49.228
S3.001	S11	15 Winter	2	+0%	2/15 Summer				48.575
S3.002	S12	15 Winter	2	+0%	2/15 Winter				47.674
S4.000	S13	15 Winter	2	+0%					48.013
S5.000	S14	15 Winter	2	+0%					47.901

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	-0.310	0.000	0.21			76.1	OK	
S1.001	S2	-0.104	0.000	0.90			125.8	OK	
S1.002	S3	-0.155	0.000	0.81			172.9	OK	
S2.000	S4	-0.148	0.000	0.52			70.6	OK	
S2.001	S5	0.096	0.000	1.65			124.1	SURCHARGED	
S2.002	S6	0.052	0.000	2.31			179.2	SURCHARGED	
S1.003	S4	-0.252	0.000	0.56			391.1	OK	
S1.004	S5	0.091	0.000	1.02			431.8	SURCHARGED	
S1.005	S6	0.083	0.000	0.62			438.1	SURCHARGED	
S3.000	S10	1.008	0.000	1.45			25.0	FLOOD RISK	
S3.001	S11	0.590	0.000	1.47			53.9	SURCHARGED	
S3.002	S12	0.034	0.000	0.59			90.1	SURCHARGED	
S4.000	S13	-0.092	0.000	0.64			45.4	OK	
S5.000	S14	-0.044	0.000	0.67			43.6	OK	

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S3.003	S13	15 Winter	2	+0%	2/15 Summer				47.565
S3.004	S14	15 Winter	2	+0%					47.076
S1.006	S7	15 Winter	2	+0%	2/15 Summer				46.069
S1.007	S8	15 Winter	2	+0%					45.176

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.003	S13	0.230	0.000	2.12			199.3	SURCHARGED	
S3.004	S14	-0.189	0.000	0.49			234.4	OK	
S1.006	S7	0.389	0.000	2.77			646.0	SURCHARGED	
S1.007	S8	-0.994	0.000	0.25			647.0	OK	

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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Maximum Rainfall (mm/hr)	0
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)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	0.000
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.877	4-8	2.198	8-12	0.063

Total Area Contributing (ha) = 5.138

Total Pipe Volume (m^3) = 114.498

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

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)

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
S1.000	32.000	0.547	58.5	0.420	5.00	0.0	0.600	o	450	Pipe/Conduit	
S1.001	74.000	0.060	1233.3	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S1.002	54.000	0.130	415.4	0.420	0.00	0.0	0.600	o	525	Pipe/Conduit	
S2.000	88.000	0.440	200.0	0.420	5.00	0.0	0.600	o	375	Pipe/Conduit	
S2.001	36.000	0.030	1200.0	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S2.002	20.000	0.030	666.7	0.420	0.00	0.0	0.600	o	450	Pipe/Conduit	
S1.003	15.000	0.490	30.6	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.004	38.000	0.200	190.0	0.420	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.005	3.000	0.490	6.1	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S3.000	30.000	0.310	96.8	0.254	5.00	0.0	0.600	o	150	Pipe/Conduit	
S3.001	79.000	0.420	188.1	0.254	0.00	0.0	0.600	o	225	Pipe/Conduit	
S3.002	14.000	0.380	36.8	0.254	0.00	0.0	0.600	o	300	Pipe/Conduit	
S4.000	45.000	0.920	48.9	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S5.000	45.000	0.760	59.2	0.254	5.00	0.0	0.600	o	225	Pipe/Conduit	
S3.003	23.000	0.070	328.6	0.254	0.00	0.0	0.600	o	375	Pipe/Conduit	
S3.004	5.000	1.500	3.3	0.254	0.00	0.0	0.600	o	375	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)
S1.000	0.00	5.20	47.000	0.420	0.0	0.0	0.0	2.66	423.4	0.0
S1.001	0.00	7.16	46.450	0.840	0.0	0.0	0.0	0.63	136.2	0.0
S1.002	0.00	7.98	46.390	1.260	0.0	0.0	0.0	1.09	236.5	0.0
S2.000	0.00	6.15	46.760	0.420	0.0	0.0	0.0	1.28	141.1	0.0
S2.001	0.00	7.19	46.320	0.840	0.0	0.0	0.0	0.58	92.0	0.0
S2.002	0.00	7.61	46.290	1.260	0.0	0.0	0.0	0.78	124.0	0.0
S1.003	0.00	8.04	46.260	2.940	0.0	0.0	0.0	4.41	1247.5	0.0
S1.004	0.00	8.40	45.770	3.360	0.0	0.0	0.0	1.76	498.6	0.0
S1.005	0.00	8.41	45.570	3.360	0.0	0.0	0.0	9.88	2794.1	0.0
S3.000	0.00	5.49	48.070	0.254	0.0	0.0	0.0	1.02	18.1	0.0
S3.001	0.00	6.88	47.760	0.508	0.0	0.0	0.0	0.95	37.8	0.0
S3.002	0.00	6.97	47.340	0.762	0.0	0.0	0.0	2.60	183.7	0.0
S4.000	0.00	5.40	47.880	0.254	0.0	0.0	0.0	1.87	74.5	0.0
S5.000	0.00	5.44	47.720	0.254	0.0	0.0	0.0	1.70	67.7	0.0
S3.003	0.00	7.35	46.960	1.524	0.0	0.0	0.0	0.99	109.8	0.0
S3.004	0.00	7.36	46.890	1.778	0.0	0.0	0.0	9.98	1102.5	0.0

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
S1.006	2.000	0.004	500.0	0.000	0.00	0.0	0.600	o	600	Pipe/Conduit	
S1.007	20.000	0.080	250.0	0.000	0.00	0.0	0.600	o	1500	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)
S1.006	0.00	8.44	45.080	5.138	0.0	0.0	0.0	1.08	306.0	0.0
S1.007	0.00	8.56	44.670	5.138	0.0	0.0	0.0	2.71	4786.2	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 * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	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	0
Number of Online Controls	0	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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Summer Storms	Yes
Winter Storms	Yes
Cv (Summer)	0.750
Cv (Winter)	0.840
Storm Duration (mins)	30

Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

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

Synthetic Rainfall Details

Rainfall Model	FEH
FEH Rainfall Version	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Cv (Summer)	0.750
Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0	DVD Status	OFF
Analysis Timestep	Fine	Inertia Status	OFF
DTS Status	ON		

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30
Climate Change (%)	0

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S1.000	S1	15 Winter	30	+0%	30/15 Summer	30/15 Summer			48.191
S1.001	S2	15 Summer	30	+0%	30/15 Summer				48.964
S1.002	S3	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.196
S2.000	S4	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.310
S2.001	S5	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.472
S2.002	S6	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.434
S1.003	S4	15 Winter	30	+0%	30/15 Summer				49.231
S1.004	S5	15 Winter	30	+0%	30/15 Summer				48.860
S1.005	S6	15 Winter	30	+0%	30/15 Summer				48.004
S3.000	S10	30 Winter	30	+0%	30/15 Summer	30/15 Summer			49.341
S3.001	S11	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.290
S3.002	S12	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.178
S4.000	S13	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.452
S5.000	S14	15 Winter	30	+0%	30/15 Summer	30/15 Summer			49.364

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S1.000	S1	0.741	140.798	0.95			347.6	FLOOD	5
S1.001	S2	1.989	0.000	2.26			316.1	FLOOD RISK	
S1.002	S3	2.281	6.826	1.54			327.3	FLOOD	2
S2.000	S4	2.175	51.042	1.76			236.6	FLOOD	4
S2.001	S5	2.702	12.152	3.34			251.5	FLOOD	2
S2.002	S6	2.694	3.977	4.56			354.3	FLOOD	2
S1.003	S4	2.371	0.000	0.98			685.7	FLOOD RISK	
S1.004	S5	2.490	0.000	1.99			839.2	SURCHARGED	
S1.005	S6	1.834	0.000	1.21			846.6	SURCHARGED	
S3.000	S10	1.121	41.225	2.10			36.4	FLOOD	8
S3.001	S11	1.305	29.554	2.00			73.4	FLOOD	5
S3.002	S12	1.538	8.160	1.01			153.4	FLOOD	2
S4.000	S13	1.347	12.458	1.31			93.3	FLOOD	4
S5.000	S14	1.419	14.207	1.40			90.5	FLOOD	4

Summary of Critical Results by Maximum Level (Rank 1) for Storm

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
S3.003	S13	15 Winter	30	+0%	30/15 Summer				49.103
S3.004	S14	15 Winter	30	+0%	30/15 Summer				48.454
S1.006	S7	15 Winter	30	+0%	30/15 Summer				47.264
S1.007	S8	15 Summer	30	+0%					45.404

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m^3)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
S3.003	S13	1.768	0.000	3.58			336.0	FLOOD RISK	
S3.004	S14	1.189	0.000	0.88			421.4	SURCHARGED	
S1.006	S7	1.584	0.000	5.44			1268.3	SURCHARGED	
S1.007	S8	-0.766	0.000	0.48			1240.0	OK	

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	1999
Site Location	GB 526100 184450 TQ 26100 84450
C (1km)	-0.025
D1 (1km)	0.330
D2 (1km)	0.277
D3 (1km)	0.234
E (1km)	0.332
F (1km)	2.519
Maximum Rainfall (mm/hr)	0
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)	0.000
Maximum Backdrop Height (m)	0.000
Min Design Depth for Optimisation (m)	0.000
Min Vel for Auto Design only (m/s)	1.00
Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Time Area Diagram for Storm

Time (mins)	Area (ha)	Time (mins)	Area (ha)	Time (mins)	Area (ha)
0-4	2.877	4-8	2.198	8-12	0.063

Total Area Contributing (ha) = 5.138

Total Pipe Volume (m^3) = 114.498

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

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)